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A Missing Market: The Future of Interstate Emissions Trading Programs After North Carolina v. EPA

Kati Kiefer

A MISSING MARKET: THE FUTURE OF INTERSTATE EMISSIONS TRADING PROGRAMS AFTER *NORTH CAROLINA v. EPA*

INTRODUCTION

The complex nature of air pollution and our constantly developing understanding of its formation have yielded a complicated and prolonged challenge in our effort to control it. Pollution is not a local problem: pollutants emitted from sources in one area frequently react in the atmosphere while traveling hundreds of miles, ultimately affecting the air quality and health of communities in different states.[1] Referred to as interstate air pollution transport,[2] this phenomenon has provoked widespread debate as to the mechanisms and governmental bodies best suited to control it.

A considerable obstacle in controlling interstate pollution concerns the design of the Clean Air Act. The Clean Air Act functions as a system of cooperative federalism.[3] While the federal government, acting through the Environmental Protection Agency (EPA), establishes air quality standards that limit the concentration of pollutants in the ambient air, states are responsible for implementing the regulation to ensure those limits are met.[4] Thus, the scheme primarily focuses a state's attention on its own air quality, and does little to encourage states to minimize air pollution that drifts across state boundaries.[5] Moreover, because a state may only regulate the sources of pollution located within its jurisdiction, the state has no control over out-of-state sources emitting air pollutants that contribute to its pollution problems.[6] Ineffective attempts by states to control interstate air pollution transport have consequently led to increased federal and EPA involvement.[7]

1. *See* Craig N. Oren, *Clean Air and Interstate Transport: Seeing the Big Picture*, 10 N.Y.U. ENVTL. L.J. 196, 196 (2002) ("[EPA] sets ambient air quality standards at levels that protect public health and welfare. States must then develop implementation plans that demonstrate that the levels of the ambient air quality standards will be attained . . . .").
2. *Id.*
3. *Id.*
4. *Id.*
5. *Id.* at 196–97.
6. Oren, *supra* note 1, at 196–97.
7. *Id.* at 199.

In May 2005, EPA promulgated the Clean Air Interstate Rule (CAIR) to address these difficulties.[8] Hailed as "the linchpin of EPA's program to improve air quality and EPA's most significant action to protect public health and the environment since the passage of the 1990 Clean Air Act Amendments,"[9] CAIR was designed to address the ongoing concerns of states adversely affected by the interstate transport of emissions.[10] Specifically, CAIR aimed to reduce the presence of two criteria pollutants, ozone and fine particulate matter ($PM_{2.5}$), in downwind states by requiring certain upwind states to reduce their emissions of the precursors to such pollutants, namely, sulfur dioxide (SO_2) and nitrogen oxides (NO_x).[11] EPA included in the rule cap-and-trade programs, which states subject to CAIR may adopt, in order to meet the required emissions reductions in a flexible and cost-effective manner.[12] While CAIR limited regional emissions, the cap-and-trade programs would allow pollution sources, such as power and utility companies, to freely buy and sell emissions allowances from in-state or out-of-state sources to achieve the required reductions.[13]

The cap-and-trade programs included in CAIR were not the first of its kind; this system has long been recognized as a cost-effective method to facilitate more substantial emissions reductions.[14] In 1990, general acceptance of an economic approach to air pollution control prompted Congress to grant EPA the authority to implement an interstate trading program for SO_2 as part of the Title IV Acid Rain Program.[15] In the years following the success of the Acid Rain Program, EPA promulgated interstate emissions trading programs for other pollutants, including the creation of a NO_x cap-and-trade program in the NO_x SIP Call.[16] Lacking Title IV's express authorization and instruction to

8. *Rule to Reduce Interstate Transport of Fine Particulate Matter and Ozone: Hearing Before the Committee on Environment and Public Works Subcommittee on Clean Air and Nuclear Safety United States Senate*, 110th Cong. 1 (2008) (statement of Brian McLean, Director of Atmospheric Programs Office of Air and Radiation U.S. Environmental Protection Agency), *available at* http://epa.gov/airmarkets/testimony.pdf [hereinafter McLean statement].

9. McLean statement, *supra* note 8, at 3.

10. *Id.* at 4.

11. Rule to Reduce Interstate Transport of Fine Particulate Matter and Ozone (Clean Air Interstate Rule); Revisions to Acid Rain Program; Revisions to the NO_x SIP Call, 70 Fed. Reg. 25,162 (May 12, 2005) (published in scattered sections of the C.F.R).

12. *Id*.

13. *Id.*

14. *See, e.g.*, Regulating Greenhouse Gas Emissions Under the Clean Air Act, 73 Fed. Reg. 44,354 (July 30, 2008) (discussing a cap and trade program for greenhouse gas emissions).

15. MEG VICTOR, ENVTL. PROT. AGENCY, RECENT EPA REGULATORY ACTIONS AND EFFECTS ON NO_x CONTROLS 1 (2006), *available at* http://www.netl.doe.gov/publications/proceedings/06/ecc/pdfs/Victor_Summary.pdf.

16. Clean Air Interstate Rule, 70 Fed. Reg. at 25,162.

implement such programs, EPA found implicit authorization pursuant to its general duty to ensure that states meet specific Clean Air Act requirements.[17]

In 2000, the Court of Appeals for the District of Columbia upheld all significant aspects of EPA's NO_x SIP Call in *Michigan v. EPA*,[18] including EPA's controversial decision to base emissions reductions on the cost-efficiency of those reductions.[19] This outcome had important consequences; many viewed the *Michigan* decision as an expansion of EPA's authority to regulate interstate air pollution.[20] In addition, relying heavily on the *Michigan* decision, EPA justified much of its methodology in promulgating CAIR's cap-and-trade programs by using the same approach adopted in the NO_x SIP Call.[21] In a unanimous opinion eight years later, the same court in *North Carolina v. EPA*[22] vacated CAIR in its entirety, finding that EPA's approach in creating CAIR's interstate emissions trading programs was fundamentally flawed.[23]

17. *See* 42 U.S.C. § 7410(a)(2)(D)(i) (2006).

18. 213 F.3d 663 (D.C. Cir. 2000).

19. *Id.* at 695.

20. Patricia Ross McCubbin, Michigan v. EPA*: Interstate Ozone Pollution and EPA's "NO_x SIP Call,"* 20 ST. LOUIS U. PUB. L. REV. 47, 48 (2001) ("[*Michigan*] will give EPA greater authority to regulate interstate air pollution in the future . . . ."); Erika Jean Doyle, Michigan v. United States Environmental Protection Agency*: The Power of EPA in Curing the Difficulty Downwind*, 13 VILL. ENVTL. L.J. 93, 118 (2002) ("[T]he immediate impact is that EPA's authority under section 7410(a)(2)(D)(i)(I) has been greatly expanded . . . .").

21. Clean Air Interstate Rule, 70 Fed. Reg. at 25,171.

22. 531 F.3d 896 (D.C. Cir. 2008).

23. *Id.* at 930. In addition to the primary issue discussed in this Article, the *North Carolina* court also held against EPA on four issues. First, in promulgating CAIR, EPA ignored "interfere with maintenance" language in section 110(a)(2)(D)(i)(I) of Clean Air Act (CAA), requiring EPA to ensure that SIPs contain adequate provisions prohibiting sources within a state from emitting air pollutants in amounts which will contribute significantly to nonattainment in, or "interfere with maintenance" by, any other state with respect to any NAAQS. *Id.* at 908–11. Second, the 2015 Phase Two deadline for upwind states to come into compliance with CAIR was incompatible with CAA mandate that SIPs contain adequate provisions prohibiting significant contributions to nonattainment consistent with provisions of Title I. *Id.* at 911–12. Third, budgets for sulfur dioxide and nitrogen oxides trading programs and region-wide cap were arbitrary and capricious. *Id.* at 916–21. Fourth, EPA could not attempt to harmonize CAIR's regulation of sulfur dioxide with the existing program for trading sulfur dioxide emissions allowances under Title IV of CAA. *Id.* at 921–22.

The court agreed with EPA that EPA did not alter the definition of the word "will" in the phrase "will contribute significantly," nor did EPA's interpretation of that term violate CAA, *id.* at 913–14, and that EPA did not act arbitrarily when it proposed a $PM_{2.5}$ contribution threshold of .15 micrograms per cubic meter but finally settled on a threshold of .2. *Id.* at 913–16.

With respect to border state issues, the court found that upwind states Texas and Florida could be included in CAIR, but the state of Minnesota could not. *Id.* at 923–28.

The *North Carolina* decision resulted in tumultuous outcry from environmental organizations and industrial groups,[24] as well as all parties involved in the action.[25] Widespread concern regarding the adverse implications of the court's vacatur for public health, the environment, and regulatory certainty prompted the court to reconsider.[26] In response to EPA's subsequent petition, the D.C. District Court granted EPA's request to remand without vacatur, allowing CAIR to remain in effect until replaced by a rule that is consistent with the Court's prior opinion.[27] While the Court did not grant an indefinite stay, it refrained from imposing a schedule by which EPA must act.[28] Although remanding CAIR will temporarily preserve its environmental values, the *North Carolina* opinion still puts into question EPA's authority to create interstate emissions trading programs.[29]

This Article evaluates government efforts to regulate interstate air pollution transport and specifically addresses the use of cap-and-trade programs as a means to facilitate these types of emissions reductions. It concludes that the decision in *North Carolina v. EPA* prevents EPA from creating interstate emissions trading programs without additional statutory authority and questions the availability of existing regulation that could provide authority for such programs. Part I provides information regarding the nature of air pollution transport and early attempts to control it, followed by an overview of the Clean Air Act and provisions that address interstate air pollution transport. Part II explains the general function and benefits of cap-and-trade programs and describes emissions trading programs preceding CAIR; this section also discusses an earlier challenge to one of the rules. Part III lays out the framework of CAIR, providing detailed context for Part IV, which examines the court's vacatur of CAIR in *North Carolina v. EPA*. Part V analyzes the consequences of the *North Carolina* decision and briefly considers alternative opportunities to regulate interstate air pollution transport through a cap-and-trade system.

24. Felicity Barringer, *Decisions Shut Door on Bush Clean-Air Steps*, N.Y. TIMES, July 12, 2008, at A1 ("[I]ndustry and lobbyists both expressed concerns about the impact of the court ruling.").

25. *Id.* ("Entergy, one of the companies that brought the case to court, emphasized on Friday that it did not want the whole rule thrown out . . . ."); McLean statement, *supra* note 8 ("[T]he court decision to vacate CAIR poses significant concerns in implementing the CAA provisions. . . . However, we are most concerned about the impacts to public health and welfare and the environmental damage that could result . . .").

26. North Carolina v. EPA, 550 F.3d 1176, 1178 (D.C. Cir. 2008).

27. *Id.*

28. *Id.*

29. McLean statement, *supra* note 8 ("Another concern is the implications of the court decision on the future of cap-and-trade programs.").

I. INTERSTATE AIR POLLUTION TRANSPORT AND THE CLEAN AIR ACT

A. The Problem of Interstate Air Pollution Transport

Interstate air pollution transport is generally recognized as the damaging effects of weather patterns that carry pollutants and their precursors downwind, away from the source responsible for the emissions, only to exacerbate air pollution problems elsewhere.[30] Due to weather patterns, topography, and concentration of pollution sources east of the Continental Divide, pollution transport has a greater impact on air quality in Eastern regions than other areas.[31] And, most often, it is the accumulation of emissions from an entire region that collectively affects a specific area.[32] The nature of pollution formation in the atmosphere and the phenomenon of interstate transport have resulted in Northeastern States becoming severely burdened by the collective flow of precursor emissions from upwind sources across a large geographic area, such as the South and the industrialized areas in the Midwest.[33]

Certain pollutants are more susceptible to this phenomenon than others. Interstate transport affects acid rain formation when SO_2 and NO_x emissions released from power plants and other sources are blown hundreds of miles across state and national borders.[34] After SO_2 and NO_x react with water vapor and other chemicals in the atmosphere to form acidic compounds, the harmful mixture falls back to earth in the form of precipitation, miles away from where the precursors were emitted.[35] Similarly, ground-level ozone, or smog, occurs on a regional scale, and is produced in complex chemical reactions when its precursors, NO_x and volatile organic compounds, react in the presence of sunlight.[36] The chemical reactions that create ozone occur when the pollutants are blown through the air by wind; consequently, the harmful effects of ozone

30. Finding of Significant Contribution and Rulemaking for Certain States in the Ozone Transport Assessment Group Region for Purposes of Reducing Regional Transport of Ozone, 63 Fed. Reg. 57,356, 57,360 (Oct. 27, 1998) (to be codified at 40 C.F.R. pts. 51, 72, 75, and 96) [hereinafter Ozone Transport Assessment Group]. Precursors refer to the chemicals that react to form the pollutant.

31. Jamie Larmann, *Comparing Apples to Oranges? EPA Faces Difficulties in Bringing to Fruition an Emissions Trading Program for NO_x*, 6 ENVTL. LAW. 603, 609 (2000).

32. Ozone Transport Assessment Group, 63 Fed. Reg. at 57,375–76.

33. Larmann, *supra* note 31, at 609.

34. ENVIRONMENTAL PROTECTION AGENCY, ACID RAIN HOME PAGE, http://www.epa.gov/acidrain/what/index.html (last visited Feb. 15, 2010). Although the precursors of acid rain formation result from both natural sources, such as volcanoes and decaying vegetation, and man-made sources, such as power plants burning coal and heavy oil produce approximately two-thirds of the annual SO_2 emissions in the United States and about one-fourth of NO_x emissions. *Id.*

35. *Id.* Acid rain causes acidification of lakes and streams and contributes to the damage of trees at high elevations. *Id.* In addition, prior to falling to the earth, SO_2 and NO_x gasses contribute to visibility degradation and harm public health. *Id.*

36. Ozone Transport Assessment Group, 63 Fed. Reg. at 57,359.

can be more severe many miles away from the source of emissions than it is at the source.[37]

Also susceptible to interstate air pollution transport is particulate matter, a chemically and physically diverse mixture of discrete particles and droplets, existing in a range of particle sizes.[38] Fine particulate matter ($PM_{2.5}$) is created when its gaseous precursors, SO_2, NO_x, ammonia, and certain volatile organic compounds, react in the air to form compounds that absorb water, ultimately existing as tiny droplets.[39] Because of its small size and the process of its formation, $PM_{2.5}$ can be created and transported substantial distances from emissions sources, contributing to health-related problems in other regions.[40]

Interstate air pollution transport is difficult to regulate on the state level, as states affected by upwind pollution have little power to restrict the emissions sources of other states.[41] States, EPA, and industry soon recognized that the problem of interstate pollution transport could not be solved without coordinated action by government.[42] Amendments to the Clean Air Act in 1990 reinforced a general awareness that interstate air pollution transport is a regional problem requiring a collaborative effort.[43] Most notably, Congress enacted the Title IV Acid Rain Program, recognizing the contribution of

37. Ozone Transport Assessment Group, 63 Fed. Reg. at 57,359. Prolonged exposure to ozone has been linked to a number of adverse health effects, primarily consisting of complications due to inflammation and damage to the lining of the lungs, which may ultimately lead to reductions in lung function. Clean Air Interstate Rule, 70 Fed. Reg. at 25,162, 25,169. In addition, ozone affects vegetation and ecosystems, leading to decreased agricultural production, reduced growth and survivability of seedlings, and increased susceptibility of plants to disease, pests, and other environmental stresses. *Id.* In long-lived species of plants and trees, these effects have the potential for long-term and adverse impacts on forest ecosystems. *Id.*

38. Rule to Reduce Interstate Transport of Fine Particulate Matter and Ozone (Interstate Quality Rule), 69 Fed. Reg. 4566, 4575 (proposed Jan. 30, 2004).

39. *Id*.

40. *Id.* at 4566, 4575. $PM_{2.5}$ has been associated with a number of serious health effects, primarily, respiratory illnesses and cardiovascular disease. Clean Air Interstate Rule, 70 Fed. Reg. at 25,168.

41. State law, of course, only affects the sources located within that state's jurisdiction. Even negotiation between states, however, may be ineffective, as upwind states do not suffer the social costs of pollution and have little incentive to consider the costs of downwind states. Cristina C. Caplan, *The Failure of Current Legal and Regulatory Mechanisms to Control Interstate Ozone Transport: The Need for New National Legislation*, 28 ECOLOGY L.Q. 169, 202 (2001). Thus, downwind states often find federal environmental laws essential for the protection of their interests. *Id.*

42. McLean statement, *supra* note 8.

43. Ozone Transport Assessment Group, 63 Fed. Reg. 57,356, 57,360. Under the 1990 Amendments, Congress provided states and EPA with the authority to create regional transport commissions for the purpose of assessing strategies to address interstate air pollution transport, and directly established a commission of eleven northeastern states to evaluate ozone transport and propose control measures, the Northeast Ozone Transport Commission (OTC). 42 U.S.C. § 7506a (2006).

interstate pollution transport to the acid rain problem.[44] EPA has also attempted to regulate interstate air pollution transport on its own initiative, although the agency's authority to do so has been questioned.[45] Nevertheless, EPA is responsible for advancing one of the first efforts to obtain comprehensive information regarding interstate ozone transport, resulting in the Ozone Transport Assessment Group (OTAG).[46]

B. Responsibilities of EPA and States Under the Clean Air Act

The regulatory scheme of the Clean Air Act is based on a concept of cooperative federalism. Cooperative federalism describes efforts of both federal government and individual states to work together to focus on meeting nationwide air quality goals to reduce concentrations of pollutants in the atmosphere.[47] While the federal government identifies the criteria pollutants,[48] each state is responsible for assuring air quality within its boundaries.[49] For each criteria pollutant, EPA must prescribe primary and secondary National Ambient Air Quality Standards (NAAQS), which reflect the maximum acceptable level of the pollutant in the ambient air.[50] Once NAAQS are

44. H.R. REP. No. 101-490, pt. 1, at 480 (1990), *reprinted in* S. COMM. ON ENV'T AND PUB. WORKS, A LEGISLATIVE HISTORY OF THE CLEAN AIR ACT AMENDMENTS OF 1990, at 3332–34 (1993) [hereinafter HISTORY OF THE CLEAN AIR ACT].

45. HISTORY OF THE CLEAN AIR ACT, at 3387–88 (1993) ("It is arguable whether long-range transport could be adequately addressed by the existing Clean Air Act. The EPA has generally argued that the Clean Air Act as currently written does not allow for EPA action on long-range transport.").

46. *See* Memorandum from Mary D. Nichols, Assistant Administrator for Air and Radiation, EPA, to Regional Administrators (Mar. 2, 1995) (discussing the Clean Air Interstate Act) *available at* http://www.epa.gov/ttncaaa1/t1/memoranda/mnozone.pdf. In 1995, EPA recognized that states were unable to manage the problem of interstate air pollution transport effectively and requested an assessment of the ozone transport phenomenon. *Id.* This led to the formation of the Ozone Transport Assessment Group (OTAG), a collaboration among thirty-seven states, EPA, industrial groups, and environmental organizations to study interstate ozone pollution and evaluate strategies to reduce its transport from one state to another. Clean Air Interstate Rule, 62 Fed. Reg. 57,362. OTAG generated technical and modeling information on regional ozone transport, ultimately completing the most extensive analysis of ozone transport ever conducted. *Id.*

47. Douglas R. Williams, *Cooperative Federalism and the Clean Air Act*, 20 ST. LOUIS U. PUB. L. REV. 67, 74–75 (2001).

48. Criteria pollutants are defined in the Clean Air Act as air pollutants emitted from "numerous or diverse mobile and stationary sources . . . . which may reasonably be anticipated to endanger public health." 42 U.S.C. § 7408(a)(1).

49. 42 U.S.C. § 7407(a).

50. 42 U.S.C. § 7409(a), (b)(1)–(2). Primary standards are set at levels requisite to protect the public health with an adequate margin of safety, while secondary standards are set at levels to protect the public welfare from any known or anticipated adverse effects. *Id.* § 7409. Currently, EPA has identified the following criteria pollutants: ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter, and lead. 40 C.F.R. § 50.1 (2009).

established for criteria pollutants, each state is required to submit State Implementation Plans (SIPs)[51] to EPA for approval,[52] specifying the manner in which the state will achieve the primary and secondary NAAQS within every air quality control region in the state.[53]

Designation of air quality control regions according to attainment status is significant for purposes of developing and carrying out a SIP. EPA typically consults with state authorities in order to obtain information and identify which air quality control regions are in nonattainment or attainment.[54] A nonattainment area does not meet NAAQS for a particular pollutant, while an attainment area does meet the primary or secondary NAAQS for the pollutant.[55] States then develop SIPs to address the requirements specific to each type of area.[56]

Each State has the additional responsibility to prevent its emissions from contributing to the failure of another State to achieve NAAQS under the "Good Neighbor" provision of the Clean Air Act.[57] Congress revised the good neighbor provision under the 1977 Clean Air Act Amendments to properly address the problem of interstate air pollution transport, recognizing the tendency of certain air pollutants to affect air quality in areas hundreds of miles away from the source.[58] In 1990, Congress again strengthened this provision,

51. *See* 42 U.S.C. § 7410(a)(1). The general function of SIPs is to provide for the implementation, maintenance, and enforcement of NAAQS within the state. *Id.* Among other specific criteria, SIPs must include emissions limitations and other pollution control measures, as well as timetables for compliance. *Id.* § 7410(a)(2)(A).

52. *Id.* § 7407(a).

53. *Id.* EPA's review process begins once it confirms that the SIP includes specific minimum criteria. *Id.* § 7410(k)(1)(B). EPA may then approve or disapprove the SIP in part, fully, or conditionally; or EPA may call for a revision of the plan. *Id.* § 7410(k)(3). After two years, if a SIP does not meet the minimum completeness criteria, or the state fails to submit an approved SIP, EPA is required to promulgate a Federal Implementation Plan (FIP). *Id.* § 7410(c)(1)(B). In addition, the state is also subject to EPA imposed sanctions under the Clean Air Act. *Id.* § 7410(a)(1).

54. *Id.* § 7407(d)(1)(A).

55. *Id.* § 7407(d)(1)(A)(i)–(ii). The area may also be considered unclassifiable, which cannot be classified by the available information as meeting or not meeting the NAAQS of a pollutant. *Id.* § 7407(d)(1)(A)(iii).

56. For nonattainment areas, SIPs must provide for implementation of all reasonably available measures as expeditiously as possible. 42 U.S.C. § 7502(c)(1) (2006). For attainment areas, SIPs must contain measures necessary to prevent significant deterioration of air quality. *Id.* § 7471.

57. *See id*. § 7410(a)(D)(i).

58. Ozone Transport Assessment Group, 63 Fed. Reg. 57,356, 57,360. The 1977 amendments replaced section 110(a)(2)(E), which required that SIPs include "measures necessary to insure that emissions of air pollutants from sources located in any air quality control region will not interfere with the attainment or maintenance of such primary or secondary standard." Clean Air Act Amendments of 1970, Pub. L. No. 91-604, § 110(a)(2)(E), 84 Stat. 1676, 1681.

reflecting the general concern that some pollutants are a regional, and not merely a local problem.[59] The current Good Neighbor provision of section 110(a)(2)(D)(i) requires that SIPs:

> [C]ontain adequate provisions prohibiting . . . any source or other type of emissions activity within the State from emitting any air pollutant in amounts which will—I) contribute significantly to nonattainment in, or interfere with maintenance by, any other State with respect to any such national primary or secondary ambient air quality standard, or II) interfere with measures required to be included in the applicable implementation plan for any other State . . . to prevent significant deterioration of air qualify or to protect visibility.[60]

Consequently, each state must identify its existing emissions sources which contribute significantly to air pollution outside its boundaries and notify nearby states.[61] A state must also provide written notice of any new sources which may have the same effect, at least sixty days before construction is to be permitted by the state.[62]

Congress also included in the 1977 amendments a process by which affected states may enforce section 110(a)(2)(D)(1), providing additional means to address interstate air pollution transport.[63] Under section 126(b), an affected state may petition EPA for a finding that if any source or group of sources emits any air pollutant in amounts that contribute significantly to nonattainment in another state, it is in violation of section 110(a)(2)(D)(1).[64] If

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The 1977 version only allowed EPA to approve a SIP if it contained provisions prohibiting emissions that would prevent downwind attainment or maintenance of the NAAQS. Clean Air Act Amendments of 1977, Pub. L. No. 95-95, § 108(a)(4), 91 Stat. 685, 693.

59. Ozone Transport Assessment Group, 63 Fed. Reg. at 57,360. The 1990 version first included in the statutory language "contribute[s] significantly," requiring that states not only prohibit emissions *preventing* nonattainment or maintenance, but also those emissions that *contribute significantly* to nonattainment or maintenance. 42 U.S.C. § 7410(a)(2)(D)(i)(I) (1994). *See* Richard L. Revesz, *Federalism and Interstate Environmental Externalities*, 144 U. PA. L. REV. 2341, 2360–61 (1996) (explaining the 1990 changes to the interstate emissions provisions of the Clean Air Act).

60. *Id.* § 7410(a)(2)(D).

61. 42 U.S.C. § 7426(a)(2) (2006).

62. *Id.* § 7426(a)(1).

63. Ozone Transport Assessment Group, 63 Fed. Reg. at 57,360.

64. 42 U.S.C. § 7426(b). EPA views sections 110 and 126 as complementary and adapted to achieving different ends. Paul D. Brown, *Lofty Goals, Questioned Motives, and Proffered Justifications: Regional Transport of Ground-Level Ozone and the EPA's NO_x SIP Call*, 60 U. PITT. L. REV. 923, 957 (1999). Section 110 addresses the extent to which the entire emissions inventory of an upwind state impacts a downwind state's ability to meet the requirements of the ozone NAAQS. *Id.* Once a finding of significant contribution is made, the offending state is free to choose any combination of measures deemed appropriate to meet the emissions reductions. *Id.* On the other hand, section 126(b) petitions are aimed at a particular source or group of sources. *Id.* A finding by the EPA that these sources contribute significantly to nonattainment in a nearby state results in direct controls imposed by EPA against the sources. *Id.*

the SIP of the state containing the source does not sufficiently address those emissions, and EPA makes a finding of significant contribution, EPA may establish federal emissions limits for those sources.[65] EPA may also find, upon its own initiative, that a SIP is substantially inadequate to mitigate interstate pollution transport under section 110(k)(5), and require the state to revise and submit a corrected SIP.[66]

II. DEVELOPMENT OF EMISSIONS TRADING PROGRAMS

A. Cap-and-Trade Programs: A Market-Based Approach to Regulating Air Pollution

Market-based emissions trading systems have proved to be an important strategy to improve air quality in a cost-effective manner, as pollution control programs are rarely developed today without including some form of environmental trading.[67] While cap-and-trade systems are not stand-alone regulation, they are typically included in pollution control rules as a tool for sources to meet the required emissions limits.[68] An efficient cap-and-trade system results in significant benefits to the environment, human health, and industry.[69] Because firms may integrate compliance planning with investment cycles and decide which methods and technologies to implement, overall transaction costs of compliance are greatly reduced.[70] The system also provides economic incentive for industry to devise and implement more cost-efficient technology to comply with emissions standards.[71] Because greater emissions reductions may be achieved with lower compliance costs, society's interest in improving air quality is achieved.[72] While emissions trading programs are not devoid of criticism,[73] overall, the cap-and-trade system "has been an extremely effective mechanism in controlling air pollution."[74]

65. Brown, *supra* note 64, at 957.

66. 42 U.S.C. § 7410(k)(5) (2006).

67. David M. Driesen, *Trading and Its Limits*, 14 PENN ST. ENVTL. L. REV. 169, 169 (2006).

68. Byron Swift, *How Environmental Laws Work: An Analysis of the Utility Sector's Response to Regulation of Nitrogen Oxides and Sulfur Dioxide Under the Clean Air Act*, 14 TUL. ENVTL. L.J. 309, 390–91 (2001).

69. *Id.*

70. *Id*.

71. Gregory Gotwald, *Cap-and-Trade Systems, with or Without New Source Review? An Analysis of the Proper Statutory Framework for Future Electric Utility Air Pollution Regulation*, 28 VT. L. REV. 423, 441 (2004).

72. *See* Swift, *supra* note 68, at 347–48.

73. Early attempts to employ market-based strategies for pollution control were not well received by environmental groups, although the success of the Acid Rain Program largely reversed any negative sentiment. *See* Brown, *supra* note 64, at 966–67; Byron Swift, *U.S. Emissions Trading: Myths, Realities, and Opportunities*, 20 NAT. RESOURCES & ENV'T 3 (2006).

The market-based approach to environmental regulation took root in the 1960s and 70s as economists identified various theoretical advantages.[75] In the 1980s, EPA endorsed the use of banking emissions for sources to increase flexibility and cost-efficiency while complying with emissions regulations,[76] and allowed emissions trading between refineries, leading to rapid emissions reductions.[77] EPA also developed a tradable permit program for the United States to meet its obligations under the Montreal Protocol.[78]

By the 1990s, cap-and-trade programs gained greater recognition and broader use after Congress authorized EPA to create and implement the first interstate cap-and-trade program for emissions of SO_2 under Title IV's Acid Rain Program.[79] Under the SO_2 cap-and-trade program, the total amount of national SO_2 emissions is capped at a fixed limit.[80] This cap, or budget, also indicates the amount of emissions reductions, because any emissions over that level must be eliminated. This budget is then allocated directly to each pollution source on an annual basis in the form of emissions allowances, which permit the source to emit a specified amount of pollution.[81] Because the annual SO_2 emissions cap results in a finite number of allowances, to induce flexibility, the allowances may be traded between sources nationally, or

Present concerns relate to an unwavering dependence on cap and trade programs in the future, as the structure and regulation of the program is crucial to the success of the program. *Id.* at 3 ("[T]he regulatory framework in which the program exists determines both the environmental and economic effectiveness of trading."). And, despite the success of the SO_2 trading program authorized by Title IV of the Clean Air Act, distinctions in the chemical behaviors of other pollutants may cause difficulties in achieving the same success. Larmann, *supra* note 31, at 626–31.

There is also concern that the prevalence of emissions trading will lead to exclusion of other options available to reduce emissions of air pollutants, possibly limiting the effectiveness of cap and trade programs. Holly Doremus & W. Michael Hanemann, Symposium, *Of Babies and Bathwater: Why the Clean Air Act's Cooperative Federalism Framework Is Useful for Addressing Global Warming*, 50 ARIZ. L. REV. 799, 806–16 (2008) (asserting that, with regard to greenhouse gas emissions, although carbon trading seems to be the primary strategy to address climate change, regulatory approaches implemented by local authorities, must be part of the solution).

74. McLean statement, *supra* note 8.

75. Doremus & Hanemann, *supra* note 73, at 801.

76. EPA, Emission Trading Policy Statement, General Principles for Creation, Banking and Use of Emission Reduction Credits, Final Policy, 51 Fed. Reg. 43,814, 43,830 (Dec. 4, 1986).

77. Doremus & Hanemann, *supra* note 73, at 801.

78. *Id.*

79. *See* 42 U.S.C. § 7651 (2006).

80. *See* Swift, *supra* note 68, at 3.

81. 42 U.S.C. § 7651b(a). The pollution sources regulated under the Acid Rain Program are referred to as electric utility units.

banked for future use or sale.[82] Sources may either reduce their own emissions to achieve compliance, or purchase additional allowances from other sources.[83]

The success of the Acid Rain SO_2 Trading Program encouraged subsequent use of cap-and-trade programs to reduce regional emissions of other pollutants.[84] As part of the 1990 Clean Air Act Amendments, Congress established the Ozone Transport Commission (OTC) to help states in the Northeast and Mid-Atlantic region meet the NAAQS for ground-level ozone.[85] In 1994, OTC created the NO_x Budget Program, a cap-and-trade program designed to reduce summertime emissions of NO_x, a precursor to ozone, from power plants and other sources in the Northeast.[86] Based largely on the successful implementation of the Acid Rain cap-and-trade program for controlling SO_2, the NO_x Budget Program represented the first instance of a group of states collaborating to form an interstate emissions trading program.[87]

To create the interstate emissions trading program, each OTC state developed and adopted state regulations consistent with major provisions OTC identified as crucial to the success of the trading program.[88] Each OTC member then allocated NO_x emissions allowances to sources within the state, which could be freely traded with sources in other OTC states.[89] Under this collaborative approach, the OTC states enacted the legislation required to facilitate the interstate emissions trading program, while EPA was responsible for administering data systems used to manage the program and providing technical assistance.[90]

Besides inclusion of cap-and-trade programs in all recent federal proposals to address climate change,[91] international markets have also established emissions trading programs, including the European Union and Australia.[92]

82. 42 U.S.C. § 7651b(b).

83. *See* Swift, *supra* note 68, at 4.

84. Doremus & Hanemann, *supra* note 73, at 802.

85. 42 U.S.C. § 7511c.

86. Memorandum of Understanding Among the States of the Ozone Transport Commission on Development of a Regional Strategy Concerning the Control of Stationary Source Nitrogen Oxide Emissions (Sept. 27, 1994), *available at* http://www.dec.ny.gov/docs/air_pdf/App_D.pdf.

87. Ozone Transport Commission, NO_x Budget Program 1999–2002 Progress Report, EPA-430-R03-900, March 2003, *available at* http://www.epa.gov/airmarkets/progsregs/nox/docs/otcreport.pdf.

88. *Id.*

89. *Id.*

90. *Id.*

91. Doremus & Hanemann, *supra* note 73, at 804 n.29 (2008) ("Indeed, all the climate bills that had been introduced as of 2007 used either cap-and-trade or a carbon tax as their primary strategy.").

92. *Id*. at 805. The European Union has developed an emissions trading scheme to meet its Kyoto Protocol mission target, while two states in Australia have initiated their own trading programs. *Id.*

Presently, cap-and-trade programs are widely accepted as a fundamental aspect of pollution control programs.[93] Following the success of the Acid Rain SO_2 trading program and the OTC NO_x Budget Program, EPA began incorporating interstate cap-and-trade programs in a number of subsequent rules, including the 1998 NO_x SIP Call,[94] the Clean Air Interstate Rule, and the Clean Air Mercury Rule in 2004.[95]

B. The NO_x SIP Call: EPA's Creation of a Cap-and-Trade Program and Judicial Review

1. The NO_x SIP Call

Despite these significant efforts, states affected by interstate ozone transport were generally not able to demonstrate attainment of ozone NAAQS.[96] EPA recognized that the primary reason for this failure was the fact that states with downwind nonattainment areas were not able to control NO_x emissions from upwind areas.[97] Pursuant to its Title I authority to ensure that states create SIPs implementing the requirements of section 110(a)(2)(D)(i)(I), EPA used this section as the statutory basis for promulgating the NO_x SIP Call, thus establishing a means to mitigate the interstate transport of ozone.[98] EPA focused on eliminating NO_x emissions to reduce ozone,[99] requiring certain upwind states to revise their SIPs to include provisions that prohibit amounts of NO_x emissions that "contribute significantly" to downwind air quality problems.[100] Specifically, the NO_x SIP Call concentrated on reducing the total amount of NO_x emissions from states

93. *See* Driesen, *supra* note 67, at 169.

94. Ozone Transport Assessment Group, 63 Fed. Reg. 57,356.

95. EPA, Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units, 70 Fed. Reg. 28,606 (May 18, 2005). The Clean Air Mercury Rule has since been invalidated, however, because EPA failed to properly de-list power plants as a source of mercury emissions under Section 112. New Jersey v. EPA, 517 F.3d 574 (D.C. Cir. 2008).

96. Ozone Transport Assessment Group, 63 Fed. Reg. at 57,360–61.

97. *Id.* at 57,361.

98. *Id.* at 57,366.

99. The NO_x SIP Call survived a challenge to EPA's decision not to rely on volatile organic compounds (VOCs) reductions, due to the scientific findings of OTAG that VOC controls would not effectively address interstate ozone transport. Michigan v. EPA, 213 F.3d 663, 688 (2000).

100. Ozone Transport Assessment Group, 63 Fed. Reg. at 57,356. Specifically, EPA determined that existing SIPs for one-hour ozone NAAQS were deficient, and EPA called on these states, under CAA section 110(k)(5), to submit revisions that complied with the NO_x SIP Call. Clean Air Interstate Rule, 70 Fed. Reg. at 25,162, 25,173–74. Since SIPs addressing eight-hour ozone NAAQS were not yet due at the time NO_x SIP Call was promulgated, EPA required states, pursuant to section 110(a)(1)–(2), to submit SIP revisions that fulfilled the requirements of section 110(a)(2)(D). *Id.*

subject to the rule during the summer months of May through September.[101] EPA developed the NO_x SIP Call with the intent that the rule not only address the regional transport of NO_x and its contribution to ozone nonattainment in downwind areas, but also to function as a remedy for section 126 petitions where appropriate.[102]

Because the Clean Air Act lacked a definition of "contribute significantly," EPA had to determine which emissions would be considered unlawful under section 110(a)(2)(D)(i)(I). EPA ultimately based its definition on two components: EPA used the actual impact of upwind emissions on downwind nonattainment problems (the air quality factor) to determine which states must reduce emissions, and identified the types of cost-effective control measures available for sources within the state (the cost factor) to determine the amount of required emissions reductions.[103]

In determining which states were subject to the NO_x SIP Call, EPA recognized that ozone pollution is generally caused by the aggregation of relatively small, diverse sources across a broad geographic area.[104] While a single state's emissions might be contributing relatively small amounts of ozone downwind, these emissions may be contributing significantly to another state's nonattainment when combined with the emissions from other states.[105] So EPA considered the overall nature of the ozone problem, i.e., the "collective contribution," in evaluating the impact of upwind states' emissions

101. Ozone Transport Assessment Group, 63 Fed. Reg. at 57,460.

102. *Id.* at 57,361–62. Between 1997 and 1999, eleven northeastern states and the District of Columbia submitted section 126 petitions to EPA, alleging that NO_x emissions in the Midwest and Southeast were contributing to their ozone nonattainment. Findings of Significant Contribution and Rulemaking on Section 126 Petitions for Purposes of Reducing Interstate Ozone Transport, 64 Fed. Reg. 28,250, 28,251 (May 25, 1999) (codified as amended at 40 C.F.R. § 52). In response to the section 126 petitions, EPA intended that compliance with the NO_x SIP Call would prevent its finding a violation of section 110(a)(2)(D). Clean Air Interstate Rule, 64 Fed. Reg. at 28,256. Due to pending litigation, however, EPA never coordinated the final rule with the 126 petitions. Findings of Significant Contribution and Rulemaking on Section 126 Petitions for Purposes of Reducing Interstate Ozone Transport, 64 Fed. Reg. 33,962, 33,965 (June 24, 1999).

103. Ozone Transport Assessment Group, 63 Fed. Reg. at 57,376. The air quality component included three factors: (1) the overall nature of the ozone problem; (2) the extent of the downwind nonattainment problems to which the upwind state's emissions are linked; and (3) the ambient impact of the emissions from the upwind state's sources on the downwind nonattainment problems. *Id.*

104. *Id.* at 57,375–76. EPA relied heavily on the findings of OTAG to develop the NO_x SIP Call. *Id.* at 57,362–63; *see supra* text and notes accompanying Part I.B. for additional information regarding OTAG. Although OTAG concluded that upwind states needed to reduce NO_x emissions, OTAG could not determine which upwind states were the most substantial contributors to downwind ozone pollution due to its use of modeling that examined emissions, not from any individual state, but from upwind regional groups of states. *Id.* at 57,383.

105. McCubbin, *supra* note 20, at 53–54.

on downwind air quality.[106] Based on this methodology, EPA concluded that emissions from twenty-three states were contributing significantly to ozone nonattainment in downwind states.[107]

To establish state NO_x emissions reductions, EPA focused on the amount of emissions that could be eliminated using cost-effective measures.[108] By evaluating the cost effectiveness of recently promulgated or proposed NO_x emissions regulations, EPA determined that elimination of one ton of NO_x emissions at a cost of approximately $2,000 was highly cost effective.[109] EPA then identified the pollution control devices costing no more than an average of $2,000 per ton of emissions reduced, assuming the cost savings of a region-wide cap-and-trade program,[110] and classified four types of pollution sources that could reduce emissions through use of such devices in a cost-effective manner.[111] Finally, EPA required each state to reduce its NO_x emissions by the amount that could be eliminated if all of those sources within the state implemented the cost-effective controls.[112] Although EPA did not require implementation of those controls, this methodology resulted in state NO_x emissions budgets based not upon the actual amount of each state's NO_x emissions, but upon the types of sources within each state's boundaries.[113]

As part of the NO_x SIP Call, EPA developed an optional interstate cap-and-trade program to assist states in achieving emissions reductions in a cost-effective manner.[114] The general design of the NO_x SIP Call trading program was modeled closely after the OTC NO_x Budget Program[115] and similar to the

106. Ozone Transport Assessment Group, 63 Fed. Reg. at 57,377 ("The fact that virtually every nonattainment problem is caused by numerous sources over a wide geographic area is a factor suggesting that the solution to the problem is the implementation over a wide area of controls on many sources, each of which may have a small or unmeasurable ambient impact by itself.").

107. *Id.* at 57,394–98. The twenty-one jurisdictions subject to the NO_x SIP Call were: Alabama, Connecticut, Delaware, District of Columbia, Georgia, Illinois, Indiana, Kentucky, Massachusetts, Michigan, Missouri, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Virginia, West Virginia, and Wisconsin. *Id.*

108. *Id.* at 57,358.

109. *Id.* at 57,377–78.

110. *Id.*

111. Ozone Transport Assessment Group, 63 Fed. Reg. at 57,377–78. The four sources were (1) electricity generating boilers and turbines larger than 25 MWe; (2) large non-electricity generating industrial boilers and turbines; (3) cement manufacturing sources; and (4) internal combustion engines. *Id.*

112. *Id.*

113. *See* McCubbin, *supra* note 20, at 56 ("Yet, under the NO_x SIP Call, two states contributing *the same amount of ozone* to downwind states, by EPA's definition, nevertheless could be contributing dramatically different 'significant' amounts of ozone.") (emphasis added).

114. Ozone Transport Assessment Group, 63 Fed. Reg. at 57,456.

115. Interstate Quality Rule, 69 Fed. Reg. 4566, 4629. The OTC NO_x Budget Program was incorporated into the NO_x SIP Call. *Id.*

trading program for SO_2 under the Acid Rain Regulation.[116] This scheme employed a region-wide cap on total emissions, equal to the aggregate amount of NO_x emissions budgets of states subject to the NO_x SIP Call.[117] Once the states received their NO_x emissions budgets, each state divided its emissions allowances among a specific group of sources.[118] These sources were then free to buy additional emissions allowances from, or sell surplus allowances to, other in-state sources or out-of-state sources within the NO_x SIP Call region.[119] The NO_x SIP Call trading program also permitted sources to "bank" unused emissions allowances for use in a later period.[120]

2. *Michigan v. EPA*

Although the cap-and-trade program included in the NO_x SIP Call was not challenged in *Michigan v. EPA*,[121] other relevant aspects of the NO_x SIP Call were subject to judicial review.[122] For the most part, the *Michigan* court upheld EPA's analytical approach in the NO_x SIP Call, including EPA's consideration of cost in determining a state's "significant contribution," and the imposition of state NO_x emissions reductions equal to the amount achievable using highly cost-effective controls, regardless of the state's emissions contribution.[123]

Petitioners first argued that EPA was precluded from considering the costs of pollution control measures in determining what constitutes "significant contribution" within the meaning of section 110(a)(2)(D).[124] The court upheld EPA's approach, asserting that "there is nothing in the text, structure, or history of section 110(a)(2)(D) that bars EPA from considering cost" in determining the amount at which a state's air pollution emissions contribute significantly to downwind nonattainment, and, therefore, must be reduced.[125]

116. Brown, *supra* note 64, at 966.

117. Ozone Transport Assessment Group, 63 Fed. Reg. at 57,456–60.

118. *Id.* at 57,460. The core group of large stationary sources includes all fossil fuel-fired stationary boilers, combustion turbines, and combined cycle systems that serve an electrical generator of capacity greater than 25 MWe. *Id.*

119. *Id.*

120. *Id.* at 57,472. The NO_x SIP Call included restrictions on banking provisions to limit the potential for significantly higher emissions levels due to banking. *Id.* at 57,473. The NO_x SIP Call allowed unlimited banking of allowances, but discouraged excessive use of banked allowances by establishing a limit on the number that can be used each season without restriction. *Id.* Sources that use banked allowances in an amount greater than 10% of the NO_x budget for those sources are subject to a discounted rate on their use. *Id.*

121. 213 F.3d 663 (D.C. Cir. 2000).

122. *Id.* at 669–71.

123. *Id.* at 674–80.

124. *Id.* at 674.

125. *Id.* at 679.

Petitioners also challenged EPA's method of determining NO_x emissions reductions for each state based on implementation of highly cost-effective controls instead of actual emissions.[126] The court asserted that, because it upheld EPA's definition of significant contribution as a function of cost, it would uphold the consequence: once a state is subject to the NO_x SIP Call, even a state with low NO_x emissions must make reductions equivalent to those achievable by highly cost-effective measures.[127] Ultimately, *Michigan* meant that a state's "significant contribution," the amount of emissions the state is required to eliminate under section 110(a)(2)(D), need not be based solely on its actual impact on another state's air quality.[128]

EPA interpreted the *Michigan* decision as judicial approval of its approach to limit state emissions based on a uniform cost method, "without concern as to the arguably inconsistent ambient impacts that may result."[129] In addition, EPA relied heavily on the *Michigan* decision to validate its promulgation of CAIR's model cap-and-trade programs.[130]

III. THE CLEAN AIR INTERSTATE RULE

In May 2005, EPA promulgated CAIR to address interstate transport of ozone and fine particulate matter, utilizing the cost-efficiency of a cap-and-trade program.[131] With updated air quality and emissions data available, EPA

126. *Michigan*, 213 F.3d at 679.

127. *Id.* Although sources closer to nonattainment areas tend to have larger effects on air quality than sources far away, the court upheld EPA's uniform cost-based approach to emissions reduction because EPA's research showed that "non-uniform regional approaches by comparison did not 'provide either a significant improvement in air quality or a substantial reduction in cost.'" *Id.* (quoting Ozone Transport Assessment Group, 63 Fed. Reg. at 57,423).

In his dissenting opinion, Judge Sentelle indicated that the majority wrongly applied both statutory interpretation and prior case law to allow EPA's consideration of cost under section 110(a)(2)(D)(i)(I). Judge Sentelle concluded that EPA's statutory authority is limited to controlling emissions based on one criterion: the amounts of emissions that contribute significantly to downwind nonattainment. *Id.* at 696. Judge Sentelle asserted that EPA, however, adopted a different criterion: the cost effectiveness of emissions reductions. *Id.* Thus, because EPA exceeded its statutory authority, the NO_x SIP Call should have been invalidated without consideration of the subsidiary issues, one of which included the use of uniform controls. *See id*.

128. *See Michigan*, 213 F.3d at 681–86.

129. Clean Air Interstate Rule, 70 Fed. Reg. 25,162, 25,177.

130. *Id.* at 25,174–78. "The EPA developed today's rule relying heavily on the NO_x SIP Call approach." *Id.* at 25,171. "[T]he Court approved EPA's approach of requiring the same control level on all affected States, without concern as to the arguably inconsistent ambient impacts that may result. By the same token, in today's action, EPA's approach should be accepted notwithstanding that the upwind controls could, at least in theory, result in an ambient impact that is below the initial threshold." *Id.* at 25,177.

131. *Id.* at 25,162.

reassessed its regulation of interstate ozone transport through emissions reductions of its precursor, NO_x.[132]

EPA also addressed interstate air pollution transport for $PM_{2.5}$ for the first time, requiring emissions reductions for its precursors, SO_2 and NO_x through CAIR.[133] Continuing a strategy of interstate air pollution control through market-based emissions trading programs, EPA replaced the NO_x SIP Call Trading Program with the CAIR ozone-season NO_x Trading Program to reduce ozone.[134] For $PM_{2.5}$ regulation, EPA added an annual NO_x Trading Program, and streamlined the Acid Rain SO_2 Trading Program with CAIR's SO_2 Trading Program.[135]

A. Purpose and Structure of the Clean Air Interstate Rule

Similar to the NO_x SIP Call, EPA promulgated CAIR pursuant to its Title I responsibility to ensure that states have in place SIPs containing prohibitions on emissions activity that contributes significantly to nonattainment in another state.[136] Basically, CAIR was designed to facilitate attainment of NAAQS for $PM_{2.5}$ and ozone in downwind areas by requiring emissions reductions of its precursors, SO_2 and NO_x, from sources in certain upwind states.[137] EPA thus required upwind states to revise their SIPs to include control measures to reduce interstate transport of these emissions.[138]

EPA's approach to CAIR reflected "a broad new program of regional controls."[139] For $PM_{2.5}$ regulation, EPA focused on "large regional reductions" of annual SO_2 and NO_x emissions as more likely to result in significant reductions of $PM_{2.5}$.[140] In assessing the air quality impact of each state, EPA adopted a low threshold level of permissible emissions, subjecting any state with emissions surpassing the minimum level to CAIR's regulatory requirements.[141] EPA asserted that this stringent level reflected the fact that $PM_{2.5}$ nonattainment problems resulted "from the combined impact of relatively small contributions from many upwind States, along with contributions from in-State sources and, in some cases, substantially larger

132. *Id.* at 25,168.
133. *Id.*
134. Clean Air Interstate Rule, 70 Fed. Reg. at 25,166.
135. *Id.* at 25,162.
136. *Id.*
137. *Id.*
138. *Id.*
139. Clean Air Interstate Rule, 70 Fed. Reg. at 25,183.
140. *Id.*
141. *Id.* at 25,174–75. EPA adopted a threshold air quality impact of 0.2 $\mu g/m^3$, so that an upwind state with contributions to downwind nonattainment below this level would not be subject to regulatory requirements, but a state with contributions at this level or higher would be subject to further evaluation. *Id.*

contributions from a subset of particular upwind States," demonstrating a pattern termed in the NO_x SIP Call as "collective contribution."[142] EPA, therefore, postulated attainment may only be achieved by controlling sources throughout the entire region, even if individual contributions are small.[143] Accordingly, EPA found that twenty-five upwind states and the District of Columbia contribute significantly to the nonattainment of NAAQS for $PM_{2.5}$ in downwind states.[144]

Although progress had been made in reducing ozone in many urban areas under the NO_x SIP Call, EPA reevaluated ozone-season pollution in CAIR,[145] recognizing that the Eastern area continued to experience elevated levels of regional scale ozone during the extended summer ozone season.[146] In regulating ozone, EPA relied on OTAG's assessments of ozone control approaches, which concluded that NO_x regulation would be the most effective strategy for reducing regional ozone transport.[147] Finding that twenty-five states and the District of Columbia contribute significantly to the nonattainment of eight-hour ozone NAAQS in another state,[148] CAIR subjected these upwind states to an ozone-season NO_x cap during May through

142. *Id.* at 25,189.

143. *Id.* at 25,175.

144. The original twenty-three states along with the District of Columbia that CAIR required to reduce annual SO_2 and NO_x emissions for the purposes of the $PM_{2.5}$ NAAQS are: Alabama, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Mississippi, Missouri, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Texas, Virginia, West Virginia, and Wisconsin. Clean Air Interstate Rule, 70 Fed. Reg. at 25,167. In later action, EPA included Delaware and New Jersey in the rule for $PM_{2.5}$. Inclusion of Delaware and New Jersey in the Clean Air Interstate Rule, 71 Fed. Reg. 25,288 (April 28, 2006).

145. Unlike EPA's effort in the NO_x SIP Call, which addressed both one-hour and eight-hour ozone standards, in CAIR, EPA focused solely on regulation of the eight-hour ozone standard. *Id.* at 25,175. In 1997, EPA promulgated revised primary and secondary standards for ozone, reducing the maximum allowable concentration of ozone in ambient air over an averaged eight-hour period, as opposed to the pre-existing, and less stringent, one-hour ozone standards. 40 C.F.R. § 50.10. EPA revoked the one-hour ozone standard in June 2005, one year after publishing the eight-hour ozone attainment and nonattainment designations. Recently, the EPA lowered the allowable level of ozone in ambient air from .08 ppm averaged over an eight-hour period to .075 ppm. EPA, National Ambient Air Quality Standards for Ozone, 73 Fed. Reg. 16,436 (Mar. 27, 2008) (codified at 40 C.F.R. § 50).

146. Clean Air Interstate Rule, 70 Fed. Reg. at 25,185. Ozone concentration levels are higher during summer months due to several contributing circumstances. First, ozone formation increases with higher temperatures and sunlight. *Id.* Second, warmer temperatures increase emissions of man-made and biogenic organics, which also may indirectly increase NO_x levels. *Id.* Finally, weather conditions in summertime also bring increased episodes of large-scale stagnation, which promote the buildup of direct emissions and pollutants formed through atmospheric reactions over large regions. *Id.*

147. *Id.*

148. *Id.* at 25,167.

September, reflecting the higher ozone concentrations during summer months.[149] States subject to CAIR for both $PM_{2.5}$ and ozone, however, are subject to both an annual and an ozone-season NO_x emissions limitation.[150]

To quantify the amounts of emissions that contribute significantly to nonattainment, and thus subject a state to regulation under CAIR, EPA essentially adopted the same formulation of factors as applied in the NO_x SIP Call.[151] EPA first considered the air quality factor, which utilized air quality modeling of SO_2 and NO_x emissions in each upwind state to estimate the ambient impact on downwind nonattainment areas.[152] This determined whether a state would be subject to CAIR.[153] Second, EPA considered the cost factor: "As in the case of the NO_x Sip Call, EPA interprets this factor as mandating emissions reductions in amounts that would result from application of highly cost-effective controls."[154] If a state, therefore, exceeded a specified threshold level of emissions according to air quality analysis, it is then considered for emissions reductions—which would be in an amount based upon the cost of achieving those reductions.[155]

EPA's use of the cost factor required evaluation of various pollution control technologies available for different sources as well as any implementation costs.[156] Although CAIR did not require that upwind states implement the specific control measures, CAIR did require states to achieve a specified level of emissions reductions—in an amount based on levels achievable if the control strategies that EPA identified as highly cost-effective were implemented.[157] Furthermore, because interstate emissions trading would

149. *Id.* at 25,232. The twenty-five states along with the District of Columbia that must reduce NO_x emissions for purposes of the 8-hour ozone NAAQS are: Alabama, Arkansas, Connecticut, Delaware, Florida, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Mississippi, Missouri, New Jersey, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia, West Virginia, and Wisconsin. *Id.*

150. *Id.* at 25,289.

151. Clean Air Interstate Rule, 70 Fed. Reg. at 25,174–75 ("[W]e adopt the formulation of those factors as described in CAIR NPR, which has little conceptual difference from EPA's application of those factors in the NO_x SIP Call.").

152. *Id.* at 25,174–75.

153. *Id.*

154. *Id.*

155. *Id.* at 25,189.

156. Clean Air Interstate Rule, 70 Fed. Reg. at 25,175. EPA ultimately concluded electric generating units (EGUs) were the only source for which highly cost-effective SO_2 and NO_x controls were available. *Id.*

157. *Id*. at 25,172–73. While CAIR's emissions reduction requirements were based on cost-effective measures for controlling EGUs, states may choose whatever measures needed to achieve the specified emissions reductions, and need not control EGUs. *Id.* at 25,167. CAIR, therefore, defined "EGU budgets" for each state that choose to adopt controls for EGUs, but also included reduction requirements for a state that chooses to achieve some or all of its required emissions reductions by controlling sources other than EGUs. *Id.* For states choosing to achieve emissions

result in less expensive reductions, EPA assumed that states opted into the model program when evaluating control costs of the required reductions—although state participation in the cap-and-trade program was not required.[158]

B. Regulation of SO_2 Emissions

EPA's methodology in establishing SO_2 emissions reductions was based on the initial allocations of SO_2 allowances prescribed in the Title IV Acid Rain Program.[159] EPA rationalized that the Title IV Acid Rain program was a logical basis for assessing emissions reductions because a large majority of EGU sources affected by CAIR were currently subject to the cap on SO_2 emissions under the Acid Rain program.[160] But since CAIR required substantially greater reductions in SO_2 emissions than Title IV, EGUs within the CAIR region would emit significantly less SO_2 under CAIR and could be expected to have a substantial number of excess allowances to emit SO_2.[161] In order to synchronize the two cap-and-trade programs, EPA retained the use of Title IV allowances as currency for CAIR's cap-and-trade program, but effectively lowered the amount of emissions each Title IV allowance authorized.[162] EPA reasoned that basing the CAIR SO_2 reductions on Title IV allowances was integral to the viability and effectiveness of both the Acid Rain Program and CAIR.[163]

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reductions by controlling EGUs, however, the EGU budgets are mandatory, whether or not they participate in the corresponding cap-and-trade program. *Id.* at 25,229. For a state choosing to require emissions reductions from both EGU and non-EGU sources, the state would obtain a higher EGU budget, thus allowing more emissions from EGUs; however, the difference would equal the amount of emissions reductions that the state can demonstrate it will achieve from non-EGU sources. *Id.* at 25,259.

158. *Id*. at 25,196 ("In modeling the CAIR . . . EPA assumes interstate emissions trading. While EPA is not requiring States to participate in an interstate trading program . . . we believe it is reasonable to evaluate control costs assuming States choose to participate in such a program since that will result in less expensive reductions.").

159. *Id.* at 25,229.

160. *Id.* While the Title IV SO_2 emissions reductions applied to the entire nation, about 90% of EGUs and EGU SO_2 emissions nationwide were subject to the CAIR SO_2 region. *Id.* at 25,294.

161. Clean Air Interstate Rule, 70 Fed. Reg. at 25,294.

162. *Id*. at 25,293–95. CAIR increased the number of allowances required to emit one ton of SO_2 in 2010 (two allowances per ton) and 2015 (2.68 allowances per ton).

163. *Id*. at 25,308. This flood of excess allowances would effectively collapse the market for Title IV allowances, and the system would no longer provide any incentive for sources to adopt long-term strategies for pollution reduction in order to sell excess SO_2 allowances. *Id.* at 25,294–95. Further, EPA was concerned that EGUs not regulated by CAIR but subject to the Acid Rain Program could use surplus Title IV allowances outside the CAIR region, potentially increasing SO_2 emissions by about 29% in 2010 and threatening the environmental gains achieved in those states. *Id.* at 25,295.

EPA established annual region-wide SO_2 emissions budgets by reducing the emissions levels set forth through the Title IV Acid Rain Program for EGUs.[164] Thus, CAIR implemented SO_2 reductions in two phases: the region-wide annual budget for the years 2010–2014 (Phase I) was based on a 50% reduction of Title IV allowances for all sources within the CAIR region, while the region-wide annual budget for 2015 and beyond (Phase II) was based on a 65% reduction of the same allowances.[165] EPA then determined that these reductions could be achieved assuming participation in the cap-and-trade program and implementation of cost-effective controls on EGUs.[166]

In determining state SO_2 emissions reductions, EPA asserted that while initial allocations of state budgets may be important for "distributional reasons, under a cap and trade system, they would not impact the attainment of the environmental objectives or the overall cost of this rule."[167] Consequently, state SO_2 emissions budgets were established in the same manner as the region-wide budget: the number of SO_2 emissions allowances allocated to sources within the state through Title IV were reduced by 50% for 2010 and 65% for 2015.[168]

C. Regulation of NO_x Emissions

To establish the region-wide annual NO_x budget for $PM_{2.5}$, EPA based reductions on total NO_x emissions from the CAIR region, multiplied by a uniform emissions rate that assumed use of highly cost-effective controls on EGUs.[169] Acknowledging advancements in technology and widespread use of specific controls on EGUs, EPA started with the same emissions rate multiplier used in the NO_x SIP Call, but manipulated it to substantially reduce more NO_x emissions in CAIR.[170] As with SO_2 reductions, CAIR implemented NO_x emissions reductions in two phases: Phase One (for 2009) provided a higher emissions rate multiplier, and Phase Two (for 2015) used a lower multiplier to

164. *Id.* at 25,201–05.

165. *Id.* at 25,229.

166. Clean Air Interstate Rule, 70 Fed. Reg. at 25,204.

167. *Id.* at 25,229. EPA consistently maintained that "[l]arge regional reductions in both pollutants, however, are more likely to result in a significant reductions [sic] in fine particles." *Id.* at 25,183.

168. *Id*. at 25,229–30.

169. *Id.* at 25,205. EPA ascertained the amount of regional NO_x emissions by summing the average annual heat input for EGUs in states within the CAIR region from 1999 through 2002. *Id.* at 25,205–06. EPA developed the NO_x emissions rate multipliers based on a target level of emissions, considering available technical information on pollution controls, costs to industry and the general public, and ambient air improvement. *Id.* at 25,205.

170. *Id.* at 25,205–06.

result in a lower region-wide NO_x emissions budget.[171] EPA then evaluated these emissions reductions using modeling techniques to conclude that they were highly cost-effective and feasible, assuming controls on EGUs and interstate emissions trading.[172]

After determining the region-wide budget, EPA then apportioned it among upwind states according to the number of oil, gas, and coal-fired EGUs within each state.[173] This fuel factor method provided larger NO_x emissions budgets to states with more coal-fired EGUs, which have higher emissions rates, thus requiring installation of more expensive controls in order to reduce the economic burden on those states.[174] Likewise, states with more oil-fired or natural gas-fired facilities received smaller NO_x emissions budgets, reflecting less expensive controls, and prevented a financial benefit to oil-fired or natural gas-fired sources that received allowances in excess of their actual anticipated needs.[175] Use of the fuel factor method resulted in adjusted state budgets with a significantly different outcome than unadjusted state budgets. Essentially, states with mostly coal-fired EGUs were required to reduce a lower amount of NO_x emissions using the fuel factor method, while states with mainly gas or oil-fired EGUs were required to reduce more NO_x emissions regardless of actual state NO_x emissions.[176] EPA adopted this approach to provide more equitable distribution, in light of the differing reduction requirements of each source, and since the method in setting state budgets "makes little difference," as participation in a cap-and-trade program would result in an outcome that does "not depend on the relative levels of individual State budgets."[177]

171. Clean Air Interstate Rule, 70 Fed. Reg. at 25,230–31. The historical annual heat input data of the applicable states was multiplied by 0.15 lb/mmBtu for 2009 and 0.125 lb/mmBtu for 2015. *Id.* In addition, EPA supplemented the regional emissions budget for 2009 with a one-time Compliance Supplement Pool of 200,000 NO_x allowances. *Id.* at 25,231–32.

172. *Id.* at 25,205–06.

173. *Id*. at 25,230–31.

174. *Id.*

175. *Id.*

176. *See* Clean Air Interstate Rule, 70 Fed. Reg. at 25,230.

177. *Id.* at 25,230–31. In reducing NO_x emissions, both CAIR and the NO_x SIP Call initially involved an air quality analysis for each upwind state: If an upwind state violated the threshold, the required emissions reductions, i.e., the state's significant contribution, are based on cost-effective measures. *Id*. at 25,174–75. In CAIR, however, the NO_x region-wide budget was established first, equal to the total NO_x emissions of all CAIR states multiplied by a rate that was evaluated as highly cost-effective. This budget was then distributed among the states. *Id*. at 25,205. In the NO_x SIP Call, individual state budgets were determined first by multiplying the NO_x emissions of each state by an emissions rate that reflected implementation of highly cost-effective controls; each state's budget was then added to create the region-wide budget. Ozone Transport Assessment Group, 63 Fed. Reg. 57,356, 57,456–60.

Arguably, the methods used by both rules to establish region-wide NO_x emissions caps are simply two ways of reaching the same number. The difference in methodology lies in determining NO_x state budgets. CAIR included an additional step: allocation of the region-wide

To regulate ozone, EPA established the region-wide ozone-season NO_x budget by multiplying the region's ozone-season NO_x emissions by the same multipliers used to determine the annual NO_x budget for $PM_{2.5}$.[178] However, states subject to CAIR's ozone-season NO_x cap are only required to make reductions during the months of May through September.[179] EPA distributed state budgets using the same fuel factor method as that used in calculating annual NO_x emissions for $PM_{2.5}$: each state received a portion of the region-wide cap based on the amount and types of EGUs responsible for ozone-season NO_x emissions in that state.[180]

D. The Design of CAIR's Cap-and-Trade Programs

States subject to CAIR emissions reductions were given an opportunity to participate in EPA-managed cap-and-trade programs for annual SO_2 emissions, annual NO_x emissions, and ozone-season NO_x emissions, if they adopted the model rules set forth in CAIR.[181] EPA acknowledged that the purpose of CAIR's interstate cap-and-trade programs was to reduce emissions on a regional level,[182] reasoning that regional reductions are generally more cost-effective than local controls, and suitably address the nature of $PM_{2.5}$ and ozone formation over a vast geographic region.[183] EPA also acknowledged that a state's decision to participate in CAIR's cap-and-trade programs was optional.[184]

With respect to NO_x regulation, EPA replaced the NO_x SIP Call cap-and-trade program with the CAIR ozone-season NO_x trading program, and created a new CAIR annual NO_x trading program.[185] Consequently, a state opting into CAIR's annual or ozone-season NO_x trading program may allocate its emissions budget to sources based upon its chosen method of allocation.[186] But in promulgating CAIR's SO_2 cap and trade programs, EPA intended to

budget to states based on a fuel-factor method, which provided equitable re-distribution according to the proportion of oil, gas, and coal-fired facilities within each state. Clean Air Interstate Rule, 70 Fed. Reg. at 25,230–31.

178. Clean Air Interstate Rule, 70 Fed. Reg. at 25,232.

179. *Id.*

180. *Id.*

181. *Id.* at 25,274. EPA reinforced the optional aspect of the trading programs because the Clean Air Act only provides authority for EPA to set air quality standards; it is the sole responsibility of the states to decide how it will meet those standards. *See supra* text and notes accompanying Part I.B.

182. Interstate Quality Rule, 69 Fed. Reg. 4566, 4630 ("Cap and trade programs are designed to reduce emissions of numerous polluting sources by significant amounts over large geographic areas.").

183. Clean Air Interstate Rule, 70 Fed. Reg. at 25,183–84.

184. *Id.* at 25,167.

185. *Id.* at 25,162.

186. *Id.* at 25,274.

streamline its operation with the existing Acid Rain SO_2 cap-and-trade program.[187] For sources subject to both the Acid Rain Program and CAIR, CAIR's SO_2 cap-and-trade program was designed to satisfy the ongoing statutory requirements of Title IV as well as CAIR emissions requirements.[188] States are thus not required to distribute allowances because sources already received their SO_2 allowances through Title IV.[189]

Similar to previous cap-and-trade programs, while CAIR's regional cap may not be exceeded, initial emissions caps at the state level did not constitute an enforceable emissions limit on the state.[190] Rather, state budgets operated as a starting point; once sources received their emissions allowances, they could freely trade with other in-state or out-of-state sources subject to CAIR.[191]

In proposing CAIR's cap-and-trade programs, EPA addressed concerns relating to a theorized increase of air pollution in specific areas, or "hot spots," due to the increase in emissions of a specific group of sources that purchased more allowances.[192] EPA confirmed that the environmental results observed under the Acid Rain Program suggested the opposite; the combination of trading with a stringent emissions cap resulted in substantial reductions of emissions throughout the region, with the highest emitting sources tending to reduce emissions by the greatest amount.[193] Further, EPA assumed

187. *Id.* at 25,162.

188. Clean Air Interstate Rule, 70 Fed. Reg. at 25,274.

189. *Id.*

190. *Id.* at 25,229.

191. *See id.* at 25,231 ("If States choose to . . . participate in the cap and trade program, allowances could be freely traded . . . . [and] would not depend on the relative levels of individual State budgets.").

192. Interstate Quality Rule, 69 Fed. Reg. 4566, 4629 ("One concern with emissions trading programs is that the flexibility associated with trading might allow sources or groups of sources to increase emissions, resulting in areas of elevated pollution or 'hot spots.'"). *See* Steven M. Johnson, *Economics v. Equity: Do Market-Based Environmental Reforms Exacerbate Environmental Injustice?*, 56 WASH. & LEE L. REV. 111, 112 (1999) (theorizing that trading programs may increase pollution in certain areas to create hot spots).

193. Interstate Quality Rule, 69 Fed. Reg. at 4629. Other independent analyses, including those by the Environmental Law Institute, Environmental Defense, and the Massachusetts Institute of Technology's Center for Energy and Environmental Policy, examined emissions trading under the Acid Rain Program, and none concluded that emissions trading resulted in hot spots of high emissions. *Id.* In comparing actual SO_2 emissions by state with the number of allowances issued to that state, data from the first four years of the Acid Rain Program revealed that emissions of virtually all states are well below their allocated allowance levels, with only three states slightly above. Byron Swift, *Acid Rain Allowance Trading and SO_2 Hot Spots—Good News from the Acid Rain Program*, 31 ENV'T REP. (BNA) 954, 956 fig.1 (2000). Further, 81% of additional allowances purchased to offset actual emissions came from the same state as the emitting source, "a high level that indicates a relative lack of emissions-shifting through trading." *Id.* The data also revealed that sources with the largest amounts of emissions have made the most

participation in CAIR's interstate cap-and-trade programs to determine emissions reductions because it resulted in less expensive emissions reductions, thus allowing EPA to justify a lower region-wide budget for SO_2 and NO_x emissions.[194] Considering the overall reduction of SO_2 emissions under the Acid Rain Program, a lower region-wide budget under CAIR suggests similarly decreased SO_2 and NO_x emissions.[195]

IV. *NORTH CAROLINA V. EPA*

Much of EPA's justification for its analytical approach in CAIR is based on the purported approval it received from the D.C. Court of Appeals in *Michigan* regarding the NO_x SIP Call.[196] Since *Michigan* left most of the NO_x SIP Call requirements intact, EPA largely adopted the same interpretation and application of section 110(a)(2)(D) for regulating downwind transport of $PM_{2.5}$ and ozone precursors.[197] In *North Carolina v. EPA*, however, the D.C. court vacated CAIR in its entirety, condemning EPA's approach as "fundamentally

reductions, indicating that "if anything, trading may be expected to cool hot spots and not create them." *Id.*

194. *See* Clean Air Interstate Rule, 70 Fed. Reg. at 25,196–97. A state's adoption of the cap-and-trade programs would not be binding on a tribe located within the state. *Id.* at 25,167. In discussing the consequences of non-uniform adoption of emissions-trading programs with respect to tribes, EPA explained:

> [A]s a matter of policy, cap and trade programs by their nature must apply consistently throughout the geographic region of the program in order to be effective. Otherwise, the existence of areas not covered by the cap could create incentives to locate sources there, and thereby undermine the environmental goals of the program.

Id. at 25,167–68.

The concern seems to be that an unregulated flow of emissions could be emitted from an area that is not subject to the emissions caps CAIR requires. EPA distinguished its position with situations in which a state does not participate in the cap-and-trade program, asserting:

> [T]he failure of a State to participate does not raise the same environmental integrity concern. A state that does not participate in the cap and trade program must still submit a SIP that limits emissions to the levels mandated by the CAIR emission reduction requirements, taking into account any emissions from new sources.

Id. at 25,168 n.10.

But even if an area is subject to CAIR's state emissions budgets, sources within that state are free to purchase more allowances from out-of-state sources under CAIR's cap-and-trade program, increasing their emissions and, thus, potentially exceeding the state emissions budget. *Id.* at 25,230–31 ("If States choose to . . . participate in the cap and trade program, allowances could be freely traded, encouraging least-cost compliance over the entire region. In such a case, the least-cost outcome would not depend on the relative levels of individual state budgets.").

195. *See* Interstate Quality Rule, 69 Fed. Reg. at 4629; *see also* Swift, *supra* note 193, at 955–58.

196. Clean Air Interstate Rule, 70 Fed. Reg. at 25,174–78.

197. *Id.* at 25,174.

flawed," and putting into question whether EPA has authority to create interstate emissions trading programs.[198]

On the heels of EPA's promulgation of CAIR, EPA received twelve petitions for reconsideration of the rule, six of which were granted,[199] although EPA ultimately proposed no changes to CAIR.[200] In addition to these petitions, fourteen petitions for judicial review of the final rule were filed with the D.C. Court of Appeals by electric utility companies, environmental protection groups, upwind states subject to CAIR emissions reductions, and downwind states purportedly affected by the significant contribution of upwind states.[201] These petitions were consolidated into a single case: *State of North Carolina v. EPA*.[202] The scope of this section, though, will only address the challenges to CAIR's model cap-and-trade programs, EPA's method of determining state NO_x emissions budgets for the NO_x trading programs, and EPA's determination of SO_2 emissions budgets.

A. CAIR's Cap-and-Trade Programs

North Carolina's persistent objections to EPA's approach to regulation of interstate air pollution transport finally reached judicial review in *North Carolina v. EPA*.[203] In its challenge to CAIR's cap-and-trade programs, North Carolina argued that the unrestricted interstate trading of pollution allowances in CAIR's cap-and-trade programs failed to assure that upwind states would abate unlawful emissions, thus subverting application of CAIR as a fulfillment

198. North Carolina v. EPA, 531 F.3d 896, 929 (D.C. Cir. 2008).

199. *See* Clean Air Interstate Rule, 70 Fed. Reg. 25,162, 25,162.

200. Rulemaking on Section 126 Petition from North Carolina to Reduce Interstate Transport of Fine Particulate Matter and Ozone, 70 Fed. Reg. 49,708 (Aug. 24, 2005).

201. Brief of Petitioner at i, North Carolina v. EPA, 531 F.3d 896 (D.C. Cir. 2008) (No. 05-1244) [hereinafter Petitioner's Brief]. Of the fourteen petitions, two were voluntarily dismissed. *Id.*

202. North Carolina v. EPA, 531 F.3d 896, 896 (D.C. Cir. 2008).

203. In 2004, North Carolina petitioned EPA pursuant to section 126, seeking the reduction of SO_2 and NO_x emissions from thirteen states that were significantly contributing to $PM_{2.5}$ and/or ozone nonattainment in North Carolina. Revisions to the Clean Air Interstate Rule, 71 Fed. Reg. 25,328, 25,334 (Apr. 28, 2006). EPA finally responded to North Carolina's request two years later (after promulgation of CAIR), and denied the section 126 petition, stating that the required emissions reductions in CAIR and the subsequent FIP operated as a complete remedy to the petition. *Id.* at 25,337–38. In addition to filing a petition for judicial review of CAIR, North Carolina had also petitioned EPA for reconsideration of CAIR after promulgation of the final rule (which was subsequently denied) and reconsideration of its denial of North Carolina's request for relief under section 126. ENVTL. PROT. AGENCY, DOCKET NO. OAR-2003-0053, PETITION FOR CONSIDERATION BY THE STATE OF NORTH CAROLINA ON RULE TO REDUCE INTERSTATE TRANSPORT OF FINE PARTICULATE MATTER AND OZONE (CLEAN AIR INSTITUTE RULE); REVISIONS TO ACID RAIN PROGRAM; REVISIONS TO THE NO_x SIP CALL, *available at* http://www.epa.gov/cair/pdfs/pfr_nc.pdf.

of EPA's section 110(a)(2)(D)(i) duty to address interstate pollution transport.[204] North Carolina contended that "a program that relies on trading cannot guarantee elimination of the 'significant contribution' from 'within the State,' as the statute requires,"[205] as sources within a state could acquire allowances in excess of the state's budget.[206] North Carolina, however, did not allege that interstate emissions trading is *per se* unlawful, but actually endorsed the use of cap-and-trade programs as a strategy for cost-effective emissions reductions.[207] Nor did North Carolina seek vacatur of CAIR, but requested that CAIR merely be remanded "so as to not relax, even temporarily, environmental protections that are already not strict enough."[208]

EPA's arguments in defense of its interstate trading program were unheard in the *North Carolina* opinion, but indicated the practical considerations in determining a feasible method to reduce air pollutants. EPA contended that because trading allows emissions reductions to be achieved in the most cost-effective manner, removing or limiting the trading program would increase the cost of controls, and likely result in a determination that a less stringent level of emissions controls is highly cost-effective.[209] EPA rebutted North Carolina's argument that CAIR fails to assure relief to downwind nonattainment areas by asserting that implementation of the Acid Rain and NO_x SIP Call trading programs "did not result in creation of the sort of 'hot spots' feared by North Carolina."[210] EPA also maintained that since all of the states participating in CAIR's cap-and-trade programs were contributing significantly to downwind nonattainment, reductions, wherever they occur, would improve air quality throughout the region.[211] Finally, EPA stressed that the pollutants regulated by CAIR are a regional concern due to their interstate transport across multiple states, and a regional approach to controlling them is appropriate.[212]

Nevertheless, observing that EPA designed CAIR "to eliminate the significant contribution of upwind states, as a whole, to downwind nonattainment," the *North Carolina* court found fault with EPA's region-wide

204. Petitioner's Brief, *supra* note 201, at 29.

205. *Id.* at 15.

206. *Id.* at 29.

207. *Id.* at 33 ("The State supports measures, like trading, that maximize cost savings and flexibility for EGUs, so long as the State receives the benefit of the reductions required by law.").

208. Reply Brief of Petitioner the State of North Carolina at 18, North Carolina v. EPA, 531 F.3d 896 (D.C. Cir. 2008) (No. 05-1244).

209. Brief for Respondent United States Environmental Protection Agency at 164–65, North Carolina v. EPA, 531 F.3d 896 (D.C. Cir. 2008) (No. 05-1244) [hereinafter EPA Brief].

210. *Id.* at 168.

211. *Id.* at 166.

212. *Id.* at 164–65.

approach to CAIR.[213] The court asserted that by establishing emissions reductions on a regional level, EPA had not considered the unlawful amount of pollution from each state.[214] Although EPA initially evaluated state emissions by measuring the air quality impact to determine which states would be subject to CAIR, once the CAIR region was established, the state emissions reductions were based on cost-efficiency, not air quality impact.[215] In particular, the court noted that EPA did not purport to measure each state's significant contribution to specific downwind nonattainment areas and "eliminate them in an isolated, state-by-state manner," because capping the emissions of each state would not achieve reductions in "the most cost-effective manner."[216] EPA instead assumed state participation in interstate emissions trading when evaluating control costs on a regional, not state, level.[217] The court concluded that EPA's apportionment decisions had nothing to do with each state's significant contribution because EPA failed to measure each state's unlawful amount of pollution in determining the apportionments.[218]

The court cited section 110(a)(2)(D)(i)(I) of the Clean Air Act to emphasize that the statute calls for measurement and elimination of each state's contribution to another state's nonattainment instead of CAIR's assurance that the entire region's significant contribution will be eliminated.[219] The model trading programs included in CAIR may or may not affect the amount of emissions from an individual upwind state. And although initial emissions budgets were allocated to states, sources have the opportunity to purchase emissions credits from sources in other states.[220] As a result, states may emit more pollution than their caps would otherwise permit.[221]

Because CAIR is designed as a complete remedy to section 110(a)(2)(D)(i)(I) problems, the court held that EPA must actually require elimination of emissions by measuring each state's significant contribution to downwind nonattainment, even if that measurement does not directly correlate with each state's individualized air quality impact on downwind nonattainment relative to other upwind states.[222] Otherwise, the court asserted, "the rule is

213. North Carolina v. EPA, 531 F.3d 896, 907 (D.C. Cir. 2008).

214. *Id.* ("Because EPA evaluated whether its proposed emissions reductions were 'highly cost effective,' at the regionwide level assuming a trading program, it never measured the 'significant contribution' from sources within an individual state to downwind nonattainment areas.").

215. *Id.*

216. *Id.*

217. *Id.*

218. North Carolina v. EPA, 531 F.3d 896, 907 (D.C. Cir. 2008).

219. *Id.*

220. *See* 70 Fed. Reg. 25,230–31.

221. *See* North Carolina v. EPA, 531 F.3d 896, 907 (D.C. Cir. 2008).

222. *Id.* at 908.

not effectuating the statutory mandate of prohibiting emissions moving from one state to another, leaving EPA with no statutory authority for its action."[223]

B. SO_2 Emissions Budgets

The EPA's decision to base CAIR's SO_2 emissions reductions on Title IV's SO_2 emissions reductions was challenged by various utility companies.[224] In addressing the issue of SO_2 budgets, the court found that EPA's decision to base the budgets on allowances received under Title IV's Acid Rain Program was not a "logical starting point" for setting CAIR's SO_2 emissions caps.[225] First, the court asserted that reducing the Title IV allowance scheme, legislation enacted in 1990, based on data from 1985 to 1987 and designed to address the national acid rain problem, would not be an appropriate method for regulating the interstate transport of $PM_{2.5}$ in 2015.[226] Without an explanation of how Title IV allowances are relevant to the obligation of states to prohibit emissions from contributing significantly to $PM_{2.5}$ nonattainment, the court found that EPA's budget determinations were arbitrary.[227] In response to EPA's assertion that its primary goal in basing budgets on Title IV allowances was to preserve the Acid Rain Program, the court rejected this goal as not among the objectives in section 110(a)(2)(D)(i)(I).[228]

The court also found that EPA failed to explain how the determination of region-wide SO_2 emissions caps based on a 50% and 65% reduction of the Title IV allowances relate to the objectives of section 110(a)(2)(D)(i)(I) prohibiting emissions from one state from contributing to nonattainment in another state.[229] While the court assumed that the percentage reductions represent "a cost-effective and equitable governmental approach" to attainment, it held that an equitable governmental approach is not among the objectives of section 110(a)(2)(D)(i)(I).[230] Further, the court asserted that

223. *Id.*

224. SO_2 petitioners also challenged the EPA's attempt to streamline CAIR's regulation of SO_2 with the existing cap-and-trade program under Title IV. Several utility companies argued that EPA lacked authority to limit the Title IV allowances, either through a trading program, or by requiring SIPs to include allowance-retirement provisions. *Id.* at 921. The court rejected EPA's purpose in streamlining the programs to prevent collapse of the Acid Rain cap and trade program: "Although it may be reasonable . . . to consider the impact on the Title IV market, it does not follow that EPA has the authority to remove allowances from that market." *Id.* at 922. Similarly, the court held that EPA cannot require all states to retire excess Title IV allowances, because EPA has no authority to determine the methods employed by states if states are satisfying the standards of section 110(a)(2)(D)(i)(I). *Id.*

225. North Carolina v. EPA, 531 F.3d 896, 916–17 (D.C. Cir. 2008).

226. *See id.* at 917–18.

227. *Id.* at 917.

228. *Id.* at 917–18.

229. *Id.* at 918.

230. North Carolina v. EPA, 531 F.3d 896, 918 (D.C. Cir. 2008).

EPA's use of cost to verify that sources could meet the percentage reduction in emissions levels by utilizing highly cost-effective controls did not conform to *Michigan*'s approval of using cost to determine a state's significant contribution.[231] While in *Michigan*, the court allowed EPA to use cost-effectiveness as a factor in determining each state's significant contribution by requiring the reductions of emissions that could be eliminated with cost-effective controls, here, EPA established SO_2 budgets by reducing the Title IV allowances, and then determined that these reductions could be achieved with cost-effective controls.[232] This approach, according to the court, does not "achieve something measurable towards the goal of prohibiting sources within the state from contributing significantly to downwind nonattainment."[233]

C. NO_x Emissions Budgets

Although CAIR's regional NO_x emissions caps were evaluated using the same cost-effective manner as the regional SO_2 emissions budget,[234] petitioners only challenged the state NO_x emissions budgets,[235] claiming EPA's use of a fuel-adjustment method to create more equitable budget distribution was arbitrary and capricious.[236] Petitioners argued that instead, EPA should have assigned each state a budget equal to its unadjusted proportion of NO_x emissions.[237]

231. *Id.*

232. *Id.*

233. *Id.*

234. Although the regional NO_x emissions budgets were not challenged in *North Carolina v. EPA*, the court indicated that it considered CAIR's regional NO_x emissions budget arbitrary. First, the court observed that the regional NO_x emissions budget was evaluated in the same manner as the regional SO_2 budget, by "simply verifi[ng] sources could meet the SO_2 caps with controls EPA dubbed 'highly cost-effective.'" *Id.* at 918. This approach was found by the court to be arbitrary and capricious. *Id.* Second, the court noted that EPA's NO_x emissions rates were based on a reduction of the NO_x SIP Call rate: "It is not clear why EPA considered this rate a useful starting point beyond the fact that such an emissions rate had been 'considered in the past.'" *Id.* at 919 (quoting Clean Air Interstate Rule, 70 Fed. Reg. 25,162, 25,205). Third, the court noticed the lack of explanation surrounding CAIR's NO_x emissions rates as it related to emissions that contribute to downwind nonattainment and asserted that "[a]s with the SO_2 caps, EPA did not draw the 'significant contribution' line on the basis of cost . . . or for that matter, draw the significance line at all," but simply evaluated the regional reduction to assure that it was highly cost-effective. *Id.* at 919 (quoting Michigan v. EPA, 213 F.3d 633, 676–77 (D.C. Cir. 2000)). This use of cost was rejected in the court's SO_2 emissions budget analysis: "EPA can't just pick a cost for a region, and deem 'significant' any emissions that sources can eliminate more cheaply." *Id.* at 918.

235. North Carolina v. EPA, 531 F.3d at 905.

236. *Id.* at 918–21.

237. *Id.* at 919. Because coal-fired EGU emissions are more costly to control than gas and oil EGUs, CAIR provided a larger emissions budget to states with a greater number of coal-fired EGUs. Thus, two states contributing an equal amount of SO_2 emissions were not required to

The court was troubled by EPA's rebuttal that any method of allocating the NO_x cap would amount to equitable burden-sharing, because EPA analyzed both the fuel-adjusted and unadjusted budgets on a region-wide basis, and, therefore, even an unadjusted budget allocation would have no relation to the significant contribution of each state.[238] The court declared that even if distribution of state budgets does not affect the total amount of region-wide emissions reductions, "that distribution is important."[239] Section 110(a)(2)(D)(i)(I) requires a state to reduce its own significant contribution.[240] In establishing state NO_x emissions budgets solely based on fairness, EPA's approach contravenes section 110(a)(2)(D)(i)(I), as EPA has "no authority to force an upwind state to share the burden of reducing other upwind state's emissions."[241] Having chosen not to evaluate emissions on a state-by-state basis and potentially requiring a state to eliminate more than its significant contribution, EPA could not put forth an adequate justification to the court.[242]

In vacating CAIR and its cap-and-trade programs, the *North Carolina* court initially acknowledged that, in the absence of CAIR, the NO_x SIP Call trading program would continue, as it was terminated only as part of the CAIR rulemaking.[243] This decision was reconsidered, however, and the court remanded CAIR without vacatur.[244]

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reduce emissions equally; instead, the state with more gas and oil EGUs must reduce a greater amount of emissions under its smaller budget than the state with coal-fired EGUs. *See infra* Part III.B.

238. North Carolina v. EPA, 531 F.3d at 920.

239. *Id.* at 920.

240. *Id*. at 921.

241. *Id.* In the NO_x SIP Call, the EPA did not distinguish between two sources with equal compliance costs, but with different impacts on downwind pollution; regardless of a state's small amount of emissions, once the EPA finds that it violates section 110(a)(2)(D), it must reduce its significant contribution. Oren, *supra* note 1, at 208. But CAIR required equitable redistribution of the NO_x region-wide budget: if two states have an equal impact on downwind pollution, but different costs of compliance, CAIR requires the state with lower costs to reduce greater amounts of NO_x emissions and thus be responsible for a larger portion of the regional reduction, therefore "forc[ing] an upwind state to share the burden of reducing other upwind states' emissions." North Carolina v. EPA, 531 F.3d 896, 921 (D.C. Cir. 2008).

242. *See* North Carolina v. EPA, 531 F.3d at 918–22.

243. *Id.* at 930. To quantify the amounts of emissions that contribute significantly to nonattainment in CAIR, EPA adopted the formulation of factors with little conceptual difference from EPA's application of those same factors in the NO_x SIP Call. Clean Air Interstate Rule, 70 Fed. Reg. at 25,174. This suggests serious uncertainty as to whether the NO_x SIP Call cap-and-trade program could withstand the same challenges as the CAIR cap-and-trade programs.

Indeed, a year after the *North Carolina* decision, the D.C. Court of Appeals held that EPA could not allow participation in the NO_x SIP Call's regional trading program to satisfy the Clean Air Act requirement that nonattainment areas reduce emissions through adoption of reasonably available control measures. Natural Resources Def. Council v. EPA, 571 F.3d 1245, 1256–58 (D.C. Cir. 2009). The court found the NO_x SIP Call's trading program was analogous to CAIR's

V. THE FUTURE OF CAP-AND-TRADE PROGRAMS

A. The Consequences of the North Carolina *Decision*

The *North Carolina* court distinguished its decision from *Michigan* by noting that in *Michigan*, petitioners did not challenge the lawfulness of the NO_x SIP Call's trading program.[245] Whereas in *Michigan*, petitioners contested only EPA's methodology in determining each state's significant contribution, *North Carolina* addressed whether CAIR could guarantee elimination of each state's significant contribution given the existence of an unrestricted cap-and-trade program.[246] Despite *Michigan*'s approval of emissions reductions that do not correlate directly with the actual air quality impact of each state, *North Carolina* demanded that CAIR assure that some measure of those eliminations will occur.[247] Since CAIR's cap-and-trade programs did not focus on elimination of a state's significant contribution, but rather, were designed to eliminate the entire region's significant contribution, the *North Carolina* court did not find *Michigan*'s decision (largely upholding the NO_x SIP Call) controlling.[248]

regional approach, making "it impossible to tell whether the rule achieved a specific statutory objective." *Id.* at 1256. Applying similar reasoning, the court again emphasized that EPA had not provided assurances that the NO_x SIP Call's cap-and-trade program would result in individual state emissions reductions because EPA "has not evaluated the effect of the program on each nonattainment area." *Id.* at 1257. Even with evidence that regional emissions have been reduced, EPA has not demonstrated that it can ensure emissions reductions within a particular area, nor has EPA "considered the impact of the NO_x SIP Call on the air quality within specific nonattainment areas." *Id.*

244. North Carolina v. EPA, 550 F.3d 1176 (D.C. Cir. 2008).

245. North Carolina v. EPA, 531 F.3d 896, 908 (D.C. Cir. 2008) ("In *Michigan* we never passed on the lawfulness of the NO_x SIP Call's trading program."); Michigan v. EPA, 213 F.3d at 676 (D.C. Cir. 2000) ("Of course we are able to assume the existence of EPA's allowance trading program only because no one has challenged its adoption.").

246. *See* North Carolina v. EPA, 531 F.3d at 908.

247. *Id.*

248. *See* Clean Air Interstate Act, 70 Fed. Reg. at 25,183. The *Michigan* and *North Carolina* decisions may also have been influenced by the types of petitioners challenging each respective rule. Oren, *supra* note 1, at 211. In *Michigan*, EPA received support from various environmental groups and states that would benefit from emissions reductions, while industrial groups, labor organizations, and the regulated states challenged EPA's cost-efficient reductions. *Id.* The *Michigan* court indicated its belief that the challenge to EPA's use of cost consideration was motivated by a purpose to prevent EPA from regulating: "[T]he gamble—at least of the small contributors—is evidently that if EPA were barred from considering costs, it would never have included such states." Michigan v. EPA, 213 F.3d at 675. Whereas previously, these groups had not hesitated in supporting cost-efficient reductions, their challenge to the NO_x SIP Call, seemed insincere. *See* Oren, *supra* note 1, at 211. Professor Oren had predicted after the *Michigan* decision that "[i]t might well be that the D.C. Circuit would decide otherwise in a challenge brought by environmental groups claiming that EPA was not going far enough in regulation." *Id.*

Ultimately, the *North Carolina* decision limits the EPA's seemingly expanded authority after *Michigan*, with devastating consequences to the environment. Although the *North Carolina* court did not explicitly hold that EPA lacked authority to create an interstate emissions trading program, there is little EPA can do to guarantee that states will eliminate their significant contributions if its regulatory program includes interstate emissions trading.[249] While EPA may be able to provide the state-by-state, upwind-downwind measurement demanded by the *North Carolina* court, the difficulty lies in the "assurances" that the court demands.[250] Since an unrestricted interstate emissions trading program allows sources within a state to acquire additional emissions allowances from out of state sources, the total emissions from a state may potentially exceed its emissions budget.[251] Thus, EPA could not guarantee that a state would reduce its significant contribution under an interstate emissions trading program.[252] By failing to require elimination of state significant contributions, EPA's rule gives no effect to section 110(a)(2)(D), requiring these eliminations, and EPA lacks any statutory authority to promulgate a cap-and-trade program.[253]

If EPA has no statutory authority to create interstate emissions trading programs, emissions reductions in future EPA regulation may not be as substantial.[254] The primary environmental benefit of cap-and-trade programs

Indeed, in *North Carolina*, the state petitioners challenged the lawfulness of EPA's trading programs based on CAIR's failure to assure relief to downwind nonattainment areas and basically argued for more stringent regulation. Petitioner's Brief, *supra* note 201, at 29–33. And, although the majority of petitioners challenging CAIR's emissions reductions were industrial groups, they did not challenge EPA's consideration of cost-effective measures. Joint Reply Brief of Entergy Corporation and FPL Group, Inc. as to Fuel Adjustment Issues at 2–4, North Carolina v. EPA, 531 F.3d 896 (D.C. Cir. 2008) (No. 05-1244).

249. *See* Clean Air Interstate Rule, 70 Fed. Reg. at 25,231.

250. In a subsequent decision, the United States Court of Appeals for the District of Columbia did emphasize that EPA may be able to reinstate the NO_x SIP Call's cap-and-trade program, "if, upon conducting a technical analysis, it finds the NO_x SIP Call results in greater emissions reductions in a nonattainment area than would be achieved" by the Clean Air Act's minimum requirement of reductions through the adoption of reasonably available control measures. Natural Resources Def. Council v. EPA, 571 F.3d 1245, 1258 (D.C. Cir. 2009). Although the modeling EPA relied on in developing the NO_x SIP Call ten years ago could not signify the upwind–downwind linkage, the present availability of such modeling is not known.

251. *See* Clean Air Interstate Rule, 70 Fed. Reg. at 25,230–31.

252. Moreover, restricting the program to permit trading exclusively between in-state sources would not reduce costs to industry as significantly as an interstate cap-and-trade program. *See* Clean Air Interstate Rule, 70 Fed. Reg. at 25,196.

253. North Carolina v. EPA, 531 F.3d 896, 908 (D.C. Cir. 2008).

254. McLean statement, *supra* note 8 ("While the court disagrees with how we employed the cap-and-trade approach in CAIR, cap-and-trade has been an extremely effective mechanism delivering broad reductions and certainty that a specific emission level is achieved . . . and dramatic human health and environmental benefits. Losing such programs means losing

is their guarantee of major reductions in pollutant emissions, as emissions are permanently capped well below baseline levels.[255] EPA's regional approach to CAIR was premised on the fact that more emissions could be eliminated in a cost-effective manner if state participation in the model cap-and-trade program was assumed.[256] Considering the emphasis Congress has placed upon pollution controls that are cost-efficient to industry[257] and previous EPA action that has also endorsed this priority,[258] cost considerations will remain a significant aspect in EPA's air pollution regulation. Without a cap-and-trade program, the costs associated with pollution control will undeniably be higher, resulting in less cost-effective emissions reductions, and hence, lesser emissions reductions.[259] This outcome would impact air quality throughout the region,[260] and subvert the purpose of the *North Carolina* decision to assure elimination of emissions that contribute significantly to downwind nonattainment.

In practice, potential challengers may not pursue *North Carolina*'s interpretation of section 110(a)(2)(D) as precluding EPA's authority to implement interstate emissions trading programs through future judicial review, considering the universal acceptance and widespread benefit of cap-and-trade programs.[261] For example, the *North Carolina* petitioners' challenge to CAIR's cap-and-trade programs concerned the lack of restrictions on emissions trading, not the use of trading programs or EPA's authority to create

assurances that reductions will be made in a timely manner by sources responsible for environmental problems. This may also make environmental protection more expensive and thus more difficult to achieve.").

255. Swift, *supra* note 73, at 4.

256. *See* Clean Air Interstate Rule, 70 Fed. Reg. at 25,196.

257. *See* McCubbin, *supra* note 20, at 59–60.

258. *See* Clean Air Interstate Rule, 70 Fed. Reg. 25,166 ("EPA's CAIR and the previously promulgated NO_x SIP Call . . . are not designed to eliminate all contributions to transport, but rather to balance the [economic] burden for achieving attainment between regional-scale and local-scale control programs.").

259. To illustrate, in both the NO_x SIP Call and CAIR, EPA ascertained a particular level of cost associated with pollution control, based on the costs of previous regulation. *See* Ozone Transport Assessment Group, 63 Fed. Reg. 57,400; Clean Air Interstate Rule, 70 Fed. Reg. at 25,175. EPA only required reductions of those emissions from control measures that could be eliminated at a cost equal to or lower than that amount, assuming use of highly cost-effective controls and participation in cap-and-trade programs. Because the costs would be higher without participation in a cap-and-trade program, not as many types of control measures would be able to reduce emissions at a cost equal to or lower than that ascertained by EPA. Thus, emissions from a lesser amount of control measures would be eliminated, resulting in lower emissions reductions.

260. *See supra* notes 119–21 and accompanying text. EPA has consistently maintained that $PM_{2.5}$ and ozone nonattainment are caused by many sources in a broad region, and, therefore, may be solved only by controlling sources throughout the region. Clean Air Interstate Rule, 70 Fed. Reg. at 25,175.

261. *See, e.g.*, *supra* notes 56–60.

such programs.[262] In its brief, North Carolina implied that limitations in the form of restricted use of banked allowances would suffice.[263] While the *North Carolina* opinion suggests that this type of restriction would be insufficient to effect the statutory mandate of section 110(a)(2)(D),[264] petitioner's request demonstrates the relative lack of adversaries to the emissions trading system.

As well, when faced with significant pressure from industrial, environmental, and political support for cap-and-trade programs, the court may attempt to alleviate the harshness of its apparent ruling in *North Carolina*.[265] Further, not considered by the court was the possibility that once CAIR's regional reductions occurred, and downwind areas were in attainment of $PM_{2.5}$ and ozone NAAQS, there would be no grounds to petition EPA under section 126(b) or contest EPA's regulation under section 110(a)(2)(D).[266] This consequence may provide another approach for the court to assuage a strict interpretation of the *North Carolina* holding. Regardless, the implications of *North Carolina* must be resolved, as alternative means to implementation of interstate emissions trading programs are limited.

B. Alternative Sources of Authority to Create Cap-and-Trade Programs

1. Interstate Transport Regions and Commissions

Despite the *North Carolina* decision, "use of the proven cap and trade approach"[267] will certainly be a significant aspect of any future regulation pertaining to air pollution. Section 176A of the Clean Air Act could be a source for the creation of interstate emissions programs.[268] Under section 176, EPA may act at its own discretion, or upon petition by a state, to establish an interstate transport region if EPA has reason to believe that the interstate transport of air pollutants from one or more states contributes significantly to a

262. Petitioner's Brief, *supra* note 201, at 33.

263. *Id.* at i ("In the NO_x SIP Call, EPA included limitations to ensure that budgets would not be significantly compromised by 'excessive use' of banked allowances. 63 Fed. Reg. at 57,431/3. This provided 'security to downwind areas that banking will not significantly increase emissions above budgeted levels.' . . . In CAIR EPA provides no assurance that trading will not result in overages greater than the *de minimis* ten percent level of the NO_x SIP Call.").

264. *See supra* note 203. Even restrictions on banking allowances could not guarantee elimination of a state's significant contribution, as sources are not prevented from obtaining additional allowances from out-of-state sources.

265. In a 2009 decision, *Natural Resources Defense Council v. EPA*, the D.C. Court of Appeals noted that the NO_x SIP Call's cap-and-trade program may be reinstated if EPA properly evaluates the effect of the program on nonattainment areas. 571 F.3d 1245, 1256–58 (D.C. Cir. 2009).

266. *See* Clean Air Interstate Rule, 70 Fed. Reg. at 25,175; 42 U.S.C. § 7410(a)(2)(D) (2006).

267. McLean statement, *supra* note 8.

268. 42 U.S.C. § 7506a.

violation of the NAAQS within the region.[269] Once an interstate transport region is established, a transport commission is created, comprised of EPA administrator (or his designee), the Governor of each state in the region (or his designee), an air pollution control official from each State in the region, and members from EPA Regional Offices of affected regions.[270] To date, several regions have either succeeded in forming a coalition or are currently in the process of developing cap-and-trade systems.[271]

The interstate transport commission is responsible for assessing the degree of interstate transport throughout the region, evaluating strategies for mitigating the interstate pollution, and recommending measures to ensure that the member states have SIPs in place that meet the requirements of section 110(a)(2)(D).[272] The commission may also request that EPA issue a finding under section 110(k)(5) that a SIP of one of the states in the region is substantially inadequate to meet the requirements of section 110(a)(2)(D).[273] Interstate transport commissions, however, are limited because they do not have authority to require implementation of their recommendations by states or EPA.[274] So even upon the commission's recommendation of a cap-and-trade program as a means to reduce interstate air pollution, EPA must still promulgate regulation to put it into effect. And, although EPA may adopt a commission's recommendations, the likelihood of judicial review following any EPA rulemaking affords an uneasy reliance on this system and detracts from the effectiveness of the commission.[275]

2. New Legislation

Conceptually, CAIR did address the goal of section 110(A)(2)(D)(i), which sought to prevent out-of-state emissions from hindering the efforts of a state in attaining NAAQS for a particular pollutant, although as a region-wide effort.[276] EPA's research indicated that, typically, two or more states contribute transported pollution to a single downward area, so that their collective contribution is responsible for the downwind nonattainment.[277] Thus, the nature of interstate transport of certain air pollutants suggests that a reduction of emissions throughout the region is an effective means of preventing nonattainment in downwind states.[278] Nevertheless, section 110(a)(2)(D)

269. 42 U.S.C. § 7506a(a).
270. 42 U.S.C. § 7506a(b)(1).
271. Doremus & Hanemann, *supra* note 73, at 804.
272. 42 U.S.C. § 7506a(b)(2).
273. *Id.* § 7506a(c).
274. Caplan, *supra* note 41, at 192.
275. *Id.* at 192–95.
276. *See* Clean Air Interstate Rule, 70 Fed. Reg. 25,162.
277. *See id.* at 25,186.
278. *See id.*

seems to direct a particular method of obtaining this goal—providing that each state eliminates its individual significant contribution, not the entire region.[279] In order to provide EPA with more flexible authority, the Clean Air Act must be amended.

One way for the legislature to address this problem is by reforming the Clean Air Act to provide EPA with explicit authority to create cap-and-trade programs. As *North Carolina v. EPA* suggests, the Clean Air Act is not likely to support EPA's regional approach to emissions reductions without the express authorization of such a program by Congress.[280] Although several pollutants are susceptible to transport across jurisdictional boundaries, the Clean Air Act was drafted to deal with air pollution as a local problem and has been relatively ineffectual in controlling the regional effects of interstate air pollution transport.[281] Likewise, because the structure of an interstate cap-and-trade program involves the efforts of several states to achieve regional emissions reductions, additional statutory authority recognizing this regional approach to interstate air pollution transport control is necessary. Although Congress questioned EPA's authority in this area in the past, it has failed to modify the Clean Air Act.[282] With the *North Carolina* holding, Congress may now be forced to take such action.

279. *See* 42 U.S.C. § 7410(a)(2)(D) (2006).

280. A LEGISLATIVE HISTORY OF THE CLEAN AIR ACT AMENDMENTS OF 1990, at 3389–90 ("Although there are precedents for emission trading under the existing Clean Air Act, a nationwide trading program is a major regulatory innovation. Historically, most legislative 'command and control' proposals would have allocated requirements to the States, which in turn would have allocated reductions to power plants. [The Acid Rain SO_2 trading program] assigns tradable allowances directly to the utilities which own the units at power plants.").

281. Brown, *supra* note 49, at 925. "When the CAA was first drafted, the primary concern was with pollutants such as carbon monoxide ('CO') and sulfur dioxide ('SO_2'). These pollutants were seen as static. It was not until the late eighties that the Bush Administration—after much resistance—conceded that SO_2 was subject to transport and casually linked to acid rain." *Id.* at n.5.

282. In the first Clean Air Act reauthorization hearing, EPA requested the following change to be made to the Clean Air Act: "Providing clearer authority for EPA to develop and directly implement multi-State solutions, such as cap-and-trade programs, for regional air pollution problems caused by any pollutant." *Hearing before the Subcommittee on Clean Air, Wetlands, Private Property, and Nuclear Safety*, 106th Cong. 75 (1999) (statement of Robert Perciasepe, Assistant Administrator, Office of Air and Radiation, U.S. Environmental Protection Agency).

> In a 1999 Senate appropriations hearing, EPA prepared a legal opinion that discussed its authority to implement cap and trade programs, concluding: "The specific provisions of the Clean Air Act that are potentially applicable to control emissions of the pollutants discussed here can largely be categorized as provisions related to either state programs . . . or national regulation. . . . None of these provisions easily lends itself to establishing market-based national or regional emissions cap-and-trade programs.

Congress may also enact legislation for a statutorily created cap-and-trade program, and provide EPA with the authority to regulate it. By enacting the Acid Rain program, which specifically prescribed a solution to the problem of interstate air pollution through market-based emissions trading, Congress has demonstrated that it is capable of the precision essential in creating an emissions cap-and-trade program.[283] But implementation of an interstate emissions trading program upon EPA's own initiative, after *North Carolina*, would require even greater legislative action.

CONCLUSION

The problem of interstate air pollution transport is generally accepted as a situation in which federal intervention is required, but also an area the Clean Air Act has failed to fully address.[284] Lacking authority to create cap-and-trade programs under the Clean Air Act, EPA loses a powerful and effective weapon in controlling interstate air pollution transport and improving air quality. Ultimately, the consequences of *North Carolina* will leave EPA, industry, and the public waiting for Congressional action.

KATI KIEFER∗

> The Clean Air Act provisions relating to state programs do not authorize EPA to require states to control air pollution through economically efficient cap-and-trade programs and do not provide full authority for EPA to impose such programs."

Hearing Before a Subcomm. of the Committee on Appropriations, United States Senate, 105th Cong. 211–214 (1999) (statement of Jonathan Z. Cannon, General Counsel, to Carol M. Browner, Administrator).

283. Caplan, *supra* note 41, at 203–08.

284. Oren, *supra* note 1, at 204 ("[T]he Clean Air Act's interstate pollution provisions have not worked well.").

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