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Using Section 111 of the Clean Air Act for Cap-and-Trade of Greenhouse Gas Emissions: Obstacles and Solutions

*M. Rhead Enion**

ABSTRACT

The Environmental Protection Agency (EPA) is moving forward with regulation of greenhouse gases under section 111 of the Clean Air Act. The next step could be creating a cap and trade system for the electrical utility industry using “standard of performance” as the statutory foundation. Past litigation on EPA’s proposed mercury cap-and-trade program provides insights about potential challenges to a carbon-trading program. This article describes those insights and discusses how EPA could set a national cap by defining a standard of performance for greenhouse gas emissions and then allow regulated facilities to use allowances to cover their greenhouse gas emissions. This article also looks to the specifics of the proposed California cap-and-trade program in order to demonstrate how EPA could allow states to use their participation in regional cap-and-trade programs to comply with section 111(d) requirements for existing sources.

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I.

INTRODUCTION

Starting in January 2011, Environmental Protection Agency (EPA) began regulating large stationary source emissions of greenhouse gases (GHGs). First, EPA is implementing regulations for power plants and industrial facilities under the Prevention of Significant Deterioration (PSD) and Title V permitting programs.¹ Second, EPA will regulate power plant and refinery emissions using new source performance standards (NSPS) set forth under section 111 of the Clean Air Act (CAA).² All of these regulations face numerous challenges in the courts.³

On December 23, 2010, EPA announced a schedule to develop rules regulating GHG emissions from refineries and power plants under NSPS.⁴ Electricity generation represents thirty-four percent of overall U.S. emissions; petroleum refineries make up another 7.3 percent.⁵ Originally, EPA's draft standards for new and modified power plants were due by July 2011, with final standards to be issued by May 2012.⁶ The refineries' standards lagged

1. BROOKS RAINEY PEARSON & JONAS MONAST, NICHOLAS INST. FOR ENVTL. POLICY SOLUTIONS, PRIMER ON GHG REGULATION UNDER THE CLEAN AIR ACT 1, available at <http://nicholasinstitute.duke.edu/climate/policydesign/primer-on-ghg-regulation-under-the-clean-air-act>.

2. *Id.*; Clean Air Act § 111(f), 42 U.S.C. § 7411(f) (2006).

3. See, e.g., GREGORY E. WANNIER, COLUMBIA LAW SCH., CTR. FOR CLIMATE CHANGE, EPA'S IMPENDING GREENHOUSE GAS REGULATIONS: DIGGING THROUGH THE MORASS OF LITIGATION 6 (2010), available at <http://blogs.law.columbia.edu/climatechange/2010/11/24/white-paper-epas-impending-greenhouse-gas-regulations-digging-through-the-morass-of-litigation/> (noting that as of November 2010, thirty five petitioners filed eighty distinct claims attacking the foundation of EPA's GHG regulations).

4. Scott H. Segal, *New Source Performance Standards for Global Greenhouse Gas Emissions from the Power and Refining Sectors: Wrong Mechanism at the Wrong Time*, 41 ENVTL. L. REP. NEWS & ANALYSIS 10312, 10312 (2011).

5. Teresa B. Clemmer, *Staving Off the Climate Crisis: The Sectoral Approach Under the Clean Air Act*, 40 ENVTL. L. 1125, 1148 (2010).

6. Franz T. Litz et al., *What's Ahead for Power Plants and Industry? Using the Clean Air Act to Reduce Greenhouse Gas Emissions, Building on Existing Regional Programs 1* (Feb. 2011) (unpublished manuscript) (on file with the World Resources Institute).

behind that timeline by about six months.⁷ In June 2011, however, EPA stated that it would delay its proposed new rules for power plants until September 2011.⁸ As of March 2012, the proposed rules are set to be published in April 2012.⁹

Many have proposed a variety of cap-and-trade schemes that would provide flexibility to the energy sector in achieving required emission decreases, while still imposing a useful cap on total U.S. GHG emissions from the sector.¹⁰ As McKinstry comments:

Regulating emissions in the utility sector from petroleum refineries can be seen as a “no regrets” first step in making a transition to economywide regulation of GHGs that will eventually be necessary to prevent dangerous anthropogenic climate change. Regulating the utility industry will assist the industry in its transition to a modern energy economy, while addressing the serious problems of climate change.¹¹

Furthermore, state experiences suggest that measures to regulate GHG emissions from utilities can be cost-effective.¹²

7. *Id.* at 1–2.

8. Jennifer A. Smokelin, Reed Smith LLP, *USEPA delays proposed greenhouse gas emissions rule for power plants*, LEXOLOGY (June 16, 2011), <http://www.lexology.com/library/detail.aspx?g=3932da90-d920-494a-bc20-a6e1d46f0db9>.

9. Greenhouse Gas New Source Performance Standard for Electric Generating Units—Reg DaRRT, ENVTL. PROT. AGENCY, http://yosemite.epa.gov/op_ei/RuleGate.nsf/byRIN/2060-AQ91 (last updated Mar. 17, 2012).

10. See, e.g., Nathan Richardson et al., *Greenhouse Gas Regulation Under the Clean Air Act: Structure, Effects, and Implications of a Knowable Pathway*, 41 ENVTL. L. REP. NEWS & ANALYSIS 10,098, 10,098 (Feb. 2011); Jonas Monast et al., *Avoiding the Glorious Mess: A Sensible Approach to Climate Change and the Clean Air Act 1–14* (Oct. 2010) (unpublished manuscript) (on file with the Nicholas Institute for Environmental Policy Solutions); Timothy J. Mullins & M. Rhead Enion, *(If) Things Fall Apart: Searching for Optimal Regulatory Solutions to Combating Climate Change Under Title 1 of the Existing CAA if Congressional Action Fails*, 40 ENVTL. L. REP. 10864, 10,868–86 (2010); Hannah Chang, *Cap-and-Trade Under the Clean Air Act?: Rethinking Section 115*, 40 ENVTL. L. REP. NEWS & ANALYSIS 10894, 10,901–04 (2010); David M. Driesen, *Capping Carbon*, 40 ENVTL. L.(FORTIETH ANNIVERSARY ISSUE) 1, 1–43 (2010). *But see* Craig N. Oren, *Is the Clean Air Act at a Crossroads*, 40 ENVTL. L. 1231, 1232 (2010) (“The Act is unlikely to be the means to address global climate disruption because the Act’s mechanisms do not fit the problem well. At most, the Act can contribute interstitially.”). See generally GREGORY E. WANNIER ET AL., *PREVAILING ACADEMIC VIEW ON COMPLIANCE FLEXIBILITY UNDER § 111 OF THE CLEAN AIR ACT 1–14* (2011), available at <http://www.law.columbia.edu/centers/climatechange/resources/caa111>.

11. Robert B. McKinstry, Jr., *The Clean Air Act: A Suitable Tool for Addressing the Challenges of Climate Change*, 41 ENVTL. L. REP. NEWS & ANALYSIS 10,301, 10,311 (2011).

12. *Id.* at 10307.

Using section 111 to implement a cap-and-trade program for the energy sector has the potential to drive cost-effective GHG emission reductions. Nor would it be the first time that EPA has used section 111 in this manner. EPA's Clean Air Mercury Rule (CAMR), which created a cap-and-trade system for mercury, was based in section 111.¹³ EPA also runs a narrowly focused nitrogen oxide emissions-trading program for large municipal waste combustors using the NSPS program.¹⁴

Section 111 requires EPA to set standards industry by industry. EPA describes the process by which it develops a standard of performance as follows:

EPA typically conducts a technology review that identifies what emission reduction systems exist and how much they reduce air pollution in practice. This allows EPA to identify potential emission limits. Next, EPA evaluates each limit in conjunction with costs, secondary air benefits (or disbenefits) resulting from energy requirements, and non-air quality impacts such as solid waste generation. The resultant standard is commonly a numerical emissions limit, expressed as a performance level (i.e. a rate-based standard). While such standards are based on the effectiveness of one or more specific technological systems of emissions control, unless certain conditions are met, EPA may not prescribe a particular technological system that must be used to comply with a NSPS. Rather, sources remain free to elect whatever combination of measures will achieve equivalent or greater control of emissions.¹⁵

For new and modified facilities, EPA develops this standard of performance directly. For existing sources, EPA must coordinate emission guidelines with states.¹⁶ States then propose standards of performance for existing sources.

The ability of EPA to consider costs in the development of performance standards helps to make section 111 a viable option for regulating GHG emissions.¹⁷ John Walke, primary author of the Environmental Petitioners' brief in the CAMR litigation, be-

13. In *New Jersey v. Env'tl. Prot. Agency*, 517 F.3d 574, 583 (D.C. Cir. 2008), the D.C. Circuit struck down the CAMR (finding that, because mercury is a hazardous air pollutant regulated under section 112, not section 111, EPA failed to follow proper procedure to remove power plants from the list of regulated sources under section 112).

14. 40 C.F.R. § 60.33 (d) (2010); Monast et al., *supra* note 10, at 11.

15. ENVTL. PROT. AGENCY, BACKGROUND ON ESTABLISHING NEW SOURCE PERFORMANCE STANDARDS (NSPS) UNDER THE CLEAN AIR ACT 2, available at <http://www.epa.gov/airquality/pdfs/111background.pdf>.

16. See, e.g., Segal, *supra* note 4.

17. Monast et al., *supra* note 10, at 7–8.

believes “there is room for progress and success in covering GHGs under the CAA, and section 111 seems to be a pathway that has a lot of support.”¹⁸ The focus on sources in section 111 gives EPA flexibility in how it regulates different sectors of the economy.¹⁹

Nevertheless, several obstacles impede regulation of GHG emissions under section 111. Setting emissions limits sector by sector may be cumbersome. Standards are limited to what is currently achievable and adequately demonstrated, inhibiting EPA’s ability to ratchet down emissions over time.²⁰ Also, not many technological solutions exist to reduce carbon emission at the source of combustion.²¹ If section 111 standards are developed with reference to technological improvements, the resulting standard may be ineffective in obtaining the necessary dramatic GHG reductions required to avert major climate change. The best approach for electric utilities in the near term, for example, may be consumer energy efficiency improvements that decrease peak electricity demand.²² A standard based solely on technological reduction of emissions ignores the potential additional reductions that could be accomplished through other means, such as consumer energy efficiency improvements. A GHG trading program has the potential to impose stricter requirements while providing the necessary flexibility for utilities to achieve these additional reductions.

This paper takes a detailed look at the potential for section 111 to serve as the foundation of a cap-and-trade program. Part II describes the potential benefits of focusing on section 111 for a GHG trading program. Part III looks to the lessons learned from the CAMR litigation. The briefs in that litigation present a challenge to a carbon trading program on two fronts: a factual chal-

18. *Understanding the New Air Pollution Rules*, 41 ENVTL. L. REP. NEWS & ANALYSIS 10079, 10088 (2011) (statement of John Walke).

19. Monast et al., *supra* note 10, at 8.

20. *See, e.g.*, Oren, *supra* note 10, at 1255 (noting that sources must be capable of meeting section 111 standards at their onset, based on what is technologically possible). *But see* Clemmer, *supra* note 5, at 1147–48 (stating “section 111 ‘looks toward what may fairly be projected for the regulated future, rather than the state of the art at present.’” (quoting *Lignite Energy Council v. Env’tl. Prot. Agency*, 198 F.3d 930, 934 (D.C. Cir. 1999) (internal quotations omitted))).

21. *See* Nathan Richardson, *Greenhouse Gas Regulation Under the Clean Air Act: Does Chevron Set the EPA Free?* 35–39 (Resources for the Future Discussion Paper 09-50 December 2009), available at <http://www.rff.org/RFF/Documents/RFF-DP-09-50.pdf> (analyzing GHG emissions and possible reductions in the electricity sector).

22. *But see* Oren, *supra* note 10, at 1257 (observing that energy efficiency will only achieve a one to ten percent reduction over the next five to ten years).

lenge to the strictness of the program and a legal challenge to the idea that allowances can be used as a substitute for actual emission reductions in section 111. Part IV considers how EPA could, if it chooses, implement a GHG trading program through section 111 by defining the standard of performance to encompass the use of emissions allowances to enforce an emissions cap. Part V takes a closer look at section 111(d), which directs states to define standards of performance for existing sources. Using the proposed California cap-and-trade program as an example, Part V discusses how EPA could develop guidelines to allow states to use their regional trading programs as equivalents to section 111(d) plans for existing sources.

II.

BENEFITS OF USING SECTION 111

It is not surprising that EPA has indicated that it will regulate GHG emissions using section 111. Section 111 provides EPA with a strong legal foundation and a robust, established regulatory system. Furthermore, if ordered to regulate GHGs under National Ambient Air Quality Standards (NAAQS), EPA may be able to transition its section 111 regulations into, for example, state implementation plans under section 110.²³

Section 111 requires EPA to promulgate standards of performance for new and modified sources²⁴ in subpart (b), and assist states in promulgating standards of performance for existing sources in subpart (d). The definition of standard of performance breaks down into five elements:

- (i) a standard for emissions of air pollutants
- (ii) which reflects the degree of emission limitation achievable
- (iii) through the application of the best system of emission reduction
- (iv) which (taking into account the cost of achieving such reduction and any non-air quality health and environmental impact and energy requirements)

23. See, e.g., McKinstry, Jr., *supra* note 11, at 10304 (arguing that regulation of GHG emissions under section 111 is a good starting point for EPA because even if EPA is eventually forced to regulate under NAAQS, it still needs “a meaningful set of requirements for both new and existing sources in the utility and petroleum refining sectors”).

24. In this Article, use of the phrase “new sources” will imply inclusion of “modified sources,” as defined in section 111. See Clean Air Act § 111(a)(2), (a)(4), 42 U.S.C. § 7411(a)(2), (a)(4) (2006) (defining “new source” to include sources that have undergone certain modifications).

- (v) the Administrator determines has been adequately demonstrated.²⁵

Section 302(l) also defines “standard of performance” as “a requirement of continuous emission reduction, including any requirement relating to the operation or maintenance of a source to assure continuous emission reduction.”²⁶

Section 111 distinguishes between an emissions standard and the methods of compliance for that standard. EPA must determine a standard of performance that, at the very least, creates a de facto emission limitation for that source.²⁷ For fossil fuel-fired steam generators, for example, EPA requires that particulate matter cannot exceed 43 nanograms per joule (ng/J) heat input;²⁸ in other words, the numerical standard functions as an efficiency requirement based on the amount of energy produced. Besides numerical standards, EPA may also include efficiency and reporting requirements.²⁹ For the steam generators, the standard requires installation, operation, and maintenance of emissions monitoring systems.³⁰

As discussed below, section 111 has several characteristics that make it amenable to the regulation of GHGs using a trading system. It has better legal precedents, and regulation tends to move faster under section 111 than some other sections of the Clean Air Act. EPA can adapt existing permits, regulations, and measurement and enforcement mechanisms used in NSPS to the regulation of GHG emissions. The statutory language supports a program, like GHG trading, that does not mandate specific technological solutions. Section 111 can also accommodate both new and existing sources in a trading program. Finally, in the event that EPA chooses (or is forced through litigation) to regulate GHGs as a criteria pollutant under NAAQS, EPA could transition a section 111 trading program into a section 110 trading program.

25. § 111(a)(1), 42 U.S.C. § 7411(a)(1) (2006).

26. § 302(l), 42 U.S.C. § 7602(l) (2006).

27. See § 111(a)(1), 42 U.S.C. § 7411(a)(1) (2006).

28. 40 C.F.R. § 60.42 (2010).

29. PEARSON & MONAST, *supra* note 1, at 2.

30. 40 C.F.R. § 60.45(c) (2010).

A. *Regulating GHGs under Section 111 Has a Strong Legal Foundation in Comparison to Other Sections of the Clean Air Act*

Section 111 is the “regulatory safety net”³¹ of the Clean Air Act, and as such, is better structured than other sections to relatively quickly implement regulation of GHG emissions.³² Section 112, which regulates hazardous air pollutants (HAPs), is meant to regulate carcinogens and other toxic chemicals.³³ GHGs do not fit this description, and the low emission thresholds and stricter maximum achievable control technology (MACT) requirement³⁴ would make a regulatory scheme for GHGs difficult, if not impossible, to implement.³⁵ Title VI is meant to protect stratospheric ozone, and although GHGs may affect or interact with stratospheric ozone, any such effect is secondary to the broader climate risks of continued GHG emissions.³⁶ NAAQS prohibit consideration of costs in establishing the standard and could result in finding the entire country out of attainment,³⁷ with no practical hope of reaching attainment in the near future for GHG concentration levels.³⁸ Finally, the Supreme Court already started EPA down the path of GHG regulation in *Massachusetts v. EPA* by finding that GHGs can be considered air pollutants under the CAA, which may be sufficient on its own to authorize regulation of existing source categories under section 111.

31. Regulating Greenhouse Gas Emissions Under the Clean Air Act, 73 Fed. Reg. 44,354, 44,418 (proposed July 30, 2008) (to be codified at 40 C.F.R. ch. 1).

32. See, e.g., *id.* at 44,488 (“Actions under other portions of the CAA may involve longer lead times to develop and implement, so that standards under section 111 for certain source categories could provide for emission reductions in the interim.”).

33. Clean Air Act § 112, 42 U.S.C. § 7412 (2006); see Regulating Greenhouse Gas Emissions Under the Clean Air Act, 73 Fed. Reg. at 44,418 (“HAPs include substances which are, or may reasonably be anticipated to be, carcinogenic, mutagenic, neurotoxic or acutely or chronically toxic.”).

34. Regulating Greenhouse Gas Emissions Under the Clean Air Act, 73 Fed. Reg. at 44,418.

35. See, e.g., Richardson et al., *supra* note 10, at 10,107 (“In short, the HAP program is a poor fit for general GHG regulation under the CAA.”).

36. See Regulating Greenhouse Gas Emissions under the Clean Air Act, 73 Fed. Reg. at 44,418.

37. *Id.* at 44,417, 44,498.

38. See, e.g., Richardson et al., *supra* note 10, at 10,106 (noting that NAAQS presents “conceptual and practical problems”).

B. *EPA Has a Robust Regulatory System in Place under Section 111*

In its advanced notice of proposed rulemaking for GHGs,³⁹ EPA noted several important features of the section 111 regulatory system that would assist EPA in establishing GHG regulations. Section 111 provides flexibility in defining the source categories and allows EPA to regulate categories in a step-by-step, piecemeal fashion.⁴⁰ EPA can take cost into account and consider traditional air pollutants in conjunction with GHGs when establishing regulatory standards.⁴¹ EPA has also previously interpreted NSPS to allow emissions trading.⁴² Finally, “EPA has already promulgated NSPS for more than 70 source categories and subcategories and [EPA] could add GHG emission standards, as appropriate, to the standards for existing source categories.”⁴³ Having existing permits, regulations, measurement and enforcement rules in place enables a relatively quick regulatory response to the need to limit emissions of a new pollutant of concern, like GHGs.

C. *Standard of Performance Does Not Depend on a “Technological System”*

Section 111(b)(5) forbids EPA from requiring a new source “to install and operate any particular technological system of continuous emission reduction.”⁴⁴ It is then reasonably clear that EPA cannot mandate specific technological solutions for new sources to comply with emissions limitations.⁴⁵ Thus, once EPA has set an emissions limitation, a given source has a variety of options available to it to achieve compliance. Most industrial sources, tending to be risk-averse, will typically choose, however, to comply through installation of technological solutions that have been

39. Regulating Greenhouse Gas Emissions under the Clean Air Act, 73 Fed. Reg. at 44,354.

40. *Id.* at 44,489; *see also id.* at 44,488 (“In the near term, it may be possible to address GHGs under section 111 in a limited fashion by establishing control requirements for new and existing sources in some number of existing source categories, while information is developed on other source categories.”).

41. *Id.* at 44,489.

42. *Id.* at 44,490 (“As EPA has interpreted the NSPS requirements in the past with respect to certain air pollutants, we believe that the NSPS program could use emissions trading, including cap-and-trade programs and rate-based regulations that allow emissions trading, to achieve GHG emission reductions.”).

43. *Id.* at 44,487.

44. Clean Air Act § 111(b)(5), 42 U.S.C. § 7411(b)(5) (2006).

45. PEARSON & MONAST, *supra* note 1, at 2.

previously examined by EPA and in practice, have EPA's seal of approval.⁴⁶

This article will assume that the phrase "technological system of continuous emission reduction" would preclude a trading system because such a trading system is generally considered to allow non-technical solutions (such as allowances and offsets). Section 111(a)(7) defines that term in one of two ways:

- (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.

One could probably argue that "technological," standing alone, may be broad enough to include a trading system that assumes, but does not mandate, the use of certain technologies. It is probably more reasonable, however, to interpret the term "technological" to imply the use of a physical technology or technologies to achieve emission reduction at a source.

Other key terms in this definition tend to preclude a broad interpretation of the term "technological." Subsection (A) requires a "process for production or operation" of a source that achieves low emissions. It is difficult to conceive of a trading system as equivalent to such a process; after all, one cannot use a trading system as a process to burn coal. Subsection (B) would be more promising, except that it provides two examples: precombustion cleaning or fuel treatment. Subsection (A) covers technology to limit emissions from the burning of fuel, while (B) covers technology that limits the pollution potential of that fuel before it is burned.

Turning to the definition of standard of performance, however, one finds the phrase "technological system of continuous emission reduction" conspicuously absent.⁴⁷ This phrase shows up four times in section 111 outside of the definition. First and most significantly, section 111(b)(5) prohibits EPA from requiring

46. See Richardson et al., *supra* note 10, at 10,105 ("In practice, emitters may or may not have much choice over what emissions control measures to take, and they assume some risk if they choose a measure that differs from predetermined options. As a result, the NSPS may force the widespread adoption of specific technology used by only a few plants in the industry (or in a closely related industry).").

47. § 111, 42 U.S.C. § 7411(a)(1) (2006).

“any particular technological system of continuous emission reduction” in order to meet the requirements of a standard of performance, as mentioned above. Second, section 111(g)(4)(B) explains that a governor of a state may petition EPA to revise its section 111 regulations if the existing standard is too weak. The governor must demonstrate that the “best technological system of continuous emission reduction” would achieve better emissions limitation than the current standard for a given source. Third, section 111(h)(1) allows EPA to issue a design standard that “reflects the best technological system of continuous emission reduction.” Fourth, section 111(j) allows for waivers from the current standard in order to encourage trial use of an “innovative technological system of continuous emission reduction.”

Review of this statutory language suggests that the phrase “standard of performance” is distinct from the phrase “technological system.”⁴⁸ For example, section 111(b)(5) implies that a technological system can be used to comply with a standard of performance (although nothing suggests that it is the *only* method of compliance). Section 111(g)(4)(B) similarly distinguishes between the technology or process and the standard of performance, which may be deemed inadequate with reference to an innovative technology or process.

D. *No Significant Difference Exists Between New and Existing Sources for the Issue of Trading*

While there may be practical difficulties, there is no significant statutory difference between new and existing sources with regard to trading for greenhouse gas emissions.⁴⁹ Section 111(b) requires EPA to publish and periodically revise standards of performance for new sources. In contrast, section 111(d) requires states to establish standards of performance for existing sources. The term “standard of performance,” however, is defined in sec-

48. See, e.g., Richardson et al., *supra* note 10, at 10,105 (“The NSPS do not require emitters to install a particular technology—they only require emitters to meet an emissions standard that the EPA determines based on technological options.”).

49. In the CAMR litigation, however, EPA and Petitioners disagreed as to whether EPA could set standards of performance for existing sources of mercury emissions. Mercury, unlike greenhouse gases, is regulated as a hazardous air pollutant (HAP) under section 112. The 1990 CAA amendments contain conflicting language that may preclude EPA from establishing standards of performance for existing sources for emissions of HAPs. Final Brief of Respondent Env'tl. Prot. Agency, *New Jersey v. Env'tl. Prot. Agency*, 517 F.3d 574, 583 (D.C. Cir. 2008), 2007 WL 3231264 at *101–02.

tion 111(a) and is the same for new and existing sources.⁵⁰ Furthermore, the alternatives to a standard of performance outlined in section 111(h) appear to apply to new and existing sources equally. Thus, EPA could design a trading program that covers both new and existing sources, with appropriate state guidelines to harmonize state regulations with EPA's national regulation of new sources.

Section 111(b)(5) presents one potential hurdle to the use of trading for existing sources. As discussed above, section 111(b)(5) prohibits EPA from requiring "any new or modified source" to use "any particular technological system." In other words, section 111(b)(5) prohibits strict command-and-control regulation whereby EPA would mandate specific pollution-control technology. EPA could, however, require *existing* sources to use a specific technological system because there is no textual equivalent under section 111(d). As discussed in Part II.C, mandating a technological system presumably would preclude a trading solution, although nowhere is EPA required to do so.

EPA would certainly encounter practical difficulties in coordinating a trading system between new and existing sources. Section 111 clearly envisions a strong state regulatory role over both new and existing sources. That section limits EPA's authority to impose a national regulatory program by delegating to the states the ability to implement and enforce standards of performance.⁵¹ Moreover, section 111(d) goes further by also delegating to the states the ability to establish the standards of performance. Nevertheless, EPA could design a trading program that allowed states to opt-in for existing sources, similar to EPA's approach in CAMR and the NO_x state implementation plan (SIP) call. EPA still has authority under section 111(d) to establish minimum standards (guidelines) that states must achieve.⁵²

50. For existing sources only, a State may consider "the remaining useful life of the existing source to which such standard applies" when applying the standard to "any particular source." § 111(d)(2), 42 U.S.C. § 7411(d)(2) (2006). One could argue that this changes the meaning of standard of performance for existing sources, although linguistically, it appears to change only the application of that standard. In any event, this caveat does not seriously impact the analysis of whether EPA or a State could impose trading under section 111. For a discussion of the importance of the phrase "any particular source," see *infra* Part III.B.

51. See § 111(c)(1), 42 U.S.C. § 7411(c)(1) (2006) (new sources); *id.* § 111(d)(1), § 7411(d)(1) (existing sources).

52. Litz et al., *supra* note 6, at 2.

E. *EPA Could Later Transition NSPS to a Section 110 Program*

For certain designated criteria air pollutants that are pervasive and harmful to public health, the Clean Air Act imposes a stringent set of regulations known generally as the National Ambient Air Quality Standards (NAAQS). As part of NAAQS, EPA must oversee State Implementation Plans (SIPs) that contain measures to attain or maintain the NAAQS.⁵³ If EPA classified GHGs as a criteria air pollutant—the goal of certain litigation—then EPA would presumably be precluded from simultaneously requiring states to develop standards of performance for existing sources of GHG emissions because of language in section 111(d)(1)(i).⁵⁴ EPA would instead regulate GHGs under NAAQS and require SIPs to regulate GHG emissions.

While EPA is not allowed to establish a standard of performance for an existing source of a NAAQS air pollutant,⁵⁵ section 111 does not provide any guidance in the event that a standard of performance is first issued for an existing source then followed by an issuance of air quality criteria (NAAQS). Furthermore, section 111 continues to regulate emissions of NAAQS pollutants from new and modified sources.⁵⁶ The major question, then, is whether EPA can effectively transition NSPS for existing sources to regulation of existing sources under NAAQS.

53. § 110, 42 U.S.C. § 7410 (2006). See generally ENVTL. PROT. AGENCY, CLEAN AIR ACT KEY SIP PROVISIONS, available at http://www.epa.gov/region1/topics/air/sips/REVISED_CLEAN_AIR_ACT_KEY_SIP_PROVISIONS.pdf; What is a State Implementation Plan (SIP)?, ENVTL. PROT. AGENCY, <http://www.epa.gov/reg3artd/airregulations/sips/sipdetail.htm> (last updated Feb. 11, 2011).

54. See § 111(d)(1)(i), 42 U.S.C. § 7411(d)(1)(i) (2006) (prohibiting EPA from establishing standards of performance for any air pollutant for which air quality criteria have been established).

55. § 111(d)(1)(A)(i), 42 U.S.C. § 7411(d)(1)(A)(i) (2006). Technically, the State would submit a plan to EPA that establishes standards of performance for any existing source, although EPA retains the authority to prescribe a plan where the State plan is unsatisfactory. § 111(d)(1), (d)(2)(A), 42 U.S.C. § 7411(d)(1), (d)(2)(A) (2006).

56. Compare § 111(d)(1)(A)(i), 42 U.S.C. § 7411(d)(1)(A)(i) (2006) (restricting regulation of existing sources to pollutants “for which air quality criteria have not been issued . . . under section 7408(a) of this title”), with *id.* § 111(b), § 7411(b) (lacking any reference to section 7408); see also Regulating Greenhouse Gas Emissions Under the Clean Air Act, 73 Fed. Reg. 44,354, 44,417 (proposed July 30, 2008) (to be codified at 40 C.F.R. ch. I) (“These new source performance standards (NSPS) reduce emissions of air pollutants addressed by NAAQS, but can be issued regardless of whether there is a NAAQS for the pollutants being regulated.”); *id.* at 44,417 (“[S]ection 111(d) prohibits regulation of a NAAQS pollutant.”).

One possible conclusion is that the Clean Air Act already anticipates such a transition. Robert McKinstry interprets the legislative history and statutory text of section 111(d) as a “gap filler,” that could “be used to establish an interim program allowing an incremental approach” to regulation of GHG emissions.⁵⁷ When NAAQS are promulgated for GHGs, nothing changes with regard to existing sources except that authority for existing source regulation shifts from section 111(d) to section 7410.

The key to this virtually seamless transition is the requirement under section 111(d)(1) that EPA must “establish a procedure similar to that *provided by section 7410* of this title.”⁵⁸ In addition, section 110(a)(2)(A) explicitly contemplates that state implementation plans could “include . . . economic incentives such as fees, marketable permits, and auctions of emissions rights.”⁵⁹ If EPA established a procedure similar to that in section 110 when regulating existing sources under section 111(d), then when NAAQS for GHGs are promulgated, the actual procedure for section 110 would take over for existing sources. A trading program begun under section 111(d)(1) could be later incorporated as an economic incentive into section 110 state implementation plans.

Comparing section 110 with section 111(d) reveals certain important similarities and differences. Both sections require a state plan that implements and enforces a standard for emissions.⁶⁰ Section 111(d) applies exclusively to existing sources;⁶¹ section 110(a)(2)(F) allows states to “require . . . (i) the installation,

57. McKinstry, Jr., *supra* note 11, at 10,305; *see also* Monast et al., *supra* note 10, at 9 (“[A] market-based approach under section 111 could provide a foundation for a similar program under the NAAQS program—indeed, if designed thoughtfully, such a market-based program could be ‘ported’ into the NAAQS program if and when the courts determine that the EPA is required to follow that route instead.”).

58. § 111(d)(1), 42 U.S.C. § 7411(d)(1) (2006) (emphasis added); *see also id.* § 111(d)(2), § 7411(d)(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 section 7410(c)* of this title” (emphasis added)).

59. § 110(a)(2)(A), 42 U.S.C. § 7410(a)(2)(A) (2006); *see also* McKinstry, Jr., *supra* note 11, at 10,307 (noting that EPA guidelines for section 111(d) call for methods of control based on an allowance system or limits on emission rates).

60. *Compare* § 110(a)(1), 42 U.S.C. § 7410(a)(1) (2006) (“Each State shall . . . adopt and submit . . . a plan which provides for implementation, maintenance, and enforcement of such primary standard.”), *with id.* § 111(d), § 7411(d) (“[E]ach State shall submit . . . a plan which (A) establishes standards of performance . . . and (B) provides for the implementation and enforcement of such standards of performance.”).

61. § 111(d), 42 U.S.C. § 7411(d) (2006).

maintenance, and replacement of equipment . . . by owners of stationary sources.”⁶²

One significant difference is that a standard of performance under section 111(d) can take costs into account, while NAAQS cannot.⁶³ So it is likely that the NAAQS standard would be stricter than the section 111 standard of performance. This disparity would result in some categories of existing sources being required to either implement additional technology or modify/replace existing technology to meet NAAQS. Under a cap-and-trade system, however, the main result would be a stricter *cap* that could be met with changes in technology, operations, or purchase of emission credits. Therefore, implementation of a cap-and-trade system for section 111 may ease the transition to NAAQS because of the flexibility emission credit trading offers.

III.

NEW JERSEY v. EPA: ARGUMENTS OVER TRADING AS A STANDARD OF PERFORMANCE

In *New Jersey v. EPA*, the D.C. Circuit rejected EPA’s attempt to remove power plants from the list of source categories regulated under section 112 for toxic mercury emissions.⁶⁴ EPA had intended to instead regulate those mercury emissions using a less restrictive cap-and-trade program, known as the Clean Air Mercury Rule (CAMR), under section 111.⁶⁵ While the court never reached the issue of whether the trading program was a valid use of EPA’s section 111 regulatory authority,⁶⁶ the litigants’ briefs on both sides of this issue provide an instructive view of potential legal issues to trading under section 111.

62. § 110(a)(2)(F), 42 U.S.C. § 7410(a)(2)(F) (2006).

63. Compare § 109(b)(1), 42 U.S.C. § 7409(b)(1) (2006) (“(1) [NAAQS] . . . shall be ambient air quality standards . . . requisite to protect the public health”), with § 111(a)(1), 42 U.S.C. § 7411(a)(1) (2006) (defining standard of performance as one that can “tak[e] into account the cost of achieving such reduction”); see also Regulating Greenhouse Gas Emissions Under the Clean Air Act, 73 Fed. Reg. 44,354, 44,417 (proposed July 30, 2008) (to be codified at 40 C.F.R. ch. I) (“EPA may not consider the costs of meeting the NAAQS in setting the standards.”).

64. *New Jersey v. Env’tl. Prot. Agency*, 517 F.3d 574 (D.C. Cir. 2008); see also Nicholas Morales, Case Comment, *New Jersey v. Environmental Protection Agency*, 33 HARV. ENVTL. L. REV. 263 (2009) (summarizing the litigation); Nathan Borgford-Parnell, *Litigation Update: New Jersey v. EPA*, 8 SUSTAINABLE DEV. L. & POL’Y 53 (2008) (same).

65. See Morales, *supra* note 64, at 268; Borgford-Parnell, *supra* note 64.

66. *New Jersey*, 517 F.3d at 584.

CAMR would have set an initial nationwide annual emissions cap for mercury emitted from existing sources of thirty-eight tons starting in 2010, followed by a second cap of fifteen tons beginning in 2018.⁶⁷ (According to EPA, the 1999 baseline emission was forty-eight tons.⁶⁸) Each state (along with two tribes and the District of Columbia) would have been allocated an emissions budget from this nationwide cap.⁶⁹ States would have either developed their own means to reduce emissions or join EPA's nationwide emissions cap-and-trade program.⁷⁰ States that participated in the trading program would have allocated emissions allowances to individual sources at the states' discretion.⁷¹ Plants would have been required to hold allowances representing their annual mercury emissions, and could have sold or banked excess allowances.⁷²

EPA characterized CAMR as "creat[ing] a standard of performance for existing sources."⁷³ What EPA actually promulgated was a set of federal emission guidelines because states submit plans to EPA that establish standards of performance for existing sources. Those guidelines allowed states to count participation in the EPA's cap-and-trade system as a standard of performance.⁷⁴

In the CAMR litigation, EPA argued that its proposed cap-and-trade program for mercury emissions from existing sources "satisfies the three substantive components" of the definition of standard of performance.⁷⁵ That is, EPA argued that its program was a "standard" that "reflected the degree of emission limita-

67. Final Brief of Respondent Env'tl. Prot. Agency, *supra* note 49, at *11; Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units, 70 Fed. Reg. 28,606, 28,618-19 (May 18, 2005) (to be codified at 40 C.F.R. pts. 60, 72, 75).

68. Final Brief of Respondent Env'tl. Prot. Agency, *supra* note 49, at *11.

69. *Id.*; see also Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units, 70 Fed. Reg. at 28,621-23.

70. Final Brief of Respondent Env'tl. Prot. Agency, *supra* note 49, at *11; Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units, 70 Fed. Reg. at 28,625.

71. Final Brief of Respondent Env'tl. Prot. Agency, *supra* note 49, at *11; Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units, 70 Fed. Reg. at 28,633.

72. Final Brief of Respondent Env'tl. Prot. Agency, *supra* note 49, at *11; see Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units, 70 Fed. Reg. at 28,616, 28,629.

73. Final Brief of Respondent Env'tl. Prot. Agency, *supra* note 49, at *10.

74. See *id.* at *121.

75. *Id.* at *122.

tion achievable” and did so “through the application of the best system of emission reduction.”⁷⁶ Parts III.A, III.C and III.D address these three substantive components, respectively.

EPA later summarized its basic legal argument in its advanced notice of proposed rulemaking (ANPR) for regulating GHGs under the CAA:

The use of emissions budgets does not make the system [cap-and-trade] less of a “standard” since the budgets must be met regardless of the methodology used to allocate allowances to specific sources.⁷⁷

According to the ANPR, the two other criteria of section 111(a)(1) can be met—assuming a sufficiently stringent cap—because the cap reflects the degree of emission reduction available in the system as a whole, and cost efficiencies will allow EPA to set a cap that is at least as stringent as the emissions reductions achieved through the next best system (presumably, technology mandates).⁷⁸

It should be noted that mercury emissions can potentially form hotspots: harmful, localized, high concentrations of mercury pollution.⁷⁹ Mercury hotspots can occur through concentrated local deposition of mercury in water bodies, eventually resulting in toxic methylmercury levels in fish and other aquatic species.⁸⁰ In contrast, GHGs tend to be well-mixed atmospheric pollutants with little direct potential for hotspots.⁸¹ Much of the opposition to CAMR related to the potential for mercury hotspots in the trading scheme because, under CAMR, any individual source

76. *Id.*

77. Regulating Greenhouse Gas Emissions Under the Clean Air Act, 73 Fed. Reg. 44,354, 44,490 (proposed July 30, 2008) (to be codified at 40 C.F.R. ch. 1).

78. *Id.*

79. *See, e.g.*, Final Opening Brief of Env'tl. Petitioners, *New Jersey v. Env'tl. Prot. Agency*, 517 F.3d 574, 583 (D.C. Cir. 2008), 2007 WL 3193050 at *4. *But see* Final Brief of Respondent Env'tl. Prot. Agency, *supra* note 49, at *63–64 (summarizing EPA's analysis that concluded local deposition of mercury would not be hazardous to public health).

80. *See, e.g.*, Final Brief of Respondent Env'tl. Prot. Agency, *supra* note 49, at *63.

81. *See generally* Monast et al., *supra* note 10, at 4. *But see* Ngoc Nguyen, *Climate-Change Law: Why CA Environmentalists Are Fighting Each Other*, NEW AM. MEDIA (Mar. 14, 2011), <http://newamericamedia.org/2011/03/cap-and-trade-story-here.php> (describing how environmental justice groups oppose cap-and-trade for GHGs because large emitters of GHGs also emit toxic co-pollutants, such as heavy metals); James L. Sadd et al., *Playing It Safe: Assessing Cumulative Impact and Social Vulnerability through an Environmental Justice Screening Method in the South Coast Air Basin, California*, 8 INT'L. J. ENVTL. RES. & PUB. HEALTH 1441 (2011) (proposing a metric for identifying vulnerable communities for air pollution).

could theoretically increase its emissions of mercury by obtaining more allowances.⁸²

Opposing briefs by the Government and Environmental Petitioners illustrate the primary objections to EPA's insistence that a cap-and-trade program could be considered a standard of performance for the purposes of section 111(a)(1). These objections come in two main forms: (1) differing interpretation of the statutory language emphasizing source-specific standards and (2) differing interpretation of the factual and scientific basis behind EPA's finding that cap-and-trade is the best system reflecting the available emission reduction.⁸³ Government Petitioners find it unlikely that Congress would "hide elephants in mouseholes" by allowing for cap-and-trade based on a single definition under section 111 while it devoted all of Title IV to the SO₂ trading program.⁸⁴ As EPA points out in its brief, the second objection is factual, and not particularly relevant to the legal question of whether a cap-and-trade system, if properly designed, would be allowed under section 111.⁸⁵ But the first objection, addressed in

82. See, e.g., Final Reply Brief of Gov't Petitioners, *New Jersey v. Evtl. Prot. Agency*, 517 F.3d 574 (D.C. Cir. 2008) (No. 05-1097), 2007 WL 2155488 at *16.

83. Government Petitioners also find it unlikely that Congress would "hide elephants in mouseholes" by allowing for cap-and-trade based on a single definition under section 111 while it devoted all of Title IV to the SO₂ trading program. *Id.* at *13-14 (quoting *Whitman v. Am. Trucking Ass'ns*, 531 U.S. 457, 468 (2001)). The power of this objection depends mostly on how one construes the legal basis for trading under section 111. The definition of "standard of performance" is the foundational element of section 111; relegating it to a "single definition" mischaracterizes its structural importance. Nor is that definition the only basis for trading under section 111. See *infra* Part IV. In addition, regulation of existing sources relies on language found in section 110 that allows for use of economic incentives.

84. Final Reply Brief of Gov't Petitioners, *supra* note 82, at *13-14 (quoting *Whitman v. Am. Trucking Ass'ns*, 531 U.S. 457, 468 (2001)).

85. Final Brief of Respondent Evtl. Prot. Agency, *supra* note 49, at *124-25. The Government Petitioners make several factual, scientific objections to CAMR that focus on how the proposed cap was not stringent enough and would allow mercury emission hotspots, in violation of section 111's requirement of a "best system" that "reflects the degree of emission limitation available." Clean Air Act § 111(a)(1), 42 U.S.C. § 7411(a)(1) (2006); Final Opening Brief of Gov't Petitioners, *New Jersey v. Evtl. Prot. Agency*, 517 F.3d 574 (D.C. Cir. 2008) (No. 05-1097), 2007 WL 3193051 at *30-32 ("CAMR requires only a fraction of the efficiency achieved by existing and available control technologies."); Final Reply Brief of Gov't Petitioners, *supra* note 82, at *15-16 ("The record reveals that such reductions [under CAMR] do not reflect the best demonstrated system of emission reduction."); Final Opening Brief of Gov't Petitioners, *supra*, at *32-35 ("EPA ignores the threats to public health posed by mercury hot-spots created by EGU emissions acting with other sources of the pollutant."); Final Reply Brief of Gov't Petitioners, *supra* note 82, at *16 ("Hot-spots of mercury pollution exist and impact public health, and a cap-and-trade plan by its nature raises the very real risk of continuing or even exacerbating these hot-

Parts III.A and III.B below, presents real difficulty for EPA's proposed trading system.

A. *What is a "Standard"?*

Through much of its legal analysis, EPA does not clearly distinguish between the standard itself and its entire cap-and-trade system.⁸⁶ But at one point, in its brief, EPA does define "state participation in a cap-and-trade system, pursuant to corresponding, federal emission guidelines, as a standard of performance."⁸⁷ More precisely, states must define a standard of performance that will reflect the national cap (i.e., keep total state emissions below the cap). Participation in EPA's cap-and-trade system is one such permissible standard, so long as it requires sources to cover their emissions with allowances. Note that for cap-and-trade, the concept of remaining within a state budget may mean that each source has sufficient allowances to cover their emissions. States do not necessarily need to keep *actual* emissions below a specified cap if interstate trading of allowances is permitted.

According to EPA, a standard of performance must first be a standard. EPA begins by analogizing to the definition of standard discussed in *Engine Manufacturers Association v. South Coast Air Quality Management District*.⁸⁸ In *Engine Manufacturers*, the Supreme Court held that the California air pollution district for Los Angeles could not prescribe the types of vehicles that fleet operators must purchase or lease because such a prescription would be considered a standard reserved to the federal government under the Clean Air Act section 209(a).⁸⁹ The Court looked to Webster's Second dictionary, which defines a standard as that which "is established by authority, custom, or general

spots as power plants avoid emission reductions by purchasing credits."). These factual objections are examples of how EPA must demonstrate in the record that the proposed cap-and-trade system is in fact a marked improvement over other, more conventional alternatives. Otherwise, litigants will quickly point to the existence of some established technology, which if applied to every source could in fact result in a lower cap, as evidence of the inadequacy of a proposed cap-and-trade standard.

86. *See, e.g.*, Final Brief of Respondent Env'tl. Prot. Agency, *supra* note 49, at *123 ("CAMR's cap-and-trade system clearly constitutes such a 'model' . . . for emissions . . .").

87. *Id.* at *122.

88. *Id.* at *123 (citing *Engine Mfrs. Ass'n v. S. Coast Air Quality Mgmt. Dist.*, 541 U.S. 246, 252–53 (2004)).

89. *Engine Mfrs. Ass'n*, 541 U.S. at 248–50, 252, 258–59.

consent, as a model or example; criterion; test.”⁹⁰ The Court noted that a standard is distinct from the enforcement of that standard.⁹¹ The term “standard” is consistently used throughout Title II to signify emission levels or control technology.⁹² Thus, to be a standard, the measure in question must affect emissions limits.

EPA argued in the CAMR litigation that a cap-and-trade system could similarly be a “model” or “criterion” established to regulate the emission of air pollutants.⁹³ EPA’s cap-and-trade model results in a cap or budget that is equivalent to a standard. States must remain within their budgets, and sources must possess sufficient allowances to cover their emissions. This is a criterion or test in the sense that it would limit emissions.

EPA’s definitional argument, however, is complicated by section 111’s distinction between regulation of new and existing sources. For new sources, EPA sets the standard of performance.⁹⁴ Thus, if EPA wanted to regulate new sources under cap-and-trade, it could have created a two-part standard of performance: a national (or regional) cap on emissions along with a requirement that all regulated new sources acquire sufficient allowances to cover their emissions.

But for existing sources, states set the standard.⁹⁵ Thus EPA first determined the achievable emissions reduction at a state level. It then told states that if they keep allocations at power plants below that level by participating in EPA’s cap-and-trade program, they are by definition creating a valid standard of performance for any existing source.⁹⁶

In either case, EPA is effectively setting a cap that operates to limit emissions, along with certain regulations in the cap-and-trade program. Ostensibly, this limit falls within the legal definition of a standard, as EPA argues. Requiring sources to keep within a regional or national cap by acquiring allowances equal to their emissions does in fact establish a measurable criterion. Neither the Environmental nor Government Petitioners advanced any arguments to the contrary. The question of whether

90. *Id.* at 252–53 (quoting WEBSTER’S SECOND NEW INTERNATIONAL DICTIONARY 2455 (1945)).

91. *Id.* at 253–54.

92. *Id.* at 253.

93. Final Brief of Respondent Env’tl. Prot. Agency, *supra* note 49, at *123.

94. Clean Air Act § 111(b), 42 U.S.C. § 7411(b) (2006).

95. § 111(d), 42 U.S.C. § 7411(d) (2006).

96. Final Brief of Respondent Env’tl. Prot. Agency, *supra* note 49, at *11.

other parts of section 111 impose additional restrictions on the meaning of “standard” is the subject of subpart B below.

B. *Must Each Source Decrease Its Emissions to Meet the Standard, Thereby Precluding the Use of Allowances?*

Beyond the narrow question of what it means to have a standard, a larger issue presents itself in the opposing briefs. Cap-and-trade, by definition, assumes certain sources will produce different levels of emissions based on their economic choice to either acquire allowances in the market (resulting in higher actual emissions at that source) or implement technological solutions (resulting in lower actual emissions at that source). If section 111 requires all sources to reduce actual emissions, then cap-and-trade is a non-starter. This is the crux of the Environmental and Government Petitioners’ legal argument against EPA’s trading scheme.

Looking to the statutory language, opposing briefs focus on two points: (1) emission reduction must be *continuous* for each source and (2) the standard of performance must be applied on a source-specific basis. While EPA claims that emission allowances fulfill the continuous emission reduction requirement of section 111(a)(1), the Environmental Petitioners argue that allowances are merely “a term of art for the right *not to reduce* emissions” that in fact violates continuity by allowing sources (at a source-specific level) to have decreased emissions one year and increased emissions the next.⁹⁷ This point is mostly subsumed by the Petitioners’ broader argument that section 111’s standard of performance is meant to apply to each source and state specifically.

1. *Must Every Source Achieve Actual Emissions Reductions?*

The Environmental Petitioners’ strongest legal claim is that a standard of performance must result in actual emission reductions from each and every source. In other words, according to the Petitioners, sources cannot use allowances to meet their obligation to limit emissions under section 111.

97. Final Opening Brief of Env’tl. Petitioners, *supra* note 79, at *26; *see also* Final Opening Brief of Gov’t Petitioners, *supra* note 82, at *32 (“EPA’s program will actually result in emission *increases* in numerous states and individual plants.”).

The Environmental Petitioners rely on two key phrases in section 111(d)(1) to support their broader argument: “each [s]tate” must set forth a standard of performance for “any existing source.”⁹⁸ CAMR allowed some states to increase mercury emissions, which the Petitioners argue violates the requirement that each state plan reduce emissions using a standard of performance.⁹⁹ The Petitioners also interpret “any existing source” to mean “each [s]tate plan must reduce emissions from *any and all* existing sources.”¹⁰⁰ In further support of their interpretation, the Petitioners point to section 302(l), which states that continuous emission reduction includes “any requirement relating to the operation or maintenance of a source to assure continuous emission reduction.” The result of this line of reasoning is that any cap-and-trade system fails under the Environmental Petitioners’ interpretation of section 111 because trading emission allowances cannot guarantee emission reduction from any and all sources or even for any given state in nationwide trading program.

EPA counters with two points. First, EPA declares that it has met the requirement that the standard be applied to any existing source because each and every source under CAMR is required to hold sufficient allowances to cover its emissions.¹⁰¹ Under this interpretation, the Environmental Petitioners are actually objecting to EPA’s *policy* choice to require allowances instead of a specified technology. The proscription in section 111(b)(5) against requiring new sources to implement “any particular technological system of continuous emission reduction” would seem to support EPA’s authority to make such a policy choice, *if* CAMR applied to new sources.

EPA’s second counter is that the Environmental Petitioners have misconstrued the practical import of a standard of performance. As discussed in Part III.B.2, a standard is always set at a

98. Final Opening Brief of Env’tl. Petitioners, *supra* note 79, at *27 (quoting § 111(d)(1), 42 U.S.C. § 7411(d)(1)).

99. *Id.*; see also Final Reply Brief of Env’tl. Petitioners, *New Jersey v. Env’tl. Prot. Agency*, 517 F.3d 574 (D.C. Cir. 2008) (No. 05-1097), 2007 WL 3231256 at *15 (“EPA avoids any textual explanation of why its approach comports with the ‘each State’ plan language in § 111(d)(1).”).

100. Final Opening Brief of Env’tl. Petitioners, *supra* note 79, at *27 (emphasis added); see Final Reply Brief of Env’tl. Petitioners, *supra* note 99, at *16 (“EPA’s brief similarly twists the obligation for ‘emission reduction[s]’ from ‘any existing source’ by substituting a very different obligation ‘requir[ing] each source to cover its emissions with allowances,’ but *not* actually reduce emissions.” (citations omitted)).

101. Final Brief of Respondent Env’tl. Prot. Agency, *supra* note 49, at *126.

level greater than the emissions of the best performers.¹⁰² Often, best performers will thus not need to reduce their emissions under the applicable standard. The Environmental Petitioners assume, incorrectly, that a standard of performance must be particularized to each and every source, even though standards are actually set by reference to source categories. EPA further notes that cap-and-trade represents an improvement over simple emission limitations, because trading allowances encourages best performers to keep their emissions low.¹⁰³

The Environmental Petitioners falter in their grammatical interpretation. The statutory language is more ambiguous than the Petitioners would care to admit. Neither definition of standard of performance in section 111(a)(1) and section 302(l) contains language requiring the standard to be applied to each source individually.

First, the Petitioners rely heavily on the word “any,” which is found only in section 111(d) pertaining to existing sources, but not in other sections pertaining to new sources. Grammatically, the word “any” functions in section 111(d)(1) as a synonym for “every”:

[E]ach State shall submit . . . a plan which (A) establishes standards of performance for *any* existing source . . . to which a standard of performance . . . would apply¹⁰⁴

In this instance, “any” is meant to prevent existing sources from escaping regulation. It does not mean “specific to each” as the Petitioners would have it.

The Petitioners also misconstrue the grammatical structure of the section 302(l) definition.¹⁰⁵ Section 302(l) does not mandate a standard of performance for a source but rather defines a standard of performance as “a requirement of continuous emissions reduction,” while including “any requirement relating to the operation or maintenance of a source” as an *example*.¹⁰⁶ The two definitions appear only to demand that EPA come up with some sort of cap or emission limit reflecting the best demonstrated and achievable emission reduction.

102. See *infra* notes 116–117.

103. Final Brief of Respondent Env'tl. Prot. Agency, *supra* note 49, at *131.

104. Clean Air Act § 111(d)(1), 42 U.S.C. § 7411(d)(1) (2006).

105. See *infra* note 107 and accompanying text.

106. § 302(l), 42 U.S.C. § 7602(l) (2006).

2. What is “Continuous Emissions Reduction”?

Section 302(l) of the CAA defines a standard of performance as “a requirement of continuous emission reduction.”¹⁰⁷ The Environmental Petitioners suggest that the definition of standard of performance in section 302 does not conflict with that of section 111, and therefore “EPA must give effect to both.”¹⁰⁸ According to the Petitioners, cap-and-trade does not meet this continuous emission reduction requirement because the required allowances for emissions cannot guarantee that any given source will not occasionally *increase* actual emissions.¹⁰⁹

EPA provides two responses to this issue of continuous emissions reduction. First, EPA notes that in the 1977 CAA Amendments, new source standards meant “the best *technological* system of *continuous* emissions reduction” while existing source standards omitted the term “*technological*.”¹¹⁰ In the 1990 CAA Amendments, this omission was noted, and the amended definition for both new and existing sources required neither a technological nor a continuous standard.¹¹¹ The chapter-wide definition of “standard of performance” set forth in section 302(l), however, still requires continuous emission reduction. Drawing on this legislative history, EPA’s first response to the Environmental Petitioners is that section 111 contains a more specific definition of standard of performance that overrides the more general section 302(l) definition.¹¹²

EPA’s second response is that even if the section 302(l) definition applies, a cap-and-trade system may still meet the requirement of a continuous emission reduction.¹¹³ That is, while any given source may increase its emissions—provided it purchases

107. *Id.* The definition goes on: “including any requirement relating to the operation or maintenance of a source to assure continuous emission reduction.” *Id.* This inclusion clause adds little to the weight of either side’s legal argument. If the required emission allowances can be considered a continuous emission reduction, then these allowances relate to operation of a source (because they are required if the source emits the pollutant in question) and help to ensure continued emission reduction by enforcing the cap. Otherwise, the reference to “operation or maintenance of a source” serves as further evidence that allowances are not continuous because the allowances cannot guarantee a continuous actual emission reduction at the source.

108. Final Reply Brief of Env’tl. Petitioners, *supra* note 99, at *16.

109. Final Opening Brief of Env’tl. Petitioners, *supra* note 79, at *25–26.

110. Final Brief of Respondent Env’tl. Prot. Agency, *supra* note 49, at *127. Compare 42 U.S.C. §§ 7411(a)(1), (7) (1988), with 42 U.S.C. § 7411(a)(1)(c) (1982).

111. Final Brief of Respondent Env’tl. Prot. Agency, *supra* note 49, at *127.

112. *Id.* at *129–30.

113. *See id.* at *130.

extra allowances—the nationwide cap is still satisfied and emissions decrease continuously over time as the cap ratchets downward.¹¹⁴

The Environmental Petitioners ridicule this notion:

EPA fails to note that the possession of “allowances” is actually a term of art for the right *not to reduce* emissions. Moreover, § 302(1) plainly does not speak in terms of “continuous allowance possession,” nor does EPA justify its interpretations severing “continuous” from “emission reductions” and abandoning the need for reductions from *particular* sources.¹¹⁵

This response, however, conflates the Environmental Petitioners’ argument that reductions must be continuous with their more critical assumption that reductions must apply to particular sources. (The latter is discussed in Part III.B.1.) Nothing about the word “continuous” requires reductions at particular sources. For example, section 302(k) defines an emission limitation as a requirement that “limits the quantity, rate, or concentration of emissions of air pollutants on a *continuous* basis.”¹¹⁶ As EPA points out, Title IV-A of the Clean Air Act requires emission limitations as part of the acid rain cap-and-trade program, notwithstanding the requirement that such limitation be continuous.¹¹⁷

In this context, the word “continuous” is ambiguous: its application depends on the intended scope of the emissions regulation. If the scope is narrowly focused on single-source emissions, then “continuous” restricts the ability of single sources to occasionally increase their emissions. If the scope is more broadly focused on regional or national emissions, then “continuous” restricts the ability of the region or nation to occasionally increase emissions.

Assuming section 302(l) must be given effect, the best case for the Environmental Petitioners is that “continuous” operates to limit sources’ ability to “go back” on their emission reduction. For example, a standard of performance could achieve *continuous* emission reduction if it prevents a source from occasionally

114. See *id.* at *130–31 (“[T]he overall cap is set below current emission levels . . . and is ‘continuous’ insofar as ‘there is never a time when sources may emit without needing allowances’” (quoting Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units, 70 Fed. Reg. 28,617 (May 18, 2005))).

115. Final Opening Brief of Env’tl. Petitioners, *supra* note 79, at *26.

116. Clean Air Act § 302(k), 42 U.S.C. § 7602(k) (2006) (emphasis added).

117. Final Brief of Respondent Env’tl. Prot. Agency, *supra* note 49, at *131.

turning off installed emission reduction technology even if the source believes it could otherwise do so while still meeting an average emission limit. This construction of the word “continuous,” however, does not comport with practical application of emission limitations under section 111.

EPA observes that for any section 111 standard of performance, the best performers will be able to meet the standard even while increasing emissions.¹¹⁸ This is because the standard of performance must account for certain costs; it does not simply apply the most restrictive technology to every source.¹¹⁹ More practically, “continuous” may instead be interpreted to restrict EPA from promulgating emissions limitations with gaps, such as only limiting emissions during weekdays or the summer. Such an interpretation would not necessarily preclude cap-and-trade.

3. Does Cap-and-Trade Violate *ASARCO* by Implementing a Bubble Concept?

The Environmental Petitioners also believe that *ASARCO, Inc. v. EPA* prohibits cap-and-trade under section 111.¹²⁰ The issue in *ASARCO* was EPA’s attempt to define a stationary source as a combination of facilities (a “bubble”) so that plant owners could offset any increase in emissions from a modification of one unit in the plant with decreases in emissions from another unit.¹²¹ Section 111(a) treats sources that make significant modifications as new sources that must then comply with (stricter) new source performance standards (NSPS). The effect of EPA’s bubble rule would be to avoid application of NSPS for many plant modifications. The D.C. Circuit held that EPA lacked the statutory authority for its bubble concept because the definition of stationary source in section 111(a) lacked a reference to a “combination of facilities.”¹²²

The Petitioners analogize to *ASARCO* by characterizing the bubble rule as a “limited emission trading scheme” within the

118. *Id.* at *131, *139–40.

119. *See, e.g., id.* (“A standard of performance . . . will always be set at some level lower than the capability of the best-performing sources, since the standard must be achievable and must take into account costs and the remaining useful life of the subject facilities.”).

120. *ASARCO, Inc. v. Envtl. Prot. Agency*, 578 F.2d 319 (D.C. Cir. 1978).

121. *Id.* at 322.

122. *Id.* at 324–25.

same plant site under section 111.¹²³ Accordingly, the Petitioners argue, the much broader CAMR trading scheme is certainly in violation of section 111.¹²⁴ Furthermore, the Petitioners argue that because *ASARCO* was law when Congress expressly authorized trading in other parts of the Clean Air Act in 1990, the absence of express authorization for trading under section 111 confirms that “§ 111 standards are technology-forcing and meant to apply uniformly to new and modified sources.”¹²⁵

EPA attempts to distinguish *ASARCO* as “irrelevant to the issues presented here” because it neither spoke to the definition of standard of performance nor addressed existing source regulation.¹²⁶ According to EPA, *ASARCO* was about netting emissions within a source, not “emissions trading *among* sources.”¹²⁷ *ASARCO* rejected the idea that sources could avoid a standard of performance requirement, while cap-and-trade would impose a standard of performance requirement on sources. Under CAMR, the requirement that sources cover their emissions with allowances is applied to each source, consistent with *ASARCO*.¹²⁸

First, the Environmental Petitioners attribute significance to the existence of *ASARCO* during the 1990 CAA Amendments. But this argument is only probative if Congress clearly believed that *ASARCO* prohibited trading under section 111. Otherwise, absence of explicit trading authorization is not nearly as significant as the Petitioners claim. It seems unlikely that Congress would link *ASARCO* to the issue of cap-and-trade because *ASARCO* dealt with avoidance of performance standards for modifications within facilities, not inter-facility trading. Furthermore, by proscribing specific technological requirements, section 111(b)(5) explicitly rejects the claim made by the Petitioners that section 111 imposes technology-forcing standards.

123. Final Opening Brief of Env'tl. Petitioners, *supra* note 79, at *28–29 (“*ASARCO* was the law when Congress amended the Act in 1990, yet Congress made no allowances for trading under § 111, while at the same time it expressly authorized intra-state and inter-state trading under other provisions of the Act.”); *see also* Final Reply Brief of Env'tl. Petitioners, *supra* note 99, at *16–17.

124. Final Opening Brief of Env'tl. Petitioners, *supra* note 79, at *28–29; Final Reply Brief of Env'tl. Petitioners, *supra* note 98, at *16–17.

125. Final Opening Brief of Env'tl. Petitioners, *supra* note 79, at *29.

126. Final Brief of Respondent Env'tl. Prot. Agency, *supra* note 49, at *132.

127. *Id.*

128. *Id.* at *133.

Second, the D.C. Circuit's opinion in *ASARCO* is limited to interpreting the definition of a stationary source and furthermore assumes no emission benefit from the bubble concept at issue. The court said, "Applying the bubble concept thus postpones the time when the best technology must be employed and at best maintains the present level of emissions."¹²⁹ In contrast, a cap-and-trade program for GHG emissions would presumably *decrease* the level of emissions compared to the employment of the best technology due to the cap on emissions.

Trading does postpone the time when best technology must be employed for any given plant, but it does so in exchange for emissions decrease over time. A properly constructed cap-and-trade program results in a faster decrease in emissions, which should be greater over time than when relying solely on technological improvements. This tradeoff is absent in *ASARCO*. For this argument to work, of course, EPA must in fact get the science right: the cap-and-trade system must reflect the "best" system of emissions reduction.

C. Does Cap-and-Trade "Reflect the Degree of Emission Limitation Achievable"?

In EPA's construction of the elements of a standard of performance, the next issue is whether cap-and-trade system "reflects the degree of emission limitation available." The mostly factual question—whether trading reflects what is achievable "through application of the best system"—is reserved for Part III.D below. The legal question dealt with here is, as EPA puts it, "whether a properly designed cap-and-trade system . . . can ever be a system that 'reflects the degree of emission reduction achievable' within the meaning of the statute."¹³⁰

EPA argues that trading can reflect the available emission limitation because—viewed as a whole—the system would decrease overall emissions to the nationwide cap.¹³¹ That cap reflects EPA's expert judgment on what level of emissions would be achievable if power plants across the country implemented available controls or other means of emissions reduction.¹³² While the stringency of the cap could be challenged on a factual basis, such a challenge is irrelevant, according to EPA, against the broader

129. *ASARCO, Inc. v. Envtl. Prot. Agency*, 578 F.2d 319, 328 (D.C. Cir. 1978).

130. Final Brief of Respondent Envtl. Prot. Agency, *supra* note 49, at *125.

131. *Id.* at *124.

132. *Id.*

point that the cap would reflect the achievable emission reduction.¹³³

The Environmental Petitioners do not present an alternative view on whether cap-and-trade could ever reflect the degree of emission limitation available. Much of their argument (and EPA's counterargument) instead concerns whether cap-and-trade is the best system to achieve this emission limitation. As discussed below, both EPA and the Petitioners incorrectly blur the distinction between *requiring* the best system and *reflecting* the best system.

Assuming that EPA or the states can quantify a level of achievable emission reduction, EPA argues there is then theoretically nothing that prevents cap-and-trade from meeting that level of achievable emission reduction over a state, regional, or national area.¹³⁴ Not even the Environmental Petitioners argue that reflecting an emission limitation implies that the limitation be imposed source by source. Therefore, cap-and-trade could in fact reflect such an overall level of emission reduction.

D. *Does Cap-and-Trade Reflect the "Best system of Emission Reduction"?*

To establish the appropriate level of emission limitation, EPA must determine what the best system can achieve in emission reduction (sometimes referred to as best demonstrated technology, or BDT).¹³⁵ That does not necessarily mean EPA must mandate that all sources use the best system, nor is it immediately obvious that the best system is inherently a technological solution.

Trading programs are acceptable under section 111 if either the standard can be a requirement to cover emissions with allowances—and thus applied to each source—or if the standard can be an emissions limitation (or cap) applied across a category of sources. In either scenario, the standard *reflects* the best

133. See *id.* at *124–25 (“[C]hallenges to the stringency of the nationwide cap . . . at most [pertain] to the factual question of whether these technical decisions have ample support in the record It is simply irrelevant, however, to the legal question[.]”).

134. See *Essex Chem. Corp. v. Ruckelshaus*, 486 F.2d 427, 433–34 (D.C. Cir. 1973) (“An achievable standard is one which is within the realm of the adequately demonstrated system’s efficiency and which, while not at a level that is purely theoretical or experimental, need not necessarily be routinely achieved within the industry prior to its adoption.”).

135. Clean Air Act § 111(a)(1), 42 U.S.C. § 7411(a)(1) (2006); ENVTL. PROT. AGENCY, *supra* note 15, at 1.

demonstrated technology by imposing restrictions on sources that will result in emissions reductions equivalent to (or better than) the reductions that would come from the imposition of the specific best demonstrated technology on each source.

At most, the phrase “reflects the degree of emission limitation” suggests that EPA must at a minimum set the standard to the level of emission limitation achieved by the best system. It does not imply that EPA must equate the standard *to* the best system. For example, EPA might determine that use of technology X is the best demonstrated technology, resulting in a ten percent GHG emissions reduction. If EPA imposes a standard—through use of a trading program—on sources that results in a ten percent GHG emissions reduction across the regulated sector, that would mean EPA’s standard reflects the limitation achieved through technology X, even if *no* sources adopt technology X.

The Environmental and Government Petitioners devote significant effort to demonstrating that EPA has not met the requirement that a standard of performance “reflects the . . . limitation achievable through the application of the *best* system of emission reduction.”¹³⁶ Most of their objection is factual: EPA failed to require states to impose a standard of performance that, in practice, would reflect the best available system.¹³⁷ In other words, EPA’s state budgets (and overall cap) were too weak. Putting that factual objection aside, both EPA and the Petitioners’ misconstrue the statutory language by assuming that cap-and-trade must in fact be the best system. Instead, section 111 requires only that cap-and-trade *reflect* an emissions limitation that is determined by looking to the best system for emission reduction.

EPA argues that “there is no reason why a properly designed cap-and-trade system cannot constitute ‘the best system of emission reduction.’”¹³⁸ EPA goes on to point out the broad defini-

136. § 111(a)(1), 42 U.S.C. § 7411 (a)(1) (2006) (emphasis added).

137. See, e.g., Final Opening Brief of Env’tl. Petitioners, *supra* note 79, at *27–28 (objecting that an increase in emissions by certain sources cannot be considered the “best system”); Final Opening Brief of Gov’t Petitioners, *supra* note 85, at *29–35 (devoting an entire subsection to a discussion of why currently available emission technologies will “[a]chieve [s]ubstantially [g]reater [e]mission [r]eductions [t]han CAMR [r]equires”); see generally *Essex Chem. Corp. v. Ruckelshaus*, 486 F.2d 427, 433 (D.C. Cir. 1973) (“An adequately demonstrated system is one which has been shown to be reasonably reliable, reasonably efficient, and which can reasonably be expected to serve the interests of pollution control without becoming exorbitantly costly in an economic or environmental way.”).

138. Final Brief of Respondent Env’tl. Prot. Agency, *supra* note 49, at *125.

tion of “system” and that EPA’s technical judgments on the meaning of “best” should be given deference.¹³⁹ Whether a proposed cap-and-trade system would be the best approach “goes to whether EPA’s technical judgments . . . have ample support in the record.”¹⁴⁰ And the “best system” is just EPA’s determination of which *plan* for emissions reduction is the approach most likely to succeed in achieving the most emissions reduction. Plans of emission reduction can encompass a wide variety of regulatory tools, including cap-and-trade, technical mandates, and voluntary measures.

The Environmental Petitioners take the opposite stance. For them, “CAMR . . . flouts the statutory mandate that each State plan include ‘the best system’ of reduction for ‘any existing source.’”¹⁴¹ CAMR does not do that, according to the Petitioners, because it allows many states (and many sources) to increase mercury emissions well into the future. Forecasted nationwide reductions in mercury emissions cannot meet the best system standard given these increases.¹⁴²

EPA makes its legal argument more difficult than necessary by trying to argue that cap-and-trade would be the best system of emission reduction.¹⁴³ Instead, EPA need only argue that it has determined that its cap reflects (or is reasonably equivalent to) the level of emissions reduction one would expect when applying the best emissions limitations available. EPA (and the Environmental Petitioners) have incorrectly interpreted the definition of standard of performance:

[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 . . . has been adequately demonstrated.¹⁴⁴

Under EPA’s interpretation, “application of the best system” modifies “standard,” which is not grammatically warranted. This would change the meaning of the definition to:

139. *Id.*

140. *Id.*

141. Final Opening Brief of Env’tl. Petitioners, *supra* note 79, at *27.

142. *Id.* at *28.

143. Richardson et al. appear to follow a similar line of reasoning to that of EPA. See Richardson et al., *supra* note 10, at 10,105 (“In principle, EPA could implement trading within a source category by claiming that trading itself was the “best system of emission reduction.”).

144. Clean Air Act § 111(a)(1), 42 U.S.C. § 7411(a)(1) (2006).

[A] standard for emissions of air pollutants through the application of the best system of emission reduction. This standard reflects the degree of emission limitation achievable.

The correct interpretation retains the grammatical structure of the definition: “application of the best system” modifies “achievable.” EPA must define a standard. That standard must reflect an achievable emission limitation.¹⁴⁵ EPA determines the achievable emission limitation by looking to the best system of emission reduction that has been adequately demonstrated. Accordingly, cap-and-trade can establish a standard that reflects, but is not necessarily equivalent to, the best system of emission reduction.

Furthermore, the Environmental Petitioners claim incorrectly that section 111(d) obligates “‘each State’ plan [to] satisfy the ‘best system of emission reduction’ standard from ‘any existing source.’”¹⁴⁶ Unfortunately for the Petitioners, they have juxtaposed two different subsections of section 111 to create a wholly new meaning not warranted by the statutory language. The term “best system” is language from section 111(a)(1), which defines standard of performance. “Any existing source” comes from section 111(d)(1), which imposes standards of performance on existing sources. The Petitioners read into the language a policy decision: that part of what makes a standard reflect the best system is that it achieves reduction at all sources.¹⁴⁷ But it simply does not follow from the statutory language that a standard reflect a reduction at each and every source.

Any existing source must, according to section 111(d), meet a standard of performance. Each standard of performance (*not* each source) must impose a system to control emissions that *reflects* what could be achieved under the best adequately demon-

145. See *Essex Chem. Corp. v. Ruckelshaus*, 486 F.2d 427, 433 (D.C. Cir. 1973) (“It is the system which must be adequately demonstrated and the standard which must be achievable.”); *Nat’l Lime Ass’n v. Env’tl. Prot. Agency*, 627 F.2d 416, 430 (D.C. Cir. 1980) (“Section 111 requires that the emissions control system considered able to meet the standard be ‘adequately demonstrated’ and the standard itself ‘achievable.’”); *Sierra Club v. Costle*, 657 F.2d 298, 330 (D.C. Cir. 1981) (“Parsed, section 111 most reasonably seems to require that EPA identify the emission levels that are ‘achievable’ with ‘adequately demonstrated technology.’ After EPA makes this determination, it must exercise its discretion to choose an achievable emission level which represents the best balance of economic, environmental, and energy considerations.”).

146. Final Opening Brief of Env’tl. Petitioners, *supra* note 79, at *27.

147. See, e.g., *id.* at *27 (objecting that State plans must meet the “best system” requirement for any existing source); Final Reply Brief of Env’tl. Petitioners, *supra* note 99, at *15 (same).

strated system. This distinction is crucial: the standard of performance is, at its heart, an objective emission limit derived from examining what is achieved by the best performers in the field. The cap, in a trading system, similarly reflects this objective emission limit. But a standard of performance, whether it is a cap or some other emission limit, need not be the “best system.”

In *New Jersey v. EPA*, the D.C. Circuit held only that EPA did not make the necessary findings to remove the sources from the list of regulated sources for mercury under section 112.¹⁴⁸ It never reached the question of EPA’s authority to impose a trading system under section 111. Parsing the arguments presented in the CAMR litigation reveals two main threads of debate concerning EPA’s authority to establish a section 111 trading program. First, a trading program that does not require significant emission reduction is open to factual objections that EPA failed to establish a sufficiently stringent standard of performance. Second, the degree to which EPA can impose regional or national standards, rather than source-specific standards, is an open legal question. Part IV considers what a section 111 trading program for GHGs might look like given the questions raised in the CAMR litigation.

IV.

TRADING UNDER SECTION 111

As outlined in Part II, section 111 is a relatively good basis on which to establish a cap-and-trade program for certain industrial sources, such as the electric sector. If EPA chooses to establish a cap-and-trade program to regulate GHG emissions using section 111, it would likely define trading in reference to a standard of performance. This is the approach EPA took in CAMR. After first summarizing key components of a trading program, this Part details how a standard of performance could be defined in terms of either a cap or an emissions reduction baseline that requires sources to cover their emissions with tradable allowances.

A. *Outline of a Trading Program*

Before delving into the application of section 111 to a trading program, it may be useful to first outline what options are available to EPA in a cap-and-trade program. At its most basic, a cap-and-trade system seeks to keep total emissions below a set cap.

148. *New Jersey v. Env'tl. Prot. Agency*, 517 F.3d 574, 578 (D.C. Cir. 2008).

Generally, a source must acquire emission allowances equal to its emissions for a given time frame (for example, each year or every three years). To meet its obligations under a cap-and-trade system, each source can (1) implement a technological solution to lower its emissions, (2) purchase allowances on the market, or (3) a combination of (1) and (2).

1. Defining the Cap

The cap represents the total level of emissions allowed in the system. Typically, the cap decreases gradually, allowing sources to efficiently reduce their emissions over time. By trading allowances, each source has some flexibility to choose when to implement technological or other solutions to reduce actual emissions. The decreasing cap promotes a market in allowances as allowance value increases with decreasing availability.

2. Allocating Allowances

There are at least three basic methods of allowance allocation. First, a number of allowances equal to the cap can be auctioned to sources. Second, allowances equal to the cap can be freely given to sources based on some metric, such as average historical emissions. Under these two methods, a source must retire one allowance for each unit of emissions. New sources must purchase sufficient allowances to cover their emissions either through the auction or through the trading market.

In the third method, the annual cap is divided amongst all existing sources, resulting in an individual cap for each source. The simplest method would be to divide the annual cap by the number of sources to get the individual cap. Each source can generate allowances if its emissions are below its individual cap. Conversely, a source emitting more than its individual cap must acquire allowances to make up the difference. Under this method, a source must retire one allowance for each unit of emission beyond its cap. If the annual cap is strictly enforced, new sources may find themselves at a significant disadvantage, as their individual cap would be zero. Therefore, a new source would be required to obtain allowances through the trading market. Alternatively, new sources can be anticipated and given an individual cap above zero. As a result, every other source receives a slightly stricter individual cap as the emissions from the new source are averaged across all participants.

3. Use of a Minimum Emission Reduction Baseline

In order to minimize the potential for hotspots, each source could be required to first meet a minimum emission reduction baseline. The baseline is considered a minimum level of emissions reduction, whereas the stricter cap is the emissions goal. That is, no source could emit more than the baseline, and allowances could not be used as a substitute for emissions reductions up to that baseline. Hotspots are mitigated because no source could choose to keep its emissions high (or increase its emissions) by purchasing a large quantity of allowances; such a source would still be required to meet the emission reduction baseline.

For trading of allowances to occur under such a system, the cap should remain below the baseline. The cap may in fact decrease each year while the emission reduction baseline remains the same.

B. *Trading as a Standard of Performance*

EPA's most likely path under section 111 is to tie a trading program to a standard of performance.¹⁴⁹ The standard of per-

149. This is the approach suggested by a group of Clean Air Act experts in an October 2010 report. See Monast et al., *supra* note 10, at 11 ("In order to create a carbon-trading program under section 111, the EPA must equate such a market-based program to a 'standard of performance.'").

Alternatively, EPA could determine that a standard of performance is not feasible, and rely instead on section 111(h) to promulgate an operational standard for cap-and-trade. Clean Air Act § 111(h)(1), 42 U.S.C. § 7411(h)(1). Linguistically, an "operational standard" is simply a test or criterion that applies to operations of a facility, which parallels the meaning of "standard" discussed in Part III.A above. Arguably, requiring facilities to obtain sufficient carbon allowances to cover their carbon emissions is an operational standard, because it is a test that must be met to continue facility operations.

The operational standard must "reflect[] the best technological system of continuous emission reduction." *Id.* As discussed in Part III.C and III.D above, the word "reflects" means the operational standard implemented here would not necessarily need to be a technological system, but rather need only achieve similar emission reductions to that of the best technological system.

Finally, EPA could rely on section 111(h)(3) to approve an alternative emission limitation that is defined in terms of a cap and the use of allowances to cover emissions. This option is limited by two key statutory phrases: "any person" and "use of such alternative by the source." *Id.* § 111(h)(3), 42 U.S.C. § 7411(h)(3) (emphasis added). Although "any person" would typically be a source owner/operator, nothing in the language restricts anyone, including environmental groups or the State of California, from presenting an alternative means of emission limitation. And while the phrase "by the source" is limiting, it would be strange to preclude other sources from adopting an established alternative. Thus, it may be possible to first demon-

formance could be equivalent to a cap or an emissions reduction baseline and would include a requirement that sources cover their carbon emissions with allowances. In addition, EPA could determine the achievable degree of emission limitation by considering cap-and-trade the best system of emission reduction.

The definition of standard of performance in sections 111(a)(1) and 302(l), along with the language of section 111 applying that standard of performance to new and existing sources, is sufficiently broad to encompass a stringent cap-and-trade system for GHGs. The failings of the CAMR cap-and-trade system had more to do with the nature of mercury emissions as a toxic pollutant capable of forming hot-spots and the weak proposed cap for mercury emissions than with the statutory language of the CAA.¹⁵⁰

The potential interplay between new and existing sources is important for this type of section 111 trading program. The simplest approach would be to allocate carbon allowances to all existing sources. Part V describes how EPA could harmonize its section 111 regulation with one such state plan: California's proposed cap-and-trade program. Then, to protect the cap, all new sources would be required to acquire allowances in the secondary market.¹⁵¹ In other words, a state could allocate allowances to existing sources as it sees fit (within the emissions cap), and new sources would have to purchase allowances from existing sources (or from state auction or reserve sales). Under this system, the underlying standard of performance is the same for new and existing sources: keep within a national emissions cap by covering all carbon emissions with allowances.

1. Standard of Performance as a Cap

In a well functioning trading program, the cap functions as a ceiling or limit on the total amount of emissions. Under section 111, a standard of performance also limits the total amount of emissions. Therefore, EPA may choose to make the cap equivalent to the standard of performance. Part of that standard

strate a cap-and-trade system as an alternative means of emission limitation, and then allow sources to apply to adopt that alternative using section 111(h)(3).

150. See, e.g., Understanding the New Air Pollution Rules, *supra* note 18 ("CAMR . . . looked fatally flawed from the beginning. But in essence, it underregulated mercury" (statement of Michal J. Bradley)).

151. Initial allocation of allowances to only existing sources would be in line with the statutory mandate that existing source standards consider the "remaining useful lives of the sources." § 111(d)(2), 42 U.S.C. § 7411(d)(2) (2006).

would include the requirement that each source own sufficient carbon allowances to cover their emissions in order to enforce the cap.

EPA must first determine “the degree of emission limitation achievable through the application of the best system of emission reduction” that “has been adequately demonstrated.”¹⁵² One interpretation of this requirement is that EPA must catalog demonstrated methods for GHG emission reductions and determine the amount of reductions available if all sources were to implement the appropriate methods.

EPA must then define a standard of performance that “reflects the degree of emission limitation achievable.”¹⁵³ In other words, the standard of performance must require an emissions reduction comparable to that of the best available system. The standard of performance would reflect this reduction amount if it requires sources to achieve at least that level of emission reduction performance. Thus, EPA could define a cap that results in emissions less than or equal to the emissions EPA would expect from application of the best system of emission reduction across all sources.

Under this trading system, the standard of performance must allow sources to use allowances to meet the standard; actual emission reduction by each and every source would not be required. Note that depending on how allowances are defined, it may not be necessary to require each source to obtain sufficient allowances to cover *all* of their emissions. Under the third allowance allocation method discussed in Part IV.A.2 above, each source would be assigned a specific individual emissions limit. (This is one potential response to the Environmental Petitioners’ objection in CAMR that a standard of performance must be source-specific.) If the source emitted below the limit, it would generate allowances; if it emitted above the limit, it would need to acquire allowances to cover the difference. Thus, the two essential elements to a cap-and-trade standard of performance are that a cap is established and that emission allowances can be used to meet the limit.

Under a typical cap-and-trade program, the cap decreases over time. This allows sources to implement technologies over a longer period while still decreasing emissions at a stringent, continuous rate. Section 111 has a mechanism to revise a standard of

152. § 111(a)(1), 42 U.S.C. § 7411(a)(1).

153. *Id.*

performance: the eight-year review process under section 111(b)(1)(B). This section requires EPA to review and revise its standards of performance. Between this revision process and the statutory mandate to consider costs when establishing a standard of performance, EPA should be able to ratchet down a cap over time.

2. Standard of Performance as a Minimum Emissions Reduction Baseline

In a variation to setting the standard of performance to the cap, EPA could instead define the standard of performance as a minimum emissions baseline. As described in Part IV.A.3 above, a minimum emissions reduction baseline would be the level of actual emissions reduction that each source must achieve before it is allowed to participate in a trading program. Allowances could not be used to meet the baseline. The benefit to this approach is that it obviates the objection of the Environmental Petitioners that a standard of performance must restrict actual emissions from individual sources.

The consequence of this approach is that EPA will set the cap below the minimum baseline. Otherwise, no source would have an incentive to participate in a trading program. This raises the not insignificant question of statutory authority. If EPA has already set a standard of performance as equivalent to a minimum baseline, why would sources seek to achieve greater emission reductions through allowance trading?

EPA must review the standard of performance at least every eight years, according to the aforementioned section 111(b)(1)(B) review process. This gives EPA both the ability and the obligation to strengthen the standard of performance while ratcheting down the cap over time. For example, part of that review process requires EPA to “consider the emission limitations and percent reductions achieved in practice.”¹⁵⁴ If some sources can achieve much greater reductions than the initial baseline, then sources may wish to participate in a voluntary emission trading market to realize more flexibility in planning for what will eventually become a much stricter mandatory baseline under the review process. EPA also has the ability to avoid the review process if it determines that such review is “not appropriate in light of readily available information on the efficacy of such stan-

154. § 111(b)(1)(B), 42 U.S.C. § 7411(b)(1)(B).

dard.”¹⁵⁵ A voluntary emissions trading program may be one method to demonstrate that a stricter mandatory emission baseline is unnecessary.

3. Measuring Achievable Emission Limitation by Considering Cap-and-Trade the “Best System of Emission Reduction”

As discussed above, when EPA or a state develops a standard of performance, that standard must reflect what is achievable if one used the best system of emission reduction. It may be useful, then, to consider cap-and-trade one possible system that should be compared to other best systems to reduce carbon emissions.¹⁵⁶

In its ANPR, EPA considers cap-and-trade a system for controlling emissions:

A cap-and-trade program can constitute a “standard for emissions of air pollutants” because it is a system created by EPA for control of emissions.¹⁵⁷

If cap-and-trade is a system of emission reduction, then EPA must consider whether it is the best system. EPA may conclude that the emissions limitation achieved using cap-and-trade is superior to that of other options because cap-and-trade has certain economic advantages over the use of specific technological solutions, namely in cost efficiency. EPA would then have to develop a stricter standard of performance to reflect that superior achievable emission limitation. (Note that the standard of performance would not necessarily need to be cap-and-trade but would need to result in similar emissions reductions.)

The stumbling block for cap-and-trade comes at the end of the definition of standard of performance. EPA must find that the best system of emission reduction be adequately demonstrated. In the case of cap-and-trade, EPA could determine this by referencing similar trading programs, such as the Regional Greenhouse Gas Initiative, European efforts under the Kyoto Protocol, and the existing acid rain trading program.

155. *Id.*

156. *See, e.g.,* Richardson et al., *supra* note 10, at 10,105 (suggesting the statutory language allows EPA to claim that trading is a “best system”).

157. Regulating Greenhouse Gas Emissions Under the Clean Air Act, 73 Fed. Reg. 44,354, 44,490 (proposed July 30, 2008) (to be codified at 40 C.F.R. ch. 1).

V.
HARMONIZING STATE CAP-AND-TRADE PROGRAMS
WITH SECTION 111(D) OBLIGATIONS

States define and impose the standard of performance on existing sources.¹⁵⁸ Nothing in section 111 requires states to implement the same cap-and-trade rules or even the same cap. In CAMR, EPA avoided this problem with a carrot-and-stick approach. EPA presented the states with the option of joining a national cap-and-trade program. It also threatened to disapprove any plan that did not establish a standard of performance that was at least strict enough to meet the state's share of the cap. EPA could make this threat because it had already defined what degree of emission limitation is achievable by surveying the best demonstrated systems of emission reduction. Each state's standard of performance must, by definition, reflect that degree of emission limitation.

One incentive for developing GHG cap-and-trade under section 111(d) is the potential for harmonization with existing state and regional trading programs. Franz Litz et al. observe that "[t]he 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."¹⁵⁹ Under section 111(d), EPA must approve state plans to implement a standard of performance for existing sources. These EPA guidelines could be written to allow states to use their existing cap-and-trade programs in their section 111(d) plans.

Plans for regional trading programs intended to reduce GHG emissions involve nearly half of the states in the Union. In 2009, northeastern and mid Atlantic states launched the Regional Greenhouse Gas Initiative (RGGI).¹⁶⁰ Two other programs—the Western Climate Initiative (WCI) and the Midwestern Greenhouse Gas Reduction Accord (Midwestern Accord)—could begin as soon as 2012.¹⁶¹ As a participant in WCI, California plans

158. See, e.g., McKinstry, Jr., *supra* note 11, at 10,306 ("Because the statute uses the singular verb, 'establishes,' it appears that the state plan (rather than the EPA regulations) will establish the standards of performance . . .").

159. Litz et al., *supra* note 6, at 2.

160. *Id.* at 14.

161. *Id.*

to dry-run its cap-and-trade program in 2012 and begin the full program in 2013.¹⁶²

Franz Litz et al. describe in detail how regional cap-and-trade programs could be reconciled with the requirements of section 111(d).¹⁶³ They identify key points of contention, including program scope and the use of offsets.¹⁶⁴ This Part takes a close look at one state program: the California Air Resources Board's (CARB's) cap-and-trade program.¹⁶⁵ It specifically considers California's definition of the cap, the scope of the program, and rules concerning banking, multi-year compliance, offsets, trading, and allowance distribution. This Part concludes that section 111(d) provides EPA with sufficient discretion to accept a program similar to California's cap-and-trade program in lieu of California's section 111(d) obligations for regulating GHG emissions.

The key point is that section 111(d) presents states with a floor, not a ceiling. So long as California, for example, establishes standards of performance and provides implementation and enforcement of those standards, it can impose additional requirements on regulated sources under state law that go beyond the minimum requirements of section 111(d).

California must, however, be careful to ensure that its program can achieve any federally mandated minimum requirements for sources regulated under section 111(d) (a narrower set of sources than the total regulated under California's program). In addition, California could incorporate new state sources into its program using section 111(c), which allows states to enforce standards of performance on new sources if EPA finds the state procedure to

162. Debra Kahn, *California Delays Cap-and-Trade Auctions, Citing Potential Gaming*, N.Y. TIMES (June 30, 2011), <http://www.nytimes.com/cwire/2011/06/30/30climatewire-california-delays-cap-and-trade-auctions-cit-96440.html>; Mary D. Nichols, Chairman, Cal. Air Res. Bd., Testimony Before California State Senate Select Committee on the Environment, Economy, and Climate Change, Informational Hearing on AB 32 Market Mechanisms (June 29, 2011), transcript available at <http://www.arb.ca.gov/cc/testimony/testimony.pdf>; see also Cal. Air Res. Bd., Major Activities for the Cap-and-Trade and Mandatory Reporting Program in 2012, <http://www.arb.ca.gov/cc/capandtrade/2012activities.pdf>.

163. See Litz et al., *supra* note 6, at 17–24.

164. *Id.* at 17–20. Other potential obstacles, as presented by Franz Litz et al., include international trading, borrowing, banking, compliance periods, and cost-containment mechanisms. *Id.* at 20–23.

165. California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms, CAL. CODE REGS. tit. 17, §§ 95800–96023 (2011) [hereinafter Cal. Cap-and-Trade Reg.].

be adequate and sufficiently stringent.¹⁶⁶ By harmonizing its trading program with section 111, California avoids regulating these sources twice for the same GHG emissions.

A. *Standards of Performance*

In CAMR, states had to define a standard of performance that reflected that national cap.¹⁶⁷ For California's GHG trading program, the standard of performance would be the requirement that each regulated source cover its emissions with allowances, along with the limited distribution of allowances such that total emissions remain below the cap. California has established a cap that decreases GHG emissions by fifteen percent by 2020 (via decreasing the number of allowances available in the market).¹⁶⁸

Ideally, EPA would develop two key pieces of guidance for states. First, EPA would clarify that GHG emissions are a world-wide problem and that, as a well distributed atmospheric pollutant, reductions in emissions are relatively interchangeable. Second, EPA would define certain parameters that an emission allowance (or offset credit) must meet for section 111 regulation of GHG emissions. This definition would be similar to what California has used to define qualifying offsets: "real, additional, quantifiable, permanent, verifiable, and enforceable" GHG reductions.¹⁶⁹

Taken together, these two pieces of guidance would support California's trading system by authorizing qualified emission allowances not otherwise regulated under section 111 to be used to meet the standard of performance. In other words, this guidance would allow California to create a pool of allowances based on capping emissions from sources both in- and outside the purview of section 111. (Arguably, this may include emission allowances generated as offsets by sources not directly regulated under section 111(d)). Sources regulated under section 111(d) could then meet their standard of performance for GHG emissions by demonstrating that they have covered their emissions with those allowances, in accordance with the California regulations. Thus,

166. Note that section 111(d)(2) implies that existing sources may have weaker standards of performance than new sources, by accounting for remaining useful life of the existing sources. See § 111(d), 42 U.S.C. § 7411(d) (2006).

167. See Part III.A.

168. CAL. AIR RES. BD., ARB EMISSIONS TRADING PROGRAM OVERVIEW (2011), available at http://www.arb.ca.gov/cc/factsheets/emissions_trading_program.pdf.

169. Cal. Cap-and-Trade Reg., *supra* note 165, § 95802(a)(12).

the breadth of the definition of the standard of performance impacts much of the analysis below, particularly scope of coverage.

B. *Scope of Coverage*

A cap-and-trade program is admittedly in tension with the structure of section 111. Section 111 envisions a standard of performance applied to each category of sources, typically distinguished by the industrial sector, for example.¹⁷⁰ A trading program requires liquidity for a functioning market and therefore is generally more efficient when applied to sources over multiple industrial sectors.

Regional trading programs tend to cover a variety of sectors that do not necessarily match up with the categories of stationary sources established by EPA under section 111.¹⁷¹ For example, California's emissions trading program covers CO₂ and other GHG emissions.¹⁷² The first compliance period (2013–2014) covers the electricity industry and large industrial facilities.¹⁷³ The second and third compliance periods (2015–2017 and 2018–2020) also cover fuel distributors.¹⁷⁴

EPA's section 111 regulation of GHG emissions, in contrast, will likely cover only emissions from the electricity industry and large industrial facilities, at least in the beginning. EPA could use its discretion, however, to create broader categories or allow a multi-sector option for trading allowances.¹⁷⁵ Alternatively, states could demonstrate that their multi-sector trading approach results in greater total reductions than what would have been achieved using the best system of emission reduction for a single source category.¹⁷⁶

Furthermore, while it is certainly reasonable to suggest, as Litz et al. do, that section 111(d) requires reductions within a speci-

170. See, e.g., § 111(b)(1)(B), 42 U.S.C. § 7411(b)(1)(B) (2006).

171. Litz et al., *supra* note 6, at 17.

172. See Cal. Cap-and-Trade Reg., *supra* note 165, § 95802(a)(121). See generally CAL. AIR RES. BD., *supra* note 168.

173. Cal. Cap-and-Trade Reg., *supra* note 165, §§ 95840, 95841, 95811. Imported electricity is covered by requiring “[f]irst [d]eliverers” in California to obtain allowances based on the estimated emissions used to generate the imported electricity. *Id.* §§ 95811(b), 95852(b).

174. *Id.* §§ 95840, 95841, 95811.

175. Litz et al., *supra* note 6, at 19.

176. *Cf. id.* at 19 (“[A] 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.”).

fied sector, nothing in section 111 compels such a narrow scope.¹⁷⁷ Section 111 does not even explicitly mandate an emissions reduction; it requires a *standard of performance*. The emphasis is on reflecting the “best system of emission reduction,” which is not source specific or even source category specific. Thus, instead of re-defining and broadening the categories of regulated sources under section 111(d), EPA (and California) would be better served by defining the standard of performance in terms of overall emission reduction, not individual source reductions.

C. Banking

Banking of allowances is a common mechanism in trading programs. Banking allows a regulated source to save allowances for use in future years. It provides sources with an incentive to reduce actual emissions early in the program, increases liquidity, and helps to smooth price fluctuations in the market.¹⁷⁸

California’s proposed trading regulations allow sources to bank an unlimited number of allowances for future use.¹⁷⁹ EPA similarly allowed unlimited banking in CAMR.¹⁸⁰ Banking is not a significant problem under section 111 regulations because sources will achieve reductions sooner than otherwise required given that banking requires sources to achieve greater emissions reductions early on in exchange for the ability to emit more in the future.¹⁸¹ This is particularly true for GHG emissions, for which earlier reductions are more valuable given the long lifespan of some GHGs. Also, CO₂ is a well-mixed global pollutant with less potential for hotspot formation and significantly less health threat from hotspot formation than, for example, the mercury hotspots considered in CAMR.¹⁸² Thus the use of banked

177. See *id.* at 23 (“The framework of section 111(d) suggests that the given reductions must take place in the relevant sector.”).

178. See generally W. BOWMAN CUTTER ET AL., RULES OF THE GAME: EXAMINING MARKET MANIPULATION, GAMING AND ENFORCEMENT IN CALIFORNIA’S CAP-AND-TRADE PROGRAM 24–42 (2011), available at http://cdn.law.ucla.edu/SiteCollectionDocuments/Centers%20and%20Programs/Emmett%20Center%20on%20Climate%20Change%20and%20the%20Environment/Rules_of_the_Game.pdf.

179. Cal. Cap-and-Trade Reg., *supra* note 165, § 95856(b). Of course, California’s program is set to expire in 2020, at which point any leftover banked allowances could become worthless. See CUTTER ET AL., *supra* note 178, at 67–68.

180. Litz et al., *supra* note 6, at 22.

181. *Id.*

182. One study has implicated urban CO₂ domes with increased local ozone and particulate matter due to feedbacks in temperatures, atmospheric stability and a

allowances, which could potentially result in a localized, temporal increase of GHG emissions, is less of a concern. (Admittedly, however, more harmful co-pollutants emitted during combustion in energy production could increase along with increased GHG emissions and would need to continue to be regulated under the Clean Air Act.)

Furthermore, under California's decreasing cap, sources are more likely to use banked allowances in future years. By banking, sources can keep their emissions at a steady rate (above the declining cap), which is less problematic—from both a legal and health perspective—than increasing emissions over time. In particular, it is difficult to argue that a program that allowed sources to significantly increase emissions over time by banking allowances constitutes a “best system of emission reduction.”¹⁸³ A steadily decreasing cap reduces this risk while forcing sources that delay technological improvements to use up their banked allowances.

D. *Borrowing and Multi-year Compliance*

In cap-and-trade, borrowing occurs when a facility covers its current year emissions with allowances assigned to future emission years. Section 111 does not speak directly to the issue of borrowing, but EPA regulations restrict state plans from deferring emissions reductions through the use of compliance periods, which cannot exceed federal guidelines.¹⁸⁴

California does not allow borrowing in its cap-and-trade program¹⁸⁵ but does provide sources with a three-year compliance period.¹⁸⁶ Litz et al. suggest that a “multi-year compliance period. . . could be regarded as providing limited borrowing within

host of other complex interactions between CO₂ and other air pollutants. Mark Z. Jacobson, *Enhancement of Local Air Pollution by Urban CO₂ Domes*, 44 ENV'TL. SCI. & TECH. 2497 (2010). But it is generally recognized that CO₂ is well-mixed in the atmosphere. *Id.* at 2497.

183. Clean Air Act § 111(a)(1), 42 U.S.C. § 7411(a)(1) (2006).

184. Litz et al., *supra* note 6, at 22 (citing 40 C.F.R. § 60.24(c)). Litz et al. also note that the CAMR rule did not include borrowing but EPA did conclude it had authority to implement borrowing if it so chose. *Id.* at 22.

185. Cal. Cap-and-Trade Reg., *supra* note 165, § 95856(b)(2). Reserve allowances have no vintage and thus can be “borrowed” to meet a current-year emissions obligation. *Id.*

186. Cal. Cap-and-Trade Reg., *supra* note 165, § 95853. *But see id.* § 95855 (obligating sources to annually retire sufficient allowances to cover thirty percent of their prior year emissions).

the time period covered by the compliance period.”¹⁸⁷ In California’s program, however, allowances have a yearly “vintage” and are not interchangeable, even within compliance periods. Thus, at the end of a three-year compliance period, each regulated source must have sufficient allowances from the correct vintage year (or later) to cover its emissions for each of the three years in the compliance period.¹⁸⁸ As Litz et al. observe, EPA could clarify its interpretation of section 111 to allow for multi-year compliance periods, which would be in line with CARB’s proposed trading program.

E. Offsets and Out-of-State Trading

Offsets—whereby activities unrelated to source emissions are counted as reductions—are not contemplated by section 111(d). Moreover, verification of offsets is problematic. Therefore, states would likely need to show that reductions at sources covered under section 111(d) plans meet or exceed what could be achieved by the best system of emission reduction. As Litz et al. suggest, states would need to limit the use of offsets accordingly.¹⁸⁹

California’s cap-and-trade program allows covered sources to cover eight percent of their annual emissions with offsets.¹⁹⁰ Offsets are GHG allowances generated from projects, such as forest sequestration, that generate verifiable and permanent GHG reductions.¹⁹¹ Qualifying offset projects are currently limited to the United States, Canada, and Mexico, but eventually projects worldwide could conceivably qualify under California’s program.¹⁹²

Litz et al. argue that because standards of performance apply to regulated section 111 source categories, offsets would likely

187. Litz et al., *supra* note 6, at 22.

188. Cal. Cap-and-Trade Reg., *supra* note 165, § 95856(b)(2).

189. Litz et al., *supra* note 6, at 20.

190. Cal. Cap-and-Trade Reg., *supra* note 165, §§ 95820(b)(2), 95854. *See generally id.* Subarticle 13, §§ 95970–73 (detailing the requirements for qualifying offsets). The Regional Greenhouse Gas Initiative has a similar restriction, allowing covered entities to use offsets for 3.3 percent of their compliance obligation. Jonas Monast et al., U.S. Carbon Market Design: Regulating Emission Allowances as Financial Instruments 13 (Feb. 2009) (working paper) (on file with The Nicholas Institute for Environmental Policy Solutions), available at <http://nicholasinstitute.duke.edu/climate/carbon-market-oversight/u.s.-carbon-market-design-regulating-emission-allowances-as-financial-instruments>.

191. Cal. Cap-and-Trade Reg., *supra* note 165, § 95802(a)(12).

192. *Id.* § 95972(c).

not count towards the minimum emissions reduction required under section 111(d).¹⁹³ In this regard, California's eight percent limit makes it easier to comply with section 111(d) because the limit applies to each covered entity. No one source can "reduce" its emissions by more than eight percent using only offsets. California's eight percent rule (along with the emissions cap) thus provides a clear minimum reduction for each regulated source. California need only demonstrate that its emissions cap minus the offsets achieves the required minimum emissions reduction. If California sets its cap to a level stringent enough to meet EPA's minimum requirements even without the use of offsets, it can avoid the problem of offsets under section 111 altogether.

A related issue is the trading of allowances between sources in California and sources either outside the United States (international trading) or in the other forty-nine states (interstate trading). As part of the Western Climate Initiative, California intends to link its trading program with other western states and Canadian provinces.¹⁹⁴ Litz et al. place international trading in much the same category as offsets: reductions from international sources would not count towards the reductions required for section 111(d) sources because that section is equally silent about using international sources to offset section 111(d) compliance obligations.¹⁹⁵

In summary, trading and offsets can be considered along two dimensions: jurisdiction and origin of emission reduction. Moving from intrastate to interstate to international trading, it becomes less likely that the traded allowance would count under section 111. Likewise, moving from trades between regulated source categories to trades with unregulated source categories to offsets, it also becomes less likely that the traded allowance would count under section 111.

It cannot be the case, however, that trading is disallowed entirely in the section 111 context. If that were the case, then section 111 could not in practice be used to support a cap-and-trade program. California's program in particular requires the ability to trade allowances between sources that would be regulated

193. Litz et al., *supra* note 6, at 20.

194. See, e.g. Cal. Air Res. Bd., Presentation, Cap-and-Trade Workshop: Regulation for Linking California's and Quebec's Cap-and-Trade Program (Feb. 3, 2012), available at <http://www.arb.ca.gov/cc/capandtrade/meetings/022012/linking-ca-and-qc-cap-trade.pdf>.

195. Litz et al., *supra* note 6, at 20.

under section 111 and those sources that would not. It would be impracticable to restrict, for example, power utilities from trading allowances with sources that are not categorized with section 111.¹⁹⁶ Thus, the standard(s) of performance must be broad enough to encompass the concept of intrastate trading in order to support California's cap-and-trade program.

F. *Initial Allowance Distribution: Allowance Reserve and Auction Price Floor*

California uses three basic methods to initially distribute allowances: auctions,¹⁹⁷ direct allocation (giving free allowances to certain regulated sources),¹⁹⁸ and an allowance reserve.¹⁹⁹ Technically, allowance distribution can be considered part of the system or mechanism of emission reduction under section 111 because the limited pool of allowances drives emission reductions in the system. Thus, allowance distribution is properly considered part of the standard of performance.²⁰⁰

Litz et al. provide the basic rule for allocation and any cost-containment mechanisms: such mechanisms cannot undermine the emissions cap.²⁰¹ That rule is tempered by the explicit consideration of costs in section 111.²⁰² The triggering of a safety valve or reserve sale is acceptable—even if it undermines the cap—if the price is above the point at which EPA deems the cost of additional reductions to be unreasonable.²⁰³ In other words, allowance distribution and cost containment cannot unreasonably undermine the standard of performance.

California's program has two specific cost-containment mechanisms. To limit allowance price spikes, California withholds four percent of the total allowances in the system and offers them for sale to compliance entities at quarterly reserve sales at price tiers

196. One major consequence of restricting trading outside of the regulated source category would be a significant loss in liquidity of the allowance market. This would be undesirable in the relatively small California market. See, e.g., CUTTER ET AL., *supra* note 178, at 24–42.

197. Cal. Cap-and-Trade Reg., *supra* note 165, § 95910 et seq.

198. *Id.* § 95890 et seq.

199. *Id.* § 95913.

200. Cf. Clean Air Act § 111(a)(1), 42 U.S.C. § 7411(a)(1) (2006).

201. Litz et al., *supra* note 6, at 23.

202. See § 111(a)(1), 42 U.S.C. § 7411(a)(1) (2006) (“[T]aking into account the cost of achieving such reduction . . .”).

203. See Litz et al., *supra* note 6, at 23 (noting that, in the scenario of a price trigger at an unreasonable price level, the state would have a “strong case” that the trigger is consistent with section 111).

of forty dollars, forty-five dollars, and fifty dollars.²⁰⁴ To prevent a collapse in allowance prices, the allowance auction has a price floor of ten dollars.²⁰⁵

Neither of these mechanisms undermines the established emissions cap. Thus, both appear to be within the discretion of CARB (and EPA) under section 111's consideration of costs. California must, however, ensure that the required section 111 emission reduction—not necessarily equivalent to its program cap—is not undermined by the sale of allowances from the reserve.

At the same time, California must demonstrate that it took into account the cost of the program as mandated by section 111. Given the cost-containment mechanisms and the implicit function of a cap-and-trade system—to identify efficient emission reductions—California should easily meet this mandate.

VI. CONCLUSION

The question of whether allowances could be used as a substitute for actual emission reductions for each source regulated under section 111 remains unanswered after the CAMR litigation. This article, referencing the statutory debate in the CAMR briefs, concludes that the definition of standard of performance in section 111 is sufficiently broad to encompass a well-designed GHG trading program.

Specifically, the standard should be defined as the requirement that each source cover its GHG emissions with tradable allowances whose supply is limited by an emissions cap. That cap would reflect the best demonstrated technology for reducing GHG emissions, as determined by EPA, and would decrease over time with periodic EPA review.

By incorporating regional cap-and-trade programs into state section 111(d) plans, EPA could reduce the burden on regulated sources and increase state participation in a national cap-and-trade program. Otherwise, sources regulated by state regional cap-and-trade programs will need to follow two distinct sets of regulations for their GHG emissions.

204. Cal. Cap-and-Trade Reg., *supra* note 165, § 95913(d)(2). The tiers increase by five percent plus the rate of inflation annually. *Id.* § 95913(d)(3).

205. *Id.* § 95911(b)(6)(A). The price floor increases by five percent plus the rate of inflation annually. *Id.* § 95911(b)(6)(B).