

Revisiting the NAAQS Program for Regulating Greenhouse Gas Emissions under the Clean Air Act

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Review

This working paper was reviewed by multiple experts inside and outside the Nicholas Institute for Environmental Policy Solutions. However, this working paper has not undergone a formal review process as it is intended to present preliminary analysis, stimulate discussion, and inform debate on emerging issues. It may eventually be published in another form and its content revised.

SUMMARY

The future is uncertain for the regulation of greenhouse gases from power plants, including the U.S. Environmental Protection Agency's (EPA) Clean Power Plan, which covers existing plants. The rule is under review in the D.C. Circuit Court of Appeals, and the Supreme Court has indicated its interest in hearing the case. Moreover, during his presidential campaign, president-elect Donald Trump promised to "scrap" the Clean Power Plan. If the rule is overturned or is severely weakened, whether through litigation or executive action, stakeholders are likely to litigate to seek to force the EPA to use other authorities under the Clean Air Act to regulate greenhouse gas emissions.

This working paper examines the opportunities and challenges associated with regulation of greenhouse gases under the National Ambient Air Quality Standards (NAAQS) program, drawing a comparison with the Clean Power Plan's approach under a different section of the Clean Air Act. The paper offers no opinion on the Clean Power Plan litigation, nor does it advocate for the Clean Power Plan or the NAAQS approach. Its focus is on understanding how the NAAQS program might incorporate greenhouse gases in the event that the EPA pursues that approach.

INTRODUCTION

The future is uncertain for the regulation of greenhouse gas emissions from power plants, including the U.S. Environmental Protection Agency's (EPA) Clean Power Plan, which covers existing plants. The rule is under review in the D.C. Circuit Court of Appeals, which may issue a decision in early 2017; the Supreme Court has indicated that it is closely following the case. Moreover, president-elect Donald Trump promised to “scrap” the Clean Power Plan during his presidential campaign.¹ If the rule does not survive or is severely weakened, whether through litigation or executive action, stakeholders are likely to litigate to seek to force the EPA to use other authorities under the Clean Air Act to regulate greenhouse gas emissions.

The Supreme Court has repeatedly held that the EPA has the authority to regulate greenhouse gas emissions under the Clean Air Act, specifically pointing to it as the authority for regulating these emissions from power plants. The EPA previously detailed its various options under the Clean Air Act in an advanced notice of proposed rulemaking (ANPR) under the George W. Bush Administration, discussing Section 111, Sections 108–110 (the National Ambient Air Quality Standards or NAAQS program), and Section 115. Stakeholder groups have petitioned the EPA to regulate greenhouse gases under the NAAQS program, and that petition still sits undecided within the EPA. Thus, if the Clean Power Plan is set aside or is severely weakened, these groups may litigate in an attempt to force the EPA to use the NAAQS program.

This working paper examines the opportunities and challenges associated with regulation of greenhouse gases under the NAAQS program and compares that approach with the Clean Power Plan's approach. The paper offers no opinion on the future of the Clean Power Plan, nor does it advocate for the Clean Power Plan or the NAAQS approach. Instead, given the EPA's authority to regulate greenhouse gas emissions under the Clean Air Act and an outstanding petition to regulate these emissions under the NAAQS program, the paper focuses on understanding how the EPA might do so. It begins with an overview of the EPA's efforts to regulate greenhouse gas emissions and then describes the NAAQS program and the opportunities and challenges it presents for regulating greenhouse gases.

BACKGROUND

This section summarizes the EPA's use of the Clean Air Act as a tool to regulate greenhouse gas emissions. It discusses the EPA's authority to regulate these emissions under the Clean Air Act, turns briefly to the EPA's Clean Power Plan to outline the policy mechanisms that the EPA incorporates, then outlines the legal challenges facing the rule and discusses their implications.

The EPA's Authority to Regulate Greenhouse Gases under the Clean Air Act

The Supreme Court has explained repeatedly that the Clean Air Act gives the EPA authority to regulate greenhouse gases. In *Massachusetts v. EPA*, the Supreme Court determined that greenhouse gases fit well within the Clean Air Act's “capacious definition of ‘air pollutant.’”² In *American Electric Power Company v. Connecticut (AEP)*, the Supreme Court reaffirmed this holding and found further that the Clean Air Act, and not a common law nuisance claim, “provides a means to seek limits on emissions of

¹ Robert Walton, *Trump Vows to Scrap the Clean Power Plan*, UTILITY DIVE, Sept. 23, 2016, <http://www.utilitydive.com/news/trump-vows-to-scrap-clean-power-plan/426905>.

² *Massachusetts v. EPA*, 549 U.S. 497, 532–33 (2007).

carbon dioxide from domestic power plants.”³ Given these holdings, it appears unlikely that the Supreme Court would now conclude that the Clean Air Act provides no authority for EPA to regulate these emissions from power plants.

Following Supreme Court decisions, the EPA under George W. Bush acknowledged the agency’s ability to regulate greenhouse gas emissions under the Clean Air Act. The ANPR, which the EPA published in response to *Massachusetts v. EPA*, examined the different options for regulating greenhouse gases under the Clean Air Act, including Section 111, Sections 108–110 (the NAAQS program), and Section 115. In this notice, the agency stated that it “believes that market-oriented regulatory approaches merit consideration under section 111 or other [Clean Air Act] authorities for regulating stationary source emissions, along with other forms of regulation.”⁴

Regulating Greenhouse Gas Emissions under Section 111: The Clean Power Plan

As part of President Barack Obama’s plan to address climate change, the EPA relied on its authority—as detailed in *Massachusetts v. EPA*, *AEP*, and the ANPR—to issue the Clean Power Plan.⁵ The rule, promulgated under Section 111(d) of the Clean Air Act, establishes the first federal greenhouse gas emissions limits for the existing fleet of fossil fuel-fired power plants.⁶ The EPA established the rule’s stringency on the basis of its determination of the “best system of emission reduction” (BSER), which consists of three building blocks: (1) improving efficiency (i.e., heat rate improvements) at coal-fired power plants, (2) shifting generation from coal-fired power plants to natural gas combined cycle units, and (3) shifting generation to renewables.⁷

Key provisions of the Clean Power Plan include states’ options for implementing the rule, the cooperative federalism approach, and the planning and implementation timeline.

State Implementation Options

States have many options in deciding how to meet the Clean Power Plan’s emissions standards, and two “trading-ready” options stand out as the most likely approaches.⁸ Under the rate-based trading-ready option, covered power plants must meet nationwide uniform performance rates (i.e., rate-based standards) by emitting no more than the applicable emissions rate or by using tradable emission rate credits to adjust their rates. Under the mass-based trading-ready option, each state is given an EPA-prescribed state goal in tons of carbon dioxide (i.e., a mass-based standard).⁹ The state must then decide how to allocate the rights

³ *American Electric Power Company v. Connecticut (AEP)*, 131 S. Ct. 2527, 2537 (2011) (“Once EPA lists a category, the agency must establish standards of performance for emission of pollutants from new or modified sources within that category. And, most relevant here, [Section 111(d)] then requires regulation of existing sources within the same category.” (citations omitted)). *Cf. id.* at 2538 (“There is an exception: EPA may not employ [Section 111(d)] if existing stationary sources of the pollutant in question are regulated under the national ambient air quality standard program, [Sections 108-110], or the ‘hazardous air pollutants’ program, [Section 112].”).

⁴ 73 Fed. Reg. 44,354, 44,514 (July 30, 2008).

⁵ 80 Fed. Reg. 64,661 (Oct. 23, 2015), available at <https://www.federalregister.gov/articles/2014/06/18/2014-13726/carbon-pollution-emission-guidelines-for-existing-stationary-sources-electric-utility-generating>.

⁶ *Id.* at 64,661.

⁷ *Id.* at 64,717, 64,723–58, 64,787–811.

⁸ EPA proposed two model rules to assist states in implementing either rate- or mass-based trading-ready approaches.

⁹ *Id.* at 64,811–19. States may apply the emissions standards directly to affected power plants (an “emissions standards” type plan) or take a “state measures” approach, which includes a mix of measures that may apply to regulated power plants and other entities, with a backstop of federally enforceable standards on the regulated plants. *Id.* at 64,835–38. States may also apply the standards as a state-level standard measured by pounds per megawatt hour (i.e., a blended rate standard), though this option has received little or no attention by states and stakeholders because it does not allow trading with other states.

to emit tons of carbon dioxide equal to the goal (called “allowances”).¹⁰ To demonstrate compliance, covered plants must have sufficient allowances to match their emissions. If multiple states use the same trading-ready pathway (rate- or mass-based) and a common or linked tracking system, power plant operators within those states could buy or sell allowances or emission rate credits across state borders.¹¹ To facilitate this interstate emissions trading, the EPA proposed both mass- and rate-based trading-ready model rules, which it sent to the White House for review in November 2016.¹²

The rule gives states the option of using non-trading-ready pathways as well. A state may use what the EPA calls a “state measures approach” to achieve its state goal. Under this approach, a state may rely in the first instance on one or more state policies to demonstrate reductions at covered power plants. If those state policies are effective in limiting emissions to a level that does not exceed the state’s goal, no federally enforceable emissions standards on the covered plants would apply. If, however, the state measures fail to reduce emissions, the state would need to have in place a federally enforceable backstop mechanism to make the required reductions. Thus, states have limited flexibility under the Clean Power Plan to rely on state measures alone and must have federally enforceable emissions standards that apply to the covered plants if the state measures prove insufficient.

State and Federal Roles in Implementation

The Clean Power Plan applies the cooperative federalism structure commonly found in environmental regulations. Under Section 111(d), the EPA sets the stringency of the rule, develops implementation guidance for the states, approves or denies state plans, and may create and issue federal plans.¹³ States have the primary responsibility for implementing the rule and creating a state plan using a process “similar to,” but not quite as expansive as, the NAAQS process for developing state implementation plans (SIP).¹⁴

Implementation Timeline

The Clean Power Plan also exhibits relatively flexible planning and implementation schedules.¹⁵

States initially had 13 months, until September 6, 2016, to submit a final plan or make an initial submittal, in which they could request a two-year extension of the deadline to submit a final plan.¹⁶ States with extensions needed to submit an update after a year and a final plan after two years.¹⁷

As finalized, the Clean Power Plan’s emissions limits phase in over a long and somewhat flexible “glide path.” Before the stay, interim limits would have taken effect in 2022, four years after state plans would have been due.¹⁸ The interim limits gradually step down over three interim compliance periods before

¹⁰ *Id.* at 64,754–55.

¹¹ *Id.* at 64,708, 64,835–37.

¹² 80 Fed. Reg. 64,966 (Oct. 23, 2015) (to be codified at 40 C.F.R. pts. 60, 62, 78).

¹³ 40 C.F.R. § 60.22 (2015). One of the legal questions in the litigation over the Clean Power Plan is whether the EPA overstepped the bounds of its authority when developing the rule’s stringency.

¹⁴ 42 U.S.C. § 7411(d)(1). As discussed more fully below, the NAAQS SIP process under Section 110 of the Clean Air Act may provide states with more flexibility across the economy to seek reductions in multiple sectors in the SIP compared with Section 111, which aims at specific categories of sources.

¹⁵ The Supreme Court stayed these timelines during litigation.

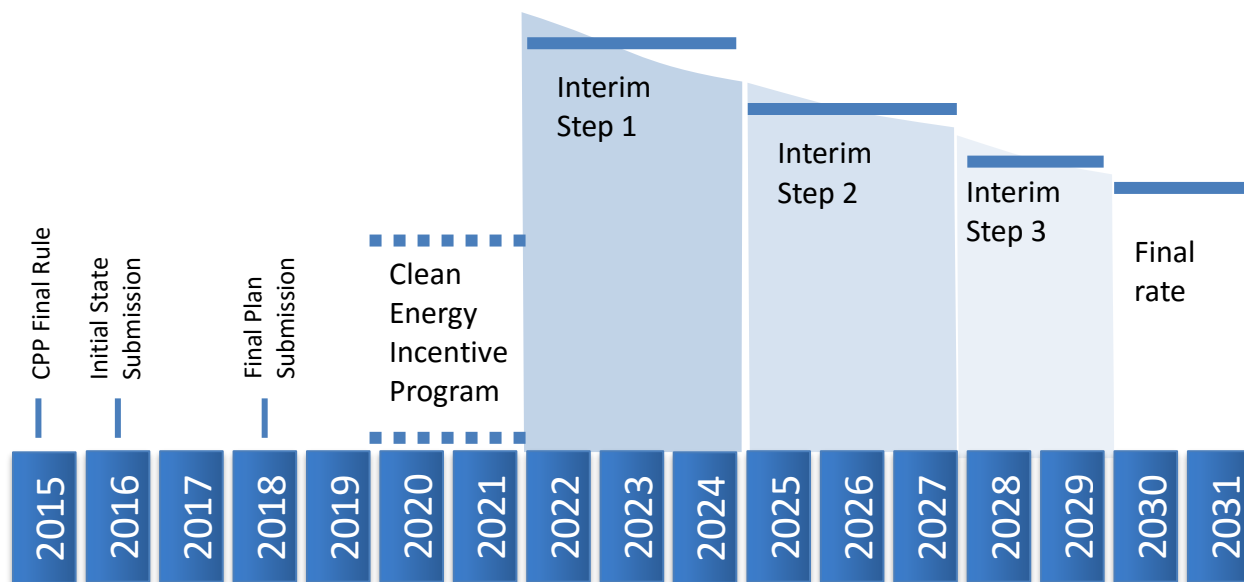
¹⁶ 80 Fed. Reg. at 64,946.

¹⁷ *Id.* at 64,946–47.

¹⁸ *Id.* at 64,743.

2030, when states are to achieve final limits.¹⁹ States may propose their own three-step glide path so long as the state interim compliance limits achieve the same emissions reduction, on average, over the seven-year interim compliance period.²⁰

Figure 1. Glide path over which emissions limits phase in under the Clean Power Plan



The EPA may choose to update the Clean Power Plan at any point after its completion. However, the Clean Air Act likely requires the agency to update the rule at least every eight years. Section 111(b), which authorizes regulation of new sources in the same source category, requires regular review of new source programs at least every eight years, and this requirement could extend to Section 111(d).²¹

Legal Challenges to the Clean Power Plan

Soon after the EPA published the Clean Power Plan, 27 states, along with several utilities, electric cooperatives, industry groups, and others, challenged the rule’s legality in the U.S. Court of Appeals for the District of Columbia Circuit.²² An additional 18 states, accompanied by several municipalities, utilities, and environmental, health, and industry groups, intervened to help the EPA defend the rule.²³ The challengers also asked the Court of Appeals to stay the rule’s implementation until after the litigation

¹⁹ *Id.*

²⁰ *Id.*

²¹ 42 U.S.C. § 7411(b)(1)(B). Stakeholders could sue to seek to force the EPA to review a Section 111(d) rule after eight years, arguing that the requirement for Section 111(b) rules also applies to 111(d) rules. However, the EPA has previously interpreted the Clean Air Act as not requiring review of existing source standards under Section 111(d). *See, e.g.*, 81 Fed. Reg. 59,276, 59,277–78 (Aug. 29, 2016) (codified 40 C.F.R. pt. 60) (“The EPA interprets CAA section 111(d) as providing discretionary authority to update emission guidelines, and by extension to require states to update standards of performance, in appropriate circumstances. The EPA believes this is the best, and perhaps only, permissible interpretation of the CAA.”)

²² *See* E&E News, *Your Guide to the Clean Power Plan in the Courts*, http://www.eenews.net/eep/documents/Clean_Power_Plan_Courts.pdf (last visited May 8, 2016) (outlining the parties for the litigation on the Clean Power Plan).

²³ *See id.*

concludes, but the court denied this request.²⁴ Following the D.C. Circuit’s refusal to grant a stay, the challengers asked the Supreme Court, which granted the stay request, thus putting on hold implementation of the Clean Power Plan until either a D.C. Court of Appeals decision (if the Supreme Court does not review the case) or a Supreme Court decision (if it does).²⁵

Initially, the D.C. Circuit scheduled a three-judge panel to hear the case in early June 2016. But in May 2016, the court decided to hear the case en banc, meaning that all participating active judges, rather than just the panel, heard the case in late September 2016.²⁶ After the D.C. Circuit issues an opinion, any of the parties may choose to request review of any part of the decision at the Supreme Court, which may choose to hear all or part of the case.

The Clean Power Plan litigation may survive in whole, in part (with either significant or minor changes), or not at all.²⁷ Two main arguments may illustrate how the Clean Power Plan could change after litigation.²⁸

First, the challengers argue that the EPA may not use Section 111(d) to include “outside the fence line”²⁹ measures in its BSER.³⁰ If this argument succeeds, the EPA could still regulate existing power plants under Section 111(d), but it would need to calculate achievable greenhouse gas emissions reductions using “inside the fence line” methods (e.g., heat rate improvements or co-firing).

Second, the challengers allege that the EPA may not regulate greenhouse gas emissions from existing power plants under Section 111(d) because the agency already regulates hazardous air pollutant emissions from the same sources under Section 112.³¹ If this argument succeeds, the EPA would not be able to

²⁴ See, e.g., State Pet. Mot. Stay & Expedited Consideration Pet. Review, *West Virginia v. EPA*, No. 15-1363 (D.C. Cir. Oct. 23, 2015).

²⁵ See, e.g., App. 29 States & State Agencies Immed. Stay Final Agency Action During Pendency Pet. Review, *West Virginia v. EPA*, No. 15-1363 (S. Ct. Jan. 26, 2016); *West Virginia v. EPA*, 577 U.S. ____ (S. Ct. Feb. 9, 2016) (order granting motion for stay).

²⁶ Chief Judge Merrick Garland did not participate in the decision to hear the case en banc—nor did he join oral arguments.

²⁷ In addition to the uncertainties around the outcome of the various legal arguments in the case, other factors complicate the survival of the Clean Power Plan. First, the election of Donald Trump in the 2016 presidential election will play a key role in how the EPA handles the case and the Clean Power Plan beginning in January 2017. Second, the death of Supreme Court Justice Antonin Scalia and the vacancy it leaves on the Supreme Court may have a significant impact on the outcome of the legal challenges. Third, a challenge to the emissions standards for new and modified sources under Section 111(b) could affect the Clean Power Plan’s future, because rules promulgated under Section 111(d) depend on a valid regulation of the same category under Section 111(b).

²⁸ Opening Brief for Pet. Core Legal Issues 29–56, 61–68, *West Virginia v. EPA*, No. 15-1363 (Feb. 19, 2016); Resp. EPA Initial Brief 25–73, 76–96, *West Virginia v. EPA*, No. 15-1363 (Mar. 28, 2016).

²⁹ An “inside the fence line” regulation would include an action that an owner or operator could take at the power plant itself (e.g., technology such as a scrubber installed on the smokestack).

³⁰ 42 U.S.C. § 7411(a)(1) (“[T]he 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 [EPA] determines has been adequately demonstrated.”).

³¹ The EPA regulates mercury emissions from existing fossil fuel-fired power plants under Section 112. 78 Fed. Reg. 24,073 (Apr. 24, 2013) (codified at 40 C.F.R. pts. 60, 63). This argument stems from the existence of two different versions of Section 111(d) in the U.S. Statutes at Large, one which clearly allows the EPA to regulate source categories under both Sections 111(d) and 112 but prohibits the EPA from regulating the same pollutant under both sections, and another that a court could read as prohibiting the EPA from regulating source categories under Section 111(d) if also regulated under Section 112. Compare Clean Air Act Amendments of 1990 § 108, 104 Stat. 2467 (1990), with Clean Air Act Amendments of 1990 § 302, 104 Stat. 2574 (1990).

regulate existing power plants under Section 111(d) as long as it also regulates those same sources under Section 112.

Effect of the Presidential Election

In addition to the Clean Power Plan litigation, the result of the 2016 presidential election presents questions about the future of the rule. For example, if the D.C. Circuit upholds the rule in whole, the Trump administration could choose to create a new rule that repeals or significantly alters the Clean Power Plan, it could weakly administer and enforce the rule, or it could leave the rule in place despite campaign pledges to the contrary.³²

Precedent of Litigation Forcing the EPA to Regulate under the Clean Air Act

Assuming that neither the Supreme Court nor Congress amends the Clean Air Act, even if executive action or litigation severely weakens or invalidates the Clean Power Plan, the EPA would still have authority to regulate greenhouse gas emissions from the power sector.³³ Given legal precedent outlining this authority and the existing endangerment finding, stakeholders may litigate to force the EPA to regulate these emissions under other Clean Air Act authorities, such as the NAAQS program. Existing precedent points to the mandatory nature of the EPA's regulation under the NAAQS program.³⁴

The Second Circuit Court of Appeals ruled that the EPA is required to regulate lead under the NAAQS program because lead satisfied two of the three tests in the NAAQS program's triggering language: it endangers public health and welfare, which the EPA found in an endangerment finding, and it is emitted from numerous and diverse sources.³⁵ However, the EPA has argued that regardless of this precedent, it is not required to regulate greenhouse gas emissions under the NAAQS program. Further, although the lead case is instructive, it does not constrain any other circuit court or the Supreme Court from finding that the EPA does have discretion to decide whether to regulate under the NAAQS program.

The ANPR also reviewed how the EPA might regulate greenhouse gases under the "international air pollution" program of the Clean Air Act, under Section 115 (see Box 1).

³² Some of these actions would result in legal challenges from supporters of the Clean Power Plan.

³³ See *Massachusetts v. EPA*, 549 U.S. at 532–33; *AEP*, 131 S. Ct. at 2537.

³⁴ *NRDC v. Train*, 545 F.2d 320, 328 (2d Cir. 1976).

³⁵ *Id.*

Box 1. Section 115 International Air Pollution

The section includes triggering language, which requires the EPA to give notification to a state governor when either (1) the EPA has reason to believe based on information from “any duly constitute international agency” that any pollutant emitted in the United States causes or contributes to air pollution that “may reasonably be anticipated to endanger public health or welfare in a foreign country” or (2) the Secretary of State requests that the EPA do so for pollution that the Secretary of State “alleges is of such a nature.”^a

Section 115 only applies when the foreign country receiving U.S. emissions has provided the United States with “essentially the same rights with respect to the prevention of control of air pollution occurring in that country as is given that country by this section.” Under the Clean Air Act, the notice given to a state governor requires a NAAQS plan revision “with respect to so much of the applicable implementation plan as is inadequate to prevent or eliminate the endangerment.” However, precedent has shown that endangerment findings under this section may not force the agency to regulate.^b

^a 42 U.S.C. § 7415.

^b *Her Majesty the Queen in Right of Ontario v. EPA*, 912 F.2d 1525 (D.C. Cir. 1990); *Thomas v. New York*, 802 F.2d 1443, 1446–93 (D.C. Cir. 1986).

One path to regulating greenhouse gases is outlined in “Legal Pathways to Reducing Greenhouse Gas Emissions under Section 115 of the Clean Air Act” (the 115 paper) (see Box 2). These legal scholars argue that Section 115 provides the EPA with a tool to establish an economy-wide, cross-sectoral greenhouse gas emissions trading program for stationary sources, while covering mobile source emissions by regulating upstream petroleum facilities.

Box 2. Legal Pathways to Reducing Greenhouse Gas Emissions under Section 115 of the Clean Air Act

Under this path, the EPA could set an aggregate national limit on the basis of the U.S. contribution to a global effort to reduce greenhouse gas emissions, as described in the United States submissions to the Paris Agreement.^a Then, the EPA could allocate this limit among the states through four possible methods: (1) requiring each state to meet an equal percentage reduction, (2) requiring each state to reduce emissions to a point at which marginal cost reductions are equal across states, (3) implementing some combination of the first two methods, or (4) taking an approach similar to that taken in the Clean Power Plan.

The 115 paper explains that after setting the limit, the EPA would issue a “SIP call”—whereby the agency calls for a state or multiple states to amend their “substantially inadequate” SIPs. The paper suggests that, similar to when it created the Clean Power, the EPA may issue model rules to assist state planning and that it may create and enforce federal implementation plans. The 115 paper also points out that these updated SIPs could integrate Section 111 regulations, like the Clean Power Plan, through the SIP revision process. SIPs could (1) quantify reductions by existing standards and programs and apply that number to reduce the baseline emissions forecast of a pollutant, (2) incorporate by reference the existing standards and programs and claim credit for their reductions, or (3) directly incorporate a state plan for the Clean Power Plan into a Section 115 plan.^b

^aMICHAEL BURGER ET AL., LEGAL PATHWAYS TO REDUCING GREENHOUSE GAS EMISSIONS UNDER SECTION 115 OF THE CLEAN AIR ACT (2016). UN Framework Convention on Climate Change, Intended Nationally Determined Contribution (2015),

<http://www4.unfccc.int/Submissions/INDC/Published%20Documents/United%20States%20of%20America/1/U.S.%20Cover%20Note%20INDC%20and%20Accompanying%20Information.pdf>. Cf.

NATHAN RICHARDSON, RFF, THE ELEPHANT IN THE ROOM OR THE ELEPHANT IN THE MOUSEHOLE? THE LEGAL RISKS (AND PROMISE) OF CLIMATE POLICY UNDER § 115 OF THE CLEAN AIR ACT (2016).

^b Given the ability of Section 115 plans to integrate with Section 111 regulations, and the close relationship between NAAQS SIPs and Section 115 implementation, it appears that Section 115 could also integrate a NAAQS program for greenhouse gas emissions.

REGULATING GREENHOUSE GAS EMISSIONS UNDER THE NAAQS PROGRAM

In the event that executive action or litigation invalidates or severely weakens the Clean Power Plan, stakeholders may sue the EPA in an attempt to force it to use its authority under the NAAQS program.³⁶ This section explains the triggering language for listing criteria pollutants and the basic features of the NAAQS program. It concludes with a discussion of the opportunities and challenges of regulating greenhouse gases under the program, including a comparison of this approach with the Clean Power Plan's approach.

Listing Greenhouses Gases as Criteria Pollutants under the NAAQS Program

As a threshold matter, the EPA would need to list greenhouse gases as a criteria pollutant. Given the ANPR and the EPA's prior endangerment findings, these emissions already meet the first two requirements for a pollutant listing. And precedent suggests that because these two criteria are met, the EPA may have to regulate emissions under the NAAQS program.³⁷

As in other sections of the Clean Air Act, certain findings trigger the EPA's responsibility to regulate a pollutant under the NAAQS program (i.e., triggering the responsibility to list the pollutant as a criteria pollutant). This triggering language contains three tests:

The EPA must publish a list including each air pollutant—

- (1) “emissions of which, in [the EPA's] judgment, cause or contribute to air pollution which may reasonably be anticipated to endanger public health and welfare”;
- (2) “the presence of which in the ambient air results from numerous or diverse mobile or stationary sources”; and
- (3) “for which [the Administrator] plans to issue air quality criteria under this section.”³⁸

The first test mimics the triggering language for other sections of the Clean Air Act, particularly sections 202 and 111 (see Table 1). The EPA already issued—and the Supreme Court upheld³⁹—an endangerment finding under Section 202 that declared, “[G]reenhouse gases in the atmosphere may reasonably be anticipated both to endanger public health and to endanger public welfare.”⁴⁰ When regulating greenhouse

³⁶ In addition to the Advanced Notice of Proposed Rulemaking, a number of legal scholars have highlighted the NAAQS program as a method for regulating greenhouse gas emissions. See, e.g., INIMAI M. CHETTIAR & JASON A. SCHWARTZ, NYU INST. POLICY INTEGRITY, *THE ROAD AHEAD: EPA'S OPTIONS AND OBLIGATIONS FOR REGULATING GREENHOUSE GASES* (2009); Holly Doremus & W. Michael Hanemann, *Of Babies and Bathwater: Why the Clean Air Act's Cooperative Federalism Framework Is Useful for Addressing Global Warming*, 50 ARIZ. L. REV. 799 (2008); Ari R. Lieberman, *Turning Lemons into Lemonade: Utilizing the NAAQS Provisions of the Clean Air Act to Comprehensively Address Climate Change*, 21 BUFF. ENVTL. L.J. 1 (2013); Patricia Ross McCubbin, *EPA's Endangerment Finding for Greenhouse Gases and the Potential Duty to Adopt National Ambient Quality Standards to Address Global Climate Change*, 33 S. ILL. U. L.J. 437 (2009); Timothy J. Mullins & M. Rhead Enion, *(If) Things Fall Apart: Searching for Optimal Regulatory Solutions to Combating Climate Change under Title I of the Existing CAA If Congressional Action Fails*, 40 ELR 10864 (2010); Rich Raiders, *How EPA Could Implement a Greenhouse Gas NAAQS*, 22 FORDHAM ENVTL. L. REV. 233 (2011); Nathan Richardson, *Greenhouse Gas Regulation under the Clean Air Act: Does Chevron Set the EPA Free?*, 29 STAN. ENVTL. L.J. 283 (2010); Nathan Richardson et al., *Greenhouse Gas Regulation under the Clean Air Act: Structure, Effects, and Implications of a Knowable Pathway*, 41 ELR 10098 (2011); Kassie Siegel et al., *Strong Law, Timid Implementation: How the EPA Can Apply the Full Force of the Clean Air Act to Address the Climate Crisis*, 30 UCLA J. ENVTL. L. & POL'Y 185 (2012).

³⁷ *NRDC v. Train*, 545 F.2d at 328; Jonathan B. Wiener, *Radiative Forcing: Climate Policy to Break the Logjam in Environmental Law*, 17 N.Y.U. ENVT. L.J. 210 (2008).

³⁸ 42 U.S.C. § 7408(a)(1).

³⁹ *Coalition for Responsible Regulation, Inc. v. EPA*, 684 F.3d 102, 113 (D.C. Cir. 2012), *aff'd in part, rev'd in part sub nom. Util. Air Regulatory Group v. EPA*, 134 S. Ct. 2427 (2014).

⁴⁰ 74 Fed. Reg. 66,496 (Dec. 15, 2009) (codified at 40 C.F.R. ch. 1).

gases under Section 111, the EPA reaffirmed and strengthened this endangerment finding.⁴¹ Because the EPA continues to find that greenhouse gases “endanger public health or welfare,” the first test has been met.

Table 1. Parallel endangerment findings within the Clean Air Act

Section 202	Section 111	Section 108
“which in [the Administrator’s] judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare.” ^a	“if in [the Administrator’s] judgment it causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare.” ^b	“which, in [the Administrator’s] judgment, cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare . . .” ^c

^a 42 U.S.C. § 7521(a)(1) (2015).

^b *Id.* § 7411(b).

^c *Id.* § 7408(a)(1).

However, unlike the findings for Sections 202 and 111, here, Congress included two additional requirements for listing a pollutant under the NAAQS program. The first is that the air pollutant is emitted by “numerous or diverse mobile or stationary sources.” Because every combustion source in every segment of the economy releases some level of carbon dioxide, it would not be difficult for the EPA to satisfy this test.⁴² The second additional requirement is that the EPA “plan[] to issue air quality criteria.” If the EPA decided that it “plans to issue air quality criteria” for greenhouse gases, it would satisfy the third test and trigger its responsibility to list greenhouse gases as a criteria pollutant under the NAAQS program.

In *NRDC v. Train*, the Second Circuit Court of Appeals held that once the first two tests of this endangerment finding are satisfied, the EPA must regulate the pollutant under the NAAQS program.⁴³ Legal experts have made similar arguments in the context of greenhouse gas emissions.⁴⁴ However, the EPA has argued that *Train* does not apply in the context of greenhouse gas emissions. Moreover, because the Second Circuit, and not the D.C. Circuit or the Supreme Court, decided *Train*, the Supreme Court and any other Circuit can make a different finding. In other words, *Train* is not controlling.

⁴¹ 80 Fed. Reg. at 64,517–27. The Clean Air Act only requires the EPA to issue an endangerment finding under Section 111 when the agency lists a new source category. 42 U.S.C. § 7501(b). Because the EPA did not list a new source category when it promulgated the updated NSPS and Clean Power Plan, it did not create a new endangerment finding. However, in the preamble, the EPA added new evidence supporting the existing endangerment finding under Section 202.

⁴² See 73 Fed. Reg. at 44,380; EPA, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990–2013 (2015), available at <http://www3.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2015-Main-Text.pdf>.

⁴³ *NRDC v. Train*, 545 F.2d at 328.

⁴⁴ Based on this precedent, some papers have argued that the EPA must regulate greenhouse gas emissions under the NAAQS program. See, e.g., Petition from the Center for Biological Diversity and 350.org, to the EPA, Petition to Establish National Pollution Limits for Greenhouse Gases Pursuant to the Clean Air Act (Dec. 2, 2009), available at http://www.biologicaldiversity.org/programs/climate_law_institute/global_warming_litigation/clean_air_act/pdfs/Petition_GH_G_pollution_cap_12-2-2009.pdf; Nathan Richardson, *Greenhouse Gas Regulation under the Clean Air Act: Does Chevron Set the EPA Free?*, *supra* note 36; Kassie Siegel et al., *supra* note 36; Rich Raiders, *supra* note 36. Cf. INIMAI M. CHETTIAR & JASON A. SCHWARTZ, *supra* note 36; Patricia Ross McCubbin, *supra* note 36.

Because stakeholders have petitioned the EPA to use the NAAQS program to regulate greenhouse gas emissions, they may litigate, seeking the outcome of the *Train* decision and potentially forcing the EPA to regulate greenhouse gas emissions under the NAAQS program.⁴⁵

Overview of the NAAQS Program

At a basic level, the NAAQS program begins with the EPA using science, and not cost, to set the target concentration of air pollution that is safe for public health and welfare. States or areas within a state that have air pollution concentrations below the standard are in “attainment”; those with concentrations at or above the standard are in “nonattainment.” States then create SIPs to prevent significant deterioration of air quality and maintain attainment levels or to achieve attainment levels. If a state fails to submit a SIP or submits an insufficient SIP, the EPA can construct and impose a federal implementation plan (FIP). Major emissions sources must also obtain different permits and meet different pollution control standards depending on whether these sources are in an attainment or nonattainment area. To ensure compliance with the states’ plans, the EPA also has the authority to issue sanctions, and the Clean Air Act provides for citizen enforcement suits.

Setting the NAAQS Standards

After the EPA lists an air pollutant as a criteria pollutant, it must begin developing primary and secondary NAAQS standards, which dictate safe concentrations of the pollutant.⁴⁶ A Clean Air Scientific Advisory Committee (“CASAC”) recommends to the EPA a range of potential safe concentrations.⁴⁷ Then, the agency uses its discretion to determine a primary standard that protects public health with an adequate margin of safety.⁴⁸ And the agency may issue a secondary standard that protects “public welfare from any known or anticipated adverse effects associated with the presence of . . . [the] pollutant,” including effects on soil, water, vegetation, crops, wildlife, weather, and visibility.⁴⁹ On the basis of these standards, each state designates and the EPA confirms which regions are in attainment and which are in nonattainment.⁵⁰ The statute calls for the EPA to review the standard at least every five years.⁵¹

⁴⁵ Petition from the Center for Biological Diversity and 350.org, *supra* note 44.

⁴⁶ 42 U.S.C. § 7409(a)(1)(B)–(a)(2) (ordering the EPA Administrator to publish NAAQS “after a reasonable amount of time for interested parties to submit written comments thereon (but no later than 90 days after the initial publication of such proposed standards)”).

⁴⁷ *Id.* § 7409(b)(1); see Rich Raiders, *supra* note 36, at 259–81.

⁴⁸ This “margin of safety” provides the EPA with discretion when setting the standards. *American Petroleum Inst. v. Costle*, 665 F.2d 1176, 1186 (D.C. Cir. 2981) (“[I]n setting margins of safety the Administrator need not regulate only the known dangers to health, but may ‘err’ on the side of overprotection by setting a fully adequate margin of safety.”).

⁴⁹ 42 U.S.C. §§ 7409(b)(1)–(2), 7602(h). With some exceptions, the EPA traditionally identifies a primary and secondary standard at the same level. See, e.g., EPA, *NAAQS Table*, last updated Mar. 29, 2016, <https://www.epa.gov/criteria-air-pollutants/naaqs-table>. This working paper assumes that the EPA would set both primary and secondary NAAQS standards at the same concentration. However, some commentators have suggested that the EPA could set the secondary standard lower than the primary standard, meaning that states could be in attainment with the primary standard but in nonattainment with the secondary standard. See Timothy J. Mullins & M. Rhead Enion, *supra* note 36, at 10872 n. 96 (outlining the debate about whether the EPA should use a primary or secondary standard, or both).

⁵⁰ Some areas are “unclassifiable,” meaning the area “cannot be classified on the basis of available information as meeting or not meeting” the NAAQS standards. 42 U.S.C. § 7407(d)(1)(A)(iii). Given the physical properties of greenhouse gases in the atmosphere, there should be classifiable areas if the EPA is forced to take the NAAQS path for greenhouse gases. Air quality control regions will likely be states because of the qualities of carbon dioxide and greenhouse gases.

⁵¹ *Id.* § 7409(d)(1).

State Implementation Plans

Each state must submit a SIP that demonstrates how the state will maintain or reach attainment levels. If states do not submit a SIP or submit an insufficient SIP, the EPA will create and implement a FIP. This section outlines key requirements for SIPs.

First, all SIPs must “include enforceable emissions limitations and other control measures, means, or techniques (including economic incentives such as fees, marketable permits, and auctions of emissions rights).”⁵² This requirement allows states to move beyond technology-based emissions reduction measures and develop SIPs that include trading programs as a means to incentivize reduced emissions (see Box 3).

Box 3. Intrastate Trading as a Compliance Mechanism

At least three states have used the language from Section 110, related to SIPs, to create intrastate markets for trading allowances, including the Mass Emissions Cap and Trade Program (MECT) in the Houston-Galveston-Brazoria ozone nonattainment area,^a the Regional Clean Air Incentives Market (RECLAIM) Program in the South Coast Air Quality Management District,^b and New York’s Acid Deposition Reduction Program.^c The MECT implements an annual declining nitrogen oxides (NOx) emissions cap for applicable facilities—major source facilities and some non-major sources with the potential to emit at least 10 tons of NOx per year. These facilities receive allowances representing one ton of NOx emissions based on historical emissions or permit allowances. Sources may trade these allowances, and the Texas Commission on Environmental Quality found that “approximately 20% of the allowances for each control period have been traded.”^d Overall, the program set a goal of 80% reduction in NOx from 1997–1999 baselines and “has functioned rather smoothly.”

^a California uses the Regional Clean Air Incentives Market (“RECLAIM”) to regulate NOx and sulfur dioxide (SO₂) emissions. S. Coast AQMD, *Regional Clean Air Incentives Market (RECLAIM)*, <http://www.aqmd.gov/home/programs/business/about-reclaim> (last visited Mar. 18, 2016). The EPA has reviewed and affirmed that RECLAIM “effectively achieves the goals of making the environment whole and deterring noncompliance.” EPA, AN EVALUATION OF THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT’S REGIONAL CLEAN AIR INCENTIVES MARKET ii note 2 (2002), <https://www3.epa.gov/region9/air/reclaim/reclaim-report.pdf>.

^b TX CEQ, *Mass Emissions Cap and Trade Program*, last modified Jan. 14, 2016, https://www.tceq.texas.gov/airquality/banking/mass_ect_prog.html; *BCCA Appeal Group v. EPA*, 355 F.3d 817 (5th Cir. 2003) (upholding EPA’s approval of Texas’ SIP that uses the Mass Emissions Cap and Trade Program as a method to meet mandated NOx reductions).

^c N.Y. ST. ENERGY RES. & DEV. AUTH., MARKET-BASED ENVIRONMENTAL PROTECTION MECHANISMS AND THE IMPACT ON ENERGY PRODUCTION AND USE (Oct. 2011).

^d TX COMM’N ENVTL. QUALITY, EMISSIONS BANKING AND TRADING PROGRAM: MECT PROGRAM AUDIT 16–17 (2006), available at <http://www.tceq.state.tx.us/assets/public/implementation/air/banking/reports/2006mectreport.pdf>; Sharon Tomkins et al., *Litigating Global Warming: Likely Legal Challenges to Emerging Greenhouse Gas Cap-and-Trade Programs in the United States*, 39 ELR 10389, n. 161 (2009).

This flexibility is not necessarily limited to trading programs within a state’s borders. Presumably, it would allow for states to engage in multistate trading programs, as is the case in some multistate trading under the NAAQS program.⁵³ (See Box 4).

⁵² *Id.* § 7410(a)(2)(A), (C). Henceforth, this working paper uses the terms SIP and FIP interchangeably.

⁵³ For an overview of the EPA’s incorporation of emissions trading under the NAAQS program, see Richard L. Revesz et al., *Familiar Territory: A Survey of Legal Precedents for the Clean Power Plan*, 46 ELR 10190, 10192 (2016).

Box 4. Interstate Trading as a Compliance Mechanism

Historically, the EPA has used the good neighbor provision as the basis for interstate trading, but the SIP provisions provide for “economic incentives such as fees, marketable permits, and auctions of emissions rights.”^a One example of a plan that uses cross-state trading as a compliance method is the evolving trading program in the Northeast United States that addresses cross-state NO_x and sulphur dioxide (SO₂) emissions. This evolution began with the NO_x Budget Program developed by the Ozone Transport Commission, a body created through the 1990 Clean Air Act Amendments. The NO_x SIP Call updated this program. Then, the EPA promulgated the Clean Air Interstate Rule (CAIR), which sought to “reduce or eliminate the impact of upwind sources on out-of-state downwind nonattainment of NAAQS for fine particulate matter . . . and eight-hour ozone.”^b After losing a legal challenge, the EPA replaced CAIR with the Cross-state Air Pollution Rule (CSAPR) to address downwind nonattainment of NAAQS standards for fine particulate matter and eight-hour ozone.^c CSAPR has faced its own legal challenges, but it remains in place.

CSAPR creates four sets of emissions allowances, one set for each of four trading programs for different NAAQS standards.^d For the SO₂ trading program, there are two state SO₂ trading groups: SO₂ Group 1—states that need to make larger reductions to eliminate their contribution to interstate emissions—and SO₂ Group 2—states that need to make smaller reductions. A source in an SO₂ Group 2 state may only use for compliance those allowances allocated to SO₂ Group 2 states, and a source in an SO₂ Group 1 state may only use for compliance those allowances allocated to SO₂ Group 1 states. For compliance with the two different NO_x trading programs, a source may use allowances allocated to any state.

^a 42 U.S.C. § 7410(a)(2)(A), (C).

^b *North Carolina v. EPA*, 531 F.3d 896, 903 (D.C. Cir. 2008) (reasoning that under the rule, a source within a state, by purchasing emissions credits, could still emit enough air pollutants to contribute significantly to nonattainment or to interfere with the maintenance of NAAQS standards).

^c *EME Homer City Generation v. EPA*, 795 F.3d 118 (D.C. Cir. 2015) (ruling that the EPA did not need “to allocate the responsibility for reducing emissions in ‘a manner proportional to’ each State’s ‘contribution[n]’ to the problem” but remanding because the rule may require a state to reduce emissions beyond the point at which every affected downwind State is in attainment, termed “over-control”); *id.* at 127 (finding that in some states, “downwind locations would achieve attainment even if less stringent emissions limits were imposed on the upwind States linked to those locations”).

^d 76 Fed. Reg. 48,208, 48,271–72 (Aug. 8, 2011) (codified at 40 C.F.R. pts. 51, 52, 72, 78, & 92).

The added flexibility of the NAAQS SIP approach provides some potential implementation options that do not exist under the Section 111(d) framework.

Second, all SIPs must comply with the “good neighbor provision,” which seeks to address cross-state pollution. SIPs must prohibit any source within the state from emitting any air pollutant in amounts that will (1) “contribute significantly to nonattainment” or “interfere with the maintenance” of any NAAQS standard, or (2) “interfere with measures . . . to prevent significant deterioration of air quality.”⁵⁴

⁵⁴ 42 U.S.C. § 7410(a)(2)(D). Opponents of a NAAQS program for greenhouse gas emissions may argue that the characteristics of greenhouse gases—long lives and universal mixing—mean that one state’s emissions would inevitably affect another state’s ability to maintain attainment levels. However, the EPA has experience with addressing interstate emissions transmission and has previously determined the appropriate contributions of each state’s emissions to attainment levels in other states. See *infra* Box 4 (discussing CAIR and CSAPR). In those situations, the EPA determined each state’s contribution to nonattainment in other states and adjusted the number of allowances needed to satisfy emissions limits. As discussed regarding Section 115, the EPA could also fairly assign budgets in the context of greenhouse gas emissions. See *supra* Box 2. The same determination may provide a rational defense to states from Section 126 lawsuits.

Nonattainment SIPs must comply with the above outlined requirements as well as three additional key constraints, described below.⁵⁵

First, a nonattainment SIP must designate a date by when the state must attain the NAAQS standards (i.e., the “attainment date”). Specifically, a state must meet a primary NAAQS “as expeditiously as practicable, but no later than five years” after designated in nonattainment, and it must meet a secondary NAAQS “as expeditiously as practicable.”⁵⁶ The EPA may extend this deadline twice for one year each time.⁵⁷ But in practice, some NAAQS have gone unattained for decades as states update regulatory measures to achieve deeper reductions.⁵⁸

Second, to meet this attainment date, nonattainment SIPs must require “reasonable further progress.”⁵⁹ In addition, they must provide for the implementation of all “reasonably available control measures” (RACM) as expeditiously as practicable.⁶⁰ The EPA interprets RACM to require states to consider all potentially available measures on a case-by-case basis to determine whether they are reasonably available in the area and whether they would advance the area’s attainment date.⁶¹ States may reject certain measures if “they would not advance the attainment date, would cause substantial widespread and long-term adverse impacts, or would be economically or technologically infeasible.”⁶² At a minimum, states must require “reasonably available control technology” (RACT), a subset of RACM.⁶³

Third, in a nonattainment SIP, a state may argue that “but for” international emissions, the SIP would attain and maintain the relevant NAAQS standards by the attainment date.⁶⁴ A state must prove that international emissions prevent it from reaching attainment, traditionally a heavy burden, although it may be lighter with greenhouse gases. In practice, the EPA’s interpretation of this provision does not give states a great deal of relief.⁶⁵ Even if a state succeeds in proving the effects of international emissions, the area remains a nonattainment area subject to certain applicable nonattainment area requirements, including reasonable further progress and RACM.⁶⁶

⁵⁵ Nonattainment SIPs must also comply with the requirements for attainment SIPs. 42 U.S.C. § 7502(c)(7).

⁵⁶ *Id.* § 7502(a)(2).

⁵⁷ *Id.* § 7502(a)(2)(C).

⁵⁸ See Symposium, *Greening the Grid: Building a Legal Framework for Carbon Neutrality: Symposium Essay: Greening the Grid and Climate Justice*, 39 ENVTL. L. 1143, 1146–47 (discussing the persistence of ozone nonattainment); Mack McGuffey & Gary R. Sheehan, Jr., *Taking Care of CAIR*, NAT. RESOURCES & ENV'T 67, 67 (2005) (discussing one of EPA’s regulatory programs aimed at controlling eastern ozone nonattainment); EPA, *Nonattainment and Maintenance Areas in the U.S.: 8-Hour Ozone (1997 Standard)* (2009), <https://www3.epa.gov/airquality/greenbook/map8hr.html>.

⁵⁹ 42 U.S.C. § 7502(c)(2). “Reasonable further progress” means “such annual incremental reductions in emissions of the relevant air pollutant as are required” to ensure attainment by the attainment date. *Id.* § 7501(1).

⁶⁰ *Id.* § 7502(c)(1).

⁶¹ 66 Fed. Reg. 586, 607 (Jan. 3, 2001) (codified at 42 C.F.R pt. 52).

⁶² *Id.* at 586, 608.

⁶³ The EPA defines RACT as “the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility.”

⁶⁴ 42 U.S.C. § 7509a(a); see, e.g., *Sierra Club v. EPA*, 346 F.3d 955 (9th Cir. 2003) (deciding that at least two instances of exceedances of NAAQS standards in California could not be attributed to emissions from Mexico).

⁶⁵ Under the context of a NAAQS program for greenhouse gases, states may push the EPA to provide more relief than traditionally given under this provision.

⁶⁶ 73 Fed. Reg. at 44,481.

Preconstruction Permits

Various preconstruction permitting requirements for new sources apply once the EPA issues NAAQS standards.⁶⁷ In the context of preconstruction permits for greenhouse gases, both the EPA and states face an implementation challenge that does not exist with the Section 111(d) approach.

For attainment areas, new or modified major emitting facilities need to obtain prevention of significant deterioration (PSD) permits (see Box 5).⁶⁸ PSD permits require

- Best available control technology (BACT), which is based on the “maximum degree of reduction” of the pollutant that the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts, determines is achievable through production processes and available methods, systems, and techniques.⁶⁹ This technology cannot exceed the relevant pollutant’s new source performance standards (NSPS).⁷⁰
- A demonstration that the additional emissions from the new or modified major emitting facility will not cause or contribute to air pollution greater than any NAAQS standard, any emissions standard, or the maximum allowable “increment.”⁷¹
- At least one year of air quality monitoring, an analysis of projected air quality impacts, and an agreement to monitor ongoing emissions.⁷²

⁶⁷ Existing sources must acquire Title V permits, but these permits impose no substantive requirements on sources.

⁶⁸ A major emitting facility is a stationary source that emits or has the potential to emit at least 100 tons per year or any source with the potential to emit at least 250 tons per year. 42 U.S.C. §§ 7475, 7479.

⁶⁹ *Id.* § 7479(3).

⁷⁰ *Id.* § 7501(3).

⁷¹ *Id.* § 7475(a).

⁷² *Id.*

Box 5. Permitting Thresholds

If the EPA revisits the NAAQS option, it may wish to address the statutory thresholds for “major emitting facilities” and “major sources.” The PSD program creates permit requirements for major emitting facilities—stationary sources that emit or that have the ability to emit at least 100 tons per year and any other source with the potential to emit at least 250 tons per year.^a The Clean Air Act requires nonattainment NSR permits for any major source, which is any stationary source that has the potential to emit at least 100 tons per year.^b

The EPA attempted to regulate greenhouse gas emissions from new major emitting facilities under the PSD program as triggered by the regulation of greenhouse gas emissions from new motor vehicles—as it determined in the “Triggering Rule.” However, because major sources of greenhouse gas emissions would include “retail stores, offices, apartment buildings, shopping centers, schools, and churches,” the agency adjusted the level of emissions required to define sources as “major”—as described in the “Tailoring Rule.”^c In the Tailoring Rule, the EPA created a new threshold (i.e., 100,000 tons per year) specifically for greenhouse gas emissions because of the number of sources capable of emitting 100 to 250 tons of greenhouse gases per year.

A number of states as well as industry groups challenged the Triggering Rule and the Tailoring Rule, and the Supreme Court ultimately decided the issue.^d In *Utility Air Regulatory Group v. EPA (UARG)*, the Supreme Court invalidated both rules but allowed the EPA to continue requiring permits for sources already subject to the PSD or Title V permitting programs for other pollutants (i.e., “anyway” sources). In the decision, the Supreme Court found the Tailoring Rule unreasonable because the unambiguous statutory terms “100 or 250 tons per year” did not leave the EPA with discretion to change the terms to “100,000 tons per year.”

^a 42 U.S.C. § 7475.

^b *Id.* § 7602(j).

^c 75 Fed. Reg. 17,004 (Apr. 2, 2010) (codified at 40 C.F.R. pts. 50–51, 70–71); *Util. Air Regulatory Group v. EPA (UARG)*, 134 S. Ct. 2427, 2447 (2014); 75 Fed. Reg. 31,514 (June 2, 2010) (codified at 40 C.F.R. pts 51–52, 70–71).

^d *UARG*, 134 S. Ct. 2427 (2014).

^e See EPA, *Air Permitting Streamlining Techniques and Approaches for Greenhouse Gases, 2012*, last updated Feb. 2, 2015, <https://www.epa.gov/caaac/air-permitting-streamlining-techniques-and-approaches-greenhouse-gases-2012>.

^f AIR PERMITTING STREAMLINING TECHNIQUES AND APPROACHES FOR GREENHOUSE GASES: A REPORT TO THE U.S. ENVIRONMENTAL PROTECTION AGENCY FROM THE CLEAN AIR ACT ADVISORY COMMITTEE PERMITS, NEW SOURCE REVIEWS AND TOXICS SUBCOMMITTEE GHG PERMIT STREAMLINING WORKGROUP (2012).

^g A workable NAAQS approach may also require the agency to undertake a regulatory reinterpretation of various NSR provisions.

For nonattainment areas, new or modified “major stationary sources” need to obtain nonattainment New Source Review (NSR) permits, which can be much more stringent than PSD program requirements.⁷³

⁷³ A “major stationary source” is a stationary source that directly emits or has the potential to emit at least 100 tons of any pollutant per year. *Id.* § 7602(j). The nonattainment section of the Clean Air Act does not define “major stationary sources.” However, the Clean Air Act’s general definition section defines a “major stationary source” as a source “which directly emits or has the potential to emit, one hundred tons or more of any pollutant” per year. Nonattainment SIPs must “expressly identify and quantify the emissions . . . which will be allowed . . . from the construction and operation of major new or modified stationary sources.” *Id.* § 7502(c)(4).

Nonattainment NSR permits require

- Lowest achievable emission rate (LAER), which can be either (1) the most stringent emissions limitation in a SIP, unless demonstrated to be unachievable or (2) the most stringent emissions limitation that sources achieve in practice.⁷⁴ However, this rate cannot exceed the relevant pollutant's NSPS.⁷⁵
- Sufficient offsets, called “emissions reduction credits,” so that the total allowable emissions from existing sources in the region “will be sufficiently less than total emissions from existing sources prior to the application for such permit to construct or modify so as to represent . . . reasonable further progress.”⁷⁶
- A demonstration that all of the owner's or operator's major stationary sources comply with all applicable emissions standards.⁷⁷
- An analysis of alternatives, including sites, sizes, production processes, and environmental control techniques, demonstrating that the benefits of the proposed source significantly outweigh the environmental and social costs imposed because of its location, construction, or modification.⁷⁸

Enforcement Sanctions

The NAAQS program includes sanctions to ensure that all states and sources comply with SIPs and the NAAQS standards. The EPA can institute sanctions if it disapproves a SIP for a nonattainment area for failure to meet required SIP elements or if it finds that a state fails to do any of the following:

- Submit a SIP or the SIP fails to meet completeness criteria
- Make any other submission or the submission fails to meet completeness criteria
- Implement a requirement from an approved SIP.⁷⁹

After the EPA makes one of the four findings, a state has 18 months to fix the deficiency. If a state fails to meet this deadline, the EPA may institute one of two sanctions: (1) loss of highway funds or (2) an increase in the required offsets for new or modified sources by a ratio of at least two to one, which is an impediment to the construction of new facilities in a state.⁸⁰ If the EPA finds a lack of good faith or if the state does not fix the deficiency within six months of the initial sanction, the agency may institute both sanctions.⁸¹ In addition to these two sanctions, the EPA may also withhold all or some of the grants that it may award to support air pollution planning and control programs.⁸²

IMPLICATIONS OF REGULATING GREENHOUSE GASES UNDER THE NAAQS PROGRAM

Executive action or litigation may severely weaken or invalidate the Clean Power Plan, and stakeholders may litigate to seek to force the EPA to regulate under the NAAQS program. In this situation, it would be necessary to analyze the different challenges and opportunities under the program. This section discusses

⁷⁴ *Id.* § 7501(3).

⁷⁵ *Id.*

⁷⁶ *Id.* § 7503(a).

⁷⁷ *Id.*

⁷⁸ *Id.*

⁷⁹ *Id.* § 7410(m).

⁸⁰ *Id.*

⁸¹ *Id.*

⁸² *Id.*

how the unique characteristics of greenhouse gases may affect the operation of a NAAQS program, outlines the consequences of setting the NAAQS standard, and compares the key aspects of the Clean Power Plan with those of the NAAQS program.⁸³

Unique Characteristics of Greenhouse Gases

Greenhouse gases present challenges and opportunities different than those of other criteria pollutants. Unlike other criteria pollutants, greenhouse gases survive in the atmosphere for up to 200 years.⁸⁴ And most greenhouse gases are “well mixed,” meaning their concentration is similar around the world, regardless of where the emissions arise.⁸⁵

The implication of these characteristics is that even if a state took aggressive measures to reduce (or even eliminate) greenhouse gas emissions within its borders, its actions may not immediately affect the concentration of these emissions because of residual emissions and emissions from other states or countries. Furthermore, even if every state in the United States completely eliminates its greenhouse gas emissions, the ambient concentration of greenhouse gases across the country may not drop significantly, because emissions from other countries could replace the emissions from the United States.⁸⁶ A comparative challenge already exists in terms of ozone concentrations in certain areas. For example, some states argue that they would be out of attainment even if they shut down all sources of NO_x and volatile organic compounds (VOCs)—precursors of ozone—because of emissions from the transportation sector.⁸⁷ However, even if the facts support these arguments, as they may in the context of greenhouse gas emissions, the NAAQS program for ozone has still progressed, leading to reductions in emissions of pollutants and public health benefits. Furthermore, in the context of greenhouse gas emissions, the international community has committed to reducing its emissions, which may allay some of this concern.⁸⁸

Another implication of the global and well-mixed nature of greenhouse gases points to the reasonableness of cross-state and cross-sector trading as a means for emissions reduction. Given the characteristics of these pollutants, reduction of one ton of emissions in one state roughly equates to reduction of one ton of emissions in another state. Thus, it makes sense to apply to each ton of emissions reduction an equivalent social benefit, regardless of whether it occurs in State A or State B.

Setting the NAAQS Standards

The agency’s decision to set the NAAQS standards at, below, or above current concentration levels of greenhouse gases has practical effects: On one hand, if the EPA decides to set the NAAQS standard

⁸³ In addition to those discussed in this working paper, other opportunities and challenges, such as transportation conformity, may exist when states consider how to implement the NAAQS program for greenhouse gases. This paper does not seek to outline all of these possible implications but rather seeks to reintroduce the potential paths and outline key questions.

⁸⁴ Holly Doremus & W. Michael Hanemann, *supra* note 36, at 820.

⁸⁵ P. Ciais et al., *Carbon and Other Biogeochemical Cycles in IPCC*, CLIMATE CHANGE 2013: PHYSICAL SCIENCE BASIS 465, 470 (T.F. Stocker et al. eds. 2013); EPA, ATMOSPHERIC CONCENTRATIONS OF GREENHOUSE GASES 2 (Apr. 2016), https://www3.epa.gov/climatechange/pdfs/print_ghg-concentrations-2016.pdf.

⁸⁶ Although the Clean Air Act allows a nonattainment state to argue that “but for” international emissions, the state would be in attainment, this provision is rarely used, does not affect the state’s nonattainment designation, and does not relieve the state from mandatory requirements applicable to all states. However, in the context of greenhouse gas emissions, states may push to use this provision more extensively.

⁸⁷ See generally Craig N. Oren, *Getting Commuters Out of Their Cars: What Went Wrong?*, 17 STA. ENVTL. L.J. 141 (1998) (outlining the effects of vehicles on attainment of different NAAQS standards, including ozone).

⁸⁸ See Paris Agreement, Dec. 12, 2015, Annex, UN Doc. FCCC/CP/2015/10/Add.1.

above the current concentration, the whole country would be in attainment as long as the global concentration remained below the attainment threshold.⁸⁹ On the other hand, if the agency decides to set the NAAQS standard at or below current concentrations, the whole country would be in nonattainment. In general, the EPA and states historically have been more aggressive at addressing air pollution in nonattainment areas, and the statute supports this approach.⁸⁹

Another implication arises from standard setting under the NAAQS approach versus Section 111. Under the NAAQS approach, the EPA may not consider costs when deciding where to set the standard; by contrast, the agency considers cost when determining a rule's stringency under Section 111. Moreover, the agency considers costs when devising the policies aimed at attaining or maintaining the NAAQS, such as defining BACT. Similarly, Section 111 requires the EPA to evaluate costs when developing the BSER.

Creating and Allocating Emissions Budgets to the States

It is likely that the EPA can assign emissions budgets to states under the NAAQS program, as it has done in SIPs created under the good neighbor provision.⁹⁰ Given this precedent, it seems likely that the EPA could allocate emissions among the states. The methodology for doing so is a topic for further research.

State Implementation Options

Using the NAAQS approach, states would have the same implementation options as those outlined in the Clean Power Plan and then some. In the Clean Power Plan, the EPA gave states broad flexibility with respect to implementation, including the choice of rate- or mass-based standards and a streamlined approach to trading across state lines through "trading-ready" plans. As it did for the Clean Power Plan, the EPA could create model rules to streamline state planning processes, and states would be able to decide between a rate- or mass-based approach, design their allowance allocation system, and propose compliance programs different from those proposed by the EPA.

Using a trading-ready option, regulated sources within one state could trade with sources in another, given that both states incorporate similar provisions regarding tracking systems and tradable instruments. This method of compliance would also be available in the NAAQS context. The plain language of the Clean Air Act encourages states to use "economic incentives such as fees, marketable permits, and auctions of emissions rights" in their SIPs, for both attainment and nonattainment areas.⁹¹ This language clearly anticipates, and encourages, the use of trading as a mechanism for compliance. Furthermore, a number of different Clean Air Act regulations already allow trading as a means of achieving emissions reductions (see Boxes 3–4).

Additionally, the NAAQS program could build on the trading options of the Clean Power Plan because it applies them economy wide and thus could include trading among many sectors rather than among a narrowly confined category of sources, like those of Section 111. Studies have shown that limiting a

⁸⁹ Because greenhouse gases are well mixed, their concentration is relatively universal across the country. P. Ciaia et al., *supra* note 85; EPA, *supra* note 85, at 2. Thus, if one state were in or out of attainment, the rest of the states would be as well. Further, each state is arguably running toward nonattainment because of the long lifespan of greenhouse gases and their universal mixing. Therefore, even if the EPA sets the standard above current concentrations, states will need to reduce emissions.

⁸⁹ Unless legally acceptable and very effective streamlining exist, this requirement would impose LAER and offsets requirements on very large numbers of small sources.

⁹⁰ See *supra* Box 4.

⁹¹ 42 U.S.C. § 7410(a)(2)(A), (C).

market-based policy to a single sector leads to higher policy costs because some sectors can reduce emissions at lower costs than others.⁹² States could explicitly apportion emissions responsibility across sectors—e.g., a state could plan for 75% of reductions from the electricity sector and 25% from the transportation sector—or they could allow the market to dictate which sectors can reduce emissions most efficiently. This benefit is particularly salient in climate policies because one ton of carbon dioxide emissions from one sector is roughly equivalent to one ton of carbon dioxide emissions from any other sector.

NAAQS would also allow the EPA to cover both new and existing sources in the trading program, encourage all states to use either mass- or rate-based standards, and allow other flexibilities, such as emissions offsets from non-covered sources or projects. These added flexibilities would allow states to address state-specific factors, such as abundant reductions available in a sector that does not lend itself to emissions trading but that does lend itself to voluntary offset creation (e.g., agriculture).

Furthermore, the NAAQS approach allows for a “portfolio” approach because it not only allows multi-sector trading, but it also could capture the benefits of renewable portfolio standards, energy efficiency resource standards, state tax credits, and other state programs. This approach allows a state to look at its entire policy inventory and plot multiple strategies to reduce emissions. Although this option provides an opportunity for some states, it may present a challenge for others if each state takes a different approach, thereby losing trading-ready pathways.

State and Federal Implementation Roles

Like Section 111, the NAAQS program embodies a cooperative federalism framework. Under Section 111, states have the power to set standards of performance, although the EPA can determine if the BSER is adequately demonstrated. In the Clean Power Plan litigation, the challengers argue that the EPA attempted to set the standard of performance, whereas the EPA argues that it was only setting the stringency of the rule.

Unlike Section 111, the cooperative federalism framework is more straightforward under the NAAQS program. In the NAAQS program, the federal government sets the standard and can provide model rules, and states may create SIPs to implement that standard. Furthermore, if states do not act or if a SIP is denied, the federal government can create and implement a FIP.

Planning and Implementation Timelines

Unlike Section 111(d), which likely requires a program review at least every eight years, the NAAQS program calls for review at least every five years.⁹³

Regarding the planning timeline, both programs give states an initial 3-year planning period, although under the NAAQS program the EPA may extend this period for 18 months. Importantly, however, this three-year planning period would not begin under a NAAQS program until after the EPA determined the NAAQS standards, a process that could take years. For example, in the case of lead, the only criteria

⁹² See, e.g., WILLIAM PIZER ET AL., RFF, MODELING ECONOMYWIDE VERSUS SECTORAL CLIMATE POLICIES USING COMBINED AGGREGATE-SECTORAL MODELS (2003) (“[A] market-based policy covering just electricity and household transportation (and excluding industry and commercial transportation) costs about twice as much for a given volume of emissions reductions as an economywide approach.”).

⁹³ 42 U.S.C. § 7409(d)(1).

pollutant added subsequent to the Clean Air Act Amendments of 1970, the EPA took approximately two years to establish a standard following litigation forcing the agency to list lead as a criteria pollutant.⁹⁴ However, because a wealth of research already exists on greenhouse gas concentrations and climate effects, this timeline could be shorter for greenhouse gases.

With respect to implementation, the Clean Power Plan provides a long and somewhat flexible timeline for achieving emission reductions as described above. The EPA could carry forward this glide path approach to a NAAQS program. If it sets a primary NAAQS at a concentration level that puts states in nonattainment, states must set an attainment date at most five years in the future, a date that the EPA could twice extend for one year. The glide path in this scenario would span at least five years. However, it is not clear that the EPA could initially provide states with a seven-year glide path. This glide path would be more flexible in a situation in which all states are in attainment or for a secondary standard.

Capturing Knowledge from Clean Power Plan Planning

One concern arising from the Clean Power Plan litigation is that if the Supreme Court invalidates the rule or its decision leads to a substantially different rule, state regulators would have wasted time learning and planning for the rule. However, much of this work could apply to the planning and implementation processes under the NAAQS program because key provisions of the Clean Power Plan can be implemented under the NAAQS program (see Table 2). Litigation may force the EPA to pivot from Section 111 to the NAAQS program. In the process, the EPA would be free to cover new power plants and to allow flexibilities that Section 111(d) did not permit. And states could transition their Clean Power Plan work to planning for SIPs. Prior to the Supreme Court stay, many states had begun their stakeholder engagement process, and were analyzing different implementation options based on modeling results. If states needed to create SIPs for greenhouse gas emissions, they could use this information in their SIP process.

⁹⁴ *NRDC v. Train*, 545 F.2d 320; 43 Fed. Reg. 46,246 (Oct. 5, 1978) (codified at 40 C.F.R. pt. 51).

Table 2. Comparison of the key provisions of the Clean Power Plan and the NAAQS Program

	Clean Power Plan	NAAQS Program
Federal/state roles	EPA determines if BSER has been adequately demonstrated, creates model rules, can create/implement federal plans States create/implement state plans	EPA sets NAAQS standards, creates model rules; can create/implement FIPs States create/implement SIPs
Trading	Allows trading among certain fossil fuel-fired power plants Permits intrastate and interstate trading through trading-ready pathways and multistate agreements Model trading rules available	Can apply to multiple sectors, new sources and allow trading among those sectors Can include intrastate and interstate trading Can create trading-ready pathways Model trading rules available
Implementation plan flexibility	Gives states options, including mass- or rate-based standards, trading-ready pathways, and state allowance allocation schemes	Can provide Clean Power Plan options and states or EPA may propose other measures Can encourage more limited options to encourage uniformity and capture efficiencies
Planning timeline	Up to three years	Up to three years plus possible extensions
Endangerment finding	EPA relied on the Section 202 finding ^a	EPA may rely on the Section 202 finding May require an independent demonstration that (1) the pollutant comes from multiple and diverse sources and (2) the EPA plans to issue air quality criteria for the pollutant
Permit requirements	Not applicable	Preconstruction and operating permits for certain major sources Nonattainment NSR permits require offsets
Standard	Applies to source emissions within a specific source category Requires EPA to consider costs when analyzing the BSER Likely reviewed at least every eight years	Applies to ambient air concentration economy wide EPA may not consider costs when setting NAAQS standards Costs are considered for implementation Reviewed at least every 5 years
Precedent	Little precedent	The EPA can rely on existing precedent, including existing interstate and intrastate trading programs
Stakeholder engagement	Stalled pending conclusion of litigation	Required

^a One of the issues in the Clean Power Plan litigation is whether the EPA needed to issue a separate endangerment finding under Section 110, rather than relying on the endangerment finding under Section 202.

CONCLUSION

Given Supreme Court precedent, the EPA clearly has authority to regulate greenhouse gas emissions from power plants. In the event that executive action or litigation severely weakens or invalidates the current form of greenhouse gas regulation—the Clean Power Plan—stakeholders may litigate to seek to force the EPA to regulate these emissions under the NAAQS program. The purpose of this working paper is to

begin a discussion of what greenhouse gas regulation would look like under a NAAQS program. Such regulation would require further research (see Table 3).

Although the challenges with the NAAQS approach are complex—especially the need to implement a preconstruction permitting program that is not well suited to greenhouse gas emissions sources—they do not foreclose this path. Furthermore, a NAAQS approach could include Clean Power Plan-like model trading rules for the power sector, similar review schedules, parallel federal-state relationships, and multi-state, multi-sector trading. Indeed, under NAAQS, the Clean Power Plan program could cover new sources and allow flexibilities that the EPA was not able to fit into the Section 111(d) framework. Additionally, the existing knowledge and work by states on the Clean Power Plan can apply directly to the planning process under the NAAQS program.

Table 3. Areas for further analysis

Issue	Further analysis needed
Standard setting	<ul style="list-style-type: none"> —At what concentration might the EPA set the standard? —In setting the standard, would the EPA set a primary and secondary standard at the same level, or set them at different levels, with the primary standard higher or lower than the secondary standard? —Could the EPA choose to set a secondary standard and no primary standard?
Emissions budgets	<ul style="list-style-type: none"> —How would EPA translate a NAAQS standard to emissions budgets for states? Would it develop a national budget and then allocate state budgets, or would it calculate state budgets directly?
Implementation	<ul style="list-style-type: none"> —How might international and interstate emissions affect the implementation challenges faced by states? —How would a rate-based standard ensure emissions reductions in a NAAQS scenario? —How might a state account for the emissions benefits of other clean energy programs? —How would EPA reconcile a standard that cannot be met by a single state’s action with the requirements and sanctions of failing to do so, especially given that it can be sued for nonenforcement? —How might EPA and states implement the NAAQS program requirement for transportation conformity?
Permitting	<ul style="list-style-type: none"> —How might EPA streamline permitting mechanisms for small sources that qualify as “major” sources under the Clean Air Act? —How would a NSR permitting program differ from a PSD permitting program? —How might the EPA apply the offset requirements to small sources?

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Nicholas Institute for Environmental Policy Solutions

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