



The Clean Power Plan: Issues to Watch

by CPR Member Scholars William W. Buzbee, David M. Driesen,
Kirsten H. Engel, Victor B. Flatt, Robert L. Glicksman, Emily
Hammond, Alice Kaswan, Alexandra B. Klass, Thomas O. McGarity,
Melissa Powers, and Joseph P. Tomain



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For more information about the authors, see page 88.

The Center for Progressive Reform
455 Massachusetts Ave., NW, #150-513
Washington, DC 20001 202.747.0698
info@progressivereform.org

Direct media inquiries to Matthew Freeman or Erin Kesler, 202.747.0698,
mfreeman@progressivereform.org or ekesler@progressivereform.org.

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Contents

Introduction	1
Executive Summary.....	3
Section I: The Clean Power Plan: A Brief Primer	8
Section II: Confronting Challenges to the Clean Power Plan.....	10
Recalcitrant States and the Federal Implementation Plan.....	11
The Constitution and the Clean Power Plan.....	14
EPA’s Systemwide Approach: The Policy and Legal Debate on Regulating Beyond the Fenceline	19
Judicial Review of the Clean Power Plan: A Roadmap	25
Section III: Implications for the Energy Sector	30
State Agency Coordination, Policy Options, and Jurisdictional Considerations	31
The Clean Power Plan and the Electricity Industry.....	33
Reliability and the Clean Power Plan	37
The Clean Power Plan and Clean Energy Policy.....	41
Regional Approaches to State Power Plan Compliance	46
Section IV: Discrete Implementation Issues	52
Should the Clean Power Plan Embrace Cap-and-Trade Programs for Greenhouse Gas Reductions, Including Offsets?	53
EPA’s Treatment of States	59
A Mass-Based Cap for Power Plants.....	64
The Clean Power Plan and Environmental Justice.....	68
About the Authors.....	87

The Clean Power Plan: Issues to Watch

Introduction

With federal climate legislation no longer politically viable, the Obama Administration has abandoned efforts to achieve legislation tailored to address the problem, and instead turned to its existing authority under the Clean Air Act (CAA). Although an imperfect tool for the purpose, the law does allow the Administration — the Environmental Protection Agency (EPA), to be specific — to make important progress reducing carbon pollution from power plants. That regulatory effort has proceeded along two tracks, one that seeks lower emissions from new or rebuilt power plants, and one that seeks to reduce emissions from existing power plants.

That second track — existing power plants — is known as the Clean Power Plan, and it is the subject of this paper from the Center for Progressive Reform (CPR). The paper compiles 13 separately authored essays from 11 CPR Member Scholars, each addressing a different topic related to the Clean Power Plan, and each representing the expertise and views of its individual author(s).

Power plants are the single largest stationary source contributor to greenhouse gases (GHGs). Electrical generating units (EGUs) emit 32 percent of the nation’s GHG emissions, exceeding industry’s 20-percent contribution. EPA’s Clean Power Plan for addressing existing power plants could have a dramatic impact on the nation’s energy mix, its GHG emissions, and on accompanying co-pollutants.

In the Plan, EPA addresses power plant emissions through § 111 of the CAA. In September, 2013, EPA proposed its current approach to *new* power plants under § 111(b).¹ In June 2014, EPA then issued the Clean Power Plan, the agency’s proposal for addressing *existing* power plants under CAA § 111(d)².

As implemented by EPA, § 111(d) establishes shared federal and state authority — cooperative federalism, as it is known. Under this structure, EPA must first establish federal emission guidelines for source categories based upon the “best system of emission reduction . . . adequately demonstrated” (BSER) for reducing power plant emissions. It is then the states’ task to develop state implementation plans (SIPs) for meeting the federal guidelines — for showing how their existing sources will attain the federal standard. If states fail to submit an adequate SIP, EPA has the authority to promulgate a Federal Implementation Plan (FIP). In addition to finalizing its rule for existing sources, EPA will publish a proposed FIP in the summer of 2015.

EPA’s proposed Clean Power Plan presents the federal government’s emission guidelines for existing power plants. The Plan has sparked heated legal and policy debates because it takes a novel approach to establishing emission guidelines. The plan has defined BSER to include a range of activities that can reduce existing power plant emissions. These include not only “inside the fence” measures undertaken at the source, but also such “beyond the fenceline” measures that take place outside of power plants but reduce power plant emissions, such as increased use of existing natural gas, renewable energy, and consumer energy efficiency that reduces the demand for energy. By expanding the range of permissible reduction strategies, EPA has significantly increased the plan’s scope. Not coincidentally, this allows the Plan to make a much more significant dent in greenhouse gas emissions in a cost-effective way.

Marshalling CPR Member Scholars' wide-ranging expertise on relevant legal and policy questions posed by EPA's Clean Power Plan, this policy paper identifies a number of the key issues that CPR Member Scholars are closely watching as EPA finalizes its rule and proposes a FIP. The paper explains the issues and how the proposed CPP addressed them. The authors offer their unique perspectives on what to watch for in the final rule this summer and what states should do to achieve the most from EPA's ambitious Clean Power Plan.

Executive Summary

Laying the groundwork for the discrete analyses to follow, the paper begins with a short section sketching basic information about CAA § 111(d) and EPA's proposed Clean Power Plan. From there, it is divided into three major sections. The second section addresses a number of likely policy and legal challenges to the CPP, including whether states should participate, the constitutionality of the CPP, the legal and policy issues associated with EPA's adoption of a systemwide approach rather than one that seeks emissions reductions only from activities that take place "inside the fenceline," and a primer on the administrative law principles likely to shape the courts' review of the final CPP rule.

The third section addresses the CPP's implications for the energy sector, considering its impact on the energy industry, its impact on reliability, implications for transitioning to a clean energy economy, and the opportunities and challenges for multi-state regional compliance given the interconnected energy grid.

The fourth section addresses several discrete implementation issues, including the legal and policy issues raised by compliance through cap-and-trade, a close look at the federal-state relationship under § 111(d) and its implications for the stringency of state targets, the use of mass-based versus rate-based state targets, and the CPP's indirect implications for environmental justice, an issue that arises through the CPP's important impacts both on GHGs and on traditional pollutants.

Confronting the Challenges to the CPP

Should States Participate? CPR Member Scholar and EPA expert Thomas O. McGarity responds to Senator Mitch McConnell's call for states to simply boycott the state implementation planning process. He observes that boycotting states might be shooting themselves in the foot. States that fail to engage in their own planning would become subject to an EPA-written Federal Implementation Plan that is likely to be more inflexible and offer fewer low-cost compliance mechanisms than the flexible state-controlled planning process envisioned under the Clean Power Plan.

Constitutionality: As soon as the CPP is released, critics will launch their legal attacks. Environmental and constitutional law scholars William W. Buzbee and Robert L. Glicksman respond to numerous constitutional attacks already lodged against the CPP, many of them spearheaded by constitutional law scholar Lawrence Tribe as counsel for the coal industry. Buzbee and Glicksman argue that the CPP does not tread on any constitutionally suspect ground, addressing:

- *Nondelegation doctrine:* The authors maintain that CPP opponents' nondelegation claim — that Congress' lack of clarity gave the agency too much power — is a makeweight with no support under existing precedent.
- *Takings doctrine:* The "takings claim" — that the plan's economic impacts unconstitutionally "take" power plants' property — is similarly far-fetched in light of existing precedent.
- *Federalism:* Buzbee and Glicksman carefully explore the heart of the constitutional claims: that the CPP, by indirectly addressing critical energy policy choices, is improperly treading on state's rights in violation of the 10th Amendment, which preserves states' rights. They demonstrate that the CPP's cooperative federalism structure, which leaves many critical decisions to the states, is typical of many environmental statutes and fully consistent with settled federalism principles and the constitution.
- *"Unconstitutional" commandeering of state authority:* In response to the claim that potential sanctions for failure to comply with the CAA, like the loss of highway funds, unconstitutionally coerce states to comply, Buzbee and Glicksman demonstrate that the states retain viable options and that the CAA's financial incentives do not unconstitutionally commandeer the states.

EPA's Systemwide Approach: Glicksman and Buzbee tackle another central cross-cutting controversy: the CPP's systemwide approach, which considers emission-reducing measures that require activities beyond the fenceline. It is widely anticipated that EPA will retain its systemwide approach when it issues the final rule, encouraging states to achieve power plant emission reductions by such means as energy conservation, increased efficiency, and renewable energy alternatives. Glicksman and Buzbee argue that a systemwide approach is both wise as a matter of policy and legally defensible.

- *Wise policy:* By basing state targets on a wide range of measures that reduce emissions from existing power plants, including shifting generation to existing natural gas plants, meeting feasible renewable energy targets, and promoting consumer energy efficiency that reduces demand, EPA has recognized the interconnected nature of the energy system and the wide array of measures that impact emissions. Allowing states to employ a variety of mechanisms to reduce emissions lets them choose the most cost-effective mechanisms, allows EPA to achieve greater aggregate GHG reductions, and helps facilitate a transition to a more sustainable energy system.
- *Legally sound:* Glicksman and Buzbee explain that the CAA instructs EPA to identify the best *system* of emission reduction, providing clear textual support for EPA's analysis of the energy sector as an interconnected system and EPA's inclusion of numerous feasible emission reduction mechanisms. EPA's § 111(d) emissions guidelines are performance standards, not strict technological requirements, and it makes sense for EPA to consider all of the mechanisms available for achieving improved performance.
- *An Administrative Law Primer:* As the foregoing discussion reveals, there is little question that the constitutionality and legality of the CPP will be challenged in court, likely as soon as the final rule is released. Because courts use principles of administrative law to structure their review of agency rules, CPR Member Scholar and administrative law expert Melissa Powers provides an overview of the potentially relevant administrative law principles that the courts are likely to utilize — and the parties are likely to argue.

Implications for the Energy Sector

Much of the CPP's promise, and almost all of its attendant controversy, stems from its potential to significantly impact the U.S. energy sector. CPR Member Scholars address a range of issues in this area:

Energy Governance: CPR Member Scholar Emily Hammond, an expert on administrative and energy law, takes up two governance issues. First, she considers the implications of the traditional regulatory divide between electricity and environmental policy. After illustrating the importance of agency coordination generally, Hammond emphasizes that to ensure a reliable, green electricity system under the CPP, state environmental agencies, which have primary authority for CPP compliance, will need to carefully coordinate with state utility commissions, which have primary authority over electricity generation and delivery. Second, she notes recent case law suggesting that states' policy options for compliance may be limited depending on whether their electricity markets are restructured. Regardless, in light of preemption concerns, Hammond urges that states exercise caution in formulating CPP compliance options, if they wish to address wholesale electricity market dysfunctions that under-incentivize investment in reliable, low-carbon electricity.

Impacts on the Energy Industry: Assuming that the final CPP continues to base state targets on renewable energy and increased consumer energy efficiency, utilities will likely continue to argue that the CPP threatens their viability as an industry. CPR Member Scholar Joseph P. Tomain, an expert on the history and structure of the energy system, argues that electricity sector spokespeople overstate the likely economic impact of the CPP and undervalue its capacity to adapt to change, a capacity demonstrated

repeatedly over the last several decades. He further observes that many utilities and states are already taking steps consistent with the CPP. Because the industry's capacity to adapt is not only a function of industry willingness to innovate, but also of appropriate and responsive state regulatory structures, Tomain urges states to evaluate and adjust their utility regulations to ensure that they facilitate rather than impede utility compliance with the CPP.

Electricity Reliability: Utilities have also argued that, if the final CPP follows the lead of the draft, it could compromise the reliability of the U.S. energy supply. Tackling the articulated reliability concerns one by one, Tomain argues that none of the asserted risks to reliability are significant. Although the CPP will contribute to the existing trend of retiring coal-fired power plants, new renewables, including distributed renewables, plus increased energy efficiency, can fill the gap. States employing renewables will face new challenges in ensuring adequate load-balancing — having supply when it is needed — but they have successfully managed the challenge to date. He acknowledges that new energy resources will require new transmission planning and investment, often on a multi-state level. Many states are, however, already actively engaged in such planning, and others should follow their lead. Tomain argues that the states and utilities have the capacity to engage in the planning and investment necessary to meet the expected CPP targets without compromising reliability, and all within EPA's expected compliance deadlines.

Transitioning to Clean Energy: Like the draft CPP, the final CPP is likely to allow states to employ whatever means they choose to achieve state targets — whether or not the specific mechanism was included in calculating the state's target. Tomain observes that, although EPA's flexibility has many advantages, it also poses certain perils. Certain paths, like industry-wide efficiency standards, renewable energy, and consumer energy efficiency standards, are likely to lead to a true transition to a clean energy economy. Other paths, like adopting carbon capture and sequestration, nuclear energy, and increased reliance on natural gas (particularly natural gas recovered through fracking) pose multiple environmental risks and could jeopardize progress toward truly clean energy. Notwithstanding the CPP's expected flexibility, Tomain urges states to avoid investing in environmentally questionable energy choices and to choose more environmentally sustainable compliance paths.

Regional Collaboration: Opportunities and Challenges. Although the final CPP will set state-specific targets, the energy grid in much of the country crosses state lines. Energy law expert and CPR Member Scholar Alexandra B. Klass analyzes the benefits and limitations of regional collaboration to meet targets, an option permitted in the proposed rule and expected to continue in the final CPP. She notes that regional multistate collaboration better reflects the realities of the existing grid and offers efficiencies as each state maximizes its most cost-effective options. She identifies the different forms of collaboration that could be possible. Klass notes that states may be unlikely to engage in the formal collaboration envisioned by the draft CPP, but that other forms of collaboration, such as separate targets combined with interstate trading, could offer significant benefits. The draft CPP created questions about how to “count” and track reductions across states, so an important issue to watch will be the degree to which the final CPP allows and facilitates more informal collaborations. In addition, Klass observes that states may wish to convert their state targets into mass-based targets to facilitate regional interstate trading and avoid accounting complexities that could emerge with rate-based targets.

Discrete Implementation Issues

Cap-and-Trade. The draft CPP allowed states to meet their state targets through the use of existing or newly developed intrastate or interstate cap-and-trade programs, and the final CPP is expected to follow suit. CPR Member Scholars address the wisdom and legality of allowing cap-and-trade as a compliance option, and then focus on the issues presented by the use of offsets or non-utility reductions to meet the target.

- *The Wisdom and Legality of Allowing Cap-and-Trade:* CPR Member Scholar Robert L. Glicksman argues that the cap-and-trade option reduces costs for states, increases the efficiency of emission reductions, and builds on existing state GHG reduction programs, like the northeastern states' Regional Greenhouse Gas Initiative (RGGI) program and California's trading program. Although § 111(d) does not explicitly refer to trading programs, the courts have upheld trading programs in other regulatory contexts, and § 111 references another statutory provision (§ 110) that explicitly endorses the use of trading programs.
- *The Use of Offsets and non-GHG Allowances to Meet State Targets:* Although EPA allows states to meet their state targets with cap-and-trade programs, the draft CPP nonetheless required that the states demonstrate actual reductions from existing electricity plants; utilities and states cannot demonstrate compliance by using allowances from non-EGU sources or offsets, like credits for carbon sequestered through forest conservation. That creates a disjunct with existing GHG cap-and-trade programs, like RGGI, which allows offsets, and California's cap-and-trade program, which allows offsets, allowances from non-EGU sources, and allowances from non-U.S. sources. It is unclear whether the final rule will or will not allow the use of non-power plant reductions to count. CPR Member Scholars weigh in on the debate, offering their views on the policy and constitutional merits of the approach.
 - *Policy Arguments in Favor of Counting non-EGU Sources:* CPR Member Scholar Victor Flatt, an expert on environmental trading systems, argues that the final rule should allow states to count non-power plant reductions because that approach would be more economically efficient, would facilitate later extensions of EPA's § 111(d) authority to additional industries, would make it easier to integrate state and regional programs into emerging international trading markets, and would facilitate compliance for those states that already have GHG trading programs that extend beyond EGUs.
 - *Policy Arguments Against Counting non-EGU Sources:* CPR Member Scholar Alice Kaswan argues that the final rule should not allow non-power plant sources to count. She asserts that the current targets were set based upon the potential for reductions in the electricity sector, and that allowing the use of offsets would undercut the incentives to transition to cleaner energy. Moreover, if power plants can use offsets to continue emitting, then fewer associated co-pollutant benefits will be achieved.
- *Legal Arguments Supporting the Use of Non-Power Plant Sources:* Regardless of the policy debate, would it be legal for EPA to allow non-power plant sources? CPR Member Scholar Victor Flatt analyzes the statutory language and concludes that it does not require that GHG reductions come from specific sources or from EGU sources themselves. He argues that the systemwide approach, and its acceptance of "beyond the fenceline" reductions, likewise supports acceptance of non-EGU reductions. Moreover, § 111(d) is a statutory gap-filler that explicitly references § 110, which addresses criteria pollutants and allows substantial state flexibility, suggesting the legality of allowing such flexibility under § 111(d) as well.

Cooperative Federalism and the Question of State Targets. The final CPP, derived from the CAA's cooperative federalism structure, will reflect a particular power dynamic between the federal government

and the states. CPR Member Scholar Kirsten H. Engel, an expert on environmental federalism, describes federal and state roles under the CPP, and observes the degree to which each state's target, though based on a common methodology, reflects the starkly different energy paths that states have followed in the past. She analyzes the pros and cons of this approach. In the expectation that the final methodology and resulting state targets will track the proposed rule, she highlights the fact that EPA's approach, while requiring something from all states, essentially defers to the states' existing patterns, so that states that have already engaged in measures to reduce emissions will be expected to continue that trajectory, while states that have done little in the past are likely to have much more modest targets.

Mass-based Targets versus Rate-Based Targets. EPA's draft rule established emissions-rate-based targets for each state, restricting the amount of carbon dioxide that could be emitted per megawatt hour of electricity produced. However, EPA allowed states to convert the rate-based target to a mass-based target that reflects the total expected emissions. While this may appear to be an arcane technicality, the choice between rate-based and mass-based targets has important implications for the administration and integrity of the targets. CPR Member Scholar David M. Driesen, an authority on environmental law policy mechanisms, argues that mass-based caps better match EPA's ultimate objective of reducing emissions, because they set a fixed limit rather than allowing emissions to increase when and if economic activity increases. Moreover, mass-based targets better match the mechanisms EPA has identified for reducing emissions, since most of the building block mechanisms reduce the quantity, not the rate, of coal-fired power plant emissions. Mass-based targets also make it easier to keep track of reductions, an advantage that both simplifies administration and reduces the risk of gaming the system. Driesen suggests that the final rule should establish mass-based targets for each state. If, however, it continues to allow the same flexibility offered in the draft rule, he urges states to convert their rate-based targets into mass-based targets.

The Clean Power Plan and Environmental Justice. GHGs are not emitted alone; power plant emissions simultaneously emit health-impairing levels of traditional pollutants, including sulfur oxides, nitrogen oxides, particulates, and mercury. Because strategies to reduce GHGs will inevitably impact such associated co-pollutants, their ancillary implications for co-pollutants is a key variable. CPR Member Scholar Alice Kaswan, an expert on climate justice, observes that the draft CPP's systemwide approach enables more stringent reduction targets than could be achieved by source-specific regulation, which substantially increases not only GHG reductions, but aggregate co-pollutant reductions. In considering the distributional impacts of potential compliance mechanisms, Kaswan explains the environmental justice critique of cap-and-trade. She argues, however, that, as applied in the energy sector and as limited by EPA's draft rule, cap-and-trade may have fewer relative drawbacks than other GHG cap-and-trade programs. In looking ahead to the final rule, a key question will be whether the state targets remain stringent enough to induce a shift to clean energy. Because the critical impacts of the CPP will be determined by state energy planning, another key question will be whether the federal government will follow the advice of environmental justice groups and require states to analyze the environmental justice implications of their state implementation plans. To maximize the environmental justice benefits of CPP compliance, Kaswan urges states to engage in comprehensive energy planning that retires the most harmful plants, encourages the least polluting energy alternatives like renewables and energy efficiency, and that addresses the social impacts of energy transition, including higher energy prices.

Section I: The Clean Power Plan: A Brief Primer

At the outset, EPA determined that the “best system of emission reduction” (BSER) for existing power plants could be achieved through a system-wide approach that takes advantage of both “inside the fence” options at power plants and “beyond the fenceline” options, like renewable energy, nuclear power, and consumer energy efficiency, all of which reduce emissions from existing power plants. EPA assessed each state’s capacity to achieve reductions through available measures and set interim (by 2020) and final (by 2030) carbon intensity targets for each state to achieve. In other words, each state must reduce the amount of carbon per unit of energy generated. Adding up the emission rates each state is required to achieve and translating that into actual predicted emissions, EPA estimates that the states, collectively will, by 2030, reduce emissions by 30 percent below 2005 emissions,³ an achievement that will demonstrate that the U.S. is at least beginning to do its part to address its contribution to global warming, and that will increase pressure on other nations to follow suit.

Under the CPP, each state is required to develop a state implementation plan (SIP) to demonstrate how it will achieve its EPA-set emissions-reductions target. States that develop their own SIPs will have significant flexibility to determine how they will reach the target. Although EPA defined each state’s target by identifying a range of available measures, EPA did not directly require each state to take the measures used to calculate its target. Instead, EPA gave each state the flexibility to achieve its target through any combination of mechanisms, including but not limited to the means used to set the target. In contrast, states that fail to produce a SIP will cede back to the federal government the authority to decide how emissions reductions from existing plants will be achieved.

In establishing state-specific targets under the draft plan, EPA applied the same BSER formula to each state, a formula that consists of four “building blocks.” The first building block consists of traditional source-specific regulation: on-site retrofits and efficiency upgrades that could improve an individual facility’s emissions’ rate, so that it takes less energy to make energy. EPA has determined that, on average, the nation’s coal-fired power plants could engage in retrofits that achieve a 6-percent reduction in emissions rates, and so EPA assumed each state could achieve a 6-percent reduction through on-site improvements.⁴

The remaining building blocks reflect the fact that power plant emissions are determined not only by on-site actions at power plants, but by “beyond the fenceline” measures that reduce demand for coal-fired power and thus reduce emissions from coal-fired power plants. Including these building blocks allowed EPA to include numerous additional measures that can much more significantly reduce GHG emissions from our existing power sector than more limited on-site tinkering.

The second building block consists of shifting energy generation from more-polluting coal-fired power plants to less-polluting natural gas plants and to nuclear generation. Because many natural gas plants are currently underutilized, EPA projects that natural gas plants could run at 70 percent of their capacity, and so EPA assumed that each state could shift coal-fired generation to available natural gas plants currently operating at less than 70 percent of their capacity.⁵

The third building block considers zero-emission energy sources, including renewables and nuclear power. Increasing energy generation from renewables and nuclear power will drive down the need to generate power, and carbon emissions, from fossil fuel-fired power plants. EPA evaluated the renewable portfolio standards in nearby states to assess the degree to which renewable energy options were available to each state.⁶ In addition, state targets were based on the assumption that states would complete nuclear power plants now under construction and avoid retiring 6 percent of the existing nuclear generation.⁷

The fourth building block addresses consumer-side energy efficiency measures, such as efficient light bulbs and home insulation, which can reduce demand for electricity, thereby lowering emissions from existing facilities. EPA assumed that states could increase their energy efficiency by 1.5 percent annually.⁸

As noted, the CPP gives states considerable flexibility in meeting the state targets. In developing their SIPs, states could impose a range of direct requirements and incentives, including facility-specific emission rate requirements, emissions-averaging systems that encourage utilities to generate more electricity from natural gas than from coal, renewable portfolio standards, or energy efficiency programs. They could also work with utilities to shut down the most polluting sources and shift generation to less-polluting or non-polluting alternatives. Although not included in the BSER calculation, states could build new natural gas facilities, implement carbon capture and storage, or invest in nuclear energy; what matters is achieving the required emissions reductions from coal-fired power plants, not how the states achieve them.

Significantly, states are permitted to adopt cap-and-trade programs, singly or in combination with other states. To facilitate the use of cap-and-trade, which seeks to achieve an absolute limit on emissions rather than a certain carbon intensity rate, EPA allows states to translate the carbon intensity standard into a mass-based target that sets an absolute cap on the state's emissions. The cap in a cap-and-trade program would limit carbon emissions, and, if functioning effectively, create a price signal and consequent incentives for activities that would lead to reductions from existing facilities, including on-site improvements, shifts from coal to natural gas, and renewable energy and energy efficiency investments.

Section II: Confronting Challenges to the Clean Power Plan

From the start, the Clean Power Plan has been controversial, fundamentally because it challenges the existing status quo of our energy system. President Obama campaigned in 2008 on a promise to take federal action on the matter, but legislative efforts stalled under the Democratic-controlled Congress early in his first term. The President had long maintained that in the absence of congressional action, he would direct EPA to use its existing authority under the Clean Air Act to regulate emissions. The Clean Power Plan is one product of that effort.

Many of the same players who rose to challenge earlier climate legislation are similarly opposed to regulatory approaches to the problem. Their objections are both large and small, broadly challenging EPA's authority to regulate on the one hand, and disputing the fine details of EPA's method of regulating on the other. This section is devoted to examining some of the broader challenges to the CPP's overall scheme.

Recalcitrant States and the Federal Implementation Plan

By Thomas O. McGarity

The Clean Power Plan (CPP) envisions that the states will bear the primary responsibility for implementing its goals. Some Republican politicians, however, have been urging states to sabotage the CPP by refusing to implement it. This section explains why refusing to implement the CPP is a very bad idea for the recalcitrant state, for its electric power industry, and for its citizens.

State Opposition to the Clean Power Plan

The CPP proposal generated a great deal of opposition in some states.⁹ Soon after EPA introduced it, the governors of 15 states denounced the plan as an unwarranted intrusion on their states' economies.¹⁰ Twelve states joined Murray Energy Corp. in a challenge to the CPP while EPA was still taking comments on the proposed rule.¹¹

In March 2015, Sen. Mitch McConnell (R-KY) urged states to “think twice” before submitting state implementation plans (SIPs) to EPA to implement the CPP.¹² He suggested that if enough states boycotted the planning process, EPA would not “be able to demonstrate the capacity to carry out such political extremism.”¹³ A “just say no” policy would also give Congress “more time to fight back.”¹⁴ In any event, McConnell warranted that EPA’s Federal Implementation Plan (FIP) could not be much worse than a state plan that was sufficiently stringent to meet with EPA’s approval.¹⁵

At least two states have apparently signed on to McConnell’s plan. In April 2015, Oklahoma’s Republican governor, Mary Fallin, signed an executive order declaring that Oklahoma would not submit a Clean Power Plan SIP at the same time that she vetoed state legislation providing for implementing such a SIP.¹⁶ The Pennsylvania legislature passed legislation prohibiting the Pennsylvania Department of Environmental Protection from submitting a greenhouse gas SIP without first securing the approval of both houses of the legislature.¹⁷

But the governors of many other states declined McConnell’s invitation.¹⁸ Even the governor of McConnell’s home state of Kentucky concluded that a state-drafted plan would be superior to a “one-size-fits-all policy imposed by Washington, D.C.”¹⁹ These states were wise to cooperate with EPA, even though they may not have been thrilled by the prospect of writing and enforcing SIPs for greenhouse gases.

State and Federal Roles Under the Clean Air Act

The Clean Air Act assigns important roles to both the federal EPA and the states. State implementation plans to implement federal standards are nothing new. Under § 109 of the statute, EPA must promulgate ambient air quality standards for ubiquitous pollutants that may endanger public health or welfare.²⁰ Section 110 then tells the states to write SIPs containing various requirements and/or economic incentives that are necessary to achieve the ambient standards by prescribed deadlines.²¹ EPA must then approve the plan if it meets the requirements of § 110. If EPA disapproves the plan and the state fails to correct the problems with the plan, EPA must write its own FIP for the state and enforce that plan.

Although we will not know what EPA has in mind for recalcitrant states until it publishes the generic FIP, it is likely to be less industry-friendly than the SIPs that states could develop on their own.... The prospect of EPA imposing an ill-fitting FIP on states that do not have approved SIPs should therefore serve as a powerful incentive to power plant operators to demand that state legislatures and agencies promulgate acceptable SIPs.

Section 111(d) of the Clean Air Act requires EPA to establish “a procedure similar to that provided by” § 110 for establishing standards of performance for existing sources and for implementing those standards of performance.²² The statute thus anticipates that individual states will, pursuant to guidelines provided by EPA, write SIPs for establishing and enforcing standards of performance subject to EPA approval.

But what about recalcitrant states that fail to submit implementation plans for EPA approval, that submit plans that do not establish adequate standards of performance, or that do not adequately enforce EPA-approved implementation plans? Section 111(d)(2) grants to EPA “the same authority” to prescribe a FIP that it has under § 110(c) and the same authority to enforce the plan that it has to enforce SIPs under § 113 and § 114.²³ Thus, if a state elects not to go along with the program EPA establishes for existing sources under § 111(d), EPA must write and enforce a FIP for the state, and EPA, not the state, will choose among the available implementation and enforcement options.

Ample precedent exists for EPA writing FIPs for the few states that choose to be recalcitrant. A very recent precedent involves EPA’s program for implementing its regulations for issuing permits to new and modified sources of greenhouse gases (GHG) under the Clean Air Act’s program for preventing significant deterioration (PSD) of air quality in areas that meet national air quality standards. After EPA promulgated its “tailoring rule,” which prescribed how states should amend their SIPs to provide for applying the PSD permit requirements to new and modified sources, nearly 80 percent of the states told EPA that they would put GHG permitting programs into effect by the January 2, 2011 deadline.²⁴ Even states that were challenging EPA’s authority to promulgate the tailoring rule wanted to put their own programs into effect so that their environmental agencies could administer the new GHG permit requirements.²⁵ Although six states reported that they lacked authority to administer GHG permitting programs and would be unable to submit an approvable plan by the deadline, they all agreed to accept the FIP that EPA was in the process of preparing.²⁶ The state of Texas refused to revise its SIP or to accept the FIP.²⁷ After issuing a “SIP call” declaring that the plans for the 13 states and Texas were “substantially inadequate,” EPA in late December 2011 promulgated FIPs that took over the permitting process for new and modified stationary sources of GHGs in eight states, including Texas.²⁸ Power plants in those states had to seek one permit from the state agency for emissions of pollutants other than GHGs and another permit from EPA for GHG emissions.²⁹

EPA’s use of FIPs has often served as a catalyst to prompt states’ eventual compliance. For example, after the D.C. Circuit rejected the states’ challenge to the tailoring rule on standing grounds,³⁰ the affected industries lobbied state legislatures to pass authorizing legislation. It did not take long for all of the states, including Texas, to submit and secure EPA approval of SIPs implementing the GHG permit program.³¹

Why States Should Write Their Own SIPs

For power plants in states that fail to submit adequate SIPs for implementing the CPP rule, things could be much worse than for states that refuse to implement the tailoring rule. EPA is in the process of writing a generic FIP that will guide its regional offices in crafting state-specific FIPs for states that fail to submit adequate SIPs. It plans to publish the draft FIP along with the final CPP rule.³² Although we will not know what EPA has in mind for recalcitrant states until it publishes the generic FIP, it is likely to be less industry-friendly than the SIPs that states could develop on their own.³³ A FIP might very well require separate EPA-enforced permits for GHG emissions from existing power plants like the separate EPA-enforced permits implementing the tailoring rule. Most importantly, EPA, in implementing a FIP, has fewer, and less desirable, emission-reduction options than the states. States, in their SIPs, can rely on an array of cost-effective and beneficial emission-reduction strategies, including demand response, energy conservation, and renewable energy programs. But EPA probably lacks the power to create such

programs, and is likely to have direct authority only over power plants. Thus, the FIP is likely to demand that the target be met through more emissions reductions from the power plants over which it does have control.³⁴ The additional costs of dual regulation and additional costs that arise due to the inability to require low-cost emission reduction measures will ultimately be borne by the state's ratepayers. The prospect of EPA imposing an ill-fitting FIP on states that do not have approved SIPs should therefore serve as a powerful incentive to power plant operators to demand that state legislatures and agencies promulgate acceptable SIPs.³⁵

Conclusion

Some state governors and regulators may be tempted to use the publication of the final CPP rule as an opportunity to thumb their noses at the federal government. While that may win debate points with some of their federal government-hating constituents, it will not be a good thing for the electric power industry in those states. Nor will it be good for the ratepayers who will have to pick up the tab for an inefficient dual regulatory system.

Recommendations

- EPA should ensure that power plants in any state that lacks an adequate SIP achieve the CPP's GHG emission reduction goals for that state using all of the tools available to the agency, including imposing a FIP if necessary.
- Because states have more regulatory options for achieving the goals of the CPP, states should not heed the advice of a few obstructionist politicians to refuse to implement the Clean Power Plan.
- Instead, states should aggressively implement those goals by submitting SIPs to EPA that ensure that the GHG reduction targets in the Plan are achieved by the deadlines set forth in the CPP.

The Constitution and the Clean Power Plan

By William W. Buzbee and Robert L. Glicksman

Since EPA's publication of the Clean Power Plan § 111(d) proposed rule, claims of constitutional infirmity have been made by opponents and scholars, including Harvard Law School Professor Laurence Tribe, acting as a private lawyer for a large coal company opposed to the rule. Some claims primarily reflect dissatisfaction with the manner in which Congress structured the Clean Air Act rather than claims of constitutional infirmity, while other arguments do implicate constitutional questions, although we find it unlikely that EPA's final rule will run afoul of the Constitution. This section breaks out the main constitutional concerns and claims, showing how EPA's action is both constrained by the Constitution yet unlikely to violate it because, under existing Supreme Court precedent, the CPP meets the Court's clear parameters for forms of permissible regulation. If issued in a form substantially similar to the proposed rule, the final § 111(d) rule should easily surmount any constitutional challenges.

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The 'Delegation Doctrine'

Opponents of the CPP have asserted that a congressional drafting error created a fundamental ambiguity and thus failed to provide the agency with sufficiently clear direction. Rarely in U.S. history has the Supreme Court found violations of the "delegation doctrine," which is also sometimes called the "nondelegation doctrine." The basic concept behind this body of constitutional law is that Congress cannot give away its legislative power to an executive agency; the legislative power cannot be delegated. As articulated by the courts, the doctrine really boils down to a prohibition on empty, overly broad delegations to agencies. The law must provide an "intelligible principle" to guide agencies in the exercise of delegated authority and discretion. However, the Supreme Court has found violations of this doctrine in only two cases, both from the early New Deal.

Since then, in case after case, the Court has upheld very broad delegations of power, sometimes even involving short statutes that provide little more than a mandate to an agency to act in the "public interest." In the 2001 *Whitman v. American Trucking* case,³⁶ the Supreme Court not only rejected a nondelegation challenge to portions of the Clean Air Act, but also to a large extent put a nail in the doctrine's coffin. The Court's opinion, by noted conservative Justice Antonin Scalia, cited to many cases upholding delegations that, in fact, are far broader than language at issue in that case or in § 111(d). The Court acknowledged judicial discomfort with telling Congress how narrowly to confer power on agencies. Since the § 111(d) regulation is part of the same lengthy and quite detailed law as the one at issue in *American Trucking*, such a claim is unlikely to prevail.

Another element of *American Trucking* is also important here. CPP critics have suggested that, even if the delegation is too broad, EPA could remedy the infirmity with a narrower approach to its § 111(d) regulation. However, the Court has made clear that, if there is a nondelegation doctrine infirmity, nothing EPA could do could save its action because the problem stems from Congress' overly broad or vague

language. The nondelegation doctrine cannot be used by CPP adversaries to indirectly steer the agency in a desired regulatory direction.

Opponents of EPA's proposed rule have identified a specific aspect of the Clean Air Act provision purporting to authorize EPA to issue the rule that, they claim, violates the delegation doctrine. When Congress amended the Clean Air Act in 1990, it passed and the President signed two versions of § 111(d) that are slightly different, without reconciling them.³⁷ The rule's opponents assert that this drafting error and resulting ambiguity create a delegation doctrine infirmity. Under this theory, the very need for a harmonizing or reconciling agency interpretation to make sense of the law is evidence of a missing "intelligible principle." Here, EPA's final rule and accompanying explanation in its "preamble" and possible accompanying legal memoranda could be somewhat important, although not literally able to cure a nondelegation problem (far-fetched though it is). Were EPA to throw up its proverbial hands and be so imprudent as to claim it could do whatever it wants to reconcile and harmonize the two clashing enactments, that might give litigants and reviewing courts an opening to find a nondelegation infirmity. But EPA is highly unlikely to do so. Instead, as in the proposed rule and accompanying materials, EPA will be able to make sense of these provisions despite the interpretive challenges they pose. Such dueling enactments, as with hundreds of other settings where laws or provisions leave an important ambiguity, do not create a constitutional crisis. Instead, they create an ambiguity where, under the oft-cited *Chevron* case, an agency is given first crack at providing a reasonable interpretation and will usually receive substantial deference from reviewing courts.³⁸ And drafting errors have never been the basis for a law's invalidation under the delegation doctrine.

Takings Violations?

Perhaps the most far-fetched claim of those asserting a constitutional infirmity in the § 111(d) rule is that requiring power plants to reduce their pollution gives rise to a "takings" claim. Although government regulation can in rare instances give rise to a "regulatory takings" claim based on the regulation's profound impact on private property rights, requiring the government either to abandon the regulation or provide "just compensation" for the loss in value, ordinary regulation by governments to address a risk to safety, health, or the environment does not cause a taking just because compliance will cost the regulated industry money or even, in the long term, make it less competitive. Such a claim is so untenable that this analysis will move to more nuanced claims, although they, too, are unlikely to be successful.

Federalism and 10th Amendment Claims

Professor Tribe and others have also claimed that the § 111(d) rule runs afoul of federalism doctrine and the 10th Amendment by infringing upon traditional state prerogatives and policy discretion in regulating electric power generation. The proposal is carefully structured to fall comfortably within the bounds of constitutional regulatory strategies; EPA would have to dramatically extend its control over the states before it would run afoul of federalism principles or the 10th Amendment.

As described in more detail below, this rule, which establishes a federal guideline and then provides states with options for meeting it, represents a quite ordinary and constitutionally acceptable form of "cooperative federalism." Such cooperative federalism strategies have long been upheld by the Supreme Court, with such cases quite explicitly talking about both permissible strategies and a few easily avoidable unconstitutional regulatory forms.³⁹ In short, these precedents establish that Congress may establish federal goals and give states the choice to implement a regulatory program necessary to achieve those goals or refuse to do so and allow the federal government to implement the program in its stead. In addition, in a just-decided case, *Mississippi Commission on Environmental Quality v. Environmental*

Protection Agency,⁴⁰ in which industry raised federalism challenges similar to the claims likely to be made against the CPP, the D.C. Circuit recognized the Clean Air Act's and EPA's constitutionally permissible use of cooperative federalism strategies.

EPA's proposed CPP is consistent with these principles. If Congress or EPA tried to order the states to do exactly as the federal government wanted in pursuit of federal goals, with such laws or regulations effectively "commandeering" the state legislative process and administrative apparatus and leaving the states no choice but to comply or be penalized, then the action could run afoul of anti-commandeering principles enunciated by the Supreme Court in its 10th Amendment jurisprudence. The circumstances in which federal regulatory programs raise legitimate 10th Amendment concerns are discussed in the famous *Hodel, New York v. United States*,⁴¹ and *Printz*⁴² cases. Those cases, however, like the new *Mississippi* case, simultaneously endorse cooperative federalism programs and provide a road map to EPA or Congress about how federal regulatory programs can avoid unduly infringing on state authority. Indeed, among the statutory programs the Supreme Court has upheld in the face of 10th Amendment attacks is a federal statute constraining state choices in setting rates for electricity generators.⁴³

EPA has carefully structured its proposal to avoid federalism problems. The § 111(d) rule sets an emissions-rate standard for greenhouse gas emissions in each state. (States are given the option to convert that rate-based approach to a mass-based approach.) States have to develop a state implementation plan (SIP) to meet this pollution reduction target. However, if they choose not to do so, EPA can itself come in and act as the regulator. Such a choice — do it yourself or have the federal government step in — is explicitly approved in all four cited relevant precedents. It is consistent with the exercise of federal supremacy in a manner that respects state sovereignty: the federal government can set targets as a federal requirement, but then give states the choice to derive responsive strategies or leave the choices (and all of the work) to the federal government.⁴⁴ States, however, seldom decline to exercise such optional authority. States tend to seek and jealously guard their retention of such planning discretion under "delegated programs," the most prevalent form of cooperative federalism.

But critics have argued that EPA's mix of permissible "building blocks" for states to achieve reduction targets goes too far. These claims are in error: EPA can give states a simple edict backed by potential federal enforcement, but also then indicate more flexible means that states and their power plants and others could adopt to reduce their carbon emissions. So here, too, EPA's proposal sets a pollution reduction target by capping emissions levels for each state, but provides states broad discretion to choose how to comply (including any combination of the building blocks identified by EPA), or to "just say no" and refuse to participate in the program, allowing EPA to step in with its own Federal Implementation Plan (FIP) for that state. In other programs, EPA has often set federal requirements and then given states guidance on strategies that the agency would approve in overseeing state plans. EPA's guidance helps states avoid wasted implementation efforts and shares EPA's expertise with the states and affected entities and constituencies. Guidance that dictated state programs and precluded other choices might be problematic, but the CPP is laden with language of discretion and state choice. That approach is unlikely to change in the final rule. In short, the CPP's cooperative federalism structure is fully consistent with settled federalism principles.

New and Existing Power Plants in State Plans

As several commentators, think tanks, and economic consultants have shown, and EPA's building block discussion also explains and encourages, both cost-effectiveness goals and carbon emissions reduction goals will likely be met most effectively if states not only derive broad trading regimes, but also allow existing high polluting plants' energy production to be replaced with low- or no-pollution forms of energy

production, often from new plants. Hence new and existing plants would likely be covered by a state plan seeking to maximize flexibility and minimize regulatory costs, despite § 111(d)'s focus on existing sources. This might initially seem odd, but states acting under a delegated program planning regime have always had broad authority to derive credible strategies to meet federal pollution reduction goals. And that can involve including new plants and demand reduction strategies — as well as any other credible, sound strategies — in plans to meet the federal reduction cap.

One question is whether states' adoption, with EPA encouragement, of such an inclusive approach would conflict with the Clean Air Act, and therefore be preempted. We conclude that such state plans would clearly be permissible both under the Constitution and under the statute's "plan" and savings clause provisions.

Well-established federalism doctrine combined with the Clean Air Act's broad "savings" clause⁴⁵ are together important in empowering states to devise economical and effective state plans. Many analysts, industries, and EPA as well, see great benefits to states using the building blocks to design plans that will create broad, possibly statewide or even multi-state trading regimes to maximize flexibility and minimize costs associated with achieving the CPP's reduction goals. As discussed in our articles elsewhere in this paper on the CPP's systemwide approach, § 111(d) explicitly cross-references § 110's planning procedure for SIPs and calls for states to devise § 111(d) plans or be subjected to a FIP. Very important to the workability of this design is both enduring Supreme Court law confirming that the Clean Air Act gives

states broad discretion to design plans meeting air pollution reduction targets,⁴⁶ and the Clean Air Act's "savings" clause.⁴⁷ This savings clause recognizes state power to provide more protection (here pollution reductions) than mandated by federal law.

In their zeal to scuttle the CPP, EPA's opponents have raised a plethora of allegedly fatal constitutional infirmities. But under close examination, the claims fail.

In fact, such savings clauses are the norm in federal environmental law, preserving state authority to provide protections for their environment and citizens that go beyond what federal law requires. In the parlance of

federalism, federal law is almost always a floor, not a ceiling. Such savings clauses are not constitutionally required, but are rooted in respect for state roles that is reflected in the Constitution and federalism jurisprudence. Such clauses also reflect a pragmatic choice; it is hard to recognize states' broad plenary police powers to protect their citizens and the environment yet somehow preclude their doing more to protect against a risk.

Since power plants and their operations involve siting choices, state public utility commissions, a wide array of pollutants, energy policies of many sorts, and also common law protections, preclusion of additional state action regarding the energy sector would be especially unlikely and difficult to design or enact. Hence, states will be acting in ways consistent with the Clean Air Act if (and likely when) they derive a plan utilizing a mix of strategies to meet pollution reduction targets, provided they do not violate a requirement of the Clean Air Act. These two interrelated pieces of law — states' SIP planning discretion and "savings" clause preservation of state power to provide additional protection — combine to give states expansive authority to derive palatable strategies to reduce pollution, so long as they can credibly show that they will meet or exceed federal targets.

Claims of 'Unconstitutional Coercion' Through Conditional Spending Constraints

Commandeering of the states is prohibited but generally avoidable, as discussed above. The recent Supreme Court health care decision, *National Federation of Independent Business v. Sebelius*,⁴⁸ did

recognize an additional federalism prohibition, namely, the federal government cannot use the threat of withholding federal funds to coerce states to do as the federal government wants. But that decision also discussed the federal governments' longstanding authority to provide states with a range of permitted choices under cooperative federalism doctrine. The Court held that the Affordable Care Act could not use a conditional federal spending strategy not only to deny uncooperative states new financial support, but also to trigger loss of vast federal support under earlier longstanding health care programs. *NFIB* was the first Supreme Court case ever to find conditional federal spending to be unconstitutionally coercive, and emphasized the extraordinary nature and size of the monetary threat. The Clean Air Act does contain possible threats to federal highway funding for several sorts of state defaults,⁴⁹ but as found in the just-issued *Mississippi* decision, those modest threats do not come close to the unconstitutional coercion in *NFIB*.⁵⁰ Nothing in *NFIB* supports the recognition of a general prohibition on federal use of supremacy-based or monetary incentives to persuade states to play an effective regulatory role. Cooperative federalism always rests on state choice in light of federal incentives. Incentives are not automatically coercive.

The FIP: The More Interesting Legal Puzzle

EPA has indicated that around the time it issues the CPP it will also propose a FIP, or a menu of likely FIP strategies, for notice and comment. How EPA construes the law to give itself, or not give itself, discretion to adopt trading regimes or bring new plants into a CPP pollution cap will be interesting. States' discretionary authority is broadly preserved by the Clean Air Act's savings clause and the § 110 planning provisions and linked case law incorporated by reference in § 111(d). This broad preservation of state power is in turn rooted in the general presumption of retained state police powers. EPA's forthcoming FIP proposal will necessarily be rooted in what the Clean Air Act authorizes. The federal government does not have the same sort of "saved" plenary police power as the states.

Conclusion

In their zeal to scuttle the CPP, EPA's opponents have raised a plethora of allegedly fatal constitutional infirmities. But under close examination, the claims fail. The various contentions that § 111(d) of the Clean Air Act violates the nondelegation doctrine are far-fetched, ignoring decades' worth of Supreme Court precedents allowing broad delegations of policy-making discretion to agencies, including a recent decision upholding different provisions of the Clean Air Act. Arguments that the § 111(d) rule, in its proposed form, works as a compensable taking of utilities' private property border on the frivolous. The federalism-based attacks on the CPP appear to warrant more serious consideration. But the approach reflected in the CPP proposal — establishing federal emissions targets for each state, allowing the states the option of devising plans to achieve the targets, and providing for federal takeover of planning, implementation, and enforcement responsibilities if a state chooses not to participate — is fully consistent with Supreme Court federalism precedents endorsing cooperative federalism programs. The CPP proposal did not run afoul of the 10th Amendment or federalism-based constraints on the exercise of the federal spending power. The final rule is also highly unlikely to do so.

EPA's Systemwide Approach: The Policy and Legal Debate on Regulating Beyond the Fenceline

By Robert L. Glicksman and William W. Buzbee

Much of the debate over the Clean Power Plan has focused on how EPA's proposal incorporates strategies to reduce emissions at power plants not only through emission-control and efficiency measures at the plants themselves, but also through "beyond the fenceline" measures that include replacing high carbon energy production at existing plants with low- or zero-emitting generation sources and with demand-reduction measures that reduce emissions at regulated sources." Some critics have argued that this last element — beyond the fenceline measures — is impermissible, while EPA and supporters assert that it is not only on strong legal footing but that it represents a logical and cost-effective approach. This section reviews both the policy and legal arguments, highlighting explanations and justifications, as well as responses to criticisms likely to be made upon issuance of EPA's final rule.

The Beyond the Fenceline Debate

In its proposal, and likely its final rule, EPA calculates state-by-state pollution targets using means to achieve emissions reductions that are already in widespread use in states and the energy sector, some of which extend beyond the fenceline of individual regulated plants but that have the effect of reducing emissions from regulated power plants. In discussing various emission reduction strategies that the states might pursue, EPA repeatedly indicates that it anticipates allowing states and power plants to rely on an array of measures that go "beyond the fenceline" so that states are not confined in their efforts to reduce power plant emissions of greenhouse gases (GHGs) to technological improvements at individual coal-burning power plants. Some states are already using some of these strategies, such as Renewable Portfolio Standards, energy efficiency programs, or statewide or regional cap-and-trade programs for greenhouse gas emissions like those being implemented in California and through the northeastern states' Regional Greenhouse Gas Initiative.

More specifically, in the proposed rulemaking, EPA identifies four "building blocks" it believes will enable states to achieve targeted emission caps by reducing GHG emissions at regulated power plants: reducing carbon intensity through improvements in heat rates at individual plants; reducing reliance on carbon-intensive generating units such as coal-fired units by increasing the use of existing natural gas plants; replacing carbon-intensive generating units with low- or zero-carbon generation, such as renewable energy production; and relying on programs to reduce electricity demand. EPA and its supporters have applauded these building blocks, which states can use together or in part as they see fit, as cost-effective and flexible means for states and their power sectors to meet reduction targets.

Significantly, only the first of these building blocks embraces the traditional approach to stationary source control utilized under the Clean Air Act since the early 1970s — reducing emissions through the setting of performance standards based on assessment of technological controls or operational practices available for the type of regulated facility. The other three entail a broader approach to reducing regulated power plant emissions through a systemwide focus on a utility's entire set of operations at multiple plants, or the performance of many or all utilities in a particular state or region, including demand reduction. Energy sector experts, economists, many states, and many energy companies applaud these more flexible and cost-effective approaches, but utilities and industries heavily dependent on carbon-intensive energy

sources, especially coal-based businesses, generally describe them as a devastating threat and have argued that they are beyond EPA’s statutory authority. We believe EPA’s approach is sound both as a matter of policy and law.

The Benefits of a Systemwide Approach

From a policy perspective, EPA’s systemwide approach offers numerous benefits over a more limited inside-the-fenceline approach. As discussed in detail below, unlike other regulated industries, power plant emissions are affected not just by individual plant characteristics, but by systemic factors that determine how much a given plant operates. In seeking to reduce regulated power plant emissions, to focus only on technical changes inside the fence of a particular electric generating unit (EGU) would miss available and cost-effective opportunities to reduce GHG emissions from existing sources.

One benefit of a systemwide approach is that it increases the cost-effectiveness of GHG emissions reductions. Building blocks that extend beyond the fenceline of individual EGUs allow states to adopt flexible § 111(d) plans that authorize states and their power plants to meet their GHG targets at lower cost. It may be cheaper, for example, for a utility to replace some of its coal-fired generating capacity with power derived from cleaner fuel sources than to improve heat rates at each of its plants. But it will often be even cheaper to develop strategies that reduce energy user demand, especially demand during times of peak usage. By shaving off such demand, fewer power plants are needed or plants will less frequently need to ramp up energy production. So a systemwide approach that allows states and utilities to reduce emissions by reducing demand instead of by investing in expensive retrofits can save consumers money and reduce costs for power plants covered by a state plan.

A second benefit of a systemwide approach is that it allows EPA to achieve greater aggregate GHG reductions. EPA estimates that retrofits to increase the efficiency of existing coal-fired power plants can achieve only about a 6-percent reduction in emissions rates. By including a wider range of available and cost-effective options, the agency can achieve much more significant aggregate reductions. As climate change impacts continue to accelerate, the ability to achieve greater reductions at lower costs is a significant advantage.

Lastly, a systemwide approach helps facilitate the transition to a cleaner energy economy. There is no need to maintain high emissions from existing coal-fired power plants when sustainable alternatives are readily available. An approach that recognizes the shortcomings of continued reliance on high-emitting facilities and encourages a transition to greater reliance on alternatives will strengthen the U.S. energy sector.

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A Section 111(d) Roadmap

In order to analyze the legality of EPA’s proposed Clean Power Plan, it is useful to provide a roadmap to EPA’s legal authority under § 111(d) of the Clean Air Act. Once EPA has set new source performance standards for a source category under § 111(b), § 111(d) requires EPA to initiate a regulatory process for existing sources in the same category. The sources at issue in this rulemaking are existing EGUs, or power plants.

The nuances of the federal and state roles are reviewed below, but the basic process involves EPA setting emissions guidelines (which in effect amount to pollution reduction targets) for each state. Under § 111(d) of the CAA, EPA must establish “standards of performance” for existing source categories for which EPA has adopted new source standards under § 111(b). The definition of a standard of performance is the same for both § 111(b) and § 111(d); the standards must reflect the degree of emission limitation achievable through the application of the best system of emission reduction (BSER) that EPA has determined has been adequately demonstrated. Once EPA sets federal emission guidelines, § 111(d) requires that states submit “plans” capable of meeting the emission reduction targets set by EPA. In describing the plans required under § 111(d), the statute explicitly cross-references § 110, the CAA provision setting forth terms and procedures for state implementation plans (SIPs) created to meet National Ambient Air Quality Standards (NAAQS). EPA must itself step in and take over the process should a state decline to derive a plan or if a state fails to submit a “satisfactory plan.” In such a circumstance, the federal government is supposed to design a Federal Implementation Plan, or FIP.

Textual and Structural Justification for the Section 111(d) Clean Power Plan

The legality of EPA’s reliance on and authorization of measures beyond the fenceline to reduce GHG emissions from regulated power plants has been little tested in the courts because EPA rarely exercises its authority under § 111(d) to control existing stationary sources, and when it has done so it has not regulated an industry that lent itself to the wide range of reduction strategies possible in the energy sector. No case has definitively interpreted the central term “system of emission reduction” in a context analogous to the current one. Nevertheless, as EPA will likely flesh out in greater detail in its final rule and accompanying materials, the legal basis for this approach is quite strong and, on the merits, deserves to be upheld by reviewing courts.

It is worth making an initial broad, thematic point: § 111(d) standards are performance standards, and the whole idea behind a performance standard is that what matters is the end result, not how a regulated entity gets there. Appropriately, EPA’s approach is end-result oriented, because what matters is that utilities in the aggregate — a state’s energy sector — reduce their GHG emissions sufficiently to reach EPA’s targeted levels. Through the Clean Power Plan and its building block approach, EPA has given states broad flexibility in deciding how to get there, especially encouraging cost-effective strategies to achieve GHG emission reductions.

A central question here is whether GHG-reducing measures that extend beyond the fenceline qualify as “systems” of emission reduction. As indicated above, state 111(d) plans establishing “standards of performance” must reflect the degree of emission limitation achievable through the application of the “best *system* of emission reduction” that EPA determines has been adequately demonstrated.⁵¹ EPA’s position is that all four building blocks qualify as “systems of emission reduction” because they either (1) improve the carbon intensity of the affected EGUs in generating electricity; or (2) because of the

integrated nature of the electricity grid and the fungibility of electricity and electricity services, they displace or avoid the need for generation from those sources and thereby reduce emissions from them. States, state public utility commissions, and power plants themselves in an array of regulatory environments have long adjusted plans for new capacity, rates, and energy sources in light of the sorts of variables here identified by EPA as building blocks.

The CAA nowhere defines the term “system.” Because the statute is silent on that question, the meaning of the term must come from someplace else. One place that courts often turn to in interpreting undefined statutory terms is the dictionary. Typical dictionary definitions of the word “system” include “an assemblage or combination of things or parts forming a complex or unitary whole,” or “any assemblage or set of correlated members,” or “a coordinated body of methods or a scheme or plan of procedure or organizational scheme.” EPA cited a similar definition in a Legal Memorandum that accompanied issuance of the proposed rule.⁵² Defining a “system” of utility emission reduction to include units operating in the same state and owned by the same utility under a central dispatch system is consistent with all of those definitions, but it also logically could be and is interpreted more expansively in light of the integrated and interdependent elements of the power sector.

The 1990 amendments changed the definition of a “standard of performance” in a way that supports EPA’s interpretation of that term to include beyond-the-fenceline measures. Congress deleted the portion of the definition (added in 1977) that required emission limits to be based on “the best *technological* system of continuous emission reduction.” EPA’s position is that, as a result of this change, the systems of emission reduction upon which § 111(d) standards of performance may be based are not limited to technological systems. Indeed, the Conference Committee report on the 1977 amendments stated that, even when § 111(b) standards for new sources had to be based on the best technological system of continuous emission reduction, § 111(d) standards for existing sources could reflect means of emission control that are “not necessarily technological.”⁵³ By allowing non-technological mechanisms, Congress opened the door to emissions reduction mechanisms, like greater reliance on lower-emitting sources or efficiency, that do not depend upon technical fixes at the source.

The fact that EPA’s systemwide approach differs from previous, more facility-focused regulatory efforts does not mean that it is illegitimate. The Supreme Court in *Massachusetts v. EPA*, the Court’s first climate change case, emphasized that Congress intended to delegate to EPA the authority to adjust its approach and policies to address novel and unprecedented situations. The statute is not designed to produce obsolescence.⁵⁴

In addition, EPA has the authority — if not the obligation — to define a term such as “system” contextually. In *Utility Air Regulatory Group v. EPA*, the Supreme Court called for such contextual treatment of the term “air pollutant,” noting that the term may mean different things for purposes of different CAA programs.⁵⁵ Relatedly, in another recent case under the Clean Air Act, *Michigan v. EPA*, the Court again emphasized the importance of statutory context and the agency obligation to integrate linked provisions and language: Agencies cannot engage in “interpretive gerrymanders under which an agency keeps part of statutory context it likes while throwing away parts it dislikes.”⁵⁶ Such a mandate is especially important where, as under § 111(d), the statute engages in explicit cross-referencing of § 111 and § 110.

Similarly, it appears reasonable for EPA to determine that the best way to achieve the goals of § 111(d) regulation is to address the meaning of the term “system” based on the configuration and method of operation of the particular industry being regulated. In its proposed rule, EPA relied repeatedly on the

unique characteristics of carbon pollution and the interconnected nature of the electric power sector to justify its “beyond the fenceline” approach. Accordingly, even if a “system” of emission reduction is defined more conventionally as source-specific pollution controls for many industrial source categories, it seems reasonable for EPA to include within the term all of the mechanisms a state could use to reduce emissions from the EGUs targeted by EPA’s § 111(d) rule, including power plant controls, shifts in generation to lower- and no-emitting sources, and utility and state policies to increase consumer efficiency.

There is precedent in the context of other CAA programs for the kind of cost-saving and market-embracing rationales EPA has offered to justify its § 111(d) proposal. Section 111(d) authorizes EPA to require states to submit plans that establish standards of performance for “existing sources”⁵⁷ of pollutants not regulated under the NAAQS or hazardous air pollutant programs. For about the first decade of the CAA’s existence, most people instinctively thought that a “stationary source” could only refer to each individual smokestack or emission point at a regulated plant. But after some vacillation, in the 1980s EPA changed its interpretation, taking a more expansive view and endorsing use of the “bubble concept.” Under that approach, EPA allowed all emission points within an industrial operation to be treated as a single “stationary source,” such that increased emissions from one part of an industrial operation could be offset by decreased emissions in another part of the same unit so as to avoid triggering new source review. After the D.C. Circuit generated conflicting opinions, the Supreme Court endorsed EPA’s changed, expansive reading of the term “stationary source.” The case in which the Court reached that result was of course the famous *Chevron* case, which not only represents a mandate for judicial deference to reasonable agency interpretations of ambiguous statutes, but also specifically endorses a novel and broad reading of a key CAA term by EPA.⁵⁸ The Court essentially found that the undefined simple term “stationary source” was enough to authorize a shift to what was a form of intra-source or intra-facility pollution trading. *Chevron* provides support by analogy for EPA’s similarly expansive reading of the term “system” of emission reduction under § 111.

It is true that dictum in the *Utility Air Regulatory Group* seemed to interpret the Clean Air Act program at issue in that case to prohibit some beyond-the-fenceline measures.⁵⁹ But the Court had no need to directly confront the question in that case, and it involved interpretation of a very different term (best available control technology) than the definition of a standard of performance for purposes of § 111(d).

Section 111(d) language and definitional and section cross-references actually lend EPA’s beyond-the-fenceline approach far more textual support than the mere term “stationary source” that was found adequate to justify the “bubble” concept upheld in *Chevron*. First, § 111(d) explicitly calls for a “procedure similar to that provided by section [110],” the SIP process for pollutants covered by the NAAQS. This cross-reference lacks further defining or clarifying language, but such definitional silence serves under *Chevron* to authorize a reasonable EPA interpretation. Moreover, Supreme Court precedents under § 110 have construed this provision as putting states in the driver’s seat, authorizing states to come up with plans to meet federal pollution levels (NAAQS), provided they meet federal minimum requirements established by the statute or EPA regulations. SIPs are effectively another trading-based regime, setting a virtual pollution bubble over a state Air Quality Control Region and obligating states to derive plans adequate to meet the NAAQS within each region within their borders. And, as further discussed elsewhere in this paper, § 110 was itself amended in 1990 to authorize implementation plans to include “economic incentives such as fees, marketable permits, or auctions of emissions rights.” The cross-reference to § 110 thus provides an explicit congressionally authorized textual hook for a

systemwide approach that allows states to choose among a wide array of regulatory strategies, including market-based strategies.

Hence, between congressional deletion of “technological” in the definition of a standard of performance in § 111(a)(1), the use of the terms “system” and “plan” in connection with § 111(d) regulation, embrace of market-based regulation, and well-developed law about the breadth of state discretion in exercising the planning authority vested in them under § 110, a § 111(d) final rule that continues to rely on systemwide building blocks stands on strong textual footing.

Judicial Review of the Clean Power Plan: A Roadmap

By Melissa Powers

Opposition to the Clean Power Plan (CPP) has already spurred lawsuits,⁶⁰ and many more will surely follow once EPA issues its final rule. Legal challenges to the CPP will almost certainly argue that EPA acted unconstitutionally, exceeded its statutory power, acted arbitrarily and capriciously, and violated procedural requirements when it promulgated the CPP. These legal arguments will invoke different judicial review and deference doctrines. This section briefly describes how courts will approach each type of legal challenge and explains how deference principles apply.

Judicial Review under the Clean Air Act

Any challenge to the CPP will arise under § 307(b) of the Clean Air Act (CAA). Section 307(b) requires parties to file challenges to nationally applicable regulations in the D.C. Circuit within 60 days of EPA's publication of a final regulation.⁶¹ The CPP is a nationally applicable regulation, so challenges to the CPP must be filed in the D.C. Circuit.⁶² Section 307 also establishes the criteria the court must employ when it evaluates the CPP. Specifically, § 307 states that a court may reverse any regulatory action it finds to be:

- (A) arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law;
- (B) contrary to constitutional right, power, privilege, or immunity;
- (C) in excess of statutory jurisdiction, authority, or limitations, or short of statutory right; [or]
- (D) without observation of procedure required by law....⁶³

This language largely mirrors the judicial review provisions of the federal Administrative Procedure Act (APA),⁶⁴ and courts apply APA judicial review doctrines and case law to CAA regulatory challenges.⁶⁵ Consistent with this approach, this section uses both CAA and APA cases to explain how judicial review will proceed.

A party seeking to challenge the CPP must have satisfied the CAA's exhaustion, or "raise it or waive it," requirements.⁶⁶ The CAA states: "Only an objection to a rule or procedure which was raised with reasonable specificity during the period for public comment ... may be raised during judicial review."⁶⁷ The D.C. Circuit has generally interpreted this requirement in the CAA and other similar statutes rather strictly. If a party cannot demonstrate that it or another party squarely presented an issue to EPA, the party likely will not be able to litigate the issue in court.⁶⁸ Although the CAA has narrow exceptions to this exhaustion requirement,⁶⁹ parties have only rarely succeeded in demonstrating they qualified for the exceptions. Thus, it seems unlikely that parties could successfully raise new legal arguments that differ substantially from the legal issues that were raised in public comments and are the focus of other parts of this paper.

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Judicial Review of Claims Alleging the Clean Power Plan is Unconstitutional

As discussed in William Buzbee and Robert Glicksman’s article elsewhere in this paper, parties have already challenged the constitutionality of the proposed CPP, and they will undoubtedly raise the same constitutional arguments once EPA issues its final rule. In reviewing the CPP’s constitutional legality, the D.C. Circuit will engage in *de novo* review, meaning that EPA’s views about the constitutionality of the CPP are by and large irrelevant in this inquiry.⁷⁰

Review of Claims Alleging EPA Exceeded its Statutory Authority

Parties will also argue (and, indeed, have already argued) that the CPP is illegal because EPA does not have statutory authority either to regulate power plants under § 111(d) at all or because EPA’s “beyond-the-fenceline” approach exceeds EPA’s statutory authority. In both of these challenges, opponents to the CPP will argue that the CAA clearly prohibits EPA’s conduct. EPA will argue either that the CAA clearly allows EPA’s actions, or that the CAA is unclear on the matter and that the court should therefore defer to EPA’s interpretation of the statute. To resolve whether EPA has acted within its statutory authority, the court will employ the *Chevron* two-step approach to statutory review.⁷¹

Step One

At step one, a court must look at the relevant statutory text to determine whether it is clear. To determine if the statute has a clear meaning, the starting point is the language of the statute itself.⁷² Courts frequently turn to external sources, such as dictionaries, to determine if a particular word or phrase has a specific meaning.⁷³ Courts also often invoke canons of construction, which are judicial doctrines governing statutory interpretation, to determine if a statute has a clear meaning.⁷⁴ Common canons of construction include *ejusdem generis* — a doctrine that says specific words in a list may help define a more general word (e.g., if a list includes pigs, cows, chickens, and other farm animals, humans would probably not be included even though they might live on a farm and be in the animal kingdom)⁷⁵ — and *expressio unius est exclusio alterius* — a doctrine that says that if a statute expressly excludes certain things, other exceptions should not be read into the law.⁷⁶ Finally, courts have adopted several general rules based on common word meanings to govern interpretation. For example, “any” generally signals congressional intent to be expansive,⁷⁷ and “shall” is usually a mandatory term,⁷⁸ while “may” is generally permissive.⁷⁹ In short, the words of the statute matter first and foremost in statutory construction.

Of course, words alone rarely offer conclusive meaning, so courts will turn to other sources to divine a statute’s meaning. The context and structure of the relevant statutory term are commonly used to guide judicial review.⁸⁰ For example, if a statute states an agency “shall” act, but then immediately conditions the agency’s actions on other permissive factors, “shall” would no longer signal mandatory action. Similarly, if other parts of a statute use a disputed term in a manner that clarifies congressional intent, courts will look at other parts of the statute to define the contested language.⁸¹ Courts may also look at other laws that use the same language to understand the meaning of a contested term.⁸² Finally, although some jurists oppose this approach, courts will look at other indicia of congressional intent, including the contested statute’s legislative history.⁸³

Ultimately, at the end of step one, a court will determine if the statute is clear. If it is, “that is the end of the matter,”⁸⁴ and the court will then evaluate if the agency’s interpretation conforms to the statute’s clear requirements. If the court finds the agency interpretation is consistent with the statute, the court will uphold the agency interpretation. If the court finds the agency has acted inconsistently with the statute, the court will either vacate or remand the agency action or interpretation.⁸⁵ If the court vacates the agency action, it no longer has any legal force or effect. In contrast, if the court remands the agency action

without *vacatur*, the action will remain in effect until the agency revises the action. In Clean Air Act challenges, the D.C. Circuit has at times agreed to remand-only remedies where *vacatur* would have serious adverse public health and environmental consequences.⁸⁶

Step Two

If a court determines that a statute is either silent or ambiguous regarding a particular issue, it proceeds to *Chevron* step two. Under step two, a court will evaluate whether an agency's interpretation is permissible or reasonable under the statutory scheme.⁸⁷ Recently, the Supreme Court explained that at step two, a court should not overturn an agency's interpretation of an ambiguous statute "unless it is arbitrary and capricious in substance or manifestly contrary to the statute."⁸⁸ Application of this test has created some confusion because it is not clear how the Court distinguishes interpretations that are "arbitrary and capricious in substance" from those that are "manifestly contrary to the statute." Regardless, the Supreme Court has made clear that the agency's interpretation should receive strong deference from the judiciary at step two.⁸⁹ If the agency's interpretation is consistent with the underlying purposes of the statute, the court should uphold that interpretation, even if the court believes an alternative interpretation is better than the one offered by the agency.⁹⁰

The process of applying *Chevron* step two may seem redundant to step one analysis, because a court will often again attempt to divine a statute's purpose and meaning to determine if an agency's interpretation of a statute is permissible. Indeed, some scholars have argued that statutory interpretation really involves a single step, and that agency interpretations should be found impermissible only when they flatly conflict with Congress's clearly stated intent.⁹¹ Others, however, note that ambiguous statutory terms can nonetheless have a limited range of meanings, and while a number of agency interpretations may be reasonable, some will not.⁹² In practice, if a court concludes that a statute is ambiguous, an agency's interpretation will almost always be upheld at step two,⁹³ unless the interpretation could in no way fit within the statutory scheme. For example, in *Whitman v. American Trucking Association*, the Supreme Court invalidated EPA's interpretation of an ambiguous part of the CAA that would have rendered "carefully designed restrictions on EPA's discretion utterly nugatory."⁹⁴ In contrast, in *Entergy Corp. v. Riverkeeper, Inc.*, the Court upheld EPA's consideration of costs in setting Clean Water Act effluent limitations guidelines reflecting the "best technology available for minimizing adverse environmental impact," noting that the consideration of costs did not clearly conflict with the statutory structure or purpose.⁹⁵ These cases illustrate the typical deferential approach courts take to step two review: Absent a glaring inconsistency between an agency's interpretation and a statute's intent, structure, or purpose, courts will typically uphold agency interpretations of ambiguous statutes.

This deference, moreover, is available even if an agency's interpretation of a statute has changed over time or even if the agency interprets similar terms differently within the same statute. The Supreme Court has rejected the argument that an agency should necessarily receive less deference for a revised

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interpretation of the statute, so long as the agency explains its reasons for the change.⁹⁶ The Supreme Court has also stated that agencies may offer differing interpretations of similar terms to further congressional intent. For example, in *American Paper Institute v. American Electric Power Service*, the Supreme Court upheld the Federal Energy Regulatory Commission's decision to set different rates for power sales to electric utilities than for sales from electric utilities, even though the statute required both sets of rates to be "just and reasonable" and "in the public interest."⁹⁷ In sum, so long as an agency's interpretation of an ambiguous statutory term is "permissible," and thus not precluded by the statute's language, structure, or purpose, courts will generally uphold the agency's interpretation.

Judicial Review of Claims Alleging EPA Acted Arbitrarily and Capriciously

When EPA issues its final regulation, parties will likely also allege that EPA has acted arbitrarily and capriciously in adopting the specific rule it did. Unlike *Chevron* review, which focuses on whether an agency has correctly interpreted a statute, arbitrary and capricious review considers whether an agency has properly implemented the statute. Opponents to the CPP have already raised a host of concerns about the proposed rule's impact on electricity prices and electricity system reliability, the feasibility of implementing the building blocks, and the rule's benefits versus costs. If the final CPP adopts the structure of the proposed rule, opponents will convert these arguments into a legal claim that the CPP is arbitrary and capricious.

In *Motor Vehicle Manufacturers Association, Inc. v. State Farm*,⁹⁸ the Supreme Court explained that arbitrary and capricious review examines whether an agency "has articulated a satisfactory outline for its action" and drawn a "rational connection between the facts found and the choice made."⁹⁹ Although arbitrary and capricious review is supposed to be narrow and deferential to agency decisions, an agency action would be arbitrary and capricious:

if the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise.¹⁰⁰

Under statutes like the CAA, which depend heavily on scientific and policy judgments, courts are especially deferential to agency decisions.¹⁰¹ EPA has lost CAA challenges under the arbitrary and capricious standard where evidence in the record contradicted EPA's conclusions,¹⁰² where EPA failed to follow its own guidelines or regulations,¹⁰³ and where EPA reversed its prior course of conduct without explanation.¹⁰⁴ In most instances, however, EPA actions have survived arbitrary and capricious review, even when they employed innovative approaches to regulation.¹⁰⁵ These outcomes illustrate the role that deference will play in any evaluation of the CPP.

Judicial Review of Claims Alleging EPA Violated Procedural Requirements

Finally, some parties have suggested that they will sue EPA for violating the procedural requirements of the CAA by failing to fully consider comments filed in opposition to the proposed CPP. The CAA includes detailed requirements for EPA to follow when it proposes and finalizes regulations.¹⁰⁶ When EPA issues a proposed rule, it must include a statement of basis and purpose, summarize the factual data on which the proposed rule is based, summarize the methodology the agency used in obtaining and analyzing data, and provide the agency's major legal interpretations and policy considerations underlying the proposal.¹⁰⁷ The final rule must similarly include a statement of basis and purpose, as well as an explanation of any changes from draft to final rule and a response to submitted comments and data.¹⁰⁸ So long as EPA adheres to these requirements, it will likely survive procedural challenges. Thus, even if the

final CPP mirrors EPA's initial proposal, challenges alleging that the notice-and-comment process was a sham would likely fail. Similarly, even if EPA substantially alters the CPP in its final form, this would likely not violate the CAA's procedural requirements so long as the changes were a logical outgrowth of the notice-and-comment process.¹⁰⁹

In sum, EPA will face a number of different legal challenges when it issues the final CPP. The standard of review will depend upon the specific challenges raised. The reviewing court will review pure legal claims (*i.e.*, whether the CPP is constitutional and whether the CAA's meaning is clear) under a *de novo* standard in which EPA's views will receive no deference. In reviewing other claims, the court will typically defer to EPA. These background principles of judicial review will shape how the court responds to the legal and policy issues discussed in the remainder of this paper.

Section III: Implications for the Energy Sector

One thing opponents and proponents agree on is that the Clean Power Plan will have a significant impact on the U.S. energy sector, including how it is governed, whether and how industry will adapt to the changing regulatory landscape, the reliability of electricity under the CPP, and the extent to which states and utilities can and should collaborate across state borders.

In this section, CPR Member Scholars address these issues.

State Agency Coordination, Policy Options, and Jurisdictional Considerations

By *Emily Hammond*

As states consider their options for CPP compliance, they will need to pay particular attention to two governance issues: (1) coordination between state public utility commissions (PUCs) and state environmental agencies; and (2) the preemption implications of states' incentive-design choices, which may vary depending on whether states have restructured their retail electricity markets.

Inter-Agency Coordination

First, a challenge for energy policy in the United States is that energy laws have evolved in a piecemeal fashion, with little unified integration of energy and environmental concerns.¹¹⁰ As a result, it has always been critical that energy and environmental agencies coordinate to help smooth the divide.¹¹¹ The federal experience offers lessons for states facing new issues of interagency coordination. At the federal level, examples of effective interagency coordination have been well documented, as have the benefits of such coordination.¹¹² Indeed, careful coordination can increase the likelihood of broad stakeholder support while decreasing the agencies' vulnerability to judicial remands.¹¹³ But when agencies fail to coordinate their efforts, they risk uninformed decision-making as well as judicial remands.¹¹⁴

Consider, for example, the recent D.C. Circuit decision in *Delaware Dep't of Natural Resources & Environmental Control v. EPA*.¹¹⁵ At issue was EPA's Clean Air Act rule aimed at the use of backup generators, which typically burn diesel fuel and emit hazardous air pollutants, among others.¹¹⁶ In its rule, EPA permitted backup generators to run without pollution controls for the purpose of providing up to 100 hours per year of demand response.¹¹⁷ In support of its 100-hour provision, which EPA had increased significantly from 15 hours in a prior rule, EPA emphasized the reliability needs of the bulk power system.¹¹⁸ But when it responded to critiques of how the rule would work within the confines of that system, the agency repeatedly stated that such issues were better addressed to the Federal Energy Regulatory Commission (FERC).¹¹⁹ That is, EPA relied on a rationale outside its expertise, without having obtained input from the agency that did have the applicable expertise. In holding the rationale arbitrary and capricious, the court emphasized that EPA should seek FERC's input on remand.¹²⁰ Coordination between EPA and FERC will likewise be necessary during implementation of the CPP — and it is a matter that has attracted significant attention.¹²¹

But having used the federal example to illustrate the importance of agency coordination generally, I now turn briefly to the corresponding importance of agency coordination at the state level. Similar to the federal split of authority, environmental and electricity considerations have generally been divided between two agencies at the state level. Typically, state environmental agencies implement the CAA, while state public utility commissions (PUCs) have authority over electricity distribution at the retail level.¹²² This authority may also extend to setting retail rates or overseeing restructured retail markets. Thus, as states work to implement the CPP framework, they will need to ensure that the relevant state-level agencies have both the authority and the political will to coordinate with one another to ensure compliance with the CAA, electricity reliability over the distribution network, and consumer protection with respect to electricity delivery.¹²³

Thus far, there has been some progress in state-level agency coordination.¹²⁴ Much of it has been attributed to the leadership of various national organizations,¹²⁵ which have themselves modeled

coordination, producing a wealth of information as well. For example, the National Association of State Energy Officials (NASEO) has partnered with the National Association of Regulatory Utility Commissioners (NARUC) and the National Association of Clean Air Agencies (NACAA) to form the “3N” group.¹²⁶ 3N has provided numerous resources addressing state compliance from the perspective of multiple state regulatory bodies, and has facilitated ongoing dialogue between them.¹²⁷

State Electricity Restructuring Status and Preemption

A second issue for states’ consideration is how their electricity restructuring status and policy choices interact with the Federal Power Act’s preemptive scope.¹²⁸ By operation of the Supremacy Clause, the Federal Power Act can limit states’ ability to regulate matters of wholesale electricity sales.¹²⁹ This distinction — that FERC regulates wholesale while states regulate retail — is deceptive in its apparent simplicity.¹³⁰ Moreover, it has come under increasing pressure as states seek ways to promote their electricity fuel preferences, notwithstanding wholesale market dysfunctions. For example, when Maryland and New Jersey each attempted to incentivize new natural gas construction by providing subsidies that compensated such generation for perceived deficiencies in the capacity markets, federal courts held that those efforts were preempted.¹³¹ The courts reasoned that these subsidies would distort prices in the wholesale markets; moreover, by restructuring their retail markets, the states had thrown in their “lot with the federal interstate markets” and relinquished their former regulatory autonomy.¹³²

It is unclear why a state’s restructuring status should matter for the issues presented in the cases described above. But provided the cases stand — petitions for certiorari have been filed in both — they may provide additional reasons for pause in restructured states that view wholesale market dysfunctions as a challenge to CPP compliance. For instance, many states recognize the reliability and environmental benefits provided by nuclear power, and view nuclear as an important part of CPP compliance.¹³³ But dysfunctions in the wholesale markets have made it difficult for nuclear power to stay competitive because reliability and environmental benefits are not directly valued in those markets.¹³⁴ States, especially restructured ones, may need to avoid remedies that directly attempt to compensate for wholesale market failures.¹³⁵ Other policy options, like carefully constructed low-carbon portfolio standards, may be less susceptible to challenges like those described here.

Recommendations

- To ensure a reliable, green electricity system under the CPP, state environmental agencies, which have primary authority for CPP compliance, will need to carefully coordinate with state utility commissions, which have primary authority over electricity generation and delivery.
- In formulating policy options for CPP compliance, preemption concerns suggest that states should exercise caution if they wish to address wholesale electricity market dysfunctions that under-incentivize investment in reliable, low-carbon electricity.

The Clean Power Plan and the Electricity Industry

By Joseph P. Tomain

The Clean Power Plan (CPP) is a watershed proposal for the U.S. electricity industry and its regulation because it begins to align energy and environmental regulation in unprecedented ways. Historically, energy and the environment have been regulated by separate legal regimes devised by separate agencies with divergent missions. Over the years, the utility industry has grown familiar with its energy regulators, but less familiar with environmental regulators. The CPP changes that arrangement. As an environmental regulation emanating from EPA, it is directed toward reducing carbon emissions from existing electric utilities.

Electric utilities have been, and continue to be, regulated by the Federal Energy Regulatory Commission and state Public Utility Commissions (PUCs) through price controls intended to set rates that reward utilities for their prudent investments and that are just and reasonable for consumers. The CPP, by imposing a set of environmental regulations on utilities, presents a particular challenge to them. More specifically, utilities, and their state regulators, must devise a plan for emissions reductions by using building blocks that will have the direct effect of changing the resources used by utilities to generate electricity and may well affect their income streams. Briefly, utilities that are heavily reliant on coal must look for other energy resources for power generation, such as wind and solar power. Also, to the extent that a state implementation plan encourages the use of energy efficiency, utilities face the risk of lost revenues due to reduced electricity sales.

It is unsurprising, then, that some voices in the electric industry do not embrace the CPP, arguing that the environmental requirements are too costly. The industry puts forward two basic arguments. First, it maintains that as a result of the availability of non-utility electricity, particularly from distributed energy resources (DER) and efficiency requirements, it will soon be in the throes of a “death spiral,”¹³⁶ and that the CPP’s additional regulations only add to their financial burdens. Second, they assert that further regulations, particularly those addressing carbon emissions, threaten the reliability of the entire electric system,¹³⁷ an issue discussed briefly here and addressed in more detail in another section of this report.

Neither argument is sound. The electric utility industry is not heading into a CPP-induced death spiral for two reasons.¹³⁸ First, at present, less than 2 percent of electricity is provided by DER.¹³⁹ Consequently, claims of financial exigency are overstated. Second, DER activities precede the CPP and are being addressed by the industry independently of the proposed rule. Claims about reliability, likewise, are not based on solid evidence or fact and, are likewise overstated.¹⁴⁰ Instead of retarding economic growth, the

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Neither argument is sound.

CPP presents opportunities for business and regulatory innovation as traditionally structured utilities reorient their business practices.

As the electric utility industry confronts the challenges posed by the CPP, it must be recognized that for four or more decades the electric industry has proven its resilience; it has faced several major challenges and, has weathered each of them. Indeed, history indicates that industry resilience, combined with a regulatory regime that recognizes the central importance of reliable and affordable electricity and adjusts regulatory requirements as needed, will meet CPP requirements.

The U.S. electric industry has been heavily price regulated for over a century under a regulatory regime that encouraged capital investment and expansion. As long as the country was growing and as long as a national infrastructure was needed, such investments had two positive effects. First, electricity played a pivotal role in the country's economic expansion and, second, utilities continued to realize economies of scale thus keeping electricity affordable. In the last third of the 20th century, however, electricity prices began to rise and the regulation of the industry became more complicated and more contentious.

Today, utilities face flattening demand, the need for investment in grid improvements, increased competition particularly from DER, regulatory requirements for renewable resources, energy efficiency, and, now with the CPP, carbon emissions reductions. Each of these drivers pressure utilities to reform their business models and pressure regulators to support those changes as utilities face reduced sales and lower revenues together with new regulatory obligations. The utility of the future will need to transform itself from a firm that sold only electricity to an energy firm that provides a variety of products and services.¹⁴¹ While utilities have argued against the CPP, utilities have successfully responded to prior

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challenges and have been full participants in the country's transition to a clean energy economy, a transition that has been developing for decades prior to the CPP.¹⁴²

Following the post-war period of economic expansion, the electric industry has faced four notable challenges of varying degrees of intensity and has met them all.¹⁴³ First, during the mid-1960s through the mid-1970s, the industry appeared to reach the end of its economies of scale. However, it continued to make capital investments, which, in turn, contributed to excess capacity and then to higher-priced electricity. Second, from the mid-1970s well into the 1980s, the nuclear industry collapsed with significant repercussions for both shareholders and ratepayers.¹⁴⁴ Third, during the late 1980s through the 1990s, heeding the general deregulatory mood in Washington, policy-makers attempted to deregulate wholesale and retail electricity sales. Those deregulatory efforts, however, were only partially successful for wholesale sales and much less so for retail sales. Finally, since the turn of the 20th century, regulators continue their efforts to restructure the industry by increasing access to the grid by new non-utility electricity providers.

For decades now, the electric industry and its state regulators have been actively engaged with meeting the emerging energy transition. Indeed, the CPP studied state clean energy efforts such as demand-side management, renewable portfolio standards, market-based emission limits and utility planning and incorporated them into its building blocks.¹⁴⁵ Consequently, the plan encourages utilities to continue experimenting with new business models, and regulators are likewise encouraged to experiment with new rate designs and other regulations and incentives.

Most significantly, the clean energy efforts already being undertaken by the industry and its regulators are consistent with the CPP. For example, energy policymakers in New York and Minnesota have taken the lead in transforming the regulation of the industry and, therefore, transforming the industry itself. In New York, the Public Service Commission has adopted an ambitious regulatory policy framework known as Reforming the Energy Vision (REV) directed at reforming how electricity is produced, distributed, consumed, regulated, and priced.¹⁴⁶ Under the plan, utilities are encouraged to explore the use of micro-grids, energy efficiency, energy storage, and demand response as well as help create markets for new energy technologies. The REV also envisions the organization of investor-owned utilities (IOUs) and a municipal electricity provider to serve as retail dispatchers similar to regional reliability organizations. The idea, then, behind this part of the REV is to more tightly organize the distribution system precisely to provide greater assurance for reliability. Most significantly, the plan is designed so that ratepayers are not saddled with significant transition or energy costs.¹⁴⁷

In Minnesota, a collaborative group of utilities, consumers, business, and government leaders as well as academicians interested in reforming the electric system generated a list of recommendations to take advantage of the transforming energy economy. The idea behind the Minnesota plan is to move away from the traditional utility business model toward one that provides increased consumer choice. Similarly, the plan is to move away from a system that rewards capital expenditures in favor of one that rewards performance and satisfies customer preferences for energy efficiency, reliability, affordability, and emissions reductions.¹⁴⁸

Other states are active as well. Hawaii's Clean Energy Initiative has a goal of achieving 70 percent clean energy by 2030 with 30 percent from efficiency measures and 40 percent from renewable resources.¹⁴⁹ Similarly, the California Clean Energy Future joins system operators and other state agencies to promote innovation and green job creation through investments in transmission, efficiency, the smart grid, and renewable resources.¹⁵⁰

Utilities themselves are also actively pursuing new business strategies through investing in distributed generation, energy efficiency, and energy storage.¹⁵¹ Additionally, industry actors are looking at opportunities for consolidation, reducing operating costs, exploring new markets to further growth, and determining how to leverage low carbon resources to provide adequate electricity.¹⁵² However, as regulated entities, utilities alone cannot undertake a successful transition without regulatory assistance and support from PUCs.

Because utilities have been rewarded for capital expansion, they have had no incentive to reduce operating costs, open transmission and distribution to other users, or to invest in new technologies. In fact, PUCs, through ratemaking, have encouraged utilities to continue to invest and expand. Thus, PUCs play a central role in providing economic incentives for utility behavior and performance. Consequently, regulators must acknowledge the direction of the CPP, and they must realize that if the electric system is going to be transformed by opening it up to more competition and a greater diversity of resources, rate designs that facilitate that transformation are necessary.

New rate designs are available, and promising methods include decoupling,¹⁵³ performance-based rates, long-term energy plans, and earnings sharing mechanisms. The core idea behind such reforms is to move away from rates that encourage consumption to rates that encourage utilities to improve performance while reducing demand.¹⁵⁴ These new regulatory models can assist utility planning and investment, satisfy customer expectations, and promote new technologies¹⁵⁵ and markets even during a period of low demand and greater competition from efficiency measures and distributed resources.¹⁵⁶

More specifically, through innovative rate designs, regulators can encourage: (1) business innovation; (2) investments in renewable resources and energy efficiency; and, (3) grid improvements and upgrades. Further, utilities, faced by the several challenges already noted, are finding that compliance with the energy efficiency and renewable energy building blocks of the CPP is becoming increasingly economical.¹⁵⁷ Consequently, utility resistance to the CPP appears more like resistance to change in general rather than to the CPP in particular. More particularly, the United States is moving toward a clean energy economy, and utilities and their regulators have been moving along with it. Indeed, the CPP does not run counter to those transformations; rather, it is consistent with them.

Recommendation

- Energy regulators should follow the lead of states such as New York and Minnesota and reevaluate electricity regulation with the goal of adopting rate designs that enable the electricity industry to comply with the CPP by encouraging renewable resources and energy efficiency reliably and affordably while facilitating a transition to a fully clean energy system.

Reliability and the Clean Power Plan¹⁵⁸

By Joseph P. Tomain

Industry claims that meeting the Clean Power Plan's (CPP) carbon reduction targets will compromise the reliability of the U.S. electricity sector. The North American Electric Reliability Corporation (NERC), an entity designated by the Federal Energy Regulation Commission (FERC) to provide congressionally required reliability assessments, has conducted a study assessing the reliability issues posed by the CPP.¹⁵⁹ In its initial study, published in November 2014, NERC identified several reliability issues including: (1) the adequacy of clean energy replacements for fossil fuel plant retirements; (2) whether EPA's assessment of potential heat rate improvements under Building Block 1 is achievable; (3) the need for transportation investments in natural gas pipelines and for electricity transmission lines (particularly to connect variable resources to the grid); (4) the adequacy of EPA's assessment of the penetration of renewable resources for electricity generation; (5) the effects of increased use of distributed energy resources (DER) on reliability; (6) whether EPA's estimates of the increased use of energy efficiency will meet the growth in electricity demand; (7) the effect of the CPP on reliability services such as load balancing and voltage and frequency support; and (8) whether the CPP allows enough time for states to comply.¹⁶⁰ Each issue is significant and will be addressed in turn.

- (1) *Fossil Plant Retirements.* Utilities have been retiring coal plants prior to the CPP for three key reasons: the aging of the coal fleet; environmental regulations such as mercury air toxics standards; and lower natural gas prices, which make natural gas electricity generation cheaper than coal generation. The environmental regulations under the CPP may contribute to retirements to some extent because states can achieve the emission-rate targets most easily by retiring high-emitting coal-fired power plants. However, plant retirements should not affect reliability. According to the U.S. Energy Information Administration (EIA), in 2015 approximately 16 gigawatts (GW) of generation will be lost of which 12.9 GW are from retiring coal plants. The EIA reports that lost generation will be more than replaced by 20 GW of new generation including wind (9.8 GW), natural gas (6.3 GW), and solar power (2.2 GW).¹⁶¹ Looking forward to additional retirements from the CPP, the trend is likely to continue: New generation from renewable resources and natural gas, plus improved efficiency, are likely to allay reliability concerns.
- (2) *Heat Rate Improvements.* The CPP suggests that heat rate improvements, *i.e.* efficiency improvements in plants, can be improved by 6 percent. NERC notes that a 6-percent heat rate improvement may be difficult to achieve. However, NERC addressed individual plant-level heat rate improvements rather than fleet-level heat rate improvements, which are likely to improve due to retirements of the least efficient plants. In other words, under the CPP, the 6-percent heat rate improvement is a statewide estimate not an estimate per plant. The CPP is flexible and does not require upgrades at each plant. Thus, as utilities retire less efficient coal plants and rely on more efficient coal plants, fleet-wide heat rate improvements are likely. Additionally, greater cogeneration and waste heat recovery can contribute to heat rate improvements.¹⁶²
- (3) *Transmission Planning and Investment.* As old generation plants retire and new ones are constructed, new and/or upgraded transmission facilities will be needed to interconnect new generation, particularly variable generation from solar and wind. Additionally, as natural gas plays a larger role in electricity generation, gas pipelines will be needed. One significant challenge is that transmission line siting authority has been divided between state and federal governments, which presents two problems. First, acquiring the necessary approvals and construction can take years, and, second, not-in-my-backyard (NIMBY) resistance is not

unknown.¹⁶³ Nevertheless, there are promising signs. First, increased penetration of renewable generation from variable resources has already created a strong impetus for new transmission lines.¹⁶⁴ Second, the electric industry and its state regulators are engaged in ongoing transmission planning processes that will continue without regard to the CPP. Third, because natural gas, unlike electricity, can be stored, utilities can store natural gas in advance to reduce reliability risks during periods of high use.

(4) *Penetration of Renewable Resources.* NERC notes that renewable portfolio standards (RPS)

programs may not achieve the goals that EPA suggests. It is true that the states have uneven records in setting and achieving RPS goals. However, that potential deficit could be offset by states whose RPS targets already exceed EPA estimates. Further, as costs for renewable resources decline, two positive consequences are emerging. First, penetration levels of renewable resources are increasing. Second, because of that increase, independent transmission companies, known as merchant transmission firms, are entering the transmission market to connect renewable energy to the grid. Significantly, in its most recent report, the EIA notes that renewable electricity will meet much of the growth in electricity demand. It is projected that renewable electricity generation will increase by 72 percent from 2013 to 2040 and will account for more than one-third of new generation.¹⁶⁵

(5) *Increased Use of Distributed Energy Resources*

(DER). Consumers are beginning to enjoy greater control over their energy consumption. Distributed resources such as rooftop solar, heat pumps, micro-grids, and even programmable thermostats and appliances provide consumers with information with which they can shape consumption choices. Utilities have expressed concern about the expansion of DER because increased penetration may reduce their retail sales. However, forward thinking electricity associations, such as the Electric Power Research Institute, are proactively engaged in incorporating DER into their generation mix.¹⁶⁶ As discussed in the section on the CPP's impacts on the electricity industry, state utility regulators can mitigate this concern through adjustments in state rate regulations. Reduced sales, moreover, must not be confused with reliability. Increased use of DER reduces stress on the grid, and, therefore, increases reliability.

(6) *Energy Efficiency and Demand Growth.* NERC points out that EPA's estimates of the growth in energy efficiency may not keep up with demand for electricity. However, the EIA projects that energy consumption will be at the near-zero growth rate of 0.3 percent per year from 2013 through 2040.¹⁶⁷ Further, states are experimenting with and recognize potential savings through their energy efficiency programs. Moreover, new technologies reduce cost to consumers, and some states are developing best practices that can be adopted by other states. In addition, through the use of building codes, appliance standards, and fuel economy standards, energy efficiency gains are being made. Finally, energy efficiency programs that rely on tradable energy credits can

The CPP may contribute to plant retirements to some extent because states can achieve the emission-rate targets most easily by retiring high-emitting coal-fired power plants. However, plant retirements should not affect reliability. According to the U.S. Energy Information Administration, in 2015 approximately 16 gigawatts (GW) of generation will be lost of which 12.9 GW are from retiring coal plants. The EIA reports that lost generation will be more than replaced by 20 GW of new generation including wind (9.8 GW), natural gas (6.3 GW), and solar power (2.2 GW).

be improved through multistate and regional programs, which create more sustainable and fluid energy efficiency markets. Thus, energy efficiency measures appear to be keeping up with demand, without a gap that would raise reliability concerns.

(7) *Reliability Services.* Because electricity cannot be stored at the necessary scale, supply and demand must be managed through a process known as load balancing. Similarly, voltage levels must be maintained, otherwise, grid disruption results. Reliability services are used to achieve load-balancing and maintain voltage levels. At this point, however, there are no large-scale commercial electricity storage solutions to help maintain and balance load, although storage options are starting to enter the market.¹⁶⁸ Adding variable resources, such as wind and solar, to the electricity resource mix does pose challenges to both load-balancing and voltage stability. Nevertheless, increased energy production from multiple sources, including variable resources, has thus far not imposed reliability problems. Many states, for example, have RPS mandates that exceed those suggested by the CPP and have not encountered reliability problems. As noted above, the industry and its regulators have been engaged in ongoing reliability planning for decades. Further, the industry has experienced multiple changes over its history while adequately managing load-balancing and maintaining voltage stability.¹⁶⁹

(8) *Timing for Compliance.* NERC, as well as other industry commentators such as the Edison Electric Institute,¹⁷⁰ suggest that the compliance window is short and that states should have more time to comply to ensure reliability. Currently, individual state plans are to be submitted June 2017, multistate plans are to be submitted in June 2018, and the compliance period begins 2020. However, a study by the Brattle Group notes that efforts to transition to a clean energy economy are occurring regardless of the CPP and, therefore, timing does not present a material issue. The study states: “[W]e find that the combination of the ongoing transformation of the power sector, the steps already taken by system operators, the large and expanding set of technological and operational tools available, and the flexibility under the CPP are likely sufficient to ensure that compliance with the CPP can be planned by states in ways that will not materially affect reliability.”¹⁷¹ Another study similarly concludes that “[t]he evidence does not support the argument that the proposed CPP will result in a general and unavoidable decline in reliability.... [W]e believe resource planners and markets will have sufficient time and resources to respond to a realistic projection of system redispatch and facility retirements.”¹⁷²

Over the last decades, reliability issues have been addressed through regional organizational arrangements and the CPP draws on those experiences. Because different states in different regions of the country have different resource mixes and different generation fleets, regional arrangements can enhance reliability, create competitive wholesale energy markets, and improve transmission while reducing carbon emissions. Regardless, new gas-fired plants, renewable resources, energy storage, and efficiency and demand response resources are all available to meet the CPP targets without threatening reliability.

Additionally, many of the commenters who argued that there is insufficient time for compliance have urged FERC to provide relief either in terms of a “reliability safety valve” or a “reliability assurance mechanism.” The core idea is simple enough: industry and its regulators want more time. The details of those mechanisms, however, are unspecified. There is cause for skepticism. One study indicates that

“[m]any of these mechanisms to address ‘reliability’ are either too lenient, constituting an escape clause from compliance, or are investment cost avoidance measures masquerading as reliability protections.”¹⁷³

A number of factors undercut the criticism that the states cannot meet the scheduled timetable. First, many organizations are putting together toolkits to help facilitate planning.¹⁷⁴ Second, the industry has regularly and successfully addressed reliability issues through ongoing planning processes, particularly through regional organizations. Third, the flexibility of the CPP allows for a variety of responses and resource mixes to allow time to adequately manage plant retirements as well as the integration of variable resources and energy efficiency, all while maintaining reliability.¹⁷⁵

Conclusion

Reliability is absolutely essential for the functioning of the electric system. Electricity, as we all know, must be available at the flip of a switch. The CPP is cognizant of reliability issues, and through EPA’s communications with states and utilities, its study of existing technologies and regulations, the CPP’s flexibility in terms of satisfying emissions reduction targets, and its encouragement of multi-state planning, reliability is fully addressed. Over the last decades, reliability issues have been addressed through regional organizational arrangements and the CPP draws on those experiences. Because different states in different regions of the country have different resource mixes and different generation fleets, regional arrangements can enhance reliability, create competitive wholesale energy markets, and improve transmission while reducing carbon emissions.¹⁷⁶ Regardless, new gas-fired plants, renewable resources, energy storage, and efficiency and demand response resources are all available to meet the CPP targets without threatening reliability.¹⁷⁷

As a number of commentators have stated: (1) reliability assessments and processes are largely in place; (2) reliability assessments are favorable for higher penetrations of renewable energy and more coal plant retirements; (3) transmission improvements have been highly effective in bringing renewable energy to market; and, (4) improved use of new and existing infrastructure is a valuable way to lower consumer costs while complying with the CPP.¹⁷⁸ In short, industry and its regulators have a long history of successfully planning and assessing reliability. Such activities will continue with or without the CPP because of the importance of electricity to our economy and to our citizens. Reliability is a critical concern, but history demonstrates that industry and its regulators can address these issues and the CPP does not present reliability obstacles.¹⁷⁹

Recommendation:

- States and utilities should continue planning processes and work with available regional transmission organizations (RTOs) and Independent system operators (ISOs) to develop regional solutions to address any reliability issues that might emerge.

The Clean Power Plan and Clean Energy Policy

By Joseph P. Tomain

The United States has been experiencing a clean energy transition. For the most part, this transition is being driven by individual states and by the private sector through clean energy investments.¹⁸⁰ The federal government has declined to take a lead role to date, but with EPA's coming release of the Clean Power Plan (CPP), that is, at last, changing. The CPP presents the states with a suite of suggested energy resources, technologies, and regulatory innovations that will assist them in reducing carbon emissions from existing generating plants. The flexibility of the CPP is a necessary element because different states have different resource mixes and different electricity generation fleets. Consequently, states will craft either individual or multi-state plans to satisfy CPP requirements.

Although the CPP is not yet final, individual states are already making progress toward satisfying CPP emission reduction targets. A recent report from Union of Concerned Scientists shows that all but four states have already decided to cut emissions; 14 states are already ahead of their emission rate trajectory; and 31 states will soon be at least halfway towards the 2020 benchmark. Perhaps most striking, one of the most politically vocal opponent states of the clean power plan, Kentucky, is ahead of meeting emissions reduction targets through already planned coal plant retirements.¹⁸¹

The CPP's carbon-reduction goal is compatible with the transition to a clean energy economy.

Nevertheless, while the CPP allows for a variety of resources, including clean coal, nuclear power, and natural gas, together with renewable resources and energy efficiency, some resources are more compatible with a clean energy transition than others. It is, therefore, important to distinguish the costs and benefits associated with the various resources that can be used to satisfy the CPP.

The CPP presents the states with a suite of suggested energy resources, technologies, and regulatory innovations that will assist them in reducing carbon emissions from existing generating plants. The flexibility of the CPP is a necessary element because different states have different resource mixes and different electricity generation fleets. Consequently, states will craft either individual or multi-state plans to satisfy CPP requirements.

There is no settled or scientific definition for clean energy. Instead, it has been variously defined in a number of legal contexts. By way of example, renewable portfolio standards (RPSs) (or alternative energy portfolio standards) have been adopted by 41 states and the District of Columbia¹⁸² and cover more than 50 percent of total U.S. electricity demand. Each state program emphasizes different resources and sets different renewable percentage goals and timetables. Clean energy standards (CES), another form of an energy efficiency standard, as endorsed by the White House and introduced in Congress,¹⁸³ operate similarly to RPS programs and can also promote renewable resources and reduce emissions.

According to the Energy Information Administration (EIA), a national CES would have the effects of reducing coal-fired generation; increasing the role of nuclear, natural gas, and renewable technologies; and, therefore, decreasing carbon dioxide emissions by 20 percent by 2025 and 44 percent by 2035,¹⁸⁴ all of which would be consistent with the goals of the CPP.

Energy efficiency standards (EES) are another tool promoting clean energy programs to reduce consumption by imposing efficiency standards on vehicles, appliances and buildings. Such programs

reduce consumption at a fraction of the cost of energy¹⁸⁵ as emissions are reduced. In 2009, for example, the federal Energy Star program, which labels energy efficient appliances, prevented 45 million metric tons of greenhouse gas emissions, the equivalent of emissions from 30 million vehicles, and saved consumers \$17 billion in their utility bills.¹⁸⁶ And, Corporate Average Fuel Economy (CAFE) standards are now scheduled to achieve 54.5 miles per gallon for cars and light trucks by model year 2025,¹⁸⁷ dramatically increasing fuel efficiency.

In addition to renewable energy and energy efficiency, the CPP also allows states to pursue “cleaner energy” resources by using clean coal, nuclear power, and most particularly, shale gas to reduce carbon emissions. While such flexibility is necessary as well as desirable, the CPP may, in fact, undervalue renewable resources¹⁸⁸ and energy efficiency¹⁸⁹ and may also underestimate the social and economic costs of clean coal, nuclear power, and shale gas.¹⁹⁰

The Social and Economic Costs of Clean Coal, Nuclear Power and Shale Gas

Clean Coal

Clean coal, or carbon capture and sequestration (CCS), is attractive because carbon can be extracted from the coal burning process and the captured carbon may be put to beneficial uses.¹⁹¹ Although EPA did not include CCS as part of the best system for emission reduction (BSER) for determining state targets, states remain free to choose their own strategies for satisfying emission reduction targets, including CCS.¹⁹² Clean coal, however, comes with significant challenges, most notably cost and environmental liability.¹⁹³

While the federal government has actively promoted CCS, it has not experienced great success. For example, of the eight demonstration projects initiated in 2003, only three were completed. Of the two projects initiated in 2004 only one was completed. Further, of the six projects selected by DOE in 2009-2010, only three are still active, and that is due to an infusion of funds from the American Recovery and Reinvestment Act of 2009. Despite over \$6 billion of federal funding, only two industrial projects are in operation, only one commercial scale project is in advanced construction, and only five projects are under development.¹⁹⁴ The CCS industry then suffered a substantial blow in February 2015 when the DOE terminated funding of an Illinois project after determining that the project could not be completed even with the \$1 billion allocated.

Further, the cost of a CCS power plant can be more than double that of a conventional plant. And, there is a cost premium for operating a plant because CCS processes can consume between 15 and 30 percent of the power generated by a plant, thus constituting a costly “energy penalty.”¹⁹⁵ As a result of these additional costs, it is estimated that electricity from CCS power plants can be expected to cost 75 percent more than electricity from conventional plants.¹⁹⁶

CCS projects also require transportation and storage infrastructure that expose air, land, and water to environmental risks as a result of methane leakage as well as toxic chemical spills from pipelines and storage facilities.¹⁹⁷ Further, CCS projects require up to 3200 percent more water than non-CCS plants.¹⁹⁸ Finally, in the long-term, stored carbon could seep out if storage facilities prove more porous than expected.

Nuclear Power

Nuclear power is another available resource for satisfying CPP requirements because of its near zero carbon emissions.¹⁹⁹ Although the BSER calculations for states did not include the construction of new nuclear power plants, it did assume the completion of plants currently under construction as well as

retention of the active nuclear fleet and avoiding premature nuclear plant closures. However, nuclear power may not be the best clean energy option for two significant reasons. First, nuclear power cannot pass a market test. Second, it is not necessary because greater gains in energy efficiency and in reduced carbon emissions can be realized by investing in alternative and renewable resources.

Currently, five nuclear plants are under construction: two in Georgia, two in South Carolina, and one in Tennessee. These plants receive substantial federal subsidies and have been encountering rising costs as well as delays.²⁰⁰ Nuclear power is not cost competitive with coal, natural gas, or even alternative renewable resources. A major study by MIT showed that the levelized cost of electricity from nuclear power can become cost competitive only under very restrictive conditions such as the imposition of a carbon price and finding a solution for permanent waste disposal.²⁰¹ Under those tight circumstances, then, nuclear generated electricity can become cost competitive. To date, however, none of those circumstances have been realized.

Nuclear advocates also point to the promise of advanced nuclear reactor designs as well as the use of modular nuclear units.²⁰² These technologies may be promising; however, they are not at commercial scale and present challenges including safety risks and economic costs.

The issue for nuclear power, then, becomes not just the question of environmental risks; rather, the issue is whether there are other clean energy investments that would be more effective both in terms of generating electricity as well as reducing emissions. One study, for example, concludes that “[f]or every dollar you spend on nuclear, you could have saved five or six times as much carbon with efficiency or wind farms.”²⁰³

*Shale Gas*²⁰⁴

In recent years, industry and policymakers have paid increased attention to natural gas, and that attention has two distinct aspects. First, by assuming that states can increase their use of existing natural gas generating capacity, the CPP recognizes that natural gas will play a role in our energy future. Although not part of the BSER calculation, some states may meet their targets by not only shifting coal-fired generation to existing natural gas plants, but by building new natural gas plants. Increased reliance on natural gas can significantly reduce GHG emissions and help states meet their targets because natural gas plants emit about half of the carbon emitted by coal-fired plants. Second, the fossil fuel industry has experienced a resurgence in development lately and, therefore, remains a significant part of our energy economy. Relative to the CPP, then, care must be taken to adequately assess the contribution that natural gas can make to achieving its goals.

Since 2005, domestic oil and gas production has been increasing dramatically. The International Energy Agency (IEA) reported that new discoveries in the United States are having a profound impact on domestic and global energy policies and markets.²⁰⁵ The IEA projects that by 2017 the United States will produce more oil than Saudi Arabia. Domestically, the EIA reports that shale gas has a positive impact on our energy economy,²⁰⁶ and a variety of other commentators claim that shale gas can address our major energy problems,²⁰⁷ serve as “game changer” for our domestic energy profile,²⁰⁸ and be a bridge fuel to the future.²⁰⁹ Indeed, in his 2012 State of the Union address, President Obama stated that the natural gas industry could create 600,000 jobs by the end of the decade.²¹⁰

Shale gas has much to recommend it: (1) abundant reserves yield low prices²¹¹ (2) natural gas power plants emit about half of the carbon dioxide released by coal; (3) natural gas is already displacing coal for electricity generation;²¹² (4) domestic production adds jobs; (5) we are beginning to reduce imports and increase energy exports;²¹³ (6) the country is becoming more energy independent;²¹⁴ and (7) given its

abundance, the price volatility experienced by the natural gas sector for the last two decades has been reduced.²¹⁵

Nevertheless, natural gas, particularly through horizontal fracturing, which is used in approximately two-thirds of the natural gas wells in the United States and up to 95 percent of all new oil and gas wells currently being drilled,²¹⁶ poses significant environmental costs and risks.²¹⁷

Air Pollution

According to a study by the Union of Concerned Scientists, increased use of natural gas for electricity generation “could contribute to that sector’s overall increase in carbon dioxide emissions.”²¹⁸ Shale gas production can cause air pollution from diesel engines, rigs, trucks, and other equipment. Additionally, gases are released from operating the wells, especially through venting and flaring, which releases large amounts of methane, fine particulate matter and volatile organic compounds (VOCs) that present risks to air and human health.²¹⁹ Further, methane leakage has the potential to cause significant environmental harm. Although the amount of methane emissions is much lower than the emissions of carbon dioxide, methane is 72 times more potent at the time of release and 25 times more potent than carbon dioxide over a 100-year period.²²⁰

While EPA initially concluded that the net environmental impact of methane emissions is likely to be small,²²¹ other studies show that non-CO₂ emissions from shale gas can result in lifecycle emissions higher than those of coal. As part of its Climate Action Plan, the White House has issued a white paper warning of the dangers of methane leakage, noting that methane emissions are expected to increase through 2030. EPA has been directed to issue methane rules to reduce emissions from oil and gas production 45 percent by 2025 from 2012 levels.²²² The final regulations are expected by 2016. Thus, air pollution will be a continuing concern.

Water Pollution

Water is a necessary input into hydraulic fracturing processes and several environmental issues emerge. First, large volumes of water are withdrawn from both ground and surface waters thus reducing the available amount of water for human consumption. Second, various chemicals are mixed into the water to improve operations. Anywhere from 10 to 50 percent of the water injected into a well can “flow back.” The flowback water contains chemicals²²³ that are often toxic, including organic pollutants, heavy metals, and radioactive materials.²²⁴ Third, this wastewater must be transported and stored; spillage from either can also have health effects. Fourth, the change in water temperature use can introduce invasive species; increase pollutant concentrations; and negatively affect plants and wildlife.²²⁵ In response, EPA has initiated a rulemaking to set water discharge standards for wastewater from shale gas production.²²⁶

And, finally, wastewater treated and disposed of through underground injection could impact drinking water resources.²²⁷ EPA is prohibited from regulating injections from hydraulic fracturing operations under the Safe Drinking Water Act²²⁸ through a loophole known as the Halliburton exception, named for firm that lobbied for it and patented hydraulic fracturing in the 1940s.²²⁹ In 2010, EPA was directed by Congress to study and review the effects of hydraulic fracturing on drinking water resources. In December 2012, the agency issued a progress report on its study.²³⁰ EPA issued a draft report in June 2015 which “did not find evidence that these mechanisms have led to widespread, systemic impacts on drinking water resources in the United States.”²³¹ A final report is due in 2016.²³²

Community Disruption

Shale gas development is occurring in regions, particularly in the eastern United States, that are unfamiliar with oil and gas exploration and production. Developing sites requires the use of trucks and other heavy equipment as well as the possible construction of new roads, drill pads, and gathering lines. These activities affect the immediate area and carry the risk of air emissions, odors, noise, spills, changes in land use, and the disruption of wildlife. They also impose widespread changes in the life in these communities. Concern about such disruption has led citizens to attempt to ban fracking in their communities.²³³ And, concern in New York about respiratory health, safety, drinking water, soil contamination, and seismic activity, as well as climate change, has led that state to ban fracturing.²³⁴ Such activity, unsurprisingly, has resulted in pushback legislation by the industry.²³⁵

The shale gas boom has seen a significant increase in drilling activity. More wells are being drilled and with that increase there is a greater need for more surface usage. Operators need more access roads; habitats are disturbed; transportation activity increases dramatically; soil erosion occurs; and, water quality is adversely affected by stormwater runoff. In addition to growing conflicts between local, state, and federal authorities, conflicts about the use of and disruption to public lands are also increasing.²³⁶

Recommendation:

- While the CPP gives states the flexibility to adopt a wide variety of “cleaner energy” resources such as nuclear power, clean coal and, most notably, natural gas, states should draft state implementation plans that prioritize renewables and energy efficiency. A clean energy economy can contribute to economic growth, jobs, new technologies, greater competition among energy actors, and increased consumer choice.

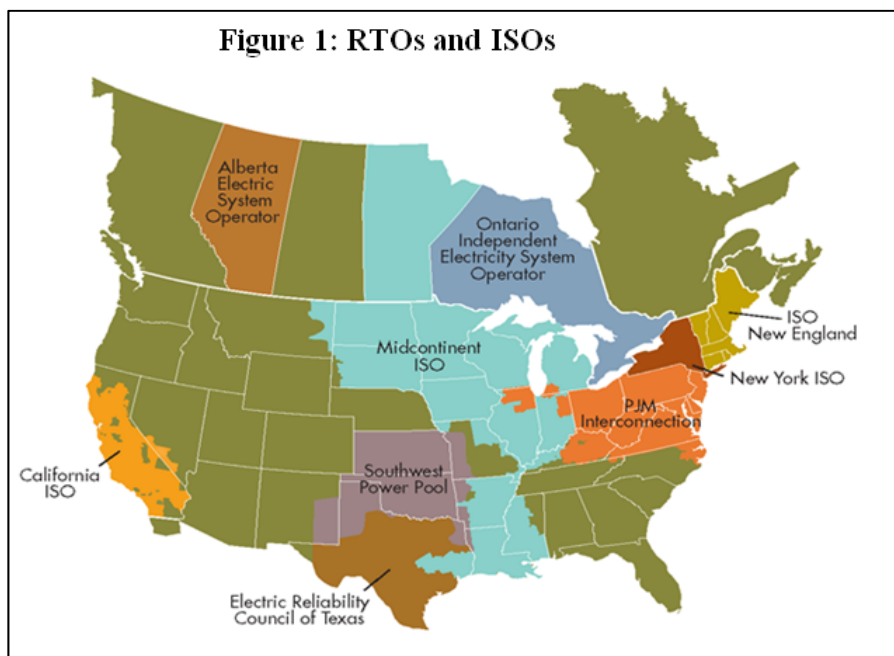
Regional Approaches to State Power Plan Compliance

By Alexandra B. Klass

This section considers the potential for collaboration between states to achieve Clean Power Plan (CPP) Compliance. The proposed draft of the CPP is written so that it imposes an individual target for each state, and gives guidance for states to use the four “building blocks” flexibly to comply with that target. But the CPP also allows for interstate/regional cooperation to achieve compliance. Such regional approaches have significant potential to ease compliance burdens because they allow states, using trading mechanisms, to take advantage of low-cost emissions reductions or increased renewable energy generation in nearby states that may be able to take those actions in a more cost-effective manner. Experts estimate that compliance costs may be reduced by billions of dollars for states and utilities that take advantage of regional efficiencies and opportunities. Another significant benefit to regional compliance is that such approaches more accurately match the regional nature of the electric transmission grid and electricity markets, thus allowing market participants to use existing frameworks for compliance. After a discussion of the U.S. transmission grid and existing energy markets, this section presents some of the benefits and hurdles associated with regional approaches to CPP compliance.

Background on the Electricity Grid and Electricity Markets and Relevant Clean Power Plan Provisions on Regional Collaboration

As an initial matter, the U.S. transmission grid is divided into three distinct interconnections: the Eastern Interconnection, which extends from the Atlantic Ocean to as far west as the western borders of the Dakotas and Nebraska, and south to Texas; the Western Interconnection which extends from the border of the Eastern Interconnection to the Pacific Ocean; and a smaller interconnection that includes most of Texas.²³⁷ There is little or no exchange of electricity between the interconnections. Within these three interconnections, or grids, Independent System Operators (ISOs) and Regional Transmission Organizations (RTOs), which are non-governmental entities approved by the Federal Energy Regulatory Commission (FERC), manage portions of the transmission grid and regional markets for wholesale power for much of the country.



In general, utilities maintain ownership of the physical transmission lines, but the RTO or ISO handles the day-to-day operation of the system and sets prices for the wholesale electricity markets within its borders. Many RTOs also handle the Renewable Energy Credit (REC) markets that utilities use to show compliance with state renewable portfolio standards (RPS). (Notably, it is these state RPS that EPA relied on in part to determine the ability of each state to achieve compliance through increased generation of renewable energy as a replacement for energy resources that emit carbon dioxide (CO₂) (building block

3)).²³⁸ Membership in RTOs is voluntary and utilities may join RTOs, move to a new RTO, or choose not to participate in an RTO at all. RTOs cover approximately two-thirds of the U.S. population and meet approximately the same amount of U.S. electricity demand.

EPA has set an initial emissions rate-based standard for each state, but states have the flexibility to convert that rate-based standard into a mass-based target.²³⁹ Thus, each state may choose to comply with the CPP based on a rate-based target (pounds of carbon dioxide per megawatt hour (lbs CO₂/MWh)) or a mass-based target (tons CO₂/state/year). States may choose to collaborate by entering into multi-state partnerships to achieve a blended rate-based or mass-based target. This would allow states with a high cost of generating more natural gas or renewable energy to engage in credit trading with states that can generate lower-carbon or no-carbon energy at lower cost. This is similar to how the Regional Greenhouse Gas Initiative (RGGI) in the Northeast currently operates and is also similar to the trading of RECs in multi-state RTO markets. If a state chooses to comply on a stand-alone basis, the state must submit its compliance plan by June 1, 2016. If two or more states inform EPA that they intend to engage in regional compliance, the compliance deadline is extended to June 1, 2017 to allow for the necessary coordination among the states.²⁴⁰

Experts estimate that compliance costs may be reduced by billions of dollars for states and utilities that take advantage of regional efficiencies and opportunities.

Potential Approaches for Regional Compliance

Regional approaches can range from formal interstate collaborations with a shared target, like RGGI to RTO-based frameworks that create a trading platform that would allow utilities to trade emissions allowances within and across state lines and that would effectively set a price on carbon²⁴¹ to state-specific plans that include common plan elements with neighboring states, such as a common accounting system²⁴² to memoranda of understanding (MOUs) on a range of common issues for states.²⁴³

The most “collaborative” of the various regional approaches would be variations on formal greenhouse gas (GHG) reduction alliances like RGGI. For those states that are already members of RGGI,²⁴⁴ revisions to the existing program to bring it in line with the requirements of the CPP would allow each member state to take advantage of regional efficiencies and trading to meet a joint, mass-based cap on CO₂ emissions. While such an approach may work well for the RGGI states, it is much less feasible in other states that are either opposed to the CPP on political grounds or do not wish to enter into formal agreements with other states on compliance.

For instance, even in Virginia, where Gov. Terry McAuliffe and the state Department of Environmental Quality (DEQ) have proposed joining RGGI to meet the requirements of the CPP, state legislators have rebuffed any efforts for legislative authority to do so.²⁴⁵ This is true even though state regulators estimate that the state will be unable to bring utility-scale wind or solar power on line by the 2020 deadline for 20 percent CO₂ emissions reductions, and even though experts indicate that if the state joined RGGI it would earn more than \$2.8 billion over the next 15 years, partly through auctions selling GHG allowances.

Moreover, even where states join a formal alliance, such alliances may be unstable if politics within the region change dramatically. For example, states can leave RGGI or similar organizations, as was the case when Gov. Chris Christie withdrew the state of New Jersey from RGGI in 2011. Because alliances like RGGI are so new and in many ways legally untested, there have also been legal challenges to the ability of a governor to unilaterally commit his or her state to RGGI (New York)²⁴⁶ as well as to unilaterally withdraw from RGGI (New Jersey).²⁴⁷

Even for those states that may not oppose the CPP on political grounds, the interstate agreements necessary to adopt a single, multi-state, mass-based or rate-based target would require a level of coordination between states on energy policy that to date does not exist outside RGGI and, arguably, even within RGGI. Each state that is party to the agreement would need to agree on whether to use a rate-based or a mass-based target and the appropriate conversion mechanism. The environmental agencies within each state would also have to coordinate on significant rulemaking to develop compatible compliance plans and dispute resolution procedures on a whole host of issues.²⁴⁸ Moreover, states with less stringent individual targets might need to meet a more stringent blended target under either a rate-based or mass-based approach, which would be an additional disincentive for states with low EPA-imposed targets to collaborate.²⁴⁹

But there are opportunities for regional compliance outside formal arrangements like RGGI in the form of new, interstate trading platforms that states and RTOs around the country are discussing.²⁵⁰ All of these options other than formal, interstate collaborations like RGGI allow states to set individual targets and then use a range of interstate trading options, some of which are discussed below, to meet that target.

For instance, there would appear to be significant, cost-effective trading opportunities for states within RTOs like the Mid-Continent Independent System Operator ([MISO](#)) and [PJM](#) that cover large areas of the United States with significant population centers, extensive transmission line networks, a history of cooperation, and the potential for generating significant new sources of utility-scale wind and/or solar energy. MISO estimates that “a regional approach to carbon management could save Market Participants \$3 billion to \$5 billion annually.”²⁵¹ Likewise, the PJM RTO analyzed various scenarios covering different combinations and levels of renewable resources, energy efficiency, natural gas prices, nuclear generation, and new entry of natural gas combined-cycle resources. It also compared regional compliance versus state-by-state compliance for each scenario. Ultimately, PJM concluded that state-by-state compliance options would result in higher compliance costs than regional compliance options for most PJM states. This is because there are more low-cost options available within the entire PJM region than there are within each individual state’s boundaries.²⁵²

One option MISO and the Southwest Power Pool (SPP) RTOs are considering is a framework where the states would submit to EPA individual implementation plans using their own mass-based targets.²⁵³ Once EPA approves the plans, the states would use trading within the RTO to reduce the costs of meeting their goals. According to one consultant, this would create regional coordination that doesn’t require a “grand bargain” of all the states trying to reallocate emissions using a rate-based approach or require states to reach the level of agreement on a group target and each state’s respective responsibility to meet that target like in RGGI.²⁵⁴ In other words, “[i]f it makes sense for [Iowa] to over-comply to reduce their tons even further so that they can sell them to Minnesota, which is cheaper for Minnesota than doing the next most onerous thing ... that’s how it’s going to work. It’s self-interest for both states.”²⁵⁵ According to one MISO representative, putting a regional price on carbon and working with MISO to trade within the region would be similar to what is already in place for SO₂ trading under the acid rain provisions of the Clean Air Act, and would be a cost-effective compliance option for the region.²⁵⁶

There are other opportunities for states outside of RTOs and ISOs to collaborate to meet individual targets, such as entering into memoranda of understanding or developing “common elements” plans. In this situation, states would set individual targets but include in their plans provisions that would allow affected sources to use common, tradable compliance instruments such as emissions allowances, and create compatible tracking systems for credits and allowances.²⁵⁷

Limitations on Regional Compliance and Ways to Overcome Them

Currently, the CPP only allows renewable generation and other lower-emission generation to “count” in the state where it is generated, not the state where it is imported and used. But one of the benefits of

regional collaboration would be to increase renewable energy generation, lower-emission natural gas generation, and energy efficiency in parts of the region where it is most cost effective and then allow utilities to use RECs or other credit trading to meet a regional compliance cap or individual state caps. As a result, the CPP would seem to hinder regional approaches to compliance because of the difficulty of deciding which state gets “credit” for the reduced emissions.

For example, in the context of using renewable energy to meet an individual state target, states may not be able to generate new renewable resources in a cost-effective manner but they may be able to acquire such generation from neighboring states where such renewable generation can be more cheaply developed or

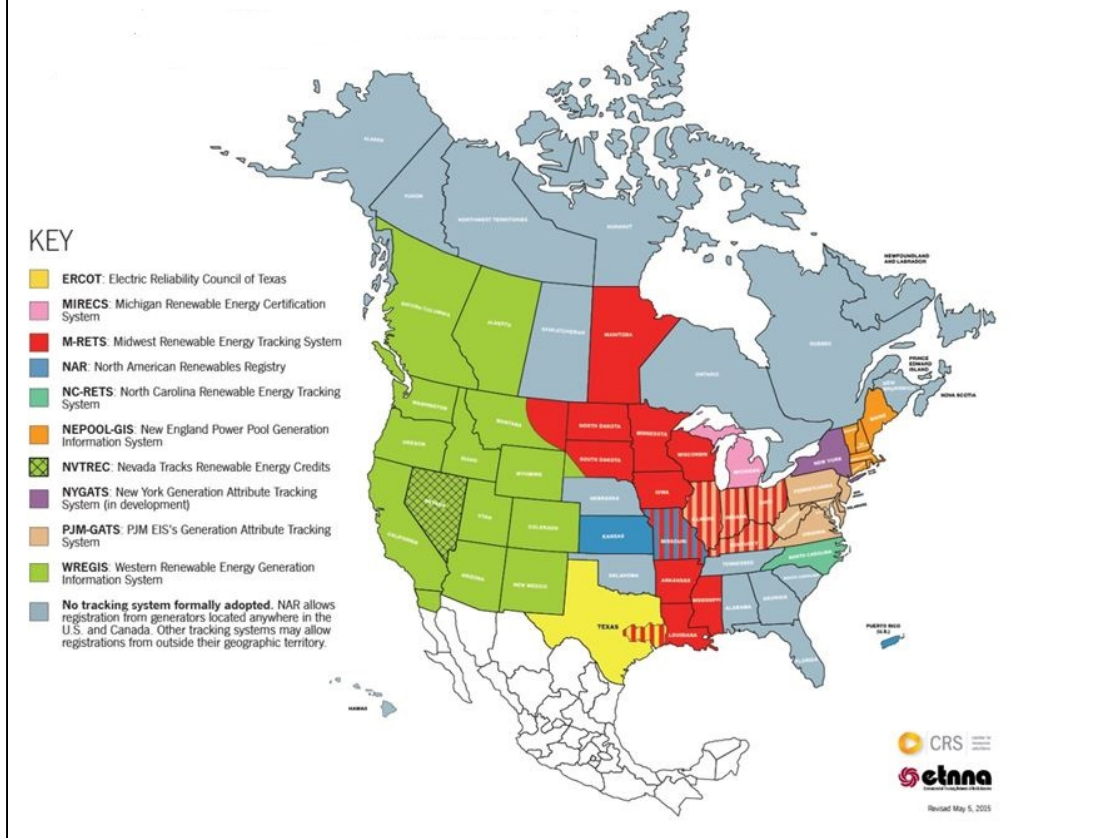
Minnesota’s RPS is driving renewable energy development in ... neighboring states because utilities can meet the Minnesota RPS in a more cost-effective manner by developing (or contracting for) new wind energy resources in other states.... The same is true for California ... [where] its RPS is driving renewable energy development in the form of utility-scale wind and solar projects in Arizona, New Mexico, Oregon, and Washington, and even as far away as Wyoming, if the necessary transmission lines can be built. The CPP should encourage imports and exports of renewable energy to support these trends, not hinder them.

expanded. Indeed, in many regions, the RPS in one state drives renewable energy development in neighboring states as much as or more than in the RPS state. Minnesota is an example. Although Minnesota now uses a significant amount of wind energy in its electricity mix (over 15 percent), much of that wind energy is imported from Iowa, North Dakota, and South Dakota, which have greater low-cost wind generation potential. Minnesota imposes an aggressive RPS on its utilities — 25 percent of the electricity mix must be from renewable sources by 2025 and that requirement is 30 percent for Xcel Energy, which is the largest utility in the state. Iowa, North Dakota, and South Dakota do not have mandatory RPSs or have very low mandates that they exceeded years ago. But Minnesota’s RPS is driving renewable energy development in those neighboring states because utilities can meet the Minnesota RPS in a more cost-effective manner by developing (or contracting for) new wind energy resources in other states. In other words, Minnesota’s RPS drives renewable energy development for the region. The same is true for California, with an RPS of 30 percent that the state is likely to increase in the near future. Because California cannot generate enough renewable energy within the state to meet that target (or to meet it in the most cost-effective manner), its RPS is driving renewable energy development in the form of utility-scale wind and solar projects in Arizona, New Mexico,

Oregon, and Washington, and even as far away as Wyoming, if the necessary transmission lines can be built. The CPP should encourage imports and exports of renewable energy to support these trends, not hinder them.

The CPP should either create a tracking platform for states to use in such trades or allow states to establish their own tracking platform based on the ones that currently exist for trading RECs.²⁵⁸ Without such tracking systems, there is the potential for double counting reductions based on renewable energy generation, particularly if one state uses a rate-based approach and another uses a mass-based approach. Tracking systems for RECs exist throughout the nation, as shown in the map that follows, even in those regions that are not currently part of an RTO or an ISO.

Figure 2: Renewable Energy Certificate Tracking Systems in North America



Experts have highlighted the difficulty of allowing for trades of renewable energy resources for CPP compliance purposes between mass-based and rate-based states because the metrics are so different.²⁵⁹ As a result, if states want the option to use regional trading as part of their compliance plans, they should consider using mass-based targets rather than rate-based targets.²⁶⁰ This would avoid the difficulty of converting between rate-based and mass-based targets as part of a trading platform. It would also avoid the problem — that states that are allowed a higher statewide emissions rate would be penalized if the rate were blended into a lower regional standard.

Another limitation on regional compliance is the lack of adequate interstate natural gas pipelines and interstate electricity transmission lines to facilitate the movement of new sources of low-carbon or no-carbon electric energy resources. Most experts believe that a cost-effective means of CPP compliance in the Northeast region will be increased reliance on combined-cycle natural gas generation to replace higher CO₂-emitting existing electricity resources. To increase the use of natural gas for electricity generation in the Northeast, more natural gas pipelines must be built to better transport natural gas to and within that region. In the absence of such pipelines the regional cost of natural gas in the Northeast may be too high for this to be a cost-effective compliance option.²⁶¹ Likewise, there are more than 10 million MW of onshore wind resources, most of which are concentrated in the Midwest and Plains states, enough to power 10 times the nation's electricity needs.²⁶² But those carbon-free electricity resources are constrained by inadequate long-distance transmission lines that often take decades to plan and construct.

The CPP will likely not address these infrastructure siting issues directly because ownership of infrastructure resources is mainly in the private sector and regulatory authority to approve them is fragmented among local, state, and federal authorities (in the case of electric transmission lines).

Nevertheless, EPA can provide guidance and funding to encourage states to cooperate to build the infrastructure needed to transport low-carbon and renewable energy resources across state lines.

Conclusion

Thus, in considering the CPP obligations, states should consider regional approaches to compliance. Such approaches can include a regional rate-based or mass-based cap, a “common elements” approach, or individual state caps with a trading platform within existing or newly defined RTO regions. With regard to all the regional approaches, it appears that a mass-based approach may best facilitate regional collaboration, particularly where states choose to adopt an individual cap and use emissions trading or collaboration with other states to meet it.

Section IV: Discrete Implementation Issues

The previous two sections of this paper addressed challenges to the Clean Power Plan (CPP) and its broad implications for the future of the nation's energy sector. This final section takes on a number of significant issues focused on specific elements of the CPP and its implementation. It addresses the use of cap-and-trade and offsets; explores issues raised by state targets, including how they compare across states and the merits of mass-based vs. rate-based targets; and concludes with an examination of the environmental justice implications of the CPP.

Should the Clean Power Plan Embrace Cap-and-Trade Programs for Greenhouse Gas Reductions, Including Offsets?

By Robert L. Glicksman, Victor Flatt, and Alice Kaswan

EPA’s proposed Clean Power Plan (CPP) rule is premised on EPA’s legal authority under § 111(d) of the Clean Air Act (CAA) to propose the best system of emission reduction (BSER) for states to reduce greenhouse gases (GHGs) at existing electric generating units (EGUs). In the proposed rulemaking, EPA allows states considerable flexibility in meeting reduction targets, and allows and encourages the states to continue to use their existing programs and adopt new cap-and-trade programs. States, on their own or in conjunction with other states, can convert their rate-based targets to mass-based targets and then use a cap-and-trade program to meet them, on its own or in combination with complementary regulatory measures. The “cap” in the cap-and-trade program can reflect EPA’s target for the state or states participating in the program. A utility receiving a limited number of allowances under the cap-and-trade program can choose a variety of mechanisms to meet the cap, including retiring or reducing the use of coal-fired power, promoting energy efficiency, or investing in lower-emission alternatives.

The use of cap-and-trade under § 111(d) presents a wrinkle, however: In the proposed rule, EPA has stated that, in determining whether states have met their reduction targets, it will only count measures that lead to reductions at affected sources — power plants. It will not count reductions from other sources, like refineries or offsets generated by such activities as forest conservation, creating a disconnect with many states’ existing GHG cap-and-trade programs. This section first addresses the legal and policy issues associated with the use of cap-and-trade in general, and then addresses the legal and policy issues associated with allowing non-EGU allowances or offsets to count in meeting a state’s target.

Allowing states to use cap-and-trade programs to meet their CPP targets would also be less disruptive of existing state greenhouse gas cap-and-trade programs than imposing direct regulatory requirements that ignore existing state programs. For example, the northeastern states that are already participating in the Regional Greenhouse Gas Initiative (RGGI), a GHG reduction cap-and-trade program for power plants, could comply with the CPP by continued participation in the program, although some adjustments would be required.

Allowing States to Use Cap-and-Trade¹

In its proposed CPP rule, EPA observed that the flexibility afforded states by allowing them to incorporate cap-and-trade programs, including pre-existing state and multi-state programs, into their implementation plans would reduce the cost of achieving the state goals, making such an approach “attractive to states.”²⁶³ One of the longstanding criticisms of traditional regulatory approaches under statutes such as the Clean Air Act and Clean Water Act is that those approaches sacrifice potential efficiencies in pollution control by failing to differentiate between regulated facilities at which the cost of controlling emissions are high and those at which control costs are lower. All regulated facilities within a particular category of regulated sources tend to be treated alike. An economically efficient approach to pollution control would subject sources with high control costs to relatively lenient controls, while expecting higher reductions from those with low control costs. That approach would achieve the same

¹ This section was written by Robert L. Glicksman.

level of reductions as a more uniform approach, but at a lower aggregate cost. Emissions trading programs can achieve this result because they allow high-cost emitters to buy allowances from low-cost emission reducers that have excess allowances because they have substantially reduced emissions.

Allowing states to use cap-and-trade programs to meet their CPP targets would also be less disruptive of existing state GHG cap-and-trade programs than imposing direct regulatory requirements that ignore existing state programs. For example, the northeastern states that are already participating in the Regional Greenhouse Gas Initiative (RGGI), a GHG reduction cap-and-trade program for power plants, could comply with their § 111(d) duties by continued participation in the program, although some adjustments would be required. Given EPA's encouragement to states to seek out cost-effective ways to reduce GHG emissions, particularly in collaboration with one another, it would make little sense to require states with existing programs to start from scratch instead of being able to build on existing programs that have already demonstrated the capacity to reduce emissions efficiently and with which regulators and regulated entities are familiar.

EPA's allowance of cap-and-trade programs in the CPP reflects EPA's longstanding support for market-based mechanisms. Over the years, EPA, with the strong support of economists and legislators and agency officials from both sides of the political aisle, has increasingly relied on market-based mechanisms to assist in controlling air pollution. As discussed in David Driesen's article on mass-based caps elsewhere in this paper, the bubble concept was a form of internal emissions trading. More importantly, the acid rain program adopted as part of the 1990 CAA amendments established the first large-scale emissions trading program in federal environmental legislation. Perhaps not coincidentally, the program applied to EGUs that emit sulfur dioxide (SO₂) or oxides of nitrogen. Congress determined that a program that allows regulated entities a range of choices in meeting their emission reduction responsibilities, including trading emission allowances among sources, is the most efficient way to abate acid rain. By most accounts, the program worked even better (and at lower cost) than anticipated. EPA has subsequently incorporated into its CAA regulatory programs trading and other mechanisms that provide a flexible array of options permitting sources to take advantage of the efforts of others, or other parts of their own operations, to meet their compliance duties.

These programs were not explicitly rooted in CAA provisions the way the acid rain program is. And yet, the programs have received judicial endorsement, most recently in the Supreme Court's 2014 decision in the *EME Homer* case, concerning interstate pollution.²⁶⁴ And part of the underpinning for that approval has been *Chevron* deference, as discussed further in Melissa Powers' contribution on judicial deference principles. There is therefore precedent for EPA's reliance on cross-source compliance mechanisms to achieve efficient pollution reduction, even without explicit statutory foundation.

In addition, Congress is on board: In the 1990 amendments, it amended § 110, the provision governing state implementation plans (SIPs), to explicitly authorize inclusion in state plans of tradeable instruments and economic incentives.²⁶⁵ Because § 111(d) plans are cross-referenced to § 110 by analogy, there is reason to believe extension of § 111(d) plans beyond the parameters of a single EGU is fully consistent with the statute. The appeal of these approaches is further enhanced if EPA vests in the states broad discretion to pick and choose among more conventional, source-specific approaches and more novel and expansive cross-source mechanisms, as EPA has done in its CPP proposal.

Some environmental justice advocates have expressed concern that cap-and-trade approaches could fail to achieve desirable co-pollutant benefits because they do not optimize the distribution of pollution reduction benefits. As discussed further in Alice Kaswan's contribution on the Clean Power Plan and environmental justice, however, the proposed CPP's approach to cap-and-trade could have fewer of the downsides and greater advantages than other existing GHG reduction programs.

Allowing States to Use Offsets and non-EGU Allowances to Meet Their Targets²

While EPA’s proposed CPP would allow reductions from trading between fossil fuel-fired EGUs regulated under the CPP, the proposed rule indicates that states cannot count “offsets” from other GHG sources or trades with non-EGU GHG sources inside or outside of the United States.

However, existing state GHG trading programs, including RGGI and California’s AB32, have a wider trading scope. Both programs allow a certain percentage of GHG source reductions to be met with biological and other approved offsets. And, while RGGI is limited to the power sector, California’s AB32 covers most of the GHG sources in the economy, notably from transportation as well as from power plants, and allows trades between EGUs and non-EGUs as well as the use of offsets. California has also officially linked its trading system with Quebec, and will soon link with Ontario, which means that trades and reductions can come from non-U.S. reductions recognized as a greenhouse gas credit in those systems.

If EPA were to allow non-EGU or non-U.S. trades and the use of offsets in a state’s BSER system, it would have both pros and cons from a policy perspective.

Policy Arguments in Favor of Allowing the Use of Non-EGU Trading, Non-U.S. Trading, and Offsets

At the outset, it’s worth noting that broad trading is especially well-suited for GHGs because the location and source of the reductions does not matter. Greenhouse gases become well mixed in the atmosphere upon release and their greenhouse gas potential is relative to worldwide concentrations, and so GHG reduction of any kind in any location is as good as a greenhouse gas reduction at another location. From the standpoint of achieving GHG reduction targets, it does not matter what source or location generates the reduction.

Allowing the use of offsets and non-EGU allowances could undercut the stringency of EPA’s program and, as a consequence, slow the hoped-for transition to a cleaner energy system. The CPP targets have been set based upon EPA’s assessment of the “best system of emission reduction” for coal-fired power plants, and EPA has determined what targets are achievable within the existing power system. If the use of offsets or a broader trading system allowed states and their utilities to invest in fewer of these measures, then electricity sector emissions could continue unabated, and achievable mechanisms to green our electricity generation would be left unexploited.

More specifically, four reasons support allowing the states to use offsets and all GHG reductions in meeting the state target: Such a system 1) is more economically efficient, 2) makes it easier for EPA to expand covered entities under § 111(d) (such as refineries) in future rulemakings, 3) makes it easier to integrate state GHG cap-and-trade programs with offsets into a worldwide GHG emissions trading system, and 4) makes it easier for states with existing GHG trading programs to comply with the CPP.

First, an “all GHG reductions” strategy is by definition more economically efficient as GHG emitters could seek out the cheapest reductions, many of which may exist outside the electricity sector. For example, forest conservation that sequesters carbon could be cheaper than investing in renewable energy. Or efficiency improvements in other industries, like cement manufacturing, could be more cost-effective than efficiency upgrades at existing

² This section was written by Victor Flatt.

power plants. Second, if and when EPA issues § 111(d) emission guidelines for other industries, like refineries and cement-manufacturing, these industries would already be integrated into GHG reduction programs, facilitating these future regulatory efforts. Third, trading systems with offsets dominate GHG control strategies around the globe, and the use of such systems is increasing rapidly. We hope that, in the long run, the United States and its states will coordinate their GHG reduction efforts with other international efforts. The more that the characteristics of U.S. trading programs match other international programs, the easier it will be to ultimately integrate state programs into a worldwide system.

Fourth, and most importantly, EPA's current approach will complicate compliance for states that have already taken the initiative to adopt mandatory GHG cap-and-trade programs because it will require them to develop new controls and tracking mechanisms to ensure that sufficient reductions are coming from the power sector itself. If EPA instead allowed an "all GHG reductions" strategy, states with current GHG cap-and-trade programs could continue using their existing systems without having to make complex adjustments. The proposed rule purported to encourage the states to use whatever means they choose to meet the targets established by the four building blocks. EPA should extend its promised flexibility to the use of non-EGU allowances and offsets.

Policy Arguments Against Allowing the Use of Offsets³

On the other hand, allowing the use of offsets and non-EGU allowances could undercut the stringency of EPA's program and, as a consequence, slow the hoped-for transition to a cleaner energy system. The CPP targets have been set based upon EPA's assessment of the "best system of emission reduction" for coal-fired power plants, and EPA has determined what targets are achievable within the existing power system. If the use of offsets or a broader trading system allowed states and their utilities to invest in fewer of these measures, then electricity sector emissions could continue unabated, and achievable mechanisms to green our electricity generation would be left unexploited. While offsets and broader trading systems might provide cheaper reduction options, the 2030 target provides states and utilities with the opportunity to invest in long-term measures that set us on a needed transition away from reliance on fossil fuels. This result could be avoided if the use of offsets and non-EGU allowances were included in the BSER calculus for setting state targets, leading to much more stringent targets, but that result is highly unlikely given the statutory focus on sector-specific regulation.

Moreover, as discussed in more detail in the section on the CPP's environmental justice implications, allowing states to count offsets in meeting their targets would reduce the co-pollutant benefits associated with actual reductions from existing EGUs in the United States.²⁶⁶ If any GHG reduction or sequestration would count, and utilities purchase offsets to keep running their coal-fired power plants rather than investing in consumer energy efficiency or lower-emitting sources, EGUs would continue to emit GHGs and associated co-pollutants.

It is true that the inconsistencies between what counts for compliance with EPA's target and what counts for compliance within existing (or future) state cap-and-trade programs will create administrative and logistical challenges as utilities consider the extent to which they can cover their emissions with offsets or non-EGU allowances. However, that challenge appears surmountable; for example, states could track electricity sector allowances separately, while still participating in a broader trading program with offsets. For better or for worse, utilities must often juggle complex webs of differing regulatory requirements, and the benefits of achieving real change in the electricity sector outweigh the administrative challenges.

³ This section was written by Alice Kaswan

Legal Arguments Supporting the Use of Offsets and Non-EGU Allowances⁴

Whether one assumes that allowing non-EGU, non-U.S. trading including offsets is a net good or bad or can be improved, there have been questions about whether it is statutorily consistent with § 111(d). Certain legal interpretations support such a reading.

As noted in the section on EPA's "beyond the fenceline" approach, § 111(d) standards are performance standards, meaning that what matters is that utilities in the aggregate reduce their GHG emissions sufficiently to hit EPA's targeted levels. The legality of this approach depends on the meaning of the word "system," which neither EPA nor the courts have interpreted before. As detailed in the prior discussion of EPA's systemwide approach, the term "system" can be interpreted broadly, a result that is consistent with past practice and congressional intent. EPA has relied on this interpretation in proposing that states can use GHG reductions from efficiency gains, trading with other EGUs, and substitution of low- or no-emission fuel sources to meet their targets.

However, EPA has imposed limits on a state's ability to use other GHG reductions or offsets. EPA appears to interpret the reference to "reductions from affected units," in § 111(d) as limiting the use of GHG offsets and related mechanisms. Thus, the draft CPP rule proposes to allow "outside the fenceline" reductions that arguably lead to reductions at an affected unit, but to preclude ones that lead to reductions outside of a unit. This distinction, however, is not necessarily required by the statute. The statute itself does not refer to reductions from affected units, but instead, the best system of emission reductions. While § 111(b) refers to "categories" of stationary sources and "standards of performance... **within** such category," § 111(d) simply requires "standards of performance (for an) existing source." There is no equivalent language to "within." This suggests that the reduction need not come from the specific source (or even like sources) itself.

The proposed rule allows any affected unit to receive credit for reductions that it has purchased in another state from another affected unit, as well as crediting reductions that come from altering the electricity-producing fleet itself to contain more zero- or lower-GHG emission sources. EPA asserts that these reductions would come from "affected units," but that result requires defining the affected units as anything from which electricity can be produced. This means that § 111(d) is not the same source control regulation as exists in § 111(b).

If "affected unit" were the distinctive dividing line between what reductions can or cannot be counted in the BSER, an argument could be made that only fossil fuel-fired units could be considered EGUs for purposes of the rule. Other sources, such as nuclear, wind, and solar, do not produce GHGs at all, placing them outside the definition of an "affected unit" subject to regulation. While dispatch of other energy sources could be seen as causing emissions reductions at fossil fueled EGUs, this is not always the case. Increases in non-GHG electricity might mean that some fossil fueled EGUs would produce less, but not necessarily at any one unit (the affected unit). EGU trading might similarly create a reduction somewhere, but again not at a particular "affected unit." Thus, the differences between this and reductions at other sources, such as offsets, or non-EGU GHG producers are minimal, since the "affected unit" itself might see no reduction.

We agree with EPA that reductions are not limited to fossil fuel-fired EGUs, not because affected units include non-GHG-producing electricity sources, but because the "affected units" language is not dispositive in the statute.

⁴ This section was written by Victor Flatt.

Section 111(d) could be interpreted to support reductions from any verifiable source in a “system of emission reduction.” There is nothing magical about reductions from non-fossil fueled EGUs that make them the only reductions that qualify as “outside the fenceline” reductions. And assuming that “outside the fenceline” reductions are allowed if the states so choose, which we believe is the crux of the reference to § 110, then they can be allowed outside of electricity producing units.

Section 111(d)’s reference to § 110, which elaborates state implementation planning to comply with National Ambient Air Quality Standards (NAAQS), also supports a broad interpretation of acceptable compliance mechanisms. In describing the state’s SIP process for meeting federal targets under § 111(d), the statute states that the procedure governing approval of state systems of emission reduction for existing sources should be “similar to that provided by § 110.” The hallmark of a § 110 SIP is that states are allowed substantial flexibility in meeting the ambient standards. In *Union Electric Co. v. EPA*,²⁶⁷ the Supreme Court upheld EPA’s position that if a proposed SIP would be effective in meeting the ambient air quality standards, EPA must approve that SIP. This result is consistent with the cooperative federalism structure that is at the heart of the Clean Air Act (CAA). While EPA has not had cause to consider the direct meaning of § 111(d)’s reference to § 110 before, it could be interpreted to mean that § 111(d) provides a hybrid sort of emissions reduction approach that includes not only source-specific controls, but a wider array as well. As discussed in the section on EPA’s use of a systemwide approach that extends beyond the fenceline, it could be interpreted to give states the substantial flexibility and autonomy in selecting the means of achieving such reductions that is contemplated by § 110 for meeting the NAAQS limits. Unless EPA is willing to grant the same sort of flexibility to the states under this section that it does under § 110, it reads the reference to § 110 out of the statute, which was not the intent of the drafters.

It makes sense to model § 111(d) SIPs on the § 110 process because § 111(d) was designed to fill a regulatory gap for pollutants that did not fall under the § 110 process because they were not criteria pollutants. The regulation of existing units under § 111(d) is unusual because it is limited to those pollutants that have not already been regulated as criteria pollutants under § 109 and § 110, or as hazardous air pollutants under § 112. Although the original 1970 Act required EPA to set standards for new sources of criteria air pollutants, it gave the states full authority to determine criteria pollutant controls on existing sources, and though somewhat qualified under more recent amendments, considerable state autonomy in controlling criteria pollutant emissions from existing sources remains. The states, in crafting their SIPs, can regulate those sources in multiple ways: *e.g.*, close them down, operate them for fewer hours, or allow existing sources to expand with offsets. Section 111(d) fills the void for regulating existing sources that would not be reined in by the NAAQS and implementation of the NAAQS by the states. Thus, the similar procedure for state regulation of existing sources for the NAAQS (§ 110) is a critical component of § 111(d)’s regulation of existing sources that are not criteria pollutants.

EPA's Treatment of States

By Kirsten H. Engel

A key issue threaded throughout the Clean Power Plan (CPP) is how EPA treats the states. To what extent does EPA ratify states' control over their own electricity sectors, and to what extent does EPA step in and assert authority? To the extent states differ significantly in terms of their existing reliance upon fossil fuels for electricity, to what extent does EPA allow these discrepancies to continue, and to what extent does EPA seek to eliminate these differences by compelling states whose existing electricity sectors are comparatively more carbon-intensive to reduce their carbon intensity to match states whose existing electricity sectors are more "green"?

After some important background, this section will discuss each of these issues in turn.

Background

Clean Air Act Section 111(d)'s Cooperative Federalism Structure

Section 111(d) of the Clean Air Act (CAA) imposes a relationship between EPA and the states known as "cooperative federalism." Under this framework, EPA establishes federal standards — in this case, "best technology" guidelines for existing fossil fuel electric generators. States, in turn, are offered the opportunity to submit plans to EPA that meet the federal standard, and, if approved by the agency, the state plans are subsequently enforceable as a matter of both state and federal law by the states and EPA, respectively. By submitting a state plan, states are able to exercise a degree of control over how the federal standard will be implemented within their state, and states are generally accorded a degree of deference in terms of enforcement, though EPA may file an enforcement action if it is convinced the state enforcement efforts are not sufficiently aggressive.

If a state declines to submit a state plan, EPA must promulgate a plan for the state and implement and enforce the plan within the state. Thus, under the federal-state partnership envisioned by the cooperative federalism regime, EPA is the dominant "partner" charged with the responsibility to establish federal standards and see them into effect across the nation. The agency is allowed to delegate implementation and enforcement of the standards to the states but, at the end of the day, the responsibility for the effectiveness of the standards is EPA's. Thus if a state is not willing to take on the job of implementation, it falls to EPA to do so. For more detail on the consequences of a state choosing not to submit an implementation plan, see Thomas McGarity's article on "recalcitrant states" elsewhere in this paper.

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Most of the federal environmental laws enacted during the 1970s employ this cooperative federalism approach.²⁶⁸ Most importantly, this is the structure of § 110 of the CAA, the provision on which Congress explicitly modeled § 111(d). As in § 111(d), Congress directed EPA to establish federal standards and allowed for states and tribal governments to write state or tribal implementation plans (SIPs or TIPs) to implement the federal standards. In states, or for tribes that failed to do so, EPA is required to write and implement a federal implementation plan (FIP).

EPA's methodology results in the establishment of state emissions goals that are essentially incremental improvements upon the electricity generating development path that the state has chosen. Generally, EPA has not based its standards for individual states on an assumption of radical changes of their existing policies.

Several important differences exist between the two provisions, however, each of which has significance for EPA's FIP authority. First, the federal standard implemented under § 110 is a maximum allowable ambient air quality standard for various pollutants, known as "criteria" pollutants. In contrast, the federal standard called for under § 111(d) is an emissions performance standard for a particular source category — fossil fuel-fired electric generators. Under the law, EPA standards are to be established based upon the "best system of emissions reduction" (BSER). Second, ambient standards that states implement under § 110 are to be established by EPA according

to what is necessary to avoid unacceptable threats to human health and the environment, irrespective of the costs of compliance with such standards. In contrast, Congress directed EPA to establish BSER upon a consideration of cost, technical feasibility, and other factors.

History of state measures reducing reliance on fossil fuels in their respective electricity sectors

In its proposed rule, EPA extensively documents the strides undertaken by states since at least the 1990s to reduce greenhouse gases (GHGs) from their electricity sectors.^{269 270}

Does the Clean Power Plan Take into Account Differences Between State Energy Generating Capacities and Resources?

Under the proposed rule, the answer to the question is a categorical "yes." Although EPA establishes a uniform methodology for determining each state's emissions rate goal, the actual goal is established through the input of state-specific information into EPA's BSER-calculation methodology. This methodology aggregates information about each state's electric generating facilities and current mix of generation resources (*e.g.*, renewable resources) as reflected in the four BSER building blocks. The addition of the emissions rates generated for the state by each building block constitutes each state's emissions rate goal that the state must achieve by 2030.

Thus, EPA's methodology results in the establishment of state emissions goals that are essentially incremental improvements upon the electricity generating development path that the state has chosen. Generally, EPA has not based its standards for individual states on an assumption of radical changes of their existing policies. Take, for example, states such as Kentucky and West Virginia that rely primarily on coal for the generation of electricity — Kentucky is 92-percent reliant on coal and West Virginia is 96-percent reliant — and have not made large investments in renewable or nuclear energy, perhaps because they do not possess easily exploited renewable resources in-state or nuclear power and have not enacted energy conservation policies.²⁷¹ The emissions rate for these states will be largely the product of Building

Block 1, which consists of carbon dioxide reductions achievable through efficiency improvements and other measures capable of being implemented at individual fossil fuel generating facilities.

On the other hand, a state that relies most heavily for electricity on natural gas-fired power plants, nuclear power, and renewable energy will have an emissions goal based upon Building Blocks 2 (substitution of natural gas plant electricity generation for coal-fired power plant generation), 3 (nuclear and renewable energy) and 4 (demand-side energy efficiency programs). New Jersey, 44-percent reliant on natural gas, 51-percent reliant on nuclear power, and 2-percent reliant on renewable energy, might be an example of this second type of state, as is Minnesota, which is 14-percent reliant on natural gas, 22-percent reliant on nuclear, and 18-percent reliant on renewable energy. In other words, the goals for individual states assume incremental improvements in already adopted policies, not radically different energy conservation and clean energy development policies.

Does the Clean Power Plan Respect State Autonomy over States' Electricity Sectors?

Again, under the proposed rule, the answer is unquestionably “yes.”

First, the CPP takes into account state differences as a result of its use of the state-planning structure of § 111(d). Each state is responsible for developing a plan for meeting its state-specific carbon dioxide emissions rate goal that it can tailor to meet its particular priorities and objectives.

Second, a state is bound only by the state-specific emissions rate goal and not by the emission rate generated by each building block. This aspect of the CPP provides states with flexibility in how they meet their 2030 emissions rate goal. A state may choose to exceed the emissions rate calculated by the methodology for Building Block 1 (*e.g.*, increases in the heat rate efficiency of the state's coal generating plants), for example, but make up for that exceedance through a greater reliance upon low- and zero-carbon (renewable energy) generating capacity and demand-side energy efficiency programs under Building Blocks 3 and 4.

Does the Clean Power Plan Allow for or Encourage State Compliance on a Regional Basis?

Again, the answer is yes.

Under the proposed rule, compliance on a regional basis is a key aspect of the flexibility EPA is providing to states when developing their § 111(d) plans. Regional compliance could facilitate cheaper compliance across the country.

The theory behind regional compliance is simple: By expanding the territory from which emissions reductions can be made from a single state to a group of states, a regional approach will generate a greater number and variety of emissions reduction options and hence enable policymakers to comply with applicable emissions targets in a more efficient manner. Regional compliance may be facilitated through a cap-and-trade mechanism whereby policymakers apply a cap upon aggregate emissions from an entire region, but permit the reductions needed to meet the cap to be distributed in an efficient and equitable manner across the region.

The regional compliance approach reflects the fact that electricity in the United States is generated and distributed on a regional basis. In addition, expanding the geographic size of balancing areas can allow a

greater percentage of intermittent power sources (*e.g.*, wind and solar) due to increased flexibility to respond to renewable energy fluctuations.

Finally, the Regional Greenhouse Gas Initiative (RGGI), the cap and trade program being implemented by northeastern states to reduce emissions from the region's electric power sector, demonstrates the viability of a regional approach to GHG reductions from the electricity sector.

EPA's proposed rule provides for incentives for states to comply on a regional basis. States that intend to comply on a regional basis are given an additional year to submit their compliance plans. Furthermore, all states are allowed to translate the EPA-provided rate-based emissions goal into a mass-based emissions goal. A regional cap and trade program will be easier to administer where states are subject to a mass-based, as opposed to a rate-based, goal. See David Driesen's article on the topic elsewhere in this report.

Pros and Cons of the Clean Power Plan's Cooperative Federalism Framework

EPA's approach to state implementation under the CPP has many pros and a few cons.

The largest "pro" is that EPA provides a healthy dose of flexibility to the states by allowing each state to craft its own plan for complying with its federally-established emissions goal. This aspect of the CPP is a direct result of EPA's use of § 111(d) of the Clean Air Act, which incorporates a cooperative federalism approach to compliance. EPA expands upon this traditional aspect of cooperative federalism by allowing and indeed encouraging, states to comply through the submission of regional plans forged through cooperative agreements with other states.²⁷²

A second "pro" of EPA's approach is that it works with states to "green" their electricity sectors and does not require that they perform the politically and sometimes technically difficult task of conforming their sectors to some ideal mix of low-carbon sources. EPA's methodology for determining state emission goals recognizes and works with states' very different starting points for carbon reductions from their electricity sectors. It does so by defining BSER as required improvements in different aspects of a state's electricity sector corresponding to the four building blocks. Under EPA's methodology, regardless of each state's starting point — its mix of electric-generating resources or energy conservation measures — each state must improve its emissions (*i.e.*, reach BSER for each building block). In constructing state 2030 emission goals in this manner, EPA recognizes that states cannot re-do their electricity sectors overnight (this would be prohibited on operational and cost feasibility grounds), and yet EPA does not let states "off the hook." Regardless of its starting point on the road to a low-carbon electricity sector, each state must do its part to reduce carbon emissions from their varied electricity sectors.

A third "pro" is the manner in which EPA's CPP will provide for federal enforcement of the states' plans to reduce carbon emissions from their electricity sectors. Once state implementing plans are approved by EPA, these plans will be enforceable both as a matter of state and federal law. This provides a federal backstop to state climate-related policies that some states might be tempted for reasons of cost or politics to weaken or abandon. This federal backstop will also strengthen certain state policies by requiring states to attain a regional renewable energy target that constitutes the average of the 2020 target of the existing state-level renewable electricity standards within each region.

A potential "con" of EPA's cooperative federalism framework is the flipside of the "pros" set forth above — the manner in which the CPP asks for improvements from all states, whether or not they have already taken steps in the past to reduce carbon emissions from their electricity sectors. This "every state must do its part" approach arguably results in failing to reward states that made significant investments in de-

carbonizing measures in the past while rewarding those states that put off such investments. Generalizations are tricky, however, and EPA has itself aptly warned against relying on the differences in state emission reduction percentages when judging the aggressiveness of state emission goals.²⁷³ More telling are the estimates of compliance costs across states. Yet current estimates of state compliance costs can vary tremendously, depending upon the assumptions made in the analysis.²⁷⁴

It is doubtful that EPA's CPP will run into legal hurdles based solely upon its incorporation of varying state emission goals. The courts have generally shown EPA ample deference in its policy decisions in the context of implementing a complex statutory scheme such as § 111(d) of the Clean Air Act. In addition, the recent case of *EPA v. EME Homer City Generation*²⁷⁵ indicates that the Supreme Court is willing to uphold EPA's imposition of differing pollution reduction burdens upon states where the differences are integral to a comprehensive plan to address a multi-state environmental problem. In *Homer*, the Court upheld EPA's strategy to address interstate air pollution in its "Transport rule," the agency's second attempt to address the complex and politically fraught issue of interstate air pollution.

What to Watch for in EPA's Final Clean Power Plan Rule with Respect to Cooperative Federalism Issues

From a cooperative federalism standpoint, EPA's final release of the CPP rule should answer several key questions relative to § 111(d) of the Clean Air Act:

1. Does EPA retain the same degree of flexibility to the states in developing their compliance plans?
2. Does EPA retain the same incentives for states to cooperate with each other to develop and submit regional compliance plans?
3. Does EPA keep the same building blocks as the proposed rule, or does it vary the blocks, and if so, how does this affect state compliance costs?
4. Over the longer term, how do states intend to use the flexibility provided to them? Do states intend to make use of the option to develop and submit regional compliance plans?
5. In the weeks and months following the release of EPA's final rule, what response do the various states give to EPA's final rule?

Conclusions

In its proposed CPP, EPA employs the cooperative federalism structure of § 111(d) of the Clean Air Act to establish performance standards for the best system of reduced carbon dioxide emissions from electricity generating sources. EPA's standards are drawn from the states themselves, many of which have been active in reducing the emissions-intensity of their electricity sectors since the 1990s. Furthermore, EPA's plan provides all states with flexibility in how they comply with the federal standards. This flexibility recognizes and works with states' very different starting points for reducing carbon emissions from their electricity sectors. It also provides for states to comply through collaboration on a regional level, an option that may prove attractive to many states because it may provide additional flexibility in terms of compliance options and reduce concerns over electricity reliability. EPA's CPP raises some questions concerning fairness if it turns out that states that invested heavily in lowering the carbon intensity of their electricity sectors bear the highest costs of the CPP going forward.

A Mass-Based Cap for Power Plants

By David M. Driesen

The Issue of the Form of Limits

One issue EPA confronts in its power plant rule concerns the form of emission limits — specifically the question of whether the rule’s limits should be expressed as a limit on the rate of emissions or as a limit on the mass of emissions. Although this issue might seem arcane, it will matter a great deal to the future of EPA efforts to address climate disruption. Mass-based standards better reflect the available mechanisms for reducing power plant emissions and provide greater certainty that emissions will be reduced notwithstanding economic growth.²⁷⁶

In the past, EPA has often promulgated rate-based limits for emissions.²⁷⁷ For power plants, such emission limits often specify the maximum pounds of a pollutant emitted per million British thermal units (BTUs) of energy produced. This form of emission limit naturally fits regulations based on end-of-the-pipe controls. In such a context, EPA could set standards by identifying the emissions rate that available end-of-the-pipe controls could achieve. Such controls would limit the rate of emissions, but the total mass of emissions would vary depending on the amount of electricity produced.

Mass-based standards better reflect the available mechanisms for reducing power plant emissions and provide greater certainty that emissions will be reduced notwithstanding economic growth.

A mass-based limit, by contrast, limits the tons of emissions emitted at a facility per year, not the rate of emissions per unit of production. The acid rain program, for example, employs mass-based limits on the tons of sulfur dioxide power plants may emit in a year. Although mass-based limits provide a hard target such that the total emissions do not vary with production rates, they prove quite flexible, because while all pollution control measures reduce the mass of emissions, only some reduce emission rates. For example, utility programs to enhance energy efficiency improvements in homes, offices, and factories (end-use efficiency) lower demand for electricity and therefore reduce the mass of emissions from power plants.²⁷⁸ End-use efficiency, however, does not reduce emission rates. Similarly, utility deployment and use of renewable energy sources, such as wind and solar energy, lower emissions by leading to reductions in electricity produced by coal-fired or natural gas-fired power plants. Hence, renewable energy reduces the mass of emissions from fossil fuel-fired plants, but does not reduce their emissions rate.²⁷⁹ Accordingly, California, the northeastern states involved in the Regional Greenhouse Gas Initiative (RGGI), the European Union (EU), and many other countries have adopted programs that rely on mass-based emission limits for greenhouse gas (GHG) emissions.

EPA’s Proposal to Allow States to Choose Between Rate-Based and Mass-Based Limits

EPA’s proposal puts forth a rate-based limit for power plants, sometimes called a carbon intensity limit, restricting the amount of carbon dioxide emitted per megawatt hour of electricity produced.²⁸⁰ EPA has proposed to offer states a choice between rate- and mass-based limits, inviting states wishing to use mass-based limits to use an energy model to convert the rate-based standards into mass-based limits. Furthermore, it has proposed to allow states to change the form of the standard after writing its regulations when it comes time to comply. The proposal is not at all clear about how it would verify that power plants have met the rate-based standards. Indeed, EPA requested comment on the idea of assigning part of the compliance obligation for meeting state standards to states or other entities.

Yet nearly all of the emission reduction systems forming the basis for the rule (the building blocks) would reduce the mass of emissions. This is true even of measures that reduce the rate of emissions, such as heat rate improvements (improvement of power plant efficiency). For example, a coal-fired power plant emits about 2,000 pounds of carbon dioxide per megawatt hour of electricity. If a plant with this baseline emissions rate implements a heat rate improvement increasing its combustion efficiency by 5 percent, this would reduce the emissions rate to 1,900 pounds per megawatt hour of electricity generated (95 percent of 2,000 pounds). This would also reduce the mass of emissions from what it would otherwise be. If the plant generated 1,500 megawatt hours of electricity annually, it would, without a heat rate improvement, produce about 3 million pounds of carbon dioxide annually (1,500 X 2,000). If production remained constant and it made a 5 percent heat rate improvement, the mass of emissions would decrease from 3 million pounds to 2.8 million pounds. If production did not remain constant, these numbers would change, but the heat rate improvement would still influence the mass of emissions. Because all emission reduction measures influence the mass of emissions, EPA recognizes that mass-based limits provide for greater simplicity in accounting for a variety of emission reduction strategies.²⁸¹

A reduction in the mass of utility emissions, however, does *not* produce a reduction in the emissions rate.²⁸² In other words, the converse is not true. Suppose we deployed renewable energy, so that we only needed 1,000 megawatt hours from a coal-fired plant formerly producing 1,500 megawatts. Lowering electricity production at a coal-fired plant by a third (as in this example) would lower the mass of emissions at the coal-fired plant by about a third as well. But the emissions rate would not decrease; the amount of pollution per megawatt hour would remain constant.²⁸³

The point that emission rate changes reduce the mass of emissions but that changes in the mass of emissions do not reduce the emissions rate may seem counterintuitive (since it is asymmetrical). But think about driving. If you drive a car getting 20 miles per gallon of gasoline to work every day and are sick for a month, you reduce the total amount of fuel consumed (the mass) because you are driving less. You do not change the *rate* of fuel consumption, which remains 20 miles per gallon. But if you tinkered with the engine and reduced the emissions rate, you would consume less gasoline.

To arrive at its rate-based limits, EPA took into account the emission reductions possible through the measures included with its building blocks. EPA then employed equations that convert measures that reduce the mass of emissions at particular facilities into estimates of the changes in overall statewide emission rates.²⁸⁴ For example, shifting generation to natural gas might lower coal-fired production and increase gas-fired production, thereby changing the overall state emissions rate without changing the emissions rate at either facility. But energy efficiency measures would not lower emission rates at all, so EPA introduced a fudge factor to give states credits for this, creating a lower statewide emissions rate reflecting the potential for demand reduction through improved energy efficiency. Conversely, if EPA's final rule were to employ a mass-based limit, it would have to estimate the effect of emission rate improvements (such as heat rate improvements) on the mass of emissions to construct the limits. But the mass-based limit would describe actual emission reductions that the technologies are expected to realize.

The Advantages of Mass-Based Limits

Mass-based limits have distinct advantages over rate-based limits. Perhaps the most significant involves the ability of mass-based caps to reliably reduce emissions below current levels even when economic growth leads to production increases. This is especially important for regulation of carbon dioxide from power plants because carbon dioxide accumulates in the atmosphere and commits us to more future climate disruption. On the other hand, in the face of a recession, a rate-based limit would demand some improvement where a mass-based limit might not. But recessions have been less common historically

than periods of economic growth. Furthermore, a recession will usually cause emissions to decline even if power plants make no technological changes to reduce emissions.

Mass-based limits also assign responsibility for reconciling environmental goals with economic growth to industry, rather than to understaffed and politically hampered regulatory agencies. This is especially important for a long-term and critical problem like climate disruption. If increased demand causes emissions to increase, as it will under rate-based limits, we will need more rules, which many state agencies have little capacity or will to produce. Mass-based limits can keep emissions below current baselines even if demand rises.

Furthermore, if EPA chooses a rate-based limit in the final rule it may undermine the programs of the states leading the charge to reduce GHG emissions — all of which have relied primarily on mass-based limits. If the northeastern states and California run into opposition as they move forward with their programs in the future, an EPA rule offering rate-based limits may lead industries in these states to pressure them to convert mass-based programs to rate-based programs.

Rate-based emissions trading programs have never worked properly, and California and the northeastern states' programs rely heavily on mass-based emissions trading to restrain power plant emissions.

Rate-based emissions trading programs have never worked properly, and California and the northeastern states' programs rely heavily on mass-based emissions trading to restrain power plant emissions. One reason involves the difficulty of accounting for demand shifts under a rate-based standard. For example, suppose that a power plant emitting 3 million pounds of pollution shuts down. If demand does not decline, however, this plant shutdown may cause another facility to increase generation, perhaps emitting an extra 3 million pounds of pollution. This means that net emissions have not changed. Yet, under the rate-based bubble programs that preceded the acid rain program, polluters would claim "phantom credits" for the shutdown facility's emissions decrease without assuming any responsibility for the associated emissions increase at another facility. The net result in this example would be a three million pound increase in emissions above planned levels, for the operator purchasing phantom credits could increase emissions by 3 million pounds above required levels with these credits. A milder form of this loss of emission reductions could occur anytime a facility slowed production.

A mass-based cap, however, eliminates the phantom credit problem. Under a mass-based program, the increased pollution associated with increasing production to make up for the shutdown facility's output could violate the mass-based cap. Accordingly, an operator looking to increase production to meet unmet demand would have to employ additional controls to avoid the emissions increase or purchase credits from some other capped source making extra reductions to make up for the increase. A mass-based cap avoids a series of problems like this that can turn emissions trading into an exercise in gaming the system.

Mass-based limits will also facilitate compliance and enforcement. Power plants' compliance with mass-based limits could be shown simply through measurements of power plant emissions.²⁸⁵ It is not at all clear how one could enforce individual facility compliance if states seek to comply with a rate-based limit partially or largely through measures that reduce the mass of emissions.

Finally, the provision in the proposal allowing states to change a limit established in EPA-approved rules after the fact invites gaming. It would allow states to take advantage of vagaries in the modeling assumptions underlying the conversions to convert non-compliance with a planned limit into compliance with a laxer limit.²⁸⁶

EPA's Final Rule Should Demand Mass-Based Limits

If EPA's final rule requires mass-based limits from the states, that would constitute an important improvement on the proposal, especially if EPA strengthens the standards appropriately. Since compliance with a mass-based cap can be shown through each source meeting its mass-based cap, such a choice could facilitate a final rule that clearly regulates power plants, even if the power plants choose to rely on state renewables and energy efficiency programs instead of investing their funds in implementing these programs. This focus on power plant, rather than state, compliance would make the rule more likely to survive judicial review.

If the final rule promulgates rate-based standards, states should convert the rate-based limits into mass-based limits and stick with them to better ensure compliance and simplify enforcement. States will then be able to verify compliance by simply collecting already required reports on the mass of emissions from regulated facilities. Otherwise, they will have to employ complicated formulas to convert programmatic choices into estimates of virtual emission rates to show compliance and will have difficulty holding pollution sources accountable.

But to make this work properly, EPA needs to change the conversion formula used to convert virtual emission rates into real mass-based limits. Currently the formula is based on projections of business-as-usual emissions, which have usually proven inaccurate.²⁸⁷ EPA should instead base conversion on the assumption that recent decoupling of economic growth and increased energy consumption will continue or be enhanced by its rule.

A choice of a mass-based limit does not mean that states must use a cap-and-trade approach. A mass-based limit could be met through mass-based source-specific limits, energy efficiency programs, renewable energy programs and other programs that reduce the mass of emissions at utilities.²⁸⁸

If EPA does choose a mass-based limit, its opponents may accuse it of implementing the failed Waxman-Markey bill through the back door regardless of the form of emission limits. EPA is not implementing Waxman-Markey through the back door. It acts pursuant to the CAA, regulates industry by industry, will not auction off allowances, does not provide for long-term large scale reductions, and will not require a cap-and-trade approach as Waxman-Markey would have.

Conclusion

Climate disruption is an urgent problem. It is important in this context not to undo a major advance that has occurred in the world of climate regulation — the use of mass-based caps.

Recommendation

- EPA's final rule should establish mass-based caps. If it does not, states should establish mass-based caps in their plans and stick with them.

The Clean Power Plan and Environmental Justice

By Alice Kaswan

Introduction

Although the location of carbon emissions is largely irrelevant to their environmental impacts, the Clean Power Plan (CPP) and state implementation plans (SIPs) will have significant ancillary benefits for associated co-pollutant emissions. This section discusses the proposed CPP's generally positive impact on aggregate co-pollutant emissions, noting the importance of a system-wide approach and sufficiently stringent targets. In addition, it discusses and responds to the environmental justice critique of cap-and-trade programs, noting that cap-and-trade under the CPP might be less troubling than expected because it avoids some of the downsides associated with other trading programs. The section concludes by identifying key issues to watch for in the final rule: the stringency of EPA's state targets, and whether EPA will require states to engage in environmental justice analysis. It also emphasizes that, whatever EPA promulgates in the final rule, the states are likely to be the key players in determining the CPP's environmental justice implications. States should engage in comprehensive energy planning that retires the most harmful plants, encourages no-emission alternatives like renewables and energy efficiency, and addresses the social justice impacts of higher energy prices by helping low-income communities invest in energy efficiency and distributed generation renewables.

The Link Between GHG Reductions and Co-pollutant Emissions

EPA's CPP will have major impacts on a range of health-threatening co-pollutants that inevitably accompany GHG emissions, including particulates, sulfur oxides, nitrogen oxides, as well as toxics like mercury.²⁸⁹ Coal-fired power plants generate more than half of the nation's sulfur dioxide emissions and substantial nitrogen oxide emissions. The sulfur and nitrogen oxide emissions contribute to the formation of fine particulates, which cause respiratory and cardiopulmonary distress and have been linked to premature death. Nitrogen oxide emissions also contribute to the formation of ozone, causing smog, which leads to a wide range of adverse health effects. Coal-fired power plants are the primary domestic source of mercury pollution.

Although other CAA programs address these pollutants, many regions remain plagued by significant and persistent air quality problems. As discussed further below, EPA and other analysts predict that the CPP, and states' implementation of the CPP, will provide ancillary co-pollutant benefits that go beyond existing regulatory requirements. Multi-benefits approaches that consider GHG reductions, co-pollutants, as well as other variables can capture important synergies and opportunities, and provide greater overall benefits.

In considering co-pollutant impacts, both aggregate and distributional effects matter. Aggregate impacts reflect the degree to which the CPP and its implementation options maximize aggregate co-pollutant reductions by sparking a transition from a dirtier to a cleaner energy system. Distributional impacts determine the degree to which the CPP and its implementation options maximize reductions where they are needed most: in the areas experiencing the highest pollution levels and those that are otherwise most vulnerable to pollution's effects.

Aggregate Co-Pollutant Benefits

The Aggregate Benefits of a Systemwide Approach

The CPP's use of a system-wide approach that encompasses measures "outside the fence line" is critical to maximizing aggregate GHG and co-pollutant benefits. Had EPA focused solely on measures that existing power plants could implement on site, EPA would likely have achieved only the 6-percent reduction in GHG and associated co-pollutant emissions considered achievable under building block 1.²⁹⁰ By encouraging a shift from coal to natural gas under building block 2, the CPP not only reduces GHG emissions, but also reduces aggregate co-pollutant emissions because coal-fired power plants generate significantly higher levels of both GHGs and co-pollutants per unit of energy than natural gas. Similarly, building blocks 3 and 4 anticipate increased use of no-emission renewable energy and energy efficiency, reducing overall pollution from coal-fired power.

EPA has emphasized the anticipated aggregate co-pollutant reduction benefits predicted under the CPP. Although the CPP's flexibility makes it difficult to predict precise co-pollutant benefits, EPA has identified the possible range, which reveals that co-pollutant benefits from the CPP comprise \$23 to \$54 billion by 2030, above and beyond an anticipated \$30 billion in climate benefits.²⁹¹ These benefits are all in addition to the benefits already anticipated from a range of recently adopted co-pollutant controls, including the Cross-State Air Pollution Rule and the Mercury Air Toxics Standard.²⁹² The actual benefits are likely higher; EPA noted that, for co-pollutants, it quantified only the particulate and ozone benefits, and did not include the benefits of reductions in toxics or acid rain.²⁹³

Co-pollutant studies by independent sources have confirmed the co-pollutant benefits of a system-wide approach. Although they did not analyze the CPP itself, researchers from Harvard and other institutions analyzed a similar flexible approach and assumed aggressive efforts to increase consumer energy efficiency. Their study demonstrated significant reductions in co-pollutants and improvements in particulate and ozone pollution.²⁹⁴ The Clean Air Task Force studied the co-pollutant consequences of an approach that achieved most reductions by shifting from coal to natural gas, and likewise found significant reductions in co-pollutants.²⁹⁵

Although EPA's systemwide approach was based upon a wide range of carbon reduction mechanisms that allowed EPA to establish more stringent targets, it is unclear whether the targets EPA proposed in the draft CPP are stringent enough to accomplish the degree of transformation that is both possible and necessary. One concern is that an insufficiently stringent target will incentivize a transition to natural gas rather than no-carbon alternatives.

Questions about Stringency

Due to the strong correlation between GHG and co-pollutant emissions, the more stringent the GHG target, the greater the co-pollutant reduction benefits. Stringency is essential to transforming the energy sector to a low-carbon, and low-co-pollutant, future.

Although EPA's systemwide approach was based upon a wide range of mechanisms for reducing power plant emissions and therefore allowed EPA to establish more stringent targets, it is unclear whether the targets EPA proposed in the draft CPP are stringent enough to accomplish the degree of transformation that is both possible and necessary. One concern is that an insufficiently stringent target will incentivize states to reduce coal-fired power plant emissions by transitioning to natural gas rather than no-carbon

alternatives. Even though the construction of new natural gas plants was not included in calculating the targets, states have the flexibility to meet their targets by whatever means they choose, including retiring coal plants and building new natural gas capacity. New natural gas plants would considerably lower GHG and co-pollutant emissions, but not as much as investments in renewable energy and energy efficiency. As Joseph P. Tomain discusses in his contribution on the CPP's role in transitioning to clean energy, greater reliance on natural gas would thus perpetuate reliance on fossil fuels with its associated emissions, present new distributional emissions concerns where new plants are built, and present the range of environmental and public health concerns associated with high-volume hydraulic fracturing, better known as "fracking."

Another important question is whether EPA was stringent enough within the building blocks. EPA has made clear that the targets are not based on each state doing the maximum possible under each building block. While that provides states with some needed flexibility in case of unexpected implementation hurdles, the question is whether EPA has expected enough — whether states could accomplish a larger percentage of the actions that EPA has identified as achievable. In addition, some commentators have argued that EPA has underestimated achievable emissions within certain building blocks. For example, the Union of Concerned Scientists has argued that EPA underestimated renewable energy sources and opportunities for achieving greater end-use energy efficiency. Also, in calculating targets, EPA indicated that it did not include numerous measures that could reduce emissions, like coal plants co-firing with natural gas, or improvements to transmission grids to reduce electricity leakage.

Cap-and-Trade versus Direct Regulation: Aggregate and Distributional Results

The Environmental Justice Critique of Cap-and-Trade

The CPP gives states the option of meeting their targets through a state or regional cap-and-trade program. Environmental justice advocates have had longstanding concerns about the distributional

It is clear that cap-and-trade programs do not maximize distributional benefits. But it is important to note a couple of reasons why that may be less troubling in this context than in others. First, in the energy sector, a trading program could, at least in general terms, have more positive distributional tendencies than in more comprehensive cap-and-trade programs. Second, the CPP's treatment of offsets is likely to preserve the co-pollutant benefits of in-sector reductions. And third, it's all relative: EPA's most likely regulatory alternatives may not provide superior distributional results.

consequences of cap-and-trade. Under that approach, a state would translate the EPA-set emissions rate targets into an equivalent mass-based cap on overall emissions from covered facilities, and then distribute allowances to covered facilities or have them purchase allowances at an allowance auction. If allowances were distributed for free, then most facilities would have fewer allowances than existing emissions. They would then have three options: (1) reduce emissions to meet the number of allowances they received; (2) reduce emissions by more than necessary and sell the excess allowances; or (3) buy allowances to cover their existing emissions and, potentially, to cover increased emissions. If allowances were sold at an auction, then facilities would buy needed allowances based on their emissions choices.

Thus, under cap-and-trade, power plants could purchase allowances rather than improving operations, thus failing to achieve co-pollutant reductions and, potentially, increasing emissions. If the facilities purchasing extra allowances are located in areas that are already heavily polluted, a cap-and-trade approach will fail to distribute reductions to the areas

that need them most. While it is possible that trades could lead to positive distributional consequences, lowering pollution where reductions are most needed, the reverse is also possible: trades could concentrate pollution — co-pollutants, in particular — in areas and communities already most heavily burdened by pollution. Due in part to these distributional concerns, some environmental justice advocates have expressed concern about states implementing the CPP through cap-and-trade programs.

The Complicated Environmental Justice Story

It is clear that cap-and-trade programs do not maximize distributional benefits. But it is important to note a couple of reasons why that may be less troubling in this context than in others. First, in the energy sector, a trading program could, at least in general terms, have more positive distributional tendencies than in more comprehensive cap-and-trade programs. Second, the CPP's treatment of offsets is likely to preserve the co-pollutant benefits of in-sector reductions. And third, it's all relative: EPA's most likely regulatory alternatives may not provide superior distributional results. I analyze each of these in turn.

Cap-and-trade could create incentives for reductions from the most-polluting sources

In the energy sector, coal-fired power has the highest GHG intensity *and* the highest co-pollutant intensity. So, if the carbon price generated by a cap-and-trade program is high enough, it will most strongly discourage the use of more-polluting coal-fired power and encourage less-polluting alternatives, including natural gas, renewables, and demand-side efficiency. That does not mean that reductions will necessarily occur where they are most needed or that all polluting facilities will reduce emissions, but it does increase the likelihood that GHG reductions will come from the most co-pollutant-intensive sources.

The extent of the positive effect will, however, depend on two factors. First, the cap-and-trade program must be stringent enough to create an effective price signal. Programs to date have often suffered from “lax caps,” and, as a consequence, emissions prices, and the incentive to reduce emissions from the most polluting sources, have been low. Second, the degree to which a robust price signal will generate reductions from the most polluting facilities depends to some degree on whether the state's utility regulations dampen utility sensitivity to price signals. In states that do not have competitive rates and in which utilities can pass costs through to consumers, high allowance prices will be less effective at reducing high-carbon sources.²⁹⁶

Precluding offsets increases energy sector co-pollutant reductions

As authorized under the CPP, cap-and-trade will also avoid one of the common environmental justice critiques of GHG cap-and-trade programs to date: the use of offsets. The CPP does not allow states to meet their targets through the use of offsets; instead, the states must show that they have achieved actual reductions in energy sector emissions.²⁹⁷ By not allowing offsets to count toward compliance with CPP targets, the CPP will drive actual changes in the electricity sector, and, as such, will likely increase aggregate co-pollutant benefits. Offsets may have other salutary co-benefits, like forest preservation, but they nonetheless detract from the co-pollutant benefits associated with in-sector GHG reductions. (See also Victor Flatt's discussion of offsets to show compliance under the CPP.)

Cap-and-trade, compared to what?

While cap-and-trade under the CPP is likely to drive reductions from the most co-pollutant intensive energy sources (coal-fired power) and will avoid diluting co-pollutant benefits through the use of offsets, neither of these features addresses a key critique of cap-and-trade: its distributional impacts. The question, then, is whether EPA could develop emission guidelines with better distributional consequences. Given

EPA's mandate to focus on the best "system" of emission reduction and the role of the states in developing actual implementation plans, it is difficult to envision alternatives with better distributional results. EPA is highly unlikely to directly require states to close their most polluting facilities and invest in EE and RE.

One plausible option — setting minimum emission-rate standards for all coal-fired power plants — might appear to offer better distributional results. Some might argue that, instead of simply giving coal-fired facilities the option of adopting efficiency improvements, EPA should require them. Such a requirement might be on its own (if EPA abandons its "beyond the fenceline" approach) or might be combined with the other building blocks, but as a mandatory component. Although it looks like consistent emission-rate standards would have more even and widespread distributional results than cap-and-trade, this approach would also fail to optimize distributional results.

First, an emission-rate standard would not lead to reductions at all plants. The existing efficiency of coal-fired power plants varies greatly. Only facilities below the standard would reduce emissions. Facilities that already meet the efficiency standard would not.²⁹⁸

Second, emission-rate standards do not prevent increases in absolute emissions, they control only the emissions *rate*. In the interconnected energy system, major shifts in production from one facility to another are possible, and could affect absolute emissions even if emission rates are improved. At least two factors could lead some facilities to increase local emissions. One is facility retirements: analysts predict that the least efficient facilities will retire rather than make efficiency improvements. To make up for the loss of supply, other power plants could operate at a higher capacity, creating localized emissions increases. The plants increasing operation might have lower emission rates than the retiring plants (particularly if coal-fired power plants retire and natural gas plants ramp up), improving aggregate pollution levels. Nonetheless, from a distributional perspective, localized emissions from the plants increasing operations would increase.

Another factor that could lead to increased emissions notwithstanding minimum emission-rate standards is a predicted "rebound" effect. If coal-fired power plants make efficiency improvements rather than retire, then they may operate the plants more intensively, leading to an increase in localized emissions. In a study of co-pollutant impacts associated with GHG controls on the energy sector, Schwartz et al., predict that, if EPA were to impose only emission-rate standards and no other flexible options, the rebound effect could cause SO₂ emissions to increase overall. Thus, while cap-and-trade does not ensure positive distributional results, a primary alternative, traditional source-specific emission-rate requirements, will not do so either.

What to Look for in the Clean Power Plan: The Federal Role

Although it would be difficult for EPA to directly control distributional results, a key issue in assessing the final rule will be whether EPA maximized aggregate co-pollutant benefits by setting sufficiently stringent state targets. Stringent targets will induce transformative change by disincentivizing coal-fired power. Moreover, stringent targets would increase the relative attractiveness of zero-emission options relative to natural gas. Stringent targets are particularly important to the effectiveness of cap-and-trade programs because low allowance prices encourage utilities to continue "business as usual" while strict targets are likely to lead to stringent caps that generate a more effective price signal to induce a deeper clean energy transition. While it is difficult to assess the adequacy of EPA's state targets without analyzing each state's calculation in detail, any significant backtracking in the final rule would present cause for concern.

The second key issue to watch for in the final rule is procedural: whether, as recommended by numerous environmental justice groups, EPA will require states to analyze the environmental justice implications of their SIPs.²⁹⁹ As discussed further below, the critical planning decisions must be made at the state level. A federal requirement to consider environmental justice implications would make the opportunities and tradeoffs of states' implementation choices more transparent, and facilitate public opportunities to influence and respond to state planning efforts.

What the States Can Do to Further Environmental Justice

Ultimately, however, the final rule is likely to continue to cede critical decision-making authority to the states, and the states will be the central arena for maximizing the environmental justice benefits of CPP implementation. Environmental justice groups and their allies should be poised to focus on state implementation planning, including the following central themes:

First, although cap-and-trade programs may not be as problematic under the CPP, the use of a cap-and-trade program is not a substitute for responsible and comprehensive state planning. Some cap-and-trade advocates have suggested that, under cap-and-trade, the government's role should be limited to setting the cap and enforcement, and that all other decisions about how to meet the cap should be left to the free market. Industry knows best, the argument goes, and industry is more likely to innovate when given unfettered flexibility.

However, industry choices are often dictated by short-term market circumstances. State agencies are better positioned to consider long-term needs and strategies. While cap-and-trade can create positive price signals and allow some room for flexibility, a state should not give up its central governing functions, and should nest a cap-and-trade program within a more comprehensive energy policy that includes a range of complementary policies that shape utility choices in positive directions.

For example, comprehensive state planning could encourage the retirement of the most polluting facilities in the most vulnerable locations. Although neither a rate-based emissions standard nor a cap-and-trade program would directly require the closure of the most polluting facilities in the most vulnerable locations, state public utility commissions and environmental agencies can work with their utilities to develop long-term plans that encourage reductions from the most polluting sources.

In addition, although unfettered market forces and the dynamics of the energy industry might induce utilities to simply build new natural gas plants, states could steer investments in more positive long-term directions. They could develop policies, like renewable portfolio standards or energy efficiency standards for buildings, that steer investments away from a short-term reliance on natural gas toward non-fossil fuel alternatives that pave the way for a more sustainable future and reduce co-pollutants.

In addition, advocates can encourage states to address the potential adverse impacts of a robust carbon price signal: higher energy prices, which are likely to affect the poor the most. One mechanism for ameliorating impacts on the poor is to use revenue from the sale of emissions allowances to address regressive impacts. Ideally, revenue could be used to help low income residents and businesses invest in energy efficiency and distributed renewable energy, measures that reduce carbon and energy bills, but that are often beyond the means of those with modest incomes. Providing funds would thus serve two salutary purposes: (1) provide low-income residents with access to energy-saving or alternative energy generating options; and (2) reduce the need for more expensive energy, ameliorating the impact of higher energy prices. For example, California has legislation that requires the state to devote 25 percent of auction revenue to energy-related investments in the state's most disadvantaged vulnerable communities.³⁰⁰

Conclusion

The CPP has the potential not only to reduce carbon emissions, but to reduce persistent co-pollutant pollution. States, in their implementation plans, have the capacity to initiate fundamental changes to the energy sector that maximize climate and public health benefits.

Endnotes

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²U.S. Environmental Protection Agency, Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 79 Fed. Reg. 34830 (June 18, 2014).

³EPA Fact Sheet: Overview of the Clean Power Plan: Cutting Carbon Pollution from Power Plants, <http://www2.epa.gov/sites/production/files/2014-05/documents/20140602fs-overview.pdf>.

⁴79 Fed. Reg. at 34856-57.

⁵79 Fed. Reg. at 34857-58.

⁶79 Fed. Reg. at 34851.

⁷79 Fed. Reg. at 34870-71.

⁸79 Fed. Reg. at 34851.

⁹Patrick Ambrosio, Comments Show Split in State Support For EPA Proposed Power Plant Rule, 45 Env. Rept. (BNA) 3499 (12/05/2014).

¹⁰See Ari Natter, State Officials at House Hearing Disagree On Impact of Proposed Power Plant Rule, 45 Environmental Reporter (BNA) 2623 (09/12/2014) (15 Republican governors denounce Clean Power Plan).

¹¹Andrew Childers, Court Skepticism, State Backlash Pose Trials For EPA's Clean Power Plan, Panelists Say, 46 Env. Rept. (BNA) 346 (02/06/2015).

¹²Andrew Childers & Anthony Adragna, McConnell Wants States to 'Hold Back' On Compliance With EPA's Clean Power Plan, 46 Env. Rept. (BNA) 648 (03/06/2015).

¹³Id.

¹⁴Id.

¹⁵Andrew Childers, Questions Likely to Remain for States Even After Clean Power Plan Is Finalized, 46 Env. Rept. (BNA) 1079 (04/10/2015) ; Joyce Cutler, EPA Wants States to Develop Own Plans For Power Plant Rule, General Counsel Says, 46 Env. Rept. (BNA) 997 (04/03/2015)

¹⁶Paul Stinson, Governor Vetoes Legislation Opposing EPA Carbon Plan, Citing Executive Order, 46 Env. Rept. (BNA) 1417 (05/08/2015); Paul Stinson, Governor Signs Executive Order Ruling Out Plan for EPA Carbon Rules, 46 Env. Rept. (BNA) 1357 (05/01/2015)

¹⁷Lorraine McCarthy, State's Lawmakers Give Themselves Veto Power Over Clean Power Plan, 45 Env. Rept. (BNA) 3105 (10/24/2014)

¹⁸Andrew Childers & Anthony Adragna, Governors Largely Shrug Off McConnell's Call To Boycott Clean Power Plan Compliance, 46 Env. Rept. (BNA) (05/22/2015)

¹⁹Id.

²⁰42 U.S.C. § 7409.

²¹42 U.S.C. § 7410

²²42 U.S.C. § 7411(d).

²³42 U.S.C. § 7411(d) (2)

²⁴State air agencies see 'seamless' movement to greenhouse gas permits as 2011 begins, Electric Utility Week, November 1, 2010, at 3 (seamless); Vincent Valk & Kara Sissell, Officials Say Most States on Schedule for GHG Permitting, Chemical Week, September 20, 2010, at 12.

²⁵State air agencies see 'seamless' movement to greenhouse gas permits as 2011 begins, Electric Utility Week, November 1, 2010, at 3.

²⁶State air agencies see 'seamless' movement to greenhouse gas permits as 2011 begins, Electric Utility Week, November 1, 2010, at 3. Thirteen states reported that they lacked authority to administer GHG permitting programs, but seven of those were confident that they could obtain that authority by the deadline. Id.

²⁷State air agencies see 'seamless' movement to greenhouse gas permits as 2011 begins, Electric Utility Week, November 1, 2010, at 3.

²⁸Environmental Protection Agency, Determinations Concerning Need for Error Correction, Partial Approval and Partial Disapproval, and Federal Implementation Plan Regarding Texas Prevention of Significant Deterioration Program. 75 Fed. Reg. 82, 430 (December 30, 2010), at 82,433; Housley Carr, Environmental Protection Agency takes over GHG authority in Texas from state agency, Global Power Report, December 23, 2010

²⁹See, e.g., Waqas Azeem, EPA issues greenhouse gas permit for El Paso Electric peaking plant, SNL Energy Finance Daily, March 27, 2014.

³⁰Texas v. EPA, 726 F.3d 180 (D.C. Cir. 2013).

³¹Withdrawal of Federal Implementation Plan; Texas; Prevention of Significant Deterioration; Greenhouse Gas Tailoring Rule Revisions, 79 FR 9123 (February 18, 2014).

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- ³² Environmental Protection Agency, Fact Sheet: Clean Power Plan & Carbon Pollution Standards Key Dates, undated, available at <http://www2.epa.gov/cleanpowerplan/fact-sheet-clean-power-plan-carbon-pollution-standards-key-dates>.
- ³³ Andrew Childers, Questions Likely to Remain for States Even After Clean Power Plan Is Finalized, 46 Env. Rept. (BNA) 1079 (04/10/2015).
- ³⁴ Andrew Childers & Anthony Adragna, McConnell Wants States to ‘Hold Back’ On Compliance With EPA’s Clean Power Plan, 46 Env. Rept. (BNA) 648 (03/06/2015) (quoting Prof. Daniel Selmi, Loyola University of Los Angeles School of Law).
- ³⁵ Jonathan Crawford, Xcel Energy exec says EPA ill-equipped for federal takeover of state climate plans, SNL Generation Markets Week, October 8, 2013.
- ³⁶ *Whitman v. Am. Trucking Ass’ns*, 531 U.S. 457 (2001).
- ³⁷ Under the Senate version, EPA’s authority to regulate under § 111(d) turns on whether EPA is already regulating a particular pollutant under the national ambient air quality standard program or under hazardous air pollutant standards promulgated under § 112. Under the House version, EPA’s authority to regulate under § 111(d) can be construed to turn on whether EPA has regulated a category of sources under either of those programs.
- ³⁸ See *Citizens to Save Spencer County v. EPA*, 600 F.2d 844, 872 (D.C. Cir. 1979) (stating, in reviewing EPA’s effort to reconcile two conflicting statutory provisions, that “where the agency in a reasonable and responsible manner exercises the discretion that by inadvertence or legislative impasse it has been afforded, and properly takes into account the various concerns and determinations that lay behind the legislative enactment, it is the duty of the reviewing court to sustain the agency’s result”). See also *Alaska Wilderness League v. Jewell*, 2015 WL 3620115, at *10 (9th Cir. June 12, 2015) (concluding that courts owe deference under *Chevron* step two to a reasonable agency interpretation when “[c]onfronted with a self-contradictory, ambiguous provision in a complex statutory scheme”).
- ³⁹ See, e.g., *Hodel v. Virginia Surface Mining and Reclamation Ass’n*, 452 U.S. 264 (1981) (upholding the cooperative federalism provisions of the Surface Mining Control and Reclamation Act and endorsing a broad array of other cooperative federalism-based statutes).
- ⁴⁰ *Mississippi Comm’n on Env’tl. Quality v. EPA*, 2015 WL 3461262 (D.C. Cir. 2015) (citing *Hodel*; *Texas v. EPA*, 726 F.3d 180, 196 — 97 (D.C. Cir. 2013)) (noting that the Supreme Court “has ‘repeatedly affirm[ed] the constitutionality of federal statutes that allow States to administer federal programs but provide for direct federal administration if a State chooses not to administer it.’”).
- ⁴¹ 505 U.S. 144 (1992).
- ⁴² *Printz v. United States*, 521 U.S. 898 (1997).
- ⁴³ *FERC v. Mississippi*, 456 U.S. 742 (1982).
- ⁴⁴ See, e.g., *Mississippi Comm’n*, 2015 WL 3461262, at *31 (citing *Hodel*) (“Here, too, the ‘full regulatory burden will be borne by the Federal Government’ if a State chooses not to submit an implementation plan. Under these circumstances, ‘there can be no suggestion that the Act commandeers ... the States.’”).
- ⁴⁵ 42 U.S.C. § 7416.
- ⁴⁶ See, e.g., *Train v. NRDC, Inc.*, 421 U.S. 60, 79 (1975).
- ⁴⁷ 42 U.S.C. § 7416.
- ⁴⁸ 132 S. Ct. 2566 (2012).
- ⁴⁹ 42 U.S.C. § 7509(b)(1).
- ⁵⁰ *Mississippi Comm’n*, 2015 WL 3461262, at *31-35.
- ⁵¹ 42 U.S.C. § 7411(a)(1) (emphasis added).
- ⁵² EPA, Legal Memorandum for Proposed Carbon Pollution Emission Guidelines for Existing Electric Utility Generating Units 51-52 (2014) (citing Oxford Dictionary of English (3rd ed.) (published 2010, online version 2013), <http://www.oxfordreference.com.mutex.gmu.edu/view/10.1093/acref/9780199571123.001.0001/acref-9780199571123>, available at <http://www2.epa.gov/sites/production/files/2014-06/documents/20140602-legal-memorandum.pdf>).
- ⁵³ H.R. Rep. No. 95-294, 1977 U.S.C.A.N. 1077, 1088 (1977) (“The section also makes clear that standards adopted for existing sources under § 111(d) of the act are to be based on available means of emission control (not necessarily technological) and must, unless the State decides to be more stringent, take into account the remaining useful life of the existing sources.”).
- ⁵⁴ *Massachusetts v. EPA*, 549 U.S. 497, 532 (2007).
- ⁵⁵ *Utility Air Regulatory Group v. EPA*, 134 S. Ct. 2427, 2339-42 (2014).
- ⁵⁶ *Michigan v. EPA*, 135 S. Ct. 2699, 2708 (2015).
- ⁵⁷ The statute defines an “existing source” to mean “any stationary source other than a new source.” 42 U.S.C. § 7411(a)(6).
- ⁵⁸ *Chevron U.S.A. Inc. v. Natural Res. Def. Council, Inc.*, 467 U.S. 837 (1984).
- ⁵⁹ *Utility Air Regulatory Group v. EPA*, 134 S. Ct. 2427, 2448 (2014).
- ⁶⁰ See, e.g., *In re Murray Energy Corp.*, No. 14-111 (D.C. Cir. June 9, 2015) (rejecting a CPP challenge because the proposed rule was not final agency action subject to judicial review); *West Virginia v. EPA*, No. 14-1146 (D.C. Cir. June 9, 2015) (same).
- ⁶¹ 42 U.S.C. § 7607(b).

⁶² In contrast, once states promulgate and EPA approves CPP implementation plans, parties must challenge EPA's actions in the appropriate local circuit of the U.S. Courts of Appeals (*i.e.*, the Ninth Circuit would have jurisdiction to hear challenges to EPA's approval of California's plan, the Tenth Circuit could hear challenges to EPA's approval of Colorado's plan, and the Fifth Circuit could hear challenges to EPA's approval of Texas's plan). 42 U.S.C. § 7607(b).

⁶³ 42 U.S.C. § 7607(d)(9). A party's ability to raise procedural arguments is conditioned on the party showing it met the Clean Air Act's exhaustion requirements and that the procedural errors were so serious and relevant that there is a substantial likelihood that the rule would have been significantly changed if the errors had not been made. 42 U.S.C. §§ 7607(d)(7)(B), (d)(8), & (d)(9)(D).

⁶⁴ 5 U.S.C. § 706(2).

⁶⁵ *Bluewater Network v. EPA*, 370 F.3d 1, 11 (D.C. Cir. 2004).

⁶⁶ 42 U.S.C. § 7607(d)(7)(B).

⁶⁷ *Id.*

⁶⁸ *Texas Mun. Power Agency v. EPA*, 89 F.3d 858, 875 (D.C. Cir. 1996) ("Under [the Clean Air Act], we may only review claims that have been first raised 'with reasonable specificity' before [EPA]..."). In dicta, the D.C. Circuit has asserted that parties do not have to exhaust claims challenging the constitutionality of parts of the Clean Air Act. *Motor & Equipment Mfrs. Ass'n, Inc. v. EPA*, 627 F.2d 1095, 1115 (D.C. Cir. 1979). Since then, the D.C. Circuit has become increasingly rigid regarding the exhaustion requirement, and it is unclear if the court would maintain that position today.

⁶⁹ Specifically, a party may be able to raise challenges in court that it did not raise previously if it can show that it was impracticable to raise the issue within the period of time given for public comment or if the grounds for objection arose after the period for public comment closed. 42 U.S.C. § 7607(d)(7)(B).

⁷⁰ However, under the doctrine of constitutional avoidance, if a statute or regulation has more than one potential meaning, a court will use the meaning that avoids constitutional questions or infirmities. *Solid Waste Agency of N. Cook Cty. v. U.S. Army Corps of Eng'rs*, 531 U.S. 159, 174 (2001); *see also* William K. Kelley, *Avoiding Constitutional Questions as a Three-Branch Problem*, 86 *Cornell L. Rev.* 831 (2001) (critiquing the Court's approach as insufficiently deferential to the executive branch).

⁷¹ *Chevron, U.S.A., Inc. v. NRDC, Inc.*, 467 U.S. 837 (1984). Where an agency charged with administering a law has used notice-and-comment rulemaking to interpret the law, courts apply the *Chevron* doctrine to analyze the agency's interpretation. *United States v. Mead Corp.*, 533 U.S. 218, 230 (2001). If the agency uses a less formal method to interpret the law, such as a guidance document that has not gone through notice-and-comment or does not have the force of law, courts will often apply *Skidmore* deference instead. *Id.* at 237. *Skidmore* directs courts to defer to agency interpretations of ambiguous statutes if the courts find the interpretations persuasive. *Skidmore v. Swift & Co.*, 323 U.S. 134, 140 (1944).

⁷² *Chevron*, 467 U.S. at 842-43 ("If the intent of Congress is clear, that is the end of the matter; for the court, as well as the agency, must give effect to the unambiguously expressed intent of Congress.").

⁷³ *See, e.g.*, *FAA v. Cooper*, 132 S. Ct. 1441, 1457-58 (2012) (looking to Black's Law Dictionary and Webster's Dictionary to determine the meaning of statutory language); *see also* 2A Norman J. Singer & J.D. Shambie Singer, *Sutherland Statutory Construction* § 47:07, at 315 (7th ed. 2007).

⁷⁴ *Shays v. FEC*, 337 F. Supp.2d 28, 52 (D.D.C. 2004) (canons of statutory construction are used at *Chevron* step one to determine the specific intent of Congress); *AFL-CIO v. FEC*, 333 F.3d 168, 183-84 (D.C. Cir. 2003) (canons of construction that assist courts in determining Congress's intent apply at *Chevron* step one).

⁷⁵ Singer & Singer, *supra* note 73, § 47:17, at 364-87; Richard E. Levy & Robert L. Glicksman, *Statutory Analysis in the Regulatory State* 121 (2014).

⁷⁶ Singer & Singer, *supra* note 73, § 47:23, at 406-26; Levy & Glicksman, *supra* note 75, at 118-19.

⁷⁷ *Massachusetts v. EPA*, 549 U.S. 497, 528 (2007).

⁷⁸ *Nat'l Ass'n of Home Builders v. Defenders of Wildlife*, 551 U.S. 644, 661 (2007).

⁷⁹ *United States v. Rodgers*, 461 U.S. 677, 706 (1983) ("The word 'may,' when used in a statute, usually implies some degree of discretion."); Levy & Glicksman, *supra* note 75, at 116-17.

⁸⁰ *Deal v. United States*, 508 U.S. 129, 132 (1993) ("[I]t is a] fundamental principle of statutory construction (and, indeed, of language itself) that the meaning of a word cannot be determined in isolation, but must be drawn from the context in which it is used."); Levy & Glicksman, *supra* note 75, at 129-30 (discussing the "whole act" rule).

⁸¹ *See, e.g.*, *Smith v. United States*, 507 U.S. 197, 201 (1993) (looking to other parts of a statute to determine the meaning of the term "foreign country"); *see also* Singer & Singer, *supra* note 73, § 46:05, at 228-31; Levy & Glicksman, *supra* note 75, at 130-33.

⁸² *See, e.g.*, *Humphrey's Ex'r v. United States*, 295 U.S. 602, 618 (1935) (looking to other statutes to determine the President's removal power); Levy & Glicksman, *supra* note 75, at 136-39.

⁸³ Daniel T. Shedd & Todd Garvey, Cong. Research Serv., R43201, *Chevron Deference: Court Treatment of Agency Interpretations of Ambiguous Statutes* 6 (2013) ("[I]t is common practice to consider legislative history during the first step of the *Chevron* test."); Levy & Glicksman, *supra* note 75, at 171-75, 79-81. *But see* *United States v. Geiser*, 527 F.3d 288, 292 (3d Cir. 2008) ("[L]egislative history should not be considered at [*Chevron*] step one.").

⁸⁴ *Chevron, U.S.A., Inc. v. NRDC, Inc.*, 467 U.S. 837, 842 (1984).

⁸⁵ See *North Carolina v. EPA*, 550 F.3d 1176 (D.C. Cir. 2008). Courts at times also vacate and remand agency actions. This has the same practical impact as a *vacatur*, in that the agency action will not have any operative effect while the agency reconsiders its invalidated rule.

⁸⁶ *Chevron*, 467 U.S. at 842.

⁸⁷ *Id.* at 843 (“[I]f the statute is silent or ambiguous with respect to the specific issue, the question for the court is whether the agency’s answer is based on a permissible construction of the statute.”).

⁸⁸ See *Mayo Found. for Medical Educ. and Research v. United States*, 562 U.S. 44, 52 (2011); see also *Astrue v. Capato ex rel. B.N.C.*, 132 S. Ct. 2022, 2034 (2012).

⁸⁹ *Chevron*, 467 U.S. at 844 (“[C]onsiderable weight should be accorded to an executive department’s construction of a statutory scheme it is entrusted to administer.”).

⁹⁰ *Id.* at 866 (“The responsibilities for assessing the wisdom of such policy choices and resolving the struggle between competing views of the public interest are not judicial ones.”).

⁹¹ Matthew C. Stephenson & Adrian Vermeule, Essay, *Chevron Has Only One Step*, 95 Va. L. Rev. 597 (2009).

⁹² Kenneth A. Bamberger & Peter L. Strauss, Essay, *Chevron’s Two Steps*, 95 Va. L. Rev. 611 (2009).

⁹³ Empirical reviews of judicial decisions have found very few examples of agency actions that fail at step two. Jason J. Czarnecki, *An Empirical Investigation of Judicial Decisionmaking, Statutory Interpretation, and the Chevron Doctrine in Environmental Law*, 79 U. Colo. L. Rev. 767, 797 (2008); Orin S. Kerr, *Shedding Light on Chevron: An Empirical Study of the Chevron Doctrine in the U.S. Courts of Appeals*, 15 Yale J. on Reg. 1, 30-31 (1998).

⁹⁴ 531 U.S. 457, 484-85 (2001).

⁹⁵ 556 U.S. 208, 222 (2009).

⁹⁶ See *F.C.C. v. Fox Television Stations, Inc.*, 556 U.S. 502, 514 (2009); *Perez v. Mortg. Bankers Ass’n*, 135 S. Ct. 1199, 1209 (2015).

⁹⁷ 461 U.S. 402, 423 (1983) (interpreting 16 U.S.C. § 824a-3(b)).

⁹⁸ 463 U.S. 29 (1983).

⁹⁹ *Id.* at 43 (quoting *Burlington Truck Lines v. United States*, 371 U.S. 156, 168 (1962)).

¹⁰⁰ *Id.* at 43.

¹⁰¹ *Bluewater Network v. EPA*, 372 F.3d 404, 410 (D.C. Cir. 2004); *Nat’l Ass’n of Clean Air Agencies v. EPA*, 489 F.3d 1221, 1229 (D.C. Cir. 2007).

¹⁰² See, e.g., *Ass’n of Irrigated Residents v. U.S. E.P.A.*, 686 F.3d 668, 677 (9th Cir. 2012) (EPA’s failure to act was arbitrary and capricious because the agency does not have “unlimited discretion to ignore evidence indicating an existing SIP might be substantially inadequate”).

¹⁰³ See, e.g., *Texas v. EPA*, 690 F.3d 670 (5th Cir. 2012) (EPA’s disapproval of Texas’s SIP was arbitrary and capricious in part because EPA’s regulations required less specificity than EPA demanded in practice).

¹⁰⁴ See, e.g., *Am. Farm Bureau Fed’n v. EPA*, 559 F.3d 512, 522 (D.C. Cir. 2009) (EPA acted arbitrarily because it failed to adequately explain its reason for changing its position on how to set the National Ambient Air Quality Standards for particulate matter).

¹⁰⁵ See *EPA v. EME Homer City Gen., LP*, 134 S. Ct. 1584 (2014).

¹⁰⁶ 42 U.S.C. § 7607(d)(2)-(7).

¹⁰⁷ 42 U.S.C. § 7607(d)(3).

¹⁰⁸ 42 U.S.C. § 7607(6).

¹⁰⁹ See *Ne. Maryland Waste Disposal Auth. v. EPA*, 358 F.3d 936, 951-52 (D.C. Cir. 2004) (“A rule is deemed a logical outgrowth if interested parties ‘should have anticipated’ that the change was possible, and thus reasonably should have filed their comments on the subject during the notice-and-comment period.”).

¹¹⁰ Emily Hammond & David B. Spence, *The Regulatory Contract in the Marketplace*, — Vand. L. Rev. — (forthcoming), available at <http://ssrn.com/abstract=2584619>.

¹¹¹ E.g., Notice of Upcoming Joint Rulemaking to Establish Vehicle GHG Emissions and CAFE Standards, 74 Fed. Reg. 24,007 (May 22, 2009) (joint rulemaking by EPA and National Highway Transportation Safety Administration); cf. *Del. Dep’t Natural Resources v. EPA*, 785 F.3d 1 (D.C. Cir. 2015) (holding arbitrary and capricious EPA’s failure to consult with FERC regarding back-up generator rule).

¹¹² Jody Freeman & Jim Rossi, *Agency Coordination in Shared Regulatory Space*, 125 Harv. L. Rev. 1131, 1146-49 (2012).

¹¹³ Freeman & Rossi, *supra* note 112; cf. Emily Hammond, *Presidential Control, Expertise, and the Deference Dilemma*, 61 Duke L.J. 1763, 1785-90 (2012) (documenting problematic dispute between DOE and NRC and collecting further examples).

¹¹⁴ *Del. Dep’t of Natural Resources*, 785 F.3d 1.

¹¹⁵ *Id.*

¹¹⁶ *Id.* at 4.

¹¹⁷ *Id.* at 6-7.

¹¹⁸ *Id.* at 18.

¹¹⁹ *Id.*

¹²⁰ *Id.*

¹²¹ For an overview of the agencies' activities, see Bud Earley, *FERC Outlines Its Role in Implementing EPA's Clean Power Plan*, Inside Energy & Env't., May 20, 2015, at <http://www.insideenergyandenvironment.com/2015/05/ferc-outlines-its-role-in-implementing-epas-clean-power-plan/>.

¹²² The term "transmission" generally refers to the movement of electric current over longer distances at higher voltages (so-called bulk power transfers), while "distribution" refers to the delivering electricity at lower voltages from high-voltage transmission lines to end-users. See generally Jack Casazza & Frank Delea, *Understanding Electric Power Systems* (2010).

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¹²⁴ See Emily Holden, *Will tension between lawmakers and regulators hamstring the Clean Power Plan?*, Energywire, June 29, 2015, at <http://www.eenews.net/stories/1060021010> ("[a]ir and electric regulators are interacting more and getting along better than ever").

¹²⁵ *Id.*

¹²⁶ NASEO, State 111(d) Resource Hub, at <http://111d.naseo.org/> (last visited July 21, 2015).

¹²⁷ See Regulatory Assistance Project, *Preparing for 111(d): 10 Steps Regulators Can Take Now* (2014) (emphasizing need for "regular and detailed dialogues" between state agencies).

¹²⁸ This issue is distinct from that of dormant Commerce Clause limits on state initiatives like renewable portfolio standards. See Steven Ferrey, *Carbon Outlasts the Law: States Walk the Constitutional Line*, 41 B.C. Envtl. Affairs L. Rev. 309 (2014) (considering both dormant Commerce Clause and Supremacy Clause challenges to state carbon initiatives).

¹²⁹ 16 U.S.C. § 824(a).

¹³⁰ See, e.g., *ONEOK, Inc. v. Learjet*, 135 S. Ct. 1591 (2015) (holding Natural Gas Act, which is read *in pari materia* with Federal Power Act, did not preempt statelaw antitrust claims against natural gas traders operating on both the wholesale and retail markets); see also *Elec. Power Supply Ass'n v. FERC*, 753 F.3d 216 (D.C. Cir. 2014), *pet'n for cert. granted* May 4, 2015 (holding Order 745 invalid as beyond FERC's jurisdiction and concluding pricing rationale was arbitrary and capricious); Emily Hammond, *Energy Law's Jurisdictional Boundaries: A Call for Course Correction*, Geo. Wash. L. Rev. Docket (Apr. 28, 2015), <http://www.gwlr.org/oneok-v-learjet/> (discussing implications of recent Supreme Court activity).

¹³¹ *PPL Energyplus, LLC v. Solomon*, 766 F.3d 241 (3d Cir. 2014), *pet'n for cert. filed* Dec. 10, 2014 (holding New Jersey effort to compensate new generation for capacity market disparities was preempted by Federal Power Act); *PPL Energyplus, LLC v. Nazarian*, 753 F.3d 467 (4th Cir. 2014), *pet'n for cert. filed* Nov. 26, 2014 (similar).

¹³² *Nazarian*, 745 F.3d at 473; see also *Solomon*, 766 F.3d at 748 ("New Jersey divorced the entities that generate electricity from those that supply it.").

¹³³ See Hammond & Spence, *supra* note 110 (documenting nuclear power's comparative benefits, especially compared to natural gas (reliability) and coal (environmental externalities)).

¹³⁴ *Id.*

¹³⁵ See *id.* (noting policy options considered by a variety of states for maintaining nuclear fleets).

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- ¹⁶¹ U.S. Energy Information Administration, *Scheduled 2015 Capacity Additions Mostly Wind and Natural Gas; Retirements Mostly Coal* (March 10, 2015).
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- ¹⁶³ Alexandra B. Klass, *The Electric Grid at a Crossroads: A Regional Approach to Siting Transmission Lines*, 48 U.C. Davis L. Rev. ____ (2015).
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- ¹⁷³ *Id.* at 14. The report goes on to note, however, should some safety valve or mechanism be implemented, that it should not delay compliance planning and that it satisfy certain principles including that such a mechanism should be to demonstrated

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<http://www2.epa.gov/sites/production/files/2015-01/documents/20150107fs-key-dates.pdf> (setting summer 2017 as deadline for states to submit individual plans and summer 2018 for states to submit multi-state plans).

²⁴¹ See Rich Heidorn, Jr., *MISO, SPP Stakeholders Developing Trading Plan to Comply with EPA Carbon Rule*, *RTO Insider*, Apr. 2, 2015.

²⁴² See Nicholas Institute for Environmental Policy Solutions, Duke University, Enhancing Compliance Flexibility under the Clean Power Plan: A Common Elements Approach to Capturing Low-Cost Emissions Reductions, Policy Brief (March 2015) (describing a situation where states develop individual plans to meet their own emissions target, rather than a multi-state plan to meet a joint target, and allow electric utilities to transfer compliance credits among units within a state and among states that share common elements in their compliance plans); Georgetown Climate Center, Clean Power Plan Implementation: Single-State Compliance Approaches with Interstate Elements (May 2015) (discussing state and stakeholder interest in single-state compliance plans that would allow for the option of interstate trading of compliance instruments and elements that may be required for such programs).

²⁴³ See, e.g., Megan Herzog, Legal Planet, A Roadmap for State Comments on the Clean Power Plan, Sept. 17, 2014.

²⁴⁴ Current RGGI members are Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont.

²⁴⁵ See Jeff Day, *Virginia Ponders Joining RGGI as State Weighs How to Meet Clean Power Plan Goals*, 93 Daily Env. Rep. A-14, May 14, 2015.

²⁴⁶ See *Thrun v. Cuomo*, Decision & Order (N.Y. Sup. Ct., Albany County, June 2012) (dismissing lawsuit based on lack of standing that alleged New York's participation in RGGI was unlawful because participation was without consent of the legislature, the RGGI regulations impose a tax not authorized by the legislature, the RGGI program is arbitrary and capricious, and the creation of RGGI violates the compact clause).

²⁴⁷ The Appellate Division of the New Jersey Superior Court held in March 2014 that Governor Christie acted illegally in withdrawing from RGGI without the state DEQ formally repealing the RGGI implementation rules, which require notice-and-comment. See Joanne M. Foster, *Gov. Christie Broke The Law When Pulling New Jersey Out Of Northeast Cap-And-Trade System, Court Rules*, *Climate Progress*, March 25, 2014.

²⁴⁸ See, e.g., National Ass'n of Reg. Utility Commissioners (NARUC) & Eastern Interconnection Planning Council (EISPC), Multistate Coordination Resources for Clean Power Plan Compliance, Sample Documents for Consideration 12-14 (May 2015) (sample MOU listing a variety of policy design issues states would need to agree upon).

²⁴⁹ See Heidorn, *supra* note 241 (explaining that North Dakota has the easiest rate-based target to meet in the United States and that states like North Dakota would have to reduce their emissions even more than EPA requires if they opted for a blended regional rate).

²⁵⁰ See, e.g., Nicholas Institute, *supra* note 242 (discussing the “common elements” approach where states developed individual compliance plans to meet their own emissions targets but allowed utilities to transfer compliance credits among units within a state and among states that share common elements in their compliance plans); Heidorn, *supra* note 241 (discussing a mechanism that would effectively set a price on carbon, similar to the cap-and-trade program to comply with the acid rain regulations and that states would use trading to reduce the cost of meeting their individual state goals); *id.* (describing proposal as one where “states would submit for EPA approval implementation plans using their individual mass-based targets. Once the plans are approved the states would use trading to reduce the cost of meeting their goals”); Georgetown Climate Center, *supra* note 242 (discussing state and stakeholder interest in single-state compliance plans that would allow for option of interstate trading of compliance instruments and elements that may be required for such programs).

²⁵¹ See MISO, EPA Proposal to Reduce Carbon Dioxide Emissions, at <https://www.misoenergy.org/WHATWEDO/EPAREGULATIONS/Pages/111%28d%29.aspx>.

²⁵² PJM, PJM Interconnection Economic Analysis of the EPA Clean Power Plan Proposal (March 2, 2015); see also Analysis Group, Electric System Reliability and EPA’s Clean Power Plan: The Case of PJM 18 (March 16, 2015).

²⁵³ See Heidorn *supra* note 241.

²⁵⁴ *Id.*

²⁵⁵ *Id.*

²⁵⁶ See Rod Cuckro, *Price on Carbon May be Sweet Spot for Midwest Grid Operator*, EnergyWire, June 8, 2015, at <http://www.eenews.net/energywire/2015/06/08/stories/1060019768>.

²⁵⁷ See Nicholas Institute, *supra* note 242; Georgetown Climate Center, *supra* note 242.

²⁵⁸ See Nicholas Institute, *supra* note 242, at 5-6; David Farnsworth, Regulatory Assistance Project, Navigating the EPA’s Clean Power Plan for Compliance with Renewable Energy (Feb. 11, 2015).

²⁵⁹ Farnsworth, *supra* note 258; Franz T. Litz & Jennifer Macedonia, Choosing a Policy Pathway for State 111(d) Plans to Meet State Objectives (Bipartisan Policy Center and Great Plains Initiative, April 2015).

²⁶⁰ See EPA, Fact Sheet, Clean Power Plan Framework, at 3, at <http://www2.epa.gov/carbon-pollution-standards/fact-sheet-clean-power-plan-framework> (“Adopting a mass-based goal would better allow a state or group of states to cap their tonnage of CO₂ emissions and set up a trading program if they choose that option.”).

²⁶¹ See Synapse Energy Economics, Inc., Final Report: Implications of EPA’s Proposed “Clean Power Plan” 26-27 (Nov. 14, 2014) (“Certain regions, particularly the Northeast, already experience natural gas pipeline constraints that have caused regional spot market prices to spike to more than 35 times higher than the rest of the country.”).

²⁶² See Press Release, Am. Wind Energy Ass’n, American Wind Power Reaches Major Power Generation Milestones in 2013 (Mar. 5, 2013), available at <http://www.awea.org/MediaCenter/pressrelease.aspx?ItemNumber=6184>.

²⁶³ 79 Fed. Reg. at 34,897.

²⁶⁴ E.P.A. v. EME Homer City Generation, L.P., 134 S. Ct. 1584, 1597 & n.10 (2014).

²⁶⁵ 42 U.S.C. § 7410(a)(2)(A).

²⁶⁶ If utilities purchase non-EGU allowances, rather than offsets, then the allowances would likely be accompanied by co-pollutant reduction benefits at the reducing source’s location. However, coal-fired power has a particularly high co-pollutant intensity — high levels of co-pollutants per ton of GHGs — and so the co-pollutant benefits of reductions at non-coal sources might not be as great as the reductions from coal-fired power plants themselves.

²⁶⁷ 427 U.S. 246 (1976).

²⁶⁸ This approach is followed not only under the Clean Air Act, but also under the Clean Water Act, the Resource Conservation and Recovery Act and the Safe Drinking Water Act.

²⁶⁹ 79 Fed. Reg. 34848-50 (2014).

²⁷⁰ Excellent additional sources of information about such efforts can be accessed on the websites of the Center for Climate and Energy Solutions (<http://www.c2es.org/>) and the Georgetown Climate Center (<http://www.georgetownclimate.org/>)

²⁷¹ Philip A. Wallach and Alex Abdun-Nab, *The Unfairness of State Standards Under the EPA’s Clean Power Plan*, Brookings’ Fixgov: Making Government Work, July 16, 2014, <http://www.brookings.edu/blogs/fixgov/posts/2014/07/16-state-standards-unfair-under-epa-clean-power-plan-wallach-abdun-nabi> (last visited July 24, 2015).

²⁷² For example, this flexibility is critical to the conclusion of one influential consulting organization that the CPP is unlikely to affect the future reliability of the electricity supply going forward. Responding to a 2014 critical assessment by the North American Electricity Reliability Corporation (NERC), the Brattle Group released a report in 2015 concluding that “The combination of the ongoing transformation of the power sector, the steps already taken by system operators, the large and expanding set of technological and operational tools available and the flexibility under the CPP are likely sufficient to ensure that compliance will not come at the cost of reliability.” See Jurgen Weiss et al., EPA’s Clean Power Plan and Reliability iv (2015) available at <http://info.aee.net/brattle-reliability-report>. The Brattle Group Report also references EPA’s flexibility in allowing states to employ emission reduction technologies not included in the BSER, including co-firing coal with biomass, demand response, combined heat and power (“CHP”), and non-utility energy efficiency measures. According to the Report, “Incorporating these and other emission reduction options will lower the emission reductions that states need to achieve under

the four building blocks, thereby ameliorating possible reliability concerns that may result from the strict application of BSER.” *Id.* at viii.

²⁷³ See U.S. Environmental Protection Agency, State Goals Overview (June 2014) at 8-10 available at:

http://www2.epa.gov/sites/production/files/2014-06/documents/state_goals_june24th_2.pdf (using hypothetical “Central State” whose electricity sector is highly fossil-fuel dependent, and “Western State,” whose electricity sector is not, EPA states “Because Western State has relatively less fossil fuel-fired generation, a given action to reduce its CO₂ emissions will have a greater impact on its CO₂ emission rate than the same action would have in a state like Central State with relatively more fossil fuel-fired generation.”).

²⁷⁴ Compare The Brattle Group, EPA’s Proposed Clean Power Plan (Policy Brief: June 2014) at 11 available at:

<http://www.hks.harvard.edu/hepg/Papers/2014/EPAs%20Proposed%20Clean%20Power%20Plan-Implications%20for%20States%20and%20the%20Electric%20%20%20.pdf> (state-specific marginal carbon dioxide abatement costs without regional cooperation) with Energy Ventures Analysis, EPA Clean Power Plan (Oct. 2014) at 23 available at: <http://www.countoncoal.org/assets/Executive-Summary-EPA-Clean-Power-Plan-Costs-Impacts.pdf> (showing average 2020 - 2030 “carbon penalties” by state).

²⁷⁵ 134 S. Ct. 1584 (2014).

²⁷⁶ See EPA, *Proposed Carbon Pollution Guidelines for Existing Stationary Sources: Electric Utility Generating Units*, 79 Fed. Reg. 34829, 348994 (June 18, 2014) [hereinafter, *Proposed Rule*].

²⁷⁷ See Alice Kaswan, *Controlling Power Plants: The Co-Pollutant Implications of EPA’s Clean Air Act § 111(D) Options for Greenhouse Gases*, 32 VA. Env’tl. L. Rev. 174, 184-85 (2014).

²⁷⁸ Proposed Rule, 79 Fed. Reg. at 34893-94.

²⁷⁹ *Id.* at 39894.

²⁸⁰ *Id.* at 34893-94.

²⁸¹ *Id.* at 34894.

²⁸² *Id.*

²⁸³ Indeed, it is possible that the decrease in the hours of operation might increase the emissions rate because of inefficiencies caused by less constant operation even as it decreased the mass of emissions.

²⁸⁴ See EPA, Goal Computation Technical Support Document 8-15 (June, 2014). EPA’s formula accomplishes this by dividing overall emissions in the state after employment of EPA’s proposed measures by the amount of electricity generated to establish a statewide emissions rate.

²⁸⁵ See Proposed Rule, 79 Fed. Reg. at 34894 (noting that the effects of reduced generation are evident in reported carbon dioxide emissions).

²⁸⁶ See Michael Wara, Danny Cullenward, and Rachel Teitelbaum, *Peak Electricity and the Clean Power Plan*, 28 Electricity J. 18 (2015) (discussing the problem of the models underlying conversions).

²⁸⁷ See *id.*

²⁸⁸ *Cap Without Trade: A Proposal for Resolving the Emissions Trading Problem Under CAA § 111*, 43 Env’tl. L. Rep. (Env’tl L. Inst.) 10555 (2013).

²⁸⁹ Joel Schwartz et al, Health Co-Benefits of Carbon Standards for Existing Power Plants (2014), available at <http://www.chgeharvard.org/sites/default/files/userfiles2/Health%20Co-Benefits%20of%20Carbon%20Standards.pdf>; Clean Air Task Force, Power Switch: An Effective, Affordable Approach to Reducing Carbon Pollution from Existing Fossil-Fueled Power Plants 24-25 (2014), available at http://www.catf.us/resources/publications/files/Power_Switch.pdf;

²⁹⁰ GHG and co-pollutant emissions from coal-fired power plants are strongly correlated, so this essay assumes that a six percent drop in GHG emissions will lead to a corresponding drop in co-pollutant emissions.

²⁹¹ 79 Fed. Reg. at 34839 (Jun. 18, 2014).

²⁹² Moreover, the Mercury Air Toxics Standard was invalidated in *Michigan v EPA*, 576 U.S. ____ (2015)

²⁹³ 79 Fed. Reg. at 34936 (Jun. 18, 2014).

²⁹⁴ Schwartz et al, *supra* note 289, at 2 (predicting, by 2020 and under their energy-efficiency intensive scenario, a 27 percent decrease in sulfur dioxide emissions, a 22 percent decrease in nitrogen oxide emissions, and a 27 percent decrease in mercury emissions, all beyond existing controls), available at <http://www.chgeharvard.org/sites/default/files/userfiles2/Health%20Co-Benefits%20of%20Carbon%20Standards.pdf>.

²⁹⁵ Clean Air Task Force, *supra* note 289, at 25 (predicting reductions of 450,000 tons in annual sulfur dioxide and 400,000 tons in annual nitrogen oxide emissions by 2020, all in addition to existing requirements).

²⁹⁶ Dallas Burtraw et al., *Greenhouse Gas Regulation under the Clean Air Act: A Guide for Economists* 13 (2011).

²⁹⁷ The state or regional cap-and-trade programs can allow the use of offsets for compliance with state targets, but the state needs to ensure that the program as a whole results in the required level of actual reductions from energy sector sources.

²⁹⁸ See Richardson, et al., *Greenhouse Gas Regulation under the Clean Air Act: Structure, Effects, and Implications of a Knowable Pathway* 54 (2010).

²⁹⁹ The legal basis for requiring environmental justice analysis could stem from Title VI of the Civil Rights Act, which prohibits state and local agencies receiving federal funding from discriminating or causing a disparate impact. Alternatively, since the federal government must ultimately approve or disapprove state SIPs, and Executive Order 12898 requires federal agencies to consider the distributional consequences of their decisions on poor and of-color populations, a state environmental justice analysis could be considered a foundation to help EPA comply with the executive order as it evaluates whether to approve the SIP.

³⁰⁰ Vien Truong and Bruce Mirken, *Opinion: Cap-and-Trade Funds to Struggling Communities*, San Francisco Chronicle (Nov. 15, 2012), <http://www.sfgate.com/opinion/openforum/article/Cap-and-trade-funds-to-struggling-communities-4042244.php> (describing SB 535, which devotes auction revenue to disadvantaged communities).

About the Authors



ALICE KASWAN, the issue alert’s coordinating editor, is a Professor of Law at the University of San Francisco, and Visiting Professor at Berkeley Law during spring and fall 2015. She writes and speaks frequently on climate justice, and is the author of “Controlling Power Plants: the Co-Pollutant Implications of EPA’s Clean Air Act 111(d) Options for Greenhouse Gases,” in the *Virginia Journal of Environmental Law*.



WILLIAM W. BUZBEE is a Professor of Law at Georgetown University Law Center and teaches and writes in the areas of administrative law, environmental law, and federalism. His books include *Fighting Westway: Environmental Law, Citizen Activism, and the Regulatory War that Transformed New York City*, and *Preemption Choice: The Theory, Law and Reality of Federalism’s Core Question*, and he is the co-author of a leading casebook, *Environmental Protection: Law and Policy*. He has testified repeatedly before congressional committees on environmental and regulatory matters.



DAVID M. DRIESEN is Syracuse University’s 13th University Professor and an expert on Emissions Trading, Environmental Law, and Law and Economics. He has published *The Economic Dynamics of Law*, *The Economic Dynamics of Environmental Law*, *Environmental Law: A Conceptual and Pragmatic Approach* (with Robert Adler and Kirsten H. Engel), *Economic Thought and U.S. Climate Change Policy* (editor), and *Beyond Environmental Law* (edited with Alyson Flournoy).



KIRSTEN H. ENGEL is the Charles E. Ares Professor of Law at the James E. Rogers College of Law at the University of Arizona. Known chiefly for her scholarship on federalism and environmental law, Engel’s more recent work focuses on state, local and regional governmental responses to climate change. Engel is the co-author of *Environmental Law: A Conceptual and Pragmatic Approach* (3d ed.) (forthcoming) and numerous book chapters and articles. Engel has held appointments in the public and nonprofit sectors, including the U.S. Environmental Protection Agency and the Massachusetts’ Attorney General’s Office, and visiting and permanent professorships at Harvard, Vanderbilt, and Tulane Law Schools.



VICTOR B. FLATT is the Tom & Elizabeth Taft Distinguished Professor of Environmental Law and the Director of the Center for Law, Environment, Adaptation, and Resources (CLEAR) at the University of North Carolina Chapel Hill School of Law. Professor Flatt is a recognized expert in climate policy, environmental markets, and environmental enforcement. He has had numerous publications in law reviews and other fora, and received commendations for his writing.



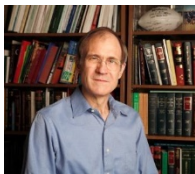
ROBERT L. GLICKSMAN is the J. B. & Maurice C. Shapiro Professor of Environmental Law at The George Washington University Law School. He is a nationally and internationally recognized expert on environmental, natural resources, and administrative law. His books deal with environmental, administrative, and public land law, statutory interpretation, risk regulation, and environmental enforcement. His numerous law review articles address issues such as climate change, federalism, and public land management.



EMILY HAMMOND is a Professor of Law at The George Washington University Law School. Professor Hammond is a leading authority on nuclear energy, electricity markets, regulatory jurisdiction, and the various responses of legal institutions to scientific uncertainty. Her work has been published in numerous top-ranking journals, and she is a co-author of textbooks on both energy law and environmental law.



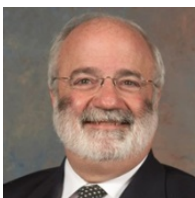
ALEXANDRA B. KLASS is a Distinguished McKnight University Professor at the University of Minnesota Law School. She teaches and writes in the areas of energy, environmental, natural resources, tort, and property law. Her recent scholarly work addresses regulatory challenges to integrating more renewable energy into the nation's electric transmission grid and siting and eminent domain issues surrounding interstate electric transmission lines and oil and gas pipelines.



THOMAS O. MCGARITY holds the Joe R. and Teresa Lozano Long Endowed Chair in Administrative Law at the University of Texas School of Law. He has written in the areas of administrative, environmental, occupational safety and health and food safety law for more than 35 years. His most recent book is *Freedom to Harm: The Lasting Legacy of the Laissez Faire Revival* (Yale University Press 2013).



MELISSA POWERS is an Associate Professor of Law at Lewis & Clark Law School and the creator and director of the school's Green Energy Institute. She was a Fulbright-Schuman scholar in 2014-2015, researching renewable energy policies and politics in Denmark and Spain. She teaches and writes in the areas of climate change, energy policy, and the Clean Air Act.



JOSEPH P. TOMAIN is Dean Emeritus and the Wilbert and Helen Ziegler Professor of Law. His primary scholarly interest is energy law and policy and he has written extensively in the area including: *Clean Power Politics: The Democratization of Energy* (forthcoming), *Energy Law & Policy* (2015), *Ending Dirty Energy Policy: Prelude to Climate Change* (2011), *Energy Law in a Nutshell*, *Regulatory Law and Policy*, *Energy Law and Policy for the 21st Century*, and *Nuclear Power Transformation*, among others. Dean Tomain also has published books entitled *Achieving Democracy: The Future of Progressive Regulation* (2014) and *Creon's Ghost: Law, Justice and the Humanities* (2009).

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