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Playing without Aces: Offset and the Limits of Flexibility under Clean Air Act Climate Policy

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PLAYING WITHOUT ACES: OFFSETS AND THE LIMITS
OF FLEXIBILITY UNDER CLEAN AIR ACT CLIMATE POLICY

BY NATHAN RICHARDSON*

The United States Environmental Protection Agency (EPA) continues to move ahead with regulation of greenhouse gas emissions under the Clean Air Act (CAA). Previous work has indicated that basic forms of compliance flexibility—trading—appear to be legally permissible under section III of the CAA. This Article takes a close look at more expansive and ambitious types of flexibility: trading between different kinds of sources, biomass co-firing, and above all, offsets. It concludes that most types of such extended flexibility are either legally incompatible with the CAA, or so legally problematic that EPA is unlikely to adopt them. This has important implications for both the costs of the CAA climate policy and the level of environmental benefits that are achievable. It also creates tension between the CAA climate policy and state-level policies, such as California’s, that aim to include various forms of extended flexibility.

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I. INTRODUCTION

Since the Supreme Court’s 2007 *Massachusetts v. U.S. Environmental Protection Agency (Massachusetts v. EPA)*¹ decision and the 2009–2010 failure of cap-and-trade in Congress, the Environmental Protection Agency

¹ 549 U.S. 497, 528–29 (2007).

(EPA)—under the authority of the Clean Air Act (CAA)²—has become the sole vehicle for federal climate policy. But that authority is limited: EPA’s freedom to design and implement climate policy is constrained by the scope of its powers under the CAA.³ Although critics’ claims that regulating greenhouse gases (GHGs) under the CAA will be a “train wreck” are overblown,⁴ CAA climate policy does require compromises. But which ones? This Article tries to answer a key part of that question, specifically: Can EPA allow emissions trading, offsets, and other flexibility mechanisms for the power plants, refineries, and other existing “stationary sources” whose carbon emissions the agency will soon regulate under the CAA?

EPA’s climate policy program under the CAA may have reached the end of its beginning, due to the recent proposal of the first regulations limiting GHG emissions from the biggest class of emitters: existing fossil fuel power plants.⁵ Limits for existing fossil power plants, and for both new and existing sources in other sectors will follow.⁶ Future existing-source regulations come via a rarely used and relatively poorly understood part of the CAA: performance standards under section 111(d).

Can these performance standards be flexible, allowing emitters to trade, or does the CAA require EPA to issue rigid, one-size-fits-all standards? To put it differently, does section 111(d) give EPA the authority to implement a modern, market-based policy for GHGs? The answer is critically important for both the economic costs and the environmental

² 42 U.S.C. §§ 7401–7671q (2006).

³ See *Chevron U.S.A., Inc. v. Natural Res. Def. Council, Inc.*, 467 U.S. 837, 842–45 (1984).

⁴ See Op-Ed., *More Hot Air from the White House*, N.Y. TIMES, Apr. 22, 2008, <http://www.nytimes.com/2008/04/22/opinion/22iht-edwarming.1.12230349.html> (last visited July 14, 2012) (quoting Bush administration press secretary referring to GHG regulation under the CAA as a “regulatory train wreck”); see also AM. LEGISLATIVE EXCH. COUNCIL, EPA’S REGULATORY TRAIN WRECK: STRATEGIES FOR STATE LEGISLATORS vi–vii (2011), available at <http://www.alec.org/docs/EPA-TRAIN-WRECK-2011-Final-Full-printres.pdf> (characterizing a suite of recent and near-future EPA regulations, including those on GHGs, as a “train wreck”). For a brief counterargument to the “train wreck” position, see Nathan Richardson et al., *The Return of an Old and Battle-Tested Friend, the Clean Air Act*, 176 RESOURCES 24, 29 (2010), which argues that CAA regulation of GHGs can be effective, at least over the short term.

⁵ See U.S. ENVTL. PROT. AGENCY, EPA 430-R-12-001, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990–2010, AT ES-6, ES-12, ES-15, 3-1 (2012), available at <http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2012-Main-Text.pdf>; Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units, 77 Fed. Reg. 22,392 (proposed April 13, 2012) (to be codified at 40 C.F.R. pt. 60); see also U.S. ENVTL. PROT. AGENCY, ELECTRIC UTILITY STEAM GENERATING UNITS SETTLEMENT AGREEMENT 3–4 (2010) [hereinafter Boiler Settlement Agreement], available at <http://epa.gov/carbonpollutionstandard/pdfs/boilerghgsettlement.pdf> (requiring EPA to promulgate a proposed rule under section 111(b) to regulate electric utility steam generating units (EGUs)); *infra* Part II.B.

⁶ See U.S. ENVTL. PROT. AGENCY, PETROLEUM REFINERIES SETTLEMENT AGREEMENT 4–5 (2010), *Am. Petroleum Inst. v. U.S. Env’tl. Prot. Agency*, No. 08-1227 (D.C. Cir. 2010), [hereinafter Refinery Settlement Agreement], available at <http://epa.gov/carbonpollutionstandard/pdfs/refineryghgsettlement.pdf> (noting EPA’s obligation to publish a proposed rule regulating petroleum refineries under the NSPS program); AM. LEGISLATIVE EXCH. COUNCIL, *supra* note 4, at 20; *infra* Part II.B.

benefits of the program.⁷ In the most basic sense, the answer appears to be yes. Independent legal observers and EPA have both concluded that section 111 does allow EPA to give emitters “compliance flexibility” up to and possibly including the authority to impose a cap-and-trade system across the entire regulated sector.⁸

But this is only part of the answer. There is more to flexibility than the ability to trade with other similar emitters, power plant to power plant. Most comprehensive climate policies, both actual and proposed, allow trading with other kinds of emitters, maybe even those in other jurisdictions.⁹ They also allow regulated emitters to buy offsets from those that are not covered, or from projects that cut atmospheric carbon in other ways, such as by preserving or planting forests.¹⁰ These forms of flexibility matter: expanding emissions markets by adding dissimilar emitters increases the opportunities for low-cost emissions cuts, and offsets may be the cheapest carbon-cutting opportunity of all.¹¹

⁷ See DALLAS BURTRAW ET AL., RES. FOR THE FUTURE, DISCUSSION PAPER NO. 11-30, RETAIL ELECTRICITY PRICE SAVINGS FROM COMPLIANCE FLEXIBILITY IN GHG STANDARDS FOR STATIONARY SOURCES 7, 22–23 (2011), available at <http://www.rff.org/RFF/Documents/RFF-DP-11-30.pdf> (analyzing cost impact of flexibility in implementation of CAA performance standards and finding that one option, a tradable performance standard, reduces overall costs by two-thirds by 2020).

⁸ See GREGORY WANNIER ET AL., RES. FOR THE FUTURE, DISCUSSION PAPER NO. 11-29, PREVAILING ACADEMIC VIEW ON COMPLIANCE FLEXIBILITY UNDER § 111 OF THE CLEAN AIR ACT 1–2 (2011), available at <http://www.rff.org/RFF/Documents/RFF-DP-11-29.pdf> (identifying areas of consensus—and lack thereof—regarding the legality of different policy options under §111(d), and specifically concluding that basic compliance flexibility is probably permissible). EPA made similar arguments in 2005 and 2008. See 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. I) (“As EPA has interpreted the NSPS [new source performance standards] 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.”); Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units, 70 Fed. Reg. 28,606, 28,606, 28,616 (to be codified at 40 C.F.R. pts. 60, 72, 75) (May 18, 2005) (establishing nationwide cap-and-trade program for mercury emissions under section 111 of the Clean Air Act).

⁹ See, e.g., WANNIER ET AL., *supra* note 8, at 8; Teresa B. Clemmer, *Staving Off the Climate Crisis: The Sectoral Approach Under the Clean Air Act*, 40 *Env'tl. L.* 1125, 1135 (2010); Ctr. for Climate & Energy Solutions, *Regional Initiatives*, http://www.c2es.org/what_s_being_done/in_the_states/regional_initiatives.cfm (last visited July 14, 2012).

¹⁰ See JONATHAN L. RAMSEUR, CONG. RESEARCH SERV., RL 34436, THE ROLE OF OFFSETS IN A GREENHOUSE GAS EMISSIONS CAP-AND-TRADE PROGRAM: POTENTIAL BENEFITS AND CONCERNS 3, 5–6 (2008); Maria Savasta-Kennedy, *The Newest Hybrid: Notes Toward Standardized Certification of Carbon Offsets*, N.C. J. INT'L L. & COM. REG. 851, 860–61 (2009).

¹¹ The potential economic value of carbon offsets has been comprehensively analyzed. In 2009 the U.S. Energy Information Administration (EIA) and the EPA performed a comprehensive analysis of congressional proposals for regulating GHGs with a cap-and-trade system. EPA found that the availability of international offsets would lower the marginal cost of emissions reduction from \$50 to \$26. See LARRY PARKER & BRENT D. YACOBUCCI, CONG. RESEARCH SERV., R40809, CLIMATE CHANGE: COSTS AND BENEFITS OF THE CAP-AND-TRADE PROVISIONS OF H.R. 2454, at 47, 47 tbl.8 (2009), available at <http://www.cnire.org/NLE/CRSreports/09Sept/R40809.pdf>.

This Article attempts to determine whether EPA can take advantage of any of these “extended flexibility” opportunities under section 111. For some opportunities, the answer appears to be yes: EPA probably can, for example, allow trading between different kinds of emitters (“source categories”). But for most types of extended flexibility, unfortunately, significant legal barriers exist. For international forest offsets—probably the most cost-effective option—these barriers appear insurmountable.

Part II of this Article discusses the basics of EPA’s CAA regulations for GHGs, while Part III defines and discusses the different types of flexibility available under climate policy. Part IV forms the core of the Article, analyzing the legal compatibility of CAA and section 111 regulation with these flexibility mechanisms. Part V then discusses implications for states, some of which have independent climate policies. Conclusions are presented in Part VI.

II. EPA’S CLIMATE REGULATIONS

Before discussing the scope of flexibility under EPA’s section 111 regulations, it is important to at least briefly describe where the agency is, how it got there, and the legal foundations of its program. In short, as of late 2011, EPA was well on its way to implementing a broad set of policies aimed at reducing GHG emissions in the U.S. with its authority under the existing CAA.¹² On April 13, 2012, the agency formally proposed the much-anticipated carbon emission performance standards for new power plants, but it has not yet detailed its plans for existing sources, the primary subject of this paper.¹³

A. *The Clean Air Act and Carbon*

Two events led to EPA’s predominant role in national climate policy. In 2007, the Supreme Court concluded in *Massachusetts v. EPA* that carbon is a pollutant subject to regulation under the CAA.¹⁴ In 2009, it appeared possible that Congress would pass legislation creating a new national climate policy and preempt the existing CAA, most likely in the form of economy-wide cap-and-trade—but these efforts ultimately failed in the Senate.¹⁵ These two developments have together left the regulatory burden squarely on EPA’s shoulders.

¹² See, e.g., 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards, 76 Fed. Reg. 74,854 (proposed Dec. 1, 2011) (to be codified at 40 C.F.R. pts. 523, 531, 533, 536, 537) (proposing heightened greenhouse gas emissions and fuel economy standards for light-duty vehicles manufactured between 2017 and 2025).

¹³ Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units, 77 Fed. Reg. 22,392 (proposed April 13, 2012) (to be codified at 40 C.F.R. pt. 60).

¹⁴ 549 U.S. 497, 528–29 (2007).

¹⁵ American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. (2009).

Under the Bush administration after *Massachusetts v. EPA*, the agency investigated pathways for GHG regulation, issuing a lengthy public analysis,¹⁶ but it did not move to actually regulate any GHG emissions sources. Under the Obama administration, EPA has moved relatively aggressively to use its CAA authority.¹⁷ The agency has made a formal endangerment finding for GHGs (enabling their regulation under the CAA),¹⁸ strengthened regulation of tailpipe emissions from vehicles,¹⁹ included GHGs in the permitting process for large new or modified emitters,²⁰ and, as noted above, proposed GHG performance standards for most new fossil fuel power plants.

B. The Knowable Pathway

Until recently, EPA's plan for regulating GHG emissions from existing stationary sources—the power plants and industrial facilities responsible for the majority of U.S. emissions—was completely unknown. In December 2010, EPA revealed its general plan: in a settlement agreement with states and environmental groups that had sued the agency shortly after *Massachusetts v. EPA*, the agency announced that it would use a specific tool under the CAA—performance standards under section 111—to limit stationary-source emissions.²¹ Still, much remains unclear, even after the agency's April 2012 proposal of standards for new sources. Given the magnitude of the emissions at stake, EPA's program for these sources will probably be the most important part of its GHG regulatory program.

As noted above, EPA's choice of regulatory program for new and existing stationary sources appears to be performance standards.²² Under section 111 of the CAA, the agency first defines categories of similar emitting sources ("source categories").²³ For new sources under section 111(b), the agency sets a performance standard based on the "best system of emission reduction."²⁴ These new sources are then required to meet the level of

¹⁶ See Regulating Greenhouse Gas Emissions Under the Clean Air Act, 73 Fed. Reg. 44,354, 44,354, 44,490 (proposed July 30, 2008).

¹⁷ See Jonathan H. Adler, *Heat Expands All Things: The Proliferation of Greenhouse Gas Regulation Under the Obama Administration*, 34 HARV. J.L. & PUB. POL'Y 421, 422, 440–42 (2011).

¹⁸ Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496 (Dec. 15, 2009) (codified at 40 C.F.R. ch. I).

¹⁹ See Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; Final Rule, 75 Fed. Reg. 25,324, 25,327 (May 7, 2010) (to be codified at 40 C.F.R. pts. 523, 531, 533, 536, 537).

²⁰ See Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 75 Fed. Reg. 31,514 (June 3, 2010) (to be codified at 40 C.F.R. pts. 51, 52, 70, 71).

²¹ See Refinery Settlement Agreement, *supra* note 6; Boiler Settlement Agreement, *supra* note 5; see also Proposed Settlement Agreement Notice, Clean Air Act Citizen Suit, 75 Fed. Reg. 82,392, 82,293 (Dec. 30, 2010) (providing notice of the settlement agreements as a result of threatened litigation over EPA's failure to establish GHG standards for fossil fuel power plants and petroleum refineries). For more information about these settlement agreements and the parties involved, see <http://www.epa.gov/airquality/cps/settlement.html>.

²² See *supra* Part I.

²³ Clean Air Act, 42 U.S.C. § 7411(b) (2006).

²⁴ *Id.* § 7411(a)(1).

emissions (or some other measure, such as efficiency) set by the standard,²⁵ though they are not required to use any specific technology to do so.²⁶ It is this set of standards that the agency proposed in April 2012, setting a stringent 1,000 lbs CO₂/MWh standard that effectively bans construction of new coal plants, at least without carbon-capture-and-storage technology.

The process for existing sources under section 111(d) is similar, but for these sources EPA only sets guidelines, whereas states are charged with setting and implementing the standards—subject to EPA review.²⁷ In practice, the process is likely to be collaborative, with EPA possibly issuing a model rule that states may adopt.²⁸ Traditionally, the section 111(b) New Source Performance Standards (NSPS) process has been technology-driven and has applied uniformly to all new sources within each category, without much flexibility.²⁹ However, section 111(d), which addresses performance standards for existing sources—which I will call Existing Source Performance Standards (ESPS)—has rarely been used at all.³⁰

III. WHAT FLEXIBILITY MEANS

Much remains unclear about these future ESPS. Some of the questions are procedural: Will other categories of sources eventually be covered? How much latitude will EPA give to states in implementing ESPS? And some are substantive: How stringent will the performance standards be?

A. Flexibility, Benefits, and Costs

But possibly more important than stringency is flexibility: How much compliance flexibility can or will be granted to emitters that must comply with the standards? In other words, is trading allowed, and if so, with

²⁵ *Id.* § 7411(b)(4).

²⁶ *Id.* § 7411(b)(5).

²⁷ *Id.* § 7411(d)(1).

²⁸ See, e.g., U.S. Env'tl. Prot. Agency, *NO_x State Implementation Plan (SIP) Call for the Mid-Atlantic States*, http://www.epa.gov/reg3artd/specprog/NOx/sip_call.htm (last visited July 14, 2012) (noting that EPA provided a model rule that states could voluntarily adopt to come into compliance with the agency's Nitrogen Oxide (NO_x) emission reduction requirements).

²⁹ See DALLAS BURTRAW, ARTHUR G. FRAAS & NATHAN RICHARDSON, RES. FOR THE FUTURE, DISCUSSION PAPER NO. DP 11-08, GREENHOUSE GAS REGULATION UNDER THE CLEAN AIR ACT: A GUIDE FOR ECONOMISTS 4–6 (2011), available at <http://www.rff.org/RFF/Documents/RFF-DP-11-08.pdf>.

³⁰ See generally DALLAS BURTRAW, ARTHUR G. FRAAS & NATHAN RICHARDSON, TRADABLE STANDARDS FOR CLEAN AIR ACT CARBON POLICY, 1, available at <http://www.rff.org/rff/Documents/RFF-DP-12-05.pdf> (discussing how the “tradable standards” regulatory tool found in CAA Section 111 is a legal and politically viable means of regulating emissions from coal plants and petroleum refineries); see also Nathan Richardson et al., *Greenhouse Gas Regulation under the Clean Air Act: Structure, Effects, and Implications of a Knowable Pathway*, 41 ENVTL. L. REP. 10,098, 10,105–06, 10,109–12, 10,115 (2011), (discussing generally the requirements under section 111(d)); WANNIER ET AL., *supra* note 8, at 3–4 (noting that although section 111 gives EPA several tools to utilize in regulating emissions from source categories, courts have yet to directly answer the most relevant questions).

whom? Because carbon is a global pollutant, it generally does not matter where emissions cuts come from: reducing smokestack emissions from a U.S. coal plant, a similar plant abroad, or avoiding deforestation in the Amazon.³¹

These extended flexibility tools are usually viewed as cost-containment mechanisms.³² Offsets, especially those available from international forest-related projects, appear to be among the lowest-cost opportunities for GHG reduction.³³ They might also be classed as environmental tools.³⁴ Because section 111 requires EPA to consider costs in setting performance standards (or at least in determining how long emitters have to comply),³⁵ reducing costs and achieving environmental goals are two sides of the same coin. Achieving similar environmental benefits for a lower cost is beneficial in its own right and may increase political flexibility for the agency. But reducing costs may also enable the agency to justify more aggressive environmental goals. Some tools may also have environmental side benefits: forest offsets could help stop biodiversity loss, or reductions in carbon emissions from sources outside the section 111 standards could lead to reductions in other pollutants emitted from those sources—although reducing emissions at covered sources might also have other benefits that would be sacrificed if reductions happen elsewhere instead.³⁶

For these reasons, and despite the focus on cost-reduction effects in this Article, it is important to understand these tools in environmental as well as economic terms. And, of course, the entire point of having a regulatory program for GHG emissions is to promote environmental goals.

Some previous work has looked at flexibility under section 111 in a general sense; that is, whether section 111 is compatible with relatively simple trading between emitters in the same source category subject to the same performance standards.³⁷ EPA and most observers appear to feel that

³¹ Actions with the same CO₂-equivalency are indistinguishable from a climate perspective, but not necessarily for other purposes. Actions have other costs and benefits not related to climate that should be weighed as well.

³² 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* 22–23 (Columbia Law Sch. Ctr. for Climate Change Law & World Res. Inst. Working Paper, 2011), available at http://www.law.columbia.edu/null/download?&exclusive=filemgr.download&file_id=542077.

³³ See *supra* note 11 and accompanying text.

³⁴ See generally *infra* Part III.B.

³⁵ Clean Air Act, 42 U.S.C. § 7411(a)(1) (2006).

³⁶ See Sarah A. Berkessy & Brendan A. Wintle, *Using Carbon Investment to Grow the Biodiversity Bank*, 22 CONSERVATION BIOLOGY 510, 510 (2008). It is also true that some tools could result in environmental harms. Some claim that the use of biomass for energy could increase the demand for forest products, with negative consequences for biodiversity, for example. See *id.* This, along with skepticism about the carbon benefits of offsets or biomass, is the source of opposition to these tools in some circles, discussed in more detail below. See *infra* Part IV.F.

³⁷ See Robert A. Nordhaus, *New Wine Into Old Bottles: The Feasibility of Greenhouse Gas Regulation Under the Clean Air Act*, 15 N.Y.U. ENVTL. L.J. 53, 56–57 (2007) (examining the most commonly considered GHG control options: command-and-control regulations, a cap-and-trade scheme, and a GHG tax).

the statute does permit this.³⁸ Scholars have applied relatively little analysis to extended flexibility. Assuming that at least some flexibility for future sources is available under section 111, how much can EPA allow emitters to trade with other sectors, buy offsets, or receive credit for other carbon-cutting actions?

In short, extended flexibility matters, but a lack of legal analysis makes it unclear whether and to what extent these tools are compatible with climate policy under the CAA, and specifically with section 111 performance standards. This Article is an attempt to fill this gap.

B. Types of Flexibility

Flexibility can come in many forms, and because the legal analysis differs significantly among the various forms, it is helpful to clearly distinguish each one. “Offsets” in particular is a broad term that can refer to many different types of activities, from paying a nearby cement plant to reduce its emissions to buying credits for avoided deforestation in faraway tropical regions.³⁹ Instead of basing analysis on such ambiguous terms, it is more useful to concretely describe different types of flexibility. As shown in Figure 1, this Article discusses five different types of flexibility.

An emitter subject to section 111 performance standards (or any emissions restriction) can either reduce its own emissions to comply, or trade with others that make an equivalent contribution—if the regulator allows.⁴⁰ These five types of flexibility categorize the different groups with which an emitter could, in principle, be allowed to trade. From Type 1 through Type 5, the source of emissions credits the regulated emitter is allowed to use becomes more distant conceptually (and often geographically). The types are divided not by geography, but by the law of section 111. Each successive type of flexibility is affected by additional legal barriers, as discussed in the following sections.⁴¹ These legal barriers are not necessarily interdependent, but generally speaking, if one class of flexibility is incompatible with the statute, more “distant” types will probably also be unavailable.

³⁸ See *supra* note 8 and accompanying text.

³⁹ See ROSS W. GORTE & JONATHAN L. RAMSEUR, CONG. RESEARCH SERV., RL34560, FOREST CARBON MARKETS: POTENTIAL AND DRAWBACKS 1 (2010).

⁴⁰ See LITZ, *supra* note 32, at 2; Nordhaus, *supra* note 37, at 64.

⁴¹ See *infra* part IV.

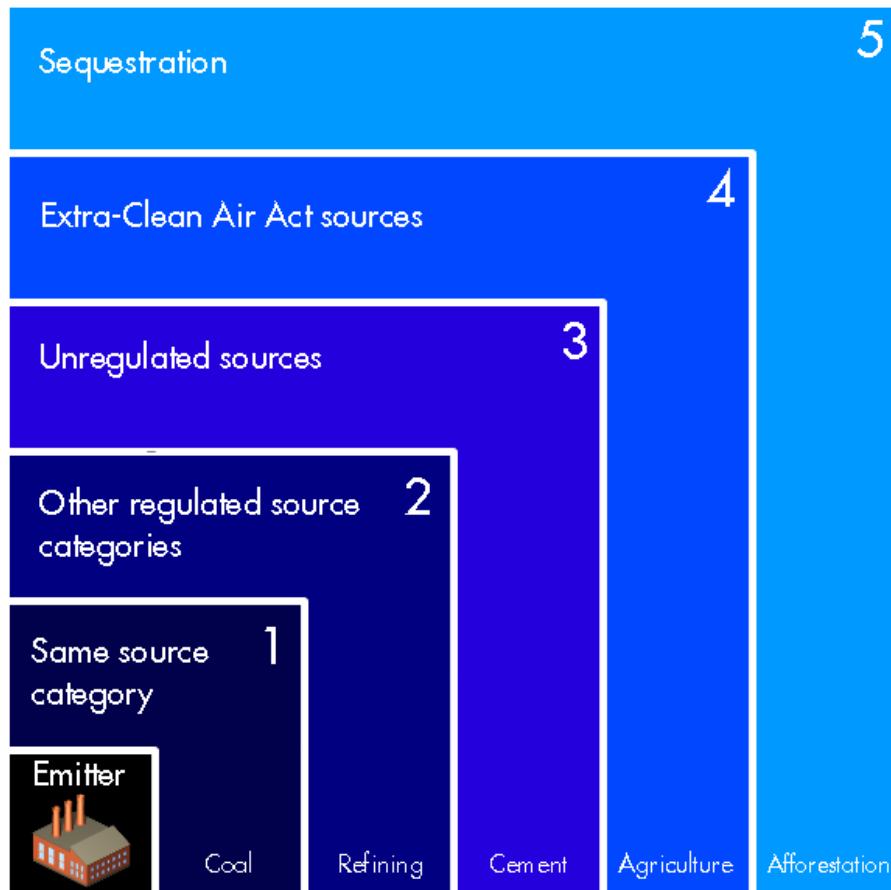


Figure 1. Types of Flexibility, with Examples

To help explain the different types of flexibility, consider a hypothetical coal-fired power plant subject to EPA performance standards. It must reduce its emissions, improve its efficiency, or do whatever is required by the performance standard—or if an emissions trading program is in effect, it may be able to purchase some form of credits created when someone else takes some kind of GHG-cutting action.

Type 1. Recall that NSPS and ESPS are set for defined source categories.⁴² If any compliance flexibility at all is available, sources will be able to trade with others in the same source category.⁴³ Our coal plant could, for example, buy credits from a similar plant that improved its efficiency or reduced its emissions more than required by the performance standard. This is Type 1 flexibility.

⁴² See *supra* note 22 and accompanying text.

⁴³ See Nordhaus, *supra* note 37, at 65–66 (raising the question of whether EPA would have the authority to combine source categories together, rather than administering a cap-and-trade program for each separate category).

Type 2. Another possibility is that sources could be permitted to obtain credits from emitters in other source categories that have their own performance standards.⁴⁴ For example, our coal plant could buy credits from an oil refinery, for which standards are also scheduled to be issued by the end of 2012 (although meeting this date appears increasingly unlikely). This trading with other sources covered under section 111, but in different source categories, is Type 2 flexibility.

Type 3. Emissions reductions could also occur at stationary sources that are not currently subject to any section 111 performance standard, and these reductions could be another source of credits for regulated emitters.⁴⁵ Our coal plant could, for example, buy credits from a cement plant that reduces its emissions. Trading with stationary sources that do not yet have section 111 GHG performance standards is Type 3 flexibility.

Type 4. CAA section 111 applies only to domestic stationary sources.⁴⁶ But emissions reductions are equally valid whether they come from those sources, from sectors outside the reach of section 111 such as vehicles or agriculture, or from stationary sources abroad. Our coal plant could, for example, buy credits from a farm that reduces its methane emissions, or from a similar coal plant in another country. Such trading with extra-CAA (or at least extra-section 111) sources is Type 4 flexibility. This is a broad category, and analysis is somewhat different for sources that fall outside section 111's definition of "stationary" and for those sources that do fit the definition but are outside its domestic jurisdiction.⁴⁷ For this reason, I analyze the two separately.

Type 5. The ultimate goal of climate policy is to reduce atmospheric concentrations of GHGs and, thereby, reduce the likelihood of dangerous climate change.⁴⁸ Reducing emissions at a source subject to section 111 standards, or at any of the other sources discussed in Type 1–4 flexibility, achieves this goal directly. When emissions from any source decrease, the rate at which atmospheric carbon is increasing also goes down, all other things being equal.⁴⁹ But this is not the only way to reduce GHG concentrations in the atmosphere. It is also possible to remove—or sequester—carbon that is already there.⁵⁰ Though technological

⁴⁴ *See id.*

⁴⁵ *See infra* notes 104–05 and accompanying text.

⁴⁶ *See* 42 U.S.C. § 7411 ("Standards of performance for new stationary sources"); *see also infra* notes 137–41 and 145–47, and accompanying text.

⁴⁷ *See infra* Part IV.D.1., D.2.

⁴⁸ United Nations Framework Convention on Climate Change art. 2, May 9, 1992, S. Treaty Doc. No. 102-38, 1771 U.N.T.S. 107, *available at* <http://unfccc.int/resource/docs/convkp/conveng.pdf>.

⁴⁹ *See, e.g.,* Elizabeth C. Brodeen, *Sequestration, Science, and the Law: An Analysis of the Sequestration Component of the California and Northeastern States' Plans to Curb Global Warming*, 37 ENVTL L. 1217, 1218–20 (2007) (discussing carbon sequestration as the only viable option in removing CO₂ from the atmosphere).

⁵⁰ *Id.* Note that this is different from the sequestration required by carbon capture and storage (CCS) projects. CCS captures carbon at the smokestack, thereby limiting or eliminating a source's emissions. Forest carbon sequestration, or sequestration geoengineering, removes GHGs from the ambient atmosphere. *Id.* at 1221–23.

sequestration projects have been suggested,⁵¹ the primary tool currently available is forest carbon sequestration.⁵² Carbon sequestration and emissions reduction are geophysically interchangeable. This means that a climate policy can, in principle, treat the two as equivalent by allowing emitters to purchase credits generated by sequestration actions taken elsewhere. To give an example, our coal plant could obtain credits from projects that plant trees (in California or possibly in Brazil). Such trading with “sources” that do not reduce *emissions*, but rather atmospheric carbon *concentrations*, is Type 5 flexibility.

C. Analyzing Flexibility Types

Using these defined types of flexibility is, I hope, clearer than using a broad term like “offsets”, which can refer to flexibility Type 3, 4, or 5 or to a combination of these types. The question of whether offsets are compatible with section 111 performance standards has an ambiguous answer because it depends on which type of flexibility one is referring to. The umbrella term “offsets” works for other purposes because the three types are geophysically interchangeable and come from a broad group of sources—those not subject to emissions limitations under the primary program. But the differences between the three types do matter legally.

IV. EXTENDED FLEXIBILITY UNDER SECTION 111 OF THE CLEAN AIR ACT

This section presents a legal analysis, that attempts to assess the compatibility of each type of flexibility with EPA regulation via section 111 performance standards. The analysis focuses almost exclusively on flexibility options for existing, rather than new, sources. This is partly because of legal and practical complications with trading that includes new sources,⁵³ but also because the emissions of existing sources are far greater than those of new sources, at least over a reasonable time horizon.⁵⁴ This means that any market for emissions allowances will be much larger for existing sources, and that a combined new/existing market will probably be dominated by existing sources.

As noted above, some existing scholarship has analyzed basic—that is, Type 1—flexibility under section 111.⁵⁵ Another small body of work has

⁵¹ *Id.* at 1223.

⁵² *Id.* at 1221–22.

⁵³ See WANNIER ET AL., *supra* note 8, at 5–7.

⁵⁴ See U.S. ENVTL. PROT. AGENCY, GREENHOUSE GAS REPORTING PROGRAM: 2010 DATA PUBLICATION 2 (2012), available at <http://www.epa.gov/climatechange/emissions/ghgdata/index.html> (showing that the majority of GHG emissions are from power plants); Jonathan Remy Nash & Richard L. Revesz, *Grandfathering and Environmental Regulation: The Law and Economics of New Source Review*, 101 NW. U. L. REV. 1677, 1707–18 (discussing how regulations regarding modifications of existing sources may actually operate to extend the lifespan of older, dirtier, power plants which contribute disproportionately to emissions).

⁵⁵ See *supra* note 8 and accompanying text.

examined Type 2 flexibility.⁵⁶ For this reason, Types 1 and 2 will be briefly discussed and will reference these existing works.

A. Type 1 Flexibility: Other Sources in the Same Category

Regulation under section 111 is driven by source categories.⁵⁷ EPA is charged with defining a list of categories of stationary sources that “cause[], or contribute[] significantly to” air pollution that endangers public health or welfare, and with revising that list as necessary.⁵⁸ For each category, the agency must issue performance standards; it does so first for new sources,⁵⁹ then, if a pollutant is not regulated under other major stationary-source CAA programs, EPA issues guidelines on which states will base similar standards for existing sources.⁶⁰ Source categories and subcategories defined by the agency are differentiated mostly by economic sector and by technology.⁶¹ For example, the categories for which EPA recently issued GHG performance standards are those for “electric utility steam generating units”⁶² (primarily coal plants) and eventually a set of six subcategories covering different classes of petroleum refineries.⁶³

Type 1 flexibility refers to the ability of sources regulated under section 111 performance standards to trade within these categories. Must every coal plant reduce its emissions or improve its efficiency as required by the standard, or can these plants trade with each other, with the underperforming plants buying allowances from those that exceed the standard?

Both EPA itself and most scholars who have examined this question appear to have concluded that at least some such Type 1 flexibility is available.⁶⁴ In fact, this generally has been what observers mean when they claim that section 111 allows for flexibility.

⁵⁶ See WANNIER ET AL., *supra* note 8, at 8 (discussing the possibility of trading between source categories).

⁵⁷ See Clean Air Act, 42 U.S.C. § 7411(b) (2006).

⁵⁸ *Id.* § 7411(b)(1)(A).

⁵⁹ *Id.* § 7411(b)(1)(B).

⁶⁰ See *id.* § 7411(d).

⁶¹ See *generally* 40 C.F.R. pt. 60 (2011) (listing over 90 source categories).

⁶² See Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units, 77 Fed. Reg. 22392 (proposed April 13, 2012) (to be codified at 40 C.F.R. pt. 60); see also Boiler Settlement Agreement, *supra* note 5, at 1 (referencing 40 C.F.R. pt. 60, subpart Da).

⁶³ See Refinery Settlement Agreement, *supra* note 6, at 1, 4 (referencing 40 C.F.R. part 60, subparts J, Ja, Db, Dc, GGG, and QQQ).

⁶⁴ See, e.g., WANNIER ET AL., *supra* note 8, at 4–5 (citing academic and EPA authorities). *But see Strengths and Weaknesses of Regulating Greenhouse Gas Emissions Using Existing Clean Air Act Authorities: Hearing Before the Subcomm. on Energy and Air Quality of the H. Comm. on Energy and Commerce*, 110th Cong. 11–14 (2008) [hereinafter *Hearing*] (including the testimony of Lisa Heinzerling, Professor of Law, Georgetown University Law Center), available at <http://democrats.energycommerce.house.gov/images/stories/Documents/Hearings/PDF/110-eaq-hrg.041008.Heinzerling-Testimony.pdf> (arguing that, among other reasons, the technological focus of section 111 implies that a trading system is incompatible with its design).

1. Flexibility: The “Best System”?

The most frequently cited grounding for Type 1 flexibility in section 111 is in the statute’s definition of performance standards: “The term “standard of performance” means a standard for emissions of air pollutants which reflects the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction) the Administrator determines has been adequately demonstrated.”⁶⁵

The argument in favor of Type 1 flexibility is that this definition gives EPA discretion to determine the “best system” for reducing emissions, considering cost, from a source category. The agency could therefore conclude that allowing sources flexibility to trade within that category is the “best system” or at least the best possible approximation of it, given the structure of section 111.⁶⁶

There is some precedent for this approach, most notably under the 2005 Clean Air Mercury Rule (CAMR), in which EPA adopted a cap-and-trade system for mercury pollution from coal plants.⁶⁷ There, the agency similarly relied on the section 111(a)(1) definition of “standard of performance”:

The term “standard of performance” is not explicitly defined to include or exclude an emissions cap and allowance trading program. In the final rule, EPA interprets the term “standard of performance,” as applied to existing sources, to include a cap-and-trade program. This interpretation is supported by a careful reading of the section 111(a) definition of the term, quoted above: A requirement for a cap-and-trade program (i) constitutes a “standard for emissions of air pollutants” (*i.e.*, a rule for air emissions), (ii) “which reflects the degree of emission limitation achievable” (*i.e.*, which requires an amount of emissions reductions that can be achieved), (iii) “through application of (a) system of emission reduction” (*i.e.*, in this case, a cap-and-trade program that caps allowances at a level lower than current emissions). Nor do any other provisions of section 111(d) indicate that the term “standard of performance” may not be defined to include a cap-and-trade program.⁶⁸

The agency further argued that a separate definition of “standard of performance” in section 302(l) does not conflict with this interpretation.⁶⁹

The agency’s rationale applies with equal force whether it chooses to implement cap-and-trade itself or some other, less ambitious emissions trading program, such as a tradable performance standard.⁷⁰ Almost any

⁶⁵ 42 U.S.C. § 7411(a)(1).

⁶⁶ WANNIER ET AL., *supra* note 8, at 4–5.

⁶⁷ Clean Air Mercury Rule, 70 Fed. Reg. 28606 (May 18, 2005) (codified at 40 C.F.R. pts. 60, 72, and 75).

⁶⁸ *Id.* at 28,616–17.

⁶⁹ *Id.* at 28,617.

⁷⁰ For a discussion of a tradable performance standard, see Richardson et al., *Greenhouse Gas Regulation Under the Clean Air Act: Structure, Effects, and Implications of a Knowable Pathway*, *supra* note 30, at 10,114–15; see also BURTRAW ET AL., *supra* note 7, at 3–5 (comparing

such program could be characterized as a “system of emission reduction,” leaving EPA only to nonarbitrarily determine that it is the “best” system, or that it at least “reflects” the emissions reductions possible under the best system.

Though the CAMR interpretation of section 111 and its scope for flexibility was questioned by some parties at the time,⁷¹ it was not tested legally because the rule was rejected by courts on unrelated grounds.⁷² EPA reiterated the plausibility of this approach in the GHG context in 2008.⁷³ This area of law remains unsettled, but several observers believe that some form of trading is legally permissible via the “best system” language.⁷⁴

2. Counterarguments to Type 1 Flexibility as the “Best System”

One counterargument to flexibility under section 111 is grounded in a 1978 D.C. Circuit decision, *Asarco v. EPA*.⁷⁵ The holding in this case prevents EPA from using a “bubbling” approach in CAA performance standards—that is, EPA is not allowed to redefine “facilities” for regulatory purposes to include multiple physical facilities, thereby allowing averaging of emissions across those physical installations.⁷⁶ Superficially, this might appear to rule out flexibility across sources within a category (Type 1) as well. The set of sources across which trading is permitted could be characterized as simply a very large bubble because, although the set as a whole would meet the prescribed standard, no individual facility would necessarily do so. If this characterization is correct, *Asarco* could rule out Type 1 flexibility.

This appears unlikely, however, for two reasons. First, Type 1 flexibility would be built into EPA’s section 111 GHG program from its outset, unlike bubbling in the rulemaking that the *Asarco* court considered. In other words, if EPA includes trading, not by altering its working definition of what a facility is, but by finding that trading is *itself* the “best system of emission reduction,” *Asarco* and its limitations would not apply. Both moves would involve somewhat creative interpretation of CAA language, but “best system of emission reduction” is arguably more ambiguous than “facility”—and therefore it would be harder for a judge to find that it has a plain meaning that courts are qualified to identify. In legal terms, this probably gets the agency beyond step one of a *Chevron U.S.A., Inc. v. Natural Res. Def.*

other regulatory policies, including flexible compliance and inflexible standard, with the cap-and-trade approach).

⁷¹ *Hearing, supra* note 64, at 11–13.

⁷² *N.J. v. U.S. Envtl. Prot. Agency*, 517 F.3d 574, 583–84 (D.C. Cir. 2008) (vacating the CAMR rule on the grounds that EPA had improperly delisted mercury from §112 of the CAA).

⁷³ Regulating Greenhouse Gas Emissions Under the Clean Air Act, 73 Fed. Reg. 44354 (July 30, 2008) (to be codified at 40 C.F.R. ch. 1) (discussing and soliciting comments on EPA regulation of GHG emissions from a variety of other sources, including ships, aircraft, nonroad vehicles, and stationary sources).

⁷⁴ See WANNIER ET AL., *supra* note 8, at 4–5.

⁷⁵ 578 F.2d 319 (D.C. Cir. 1978).

⁷⁶ *Id.* at 326–27.

Council, Inc. analysis,⁷⁷ and if so, greatly increases the chances that its interpretation will survive a challenge.

Chevron itself provides a second reason why *Asarco* might not apply—because *Asarco* was decided well before *Chevron*, the agency might now be entitled to greater discretion to interpret the language of the CAA where, as here, it appears to be ambiguous. If this is correct, not only Type 1 flexibility, but also the bubbling practice at issue in *Asarco* might be permissible.

Another counterargument to Type 1 flexibility is that including it misinterprets the “best system” language in section 111(a). This language, the counterargument goes, guides EPA in determining a performance standard’s stringency, but does not necessarily allow the agency to adopt that system via section 111 regulation. In other words, standards are intended to “reflect” the “best system,” not to *be* the best system. Another related counterargument is that compliance flexibility stretches the meaning of “system” to the breaking point in what has traditionally been a technology-focused process.⁷⁸

Assuming that these counterarguments do not prevail, EPA and the states—being charged with setting ESPS under section 111(d)—can include Type 1 flexibility in their performance standards.⁷⁹

3. States’ Independent Powers

A separate route that would allow Type 1 flexibility for existing sources under section 111(d) is based on the role of states, which may allow them to include Type 1 flexibility under section 111(d) standards for existing sources even if EPA itself cannot. This argument is grounded in the procedure for section 111(d) regulation: EPA sets national guidelines that the states implement via “a procedure similar to that provided by section 110 under which each State shall submit to the Administrator a plan which (A) establishes standards of performance . . . and (B) provides for the implementation and enforcement of such standards of performance.”⁸⁰

The reference in the first sentence is to the State Implementation Plan (SIP) process under section 110 of the CAA.⁸¹ This is part of the National Ambient Air Quality Standards (NAAQS) program, in which EPA similarly sets standards that states implement and enforce.⁸² The SIP process is extensively detailed in section 110 and is quite flexible. Notably, state SIPs can include “economic incentives such as fees, marketable permits, and

⁷⁷ 467 U.S. 837 (1983). In *Chevron*, the Supreme Court held that agency interpretations of ambiguous statutory language prevail unless they are not “reasonable” or “permissible.” *Id.* at 842-43. The question of ambiguity is step one, and that of reasonableness of interpretation is step two. *Id.*

⁷⁸ This is similar to the argument advanced by Professor Heinzerling in her 2008 testimony. *Hearing, supra* note 64, at 8-10.

⁷⁹ Clean Air Act, 42 U.S.C. § 7411(d) (2006).

⁸⁰ *Id.*

⁸¹ *Id.* § 7410(a).

⁸² *Id.* §§ 7409-7410.

auctions of emissions rights.”⁸³ Although offsets are not explicitly mentioned, it can be argued that this grant, particularly the “economic incentives” language, is sufficiently broad to include Type 1 flexibility. Further, the argument goes, if offsets are in principle permissible under section 110 SIPs, then states can also implement them under the “similar” section 111(d) procedure. Though admittedly complex, this argument is appealing and has a firmer grounding in the statute than many of the other pro-offset arguments.

However, the substantive flexibility granted to states under section 110 may not be fully incorporated into section 111(d). Section 111(d)’s reference to section 110 does not permit either the states or EPA, in its approval process, to ignore the requirements of section 111 itself. The language quoted above from section 111(d) indicates that, whatever the section 110-like “procedure” for EPA and state cooperation, the submitted plan must establish, implement, and enforce “standards of performance.”⁸⁴ This puts us back where we started: the definition of “standards of performance” in section 111(a), including the “best system” language.

Put differently, the reference in section 111(d) to a process similar to the State Implementation Plans under NAAQS is purely procedural, not substantive. The substantive limits of section 111(d) regulations are determined not by section 110, but by section 111, and whatever flexibility exists must be found there. As noted above, section 111(a) defines “standards of performance” as based on the “best system of emission reduction.”⁸⁵ Any type of flexibility under section 111 performance standards must fit within this definition, regardless of what section 110 has to say about flexibility under NAAQS. The argument in favor of offsets based on the states’ role therefore collapses into the argument discussed in the previous section—whether “best system” itself can be interpreted to include offsets. If this interpretation of section 111(d) and its reference to section 110 is correct, that reference either grants no substantive flexibility, or any flexibility granted is superfluous.

4. The Scope of Type 1 Flexibility

Even if an argument for Type 1 flexibility based on section 111(d)’s analogy to section 110 is relatively weak, the primary argument that the “best system” language in section 111(a) allows Type 1 flexibility remains strong. It is this argument that both EPA and most scholars have relied on in concluding that Type 1 flexibility is permissible.⁸⁶

How far could EPA and the states go with Type 1 flexibility? In principle, it might be able to create a cap-and-trade program for entire

⁸³ *Id.* § 7410(a)(2)(A).

⁸⁴ *Id.* § 7410(c) (requiring each State to submit to EPA a procedure for implementing and enforcing the new source performance standards).

⁸⁵ *See supra* Part IV.A.1.

⁸⁶ *See supra* note 8 and accompanying text.

source categories, as it attempted to do in the 2005 CAMR,⁸⁷ but this appears highly unlikely for GHGs, largely for political reasons.⁸⁸ More modest market-based mechanisms, such as a tradable performance standard based on efficiency improvements, have been suggested.⁸⁹

B. Type 2 Flexibility: Other Regulated Source Categories

Even CAMR—the high point of ambition for flexibility under section 111 to date—did not extend that flexibility beyond a single source category. For GHGs, EPA will eventually need to issue standards for a wide variety of categories, from cement plants and steel mills, to other heavy industrial facilities. The agency has already proposed standards for electric utility generating units.⁹⁰

The agency could not approximate an economy-wide carbon policy by regulating all U.S. GHG emissions under section 111 because some types of GHG sources—such as vehicles and most agricultural operations—do not fit the statute’s definition of “stationary source.”⁹¹ Nevertheless, expanding flexibility across source category boundaries would make trading markets more effective.⁹² If the most cost-effective emissions reductions among sources regulated under section 111 come from one source category, regulation that allows sources outside that category to trade with sources inside it will be cheaper for the same level of overall emissions.

Observers have considered whether EPA has authority under section 111 to allow trading across source categories, which this Article defines as Type 2 flexibility.⁹³ Their tentative conclusion is that it does appear to be possible to allow such flexibility, for at least three reasons. First, there is no statutory preclusion, presumably because the drafters of section 111 did not explicitly consider any form of flexibility. But neither is there any clear statutory authority.⁹⁴

⁸⁷ See Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units, 70 Fed. Reg. 28,606, 28,606, 28616 (May 18, 2005) (proposing a cap and trade system under the definition of “standard of performance”).

⁸⁸ See Gabriel Nelson, *EPA Promises to Avoid Cap, But Some Utilities Want Trade*, E&E NEWS, Feb. 4, 2011, <http://www.eenews.net/eenewspm/2011/02/04/archive/2?terms=gabriel=nelson> (last visited July 15, 2012) (quoting EPA assistant administrator Gina McCarthy as disavowing cap and trade as an option the agency is considering under the CAA).

⁸⁹ See Richardson et al., *Greenhouse Gas Regulation Under the Clean Air Act: Structure, Effects, and Implications of a Knowable Pathway*, *supra* note 30 at 10114–10115; see also BURTRAW ET AL., *supra* note 29, at 293, 304–08; BURTRAW ET AL., *supra* note 7, at 3–5.

⁹⁰ Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units, 77 Fed. Reg. 22392 (proposed April 13, 2012) (to be codified at 40 C.F.R. pt. 60).

⁹¹ See *infra* Part IV.D.; Clean Air Act, 42 U.S.C. § 7411(a)(3) (2006).

⁹² WANNIER ET AL., *supra* note 8, at 3.

⁹³ *Id.* at 8.

⁹⁴ *Id.*

Second, the agency's categorization powers may allow it to achieve the practical equivalent of Type 2 flexibility.⁹⁵ As noted above, the agency has the authority to revise source categories and create subcategories as it sees fit—it may “distinguish among classes, types, and sizes within categories.”⁹⁶ This probably allows EPA to expand existing categories, and possibly to create new “supercategories” encompassing multiple existing categories and relegating those existing categories to subcategory status.⁹⁷ In this case, it would further appear to be able to define performance standards specific to each subcategory, but allow flexibility across the entire supercategory.⁹⁸ This flexibility would technically be Type 1, but in practice would be equivalent to Type 2.

There is no precedent for such a recategorization, and much less for the Type 2 flexibility it may enable. Nevertheless, this route appears legally plausible, and no conflict with any provision of section 111 is apparent.⁹⁹

Finally, section 111(d) itself does not appear to require states to regulate via source categories at all. Sources are subject to section 111(d) regulation if: (a) their emissions of the pollutant in question are not regulated elsewhere in the Act, and (b) they would be subject to section 111(b) NSPS if they were new sources.¹⁰⁰ This means that section 111(b) regulation and the source category definitions that drive it define the scope of possible section 111(d) regulation. But section 111(d) itself makes no mention of source categories. It does not require states issuing performance standards for existing sources to base those standards on the same category definitions used by EPA, or any such category definitions at all. It appears that all the states must do is regulate the sources that fall under section 111(d), using “standards of performance” as defined in section 111(a). If this reading is correct, then Type 2 inter-category flexibility is well within the scope of authority granted to the states. Nor does anything in the statute prevent EPA from approving a set of state performance standards allowing Type 2 flexibility, or from writing a model rule for states to adopt that includes such flexibility.

⁹⁵ 42 U.S.C. § 7411(b)(2) (2006) (allowing the agency to “distinguish among classes, types, and sizes within categories of new sources”).

⁹⁶ *Id.*

⁹⁷ WANNIER ET AL., *supra* note 8, at 8.

⁹⁸ A related question is whether the agency can create and/or revise source categories for GHG purposes while leaving them intact for purposes of regulating other pollutants under existing performance standards. The answer appears to be yes. The agency currently uses a long list of source categories at 40 C.F.R. part 60 that are not mutually exclusive—in other words, overlap between categories is tolerated, and therefore new GHG-specific categories, supercategories, and subcategories do not appear problematic. In addition, nothing in section 111 restricts EPA's authority to define and redefine source categories as it sees fit, or implies that the same categories must be used for all pollutants.

⁹⁹ Just because intercategory trading is apparently legal does not mean that it is simple. Trading across different sectors subject to regulations of differing stringency and design could prove administratively complex and/or susceptible to manipulation, especially if EPA eschews quantity-based standards (tons of GHGs emitted) in favor of standards based on efficiency improvements or other measures.

¹⁰⁰ 42 U.S.C. § 7411(d)(1) (2006).

C. Type 3 Flexibility: Unregulated Source Categories

If EPA can allow regulated sources to trade within their own categories (Type 1) and possibly with other categories (Type 2), what about emissions sources that are not regulated under section 111 standards at all? Some of these sources might not have section 111 GHG standards because EPA has not yet issued them but could issue such standards in the future. Trading with these kinds of sources is Type 3 flexibility and is discussed in this section. Other sources might not have standards because they are outside the reach of section 111 entirely. Trading with these sources is Type 4 flexibility and is analyzed in the next section.

Type 3 flexibility is the first type of flexibility considered here that could be described as a form of offset. If sources inside the section 111 regulatory program are permitted to trade with GHG sources (even temporarily) outside of it, they are offsetting their emissions via cuts in unregulated emissions elsewhere.

At first impression, it might appear that Type 3 flexibility is a narrow category with limited practical importance. If source categories that do not currently have section 111 standards account for a large volume of GHG emissions, EPA could simply issue standards for them.¹⁰¹ And if those sources have relatively low-cost opportunities to reduce those emissions—making them viable sources of credits—issuing standards makes those credits available as Type 2 flexibility, rather than Type 3.

However, the standard-setting process takes time, particularly for existing sources under section 111(d), which requires every state to issue its own standards.¹⁰² Standards are issued for different source categories at different times, according to a schedule of regular reviews.¹⁰³ Each standard is subject to notice-and-comment rulemaking and, possibly, to litigation. Flexibility that includes sources in different stages of this process may therefore be important.

The discussions of Type 1 and Type 2 flexibility in the previous sections have shown two general tools for incorporating flexibility: EPA's powers over source category definitions may allow Type 2 to be incorporated, and the "best system of emission reduction" language in the statute's definition of performance standards may also incorporate Type 1 flexibility. Both tools may be useful in reaching for Type 3 flexibility.

1. Converting Type 3 into Type 2 Flexibility

As noted above, once EPA issues performance standards for a source category, potential trading with sources in that category becomes Type 2, rather than Type 3, flexibility.¹⁰⁴ Because Type 2 flexibility appears

¹⁰¹ *Id.* § 7411(b)(1)(B).

¹⁰² *Id.* § 7411(d)(1).

¹⁰³ Every eight years, as prescribed by section 111(b)(1)(B). States may also petition for interim revisions for a variety of reasons. *See id.* § 111(g).

¹⁰⁴ *See supra* Part IV.B.

compatible with section 111, doing this would effectively make Type 3 flexibility compatible as well. But, as noted above, EPA and the states cannot quickly issue and implement substantive standards for all source categories that emit GHGs.¹⁰⁵ If there were a way to shorten this process, however, EPA might be able to at least temporarily achieve Type 3 flexibility in practice.

One option for doing so would be for the agency to issue “paper” performance standards for categories that it believes would be useful sources of cost-effective emissions cuts. These standards could be minimally stringent, such that any reductions in emissions achieved by sources in the category could be immediately converted into credits for use by sources that are the primary target of section 111 regulation, presumably those in the energy and refining sectors. Over time, EPA could then issue revised, more stringent standards for those categories as the agency completes its technical analysis and regulatory process.

For example, if EPA issues standards requiring emissions reductions from fossil power plants, but wants to allow those plants to obtain credits from reductions made at cement plants, it could issue a paper or pro forma performance standard for cement plants, under which virtually any emissions reductions would be available for trading. More stringent standards for cement plants would then follow in the future.

But this process works only if EPA can issue minimally stringent performance standards more quickly than it can issue fully formed standards. It does not appear that the agency can do so. Even though technical analysis would be simpler, the agency would still have to follow notice-and-comment procedures, including mandatory periods for public comment and Office of Management and Budget review.¹⁰⁶ Thus, large parts of the rulemaking process are duplicated under this scheme. Paper standards would also be vulnerable to litigation. Environmental groups would almost certainly sue, claiming that EPA’s decision to issue lax standards for a given source category violates its obligations under section 111 because such standards arbitrarily would not reflect the “best system of emission reduction” for that category. Given these downsides, EPA would probably be better off using its limited resources to develop defensible standards for sectors it believes can achieve low-cost GHG reductions, rather than rushing to include those categories via regulatory sleight-of-hand.

2. Pure Type 3 Flexibility

If converting Type 3 into Type 2 flexibility is not legally permissible, or at least not practical, could EPA allow Type 3 flexibility directly? It appears possible, albeit unlikely. The reasons are complex, and analyzing Type 3 flexibility forms the heart of this Article.

¹⁰⁵ See *supra* Part IV.C.

¹⁰⁶ 42 U.S.C. § 7411(b)(1)(B) (2006).

a. Section 111 Does Not Rule Type 3 Flexibility Out—or In

The first and simplest argument in favor of Type 3 flexibility is that neither the CAA in general, nor section 111 in particular, expressly forbid it. In fact, they give EPA a lot of flexibility in program design.¹⁰⁷ As noted, section 111 does not mention any form of compliance flexibility, much less specifics about whether sources can trade with emitters not subject to their own performance standards. EPA may therefore be relatively free to interpret the statute in favor of such flexibility, with substantial deference from federal courts under *Chevron*.¹⁰⁸ Recall that under *Chevron* deference, unless EPA's interpretation is contradicted by the plain language of the statute (step one) or, much less likely, is deemed unreasonable (step two), that interpretation prevails.¹⁰⁹

Using congressional failure alone to explicitly exclude something from EPA's grant of authority is not enough to reach the deference available in *Chevron* step two. Agencies cannot create powers out of whole cloth, but rather must ground them in the statute. When they do so, that interpretation—if challenged—is subject to scrutiny by courts. In other words, pointing to the fact that Congress has not forbidden EPA to consider offsets under section 111 is a necessary first step, but it is far from enough. This approach does not indicate the statutory source of EPA's authority to use offsets, much less whether interpretation of that source to allow offsets is valid.

b. Parallels Elsewhere in the Clean Air Act

A second argument in favor of Type 3 flexibility is that Congress's inclusion of something similar to Type 3 flexibility elsewhere in the CAA shows that offsets are broadly compatible with the statute and that Congress was aware of their advantages, particularly when regulation threatens to impose large costs.

Offsets are not unknown in CAA regulation, having been formally included since the 1977 amendments to the statute—albeit in limited fashion.¹¹⁰ These well-established CAA offsets, or “emissions reduction

¹⁰⁷ See Administrative Procedure Act, 5 U.S.C. §§ 551–554 (2006); Clean Air Act, 42 U.S.C. § 7607(d) (2006); see also *Lignite Energy Council v. EPA*, 198 F.3d 930, 933 (D.C. Cir. 1999) (noting that EPA has “considerable discretion under section 111”).

¹⁰⁸ See *Chevron U.S.A., Inc., v. Natural Res. Def. Council, Inc.*, 467 U.S. 837, 842–44 (1984).

¹⁰⁹ See *id.* at 843–44.

¹¹⁰ See Jan Peter Voß, *Innovation Processes in Governance: The Development of ‘Emissions Trading’ as a New Policy Instrument*, 34 SCI. & PUB. POL'Y 329, 333 (2007), available at <http://docserver.ingentaconnect.com/deliver/connect/beechn/03023427/v34n5/s3.pdf?expires=1331697165&id=67736855&titleid=898&accname=Guest+User&checksum=B0CCC43FF55C2093CC43D2C2F3EE1185> (noting that EPA incorporated the “bubble concept” from the early 1970s to develop an offset mechanism in the 1977 amendments and establish the first “limited market for emission rights”).

credits” (ERCs) in CAA jargon, are part of NAAQS in section 110 of the Act and are described below.¹¹¹

For a permit to be issued for construction of a new emitting facility where pollution levels exceed the NAAQS, the firm seeking the permit must do two things. First, it must install tight emissions controls (to result in the Lowest Achievable Emissions Rate, or LAER).¹¹² Second, it must offset the residual emissions from the project, which can be done via ERCs.¹¹³ Firms that verifiably reduce emissions obtain these credits and can either use them for their own future projects or sell them to other firms seeking permits for new projects.¹¹⁴ The ERC program is specified in the statute itself¹¹⁵—it is not based on EPA interpretation of general pollution-control powers under the CAA.

The ERC program has been widely used, but its reach is narrow. It is relevant only in areas that are in “nonattainment” for (that is, failing to meet) NAAQS.¹¹⁶ Even in those areas, offsets are not used as a general emissions-control policy tool, but only when preconstruction permits are needed.¹¹⁷ And even then, the ERC offsets required for the permit must be created within the same nonattainment area.¹¹⁸ ERC offsets are best viewed as a safety valve that prevents strict regulations on nonattainment areas from completely shutting down economic growth rather than a general tool for reducing compliance costs. In fact, they do little to reduce costs because facilities still must comply with the underlying emissions regulations: LAER. In reality, they are more like a very limited and idiosyncratic Type 2 flexibility than they are like Type 3 flexibility.

The presence of the ERC program in the CAA has conflicting implications for the use of offsets under other CAA programs, including those for GHGs. ERCs themselves are not a useful option for potential GHG offsets under the CAA because it is unlikely that NAAQS will be set for GHGs—EPA has chosen to use section 111, not section 110, as its primary vehicle for stationary-source GHG regulation.¹¹⁹

¹¹¹ See 42 U.S.C. § 7503(c) (2006).

¹¹² *Id.* § 7503(a)(3).

¹¹³ *Id.* § 7503(c)(1).

¹¹⁴ See, e.g., Pa. Dep’t of Env’tl. Prot., *Emission Reduction Credit Registry System*, <http://www.dep.state.pa.us/dep/deputate/airwaste/qa/permits/erc/ercmain.pdf> (last visited July 15, 2012) (giving a general overview of Pennsylvania’s ERC scheme, including how ERCs are typically generated and transferred).

¹¹⁵ See 42 U.S.C. § 7503(c)(2) (2006).

¹¹⁶ *Id.* § 7503(c)(1).

¹¹⁷ See *id.*

¹¹⁸ *Id.* Offsets can also come from an upwind area—that is, another nonattainment area—if emissions from that other area affect compliance in the area where the permit is being sought. *Id.*

¹¹⁹ Robin Bravender, *EPA Chief Signals Opposition to Clean Air Act Curbs on GHGs*, GREENWIRE, Dec. 8, 2009, <http://www.eenews.net/public/Greenwire/2009/12/08/4> (last visited July 15, 2012) (quoting EPA Administrator Lisa Jackson: “I have never believed and this agency has never believed that setting a national ambient air quality standard for greenhouse gases was advisable”).

Even if they are a poor analogy for hypothetical Type 3 flexibility under section 111, ERCs at least superficially indicate that offsets are not in principle incompatible with the CAA. One might try to take this further and interpret ERCs as evidence that Type 3 flexibility under section 111 is specifically compatible. But section 111 contains no parallel to the ERC language in section 110. Congress demonstrated with the ERC program that it was aware of the benefits of offsetting emissions and was capable of crafting language that would specifically include them in EPA's authority.¹²⁰ Congress's failure to do so elsewhere in the Act, notably under the performance standard provisions in section 111, could therefore be interpreted to indicate that it did not intend to grant such authority anywhere else. This leads to a contrary interpretation of ERCs—their presence in section 110 but not section 111 seems to imply that Congress *did not* intend for EPA to have the authority to implement anything similar for performance standards.

This *expressio unius* argument should not be taken too far.¹²¹ The CAA is a flexible statute, with many different programs aimed at different pollutants from different sources.¹²² EPA has a long history of interpreting these programs relatively independently,¹²³ strengthened by *Chevron* deference,¹²⁴ and an *expressio unius* argument that depends on Congressional consistency throughout the statute is therefore not very strong. It is difficult to argue that the scope of authority delegated to EPA should be exactly the same for each CAA program, despite their wide variation in aims and structure.

Nevertheless, an *expressio unius* argument based on ERCs probably is a strong counter to the argument that the presence of offsets elsewhere in the statute makes them *compatible* with section 111. In short, ERCs do not seem to provide clear evidence either way on the question of whether offsets are appropriate under section 111.

¹²⁰ See H.R. REP. NO. 95-294, at 511–13 (1977), *reprinted in* 1977 U.S.C.C.A.N. 01077, 1473–1475.

¹²¹ *Expressio unius est exclusio alterius* is “[a] canon of construction holding that to express or include one thing implies the exclusion of the other, or of the alternative.” BLACK’S LAW DICTIONARY 661 (9th ed. 2009).

¹²² For example, *compare* 42 U.S.C. § 7412 (2006) (defining elements of the Clean Air Act’s hazardous air pollutants program), with 42 U.S.C. § 7521 (2006) (introducing emissions standards program for motor vehicles).

¹²³ See *e.g.*, Thomas O. McGarity, *The Clean Air Act at a Crossroads: Statutory Interpretation and Longstanding Administrative Practice in the Shadow of the Delegation Doctrine*, 9 N.Y.U. ENVTL. L.J. 1, 1–2 (2000) (explaining that Congress gave EPA a fair amount of discretion to interpret the CAA); See also Susannah Landes Foster, Note, *When Clarity Means Ambiguity: An Examination of Statutory Interpretation at the Environmental Protection Agency*, 96 GEO L.J. 1347, 1366–67 (2008).

¹²⁴ See *supra* note 108 and accompanying text.

c. The “Best System” and Type 3 Flexibility

A third argument for Type 3 flexibility is that, if EPA can include Type 1 (and possibly Type 2) flexibility as part of the “best system of emission reduction,” that language similarly supports the inclusion of Type 3. EPA can, the argument goes, declare the “best system” to be “trading *plus* offsetting Type 3 flexibility” and be done with the issue—or at least get over the *Chevron* step one bar. This might be correct, and is probably the strongest legal argument for Type 3 flexibility under section 111.

Including both Type 1 and Type 3 via the “best system” language places a heavy burden on that part of the statute—with implications for both the courts’ view of EPA’s interpretation and the agency’s own tolerance for such ambitious maneuvers. It is certainly not possible to rule out such a move for Type 3 flexibility while still accepting it as a legally plausible justification for Type 1, but including both based on the same statutory language would be a particularly bold strategy. The agency has already indicated that Type 1 flexibility is available under section 111, and as such, may consider it to be a higher priority than implementing Type 3.¹²⁵ Its interpretation of the “best system” language will therefore already be doing heavy lifting, and it may not bear—or EPA may fear that it will not bear—the further strain of including offsets. Identifying the “best system” as Type 1 and Type 3 flexibility—trading *and* offsets—asks a lot of EPA general counsel and ultimately, given the inevitable lawsuit, of courts.¹²⁶ Nevertheless, this is at best informed speculation. The only legal judgments that matter are those of the agency in determining the initial scope of the program, and of the courts in determining its final legal status.

Even if EPA does adopt Type 3 flexibility via the “best system” language, a court could find grounds to reject it without threatening Type 1 flexibility. Type 3 flexibility, by definition, requires EPA to consider emissions and/or carbon impact from sources that are not directly regulated by performance standards.¹²⁷ *Asarco*, discussed in Part IV.A.2 above, can be viewed as restricting the ability of the agency to redefine the limits of the “fence” within which emissions and standards compliance can be averaged or traded. Identifying Type 1 flexibility as part of the “best system” allows EPA to move the fence despite *Asarco*, but it does nothing to permit inclusion of “outside-the-fence” facilities and resources, as required by Type 3 flexibility.

No CAA performance standard and no CAA program of any type has allowed offsetting from such outside-the-fence sources. Language within the statute neither readily supports such a move nor directly contradicts it.¹²⁸

¹²⁵ See *supra* Part IV.A.

¹²⁶ This is especially true if EPA seeks to include *international* offsets, as courts are hesitant to extraterritorially apply statutes in the absence of clear congressional intent. See *infra* Part IV.D.1.

¹²⁷ See *supra* Part III.B. (defining Type 3 flexibility).

¹²⁸ See Clean Air Act, 42 U.S.C. § 7503 (2006). The statute gives EPA flexibility in design programs under section 111, and courts tend to be deferential to the agency. See Part IV.C.2.a.

Whatever ambiguities exist, section 111 is focused on regulating defined source categories.¹²⁹ Source categories are, in many ways, the defining feature of section 111 regulation. Type 3 flexibility would ignore the “fences” implicit in a source category approach, without even the veneer of compatibility provided by using EPA’s recategorization powers, as suggested above for Type 2 flexibility. A court might therefore conclude that Type 3 flexibility is incompatible with the general source category–driven structure of section 111, even if it accepts the agency’s claim that such flexibility is a reflection of the “best system”.

d. Type 3 Flexibility and States’ Independent Powers

Another argument is that states’ powers under section 111(d) may allow them to provide existing sources with Type 3 flexibility, even if EPA could not. This argument is largely identical to that discussed in Part IV.A.1. for Type 1 flexibility, and suffers from the same flaws. Above all, section 111(d)’s reference to section 110 appears to be purely procedural, and does not grant the authority to use substantive tools that are outside the section 111(a) definition of performance standards.

However, even if states’ section 110 powers are fully incorporated by the section 111(d) “procedure similar” reference, they still might not include Type 3 flexibility. As mentioned above, NAAQS already includes offsets—ERCs—albeit indirectly, via preconstruction permitting in nonattainment areas.¹³⁰ Although the *expressio unius* argument based on ERCs is relatively weak when applied to the CAA as a whole, it is somewhat stronger when its scope is limited to NAAQS.¹³¹ ERCs would lose much of their significance if states could allow emitters to broadly offset their emissions. On the other hand, Congress might have been sufficiently concerned about costs in the specific situation covered by ERCs (new sources in high-pollution areas) to carve out an offset provision, while still intending to allow states discretion over whether to use them more generally.¹³²

3. The Case for Type 3 Flexibility

It is difficult to draw a definitive conclusion about the compatibility of Type 3 flexibility with section 111 performance standards. The statute does not clearly rule them in or out. Arguments based on parallels to ERCs under NAAQS and those based on states’ powers under section 111(d) and section

¹²⁹ See 42 U.S.C. § 7411 (2006).

¹³⁰ See *supra* Part IV.C.2.b.

¹³¹ See *supra* Part IV.C.2.b.; *Coal. for Clean Air v. S. Cal. Edison Co.*, 971 F.2d 219, 230 (9th Cir. 1992) (Noonan, J., dissenting) (agreeing with the majority that *expressio unius* applies to provisions that survived the 1990 amendments).

¹³² See H.R., 91ST CONG., HOUSE CONSIDERATION OF THE REPORT FROM THE CONFERENCE COMMITTEE, DECEMBER 18, 1970, at 112 (1970); S. COMM. ON ENV’T AND PUB. WORKS, 101ST CONG., SENATE DEBATE ON THE CLEAN AIR ACT AMENDMENTS OF 1990 CONFERENCE REPORT, October 27, 1990, at 1053 (1990).

110 do not offer much support and are in tension with each other.¹³³ But the core argument—analogueous to that for Type 1 flexibility, that the offsets made available by Type 3 are part of the “best system”—is at least superficially strong. Nevertheless, the tension between the source category–based design of section 111 and Type 3 flexibility may be hard for a court to ignore. Type 3 flexibility by definition breaks through not only the barriers between source categories but also those between sources inside and those outside of section 111 entirely.¹³⁴ This has no apparent precedent under any section 111 regulation or indeed any CAA program.

D. Type 4 Flexibility: Extra–Clean Air Act Sources

The above discussion of Type 3 flexibility relates only to emissions from sources that could be subject to their own section 111 performance standards. But many sources of GHG emissions are entirely outside the reach of section 111.¹³⁵ Trading with these sources is Type 4 flexibility because some sources are either located outside the geographic—and apparently jurisdictional—reach of the CAA or are difficult or impossible to classify into source categories at all, regardless of their location.¹³⁶

1. International Sources

International sources appear to be outside the reach of section 111 regulation. Courts interpret statutes not to have extraterritorial application unless there is evidence of congressional intent to the contrary.¹³⁷ No such evidence exists in section 111, and there is little elsewhere in the CAA to indicate such intent.¹³⁸ Even section 115 of the statute—which deals specifically with emissions that have international health or welfare impacts—limits regulatory authority to domestic pollutants, although it does require that other countries give the United States reciprocal rights.¹³⁹ Section 115 is the international emissions counterpart to NAAQS under section 110,¹⁴⁰ but section 111 performance standards have no such counterpart.

International sources certainly could not be subject to direct emissions limitations under section 111 because—even if it had extraterritorial reach—

¹³³ See WANNIER ET AL., *supra* note 8, at 6.

¹³⁴ See *supra* Part III.B.

¹³⁵ See discussion *supra* Part IV.C.

¹³⁶ See *supra* Part III.B (defining the different types of flexibility explored in this Article).

¹³⁷ See *Morrison v. Nat'l Austl. Bank Ltd.*, 130B S. Ct. 2869, 2873 (2010) (citing U.S. Equal Emp't Opportunity Comm'n v. Arabian Am. Oil Co., 499 U.S. 244, 248 (1991)) (“It is a [l]ongstanding principle of American law [“]that legislation of Congress, unless a contrary intent appears, is meant to apply only within the territorial jurisdiction of the United States.[”] When a statute gives no clear indication of an extraterritorial application, it has none.”).

¹³⁸ Clean Air Act, 42 U.S.C. §§ 7401–7671 (2006).

¹³⁹ See *id.* § 7415(a)–(c).

¹⁴⁰ See *id.* § 7415(a)–(b) (identifying section 7410 SIPs as the vehicle for implementation of emissions reduction required under section 7415).

the section contains no provisions for enforcement. Whether these sources can benefit from section 111 regulation as suppliers of credits to those sources that are subject to performance standards is more ambiguous. But in practice it would be difficult, and perhaps impossible, for EPA to monitor and enforce the emissions reductions behind such credits. Cooperation with foreign governments would be necessary, and EPA has no legal authority to negotiate such agreements and no experience in this area—though executive agreements by the President or negotiated and ratified treaties might supply this authority.¹⁴¹

Whatever EPA's limitations, at least one state has moved ahead with plans to include international sources in its independent program. California has signed memoranda of understanding with states in Mexico and Brazil that may eventually lead to forest offsets from those areas entering the California program.¹⁴² Whether this policy will survive legal challenge is unclear.¹⁴³ States may generally have greater practical capability to incorporate international sources in their programs—either in their independent programs or in those required under section 111(d)—though they also face additional legal barriers.¹⁴⁴ The states' role in section 111(d) regulation is discussed in more depth in Part V below.

2. *Nonstationary Sources*

Even domestically, section 111 only applies to stationary sources,¹⁴⁵ and the source categories on which section 111 regulation is based can only encompass stationary sources.¹⁴⁶ As defined by section 111(a)(3), a stationary source is “any building, structure, facility, or installation which emits or may emit any air pollutant.”¹⁴⁷

¹⁴¹ See e.g., U.S. CONST. art II, § 2 (authorizing the President to enter into treaties only with consent of at least two-thirds of the Senate); *American Ins. Ass'n v. Garamendi*, 539 U.S. 396, 415 (2003) (“Our cases have recognized that the President has authority to make ‘executive agreements’ with other countries, requiring no ratification by the Senate . . . this power having been exercised since the early years of the Republic.”).

¹⁴² See Memorandum of Understanding on Environmental Cooperation Between the State of Acre of the Federative Republic of Braz., the State of Chiapas of the United Mex. States, and the State of Cal. of the U.S. art. 2, Nov. 16, 2010, available at http://www.socioambiental.org/banco_imagens/pdfs/Memorando_Acre_Chiapas_California_REDD_Nov_2010.pdf; see also Margot Roosevelt, *Chiapas to California: Preserving Forests for Dollars?*, L.A. TIMES, Dec. 9, 2010, <http://latimesblogs.latimes.com/greenspace/2010/12/cancun-climate-forests-carbon-trading-california-chiapas.html> (last visited July 15, 2012).

¹⁴³ See DANIEL F. MORRIS, NATHAN RICHARDSON, & ANNE RIDDLE, RES. FOR THE FUTURE, ISSUE BRIEF 11-12, IMPORTING CLIMATE MITIGATION: THE POTENTIAL AND CHALLENGES OF INTERNATIONAL FOREST OFFSETS IN CALIFORNIA CLIMATE POLICY 1-2 (2011), available at [http://www.rff.org/RFF/documents/RFF-IB-11-12-%20\(2\).pdf](http://www.rff.org/RFF/documents/RFF-IB-11-12-%20(2).pdf).

¹⁴⁴ See *id.* at 9-12 (noting that California's carbon offset plan could be vulnerable to challenges at the state level, federal regulatory level, and at a Constitutional level).

¹⁴⁵ See generally Clean Air Act, 42 U.S.C. § 7411 (2006) (noting “[s]tandards of performance for new stationary sources”) (emphasis added).

¹⁴⁶ See *id.* § 7411(b) (stating that the EPA Administrator must publish “a list of categories of stationary sources”).

¹⁴⁷ See *id.* § 7411(a)(3).

However, many sources of GHG emissions do not fit this definition, including vehicles, many aspects of agricultural operations, and, most importantly, forests. Forests certainly are not “buildings” or “facilities” and it seems bizarre to call them “structures” or “installations” in anything but the most abstract sense. The definition of “stationary source” seems to refer to the built environment. If this is correct, it means that credits or offsets generated by avoided-deforestation projects, whether domestic or international, are outside the scope of section 111.

3. Barriers to Type 4 Flexibility

In short, Type 4 flexibility requires regulators—either the EPA or states—to argue that section 111 allows trading not only with things that are not currently regulated (Type 3 flexibility) but also with things that could never be regulated under section 111 and are excluded from its scope. Regulators would have difficulty arguing that these GHG sources are part of the “best system of emission reduction,” and the argument exacerbates tension with the source category–driven character of section 111 regulation and the “fence” it creates.¹⁴⁸

Congress never intended section 111 performance standards to include vehicle emissions, as mobile sources are dealt with elsewhere, under Title II of the statute.¹⁴⁹ Congressional intent with respect to other classes of “nonstationary” sources is less clear, but including such sources has no precedent under any CAA Title I program.

A counterargument is that Type 4 flexibility does not require regulators to “include” such extra–section 111 sources: it need not impose any substantive emissions limitations on these sources, group them into any source category, or otherwise make them a formal subject of section 111 regulation. All that is necessary is that they be considered a mechanism for reducing emissions from sources that *are* regulated under section 111. These regulated sources remain the focal point of CAA compliance, and they are the ones that must be within the geographic scope of the Act’s application and within the section 111(a)(3) definition of “stationary source.”

Notwithstanding this argument, however, Type 4 flexibility still faces obstacles to implementation: it has no grounding in the statute outside of the “best system” language, it remains in tension with the source category design of performance standards, and creates significant practical problems of monitoring and enforcement, particularly for EPA.¹⁵⁰

¹⁴⁸ See *supra* Part IV.C.2.c, for a similar discussion of the tension between Type 3 flexibility and the “best system” language and category-driven character of section 111.

¹⁴⁹ 42 U.S.C. §§ 7521–7554 “Motor Vehicle Emission and Fuel Standards.”

¹⁵⁰ Council on Foreign Relations, *The Global Climate Change Regime*, <http://www.cfr.org/climate-change/global-climate-change-regime/p21831> (last visited July 15, 2012).

E. Type 5 Flexibility: Sequestration

Even if EPA were to successfully argue that Type 3 and possibly Type 4 flexibility are part of the “best system,” this move still might not allow credits generated by *sequestration* of GHGs—Type 5 flexibility—to be incorporated into performance standards.

Sequestration, by definition, does not reduce emissions.¹⁵¹ Sequestration offsets are generated when nonemitting entities (usually landowners) make moves that reduce *concentrations* but not *emissions* of a pollutant.¹⁵² Landowners who plant trees or otherwise change land-use practices to increase the potential for sequestration are potential sources of sequestration offsets, which are specifically referred to as *afforestation* offsets.¹⁵³ Correspondingly, policies that allow the use of such offsets give landowners the incentive to take such action.¹⁵⁴ But these actions do not reduce emissions. In fact, they *increase* emissions when emissions restrictions are in place if emitting sources opt to purchase the resulting offsets instead of cutting their own emissions.¹⁵⁵

¹⁵¹ See MELISSA CHAN & SARAH FORBES, NAT'L ENERGY TECH. LAB., CARBON SEQUESTRATION ROLE IN STATE AND LOCAL ACTIONS 2–3 (2005), available at http://www.netl.doe.gov/technologies/carbon_seq/refshelf/slfinal_1.pdf; OFFICE OF ATMOSPHERIC PROGRAMS, ENVTL. PROT. AGENCY, No. 430-R-05-006, GREENHOUSE GAS MITIGATION POTENTIAL IN U.S. FORESTRY AND AGRICULTURE 2-1 to 2-2 (2005) available at http://www.epa.gov/sequestration/greenhouse_gas.html.

¹⁵² See CHAN & FORBES, *supra* note 151; LIESE COULTER ET AL., GLOBAL CLIMATE PROJECT, REPORT NO. 6, CARBON REDUCTIONS AND OFFSETS 6 (2007) available at http://www.globalcarbonproject.org/global/pdf/ReportSeries/GCP_Report_No.6.pdf.

¹⁵³ Regional Greenhouse Gas Initiative, *Afforestation*, <http://www.rggi.org/market/offsets/categories/afforestation> (last visited July 15, 2012); see generally Tristram O. West, Gregg Marland, *A Synthesis of Carbon Sequestration, Carbon Emissions and Net Carbon Flux in Agriculture: Comparing Tillage Practices in the United States*, 91 AGRIC. ECOSYSTEMS & ENVTL. 217 (giving a broad overview of how agriculture and land use practices can be used to reduce atmospheric carbon dioxide concentration).

¹⁵⁴ Amy L. Ross-Davis et al., *Afforestation Motivations of Private Landowners: An Examination of Hardwood Tree Plantings in Indiana*, 22 N. J. APPLIED FORESTRY 149, 149–150 (2005) available at <http://www.human-dimensions.org/storage/article-pdfs/3.pdf>. This example illustrates the effects of afforestation offsets. Offsets created by avoided deforestation—that is, projects that prevent the destruction of forests (and the resulting emissions) that would have otherwise occurred—are harder to classify. Avoiding deforestation does reduce emissions because at least some portion of the carbon locked into the forest's biomass would otherwise be emitted when the trees burn or decompose. Georg Kindermann et al., *Global Cost Estimates of Reducing Carbon Emissions Through Avoided Deforestation*, 30 Prc. Of the Nat'l Acad. Of Sci. 10,302, 10,302 (2008). But it also has a sequestration component, to the extent that forests that survive as a result of the avoided-deforestation project continue to sequester atmospheric carbon. In other words, afforestation offsets are an example of Type 5 flexibility, but avoided-deforestation offsets are partly Type 4 and partly Type 5. The distinction is unlikely to matter, however. First, the distinction matters only if one of the two types is legal under section 111 but the other is not, and it appears that neither Type 4 nor Type 5 flexibility is legally permissible. Second, even if Type 4 flexibility is permissible but Type 5 is not, EPA could simply characterize avoided-deforestation offsets as Type 4 by avoiding the emissions/sequestration issue entirely.

¹⁵⁵ Transnational Institute, *Carbon Trading*, <http://www.tni.org/primer/carbon-trading> (last visited July 15, 2012). Note that this does not mean that sequestration offsets are ineffectual in terms of their climate impacts. Instead, it means that they affect atmospheric carbon via a

For purposes of CAA regulation, the distinction matters. Because sequestration offsets do not reduce emissions, it is hard to see how they can be considered part of the “best system of emission reduction.” The plain language of section 111(a) appears to require actual, concrete emissions reductions, not reductions in atmospheric concentrations. It is entirely plausible that such an argument will be made by environmental groups in litigation against any CAA program that includes forest offsets.¹⁵⁶ The plain language of the statute makes it relatively easy for judges to accept the argument and find that EPA would exceed its discretion to permit offsetting emissions through sequestration.¹⁵⁷

This is an unfortunate limitation of section 111 and an illustration of the fact that the section—along with much of the rest of the CAA—was designed for control of pollution problems fundamentally different from GHGs. Contrary to the toxic, local, or at most regional, pollution problems covered by the CAA in the past,¹⁵⁸ the globally mixed, stock pollutant nature of GHGs makes worldwide ambient concentrations more important than current emissions or short-term concentrations.¹⁵⁹ The CAA is not incapable of dealing with such a pollutant, but it has limitations—of which the apparent inability to deal with sequestration is one example.

Offset proponents might argue that differentiating between sequestration and emissions-reducing offsets is splitting hairs. The intent of Congress in crafting section 111, they might argue, was to give EPA the tools

mechanism other than the direct reduction of anthropogenic emissions. The difference is immaterial from a geophysical perspective but relevant from a legal one.

¹⁵⁶ See, e.g., Press Release, Clean Air Task Force, Statement of Ann Brewster Weeks on EPA Deferral of CO₂ Emissions from Bioenergy and Other Biogenic Sources from Clean Air Act Permitting Requirements (Mar. 19, 2011), available at http://www.catf.us/newsroom/releases/2011/20110309-CATF_Statement_on_EPA_Biomass_announcement.pdf (claiming, in reference to EPA decision to treat biomass emissions as carbon neutral for CAA permitting purposes, that “there is nothing in the Clean Air Act that supports either a categorical off-ramp from permitting or a categorical BACT [best available control technology] determination for biomass fuels. Treating a ton of carbon pollution emissions generated by burning trees differently than a ton of carbon pollution emissions generated by burning any other fuel, either on a temporary basis or permanently, is just not justified in the law.”) Weeks is Senior Counsel and attorney of record for the Conservation Law Foundation, one of a group of environmental plaintiffs that sued the EPA in *Ctr. for Biological Diversity v. EPA*, No. 11-1101, (DC Cir. 2011) regarding the agency’s 2011 decision to delay a decision on the treatment of biomass emissions in the permitting process for three years (effectively treating biomass as carbon neutral during that period).

¹⁵⁷ Clean Air Act, 42 U.S.C. § 7411(a)(1) (2006) (“The term ‘standard of performance’ means a standard for emissions of air pollutants which reflects the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated”).

¹⁵⁸ See U.S. Env’tl. Prot. Agency, *History of the Clean Air Act*, http://epa.gov/air/caa/caa_history.html (last visited July 15, 2012).

¹⁵⁹ See *id.*; see U.S. ENVTL. PROT. AGENCY, REGULATING GREENHOUSE GAS EMISSIONS UNDER THE CLEAN AIR ACT 5 (2008), available at <http://www.epa.gov/climatechange/Downloads/anpr/ANPRPreamble.pdf> (noting that the CAA is “ill-suited” for the task of regulating greenhouse gases).

to address threats to public health from emitting source categories, not to rigidly focus on reducing smokestack emissions.¹⁶⁰ Congress, they might further argue, did not and could not have anticipated the intricacies of all pollutants that might be regulated under the CAA and, in particular, the peculiar characteristics of global (as opposed to local) pollution problems like GHGs.

This argument contradicts the plain language of the statute.¹⁶¹ Congress could have given EPA the authority to require or allow actions *other than* emissions reduction to mitigate harms from air pollutants, but did not do so, at least not in section 111. Even despite this conflict with the plain language of the statute, a court might still be willing to liberally interpret the section 111(a) definition if it were not for the fact that many environmental groups dispute the utility of offsets in countering climate change. These groups will argue, with some justification, that smokestack emissions reductions are a more effective and measurable policy tool for reducing the impact of GHGs than are most forms of offsets.¹⁶² This, they might generalize, is the reason for (or at least a reason for not deviating from) Congress' focus on emissions reductions—only such reductions can guarantee environmental benefits. Both sides in this debate make good points, but only one has the statutory text on its side.

Another counterargument is that carbon sequestration could be considered a form of “negative emissions.” This makes sense from a certain perspective because sources regulated under section 111 performance standards that might buy credits generated by sequestration projects would do so as a means to reduce their net emissions. Regulated facilities have “positive emissions” from their operations, and Type 5 flexibility—sequestration offsets—provide the negative counterpart. This is conceptually valid but semantically ambitious, akin to a football announcer commenting that a player pushed back from the line of scrimmage “gained negative yardage”, or EPA suggesting that regulation does not have costs, but rather, “negative benefits.” It is hard to predict how a court would view this interpretation, but relying on it seems very risky.

Assuming one believes that offsets are a useful policy tool, a focus on emissions over concentrations is a disadvantage for CAA performance standards relative to NAAQS—a program that does focus on atmospheric concentrations of the pollutants it regulates, and gives states broad latitude to regulate with the aim of meeting concentration targets.¹⁶³ But performance

¹⁶⁰ Frank B. Cross, *Section 111(d) of the Clean Air Act: A New Approach to the Control of Airborne Carcinogens*, 13 B.C. ENVTL. AFF. L. REV. 215, 231–234 (1986).

¹⁶¹ See 42 U.S.C. § 7411 (2006).

¹⁶² See, e.g., JONATHAN L. RAMSEUR, CONG RESEARCH SERV., RL 34241, VOLUNTARY CARBON OFFSETS: OVERVIEW AND ASSESSMENT 2–15 (2009), available at <http://www.fas.org/sgp/crs/misc/RL34241.pdf> (describing various integrity concerns with carbon offsets); Sylvester Johnson, *Politically Possible Tax for Reduction of Fossil Fuel Usage in the U.S. and Worldwide*, EARTHZINE, July 20, 2009, <http://www.earthzine.org/2009/07/20/politically-possible-tax-for-reduction-of-fossil-fuel-usage-in-the-us-and-worldwide/> (last visited July 15, 2012).

¹⁶³ 42 U.S.C. § 7408(a) (2006) (calling on EPA to determine air quality criteria for air pollutants which “may reasonably be anticipated to endanger public health or welfare”); *Id.* at

standards have many other practical advantages over NAAQS, and the mainstream view held by EPA, industry, and most major environmental groups appears to be that a NAAQS for GHGs is the wrong approach, both politically and practically.¹⁶⁴

If Type 5 flexibility—sequestration offsets—is incompatible with section 111 performance standards, major sources of offsets—such as afforestation of previously deforested land or other land-use changes, or even future carbon-sequestering geoengineering projects—will be unavailable. If this is correct, it implicitly forces CAA climate policy to accept the forest status quo *and* to forgo any incentives to remedy future deforestation. In practice, this would substantially reduce the volume of offsets available.

F. Biomass—Another Option?

Although allowing power plants to burn biomass for electricity generation is a flexibility mechanism, it does not readily fit into the framework described in Part III.B. However, this option might be more important than some of the analyzed types of flexibility. Legal analysis of the scope for including such biomass co-firing within section 111 performance standards is also quite similar in many ways to that for compliance flexibility with other sources described in the preceding sections. Briefly discussing biomass therefore is not only useful in its own right, but sheds additional light on interpretation of section 111.

Biomass co-firing has been cited by EPA as a plausible short-term emissions-reducing option,¹⁶⁵ and its cost savings appear to be substantial.¹⁶⁶ Biomass is also controversial, however, with critics claiming that it would do little if anything to reduce net emissions.¹⁶⁷ Notwithstanding

§ 7410 (listing the specific requirements that states must adhere to so as to be in compliance with NAAQS); see *supra* Part IV.A.3 (discussing flexibility for states regarding NAAQS).

¹⁶⁴ See Nathan Richardson, *Greenhouse Gas Regulation under the Clean Air Act: Does Chevron Set the EPA Free?*, 29 STAN. ENVTL. L.J. 283, 296–99 (2010); see also Richardson et al., *Greenhouse Gas Regulation Under the Clean Air Act: Structure, Effects, and Implications of a Knowable Pathway*, *supra* note 30, at 10,102–03.

¹⁶⁵ See U.S. ENVTL. PROT. AGENCY, EPA DOCKET NO. OAR-2008-4444, Technical Support Document for the Advanced Notice of Proposed Rulemaking for Greenhouse Gases; Stationary Sources, Section VII 17 (2008) (“In addition to heat rate improvements, biomass co-firing can substitute for some of the coal in most types of existing and future coal-fired boilers, resulting in proportionately lower GHG emissions As a pragmatic order-of-magnitude estimate, biomass co-firing might eventually substitute for 2 percent to 5 percent of coal used in the current coal fleet.”).

¹⁶⁶ See BURTRAW ET AL., *supra* note 7, at 14–16.

¹⁶⁷ See, e.g., Press Release, Ctr. for Biological Diversity, Lawsuit Challenges Clean Air Act Exemption for Biomass Burners (Aug 15, 2011), http://www.biologicaldiversity.org/news/press_releases/2011/biomass-08-15-2011.html (last visited July 1, 2012) (“Recent scientific information indicates that burning biomass—trees, for example—can actually increase global warming pollution, even compared to fossil fuels. According to scientists, nearly all biomass fuels cause at least temporary near-term increases in atmospheric CO₂ concentrations, significant amounts of which will persist in the atmosphere and cause climate damage for a century or more. This near-term increase directly undermines efforts to reduce carbon dioxide

this controversy, can EPA legally treat biomass as an emissions reduction strategy?

It is important, first, to draw a distinction between facilities that exclusively burn biomass, and biomass co-firing at fossil fuel power plants. No legal barrier prevents EPA from setting separate section 111 performance standards for dedicated biomass facilities; these could be regulated under their own source category, distinct from fossil fuel plants.¹⁶⁸

Biomass facilities do have significant smokestack GHG emissions,¹⁶⁹ but there is no apparent reason why EPA cannot consider the net lifecycle emissions of biomass if it so chooses.¹⁷⁰ EPA need not treat emissions of a pollutant from different source categories equally. The agency, for example, is required to consider costs independently for each category.¹⁷¹ This does not, of course, mean that EPA decisions on stringency for biomass-only facilities are easy. As noted, the lifecycle emissions of biomass are a subject of controversy.¹⁷² But that is a technical and policy problem, not a legal one.

The scope for allowing differential treatment of biomass co-firing under section 111 performance standards is more complex, however. Like the types of flexibility discussed above, biomass co-firing does not reduce emissions at the regulated facility; rather, it probably would *increase* emissions because biomass fuels are generally less efficient than fossil fuels (i.e., more must be burned to achieve the same energy output, resulting in greater GHG emissions).¹⁷³ Regrowth would then result in resequestration of at least some of these carbon emissions, although how much is the subject of controversy.¹⁷⁴

But, just as with Type 5 flexibility, this resequestration is indirect and affects atmospheric carbon concentrations, not smokestack emissions.¹⁷⁵ As discussed above with reference to offsets,¹⁷⁶ section 111 explicitly targets emissions reductions from facilities in regulated source categories, in contrast to other sections of the CAA such as the section 110 NAAQS that

emissions over the next several years, an effort that is essential to avoid the very worst damage due to climate change.”).

¹⁶⁸ See 42 U.S.C. § 7411(b) (2006).

¹⁶⁹ See, e.g., STOCKHOLM ENV'T INST., GREENHOUSE GAS AND AIR POLLUTANT EMISSIONS OF ALTERNATIVES FOR WOODY BIOMASS RESIDUES 32–36 (2010), available at http://data.orca.org/index.php/download_file/view/150/168/ (examining the emissions data from various uses of woody biomass).

¹⁷⁰ See 42 U.S.C. § 7411(b)(1)(A), (f)(2)(A)–(C) (2006).

¹⁷¹ See *id.* § 7411(h)(2)(B).

¹⁷² See Ctr. for Biological Diversity, *supra* note 167.

¹⁷³ See OR. DEP'T OF FORESTRY, ENVIRONMENTAL EFFECTS OF FOREST BIOMASS REMOVAL 46 (2008), available at http://www.oregon.gov/ENERGY/RENEW/Biomass/docs/ODF_Biomass_Removal_Effects.pdf (noting also that forest biomass could be “CO₂ neutral” due to new plant growth).

¹⁷⁴ *Id.*; see also Eric Mortenson, *Using Oregon's Forests for Bioenergy Production has a Down Side: Increased Carbon Emissions*, THE OREGONIAN, Oct. 23, 2011, http://www.oregonlive.com/environment/index.ssf/2011/10/using_oregons_forests_for_bioe.html (last visited July 15, 2012) (describing controversy over carbon neutrality of woody biomass).

¹⁷⁵ OR. DEP'T OF FORESTRY, *supra* note 173, at 46–47 (describing carbon cycle but also noting carbon emissions from biomass processing, transportation, and production).

¹⁷⁶ See *supra* Part III.B.

target concentrations of pollutants in the atmosphere.¹⁷⁷ Momentarily setting aside the lack of certainty over lifecycle carbon effects, characterizing biomass co-firing as emissions reduction is at worst simply incompatible with the language of section 111, and at best requires an ambitious redefinition of the term “emissions.” As noted above, opponents of biomass combustion, as part of carbon policy, have taken legal positions along these lines in response to other EPA biomass regulation.¹⁷⁸

It is possible, however, that EPA might be able to avoid some of the problems associated with differential treatment of biomass co-firing by using its powers to define source categories, just as it may be able to do for Type 2 flexibility.¹⁷⁹ For example, EPA could create new source categories for power plants that use biomass for a given percentage of their fuel inputs, then issue performance standards for those categories that, as discussed above for biomass-only source categories, treat emissions more favorably than those from purely fossil power plants.¹⁸⁰ This move allows the agency to convert co-firing, analogous to Type 5 flexibility, into Type 2 flexibility. Although promising, a similar move is not available for other sources of Type 5 flexibility because they are not emitters and cannot be placed into a source category.

Although somewhat inelegant, such categorization would allow the agency to avoid the strongest arguments in a challenge to rules that treat biomass emissions differently—though at the cost of additional administratively complex rulemakings. EPA has so far shown no evidence that it intends to subdivide the fossil electricity source category for which it will soon propose performance standards. Until and unless it does so, it may be legally impossible for the agency to credit biomass co-firing.¹⁸¹ Fine subcategorization, whether to shoehorn differential crediting of biomass co-firing or for other reasons, may also decrease the cost-effectiveness of regulation, undercutting the rationale for flexibility.¹⁸²

In short, differential treatment of biomass emissions under section 111 regulation may prove problematic for EPA. Although the agency appears free to treat emissions from biomass-only facilities as it wishes, favorable treatment for biomass co-firing at fossil-fuel Electric Generating Units (EGUs) may be legally difficult because it does not result in smokestack emissions reductions. EPA’s categorization powers may provide

¹⁷⁷ See *supra* Part IV.A.3. (discussing the difference between sections 110 and 111).

¹⁷⁸ See *supra* note 167 and accompanying text.

¹⁷⁹ See 42 U.S.C. § 7411(b) (2006) (directing EPA to, *inter alia*, publish “list[s] of categories of stationary sources” and authorizing the agency to “distinguish among classes, types, and sizes within categories”).

¹⁸⁰ See *id.* (directing EPA to establish performance standards for sources in such categories). As noted for Type 2 flexibility generally, this would probably complicate the design of a trading system. See *supra* Part IV.B.

¹⁸¹ Franz T. Litz & Nicholas M. Bianco, *What to Expect from EPA: Regulation of Greenhouse Gas Emissions Under the Clean Air Act*, 40 ENVTL. L. REP. NEWS & ANALYSIS 10480, 10482 (2010) (noting that emissions trading between categories of sources may not be allowed under section 111).

¹⁸² BURTRAW ET AL., *supra* note 7, at 18.

a workaround, although stretched agency resources might make the option unattractive.

Though seemingly a small issue, biomass co-firing has additional importance because many analyses of potential EPA carbon regulation have assumed that it would be an available tool,¹⁸³ and have predicted substantial associated cost savings.¹⁸⁴ If it is not available, estimates of the emissions reductions available to EPA will have to be revised down, perhaps significantly.

Type of flexibility:	Arguments for:	Arguments against:	Compatible with §111?
Type 1: same source category	<ul style="list-style-type: none"> •Part of “best system of emission reduction” •State powers through §111(d); §110 analogy (existing sources only) 	<ul style="list-style-type: none"> •“Best system” refers to level of stringency, not design of standards •Section 111 design’s technology focus is incompatible with trading §110 defines •§111(d) is procedure, not substance 	Probably
Type 2: other regulated categories	<ul style="list-style-type: none"> •Agency ability to redefine source categories makes Type 2 equivalent to Type 1 	<ul style="list-style-type: none"> •No precedent for “supercategories” 	Probably
Type 3: unregulated categories	<ul style="list-style-type: none"> •Agency could issue “paper” standards, converting into Type 2 •ERCs under §110 give parallel support •Part of “best system” 	<ul style="list-style-type: none"> •Paper standards do not save time and are likely to result in litigation •§110 ERCs create negative inference •Arguably incompatible with source category-based design of §111 	Probably not
Type 4: extra-CAA sources	<ul style="list-style-type: none"> •Extra-CAA sources not subject to regulation, just sources of credits, so limitations of statute’s reach not important 	<ul style="list-style-type: none"> •No indication that §111 is extraterritorial •Sources outside §111 definition create further incompatibility with source category design •No EPA international authority to monitor or enforce 	Probably not
Type 5: sequestration offsets	<ul style="list-style-type: none"> •Sequestration is “negative emissions” 	<ul style="list-style-type: none"> •Sequestration does not reduce emissions, so cannot be part of “best system of emission reduction” 	Probably not
Biomass co-firing	<ul style="list-style-type: none"> •Agency can create narrow source categories for varying levels of co-firing 	<ul style="list-style-type: none"> •Biomass does not reduce emissions, so cannot be part of “best system” 	Probably

Table 1. Key Arguments and Counterarguments for Flexibility under §111

¹⁸³ See, e.g., *id.* at 14; Richardson et al., *Greenhouse Gas Regulations Under the Clean Air Act: Structure, Effects, and Implications of a Knowable Pathway*, *supra* note 30, at 10,112.

¹⁸⁴ See FED. ENERGY MGMT. PROGRAM, U.S. DEP’T OF ENERGY, FEDERAL TECHNOLOGY ALERT: BIOMASS CO-FIRING IN COAL-FIRED BOILERS 3, *available at* <http://www.nrel.gov/docs/fy04osti/33811.pdf>; see also BURTRAW ET AL., *supra* note 7, at 21–22 (discussing the potential collective cost savings from introducing general flexibility in CO₂ emissions reduction activities).

G. Summary

The arguments presented for and against each type of flexibility, and for biomass co-firing, are admittedly complex. Table 1 above collects the most important arguments for easier consideration.

V. THE ROLE OF STATES

The previous Parts of this Article discussed possible legal limitations to the compliance flexibility available to EPA under section 111 for the sake of regulating GHGs. But the ESPS under section 111(d)—probably the most important and wide-reaching part of GHG regulations under the CAA—is federalist at heart: the states, not EPA, play the largest role.¹⁸⁵ It is therefore important to look at what effect these legal limitations will have on states—both on their implementation of section 111(d) performance standards, and on their independent climate policies. Although states have great freedom to implement climate policies in principle, this section illustrates how that freedom is restricted in practice if CAA section 111 performance standards are imposed, particularly if those standards exclude the extended flexibility mechanisms discussed above.

Comparing federal and state climate policies is necessarily an apples-to-oranges comparison. Although the above discussion of federal policy focuses on the limitations presented by the CAA, the following discussion treats states as free actors, legally bound only by the Constitution.¹⁸⁶ This ignores the fact that state policy depends on state legislative action, just as the limits of federal policy would change if Congress amended the CAA or passed new climate legislation.

Despite this contradiction, there are some good reasons for treating states this way. First and most obviously, some states have more political flexibility or willingness to act on climate change than Congress currently does, as a matter of political reality.¹⁸⁷ Moreover, some state legislatures already have acted to create state-level climate policy, most notably California in the form of its Assembly Bill (A.B.) 32 law.¹⁸⁸ Finally, and more practically, analyzing the limits of state environmental regulators' ability to

¹⁸⁵ DALLAS BURTRAW, ARTHUR G. FRAAS & NATHAN RICHARDSON, RES. FOR THE FUTURE, DISCUSSION PAPER NO. RFF DP 12-05, TRADABLE STANDARDS FOR CLEAN AIR ACT CARBON POLICY 3-4 (2012), available at <http://www.rff.org/Publications/Pages/PublicationDetails.aspx?PublicationID=21738>.

¹⁸⁶ U.S. CONST. art. VI, cl. 2.

¹⁸⁷ See e.g., H. Joseph Drapalski III, Note, *The Viability of Interstate Collaboration in the Absence of Federal Climate Change Legislation*, 21 DUKE ENVTL. L. & POL'Y F., 469 (2011); see also Wendy Koch, *States take Lead in Efforts to Fight Climate Change*, USA TODAY, Jan. 23, 2011, <http://content.usatoday.com/communities/greenhouse/post/2011/01/states-tackle-global-warming-cut-greenhouse-gas-emissions/1> (last visited July 15, 2012) (discussing some of the state and regional initiatives to fill the void left by Congressional inaction on climate change policy).

¹⁸⁸ California Global Warming Solutions Act of 2006, CAL HEALTH & SAFETY CODE §§ 38500-38599 (West, 2012).

enact climate policies would require a detailed analysis of each state's environmental statutes and would be beyond the scope of this Article.

A. Environmental Federalism and States' Freedom To Act

States are generally able to enact their own climate policies, including emissions-trading or tax policies.¹⁸⁹ Indeed many states already have done so. Nine states have joined together in the Regional Greenhouse Gas Initiative (RGGI), an interstate trading program for GHG emissions from the electricity sector.¹⁹⁰ California has enacted a comprehensive GHG regulatory policy under A.B. 32 that will include a cap-and-trade system.¹⁹¹ California is also part of the Western Climate Initiative (WCI), which until recently included other U.S. states and Canadian provinces. However, though no other WCI member-state has been as aggressive as California.¹⁹²

B. Constitutional Issues with State Programs

Some have raised constitutional concerns about these policies.¹⁹³ One argument is that they violate the Dormant Commerce Clause by discriminating against out-of-state businesses (such as coal EGUs).¹⁹⁴ Reports in late 2010 claimed that some states outside of RGGI and WCI

¹⁸⁹ See DALLAS BURTRAW & BILL SHOBE, RES. FOR THE FUTURE, DISCUSSION PAPER NO. RFF DP 09-54, STATE AND LOCAL CLIMATE CHANGE POLICY UNDER A NATIONAL EMISSIONS FLOOR 4-5, 7, 14 (2009), available at <http://www.rff.org/Publications/Pages/PublicationDetails.aspx?PublicationID=21605> (discussing the various climate change policies adopted by states and local governments, including the possibility of taxing and cap and trade programs).

¹⁹⁰ Regional Greenhouse Gas Initiative, *Mission Statement*, <http://www.rggi.org/rggi> (last visited July 15, 2012) (listing state participants, including Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont).

¹⁹¹ See CAL. AIR RES. BD. (CARB), CLIMATE CHANGE SCOPING PLAN: A FRAMEWORK FOR CHANGE 30 (2008), available at <http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm>.

¹⁹² See Margot Roosevelt, *California, New Mexico and 3 Canadian Provinces Outline Regional Cap-and-Trade Program*, L.A. TIMES, July 28, 2010, <http://articles.latimes.com/2010/jul/28/local/la-me-climate-pact-20100728> (last visited July 15, 2012); see generally Western Climate Initiative, *Design for the WCI Regional Program* (2010), <http://www.westernclimateinitiative.org/the-wci-cap-and-trade-program/program-design> (last visited July 15, 2012) (providing links to documents and reports about the WCI cap-and-trade program).

¹⁹³ See, e.g., Robert N. Stavins, *AB 32, RGGI, and Climate Change: The National Context of State Policies for a Global Commons Problem*, AN ECONOMIC VIEW OF THE ENV'T, Oct. 1, 2010, <http://www.robertstavinsblog.org/2010/10/01/ab-32-rggi-and-climate-change-the-national-context-of-state-policies-for-a-global-commons-problem/> (last visited July 15, 2012) (predicting these policies may face constitutional challenges arising from issues of federal preemption and the dormant commerce clause).

¹⁹⁴ See, e.g., *id.* ("In brief, in the absence of meaningful Federal action, sub-national climate policies could well become the core of national action. Problems will no doubt arise, including legal obstacles such as possible Federal preemption or litigation associated with the so-called Dormant Commerce Clause.").

would file suits against California on Dormant Commerce Clause grounds.¹⁹⁵ In December 2011, a District Court judge granted summary judgment to a group of farming and oil-industry plaintiffs who sued to enjoin implementation of the law's Low Carbon Fuel Standard (LCFS).¹⁹⁶ The decision was appealed to the Ninth Circuit, and the injunction was stayed on April 23, 2012, allowing the California Air Resources Board (CARB) to continue enforcing the LCFS, pending the outcome of the appeal.¹⁹⁷

Another argument is that RGGI and other interstate GHG policies violate the Compact Clause,¹⁹⁸ which forbids states to enter into an "Agreement or Compact with another State, or with a foreign Power" without congressional consent.¹⁹⁹ Congress has given no specific consent for RGGI or WCI and, the argument goes, these are "compacts" of the type forbidden by the Constitution. Such a challenge does not appear to have been made against either group to date, however, and some scholars have concluded that such a challenge would be likely to fail.²⁰⁰ However, the Compact Clause may nevertheless create problems if states attempt to include international offsets in their programs or link with trading markets in other countries (as California plans to do with its Canadian WCI partners).²⁰¹ These constitutional issues remain unresolved, but are largely outside the scope of this Article.

Although these constitutional issues remain unresolved, neither of them appear likely to derail state-level climate policies generally.²⁰² But that does not necessarily resolve the narrower questions of whether and how

¹⁹⁵ See Mark Schapiro, *Four States Prepare Legal Assault on California's Climate Law*, CALIFORNIA WATCH, Sep. 10, 2009, <http://californiawatch.org/dailyreport/four-states-prepare-legal-assault-californias-climate-law-4564> (last visited July 15, 2012) (stating that "[t]he attorneys general of Alabama, Nebraska, Texas and North Dakota have been devising a legal strategy to challenge the California act, signed by Gov. Arnold Schwarzenegger in 2006, on the grounds that it interferes with the right to freely conduct interstate commerce").

¹⁹⁶ *Rocky Mt. Farmers Union v. Goldstene*, CV-F-09-2234 LJO GSA, 2011 WL 6934759 (E.D. Cal. 2011).

¹⁹⁷ Order Staying Injunction Pending Appeal, *Rocky Mountain Farmers Union v. Goldstene* (9th Cir. 2012), No. 12-15131.

¹⁹⁸ See Endangered Environmental Laws, *Recent Cases: Indeck Corinth v. Paterson*, http://www.endangeredlaws.org/case_RGGI.htm (last visited July 15, 2012).

¹⁹⁹ U.S. CONST. art. I, § 10, cl. 3.

²⁰⁰ See, e.g., Michael S. Smith, *Murky Precedent Meets Hazy Air: The Compact Clause and the Regional Greenhouse Gas Initiative*, 34 B.C. ENVTL AFF. L. REV. 387, 415 (2007) ("In its current iteration, it is likely that RGGI will not require congressional consent"); see also Daniel A. Farber, *Climate Change, Federalism, and the Constitution*, 50 ARIZ. L. REV. 879, 908 (2008) ("Thus, although the states may be limited in their ability to form multi-state regulatory authorities without congressional approval, policy coordination between states does not seem to pose the same kind of challenge to national authority. Thus, if a number of states coordinate on the adoption of similar climate change regulations and allow trading between their emission sources, the Compact Clause should not be implicated, provided that regulatory authority and enforcement powers continue to be held by the states themselves rather than by some interstate agency. For this reason, the RGGI trading system between the Northeast states does not appear to pose a problem under the Compact Clause.").

²⁰¹ See Roosevelt, *supra* note 192.

²⁰² See, e.g., Endangered Environmental Laws, *supra* note 198; Farber, *supra* note 200.

such policies might include offsets or the other flexibility mechanisms discussed above.

C. Leakage

If EPA adopts even a basic form of compliance flexibility for section 111 GHG performance standards—such as Type 1—this would raise concerns about GHG emission “leakage” in states that have more aggressive standards.²⁰³ Because the stricter state programs do not result in increased stringency of the national program, those state programs may not reduce emissions, but rather simply export them to other states. Emitters that comply with strict state programs will over-comply with the federal standards, and therefore will have allowances or credits that can be traded to out-of-state emitters. The buyers of these credits can then emit the same amount of GHGs that the state sought to eliminate. Because GHGs are global pollutants, the state policy would see no environmental benefit.

Can this problem be avoided? Maybe. It helps that states control the implementation of section 111(d) standards.²⁰⁴ A state with a more stringent program could opt out of any flexibility component of those standards suggested by EPA, or at least out of any interstate trading.²⁰⁵ It might also be able to design its section 111(d) program so as to allow only emissions reductions beyond those required by both federal *and* state regulation to generate tradable credits. Other technical fixes are undoubtedly available.

D. Extended Flexibility at the State Level

Because state legislatures and state environmental regulators control the design of state-level climate policies, those policies can include almost any particular tool. A state could enact a cap-and-trade system (as California and RGGI have),²⁰⁶ a renewable portfolio standard (as many states have done), a carbon tax, or other mechanisms.

This includes many types of extended flexibility as well. Nothing prevents California from, for example, allowing land-use change of some type to generate offsets for use in the A.B. 32 cap-and-trade program. Assuming that interstate trading programs like RGGI are generally legal,²⁰⁷

²⁰³ See *Regulating Greenhouse Gas Emissions Under the Clean Air Act*, 73 Fed. Reg. 44,354, 44,413–14 (July 30, 2008) (to be codified at 40 C.F.R. ch. 1) (noting concerns that GHG regulation could be undercut by leakage at both an international and national level); see also William A. Pizer, *Issue Brief 4: Scope and Point of Regulation for Pricing Policies to Reduce Fossil-Fuel CO₂ Emissions*, in *ASSESSING U.S. CLIMATE POLICY OPTIONS: A REPORT SUMMARIZING WORK AT RFF AS PART OF THE INTER-INDUSTRY U.S. CLIMATE POLICY FORUM 77* (Raymond J. Kopp & William A. Pizer, eds., 2007) (discussing leakage concerns associated with California’s regulatory program).

²⁰⁴ Clean Air Act, 42 U.S.C. § 7411(c) (2006).

²⁰⁵ See WANNIER ET AL., *supra* note 8, at 3, 8, 10, 14.

²⁰⁶ See *supra* notes 189–192 and accompanying text.

²⁰⁷ See *supra* Part V.B (discussing possible constitutional issues with state GHG interstate trading programs).

offsets from other participating states could similarly be included. From the perspective of each regulating state, this is a form of Type 4 flexibility because the out-of-state sources are outside the reach of state regulators.

Legal problems with extended flexibility may arise in two scenarios. First, international offsets may present constitutional problems that could limit or prevent their adoption. Second, the limitations on extended flexibility under the CAA discussed above could cause compatibility issues with state-level programs, perhaps even causing states not to include them. This particular constitutional issue has been analyzed elsewhere,²⁰⁸ so this Part will only discuss the second legal problem: state and federal CAA compatibility.

Even if states face no constitutional restrictions on their ability to incorporate extended flexibility, they could, ironically, be discouraged from doing so by the presence of the parallel EPA program. If EPA cannot include certain types of flexibility in its program, or simply chooses not to, it may become incompatible with state programs that do include those types. If emitters in, say, California, use international avoided-deforestation offset purchases (Type 4 flexibility) to comply with emissions cuts required by the state, they would be out of compliance with a federal standard that required emission cuts at the facility or source category (Type 1) level. This would be true even if state requirements were more strict than federal requirements in terms of emissions. In this scenario, credits obtained through types of flexibility excluded under federal regulation would be useful only for the additional emissions reductions states impose beyond EPA requirements. This increases the cost of state programs without any emissions benefit.

This simple scenario hides much legal complexity. ESPS regulation under section 111(d) is primarily a state activity.²⁰⁹ EPA simply sets initial guidelines and reviews state plans, intervening only if states fail to act.²¹⁰ But states do not have complete discretion in writing their section 111(d) plans. As discussed above, states must set standards of performance within the definition of the CAA, which limits their ability to incorporate extended flexibility just as it does for EPA.²¹¹ Section 111(d) does not limit states' ability to regulate emissions more stringently, but neither does it grant states the ability to use tools other than "standards of performance" for the emissions cuts or efficiency improvements required under the CAA. This is in contrast to NAAQS, which does grant state plans such broad flexibility so long as environmental targets are met.²¹²

It is possible that EPA could take more creative approaches to section 111(d) regulation, such as setting state-level budgets rather than facility-level

²⁰⁸ See MORRIS ET AL., *supra* note 143, at 12; see also Molly K. Macauley & Nathan Richardson, *Seeing the Forests and the Trees: Technological and Regulatory Impediments for Global Carbon Monitoring*, 26 BERKELEY TECH. L.J. 1387, 1402–04 (2011).

²⁰⁹ See *supra* note 185 and accompanying text.

²¹⁰ Clean Air Act, 42 U.S.C. § 7411(d) (2006).

²¹¹ See *supra* Part IV.A.3.

²¹² 42 U.S.C. § 7410(a)(2) (2006).

targets. But even if doing so is permissible under section 111, it is unclear whether such approaches would permit any of the types of flexibility (3, 4, or 5) that may not be compatible with section 111.

EPA's position on compatibility between its planned section 111(d) standards and state-level climate programs is unclear. One senior figure at the agency has indicated that EPA will seek compatibility, stating that "[t]here is a very live possibility in upcoming guidelines and state implementation of those guidelines [that section 111(d) standards] would be compatible with existing state programs."²¹³ But others at EPA have expressed skepticism over whether compatibility is possible, particularly with state programs that include trading and offsets.²¹⁴ EPA officials have also stated that they do not intend to implement cap-and-trade via section 111.²¹⁵ Although it is unclear exactly what regulatory approaches EPA would include and exclude, linking section 111(d) regulation to state programs that explicitly use cap-and-trade might violate EPA's intention for section 111.²¹⁶

It is important to stress that none of these potential incompatibilities limits states' freedom to develop their own climate policies, including the freedom to determine what level of flexibility is available and whether extended flexibility is included.²¹⁷ But compliance with section 111(d) is not optional, and states are bound by its limitations.²¹⁸ For categories of sources regulated under CAA performance standards, states therefore face a choice: impose dual, overlapping requirements, or tailor their programs to comply with the limits of section 111(d)—at least for that portion of emissions reduction required by the federal guidelines.

If states with their own climate programs are unable to use extended flexibility for compliance with section 111(d) EPA regulation, these states' program choices will narrow, and other states may be less likely to join existing interstate climate agreements. States with existing programs will probably be less likely to include offsets in their programs because they would be useful only for emissions restrictions beyond federal requirements. The administrative, enforcement, and compliance costs of an offset program might not be justifiable under these conditions, leading states to abandon

²¹³ Dawn Reeves, *EPA Hints At Granting State GHG Programs "Equivalency" under NSPS*, INSIDE EPA, Apr. 7, 2011, <http://insideepa.com/201104072360309/EPA-Daily-News/Daily-News/epa-hints-at-granting-state-ghg-programs-equivalency-under-nsps/menu-id-95.html> (quoting EPA senior air counsel Joe Goffman).

²¹⁴ *Id.* ("EPA air chief Gina McCarthy at the listening sessions has openly grappled with how the agency could incorporate flexibilities offered under the state programs, such as allowance purchases and offsets, into the federal rule.").

²¹⁵ *Id.* ("McCarthy has also been adamant that EPA would not seek to establish a broad cap-and-trade program under the NSPS rules, particularly given the current political climate against a carbon cap on Capitol Hill.").

²¹⁶ Section 111's existing source performance standards are technology requirements designed to apply to a facility regardless of a GHG trading scheme. *See* 42 U.S.C. § 7411(d) (2006).

²¹⁷ *See* WANNIER ET AL., *supra* note 8, at 10–11.

²¹⁸ *See* Clean Air Act, 42 U.S.C. § 7411(d)(1) (providing that "each State shall submit to the Administrator a plan which (A) establishes standards of performance . . . and (B) provides for the implementation and enforcement of such standards of performance").

offsets entirely.²¹⁹ As a result, costs would increase (assuming offsets are the cheapest option available to emitters for meeting state requirements). This has obvious effects on the regulating states, but also makes other states less likely to join interstate programs. Federal climate regulation might also rob efforts to implement climate policy at the state level of much of their momentum.²²⁰

VI. CONCLUSIONS AND IMPLICATIONS

A. Legal Limits, Political Pressure, and EPA

At least in the short term, EPA action under the CAA appears to be the only game in town for federal climate policy. In practice, this means an old statute will be used for a new, possibly uniquely challenging policy problem. This is not a disaster. Evidence suggests that, given smart choices, EPA can implement a fairly effective and cost-effective set of short- to medium-term policies. There are limitations, however. Cost-effective climate policy almost certainly involves an economy-wide carbon price and incorporates offsets—in particular, those generated by forest management in tropical countries.²²¹ The CAA pathway appears incompatible with both.

The inclusion of extended flexibility, including some forms of offsets, in the most important part of the EPA/CAA climate program—section 111 performance standards—cannot be ruled out. But including them requires ambitious interpretation of statutory language, and even that is not enough to allow the use of the most attractive categories of offsets: forests. Although EPA may be able to implement carbon-cutting policies that politically the current Congress cannot,²²² the agency is legally constrained by the scope of authority granted by earlier Congresses as embodied in the CAA. In other words, EPA's powers are limited. In congressional discussions of climate bills, politics made it necessary to deviate from blackboard ideals of cost-effective policies.²²³ The CAA will require EPA to deviate from those idealized policies too.

²¹⁹ See, e.g., Richardson et al., *supra* note 30, at 10102–03 (2011) (describing the complexities inherent in regulating GHGs through the CAA NAAQS program).

²²⁰ Conceivably, section 111(d) could also promote stronger climate policies in those states that do not already have them because it will force all states to have the administrative structure of a climate policy in place, reducing start-up costs for the program.

²²¹ See ORG. FOR ECON. CO-OPERATION & DEV., COST-EFFECTIVE ACTIONS TO TACKLE CLIMATE CHANGE 4 (2009), available at <http://www.oecd.org/dataoecd/1/40/43656443.pdf> (discussing the cost-effectiveness of various carbon emission mitigation policies); BRIAN C. MURRAY ET AL., NICHOLAS INST. FOR ENVTL. POLICY SOLUTIONS, INCLUDING INTERNATIONAL FOREST CARBON INCENTIVES IN CLIMATE POLICY: UNDERSTANDING THE ECONOMICS 10–11 (2009), available at <http://www.nicholas.duke.edu/institute/carbon.economy.06.09.pdf>.

²²² WORLD RES. INST., U.S. CLIMATE ACTION IN 2009–2010, at 1 (2010), available at http://pdf.wri.org/factsheets/factsheet_us_climate_action_in_2009-2010.pdf.

²²³ See, e.g., U.S. Congressman Pete Stark, *Statement of Congressman Peter Stark Opposing Watered-Down Global Warming Legislation*, <http://www.stark.house.gov/index.php?option=com>

Even if they are not legally conclusive, the strength of arguments against Types 3, 4, and 5 flexibility makes it much less likely that EPA will take the practical risk of including offsets. Though the agency has made some bold interpretive moves in the recent past—most notably in CAMR—courts have not generally been receptive.²²⁴ The agency may therefore have lost some of its appetite for ambitious interpretation of the CAA, particularly in the context of its already controversial GHG regulatory programs.²²⁵

Moreover, institutional politics may constrain the agency in practice as much as or more than the CAA itself does. Many in Congress, particularly but not exclusively Republicans, are strongly opposed to the agency's GHG regulatory programs, and have sought legislation delaying or removing EPA authority over GHGs.²²⁶ They have also sought to cut agency funding.²²⁷ In this environment, EPA is much less likely to be bold than it would be in quieter times or for less headline-grabbing pollutants, particularly with respect to tools like offsets that do not have strong support from many environmentalists.

For offsets, reduced EPA funding has direct implications. Offset programs are likely to be administratively complex and labor intensive for the agency, especially relative to more traditional performance standard approaches under section 111.²²⁸ Although some of this workload could be shifted to states under section 111(d), much of it could not—especially insofar as international offsets are concerned.²²⁹ Budgetary situations in the states are hardly more favorable.²³⁰

_content&view=article&id=1299:statement-opposing-watered-down-global-warming-legislation&catid=54:press-releases-2009&Itemid=100011 (last visited July 1, 2012).

²²⁴ See *N.J. v. U.S. Envtl. Prot. Agency*, 517 F.3d 574, 583–84 (D.C. Cir. 2008) (rejecting EPA's CAMR mercury cap-and-trade program); see also *N.C. v. U.S. Envtl. Prot. Agency*, 531 F.3d 896, 909–10, 929–30 (D.C. Cir. 2008) (per curiam) (vacating and remanding EPA's Clean Air Interstate Rule limiting sulfur dioxide and nitrogen oxide emissions).

²²⁵ See, e.g., Ryan Tracy, *House Votes to Stop EPA from Regulating Greenhouse Gases*, WALL ST. J., Apr. 7, 2011, <http://online.wsj.com/article/SB10001424052748704101604576249371174457668.html> (last visited July 15, 2012) (discussing Republican attempts, with limited support from a few Democratic members, to legislatively curb EPA's authority under the Clean Air Act to combat GHG production); Lynne Peeples, *TRAIN Act to Limit Clean Air Protection Passes the House*, HUFFINGTON POST, Sep. 23, 2011, http://www.huffingtonpost.com/2011/09/23/train-act-clean-air-protection-house_n_978502.html (last visited July 15, 2012); David Rogers, *EPA Funding Cuts Outlined by COP* POLITICO, July 6, 2011, <http://www.politico.com/news/stories/0711/58409.html> (last visited July 1, 2012).

²²⁶ See Peeples, *supra* note 225.

²²⁷ See Rogers, *supra* note 225.

²²⁸ For an example of the potential complexity of an offset program and the multitude of factors involved, see RENÉE JOHNSON ET AL., CONG. RESEARCH SERV., R 41086, POTENTIAL IMPLICATIONS OF A CARBON OFFSET PROGRAM TO FARMERS AND LANDOWNERS 4–8 (2010), available at <http://www.nationalaglawcenter.org/assets/crs/R41086.pdf>; Peter Erickson, Michael Lazarus & Alexia Kelly, *The Role of Domestic Offsets in U.S. Climate Policy and the Importance of Program Design* 7, available at http://www.lindentrust.org/pdfs/SEL_WRI_InternalReview_Offset_Supply.pdf.

²²⁹ See *supra* Part IV.D.1.

²³⁰ See, e.g., ELIZABETH MCNICHOL, PHIL OLIFF & NICHOLAS JOHNSON, CTR. ON BUDGET & POL'Y PRIORITIES, STATES CONTINUE TO FEEL RECESSION'S IMPACT 2–3 (2012) (noting that budget deficits for most states are so large that “even if revenues continue to grow at last year's rate [of 8.3% at

Put differently, it is not clear that offsets have a constituency pressing EPA to include them, so why would EPA expend its limited political capital and agency resources to implement them, given the apparent legal barriers and administrative costs?

The role of political pressure in the design of EPA's GHG programs is somewhat ironic; offsets and emissions trading are cost-control and efficiency mechanisms.²³¹ Without them, EPA regulation is likely to be more costly,²³² less environmentally valuable,²³³ or both. Although it grabs headlines to accuse EPA of attempting to implement cap-and-trade through the back door, such attacks make trading less likely, not caps.²³⁴ The same may be true for offsets.

B. Flexibility and Stringency

If extended flexibility options like offsets are not available, the implications affect not only the costs of EPA-driven climate policy, but also the level of stringency—that is, the level of environmental benefits—that the agency can legally and politically justify. The issues of stringency and flexibility are linked. The more stringent EPA's CAA climate policy, the more important extended flexibility becomes. If CAA regulation requires only minimal reductions in GHG emissions, many sources will be able to meet the standards at reasonable cost either alone or via Type 1 flexibility (trading with sources in the same category). Evidence suggests that significant opportunities for improving efficiency are available at coal plants, for example.²³⁵

It is possible that these and other relatively easily identifiable and low-cost opportunities for domestic emissions reduction could be targeted by

the end of the fiscal 2011 year]—which is highly unlikely . . . it would take *seven years* to get [the states] back on a normal track”).

²³¹ See *supra* Part III.A.

²³² Kevin Doran & Alaine Ginnochio, *United States Climate Policy: Using Market-Based Strategies to Achieve Greenhouse Gas Emission Reductions*, 3 ENVTL. & ENERGY L. & POL'Y J. 31, 71, 79 (2008) (noting that “[t]he primary benefit of emission offsets is that they help lower the cost of reducing emissions” and that “[e]ven if the efficiencies of an emissions tax outweigh the benefits of a cap-and-trade system, a cap-and-trade system may be the best choice and may represent the cost of prior inaction”).

²³³ *Id.* at 33, 38 (arguing, in part, that it is necessary to set a price on carbon—either through a cap-and-trade scheme or through a tax on emissions—in order to keep “global temperature changes within an acceptable range”).

²³⁴ See, e.g., Phil Kerpen, *Chris Christie Strikes a Major Blow Against Cap-and-Trade*, FOX NEWS.COM, May 26, 2011, <http://www.foxnews.com/opinion/2011/05/26/chris-christie-strikes-major-blow-cap-trade/> (last visited July 14, 2012) (hailing the New Jersey governor for withdrawing from a multi-state compact to implement a cap-and-trade system in the American northeast, deriding cap-and-trade programs in general, and suggesting that President Obama will rely on the EPA to engage in “back door regulatory attacks on affordable energy and American jobs”).

²³⁵ See BURTRAW ET AL., *supra* note 29, at 299–301; BURTRAW ET AL., *supra* note 7, at 7–8; see also generally SARGENT & LUNDY, LLC, COAL-FIRED POWER PLANT HEAT RATE REDUCTIONS, FINAL REPORT (2009), available at <http://www.epa.gov/airmarkt/resource/docs/coal-fired.pdf> (studying various methods of reducing required fuel energy input for coal-fired power plants).

performance standards. But if these opportunities are not available, or if EPA fails to identify them, then the costs of climate policy will increase or ambitions for GHG reductions will have to be moderate. The more stringent EPA's emissions reduction goals become, and the longer the CAA remains the only federal climate policy, the more quickly these opportunities will be exhausted. In the meantime, other countries may adopt policies that incorporate offsets.²³⁶ It is possible that by the time the United States adopts a climate policy not grounded in a 1970s statute, other countries may have already taken advantage of the most cost-effective carbon-reducing opportunities.²³⁷

The relationship between stringency and flexibility goes in both directions. Because EPA must take cost into consideration when setting performance standards under section 111,²³⁸ and because higher-cost regulation will likely increase political pressure on the agency, the environmental goals reachable under section 111 are constrained. If extended flexibility is unavailable, then standards cannot be as stringent. Although the agency's ability to consider costs is generally a good thing, in this case it combines with section 111's apparent limitations on available tools to undermine EPA's ability to achieve meaningful emissions reductions under the CAA.

Not everyone agrees that this tradeoff exists.²³⁹ The analysis in this Article has generally assumed that the effect of extended flexibility tools like offsets on carbon concentrations is equivalent to the smokestack emissions cuts they replace. But some view the environmental gains of offsets and other options such as biomass co-firing as illusory.²⁴⁰ These observers may cheer rather than lament a policy pathway in which these tools are difficult

²³⁶ See BURTRAW ET AL., *supra* note 29, at 305.

²³⁷ On the other hand, it might be better to wait. In principle, technological change could make carbon-reducing opportunities cheaper, not more expensive, over time. Even if other countries were to, for example, take advantage of the most cost-effective forest offsets, future energy technologies might make all offsets less attractive, or sequestration geoengineering could even become available at low cost. ROBERT N. STAVINS & KENNETH R. RICHARDS, THE COST OF U.S. FOREST-BASED CARBON SEQUESTRATION 8 (2005), *available at* http://www.c2es.org/docUploads/Sequest_Final.pdf ("In the give-and-take of policy debates, the abatement costs of proposed regulations have sometimes been over-estimated. This . . . is also a natural consequence of employing short-term cost analyses that do not take into account the potential for future cost savings due to technological change."). Predicting these changes is impossible, but offsets, particularly forest offsets, are the most cost-effective large-scale emissions reductions currently available.

²³⁸ U.S. ENVTL. PROT. AGENCY, BACKGROUND ON ESTABLISHING NEW SOURCE PERFORMANCE STANDARDS (NSPS) UNDER THE CLEAN AIR ACT 1-2 (2012), *available at* <http://www.epa.gov/airquality/cps/pdfs/111background.pdf> (explaining how costs are considered under section 111).

²³⁹ See, e.g., EJ MATTERS, FACTSHEET: THE CAP AND TRADE CHARADE FOR CLIMATE CHANGE 1-7, *available at* http://www.ejmatters.org/docs/Cap-Trade_FACTSHEET.pdf (summarizing the opposition of some environmental justice groups to both cap-and-trade and carbon offsets).

²⁴⁰ See, e.g., EJ MATTERS, THE CALIFORNIA ENVIRONMENTAL JUSTICE MOVEMENT'S DECLARATION AGAINST THE USE OF CARBON TRADING SCHEMES TO ADDRESS CLIMATE CHANGE, *available at* http://www.ejmatters.org/docs/CA_EJ_Declaration_on_Carbon_Trading.pdf (stating the California Environmental Justice Movement's findings that carbon trading and offsets will not result in reduced emissions).

or impossible to implement. As lawsuits by California environmental justice groups over that state's decision to implement a cap-and-trade system illustrate,²⁴¹ it may be these groups, rather than industry, that are most likely to challenge EPA regulations that include alternative tools.

It is important to understand and verify the actual impact of offsets or biomass combustion on carbon concentrations and adjust policy accordingly. Nevertheless, a policy pathway that leaves one or more of these tools off the table entirely before they can be studied in practice is at least less than ideal, and may be substantially more costly. To the extent that this is true of a policy path led by EPA and the states, it is another in a list of disadvantages of that path relative to a legislative path.²⁴²

C. States

Can the states provide a way out of this dilemma? To date, they have been the leaders in U.S. climate policy,²⁴³ and that may not change even after EPA implements CAA performance standards for major sectors of the economy. States retain the freedom to pursue their own climate policies, using whatever tools they determine are most effective, including statewide cap-and-trade programs (like California) and, potential constitutional issues aside, international forest offsets.

But this theoretical freedom is tempered in practice by interactions with EPA's program. Because states must comply with EPA's guidelines and with the limits of section 111 in doing so,²⁴⁴ tools that are unavailable to EPA are similarly unavailable to states for the emissions reductions in-state sources must make to comply with section 111 standards.²⁴⁵ Because of this, states may decide that administratively costly offset programs are not worth pursuing, and this will increase the costs (and possibly the stringency) of these states' programs.²⁴⁶ States without climate policies may also be less likely to adopt them.

D. Implications of Limited Flexibility

The CAA is a valuable pathway to reducing greenhouse gas emissions, despite its apparent inability to incorporate cost-effective extended

²⁴¹ See, e.g., *Ass'n of Irrigated Residents v. Cal. Air Res. Bd.*, 206 Cal. App. 4th 1487 (2012).

²⁴² This is not to suggest that the legislative path is ideal either. As the Waxman-Markey bill illustrates, real-world federal carbon legislation is likely to be far from blackboard ideals and full of carve-outs, exceptions, and other features that limit its cost-effectiveness. See H.R. 2454 11th Cong. 439, 944–945, 1390 (1st Sess. 2009).

²⁴³ See ANDREW AULISI ET AL., *WORLD RES. INST., CLIMATE POLICY IN THE STATE LABORATORY: HOW STATES INFLUENCE FEDERAL REGULATION AND THE IMPLICATIONS FOR CLIMATE CHANGE POLICY IN THE UNITED STATES 4–5* (2007), available at <http://www.wri.org/publication/climate-policy-in-the-state-laboratory>.

²⁴⁴ WANNIER ET AL., *supra* note 8, 13–14.

²⁴⁵ See *id.* at 1–3, 13–14.

²⁴⁶ See *supra* text accompanying notes 219–20.

flexibility tools. Compliance with the Act, first of all, is required by law.²⁴⁷ Moreover, the CAA still appears capable, in the hands of a bold, smart EPA, of achieving meaningful carbon reductions at modest cost over the short term.²⁴⁸ The short term matters because no federal-level alternative is likely to arise for some time. It is further likely that any new legislative policy that does eventually emerge will be far from ideal (perhaps just as far as the CAA appears to be) as a result of political compromise. Nevertheless, section 111 performance standards that cannot include extended flexibility, particularly international forest offsets, appear to leave some of the best climate policy tools off the table.

Can this problem be solved? In principle, yes. A minimally invasive solution would be for Congress to amend the CAA to explicitly allow extended flexibility (with appropriate verification requirements) in section 111 performance standards. But this seems unlikely given the current political stalemate regarding passage of federal environmental legislation.²⁴⁹ The last significant changes to the CAA, in 1990, required years of debate and major political compromise and resulted in the addition of multiple new titles to the Act.²⁵⁰ Essentially, Congress passed major new environmental legislation that was labeled as a set of amendments to an existing statute.²⁵¹ The current makeup and level of debate in Congress makes it unlikely that this would happen today.²⁵² And even if Congress is capable of passing major environmental legislation, it would be better off passing dedicated climate legislation, not tweaking the existing CAA to make it better fit the GHG problem. As noted at the outset, this too seems unlikely.²⁵³

²⁴⁷ See, e.g., Clean Air Act, 42 U.S.C. § 7413(a)(2) (2006) (describing the EPA's enforcement power if an individual emitter or a state is out of compliance).

²⁴⁸ Richardson et al., *Greenhouse Gas Regulation under the Clean Air Act: Structure, Effects, and Implications of a Knowable Pathway*, *supra* note 30, at 10115–16; see also Richardson et al., *supra* note 4, at 28.

²⁴⁹ See generally Carol A. Casazza Herman et al., *Breaking the Logjam: Environmental Reform for the New Congress and Administration*, 17 N.Y.U. ENVTL. L.J. 1, 2 (2008) (discussing the “urgent need for innovative strategies for environmental protection that will break the political logjam and meet environmental challenges that have become increasingly complex”); see also Teresa B. Clemmer, *Staving Off the Climate Crisis: The Sectoral Approach Under the Clean Air Act*, 40 ENVTL. L. 1125, 1135 (2010) (calling attention to legislative gridlock in Congress, and noting that “nowhere is it more pronounced than in the context of climate change”).

²⁵⁰ See U.S. Env'tl. Prot. Agency, *The Clean Air Act Amendments of 1990: Overview*, <http://www.epa.gov/air/caa/overview.txt> (last visited Mar. 14, 2012) (“By large votes, both the House of Representatives (401-21) and the Senate (89-11) passed Clean Air bills that contained the major components of the President’s proposals. Both bills also added provisions requiring the phaseout of ozone-depleting chemicals, roughly according to the schedule outlined in international negotiations (Revised Montreal Protocol). The Senate and House bills also added specific research and development provisions, as well as detailed programs to address accidental releases of toxic air pollutants.”).

²⁵¹ See generally *id.*; ARNOLD W. REITZE, JR., ENVTL. LAW INST., AIR POLLUTION CONTROL AND CLIMATE CHANGE MITIGATION LAW 16–17 (2d ed. 2010).

²⁵² See Casazza Herman et al., *supra* note 249, at 1–2.

²⁵³ See *supra* Part I.

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E. Further Research

It is worth stressing again that the availability of extended flexibility under CAA GHG regulation is seriously underexplored. This Article has begun to address that gap, but it remains wide open. Substantial ambiguity remains over core questions, such as EPA's ability to use its categorization powers to achieve Type 2 flexibility, and, more deeply, over the meaning and implications of the "best system" language itself, upon which most arguments in favor of flexibility depend. In addition, legal scholars with expertise beyond environmental and administrative law have opportunities to make valuable contributions. For example, the constitutionality of state actions to include international offsets in their programs is unclear. International and constitutional law scholars will also be needed to better determine whether the CAA is compatible with international offsets.

Although it is likely that the courts and/or Congress will make the final decision on many of the issues discussed in this Article, ample room remains for further work to better understand the law as it stands. That work will be valuable, both to EPA and to the states as they plan their regulatory programs under section 111, and to industry as it attempts to predict what those programs will require.