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What's Ahead for Power Plants and Industry? Using the Clean Air Act to Reduce Greenhouse Gas Emissions, Building on Existing Regional Programs

Franz T. Litz
World Resources Institute

Nicholas Bianco
World Resources Institute

Michael B. Gerrard
Columbia Law School, michael.gerrard@law.columbia.edu

Gregory E. Wannier
Columbia Law School, Sabin Center for Climate Change Law

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COLUMBIA LAW SCHOOL
CENTER FOR CLIMATE CHANGE LAW

WORLD RESOURCES INSTITUTE

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EXECUTIVE SUMMARY

In the absence of congressional action on climate change, all eyes are on the states and the United States Environmental Protection Agency (EPA) to see how they will regulate greenhouse gas emissions from existing large power plants and industrial facilities. Indeed, power plants and industrial facilities are the sources of half of all U.S. greenhouse gas emissions, making those plants and facilities central to any effort to reduce the country's total emissions.[1] This working paper explores a promising pathway for the states and EPA to make these reductions using the standards of performance under section 111 of the Clean Air Act.

EPA has announced that it will begin the process for regulating power plants and refineries under section 111.[2] EPA has scheduled listening sessions with stakeholders and intends to issue draft performance standards for new and modified power plants by July 26, 2011, and at the same time issue to the states a draft mandatory guideline that requires states to develop plans to impose performance standards on existing power plants. The final performance standards and mandatory guidelines are expected in May 2012. The process for refineries will lag behind that for the electricity sector by about

1. Franz Litz is a Senior Fellow at the World Resources Institute; Nicholas Bianco is a Senior Associate at the World Resources Institute; Michael Gerrard is the Andrew Sabin Professor of Professional Practice and Director of the Center for Climate Change Law at the Columbia University Law School; and Greg Wannier is the Deputy Director and Research Fellow at the Center for Climate Change Law.

   In the proceedings of the United Nations Framework Convention on Climate Change, the Obama administration has committed the United States to a 17 percent reduction below 2005 levels by 2020. It is unlikely that the country can meet this commitment without significant reductions from the power and industry sectors.

2. See http://www.epa.gov/airquality/pdfs/settlementfactsheet.pdf.

six months, with draft rules to be issued in December 2011 and final rules expected in November 2012.

Like many other requirements of the Clean Air Act (the Act), the standards of performance under section 111 are designed and implemented through a federal-state partnership. EPA lists the categories of sources and establishes performance standards for new and modified emitters within listed categories. EPA also establishes a mandatory "guideline" for states, creating a federal "floor" for regulation of existing sources that applies only if the states fail to set their own standards of performance that meet or exceed this floor.[3] This guideline includes possible "system[s] of emission reduction" that the states may use to set standards of performance. In promulgating these plans, the states will have considerable flexibility, since the standards of performance under section 111(d) may take the form of traditional emissions rate limitations or any number of other more flexible mechanisms. The emergence of state cap-and-trade programs raises the question of whether these cap-and-trade programs could be used to meet a state's obligations under section 111(d) of the Act.

The traditional approach to regulating power plant and industrial facilities is through performance standards that prescribe specific emissions limitations on individual sources. This approach has been used for years to control conventional pollutant emissions, and is the safest approach from a legal defensibility standpoint. Because many states have already begun regulating some existing sources using cap and trade, the traditional approach may not be the one preferred by the states or their stakeholders. Indeed, states that have already chosen to reduce emissions from power plants and industry using flexible, market-based approaches, can be expected to develop plans calling for alternatives to the traditional source-specific performance standards. EPA under George W. Bush concluded that the Clean Air Act allows cap and trade as a demonstrated and effective form of regulation under Section 111(d), and the Obama EPA has not contested this interpretation. Until federal courts rule on this approach, however, there will be some uncertainty about its viability.

The assumption that the states and many of their stakeholders will propose cap and trade under section 111(d) of the Clean Air Act has led to a number of questions around program design features, such as whether the Act allows offsets, or trading across listed categories of sources and whether the existing regional cap-and-trade program designs would be acceptable to EPA under section 111(d). Even though many of these issues are questions of first impression and therefore cannot be answered with absolute certainty, this paper explores the arguments for and against specific cap-and-trade design features in the context of section 111, including the implications for existing and planned regional cap-and-trade programs.

Box 1 | **Findings**

This working paper examines the process for establishing performance standards covering existing power plants and industrial facilities in the United States and finds

1. Congress granted the EPA and the states considerable flexibility in determining how to cover existing power plants and industrial facilities under section 111 of the Clean Air Act.
2. After lengthy collaboration with stakeholders, twenty-three states designed and many implemented flexible, market-based emissions-trading mechanisms to reduce greenhouse gas emissions from existing power plants and industrial facilities.
3. The discretion afforded to states under the Clean Air Act should permit them to propose a variety of policy mechanisms, including cap and trade.
4. The regional cap-and-trade designs present specific opportunities and challenges when reconciling the designs with section 111 of the act, including the following:
   A. Offsets cannot be used to meet federal minimum reductions but may be allowed above and beyond federal minimums.
   B. Trading between regulated categories of sources depends on the EPA's interpretation of the act.
   C. Borrowing and safety valve mechanisms are problematic unless they can be designed to ensure minimum reductions within federal time frames.

3. In specific cases, there are some exceptions to this "federal floor," in which the states may treat existing sources more leniently based on the facts, which we briefly discuss later.

I. INTRODUCTION

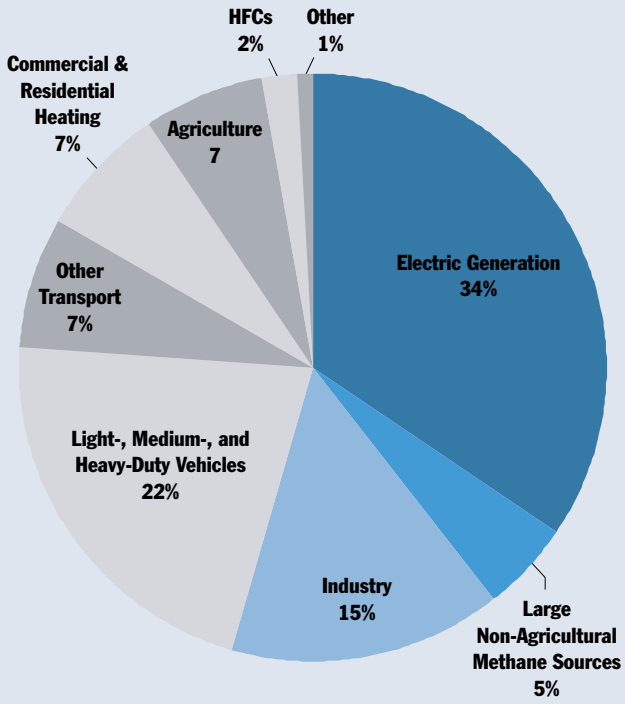
With action stalled in the U.S. Congress on climate change legislation, the Obama Administration must look to its existing legal and regulatory authorities to reduce greenhouse gas emissions.[4] A key authority is found in section 111 of the Clean Air Act, which provides for the establishment of source categories and performance standards for new pollution sources within those categories.[5]

Section 111(d) will be an important component of any EPA-led effort to reduce greenhouse gas emissions because it offers one of the few mechanisms for regulating large existing sources, such as existing power plants and industrial sources.[6] Indeed, power plants, industry, and other source categories covered by section 111 regulation—such as large non-agricultural methane sources—make up as much as 54 percent of the U.S. emissions inventory.[7] Although section 111(d) has been implemented through traditional performance standards that impose an emissions rate limitation on pollution sources, it is likely that section 111 also would permit other less-traditional regulatory approaches.

A number of U.S. states have chosen market-based approaches to reduce emissions from power plants and industrial pollution sources. Their choice was based on the belief that such approaches yield greater emissions reductions at a lower cost than do traditional performance standards, which require all plants to implement the same emissions limitation. Market-based mechanisms the view goes, provide regulated entities an incentive to seek out and pursue the lowest cost reduction opportunities.

EPA and the states have had little experience applying section 111(d) because it pertains only to pollutants that are neither criteria pollutants subject to National Ambient Air Quality Standards (NAAQS) nor hazardous air pollutants under the National Emissions Standards for Hazardous Air

Figure 1 | **Sources Amenable to Regulation Under Section 111 of the Clean Air Act**



Performance standards could cover up to 54 percent of U.S. greenhouse gas emissions. The pie chart above depicts all U.S. greenhouse gas emissions in 2008. Those sources amenable to regulation under section 111 are colored blue. They include: power plants, industry, and large non-agricultural methane sources. Large non-agricultural methane sources include: landfills, coal mines, natural gas and petroleum systems, and wastewater treatment facilities.

Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2008, 430-R-10-006, U.S. Environmental Protection Agency, Office of Atmospheric Programs, 15 Apr. 2010.

4. At the 2009 Conference of the Parties to the United Nations Framework Convention on Climate Change in Copenhagen, President Barack Obama committed the United States to a 17 percent reduction of greenhouse gas emissions from 2005 levels by 2020. The Obama administration is a party to the December 2010 Cancun Agreements, which once again took note of the Copenhagen reduction pledges. See http://unfccc.int/files/meetings/cop_16/application/pdf/cop16_lca.pdf.
5. Appendix A contains the full statutory text of section 111 of the Clean Air Act.
6. Nicholas Bianco and Franz Litz, Reducing Greenhouse Gas Emissions in the United States Using Existing Federal Authorities and State Action, World Resources Institute, 2010; available at http://www.wri.org/federalclimateaction; Nathan Richardson, Art Fraas and Dallas Burtraw, Greenhouse Gas Regulation under the Clean Air Act, Structure, effects and Implications of a Knowable Pathway, Resources for the Future (April 2010); Franz T. Litz and Nicholas M. Bianco, What to Expect from EPA: Regulation of Greenhouse Gas Emissions under the Clean Air Act, *Environmental Law Reporter* 40 (May 2010):ELR 10480. Also see the discussion in section II.C.2.
7. Bianco and Litz, Reducing Greenhouse Gas Emissions.

Box 2 | Distinguishing Section 111 Performance Standards from the Tailoring Rule and Preconstruction Permitting

It is important to distinguish the regulation of new, modified, and existing sources through the "standards of performance" under section 111 of the Clean Air Act—the subject of this paper—from the preconstruction-permitting program under the Act's Prevention of Significant Deterioration (PSD) provisions. PSD calls for the installation of Best Available Control Technology (BACT) in new and modified plants and does not apply to existing facilities. The EPA's "tailoring rule" and BACT guidance document detail how the PSD/BACT preconstruction-permitting program will be implemented. New source performance standards under section 111 of the Act will serve as the "floor" for BACT determinations.

Pollutants (NESHAP) program.[8] To date, EPA and the states have regulated existing landfills, municipal waste combustors, sulfuric acid, phosphate fertilizer and pulp and paper production facilities, petroleum refiners, and hospital/medical/infectious waste incinerators under section 111(d) for a variety of pollutants, but not for their greenhouse gas emissions.[9] In addition, EPA's proposed Clean Air Mercury Rule (CAMR) sought to use section 111(d) to implement cap and trade at the state level. Even though CAMR was vacated by the District of Columbia Circuit Court of Appeals for reasons not related to whether cap and trade is permitted under section 111,[10] the discussion of CAMR's design will be useful in considering whether the designs of existing state programs will be consistent with impending federal requirements.

8. EPA defined six criteria air pollutants under section 108(a) of the Clean Air Act: particulate matter, ground-level ozone, carbon monoxides, sulfur oxides, nitrogen oxides, and lead. When the Clean Air Act was amended in 1990, Congress listed 188 toxic air pollutants in section 112(b)(1) of the act. Because greenhouse gases (GHGs) have not been designated as criteria pollutants under section 108, nor listed as hazardous air pollutants under section 112, they qualify for regulation under section 111(d).

9. See 40 CFR Part 60, Subparts CB (municipal combustors guideline); CC (municipal landfills guideline); CD (sulfuric acid production guideline); and CE (medical waste incinerators).

10. New Jersey v. EPA, 517 F.3d 574 (D.C. Cir. 2008).

Although the experience with CAMR is helpful to understanding how a state might implement cap and trade to reduce emissions under section 111(d), a number of questions remain. CAMR involved a relatively simple cap-and-trade system covering one discrete category of sources. A review of the cap-and-trade program designs reflected in three regional initiatives in North America reveals greater complexity, particularly with respect to offset provisions, intersectoral and international trading, and safety valve mechanisms.

This working paper examines the feasibility of accommodating regional cap-and-trade programs in the implementation of section 111 for power plants and industrial facilities. Part II of the paper examines section 111 of the Act, explains the respective roles of EPA and the states, and discusses whether cap and trade is permissible under that section of the Act. Part III provides an overview of existing regional cap-and-trade programs. Part IV addresses the challenges posed by section 111(d) when attempting to reconcile it with the existing and potential regional program designs. Part V looks at the possible scenario in which EPA fails to proceed to regulate emissions under section 111 for specific categories of sources and addresses possible responses by states seeking to push for additional action. Finally, part VI concludes by describing a possible path forward for EPA and the states under section 111 and the future of state-level cap-and-trade programs in this context.

II. COVERING NEW AND EXISTING SOURCES UNDER SECTION 111 OF THE CLEAN AIR ACT

Section 111 of the Act gives EPA and the states certain legal authorities and potential responsibilities to regulate sources of harmful emissions, such as power plants, industrial facilities, and other large stationary sources of greenhouse gas emissions. This part of the paper explores section 111 generally to show how EPA lists emissions source categories and establishes and implements standards for listed categories, as well as the potential roles states play in the listing of categories and the implementation of these standards. In

addition, this section examines the potential for state-level cap-and-trade programs under section 111(d).

A. Summary of Section 111

Through section 111 of the Act, Congress granted EPA the authority to regulate new and modified emissions sources and to require that the states regulate existing sources in the same categories for certain pollutants. The steps for establishing standards of performance and regulating new and modified stationary sources are discussed below in this section.

1. EPA Administrator Determines Source Categories Covered

The first step in regulating stationary sources of greenhouse gas emissions is for EPA to establish source categories. Section 111(b) requires the EPA Administrator (the Administrator) to create and periodically update a list of emissions source categories that "in [the Administrator's] judgment… causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare."[11] Because the statute specifically allows the Administrator to distinguish among "classes, types, and sizes within categories of new sources" when establishing standards,[12] the Act would seem to allow fairly general source categories with any number of subcategories.[13]

Box 3 | **Excerpt of Section 111(b)**

§111(b)(1)(A). The Administrator shall, within 90 days after December 31, 1970, publish (and from time to time thereafter shall revise) a list of categories of stationary sources. He shall include a category of sources in such list if in his judgment it causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare.

(B)Within one year after the inclusion of a category of stationary sources in a list under subparagraph (A), the Administrator shall publish proposed regulations, establishing Federal standards of performance for new sources within such category.

Most emissions sources that emit greenhouse gases are already represented in the long list of source categories EPA has designated, including power plants and many industrial sectors.[14] Some greenhouse gas emitters, such as coal mines and natural gas distribution facilities, are not currently regulated under section 111, however, but section 111(g) allows any governor to apply to EPA for the designation of additional categories of sources. Upon a sufficient showing, the EPA Administrator must list the new category and establish performance standards. Thus the states can request that additional categories be listed, but they cannot define categories on their own. This distinction is important to discussing the possible scope of a state-level cap-and-trade program under section 111(d).[15]

Part 60 of Title 40 of the Code of Federal Regulations contains numerous subparts, each containing the standards of performance for listed categories of emissions sources. An example is subpart D, the Standards of Performance for

11. 42 U.S.C. section 4211(b). See text in box. Note that the endangerment finding under section 111(b) hinges on EPA's making a determination that the category is a "significant" contributor to air pollution. This requirement vests more discretion in the Administrator than do the requirements under Title II of the Clean Air Act, which do not have the "significant" qualifier. The Supreme Court's decision in *Massachusetts v. EPA* concerned the Title II endangerment finding.

12. 42 U.S.C. section 4211(b)(2).

13. This is an important consideration for establishing a cap-and-trade program under section 111(d) for existing sources. EPA establishes the category, and there is some doubt about permitting trading of allowances across categories.

14. Some significant sources of emissions that have not yet been designated as categories under section 111 include coal mines and natural gas distribution systems.

15. Because EPA can revise the list of categories and has broad discretion in what types of sources are combined within categories, it theoretically could combine existing categories of sources into larger categories. But based on the recent announcement that EPA will set performance standards for greenhouse gas emissions from power plants and refineries, this seems unlikely.

Fossil Fuel–Fired Steam Generators for which Construction is Commenced after August 17, 1971.

2. EPA Sets Standards of Performance for New and Modified Sources

In section 111(b)(1)(B), Congress gave EPA one year after listing a source category to propose regulations to create standards of performance for that category. A standard of performance is an emissions limitation that is "achievable through the 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." This definition has at least three key points. First, the standard is an emissions standard that must reflect the application of the "best system of emission reduction." Second, cost must be considered, along with health and environmental and energy impacts. Third, either the "system of emission reduction" must have been adequately demonstrated in practice, or EPA must have a reasonable basis for assuming that it will be adequately demonstrated within the established time frame for compliance.[16]

3. State Delegation for New and Modified Sources

While states have little role in issuing performance standards for new and modified sources, they can receive delegation to implement and enforce the standards promulgated by EPA. Under section 111(c), a state may submit a procedure for implementing the new source performance standards program, and if EPA determines that the procedure is adequate, then the Administrator must delegate the program's implementation to the state. Some states seek and receive delegation to control the implementation of the federal requirements within their borders. The federal government retains concurrent authority to enforce the standards even in delegated states.

Box 4 | **Excerpt of Section 111(a)**

§111(a)(1) provides: The term "standard of performance" means a standard for emissions of air pollutants which reflects the degree of emission limitation achievable through the 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.

B. Section 111(d) Performance Standards for Existing Sources

Although most of the regulatory activity under section 111 has consisted of standards for new and modified sources,[17] a wide range of existing source categories of greenhouse gas emissions may be regulated under section 111(d) of the Act. Section 111(d) has been used less often because it applies only to pollutants, like greenhouse gases, that are neither criteria pollutants nor hazardous air pollutants.[18] According to section 111(d), the states must regulate the existing sources under federal oversight.[19] If a state fails to submit and implement an adequate plan to regulate existing sources, then EPA must impose a federal plan on that state.[20]

Congress referred to the State Implementation Plan (SIP) process in section 111(d) when it called for the states to

16. An example of a standard of performance can be found at 40 CFR Subpart D—the standards of performance applicable to new fossil fuel–fired steam generators—applies to steam generators with a heat input greater than 250 million British thermal units (MMBTUs). The generator must meet an emissions rate for particulate matter, sulfur dioxide, and nitrogen oxides. For particulate matter, the source must not emit more than 0.10 pounds per MMBTUs of heat input. For sulfur dioxide, the standard is 0.81 pounds per MMBtu for non-coal-fired units and 1.20 pounds per MMBtu for coal units. For nitrogen oxides, the standard varies from 0.20 pounds per MMBtu for gas-fired units to 0.80 pounds per MMBtu for units firing certain types of coal. Thus, the standards were set to differentiate among different types of fossil fuel–fired steam generators.

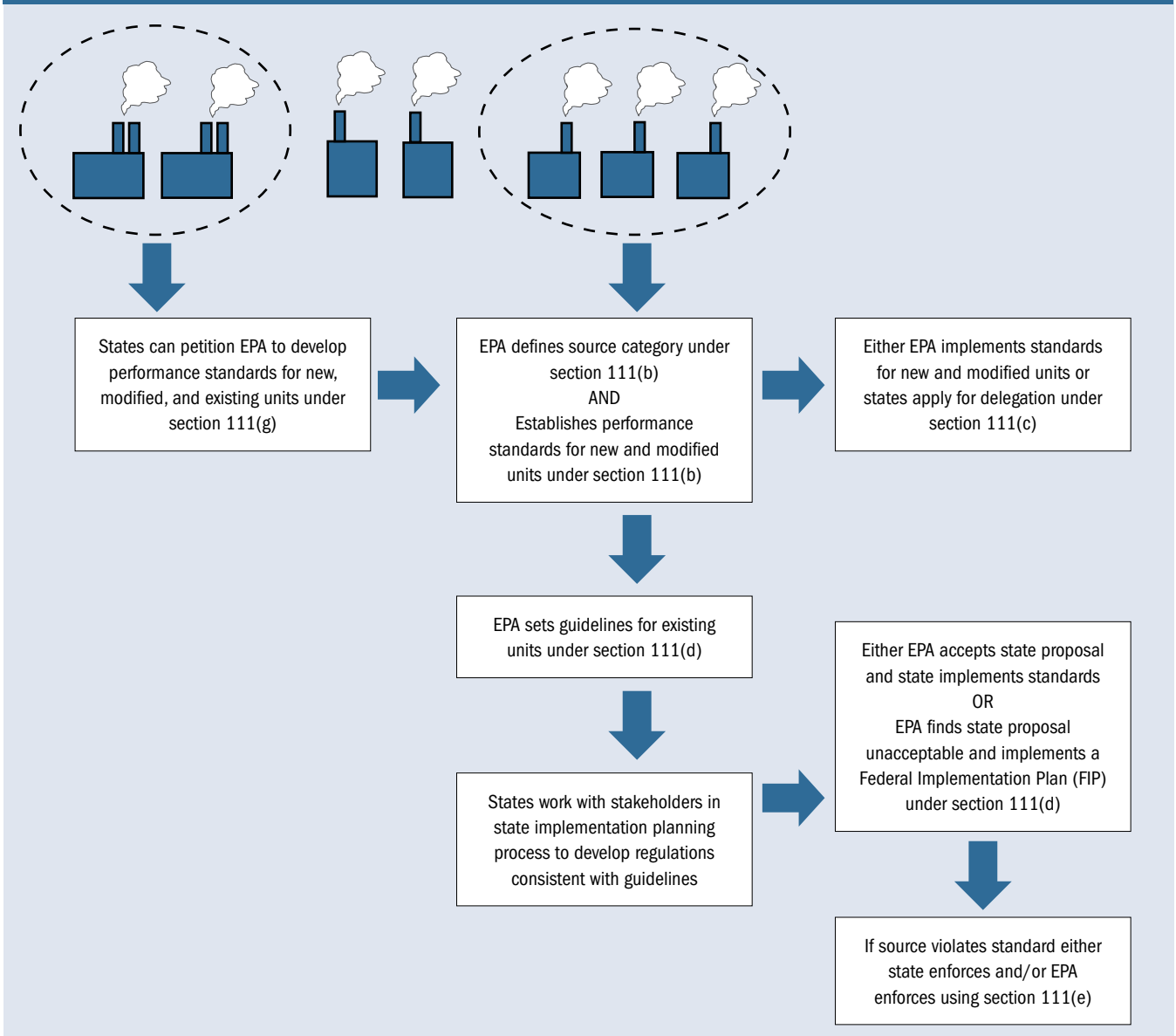
17. See 40 CFR Part 60, Subparts D through KKKK.

18. Criteria pollutants are those for which EPA issues National Ambient Air Quality Standards and designates attainment and nonattainment areas. The states must then develop implementation plans that include measures to prevent the deterioration of air quality in attainment areas or to improve air quality to bring nonattainment areas into attainment. Hazardous air pollutants are those listed under section 112 of the act.

19. 42 U.S.C. section 4211(d)(2).

20. Ibid.

Figure 2 | **Regulatory Pathway for Section 111**



draw up plans to cover existing sources of emissions. The SIP process grants the states a great deal of discretion in deciding how to regulate emissions sources within their territories, which may include the use of market-based mechanisms. Thus, it may be inferred that Congress intended to give the states a great deal of flexibility in carrying out the dictates of section 111(d).

As required by section 111(d)(1) of the Act, EPA has issued regulations that prescribe the procedure for submitting and approving the states' plans for regulating existing sources under section 111(d).[21] The process begins with EPA's issuing emissions guidelines for the states to use in developing plans for covering existing sources within the same categories that EPA established under section 111(b).[22] Very often, EPA issues these emissions guidelines for the states at the same time that it issues or updates the

21. 42 U.S.C. section 4211(d)(1); 40 CFR Part 60, Subpart B.

22. 42 U.S.C. section 4211(d)(1); 40 CFR §60.22.

Box 5 | Possible Regulatory Mechanisms Fitting Definition of "Standard of Performance"

Although this paper focuses mostly on the potential for cap and trade under section 111(d), the Act's broad definition of "standard of performance" may permit many other regulatory mechanisms, such as

- Emissions rates applicable to all sources within a category, whether based on emissions per unit of output or per unit of heat input.
- An emissions rate-based trading program that prescribes an emissions rate but allows trading of allowances among sources to achieve the established rate.
- A system that sets lifetime emissions limits (tons of CO_2) for regulated sources and permits trading of these limits between sources.
- An allowance system that provides for the retirement over time of existing plants.

new source performance standard under section 111(b) of the Act. With the emissions guidelines in hand, states then develop plans for covering their existing sources. In developing those plans, states are permitted to consider "among other factors, the remaining useful life of the existing source to which such standard applies," thereby permitting more flexible standards for existing units under 111(d) than those established for new units under 111(b).[23]

1. The Issue of National Ambient Air Quality Standards (NAAQS)

Section 111 allows EPA and the states to issue standards of performance for existing sources only for those pollutants that have not been listed as criteria pollutants for which National Ambient Air Quality Standards (NAAQS) are to be set and for hazardous air pollutants under the Act. Both the Bush and Obama Administration EPAs have taken the position that establishment of NAAQS for greenhouse gas emissions is neither required nor desirable.[24] Similarly, neither administration has sought to list greenhouse gases as hazardous pollutants. If, for any reason, EPA were to list greenhouse gases as criteria pollutants or hazardous pollutants, then the section 111(d) pathway described in this paper would not be available to EPA and the states.

Although two successive administrations have concluded that NAAQS are inappropriate for greenhouse gas emissions, some argue that EPA may have no choice but to designate greenhouse gases as criteria pollutants under section 108 of the Act.[25] The NAAQS path would result in the need for state implementation plans to protect and improve air quality.[26] This view is based on the observation that the endangerment finding that leads to listing criteria pollutants in section 108 of the Act is identical to the endangerment finding that EPA already has made under Title II of the Act.[27]

EPA has two statutory arguments to counter this contention. First, the terms of section 108 are permissive: EPA is not required to list a pollutant and to issue a NAAQS for each and every pollutant found to endanger public health and welfare. Instead, a plain reading of the statute limits the pollutants that must be listed to those "for which [the Administrator] plans to issue air quality criteria."[28] A second and more structural argument is that the interpretation of section 108 to compel the listing of greenhouse gases as criteria pollutants would render meaningless

23. (italics added).

24. Advanced Notice of Proposed Rulemaking: Regulating Greenhouse Gas Emissions Under the Clean Air Act, 73 Fed. Reg. 44354, 44476-44520 (2008). The Obama EPA has not distanced itself from the statement that EPA does not intend to list greenhouse gases under section 108 of the Act. In addition, EPA's recent announcement to regulate existing sources of greenhouse gases under section 111(d) is a de facto continuation of this position. http://www.epa.gov/airquality/pdfs/settlementfactsheet.pdf.

25. Nathan Richardson, Greenhouse Gas Regulation under the Clean Air Act: Does Chevron v. NRDC Set the EPA Free? RFF Discussion Paper 09-50 (December 2009); available at http://www.rff.org/RFF/Documents/RFF-DP-09-50.pdf.

26. 42 U.S.C. §§7408–10; 74 Fed. Reg. 55292, 55297 (October 27, 2009).

27. See http://www.epa.gov/climatechange/endangerment.html.

28. 42 U.S.C. §7408(a)(1)(C).

section 111(d) of the Act. Section 111(d)(1)(A) has two requirements for applicability. The first is that it applies only to a pollutant "for which air quality criteria have not been issued or which is not included on a list published under section [108(a)]." The second is that it applies only when section 111(b) applies.[29] Section 111(b)(1)(A), however, says that 111(b) itself must be triggered by an endangerment finding.[30] If every endangerment finding were to mandate listing under section 108, this area of the statute would be rendered meaningless. Thus the language governing the applicability of 111(d) seems to have contemplated that some pollutants would endanger the public health and welfare but never become criteria pollutants under section 108(a).[31]

2. The Process for the State Implementation Plan (SIP)

Congress called for a SIP-like process in covering existing sources under section 111(d): "The Administrator shall prescribe regulations which shall establish a procedure similar to that provided by section [110] of this title under which each State shall submit to the Administrator a plan."

Section 110 pertains generally to state plans to attain National Ambient Air Quality Standards or, if a state is already in attainment, to prevent a significant deterioration of air quality in the state. Section 110(a)(2)(A) of the Act lists the broad array of policy mechanisms allowed in a state's SIP:

> Each such plan shall—
>
> (A) 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. (italics added)

The reference in section 111(d) to the section 110 SIP process tends to support substantial state discretion in selecting the appropriate "standard of performance" mechanism for existing sources. It also supports the use of market-based mechanisms.

3. EPA's Emissions Guidelines for Section 111(d)

According to 40 CFR section 60.22, the EPA emissions guidelines must contain the following:

> a. Information concerning known or suspected endangerment of public health or welfare caused, or contributed to, by the designated pollutant.[32]
>
> b. A description of systems of emission reduction that, in the judgment of the EPA Administrator, have been adequately demonstrated.
>
> c. Information about the degree of emission reduction that is achievable with each system, together with information about the costs and environmental effects of applying each system to designated facilities.
>
> d. Incremental periods of time normally expected to be necessary for the design, installation, and start-up of identified control systems.
>
> e. An emission guideline that reflects the application of the best system of emission reduction (considering the cost of such reduction) that has been adequately demonstrated for designated facilities, and the time within which compliance with emission standards of equivalent stringency can be achieved. The Administrator will specify different emission guidelines or

29. 42 U.S.C. §7411(d)(1)(A).

30. 42 U.S.C. §7411(b)(1)(A).

31. Note that the states' discretion to implement the regulatory mechanisms of their choice probably grows only if NAAQS are established for greenhouse gases. The states' implementation-planning process under section 110 of the Act provides for a great deal of flexibility in finding ways to preserve and improve air quality. Cap-and-trade programs have been considered approvable parts of the states' implementation plans for other pollutants. New York, for example, implemented a state-level cap-and-trade program to reduce non-ozone-season NOx emissions in the state. See http://www.dec.ny.gov/regulations/64111.html. In addition, the NOx SIP Call program covering power plants and industrial boilers was a cap-and-trade program created in response to ozone transport concerns. See http://www.epa.gov/airmarkt/progsregs/nox/otc.html.

32. Section 60.22. Note that this is not a requirement for a new endangerment finding but a place to recite the impacts of the emissions to be regulated.

compliance times or both for the different sizes, types, and classes of designated facilities when costs of control, physical limitations, geographical location, or similar factors make subcategorization appropriate.

f. Other available information as the Administrator determines may contribute to the formulation of the states' plans.

These guidelines must be issued initially in draft form, in order to permit public review and comment.[33] This draft may be issued when or after a performance standard is proposed under section 111(b). EPA will revise the guidelines in accordance with the comments it receives and then will issue the guidelines in final. EPA has issued guidelines under section 111(d) for the following categories of sources: municipal waste combustors, municipal solid waste landfills, sulfuric acid production facilities, kraft pulp mills, primary aluminum reduction plants, phosphate fertilizer plants, and hospital/medical/infectious waste incinerators.[34]

4. State Plans under the Section 111(d) Procedure

Within nine months after EPA issues its final emissions guidelines, EPA's regulations require the states to adopt and submit their plans for covering existing sources, although EPA may specify a different time period for submission.[35] Each state must hold at least one public hearing before adopting and submitting its plan to EPA.[36] EPA regulations specify that the state plan must have the following contents:[37]

a. Emissions standards. Each plan must include emission standards and compliance schedules. The emission standards must prescribe "allowable rates of emissions" except when clearly impracticable.[38]

b. Measurement, monitoring, reporting, and record keeping. The state plan must contain provisions for emissions test methods, monitoring, reporting, and compliance verification.

c. Coverage. The state plan must cover all existing facilities that would be subject to the new source performance standards if they were new or modified existing sources.[39]

d. Inventory. Each plan must contain the inventory of existing emissions sources in the state.

e. Legal authority. Each plan must demonstrate that the state has the legal authority to implement and enforce the plan.

The state plan must contain emissions standards that are "no less stringent" than those contained in the federal guidelines.[40] Similarly, compliance times in the state plan must be expeditious and no later than the compliance times in the federal guidelines.[41] With the exception of these requirements, both the statutory text and the regulatory procedure for implementing the plan requirement appear to allow states to propose alternative approaches to EPA's guidelines.

33. 40 CFR §60.22(a). The regulations do not specify time periods for this review and comment.

34. 40 CFR Part 60, Subparts Cb through Ce; 40 CFR Part 62.

35. 40 CFR §60.23(a)(1).

36. 40 CFR §60.23(c)(1). Notice requirements also are specified in the regulations. See 40 CFR §60.23(d).

37. 40 CFR §§60.24 to 60.26.

38. The CAMR rule making sought to add the words "allowance system" alongside the terms "allowable rates of emissions" in the 40 CFR Part 60, Subpart B regulations, but this addition was vacated when the D.C. Circuit vacated the entire CAMR rule making. See New Jersey vs. EPA, 517 F.3d 574, 583 (D.C. Cir. 2008).

39. The regulations refer to such exiting facilities as "designated facilities." Section 60.21(b) provides that "designated facility means any existing facility (see §60.2(aa)) which emits a designated pollutant and which would be subject to a standard of performance for that pollutant if the existing facility were an affected facility (see §60.2(e))."

40. 40 CFR §60.24(c). Note that EPA's rules have a provision that under specific circumstances such as high cost or physical impossibility, the states may impose less stringent requirements on sources. See 40 CFR §60.24(f).

41. Ibid.

5. EPA Action on State Plans

In its section 111(d) regulations, EPA gives itself four months to approve or disapprove of state plans. Upon approval of the plan, it is incorporated into the federal regulations at 40 CFR part 62. If a state fails to submit a plan or EPA finds a state's plan inadequate, EPA must impose a federal plan on the state.[42] EPA's regulations require that this federal plan be promulgated within six months of the date the state plan submission was due.

C. The Potential for Cap and Trade under Section 111(d)

EPA has previously interpreted section 111 to allow cap and trade as a "standard of performance" within the meaning of section 111(a)(1) of the Act, although this interpretation was contested in a legal challenge to the Clean Air Mercury Rule (CAMR).[43] The Federal Circuit Court of Appeals never decided the legal challenge to the CAMR cap-and-trade program and instead vacated CAMR on other grounds.[44] EPA's Advanced Notice of Proposed Rulemaking (ANPR) on greenhouse gas regulations issued in July 2008 also stated that cap and trade is a permissible option for regulation under section 111(d).[45]

The current EPA has neither endorsed nor disavowed the previous administration's interpretation of the Act to allow cap and trade. The statutory context for this position is examined below, followed by a discussion of the importance of the deference afforded to EPA in interpreting the Act. The Clean Air Mercury Rule (CAMR) provides an example of how section 111(d) cap and trade under the Clean Air Act might play out.

1. The Statutory Language

Section 111 does not expressly provide for the states' establishment of a cap-and-trade program under section 111(d), although it does refer to the SIP-like process that incorporates a variety of different regulatory mechanisms, including market-based mechanisms.[46] Instead, the section calls for each state to submit a plan that establishes "standards of performance" for "any existing source for any air pollutant" that is neither a criteria pollutant nor a hazardous air pollutant.[47] The definition of "standard of performance" appears to allow cap and trade if it is reasonably considered a "system of emissions reduction":

> The term "standard of performance" means a standard for emissions of air pollutants which reflects the degree of emission limitation achievable through the 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.[48]

EPA interpreted the statutory language to define "emissions standard" as follows in its regulations implementing section 111(d): "Emissions standard means a legally enforceable regulation setting forth an allowable rate of emissions into the atmosphere, [establishing an allowance system,] or prescribing equipment specifications for control of air pollution emissions." The bracketed phrase "establishing an allowance system" was vacated along with the CAMR rule for reasons unrelated to the legality of cap and trade under section 111. The following definition of "allowance system" also was vacated:

> Allowance system means a control program under which the owner or operator of each designated facility is required to hold an authorization for each specified unit of a designated pollutant emitted from that facility during a specified period and which limits

42. 42 U.S.C. section 4211(d)(2). 40 CFR §60.27(c).

43. Note that under the Clinton administration, the EPA general counsel stated in a memorandum that the "EPA has long held the view that trading across plant boundaries is impermissible under sections 111 and 112." See http://www.law.umaryland.edu/environment/casebook/documents/EPACO2memo1.pdf.

44. New Jersey v. EPA, 517 F.3d 574, 583 (D.C. Cir. 2008).

45. 40 CFR 60.21, .24; 73 Fed. Reg. 44487 (July 30, 2008).

46. One could argue that the reference to section 110 of the act in section 111(d) incorporates the language found in section 110(a)(2)(A), which expressly allows "economic incentives such as fees, marketable permits, and auctions of emissions rights." The reference to section 110, however, is to a "procedure similar to that provided by section [110]" rather than to the substantive provisions of section 110.

47. 42 U.S.C. Section 7411(d)(1)(a).

48. 42 U.S.C. Section 7411(a)(1) (italics added).

> the total amount of such authorizations available to be held for a designated pollutant for a specified period and allows the transfer of such authorizations not used to meet the authorization-holding requirement.

Even though this rule language was vacated along with the CAMR rule for other reasons, it represents an interpretation that EPA considered reasonable at the time. The current EPA has neither officially endorsed nor disavowed this interpretation, and no federal court has passed on its legal merit.[49]

Another statutory provision in section 111(d) suggests that the states should have more flexibility in establishing standards of performance for existing sources than EPA has in establishing new source performance standards under section 111(b). Section 111(d)(1)(B) provides that EPA "shall permit the State in applying a standard of performance to any particular source under a plan submitted under this paragraph to *take into consideration, among other factors, the remaining useful life of the existing source* to which such standard applies" (italics added). Because Congress expressly allowed states to take into account the remaining useful life of existing sources when devising their plans for regulating existing sources, it may be argued that Congress intended section 111(d) regulation to incorporate greater flexibility than the once-size-fits-all approach found in section 111(b).

Notwithstanding the strong statutory arguments in favor of regulatory flexibility, including cap and trade, the congressional silence on cap and trade in section 111 offers a counterargument to those favoring a traditional emissions rate–based performance standard. Title IV of the Clean Air Act and section 110(a)(2)(A) contain express provisions for flexible market-based mechanisms, both added in the 1990 amendments to the act. As this counter argument goes, if Congress had intended to allow such mechanisms under section 111, it would have expressly provided for them. Importantly, however, Congress referred to section 110 in section 111(d) (when it referenced section 110's SIP-like process). It may be argued that there was no need to refer expressly to specific regulatory mechanisms in section 111(d) because the reference to section 110 signaled Congress's intent to allow the states a broad array of options, including market-based mechanisms, as listed in section 110(a)(2)(A).

2. The Deference Granted to EPA: The Chevron Decision

Because cap and trade is not expressly authorized in section 111 of the Act, some interpretation of the provision is required to reach the conclusion that the states may indeed use cap and trade to reduce emissions from existing power plants and industrial sources under section 111(d). As previously noted, EPA has interpreted the Act in the past to allow for cap and trade under section 111. Assuming that EPA sticks to this past interpretation, the question is whether its interpretation deserves deference under the Supreme Court's decision in Chevron v. Natural Resources Defense Council.[50] In Chevron, the Court established the following two-pronged test:

- If Congress has expressed its intent unambiguously in the statute, then the Agency and the Court must adhere to that intent.
- If, however, the statute is silent or ambiguous with respect to the specific question, the issue for the court is whether the agency's answer is based on a permissible interpretation of the Act.[51]

Since section 111 of the Act does not specifically address whether cap and trade is properly considered a "standard of performance," the statute may be considered silent on the issue. Even if some elements of section 111, or other parts of the statute, introduce some ambiguity around the question, the Chevron decision calls for deference to EPA's interpretation in the face of such ambiguity.

49. In the CAMR litigation, the court explicitly declined to consider any legal arguments beyond EPA's faulty delisting of coal- and oil-fired power plants. See NJ v. EPA, 517 F.3d at 584 ("In view of our disposition, the court does not reach other contentions of petitioners or intervenors").

50. 467 U.S. 837 (1984).

51. Ibid.

One counterargument to this paper's analysis might be the Supreme Court's assertion on matters of statutory interpretation that "Congress . . . does not alter the fundamental details of a regulatory scheme in vague terms or ancillary provisions—It does not, one might say, hide elephants in mouseholes."[52] This argument is a rebuff to pure textual analysis and shows a general hostility to drawing out large regulatory programs from small pieces of statutory text. Nonetheless, this argument does not apply convincingly in this context. The doctrine was first applied to reject assertions that an "adequate margin of safety" included cost considerations because of the term "adequate margin."[53] In contrast, the regulatory policy here builds off a full section of the statute, entire sections of which are purposefully vague and explicitly grant EPA discretion in implementing them. Thus EPA may fairly contend that the argument for Chevron deference builds in many ways off the explicit authority to pursue its judgment under the statute, and not from mere textual manipulation.

Even though the deferential standard embodied in Chevron tends to support EPA's interpretation of the Act to allow cap and trade, until the question is ultimately decided by the federal courts, uncertainty on the question will remain. Beyond the "big" question of whether cap and trade is allowed are a number of questions relating to whether specific cap-and-trade design features are allowed under section 111(d). These questions are addressed in Part IV of this paper.

3. The Clean Air Mercury Rule (CAMR) Example and the Arguments against Cap and Trade under Section 111(d)

a. CAMR

With the Clean Air Mercury Rule (CAMR), EPA sought to encourage states to implement cap and trade under section 111(d) to reduce mercury emissions from coal- and oil-burning power plants. Because EPA had previously decided to regulate mercury emissions from coal- and oil-fired power plants under section 112 of the Act, mercury emissions from these plants initially were ineligible for regulation under section 111(d).[54] EPA first had to remove coal- and oil-fired power plants from the section 112 list and, at the same time, issue a new source performance standard covering mercury and guidelines for the states for regulating mercury under section 111(d). EPA's guidelines thus included a model rule for a state-based cap-and-trade program covering mercury emissions from coal-burning power plants.[55]

The design of the model CAMR cap-and-trade program was simple.[56] It covered one portion of the electric generation sector: coal-fired electric steam generating or combustion turbine units serving electric generators with a nameplate capacity of 25 MW or more. It established simple allowance budgets and allowed the states to allocate allowances at their discretion. The design contained no cost-containment mechanism, no offsets, and no international trading of allowances.

On challenge, the D.C. Circuit Court of Appeals threw out the CAMR rule on the grounds that EPA had improperly removed power plants from the hazardous pollutant category list. Although the challengers also argued that cap and trade was not allowed under section 111(d), the court did not reach this question.[57]

b. Arguments against Cap and Trade in the CAMR Case

Some states and environmental challengers sought to have CAMR tossed out, primarily on the grounds that EPA improperly removed mercury-emitting coal- and oil-emitting power plants from the hazardous pollutant emitter list. In contrast, petitioners raised three additional arguments in

52. Whitman v. Am. Trucking Associations, 531 U.S. 457, 468 (2001).

53. Ibid., 468–69.

54. See 42 U.S.C. 7411(d)(1)(A).

55. 40 CFR Part 60, Subpart HHHH.

56. Ibid.

57. New Jersey v. EPA, 517 F.3d 574 (D.C. Cir. 2008).

their briefs over the legitimacy of cap and trade under section 111:[58]

1. The petitioners argued that section 111(d) refers to the issuance of standards of performance applicable to "any existing source," meaning that the standards must require the same emissions rate at each and every unit. In response, EPA contended that "any existing source" means any and all sources within the category, a condition satisfied by the cap-and-trade program.

2. The petitioners argued that even though "standard of performance" is defined broadly in section 111(a) of the Act to refer to a "system of emission reduction," the terms are defined in section 302 as "a requirement of continuous emission reduction, including any requirement relating to the operation or maintenance of a source to assure continuous emission reduction." In response, EPA pointed out that the definition in section 111(a) governs the use of the terms in the section 111 context, and not the definitions in section 302. The agency contended further that even if the section 302(l) definition did apply, a cap-and-trade program would meet the requirement of "continuous emissions reduction."

3. The petitioners contended that the decision in ASARCO v. EPA prevents trading among sources subject to a standard of performance under section 111. The ASARCO case involved a source that sought to avoid compliance with a new source performance standard under section 111(b) by improving the emissions performance at another emissions point in the same facility. In response to this claim, EPA argued that ASARCO had been overturned by the subsequent decision in Chevron v. NRDC.[59] It also contended that to the extent ASARCO is still good law, it applies only to emissions performance standards for new sources under section 111(b), not to the more flexible standard-setting process for existing units embodied in section 111(d). Section 111(d) refers to the state implementation plan process under section 111 of the Act, which vests a great deal of discretion in the states to devise regulatory mechanisms.

4. Conclusion on Cap and Trade under Section 111(d)

Because the Circuit Court of Appeals in the CAMR case never reached the arguments on cap and trade under section 111(d), whether EPA would have prevailed in its interpretation of the Act to allow cap and trade is not known. But given the deference afforded EPA in interpreting ambiguity in the statute under Chevron, as well as the strength of the agency's other arguments, it seems likely that EPA would have prevailed in any determination to allow cap and trade under section 111(d).

III. STATE-LEVEL CAP-AND-TRADE PROGRAMS

Assuming that cap and trade is permitted under section 111(d), the question then is what that cap-and-trade program may look like. This part of the paper examines the cap-and-trade program designs developed in the regions of North America, and part IV looks at the design elements against the backdrop of section 111(d).

Twenty-three U.S. states have actively participated in the design and/or implementation of three regional cap-and-trade programs to reduce greenhouse gas emissions. The first of the three programs, the northeastern and mid-Atlantic Regional Greenhouse Gas Initiative (RGGI), which covers CO_2 emissions from large power plants, was launched in January 2009. RGGI was followed by the Western Climate Initiative (WCI) and the Midwestern Greenhouse Gas Reduction Accord (Midwestern Accord), both of which are economy-wide programs designed for implementation in 2012.

Currently, all ten of the RGGI states are implementing this program, and both the Midwestern Accord and Western Climate Initiative jurisdictions have completed their regional designs. Of the states engaged in these latter two initiatives, only New Mexico and California have promulgated regulations to implement the cap-and-trade program. But because the gubernatorial administrations of many of

58. See EPA's Appellate Brief, 2007 WL 2155494 (C.A.D.C.).

59. 467 U.S. 837 (1984).

the states in these programs currently are changing, the likelihood of implementation in additional states is uncertain.

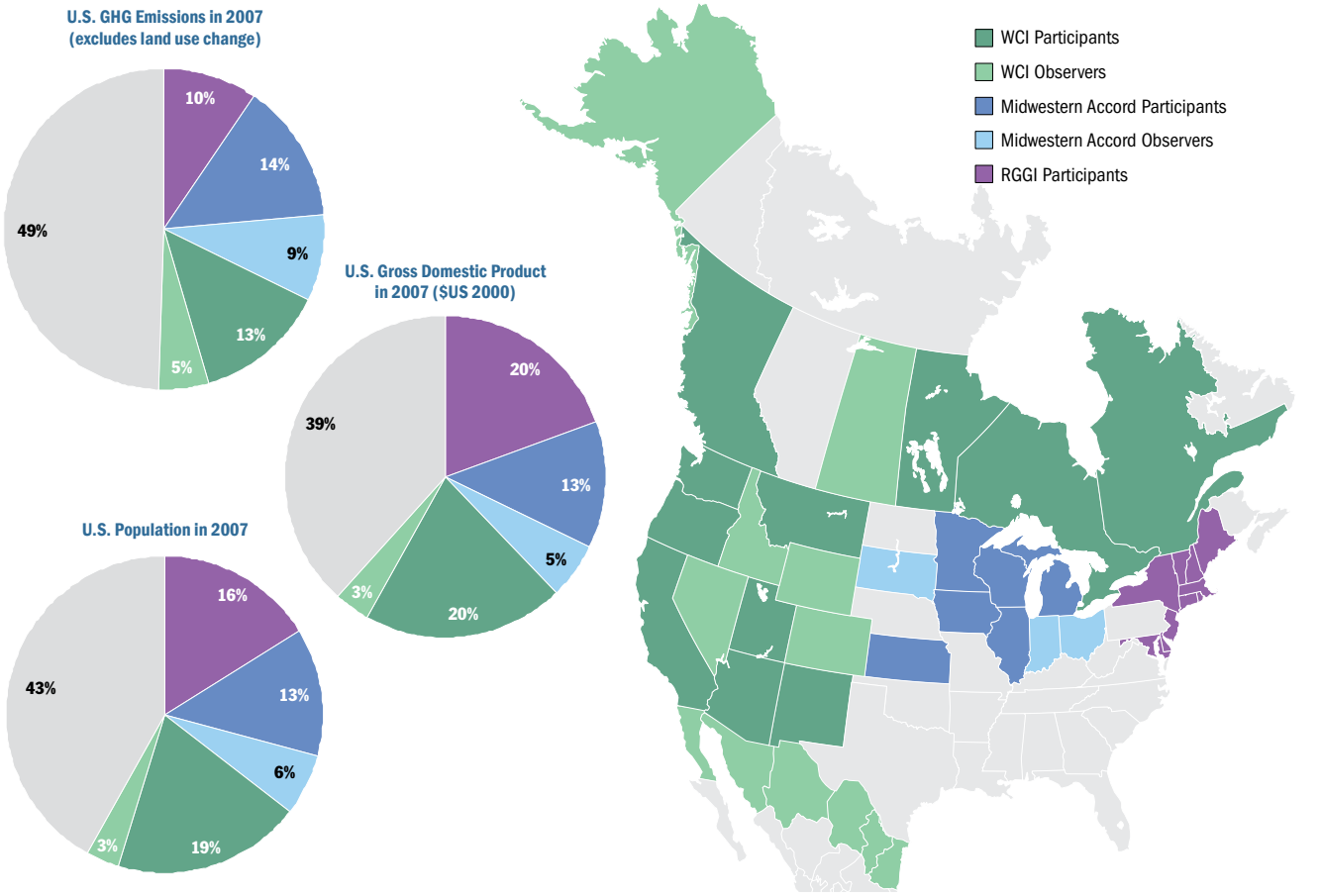
Notwithstanding the uncertainty of implementation in the midwestern and some western states, the cap-and-trade designs are region specific, based on substantial stakeholder input. Even the designs of those states that have not implemented cap and trade provide a good sense of the kinds of choices that they would make if they chose cap and trade as a mechanism to meet their section 111 obligations.

A. The Regional Greenhouse Gas Initiative

RGGI is the United States' first cap-and-trade program for greenhouse gases, and it covers ten northeastern and mid-Atlantic states: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont. The program caps carbon dioxide (CO_2) emissions from large fossil fuel–fired electric generating units, with the goal of stabilizing emissions from 2009 through 2014 at a level roughly equivalent to recent historical emissions. The program then will reduce the cap by 2.5 percent per year over the next four years to reduce the baseline in 2018 by 10 percent. The RGGI states held their first auction for allowances on September 25, 2008, and began regulating CO_2 emissions on January 1, 2009.[60] But owing to an unexpected decline in natural gas prices, greater nonfossil generation of power (hydroelectric, wind, and nuclear), and the economic

60. RGGI Fact Sheet, available at http://rggi.org/docs/RGGI_Executive%20Summary_4.22.09.pdf.

Figure 3 | **Regional Cap-and-Trade Programs**



Climate Analysis Indicators Tool (CAIT US) Version 4.0. (Washington, DC: World Resources Institute, 2011).

downturn, RGGI currently is issuing more allowances than it has emissions from covered sources. In fact, emissions in 2009 fell 34 percent below the RGGI cap.[61] As a result, allowance auction prices have fallen to the floor price.

When the participating governors signed an MOU creating RGGI in December 2005, they agreed to review the full program in 2012. The RGGI states now are preparing for that review, which will present an opportunity to make corrections in RGGI's course, including tightening its emissions cap. The program review also makes it possible to make any adjustments necessary to bring the program in line with section 111's requirements for power plants determined by EPA.

B. The Western Climate Initiative

The Western Climate Initiative (WCI) is the most international of the three regional initiatives, with seven U.S. states—Arizona, California, Montana, New Mexico, Oregon, Utah, and Washington—and four Canadian provinces—British Columbia, Manitoba, Ontario, and Quebec—participating. WCI also has six Mexican states as observers, along with six more U.S. states and four more Canadian provinces. The program has a 2012 start date. For the first three years, approximately one-half the regions' emissions will be covered as it will include electric generation, industrial combustion at large sources, and industrial process emissions. In 2015, the program's scope will expand to cover nearly 90 percent of the region's emissions when it includes the remaining residential, commercial, and industrial combustion fuels. If all the program's members implement the program on schedule, regional emissions will fall 15 percent below 2005 levels by 2020. But because each jurisdiction has established a separate reduction target, the actual regional reductions will depend on which jurisdictions actually implement the cap-and-trade program. For example, Utah has committed to reducing emissions to 2005 levels by 2020, and Oregon has committed to reducing emissions to 10 percent below 1990 levels by 2020. In addition, whereas many of the Canadian members have made important strides toward implementing the WCI program, the U.S. states currently lag behind schedule, as only California and New Mexico have begun to implement the WCI program.

C. The Midwestern Greenhouse Gas Reduction Accord

The Midwestern Greenhouse Gas Reduction Accord (the Midwestern Accord) covers six U.S. states—Illinois, Iowa, Kansas, Michigan, Minnesota, and Wisconsin—and one Canadian province, Manitoba.[62] Observers include Indiana, Ohio, South Dakota, and the province of Ontario. The program's scope is comparable to that of the WCI program, but its start date has not yet been set. The Midwestern Accord establishes for all members a single greenhouse gas reduction target of 18 to 20 percent below 2005 levels by 2020. The Midwestern Accord was negotiated by an advisory group appointed by the member jurisdictions and that was composed of industrial and environmental stakeholders, which suggests that there is regional support for this particular design. Even though no jurisdiction has proposed the Midwestern Accord program for adoption, and recent elections in many of the states make its adoption less likely, the program represents an important statement by the region's state officials and stakeholders.

D. Comparing the Program Designs

Because they represent a mix of policy decisions made to enable action, the regional programs can help lead to additional reductions. Accordingly, preservation of these programs will make it easier for the member states to exceed the federal requirements. If they are to avoid double regulation,[63] however, the states must demonstrate that their programs are consistent with the statutory limitations of section 111. To do this, they must show that their cap-and-trade program will achieve a level of reductions from the

61. See RGGI Emissions Trends, Environment Northeast (June 2010), at http://www.env-ne.org/public/resources/pdf/ENE_RGGI_Emissions_Report_20100617_FINAL.pdf.

62. Midwestern Greenhouse Gas Reduction Accord, November 15, 2007. See http://midwesternaccord.org/midwesterngreenhousegasreductionaccord.pdf.

63. If EPA does not allow a state implementing a regional program to use that program to comply with section 111(d) requirements, then states will have to adopt performance standards to comply with section 111 alongside the regional cap-and-trade programs—i.e., double regulation.

regulated entities that is equal to or better than that prescribed by EPA. The relevant design elements here are the program's scope, cap type, cap level, geopolitical boundaries, offset policies, linking, temporal flexibility (banking, borrowing, length of compliance period), and safety valves. Table 1 lists the design features of each regional program.

IV. CAP AND TRADE UNDER SECTION 111(D): RECONCILING REGIONAL DESIGNS WITH THE ACT

The current state-level cap-and-trade programs were designed and implemented by the states after substantial stakeholder input. The experience of these states and their stakeholders has taught them important lessons on how to reduce emissions. As a result, many states and their stakeholders are expected to try to continue these programs within the framework of section 111. Next we look at ways of implementing the regional programs while meeting the states' obligations under section 111(d).

It is important to reemphasize that state plans under section 111(d) will have to be at least as stringent and reductions must be accomplished at least as quickly as the federal guideline requires. As noted above, the RGGI emissions cap for the power sector is currently greater than the actual emissions in the region. It is likely, therefore, that RGGI will have to tighten its emissions cap if it is to satisfy section 111(d) minimums. Any reductions RGGI is to accomplish, furthermore, will have to be accomplished at least as quickly as the federal guideline requires. Stringency and timing of reductions are perhaps the easiest design features of existing state program to judge. Scope, offsets, international trading and temporal compliance flexibility present thornier challenges.

A. Scope

1. The Issue

The scopes of the regional cap-and-trade programs differ; for example, RGGI covers only the power sector, whereas both WCI and the Midwestern Accord cover several sectors, to be phased in over time. In general, a broader scope is preferable because the more sources that a program covers, the more opportunities it will offer for reductions and innovation. A broad scope with a unified carbon price also helps avoid perverse incentives to increase emissions in a sector of the economy where emissions are less regulated or less expensive. The net result of a broad scope is greater reductions at a lower cost.

2. Section 111

Section 111 is built around the establishment of categories of stationary emissions sources. EPA decides on the categories, and only those categories defined under section 111(b) by EPA are available for regulation under section 111(d).[64] Although the states can petition EPA to list a new category and, presumably, to revise the current list, EPA is the legal authority for establishing categories.[65]

EPA has substantial leeway in establishing categories. Indeed, section 111(b)(2) expressly states that EPA "may distinguish among classes, types, and sizes within categories of new sources for the purpose of establishing such standards." It follows that EPA may define a category of greenhouse gas emissions sources very broadly and allow for different treatment of segments of that category in order to establish new source performance standards. Such a broad definition of the source category would make it easier for the states to implement a broad-scope cap-and-trade program. Therefore the states could petition EPA to draw the boundaries of section 111(b) categories so as to make it easier for states to comply using their broad-scope cap-and-trade programs.

In the past, emissions reductions have come from individual source categories covered by narrow standards of performance. For example, CAMR covered only one source category: coal- and oil-burning power plants. Although the statute restricts section 111(d)'s authority to only those source categories regulated under section 111(b), nothing in the statutory language expressly

64. 42 U.S.C. 7411(d)(1)(A)(ii) limits regulations to those categories of sources to which a new source performance standard applies under section 111(b).

65. 42 U.S.C. 7411(g).

Table 1 | **Design Features of the Three Regional Cap-and-Trade Programs**

Regional Program	Northeastern and Mid-Atlantic Regional Greenhouse Gas Initiative (RGGI)	Midwestern Accord	Western Climate Initiative (WCI)
Scope	Applies to emissions of CO_2 from electrical generators with capacity greater than 25 MW.	Applies to emissions of six GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, SF_6) from sources that emit more than the equivalent of 25,000 MMT of CO_2: • Electrical generation, including imported electricity. • Industrial and commercial fossil fuel combustion. • Industrial process emissions. • Fossil fuel suppliers, including suppliers of transportation fuels.	Applies to emissions of seven GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, NF_3, SF_6) from sources that emit more than the equivalent of 25,000 MMT of CO_2: *Beginning in 2012 includes* • Electrical generation, including imported electricity either directly or indirectly through a set-aside. • Industrial and commercial fossil fuel combustion. • Industrial process emissions. *Beginning in 2015 includes* • Transportation fuel suppliers. • Residential fuel suppliers.
Cap Type	Absolute cap.	Absolute cap.	Absolute cap.
Level of Cap	Target keeps emissions levels constant until 2014, then decreases 2.5% annually through 2018.	Target of 18% to 20% emissions reductions from 2005 levels by 2020 and 80% reductions by 2050.	Target of 15% emissions reductions from 2005 emissions levels by 2020.
International?	No.	Yes.	Yes.
Offsets and Linking	Offsets may constitute 3.3% to 10% of compliance obligation, depending on price triggers. Geographic scope initially limited to the United States. If the stage 2 trigger is met, then international offsets approved under the UNFCCC may be used (i.e., CDM & JI).	Offsets may constitute no more than 20% of compliance obligation unless price triggers are met. The offset limits under those circumstances have not yet been defined. Acceptance of CDM and JI offsets will be evaluated.	Offsets may not constitute more than 49% of emissions reductions; however, each jurisdiction may set a lower limit.
Banking	Allowed.	Allowed.	Allowed.
Borrowing	Not allowed.	Borrowing one to two years into future is allowed for up to 20% of the compliance obligation. Limit may be tightened or loosened via price triggers. Those limits have not yet been defined.	Not allowed.
Length of Compliance Period	Three-year compliance period with one-year extension if stage 2 trigger is met.	Three-year compliance period.	Three-year compliance period.
Price Cap/ Safety Valve/ Price Trigger	Two-stage price trigger based on twelve-month rolling average allowance price: • If price exceeds $7 (stage 1), then offset limit will increase to 5% of allowances. • If price exceeds $10 (stage 2), then offset limit will increase to 10% of allowances; compliance period will increase to four years; and offsets from UNFCCC-approved carbon program will be recognized.	• If allowance price exceeds upper trigger price, then borrowing and offset limits will increase. • If allowance price falls below lower trigger price, then borrowing and offset limits will decrease. • If allowance price exceeds upper significant price threshold, then allowances will be released from strategic reserve (filled by setting aside 2% of allowances annually). • If price decreases below lower significant price threshold, then allowances will be removed from circulation and placed in strategic reserve.	Cost-containment mechanisms are under development.

precludes EPA or the states from trading allowances across different regulated categories of emissions sources.

The states may propose a plan under section 111(d) that is equivalent to or more stringent than EPA's guidelines. In fact, EPA contemplated this possibility in its regulations implementing section 111(d),[66] and it is consistent with the general reservation of the states' authority contained in section 116 of the Clean Air Act.[67]

3. Possible Solutions

The challenge of reconciling regional cap-and-trade scope with section 111 for covered stationary sources has at least three possible solutions.

First, EPA could draw broad categories of emissions sources under section 111(b). One approach would be for the agency to create a category consisting of all stationary greenhouse gas emitters or all stationary combustion facilities over a certain-size threshold (such as 25,000 tons of CO_2e). Although this approach would make trading between economic sectors more consistent with the past implementation of section 111(d) and thus less vulnerable to legal challenge, it probably is an unlikely outcome given EPA's recent decision to proceed with developing standards for the existing power plant and refineries categories. That said, however, under this approach, the states could include additional source categories that already are part of their regional cap-and-trade programs, by proposing size thresholds lower than those set by EPA, because doing so would increase the program's stringency as long as the rate of reduction was the same.

Second, EPA could interpret "standard of performance" to allow a "system of emission reduction" that allows trading across various regulated categories of emissions sources. This approach would require EPA to first define and issue section 111(b) standards for source categories that included the sectors in the states' cap-and-trade programs. For example, EPA could establish separate standards for power plants, refineries, chemical manufacturers, and the like. Ideally, EPA would include this multi-sector option in the guidelines it issues under section 111(d) and would expressly interpret the Act to allow trading across the different source categories in section 111.

Third, a state could propose covering in its section 111(d) cap-and-trade program those sectors for which EPA had issued 111(b) standards, as well as sectors for which EPA had not issued 111(b) standards. To support this proposal, state would likely have to demonstrate that the total reductions achieved in each sector for which EPA had established 111(d) guidelines would be equal to or greater than the reductions that would be achieved without multi-sector trading. The states also could argue that multi-sector cap and trade was a better system of regulation than the single-sector performance standard approach. This argument would be relatively straightforward given the economic literature supporting the conclusion that multi-sector cap and trade leads to lower costs than does a single-sector emissions performance standard or cap and trade.

B. Offsets

1. Issue

Project-based reductions, or *offsets*, are activities that take place away from the emissions sources covered by the cap-and-trade program. All three regional cap-and-trade program designs include offsets. Offsets offer opportunities for inexpensive emissions reductions, and they reduce the cost of achieving a given level of emissions reductions. Offsets also provide a mechanism to bring sectors into the carbon market voluntarily. In turn, this provides access to capital for improvements but imposes no obligation to make those improvements, which may be desirable for

66. According to 40 CFR §60.24(g), "Nothing in this subpart shall be construed to preclude any State or political subdivision thereof from adopting or enforcing (1) emission standards more stringent than emission guidelines specified in subpart C of this part or in applicable guideline documents or (2) compliance schedules requiring final compliance at earlier times than those specified in subpart C or in applicable guideline documents." This is consistent with the Clean Air Act's broad reservation of state authority in section 116.

67. Section 116 contains a few limitations on the states' authority to go further than the federal requirements, most notably the "no third car" limitation that permits only California to issue vehicle standards that are more stringent than the federal requirements, although other states may follow California's lead. See 42 U.S.C. 7416.

sectors not yet deemed for direct regulation. Offset provisions are also among the most complex features of existing programs and the states have had limited experience in ensuring that offsets represent credible emissions reductions.

2. Section 111

Section 111 of the Clean Air Act makes no mention of offsets. Rather, section 111(d) standards of performance are restricted to source categories regulated under section 111(b). It is unlikely, therefore, that offsets could be used to meet the minimum reductions required by EPA's guidelines issued under section 111(d). That is, reductions must come from the sources covered by the section 111(d) standard of performance.

3. Possible Solution

Offsets could be used to achieve reductions above and beyond the federal minimum set in the section 111(d) guideline. To do this, the states would establish strict caps limiting the use of offsets, so as to ensure that sectoral reductions in a particular state are not undermined by offsets in the system. States might find this to be a reasonable trade-off if they decided that they would like to achieve reductions above and beyond those achieved by EPA (e.g., those states with ambitious economy-wide reduction targets) and/or if they have stakeholders very interested in participating in the offsets market.

C. International Trading

1. Issue

Thus far, trading between jurisdictions has been an integral part of the cap-and-trade design for air pollutants. Trading between states with 111(d) compliant programs is relatively straightforward and should not present any challenges. But both the Midwestern Accord and the Western Climate Initiative have Canadian members, and in such a linked trading regime, it is impossible to predict where the reductions will take place. That is, the location of the reductions will be driven by market forces and will occur wherever they are cheapest. This means that a linked program could achieve greater emissions reductions in the Canadian provinces than in the U.S. states (or the reverse).

2. Section 111

Section 111 says nothing about obtaining reductions from international sources and using those reductions to offset compliance obligations under section 111(d). The international trading issue is similar to the scope and the offsets issue insofar as the reductions from international facilities covered by a cap are considered to be reductions achieved at facilities not regulated under section 111(d). Therefore, it is unlikely that they could count toward the reductions required by section 111(d) regulated sources. That is, these reductions will be made outside the categories of sources regulated under section 111.

3. Possible Solution

As with offsets, if the states can show that the allowances provide reductions above and beyond the federally required minimum reductions, international allowances might be used in the state-level cap-and-trade programs under section 111(d). Similarly, this may require the states to show that in an internationally linked cap-and-trade program, the reductions at the domestically located sources within the regulated category will equal or exceed those expected through EPA's guideline.

The challenge here is that it is impossible to predict certainly and precisely where market forces will drive reductions. The states could address this issue in one of three ways. First, they could adopt trading limits. This approach was proposed in EPA's Transport Rule. Second, the states could adopt parallel source performance standards. If those standards are stringent enough to ensure that EPA's targets will be met, then they probably would undermine the efficiency gains provided by market-based cap-and-trade programs. The third and most appealing option would be to allow states to include a program review in their cap-and-trade rules that requires periodic review and revisions if in-state reductions fell below those required by NSPS. This would enable states to allow more

flexibility in their cap-and-trade systems, but step in where needed. This process is described in section IV.F.

4. Other Considerations: The Constitutional Issue

Another issue posed by internationally linked programs is whether the "link" constitutes an "agreement or compact" with a foreign power that Congress must approve under Article I, Section 1, of the United States Constitution.

Avoiding the creation of an "agreement or compact" that would run afoul of the U.S. Constitution is perhaps an easier challenge to confront than section 111. First, there is no need for any "agreement or compact" to link trading programs. Instead, the trading programs could be linked through the unilateral recognition of one system's allowances by another system. For example, the province of Quebec could allow its sources to supply RGGI allowances for compliance purposes. Because Quebec entities may obtain those allowances on the open market, there is no need for involvement by the U.S. state entity. Similarly, the U.S. states could unilaterally recognize the allowances of a Canadian province without the need for an agreement.

Each RGGI state allows its sources to use other states' allowances for compliance. There is no binding agreement that requires states to accept one another's allowances, and no penalties can be assessed against a member state if it leaves the program. The risk that a member state's jurisdiction would leave is low, however, since it would create havoc for those of its regulated entities that invested in allowances and emissions abatement. The member state also would likely have a mixture of allowances from other states and would have no guarantee that the other states would take them back after its jurisdiction pulled out.

Put in another way, these arrangements probably do not violate international law because they do not constitute binding agreements on both parties: the Vienna Convention on the Law of Treaties recognizes as treaties only those instruments that impose actual obligations: "Every treaty in force is binding upon the parties to it and must be performed by them."[68] WCI does not require this commitment, and so it does not count as a treaty and is not precluded under international law. Instead, the question is whether the domestic constitutions allow such state actions.[69] In the United States, the states are generally allowed to enter into compacts or agreements only with the consent of Congress.[70] The Supreme Court has held, however, that interstate compacts do not require congressional consent so long as they do not "increase . . . political power in the States, which may encroach upon or interfere with the just supremacy of the United States."[71] In recent academic and judicial activity, this ruling has been expanded to apply to foreign relations: "agreements involving local transborder issues, such as agreements to curb a source of pollution . . . have been considered not to require Congressional consent."[72]

In this context, it seems likely that a voluntary international compact between subnational entities to coordinate in reducing greenhouse gases would constitute an agreement "to curb a source of pollution" that has been upheld, even in the absence of congressional approval.

68. Vienna Convention on the Law of Treaties, May 23, 1969, 1155 U.N.T.S 331, Art. 26.

69. International Law Commission, Draft Articles on the Law of Treaties, in United Nations Conference on the Law of Treaties, First and Second Sessions, Vienna, 26 March– 24 May 1968 and 9 April–22 May 1969, Art. 5(2).

70. Raymond S. Rodgers, The Capacity of States of the Union to Conclude International Agreements: The Background and Some Recent Developments, *American Journal of International Law* 61 (1967):1021.

71. Curtis A. Bradley, The Treaty Power and American Federalism, *Michigan Law Review* 97 (1998):390, 461 (quoting Virginia v. Tennessee, 148 U.S. 503, 519 (1893)).

72. Restatement (Third), see 42 U.S.C. section 4211(b), § 302. There also are cases that have approved certain compacts or agreements between subnational entities and foreign entities without congressional approval. For example,, see In re Manuel P., 263 Cal. Rptr. 447, 459 (1989) (allowing San Diego agreement to share juvenile offenders' information with Mexico); McHenry County v. Brady, 163 N.W. 540, 544–47 (N.D. 1917) (confirming the legality of a county agreement with a Canadian town to build a drainage ditch).

D. Borrowing, Banking, and Compliance Periods

1. Issue

All three regional programs provide for the unlimited banking of allowances and a three-year compliance period. Under the Midwestern Accord, allowances may be borrowed from future compliance periods. In addition, greater flexibility in the timing of the reductions can make the program more efficient, allowing for greater reductions at a lower cost. This holds as long as the temporal flexibility does not jeopardize the program's integrity. The reason is that these temporal flexibility mechanisms make it less certain that the emissions reductions from the cap-and-trade program will be equal to or greater than the federal minimum in any given year.

2. Section 111

Section 111 also says nothing about the use of mechanisms that might have the effect of front-loading or deferring emissions reductions. The EPA regulations implementing section 111(d) do, however, refer to "compliance times," stating that compliance times in a state plan to cover existing sources must be no later than those contained in the federal guideline.[73]

EPA's design choices provide some indication of the design choices that it believed were appropriate in this context. For example, the CAMR cap-and-trade program included unlimited banking, and EPA also proposed a borrowing mechanism tied to an allowance trigger price. When the allowance prices rose to the trigger, the mechanism would allow the compliance entities to buy allowances for future compliance periods, that is, borrow allowances from the future to reduce the price of allowances in the present. Although EPA ultimately did not include this borrowing mechanism in the final CAMR rule, it nevertheless concluded that it did have the authority to include such a mechanism in the preamble to the final CAMR rule.[74]

3. Possible Solutions

The fact that EPA included unlimited banking in the CAMR cap-and-trade rule suggests it believes that banking is permitted under section 111(d). This makes sense, for the states are required to achieve reductions no later than the federal program would have, so advance compliance should not be a problem here.

Nonetheless, although banking encourages over-compliance in the early years, borrowing enables regulated entities to delay compliance. Borrowing is a feature limited to the Midwestern Greenhouse Gas Reduction Accord, although the multi-year compliance periods in all three regional programs could be regarded as providing limited borrowing within the time period covered by the compliance period. The borrowing provisions in the Midwestern Accord require the "payment" of interest on borrowed allowances. Therefore, while borrowing does delay compliance, it also can lead to greater reductions in later years as long as its use is limited. If there is too much borrowing, the higher reductions required in future years could drive up allowance prices in a way that would change the nature of the program. Specifically, the Midwestern Accord, however, contains embedded price triggers that, if reached, would lead to a reduction in the interest rate, the expanded use of offsets, and possibly a release of allowances from the strategic reserve.

One solution to this challenge is that in its guideline under section 111(d), EPA could specify that its interpretation of the statute allows multi-year compliance periods, banking, and limited borrowing. The guideline also could clarify any constraints that the agency believes are necessary to impose on borrowing allowances. Such provisions are consistent with EPA's approach in the proposed CAMR rule.[75]

E. Cost-Containment Mechanisms

1. Issue

All three regional programs have some form of cost-containment mechanism designed to hold down prices deemed to be too high while at the same time preserving the

73. 40 CFR §60.24(c).

74. 70 Fed. Reg. 28606, 28630 (May 18, 2005).

75. Ibid.

program's emissions reduction goals. This is done through allowance price triggers that modify features such as limits on offsets, length of compliance period, and borrowing or, for the Midwestern Accord, by releasing allowances from a strategic reserve filled with allowances set aside from the cap. This mechanism permits the states to have a more ambitious program design than they could have without these provisions.

2. Section 111

The framework of section 111(d) suggests that the given reductions must take place in the relevant sector. Although section 111(d) does not specify the timing of those reductions—other than the requirement that EPA revise the new source performance standards every eight years—EPA has included the concept of "compliance times" in the rules implementing section 111(d). Thus, 40 CFR section 60.24(c) requires that the compliance times proposed by the states in their plans to implement 111(d) must achieve the reductions at least as soon as the federal guidelines would achieve them.

3. Possible Solutions

States will need to demonstrate that their cost-containment mechanisms will not prevent achievement of the emissions reductions requirements, and thus do not undermine the emissions cap. When deciding where to set the emissions standard, EPA must "take into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy requirements." Accordingly, the determination of what costs are reasonable and what are excessive is firmly embedded in section 111. If a state can show that its price triggers will take effect only at prices at or above those that EPA already has determined to be unreasonable, it will have a strong case that those triggers are consistent with the statute. This reading also is consistent with the proposed safety valve provision in the proposed CAMR rule.[76] Although EPA decided that the safety valve mechanism was not necessary to control costs in the CAMR rule, it could reach a different conclusion for greenhouse gases. But if a state were experiencing long-term price inflation and were continuing to rely on cost-containment provisions, EPA could decide whether the state's particular cap-and-trade program was, in fact, the best system of compliance and thus whether certain design elements were preventing the state from reaching the appropriate level of reductions.

F. Process

The states could make the case for these design features when making their submission under section 111(d). The preferable way, however, for states to implement cap-and-trade programs with these design elements would be for EPA to explicitly allow these features in its guidelines. This would clarify the process for the states and permit the more targeted engagement of stakeholders as well as the more rapid adoption of emissions standards.

If a state's adoption of certain design features requires a periodic review to ensure that they do not violate the requirements of section 111, the state's mechanism for periodic review must necessarily include automatic adjustments to ensure that the minimum federal reductions are achieved.

V. IF EPA FAILS TO ACT: THE RIGHT TO PETITION UNDER SECTION 111(G)

EPA has announced that it is moving forward with greenhouse gas standards of performance for power plants and refineries. If EPA fails to act on any of the other categories of sources, state governors have the authority under section 111(g) to petition EPA to force it to act. Under section 111(g), a state may argue that EPA should have included a category of sources that was not included or that standards of performance should have been issued for a specific pollutant for an already listed category of sources.

EPA has significant discretion in how it pursues regulation under section 111. Although many categories of stationary greenhouse gas emitters already have been listed among the source categories triggering the section 111(b) endan-

76. Ibid.

germent finding, the statute expressly provides that EPA may distinguish among subcategories, classes, or types of sources within each category. This indicates that the agency has broad discretion in regulating a category once it has been listed. This discretion notwithstanding, governors have the right to question EPA's decision not to list a particular category or not to promulgate emissions standards.

Several issues will arise if EPA chooses not to act but the state's petitions under 111(g) are successful. Nonetheless,

- A reluctant EPA will be slower to act, and court proceedings will require time to achieve a result.
- Because the use of cap and trade under section 111 is not yet settled law, which cap-and-trade design elements will be allowed is uncertain. Given that the courts will give deference to EPA's interpretation of the Clean Air Act, EPA can help those states pursuing cap and trade by interpreting the Clean Air Act in a way consistent with the states' proposed plans under section 111(d).

VI. CONCLUSION: A POTENTIAL PATH FORWARD FOR THE STATES AND EPA

EPA has announced that it will begin regulating power plants and refineries under section 111 of the Clean Air Act. The agency will issue final mandatory guidelines to the states for power plants in May 2012 and for refineries in November 2012. The states then will be required to submit a plan to regulate existing power plants and refineries to EPA for approval. After lengthy processes that included their key stakeholders, many states already designed and implemented cap-and-trade programs to reduce greenhouse gas emissions from existing power plants and other facilities.

A number of states have already begun asking EPA to have their current programs qualify under section 111 of the Act. Those states proposing to implement cap and trade under section 111(d) are likely to be able to do so given the flexibility inherent in the Clean Air Act. EPA has an important oversight role and will decide what types of regulatory mechanisms will be listed in the federal guidelines and/or approved in the state plans under section 111(d). Courts are likely to give EPA's interpretation of the statute deference, because the Act is mostly silent or at least ambiguous on cap-and-trade design questions.

Box 6 | **Section 111(g) Revision of regulations**

(1) Upon application by the Governor of a State showing that the Administrator has failed to specify in regulations under subsection (f)(1) of this section any category of major stationary sources required to be specified under such regulations, the Administrator shall revise such regulations to specify any such category.

(2) Upon application of the Governor of a State, showing that any category of stationary sources which is not included in the list under subsection (b)(1)(A) of this section contributes significantly to air pollution which may reasonably be anticipated to endanger public health or welfare (notwithstanding that such category is not a category of major stationary sources), the Administrator shall revise such regulations to specify such category of stationary sources.

When states propose using their cap-and-trade programs for compliance with EPA's guidelines under section 111(d), the following considerations will be important:

- The states' case will be bolstered if EPA expressly lists emissions trading as a demonstrated "system of emission reduction" when it issues its mandatory guidelines under section 111(d).
- If EPA's focus in determining whether a state's plan is as stringent as the federal guidelines is on emissions reductions, then certain features of state cap-and-trade programs are more likely to pass muster, such as trading across sectors and international linking. If a state's proposed plan would reduce emissions by as many or more tons as the federal guidelines would, then the plan should be regarded as having equal or greater stringency.

- EPA could interpret the provisions of section 111(d) and its implementing regulations to allow for flexibility when that flexibility reduces costs while preserving the program's environmental integrity. This flexibility could include temporal flexibility, international trading, price triggers, and limited offsets.

In the past, both EPA and the states have implemented section 111 by establishing source-specific emissions standards, thereby making it a legally "safe" path forward. But given the years of engagement with stakeholders and the time and effort spent designing successful cap-and-trade mechanisms, many states can be expected to want to follow a different path and to use these emissions trading programs to meet federal requirements and, in some cases, to go beyond those requirements. Our analysis suggests that this should be permitted under section 111 of the Clean Air Act.

APPENDIX A

Full Text of Section 111 of the Clean Air Act

§ 7411. Standards of performance for new stationary sources

(a) Definitions

For purposes of this section:

(1) The term "standard of performance" means a standard for emissions of air pollutants which reflects the degree of emission limitation achievable through the 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.

(2) The term "new source" means any stationary source, the construction or modification of which is commenced after the publication of regulations (or, if earlier, proposed regulations) prescribing a standard of performance under this section which will be applicable to such source.

(3) The term "stationary source" means any building, structure, facility, or installation which emits or may emit any air pollutant. Nothing in subchapter II of this chapter relating to nonroad engines shall be construed to apply to stationary internal combustion engines.

(4) The term "modification" means any physical change in, or change in the method of operation of, a stationary source which increases the amount of any air pollutant emitted by such source or which results in the emission of any air pollutant not previously emitted.

(5) The term "owner or operator" means any person who owns, leases, operates, controls, or supervises a stationary source.

(6) The term "existing source" means any stationary source other than a new source.

(7) The term "technological system of continuous emission reduction" means—

(A) a technological process for production or operation by any source which is inherently low-polluting or nonpolluting, or

(B) a technological system for continuous reduction of the pollution generated by a source before such pollution is emitted into the ambient air, including precombustion cleaning or treatment of fuels.

(8) A conversion to coal

(A) by reason of an order under section 2(a) of the Energy Supply and Environmental Coordination Act of 1974 [15 U.S.C. 792(a)] or any amendment thereto, or any subsequent enactment which supersedes such Act [15 U.S.C. 791 et seq.], or

(B) which qualifies under section 7413 (d)(5)(A)(ii) [1] of this title, shall not be deemed to be a modification for purposes of paragraphs (2) and (4) of this subsection.

(b) List of categories of stationary sources; standards of performance; information on pollution control techniques; sources owned or operated by United States; particular systems; revised standards

(1)

(A) The Administrator shall, within 90 days after December 31, 1970, publish (and from time to time thereafter shall revise) a list of categories of stationary sources. He shall include a category of sources in such list if in his judgment it causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare.

(B) Within one year after the inclusion of a category of stationary sources in a list under subparagraph (A), the Administrator shall publish proposed regulations, establishing Federal standards of performance for new sources within such category. The Administrator shall afford interested persons an opportunity for written comment on such proposed regulations. After considering such comments, he shall promulgate, within one year after such publication, such standards with such modifications as he deems appropriate. The Administrator shall, at least every 8 years, review and, if appropriate, revise such standards following

the procedure required by this subsection for promulgation of such standards. Notwithstanding the requirements of the previous sentence, the Administrator need not review any such standard if the Administrator determines that such review is not appropriate in light of readily available information on the efficacy of such standard. Standards of performance or revisions thereof shall become effective upon promulgation. When implementation and enforcement of any requirement of this chapter indicate that emission limitations and percent reductions beyond those required by the standards promulgated under this section are achieved in practice, the Administrator shall, when revising standards promulgated under this section, consider the emission limitations and percent reductions achieved in practice.

(2) The Administrator may distinguish among classes, types, and sizes within categories of new sources for the purpose of establishing such standards.

(3) The Administrator shall, from time to time, issue information on pollution control techniques for categories of new sources and air pollutants subject to the provisions of this section.

(4) The provisions of this section shall apply to any new source owned or operated by the United States.

(5) Except as otherwise authorized under subsection (h) of this section, nothing in this section shall be construed to require, or to authorize the Administrator to require, any new or modified source to install and operate any particular technological system of continuous emission reduction to comply with any new source standard of performance.

(6) The revised standards of performance required by enactment of subsection (a)(1)(A)(i) and (ii) [1] of this section shall be promulgated not later than one year after August 7, 1977. Any new or modified fossil fuel fired stationary source which commences construction prior to the date of publication of the proposed revised standards shall not be required to comply with such revised standards.

(c) State implementation and enforcement of standards of performance

(1) Each State may develop and submit to the Administrator a procedure for implementing and enforcing standards of performance for new sources located in such State. If the Administrator finds the State procedure is adequate, he shall delegate to such State any authority he has under this chapter to implement and enforce such standards.

(2) Nothing in this subsection shall prohibit the Administrator from enforcing any applicable standard of performance under this section.

(d) Standards of performance for existing sources; remaining useful life of source

(1) The Administrator shall prescribe regulations which shall establish a procedure similar to that provided by section 7410 of this title under which each State shall submit to the Administrator a plan which

(A) establishes standards of performance for any existing source for any air pollutant

(i) for which air quality criteria have not been issued or which is not included on a list published under section 7408 (a) of this title or emitted from a source category which is regulated under section 7412 of this title but

(ii) to which a standard of performance under this section would apply if such existing source were a new source, and

(B) provides for the implementation and enforcement of such standards of performance. Regulations of the Administrator under this paragraph shall permit the State in applying a standard of performance to any particular source under a plan submitted under this paragraph to take into consideration, among other factors, the remaining useful life of the existing source to which such standard applies.

(2) The Administrator shall have the same authority—

(A) to prescribe a plan for a State in cases where the State fails to submit a satisfactory plan as he would have under section7410 (c) of this title in the case of failure to submit an implementation plan, and

(B) to enforce the provisions of such plan in cases where the State fails to enforce them as he would have under sections 7413 and 7414 of this title with respect to an implementation plan. In promulgating a standard of performance under a plan prescribed under this paragraph, the Administrator shall take into consideration, among other factors, remaining useful lives of the sources in the category of sources to which such standard applies.

(e) Prohibited acts

After the effective date of standards of performance promulgated under this section, it shall be unlawful for any owner or operator of any new source to operate such source in violation of any standard of performance applicable to such source.

(f) New source standards of performance

(1) For those categories of major stationary sources that the Administrator listed under subsection (b)(1)(A) of this section before November 15, 1990, and for which regulations had not been proposed by the Administrator by November 15, 1990, the Administrator shall—

(A) propose regulations establishing standards of performance for at least 25 percent of such categories of sources within 2 years after November 15, 1990;

(B) propose regulations establishing standards of performance for at least 50 percent of such categories of sources within 4 years after November 15, 1990; and

(C) propose regulations for the remaining categories of sources within 6 years after November 15, 1990.

(2) In determining priorities for promulgating standards for categories of major stationary sources for the purpose of paragraph (1), the Administrator shall consider—

(A) the quantity of air pollutant emissions which each such category will emit, or will be designed to emit;

(B) the extent to which each such pollutant may reasonably be anticipated to endanger public health or welfare; and

(C) the mobility and competitive nature of each such category of sources and the consequent need for nationally applicable new source standards of performance.

(3) Before promulgating any regulations under this subsection or listing any category of major stationary sources as required under this subsection, the Administrator shall consult with appropriate representatives of the Governors and of State air pollution control agencies.

(g) Revision of regulations

(1) Upon application by the Governor of a State showing that the Administrator has failed to specify in regulations under subsection(f)(1) of this section any category of major stationary sources required to be specified under such regulations, the Administrator shall revise such regulations to specify any such category.

(2) Upon application of the Governor of a State, showing that any category of stationary sources which is not included in the list under subsection (b)(1)(A) of this section contributes significantly to air pollution which may reasonably be anticipated to endanger public health or welfare (notwithstanding that such category is not a category of major stationary sources), the Administrator shall revise such regulations to specify such category of stationary sources.

(3) Upon application of the Governor of a State showing that the Administrator has failed to apply properly the criteria required to be considered under subsection (f)(2) of this section, the Administrator shall revise the list under subsection (b)(1)(A) of this section to apply properly such criteria.

(4) Upon application of the Governor of a State showing that—

(A) a new, innovative, or improved technology or process which achieves greater continuous emission reduction has been adequately demonstrated for any category of stationary sources, and

(B) as a result of such technology or process, the new source standard of performance in effect under this section for such category no longer reflects the greatest degree of emission limitation achievable through application of the best technological

system of continuous emission reduction which (taking into consideration the cost of achieving such emission reduction, and any non-air quality health and environmental impact and energy requirements) has been adequately demonstrated, the Administrator shall revise such standard of performance for such category accordingly.

(5) Unless later deadlines for action of the Administrator are otherwise prescribed under this section, the Administrator shall, not later than three months following the date of receipt of any application by a Governor of a State, either—

(A) find that such application does not contain the requisite showing and deny such application, or

(B) grant such application and take the action required under this subsection.

(6) Before taking any action required by subsection (f) of this section or by this subsection, the Administrator shall provide notice and opportunity for public hearing.

(h) Design, equipment, work practice, or operational standard; alternative emission limitation

(1) For purposes of this section, if in the judgment of the Administrator, it is not feasible to prescribe or enforce a standard of performance, he may instead promulgate a design, equipment, work practice, or operational standard, or combination thereof, which reflects the best technological system of continuous emission reduction which (taking into consideration the cost of achieving such emission reduction, and any non-air quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated. In the event the Administrator promulgates a design or equipment standard under this subsection, he shall include as part of such standard such requirements as will assure the proper operation and maintenance of any such element of design or equipment.

(2) For the purpose of this subsection, the phrase "not feasible to prescribe or enforce a standard of performance" means any situation in which the Administrator determines that

(A) a pollutant or pollutants cannot be emitted through a conveyance designed and constructed to emit or capture such pollutant, or that any requirement for, or use of, such a conveyance would be inconsistent with any Federal, State, or local law, or

(B) the application of measurement methodology to a particular class of sources is not practicable due to technological or economic limitations.

(3) If after notice and opportunity for public hearing, any person establishes to the satisfaction of the Administrator that an alternative means of emission limitation will achieve a reduction in emissions of any air pollutant at least equivalent to the reduction in emissions of such air pollutant achieved under the requirements of paragraph (1), the Administrator shall permit the use of such alternative by the source for purposes of compliance with this section with respect to such pollutant.

(4) Any standard promulgated under paragraph (1) shall be promulgated in terms of standard of performance whenever it becomes feasible to promulgate and enforce such standard in such terms.

(5) Any design, equipment, work practice, or operational standard, or any combination thereof, described in this subsection shall be treated as a standard of performance for purposes of the provisions of this chapter (other than the provisions of subsection (a) of this section and this subsection).

(i) Country elevators

Any regulations promulgated by the Administrator under this section applicable to grain elevators shall not apply to country elevators (as defined by the Administrator) which have a storage capacity of less than two million five hundred thousand bushels.

(j) Innovative technological systems of continuous emission reduction

(1)

(A) Any person proposing to own or operate a new source may request the Administrator for one or more waivers from the requirements of this section for such source or any portion thereof with respect to any air pollutant to encourage the use of an innovative technological system or systems of continuous emission reduction. The Administrator

may, with the consent of the Governor of the State in which the source is to be located, grant a waiver under this paragraph, if the Administrator determines after notice and opportunity for public hearing, that—

(i) the proposed system or systems have not been adequately demonstrated,

(ii) the proposed system or systems will operate effectively and there is a substantial likelihood that such system or systems will achieve greater continuous emission reduction than that required to be achieved under the standards of performance which would otherwise apply, or achieve at least an equivalent reduction at lower cost in terms of energy, economic, or nonair quality environmental impact,

(iii) the owner or operator of the proposed source has demonstrated to the satisfaction of the Administrator that the proposed system will not cause or contribute to an unreasonable risk to public health, welfare, or safety in its operation, function, or malfunction, and

(iv) the granting of such waiver is consistent with the requirements of subparagraph (C).

In making any determination under clause (ii), the Administrator shall take into account any previous failure of such system or systems to operate effectively or to meet any requirement of the new source performance standards. In determining whether an unreasonable risk exists under clause (iii), the Administrator shall consider, among other factors, whether and to what extent the use of the proposed technological system will cause, increase, reduce, or eliminate emissions of any unregulated pollutants; available methods for reducing or eliminating any risk to public health, welfare, or safety which may be associated with the use of such system; and the availability of other technological systems which may be used to conform to standards under this section without causing or contributing to such unreasonable risk. The Administrator may conduct such tests and may require the owner or operator of the proposed source to conduct such tests and provide such information as is necessary to carry out clause (iii) of this subparagraph. Such requirements shall include a requirement for prompt reporting of the emission of any unregulated pollutant from a system if such pollutant was not emitted, or was emitted in significantly lesser amounts without use of such system.

(B) A waiver under this paragraph shall be granted on such terms and conditions as the Administrator determines to be necessary to assure—

(i) emissions from the source will not prevent attainment and maintenance of any national ambient air quality standards, and

(ii) proper functioning of the technological system or systems authorized. Any such term or condition shall be treated as a standard of performance for the purposes of subsection (e) of this section and section 7413 of this title.

(C) The number of waivers granted under this paragraph with respect to a proposed technological system of continuous emission reduction shall not exceed such number as the Administrator finds necessary to ascertain whether or not such system will achieve the conditions specified in clauses (ii) and (iii) of subparagraph (A).

(D) A waiver under this paragraph shall extend to the sooner of—

(i) the date determined by the Administrator, after consultation with the owner or operator of the source, taking into consideration the design, installation, and capital cost of the technological system or systems being used, or

(ii) the date on which the Administrator determines that such system has failed to—

(I) achieve at least an equivalent continuous emission reduction to that required to be achieved under the standards of performance which would otherwise apply, or

(II) comply with the condition specified in paragraph (1)(A)(iii), and that such failure cannot be corrected.

(E) In carrying out subparagraph (D)(i), the Administrator shall not permit any waiver for a source or portion thereof to extend beyond the date—

(i) seven years after the date on which any waiver is granted to such source or portion thereof, or

(ii) four years after the date on which such source or portion thereof commences operation, whichever is earlier.

(F) No waiver under this subsection shall apply to any portion of a source other than the portion on which the innovative technological system or systems of continuous emission reduction is used.

(2)

(A) If a waiver under paragraph (1) is terminated under clause (ii) of paragraph (1)(D), the Administrator shall grant an extension of the requirements of this section for such source for such minimum period as may be necessary to comply with the applicable standard of performance under this section. Such period shall not extend beyond the date three years from the time such waiver is terminated.

(B) An extension granted under this paragraph shall set forth emission limits and a compliance schedule containing increments of progress which require compliance with the applicable standards of performance as expeditiously as practicable and include such measures as are necessary and practicable in the interim to minimize emissions. Such schedule shall be treated as a standard of performance for purposes of subsection (e) of this section and section 7413 of this title.

ABOUT THE AUTHORS

Franz T. Litz leads WRI's efforts to engage federal agencies on climate change regulatory matters, and is also active in WRI's work at the state and regional levels in North America. He has advised the major regional climate change initiatives in the United States and Canada, as well as a number of individual states. Before his work at WRI, Franz led the climate change efforts of the New York State environmental agency, where he was instrumental in the design and creation of the Regional Greenhouse Gas Initiative. Franz is a lawyer and previously spent a number of years in private practice in Boston, Massachusetts.
Contact: franz@wri.org

Nicholas M. Bianco leads the World Resources Institute's state and regional climate change efforts and plays an active role in WRI's work with federal agencies in the United States, including the U.S. Environmental Protection Agency and Department of Agriculture, among others. Before coming to WRI, Nicholas was engaged in climate change regulatory work with the Massachusetts Department of Environmental Protection.
Contact: nbianco@wri.org

Michael B. Gerrard is Andrew Sabin Professor of Professional Practice and Director of the Center for Climate Change Law at Columbia Law School. He practiced environmental law in New York full-time between 1979 and 2008. He formerly chaired the Section on Environment, Energy and Resources of the American Bar Association.
Contact: michael.gerrard@law.columbia.edu

Gregory E. Wannier is a Post-Doctoral Research Scholar and Deputy Director of the Center for Climate Change Law (CCCL) at Columbia Law School. He received his joint J.D./M.S. in Environment and Energy Studies from Stanford Law School, and the E-IPER program at Stanford University, School of Earth Sciences.
Contact: gregory.wannier@law.columbia.edu

ABOUT WRI

The World Resources Institute is a global environmental think tank that goes beyond research to put ideas into action. We work with governments, companies, and civil society to build solutions to urgent environmental challenges. WRI's transformative ideas protect the earth and promote development because sustainability is essential to meeting human needs and fulfilling human aspirations in the future.

ABOUT THE CENTER FOR CLIMATE CHANGE LAW

The Center for Climate Change Law at Columbia Law School analyzes and develops legal techniques to fight climate change; compiles and publishes information about legislative, regulatory and judicial developments; and convenes and trains legal scholars, lawyers and government officials.

World Resources Institute Working Papers contain preliminary research, analysis, findings, and recommendations. They are circulated to stimulate timely discussion and critical feedback and to influence ongoing debate on emerging issues. Most working papers are eventually published in another form and their content may be revised.

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