

C O M M E N T

State Implementation of the Clean Power Plan: Why It Matters to Industries Outside the Power Sector

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I. Introduction

On August 3, 2015, President Barack Obama announced the U.S. Environmental Protection Agency's (EPA's) Clean Power Plan (CPP),¹ which establishes guidelines that states must apply to achieve reductions in carbon dioxide (CO₂) emissions from the existing fleet of fossil fuel-fired electric generating units. Under §111(d) of the Clean Air Act (CAA),² states will promulgate their own laws and regulations achieving the emissions reductions from existing fossil fuel-fired power plants required by these guidelines and will submit plans incorporating those programs to EPA for review and approval or disapproval. If a state does not submit a plan, or if EPA disapproves a state plan, EPA is required to promulgate a federal plan that will be enforceable in that state.

Organizations and companies outside of the utility sector have expressed concerns regarding the impacts of the CPP on electricity prices and reliability. However, the mechanism that states employ to achieve the reductions required under the CPP is likely to have a more profound impact on industry sectors outside of the utility sector in the long term than the relatively modest impacts of the CPP itself. The power industry is just the first of many industries that likely will become subject to greenhouse gas (GHG) emissions standards for existing facilities under the CAA. A state's choices for how to implement the CPP for the power industry could constrain its ability to use other mechanisms for other industry sectors.

One of the fundamental choices that states will need to make in determining how to implement the CPP will be whether to regulate existing facilities by creating a standard in the form of an emissions rate expressed as emissions per megawatt hour (MWh) of electricity produced (rate-based approach) or by establishing a standard in the

form of total tons of CO₂ emissions permissible and relying on trading to enable sources to achieve compliance with the emissions cap in a cost-effective manner (mass-based approach).³ Mass-based trading programs have been employed by California and the nine states in the Regional Greenhouse Gas Initiative (RGGI).⁴ If, as is the case with most industries, companies prefer the flexibility that will be provided by emissions trading over a more traditional command-and-control program, it will be critically important to companies outside of the utility sector that their states implement a mass-based system for the utility sector rather than develop a rate-based program.

It will also be important that the state mass-based program distributes a substantial number of allowances by auction rather than potentially concentrating all allowances in the hands of a limited number of companies. The utility industry is responsible for the majority of CO₂ emissions from stationary sources in the United States, and there are significant opportunities for cost-effective emissions reductions from the industry. If a state does not adopt a mass-based system for the utility sector, then the state may significantly limit or entirely foreclose opportunities to develop effective mass-based programs for other industry sectors. Any mass-based program that excludes the utility sector will result in a significantly smaller pool of emissions allowances and a less vibrant market for emissions allowance trading for sources in the program. This could deprive other non-utility industry sources of the benefits of mass-based programs, which include flexibility to reduce emissions in the most cost-effective manner. Selection of

1. For more information on the CPP, including a link to the final rule, visit EPA, *Clean Power Plan for Existing Power Plants*, <http://www2.epa.gov/cleanpowerplan/clean-power-plan-existing-power-plants#CPP-final>.
2. 42 U.S.C. §§7401-7671q, ELR STAT. CAA §§101-618.

3. The issues discussed here will also be applicable to EPA's decision as to whether to impose a rate-based or mass-based federal plan in states that refuse to submit a plan or whose plan is disapproved. Under the proposed federal plan rule, EPA has presented both a rate-based and mass-based federal plan, indicated that it will adopt one version, and requested comment on which version to adopt.

4. The RGGI is a cooperative effort among nine member states to cap and reduce CO₂ emissions from the power sector. The participating states are: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. For more, visit the RGGI website at <http://www.rggi.org/>.

a rate-based approach could limit opportunities to mitigate the impact of GHG emissions regulation on industries that compete in international markets through the award of free mass-based allowances, since the allowance market will be significantly smaller without the participation of the utility industry. Finally, a rate-based system will not provide states with sources of revenues from an auction of allowances that may support other state interests.

II. Regulation Under §111(d)

A. Under §111(d), EPA Determines the Required Emissions Reductions and States Determine How to Achieve Those Reductions

Under CAA §111(d), EPA must prescribe regulations requiring that states submit to EPA a plan establishing standards of performance for any existing stationary source of air pollution “to which a standard of performance under this section would apply if such existing source were a new source” and where emissions of the relevant pollutant from the existing source is not regulated under §108(a) or §112 of the Act.⁵ Section 111(d) and EPA’s regulations implementing that section, first adopted in 1975, require that EPA establish guidelines for states to use in developing those technology-based standards, that states then develop plans containing the standards and mechanisms to enforce them, and that the states submit those plans to EPA for approval or disapproval.⁶ The CAA gives EPA the same authority that it has under §110 to impose a federal plan if a state fails to submit a plan or submits an inadequate plan.⁷

This structure differs from that applicable to new sources regulated under §111(b), pursuant to which EPA will actually promulgate federal standards for new sources, and those standards will be enforceable regardless of state action. By contrast, under §111(d), EPA will publish guidelines that will describe the degree of emissions limitation that can be achieved through “application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated.”⁸ Each state will then establish the actual standards and, in so doing, will determine what type of regulatory structure it will use to achieve equivalent reductions. The state will promulgate these standards as state law and submit those standards as part of its state plan,⁹

and those state standards will become federally enforceable under the CAA if EPA approves the plan.¹⁰ EPA will, however, promulgate the standards where states fail to submit a plan or submit an inadequate plan.

B. Regulation of GHG Emissions From Existing Sources Pursuant to §111(d) Will Likely Be Extended to Other Industries

Eventually, EPA is likely to establish new source standards and existing source guidelines for GHG emissions from virtually all other industries in the United States. Two separate statutory mandates within §111 support this result. First, like many other sections of the CAA, §111 includes a precautionary endangerment trigger for regulations, requiring the EPA Administrator to regulate each category of stationary sources that “in his judgment . . . causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare.”¹¹

Section 202 of the CAA includes a similar endangerment standard and, in *Massachusetts v. EPA*,¹² the U.S. Supreme Court held that, if EPA made such a finding, it would be required to regulate mobile sources under §202. EPA made that endangerment finding with respect to regulation of GHGs and that finding has withstood judicial review.¹³ That finding should apply equally to any stationary source of GHG emissions, which includes virtually

cedure similar to that provided by section 7410 of this title under which each State shall submit to the Administrator a plan” establishing the standard. 42 U.S.C. §7411(d)(1). Section 110 itself requires that each SIP “include enforceable emission limitations and other control measures, means, or techniques (including economic incentives such as fees, marketable permits, and auctions of emissions rights), as well as schedules and timetables for compliance, as may be necessary or appropriate to meet the applicable requirements of this chapter.” 42 U.S.C. §7410(a)(2)(A). Because the “applicable requirements of this chapter” include §111(d), the enforceable emission standards of the state plan referenced in §111(d) should also be a part of the larger SIP. *Id.* This statutory construction provides additional support for the authorization of trading mechanisms under §111(d). If a §111(d) plan is understood to be part of a SIP, the parenthetical expanding the definition of “enforceable emission limitations and other control measures, means, or techniques” to include “economic incentives such as fees, marketable permits, and auctions of emissions rights” is most reasonably read also to relate to the standards established pursuant to §111. Nonetheless, even if a §111(d) plan were entirely distinct from a SIP, EPA has offered other rationales for why trading is an allowable mechanism for a state plan under the CPP.

10. In the CPP, EPA also is allowing a state to submit a “state measures” plan that would include some measures that are not federally enforceable, but such a plan must include a federally enforceable backstop and a mechanism that would trigger implementation of the backstop in the event the plan fails to achieve sufficient reductions.

11. 42 U.S.C. §7411(b)(1)(A).

12. 549 U.S. 497, 37 ELR 20075 (2007).

13. Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66496 (Dec. 15, 2009), *aff’d*, Coalition for Responsible Regulation v. EPA, 684 F.3d 102, 42 ELR 20141 (D.C. Cir. 2012), *aff’d in part and rev’d in part on other grounds sub nom.* Utility Air Regulatory Grp. v. EPA, 134 S. Ct. 2427, 44 ELR 20132 (2014).

5. 42 U.S.C. §7411(d)(1).

6. 40 C.F.R. §§60.20-60.29.

7. See 42 U.S.C. §7411(d)(2).

8. 42 U.S.C. §7411(a)(1) (definition of “standard of performance”).

9. Some have suggested that a §111(d) plan is not also part of a state implementation plan (SIP). However, §111(d) makes specific reference to “a pro-

all major source categories that are regulated under §111. Those categories are listed in 40 C.F.R. Part 60 and include many sources that emit CO₂, including, for example, incinerators; refineries; industrial, commercial, and institutional boilers; steel manufacturing facilities; smelters and other mineral processing facilities; internal combustion engines and other smaller electricity generating units; chemical manufacturing plants; landfills; fertilizer manufacturing plants; and many other categories of industrial operations.

To the extent that EPA must make an endangerment finding for a source category that is already listed, then EPA's endangerment finding in 2009 provides a basis for the finding under §111. Moreover, in the final new source standards for GHG emissions from power plants, EPA concluded that it need not make a new endangerment finding for fossil fuel-fired power plants, which already are listed under §111, in order to establish standards of performance for their GHG emissions. EPA's rationales are likely to withstand judicial review under the deferential standard afforded to agency interpretations of ambiguous provisions of statutes that they administer.¹⁴

Second, §111(b) requires that EPA shall "at least every 8 years, review and, if appropriate, revise" the standards for new sources following the same procedure as applicable to their initial promulgation.¹⁵ EPA's failure to include standards for emissions of GHGs at the time it reviewed and revised the new source performance standards for electric utilities and refineries was the subject of appeals of those standards, which resulted in settlement agreements that ultimately led to the CPP and will still require EPA to develop GHG emission standards for new, modified, reconstructed, and existing refineries.¹⁶

Under the same rationale that led to these settlement agreements and to the CPP, when EPA reviews and revises the new source performance standards for other industrial source categories that emit significant amounts of GHGs, it will now also need to include an emissions standard for GHGs. Because §111(d) requires EPA to promulgate guidelines and states to establish standards for "any existing source for any air pollutant . . . to which a standard of performance under this section would apply if such existing source were a new source," the inclusion of a GHG emission standard for new sources will also require regulation of all existing sources within these categories. Each revision of the standard may trigger a revision of the existing source standards under the same rationale.¹⁷ Even if a different Administration declines to regulate GHG emis-

sions from additional source categories, the various statutory mandates may allow states and environmental groups to bring legal challenges to potentially compel regulation, as they did for power plants and refineries.¹⁸

III. States' Discretion Under the CPP Includes Choosing Between Regulation Based on Mass or Rate of Emissions

A. Goals Set in the CPP

As noted, under the CPP, EPA determines the amount of the reductions that must be achieved and the timing of those reductions, while states are given leeway in deciding the policy mechanism whereby they will achieve those reductions. This same structure will likely govern future rules for existing sources in other industrial sectors.

In the CPP, EPA expresses the goal as an emissions rate: pounds of CO₂ emitted per unit of production measured in MWhs. EPA establishes specific rates for steam-generating units (generally coal units) and stationary combustion turbines (generally combined-cycle natural gas plants), which it derived from determining the "best system of emission reduction" to include reductions that can be achieved by considering the electricity system as a whole, including both "inside-the-fence" unit-level improvements in efficiency and "outside-the-fence" systemwide reductions that can result from switching dispatch from coal-fired units to unused capacity in combined-cycle natural gas facilities and from fossil fuel-fired plants to new or expanded generating facilities that do not emit CO₂. This system-based approach reflects the fact that electricity generation and distribution functions as a system, where units are

tionary Sources: Electric Utility Generating Units (Docket No. EPA-HQ-OAR-2013-0602) 19-21 (Nov. 26, 2014).

18. The settlement agreements requiring EPA to take action with respect to GHG emissions from power plants and refineries, *supra* note 16, arose from appeals from EPA's promulgation of revised new source performance standards challenging the lack of GHG emissions. The appeal of the power plant standards was commenced before *Massachusetts v. EPA* was decided. After that decision, in the case of power plants, at EPA's request, the Court remanded the issue of regulating GHGs to the Agency for reconsideration, 75 Fed. Reg. 82392; additionally, in the case of refineries, EPA granted an administrative petition to reconsider the issue of regulating GHG emissions, 75 Fed. Reg. 82390. Although these actions were not the result of a judicial decision, the endangerment finding and EPA's application of §111 to power plants will provide a strong argument in legal challenges if EPA failed to establish GHG emissions standards for a source category with significant emissions. The endangerment standard, incorporated into the CAA Amendments of 1977, merely requires that the emissions cause or contribute to air pollution that may reasonably be anticipated to endanger health or welfare, not that actual harm be shown to be caused by emissions from the sector considered in isolation. *See, e.g., American Lung Ass'n v. EPA*, 134 F.3d 388, 389, 28 ELR 20481 (D.C. Cir. 1998); *Lead Indus. Ass'n, Inc. v. EPA*, 647 F.2d 1130, 1155, 10 ELR 20643 (D.C. Cir. 1980); *Ethyl Corp. v. EPA*, 541 F.2d 1, 13-17, 6 ELR 20267 (D.C. Cir. 1976), *cert. denied*, 426 U.S. 941 (1976); H.R. REP. NO. 95-294, at 49 (1977) (statement in U.S. House of Representatives Report accompanying 1977 Amendments to the CAA that one of the legislation's purposes is "(t)o emphasize the preventive or precautionary nature of the act, i.e., to assure that regulatory action can effectively prevent harm before it occurs; to emphasize the predominant value of protection of public health").

14. *Chevron U.S.A., Inc. v. Natural Res. Def. Council, Inc.*, 467 U.S. 837, 14 ELR 20507 (1984).

15. 42 U.S.C. §7411(b)(1)(B).

16. *See* Notice of Proposed Settlement Agreement; Request for Public Comment, 75 Fed. Reg. 82390 (Dec. 30, 2010) (refineries); Notice of Proposed Settlement Agreement; Request for Public Comment, 75 Fed. Reg. 82392 (Dec. 30, 2010) (electric generating units). Those agreements did not require EPA to promulgate regulations, but to make decisions regarding whether to regulate, and established a time line for doing so.

17. Some of the commenters on the CPP urged EPA to reconsider and revise the CO₂ emissions rate at least every two years in order to ensure the inclusion of all new and existing facilities. *See* Comments of Calpine Corp. on the Proposed Carbon Pollution Emission Guidelines for Existing Sta-

called upon interchangeably in order to balance supply and demand in real time.

In addition to establishing national emissions performance rates for each of the two categories of fossil fuel-fired power plants defined in the CPP, EPA also used the performance rates to establish for each state its own state-specific rate goal based upon the mix of generation sources within the state. Further, EPA also established two forms of mass-based emissions targets for each state based on the same type of calculations: a mass emissions goal for existing units, and a goal for existing units plus a new unit complement budget.

In achieving the emissions reduction requirement, states are not limited to the mechanisms EPA relied on to develop the goals. Instead, states may employ a variety of emission reduction measures. The most significant choices states face fall into three categories.¹⁹ First, a state must determine whether it will apply a more traditional command-and-control program, where it dictates hours of operation and emissions limits through permits, regulations, and public utility requirements, or a more flexible regime involving trading of pollution rights. Second, assuming the state adopts the more flexible trading program, the state must choose whether it will adopt a mass-based system involving trading of a fixed number of emissions allowances or a rate-based system involving trading emission rate credits. Third, if a state adopts a trading program, it must decide how to allocate the rights to emit that will be traded.

B. Choices Among Command-and-Control, Rate-Based Trading, and Mass-Based Trading

The most fundamental choices that a state will need to make is the form of the standards that it will implement and whether it will allow trading among sources to achieve those standards. A state could employ a complex of command-and-control measures, including run-time restrictions. Industry generally prefers the flexibility afforded by trading mechanisms over this command-and-control approach. In addition, because command-and-control approaches require complex planning decisions and might lead to concerns about reliability impacts, states may be reluctant to adopt them. Some form of trading approach,

therefore, seems more likely for states and more promising for industry.

States pursuing trading options might implement a rate-based trading program or a mass-based trading program. In a rate-based trading program, a state could establish a system that includes trading emission rate credits to enable sources to achieve the performance rate goals EPA set in the CPP for the two categories of sources, or could participate in a single or multistate plan to achieve a single blended rate goal determined for the participating state(s). States can draw little guidance for those approaches from existing programs. Although EPA has provided for a variety of trading programs under the CAA and other environmental statutes, it has never employed an uncapped rate-based trading program involving multiple stationary sources. The first averaging program, known as bubbling, where a cap is placed over units within a source, involved establishing a mass-based cap for the source.²⁰ Although EPA has allowed some forms of uncapped rate averaging, this approach has been limited to Title II requirements for the sale of products, such as automobiles and fuels. These programs are nationally applicable programs, administered by EPA, where manufacturers can average the emissions rate of a fleet of automobiles sold in the United States or the average content of fuel sold.

No trading program established to date has involved rate averaging over a universe of regulated and unregulated stationary sources.²¹ Moreover, the CPP makes it clear that trading may not occur between states employing mass-based trading programs and those employing rate-based programs, so that adoption of a rate-based trading approach would preclude trading involving sources in California and the nine RGGI states, which have already designed and are implementing mass-based approaches to regulate GHGs and are likely to rely on those approaches to develop their state plans to comply with the CPP.²²

On the other hand, states could adopt a mass-based program, where the mass-based allowances are allocated to the regulated community to trade.²³ These types of

19. Although these three categories represent the most basic choices that a state must make, programs that states have adopted to date typically implement a variety of measures complementary to the basic measures. For example, both the California and RGGI programs include a renewable portfolio standard requiring that utilities within the state establishing the standard deliver a percentage of their electricity from renewable sources as well as requirements for implementing energy efficiency. Nonetheless, in the California and RGGI programs, these measures do not affect the regulatory cap on GHG emissions; instead, they reduce demand for allowances and, in turn, lower allowance prices. See EDMUND G. BROWN JR. ET AL., FIRST UPDATE TO THE CLIMATE CHANGE SCOPING PLAN, BUILDING ON THE FRAMEWORK 4 (2014), available at http://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf; RGGI MEMORANDUM OF UNDERSTANDING §7 (Complementary Energy Policies), available at http://www.rggi.org/docs/mou_final_12_20_05.pdf.

20. See *Chevron U.S.A., Inc. v. Natural Res. Def. Council, Inc.*, 467 U.S. 837, 14 ELR 20507 (1984) (affirming EPA's interpretation of "source" to allow a bubble).

21. See U.S. EPA, *The United States Experience With Economic Incentives for Protecting the Environment*, in U.S. EPA, TRADING PROGRAMS ch. 6 (2001) (discussing EPA trading programs).

22. The CPP generally gives states the choice of participating in trading through a mass-based or rate-based approach. See 40 C.F.R. §60.5750. The rule establishes two different trading currencies for the two programs—allowances for mass-based programs and emissions rate credits for rate-based programs—and specifies that mass-based programs "must" follow one set of requirements and rate-based programs "must" follow a second. *Id.* §60.5790.

23. The CPP gives states the choice of adopting mass-based programs for existing facilities only or for new and existing facilities, setting different budgets for each to accommodate load growth for the budgets including new facilities. However, if new facilities are not included in the mass-based budget, the requirements of the rule could be undermined by the phenomenon of "leakage," whereby new facilities could be built and their electricity could be sold into other states, allowing those states to meet their budgets even while the new generation facilities may displace resources that generate fewer emissions. The rule therefore requires states adopting mass-based plans to address this potential concern in their plans, whether by including new units in the plan and meeting the mass-based budget that includes new

cap-and-trade programs have been successfully implemented for a wide variety of pollutants, including GHGs. Systems involving issuance of mass emissions allowances for the emission of a ton of GHGs, or “tradable permits,” and auctions of those allowances have already been implemented by California and the nine states in the RGGI. Title IV of the CAA established a mass-based system to address acid rain, where allowances reflecting the emission of a ton of sulfur dioxide were distributed, auctioned, and traded, and the regulated entities were required to surrender allowances equal to their tons of annual emissions. Mass-based trading programs have been employed as emissions control measures to implement the good neighbor provisions of the CAA.²⁴ Sections 110 and 111 of the CAA provide support for a mass-based trading system.²⁵

C. Choices in How to Allocate Emissions Rights

Assuming that states elect to adopt an implementation system involving trading, they will also need to decide how to distribute emission trading rights. With a rate-based program, the credit is inherently linked to the activity producing the emission rate responsible for the emission reduction—the electricity generation source, the emission source, or the energy efficiency source. In a mass-based system, the state may assign allowances to particular emissions sources at no charge; it may assign the allowances to particular emissions sources at a fixed charge; it may allocate allowances for free to promote purposes such as consumer price mitigation, alternative energy, energy efficiency, or some other purpose; it may auction allowances; or it may adopt some combination of these mechanisms.

Both the RGGI states, which regulate utility CO₂ emissions with a mass-based system, and California, which is implementing a mass-based economywide CO₂ emissions regulatory program, utilize a combination of these allocation mechanisms. Both programs distribute the majority of emissions allowances by way of an auction with a reserve price, allocate some portion of allowances or auction revenues for consumer relief or strategic energy purposes, and may allocate some allowances directly to a regulated entity to mitigate potential adverse impacts. For example, free allowances might be allocated to an independent power producer that has recently invested in pollution control equipment in order to provide that company with a return on that capital investment that might otherwise be lost. Free allowances might also be awarded to industries

where the cost of allowances would detrimentally affect the industry’s ability to compete in international trade.²⁶

IV. Why State Choices for the Utility Sector Are Important for Other Industries

Although a command-and-control standard regulating industry practices may be more appropriate for some industries,²⁷ most industries prefer an approach that limits the tons of emissions and allows sources to trade to achieve reductions at the lowest cost with the maximum flexibility. Thus, most states and most industries will likely seek to implement the CPP and §111(d) programs for other industries with a program authorizing trading.

Implementation of an untested rate trading program will pose challenges for state regulators attempting to design, and utility companies attempting to comply with, such an unusual program. However, the adoption of a rate-based program is also likely to have a significant and adverse impact on other industries whose stationary source GHG emissions will be regulated in the future. This is because a mass-based program can readily be expanded to incorporate a wide variety of industries using the common currency of a ton of CO₂, while emissions rates are not as readily fungible.²⁸ A state’s failure to adopt a mass-based program with a substantial auction component for the utility sector, which is responsible for the majority of CO₂ emissions from stationary sources, will significantly constrain its ability to implement a mass-based program for other industry sectors, will result in a substantially

units, or through another mechanism. See 40 C.F.R. §60.5790(b)(5). As a practical matter, in most cases, adopting a plan with a mass-based target that does not include new facilities will only increase the administrative burden on states.

24. See *EPA v. EME Homer City Generation, L.P.*, 134 S. Ct. 1584, 44 ELR 20094 (2014) (affirming EPA’s use of cost to determine reduction requirements in federal implementation plan establishing a mass-based cap-and-trade program to implement the good neighbor provisions of §110 of the CAA).

25. See *supra* note 9.

26. See California Air Res. Bd., *Allowance Allocation*, <http://www.arb.ca.gov/cc/capandtrade/allowanceallocation/allowanceallocation.htm> (last revised May 22, 2015); RGGI Model Rule, Subpart XX-5 (CO₂ Allowance Allocations), available at https://www.rggi.org/docs/ProgramReview/_FinalProgramReview/Materials/Model_Rule_FINAL.pdf.

27. For example, EPA has proposed new source performance standards regulating methane emissions from new oil and gas production units. Oil and Natural Gas Sector: Emission Standards for New and Modified Sources, 80 Fed. Reg. 56593 (Sept. 18, 2015). The Agency has proposed that these standards take the form of work practice and operational standards. Current studies suggest that most production wells capture methane, which is a valuable product, while a few, outlier “super-emitters” are responsible for most emissions. Thus, because the economic incentive to conserve product is not adequately motivating these super-emitters, work practice and design standards based on the better performing facilities are likely a more appropriate approach for regulating this sector and one that will likely be favored by the majority of the industry that is employing these measures to capture methane for sale as product.

28. EPA acknowledged the probable lack of fungibility of rate-based programs among different industry sectors in its Advance Notice of Proposed Rulemaking on Regulating Greenhouse Gas Emissions Under the Clean Air Act, 73 Fed. Reg. 44354, 44515-16 (July 30, 2008) (“Rate-based trading programs are most easily applied in a specific sector where facilities have similar emissions characteristics.”). EPA further noted that rate-based programs may not even apply well to industries with multiple products or multiple inputs:

Measuring outputs to determine the regulatory intensity may present some difficulty. In particular, determining the intensity for facilities that generate multiple products would be challenging. Sectors that use multiple inputs (e.g., different fuels) might require use of a common metric (e.g., Btu combusted) to support a rate-based approach based on inputs.

Id. at 44516.

smaller and less liquid market if it does adopt a mass-based program for other industries, and will constrain the state's ability to provide meaningful relief for industries facing international competition.

A rate-based program will not create emissions rights that could be easily traded with other industrial categories. EPA has expressed the emissions targets in the CPP in terms of pounds of CO₂ per MWh. Under this approach, standards for iron and steel, cement manufacturing, fertilizer production, refineries, and chemical manufacturing are all likely to be expressed in terms of pounds of CO₂ per unit of production of the relevant product. Pounds of CO₂ per ton of steel, for example, are likely not fungible with pounds of CO₂ per MWh. However, if the rate for each facility is converted to a common currency of pounds or tons of CO₂, as in a mass-based approach and as has been done for other trading programs involving different types of stationary sources, trading can readily occur.

If states do not adopt a mass-based program for electricity generating units, the size of the potential allowance market will be at least two-thirds smaller than it would otherwise be. In 2013, power plants reported emitting 2.1 billion metric tons of carbon dioxide equivalent (CO₂e) out of the 3.18 billion metric tons CO₂e emitted by all large stationary sources that are subject to the EPA reporting requirements.²⁹ Thus, power plants represented two-thirds of the emissions of large stationary sources that may eventually be regulated under §111(d).³⁰ The two next largest sectors were the petroleum and natural gas systems sector with 224 million metric tons (MMT) CO₂e or 7% of the total, and the petroleum refinery sector with 177 MMT CO₂e or 5.6% of the total.³¹ With such a dramatically smaller market, allowance prices will likely be higher and the opportunities for market manipulation will be commensurately greater.

There are also far fewer facilities in some critical industry sectors that will likely be covered by regulations. There were 1,572 utility facilities reporting GHG emissions in 2013. By contrast, there were only 296 metal facilities, 376 minerals facilities, and 233 pulp and paper facilities that were required to report GHG emissions in 2013.³² Even these numbers may overstate the number of facilities that may be covered by a future emissions standard, since these broader classifications frequently cover a number of different industrial categories regulated under the existing new source performance standards in 40 C.F.R. Part 60. If a state does not adopt a standard that will allow trading across industry sectors and among states, in many states, there will be exceedingly few and perhaps no potential trading partners for companies falling into these categories.

Moreover, there are many opportunities for cost-effective emissions reduction within the utility industry that exist today or will become available in the near future that EPA did not consider in its determination of the best system of emission reduction for the utility industry. If a mass-based program is established for the utility industry, there will be a greater incentive for the development of these technologies, whose implementation could reduce allowance prices for other industries below the cost of emissions reductions that EPA determines represent the best system of emission reduction for those industries, when considered in isolation.

There are also a number of technological innovations that will provide additional cost-effective means to reduce emissions from the power sector by 2030. These include new nuclear facilities and improved technologies that will increase the output of existing nuclear facilities, improved technologies for hydroelectric power, carbon capture and sequestration technologies at existing coal-fired power plants and natural gas-fired plants, improvements in both distributed and utility-scale solar generation, improved storage technologies, and the implementation of smart grids, demand-response aggregation, and improved techniques for distributed generation or energy efficiency that will reduce demand, increase the dispatch of local generation sources, and reduce transmission losses.³³

A mass-based system also provides greater opportunities for implementing measures to provide relief that can assist non-utility interests. The RGGI states auction the balance of their revenues and devote those revenues to a variety of purposes, including consumer rate relief, and provide funds for energy efficiency or alternative energy programs. Revenues might even be used to help balance budgets. This approach has resulted in increased jobs and net economic value, while still reducing emissions substantially.³⁴ Prospective modeling conducted by the RGGI showed that a lower cap would produce higher economic growth in terms of gross state product than would a higher cap.³⁵ More significantly, a mass-based approach where the majority of allowances attributable to the utility sector are auctioned will allow a state to mitigate the impact of GHG emission regulation on industries that compete internationally

29. U.S. EPA, *Greenhouse Gas Reporting Program 2013: Reported Data*, <http://www.epa.gov/ghgreporting/ghgdata/reported/index.html> (last visited Aug. 7, 2015).

30. See *id.* EPA might also regulate GHG emissions from smaller sources in the future under §111 by adding additional categories that encompass those sources.

31. *Id.*

32. *Id.*

33. See Comments of Exelon Corp. on U.S. Environmental Protection Agency's Proposed Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 79 Fed. Reg. 34830 (June 18, 2014) 64-68 (submitted Dec. 1, 2014).

34. See PAUL J. HIBBARD ET AL., *THE ECONOMIC IMPACTS OF THE REGIONAL GREENHOUSE GAS INITIATIVE ON TEN NORTHEAST AND MID-ATLANTIC STATES* (2011), available at www.analysisgroup.com/uploadedfiles/content/insights/publishing/economic_impact_rggi_report.pdf.

35. Compare REMI ECONOMIC ANALYSIS OF RGGI IPM POTENTIAL SCENARIOS (Nov. 28, 2012), at 25, available at http://www.rggi.org/docs/ProgramReview/November28/12_11_28_REMI_Presentation.pdf (showing an increase in gross state product of \$977 million with a 106 million ton cap, and \$4,976 million with a 97 million ton cap), with NESCAUM, REMI ECONOMIC IMPACT ANALYSIS ASSUMPTIONS AND RESULTS: 91 CAP BANK MODEL RULE CASE (2013), at 22, available at http://www.rggi.org/docs/ProgramReview/REMI%2091%20Cap%20Bank%20MR_2013_06_03.pdf, (showing an increase in gross state product of \$8.7 billion with a 3% discount rate at the 91 million ton cap that was adopted).

by providing those industries with free allowances that will have market value.³⁶

By contrast, in a rate-based program, there is no product that can be auctioned or differentially allocated. Parties with low emissions rates may trade with those of high emissions rates, but this produces nothing of value that might offset consumer impacts, lower other taxes, or be provided to industries stressed by international competition.

These economic results also belie any suggestion that a rate-based approach is required to allow either load growth or economic growth. Although often touted as a benefit of a rate-based approach, there is no theoretical or empirical basis for the conclusion that either load growth or economic growth necessarily requires growth in GHG emissions. As noted above, there are many opportunities to increase effective generation or the efficiency of use of electricity without investing additional capital in fossil-fired generation facilities. In fact, a program that commits long-term capital to those resources will increase the cost and burden of achieving necessary reductions for other industries.

Finally, if a state were to adopt a rate-based standard for the utility sector and then subsequently develop a mass-based standard allowing trading for other sectors, the state would have to address the phenomenon referred to as “leakage.” In this case, leakage would mean the transfer of emissions from one industry to another, such that there is no actual reduction in total emissions. For example, consider a scenario in which emissions from the power sector are not constrained by a cap, but non-utility industries are subject to a cap-and-trade system. In that case, a non-utility stationary source might be able to meet its reduction obligations by electrifying, emitting no carbon directly on its own. Instead, to provide the electricity for the non-utility source, a power plant must run. If that electric power came from a fossil fuel-fired power plant, then the carbon emissions will simply have been transferred from one sector

to another—yet the power plant may still be able to demonstrate compliance by averaging its additional production and emissions into the rate-trading program. Thus, the full measures of reductions required for the non-utility industry might not be achieved because of increased emissions from an uncapped electricity sector. The threat of this result raises questions as to whether a state could acceptably design mass-based programs for non-utility sources if its initial choice is to develop a rate-based program for the utility sector.

V. Conclusion

Although litigation over the CPP may stall and delay regulation of GHGs from stationary sources, given EPA’s endangerment finding, all significant industrial sectors are likely to face regulation eventually. Under the CAA, state decisions will factor prominently in how that regulation is structured and implemented. Mechanisms that allow trading with vibrant commodity markets will ultimately provide industry with the greatest flexibility to implement reductions at the lowest cost.

Because the electric power sector represents two-thirds of industrial emissions and will be the first sector to be regulated, industries in other sectors have a substantial interest in ensuring that the regulatory structure will provide for a market that will allow interstate, inter-industry, and perhaps international trading. Only a mechanism involving trading of allowances for pollutant emissions will enable the creation of this type of program. An allocation mechanism that provides for an auction with reinvestment of the proceeds but allows the award of free allowances to industries stressed by international competition will also provide a program that will spur economic growth while not unduly burdening industry.

36. The economywide California program provides free allowances to some industries. *See supra* note 26.