Visibility, Regional Haze, and the Clean Air Act: Status of Implementation

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Summary

Section 169A of the Clean Air Act (CAA) sets "as a national goal the prevention of any future, and the remedying of any existing, impairment to visibility" in designated "class I areas" (e.g., national parks and wilderness areas). It requires 26 categories of major stationary sources of pollution—including electric generating units (EGUs)—in existence on the date of enactment (1977), but not more than 15 years old as of that date, to install "best available retrofit technology" (BART) if the state determines the source may reasonably be anticipated to cause or contribute to any impairment of visibility in any class I area. A key contributor to regional haze is very fine particles ($PM_{2.5}$), to which sulfur dioxide (SO_2) and nitrogen oxides (NOx) are important contributors. EGUs are major emitters of SO_2 and NOx.

The Environmental Protection Agency (EPA) was directed to issue regulations to assure that State Implementation Plans (SIPs) required (1) reasonable progress toward meeting the national goal and (2) compliance with specific provisions, including the BART requirements. However, EPA delayed issuing regional haze rules, and in 1990 Congress amended the CAA's visibility requirements. EPA issued the final regional haze rule on July 1, 1999. Among its provisions, the rule required "reasonable progress" toward visibility improvement and a state BART implementation plan. For BART, states could alternatively propose a trading program—but only if it achieved greater progress in improving visibility.

The BART requirement's interaction with other air pollution control programs has become an issue—most notably its relation to the Clean Air Interstate Rule (CAIR) designed to reduce emissions crossing state lines and hindering compliance with National Ambient Air Quality Standards (NAAQS). CAIR involves controls on SO_2 and NOx, focuses on EGUs as the most cost-effective source to control, and proposes using a trading mechanism to accomplish reductions. At issue is how the model CAIR trading program for EGUs interacts with the BART requirement for EGUs. In 2005, EPA made a final determination to exempt EGUs subject to the CAIR trading program from the Section 169A visibility BART program. Critics of EPA's proposal point out that Section 169A specifies protection of individual class I areas and that BART requirements would be more stringent than CAIR for individual sources; and they claim that overall, visibility improvements attributable to CAIR would not be adequate to meet CAA goals.

EPA's effort to meld the visibility program with CAIR is consistent with its expressed desire to redirect CAA compliance strategies toward a market-oriented, cap-and-trade program, viewed by many as more cost-effective than direct regulation (such as BART). The Administration has proposed "Clear Skies" legislation to create a more integrated trading process for addressing SO_2 and NOx emissions from EGUs, but it failed to be reported out of committee in the Senate. CAIR represents a regulatory initiative to achieve a step in coordinating certain CAA programs, but it may be that a statutory solution will be necessary.

This report will not be updated.

Contents

Tables

Contacts

Background to the Regional Haze Rule

When amending the Clean Air Act in 1977, Congress added provisions focused on protecting the quality of clean air areas, and especially of national parks and other important national sites.

Codifying regulations developed by EPA in 1974 and 1975, the Prevention of Significant Deterioration (PSD) program focuses on preventing further deterioration of air quality in pristine areas of the country by specifying how much increase in pollution levels is permitted.[1] Mandatory class I areas—those areas that receive the maximum amount of protection—include most national parks, national wilderness areas, and national memorial parks, currently 156 areas. PSD regulations apply to emissions of sulfur dioxide (SO_2), particulates (PM), and nitrogen oxides (NOx) from new and modified sources of air pollution.[2]

Along with the PSD program for new sources, the Congress also added a new Section 169A, setting "as a national goal the prevention of any future, and the *remedying of any existing*, impairment to visibility in mandatory class I Federal areas...."[3] PSD and Section 169A act in tandem, with PSD controlling new sources of impairment and Section 169A reducing emissions from existing sources of impairment. Under PSD, major new or modified sources in PSD areas must undergo preconstruction review and must install "best available control technology" (BACT); more stringent controls can be required if modeling indicates that BACT is insufficient to avoid violating an allowable PSD increment or the National Ambient Air Quality Standard itself. Under Section 169A, 26 categories of major stationary sources of pollution in existence on the date of enactment (1977), but not more than 15 years old as of that date, must install "best available retrofit technology" (BART) if the state determines the source may reasonably be anticipated to cause or contribute to any impairment of visibility in a class I area. Included in the list are electric generating units (EGUs).

Implementing these provisions protecting visibility has not been easy, particularly Section 169A respecting existing sources. First, EPA had to define what visibility was. In general, visibility impairment from human activities manifests itself in two ways: (1) plume blight, where a clearly identifiable plume of smoke emanates from one or more sources; and (2) regional haze, where a uniform reduction in visual range occurs, or a layered discoloration by hovering bands of air tinged brown, yellow, or red. Second, EPA had to promulgate regulations within 24 months of enactment to assure that State Implementation Plans (SIPs) required (1) reasonable progress toward meeting the national goal mentioned earlier, and (2) compliance with several very specific provisions, including the Best Available Retrofit Technology (BART) requirements for existing sources.

EPA promulgated rules in 1980 to address visibility impairment that was "reasonably attributable" to a single source or small group of sources (i.e., plume blight).[4] As with many air pollution regulations, these visibility regulations are implemented by states through SIPs. In

[1] 1977 Clean Air Act Amendments, Part C, Title 1. P.L. 95-95.

[2] EPA could administratively set PSD requirements for other pollutants for which National Ambient Air Quality Standards (NAAQS) have been established.

[3] Section 169A, Clean Air Act, 42 U.S.C. 7492 (italics added).

[4] 45 *Federal Register* 80084 (December 2, 1980); 40 CFR 51.300-51.307.

general, the 36 states with mandatory class I areas were required to revise their SIPs to assure reasonable progress toward the national visibility goal. The major elements of the regulation were (1) identifying existing sources causing visibility impairment and creating procedures for determining which existing stationary sources should be subject to BART requirements; (2) assessing potential adverse impacts from proposed new sources (or modified old sources) and recommending remedial actions via the New Source Review (NSR) process and the PSD program; (3) developing a 10-15 year long-term strategy to make "reasonable progress" toward the visibility goal; and (4) conducting visibility monitoring in mandatory class I areas.

As noted, these regulations deal with plume blight only—regional haze reduction was explicitly delayed until some future date. This lack of aggressive implementation of Section 169A extended to the implementation of the 1980 regulations as well. After 35 of 36 states missed the September 1981 deadline for final visibility plans, the Environmental Defense Fund sued the EPA in 1982 to implement the plume blight regulations. The suit was settled in 1984 with the EPA developing a phased-in schedule for compliance with a December 1986 deadline for states to revise their SIPs to include controls on existing sources that hinder visibility goals.[5] This sequential implementation of plume blight regulations actually extended through 1989. So far, the only BART installation to occur under the 1980 regulations has been the installation of sulfur dioxide scrubbers at the Navajo Generating Station in Arizona in 1991.[6]

EPA's lack of initiative on visibility during the 1980s prompted the Congress to revisit the issue in the 1990 amendments to the Clean Air Act. Those actions included a new Title IV, controlling precursors of acid rain and regional haze,[7] and a new Section 169B. In some ways, Section 169B was a triggering mechanism to force EPA to move on Section 169A with respect to regional haze. Specifically, the 1990 Amendments required EPA to establish a Grand Canyon Visibility Transport Commission (GCVTC) within 12 months of enactment (and other commissions upon its own discretion or petition from at least two states). Commissions were required to assess the scientific, technical, and other data available on visibility impairment from potential or projected emissions growth in the region. Based on those data, the commissions were to issue reports within four years to EPA recommending what measures, if any, should be taken to remedy such impairment. Within 18 months of receiving a commission's report, EPA was to carry out its responsibilities under Section 169A, including criteria for measuring "reasonable progress" toward the national goal. Finally, states affected by any regulations promulgated under Section 169A were required to revise their SIPs within 12 months of such promulgation.

In 1991, a Visibility Transport Commission for the region affecting visibility in Grand Canyon National Park was established. In June 1996, this commission (consisting of the governors of Arizona, California, Colorado, Nevada, New Mexico, Oregon, Utah, and Wyoming, and the leaders of five Indian tribes) approved a set of recommendations for improving western vistas.[8] There were nine primary recommendations, including increased energy conservation, use of

[5] *Environmental Defense Fund v. Gearstick*, No. CO2-6850 (N.D. CA) (April 20, 1984). See 49 *Federal Register* 20647 (May 16, 1984).

[6] 56 *Federal Register* 50172 (October 3, 1991); 40 CFR 52.

[7] As noted by Section 401(a)(1): "the presence of acidic compounds and their precursors in the atmosphere and in deposition from the atmosphere represents a threat to natural resources, ecosystems, materials, visibility, and public health."

[8] *Recommendations for Improving Western Vistas*, Report of the Grand Canyon Visibility Transport Commission to the United States Environmental Protection Agency, June 10, 1996. A ninth state, Idaho, was included in the region, but chose not to participate in the commission.

renewable energy, and emission reductions from stationary sources.[9] The commission's Baseline Forecast anticipated that current regulatory programs would reduce emissions of sulfur dioxide from stationary sources (power plants, smelters, and other industrial sources) 13% by the year 2000, although additional measures under consideration might reduce emissions 20%-30%. In light of this uncertainty about the effects of current programs and the fact that emissions were projected to decline in the short term without additional regulation, the commission agreed to set only regional targets for sulfur dioxide emissions in the year 2000. The ultimate targets would be in the range of 50%-70% reduction by the year 2040, but "interim targets may also be needed to ensure steady and continuing emission reductions and to promote investment in pollution prevention."[10] If the targets are exceeded, this would trigger a regulatory program, probably including a regional cap on emissions, with market-based trading.

The Regional Haze Rule

The 1990 Clean Air Act Amendments required the EPA Administrator to take action under Section 169A within 18 months of receipt of a commission report. The proposed rule appeared in the *Federal Register* on July 31, 1997.[11]

The final regional haze rule was published on July 1, 1999.[12] The regional haze program represents a nationwide effort to protect 156 PSD class I areas from visibility impairment from manmade air pollution. All 50 states are included under the program—including those that do not have any class I areas within their boundaries—since pollution causing haze can travel beyond a state's boundaries and contribute to impaired visibility in a class I area located elsewhere. The rule encourages regional approaches. Indeed, the final rule includes special provisions (Section 309 program)[13] that permit the former member-states of the Grand Canyon Visibility Transport Commission to implement their specific recommendations within the framework of the national regional haze program (Section 308 program).

States are required under Section 169A to develop SIPs that ensure reasonable progress toward the national goal. Under Section 308 of the rule, SIPs must contain the following:

- **Reasonable progress goals.** States must establish goals expressed in deciviews[14] that provide for reasonable progress toward achieving natural visibility conditions in class I areas by 2064.
- **Calculations of baseline and natural visibility conditions.** States must determine baseline conditions expressed in deciviews for the most impaired and least impaired days during 2000-2004.
- **Long-term planning.** States must submit a long-term strategy to address regional haze for each class I area within the state or affected by emissions within

[9] The recommendations are summarized in ibid., pp. i-iii.

[10] Ibid., pp. 34-35.

[11] 62 *Federal Register* 41138 (July 31, 1997).

[12] 64 *Federal Register* 35714-35774 (July 1, 1999).

[13] Referring to section 309 of the rule (not of the statute).

[14] A measure of clarity of the air.

the state. The strategy must include compliance schedules, enforceable emission limitations, and other measures necessary to achieve reasonable progress goals.

- **Monitor strategy.** States must submit with the SIP a strategy for measuring, characterizing, and reporting regional haze.
- **Best Available Retrofit Technology (BART).** States must submit a BART implementation plan, including emission limitations and compliance schedules for each BART-eligible source[15] that "may reasonably be anticipated" to contribute to visibility impairment in a class I area. States may choose to use a trading program or other alternative, if that alternative will achieve greater reasonable progress to natural visibility conditions than BART.
- **Tracking Progress.** SIPs must include several provisions to ensure the adequacy of the SIP. In particular, the SIP must include requirements for submitting SIP revisions to EPA every 10 years, beginning in 2018. Progress reports tracking the state's reasonable progress efforts are due every five years. Reports must include a determination of the adequacy of the state's SIP.

An alternative program is provided in Section 309 as an option for nine former members of the Grand Canyon Visibility Transport Commission (GCVTC).[16] Five states chose to meet the EPA deadline for inclusion under this option.[17] Based on the commission's 1996 report, Section 309 allows states to choose to follow the commission's recommendations for reducing visibility impairment in the 16 class I areas in Colorado rather than the Section 308 program, up to the year 2018.[18] Focused primarily on SO_2 emissions, which are a major component of regional haze, states set voluntary "SO_2 milestones," instead of requiring BART. If the milestones are not achieved, then a back-up mandatory emissions trading program would be activated to ensure compliance with the milestones. The successor organization to the GCVTC, the Western Regional Air Partnership (WRAP) submitted to EPA an annex to the commission's report in 2000 that identifies the voluntary SO_2 reduction milestones out to the year 2018, along with the back-up trading program details. The 2018 milestone of 510,000 tons would represent a reduction of 320,000 tons from 1990 emissions of 830,000 tons. EPA approved the annex in 2003.[19]

The Regional Haze Rule and Very Fine Particulates

While working on the regional haze rule, EPA was also proposing to implement a new National Ambient Air Quality Standard (NAAQS) for very fine particulates ($PM_{2.5}$), which are key contributors to regional haze. To implement the 1997 $PM_{2.5}$ NAAQS, a monitoring network had to be established and three years of data collected before states could identify $PM_{2.5}$ nonattainment areas and begin the development of SIPs. Adhering to the separate schedules could lead some states to revising SIPs twice, once for visibility and then, a year or two later, for $PM_{2.5}$ attainment. As a result, EPA proposed that states preparing SIPs for attaining the 1997 $PM_{2.5}$

[15] Defined at *Clean Air Act*, Section 169A(g)(7).

[16] Arizona, California, Colorado, Idaho, Nevada, New Mexico, Oregon, Utah, and Wyoming.

[17] Arizona, New Mexico, Oregon, Utah, and Wyoming.

[18] *Recommendations for Improving Western Vistas*, Report of the Grand Canyon Visibility Transport Commission to the United States Environmental Protection Agency, June 10, 1996.

[19] 68 *Federal Register* 33764-33791 (June 5, 2003).

NAAQS combine it and their submittal of the regional haze SIP revisions.[20] In P.L. 105-178, enacted June 9, 1998, Congress codified this proposal and also extended deadlines for areas not designated nonattainment. The enacted language stipulates that SIPs implementing the regional haze rule be submitted on the same schedule as those for $PM_{2.5}$ nonattainment areas.[21]

This linking of the implementation schedules of regional haze and $PM_{2.5}$ rules effectively extended the regional haze actions. Under the nationwide Section 308 program, states classified as attainment under the 1997 $PM_{2.5}$ NAAQS have one year after that designation (which occurred on December 17, 2004) to submit to EPA their revisions to SIPs to implement the regional haze requirements. But states classified as nonattainment under the 1997 $PM_{2.5}$ NAAQS will have three years after that designation to submit to EPA their revised SIP, allowing them to combine implementation of the regional haze rule with the 1997 $PM_{2.5}$ NAAQS compliance. Optional SIP schedules are provided for states that chose to develop a regional, coordinated approach to regional haze. Likewise, states choosing to follow the recommendations of the GCVTC have an alternative compliance schedule. **Table 1** provides a rough implementation schedule for the regional haze rule based on EPA's latest estimated schedule for $PM_{2.5}$ compliance.[22]

Table 1. Schedule Outline for Section 308 Regional Haze Program

Date	Regulatory Action
April 5, 2005	Effective date of final $PM_{2.5}$ NAAQS area designations.
April 5, 2006, or one year after the final $PM_{2.5}$ designation date	States submit haze plans for areas designated attainment or unclassifiable under $PM_{2.5}$ NAAQS.
April 5, 2008	States submit haze plans for areas designated nonattainment under $PM_{2.5}$ NAAQS. States participating in regional planning submit haze plans.
2011-2013 (five years after approval of haze plans)	Sources subject to BART required to install and operate BART.
2013 (and every five years thereafter)	States submit progress report on reasonable progress goals and adequacy of haze plans.
Before 2018	Sources comply with any emission trading or alternative control measures.
2018 (and every 10 years thereafter)	States complete revised haze plans.

Source: Environmental Protection Agency.

[20] For discussion of the $PM_{2.5}$ SIP deadlines, see CRS Report 97-8, *Air Quality: Background Analysis of EPA's 1997 Ozone and Particulate Matter Standards*, pp. 22-23 (note 54).

[21] Section 6102(c)(2), The Transportation Equity Act for the 21st Century.

[22] In September 2006, EPA promulgated a revised $PM_{2.5}$ NAAQS. With an implementation schedule five years later than the 1997 standard, there maybe some future effort to coordinate the revised standard's implementation with the regional haze rule's schedule.

The Regional Haze Rule and the Clean Air Interstate Rule

The regional haze and $PM_{2.5}$ programs interact with other air quality programs as well—notably EPA's finalized Clean Air Interstate Rule (CAIR).[23]

The Clean Air Interstate Rule (CAIR)[24]

Published May 12, 2005, CAIR addresses the effect of interstate transport of air pollutants on nonattainment of the NAAQS for fine particulates ($PM_{2.5}$) and the 8-hour ozone standard. For $PM_{2.5}$, the rule finds that the interstate transport of SO_2 and NOx from 23 states and the District of Columbia contribute significantly to downwind nonattainment; for ozone, the rule finds that interstate transport of NOx from 25 states and the District of Columbia contribute significantly to downwind nonattainment of the 8-hour ozone standard. Both SO_2 and NOx are involved in regional haze and $PM_{2.5}$, with SO_2 playing a particularly major role,[25] so all three programs ultimately deal with some of the same sources of pollution—of which electric generating units are a major one.

To remedy the situation, CAIR generally follows (with some important exceptions) the methodology EPA employed with the NOx SIP Call,[26] a regulation addressing regional ozone nonattainment. With CAIR, EPA proposes a region-wide emissions cap for NOx and SO_2 to be implemented in two phases—2010 (2009 for NOx) and 2015. Based on the methodology employed in the rule, EPA's estimates of emissions under the caps are provided in **Table 2**. EPA determined the caps by applying "highly cost effective" pollution controls on electric generating units.

Table 2. EPA Estimates of Regional NOx and SO_2 Emissions

(million tons)

Year	NOx Emissions (no cap)	NOx Emissions (with cap)	SO_2 Emissions (no cap)	SO_2 Emission (with cap)
2010 (2009 for NOx)	2.7	1.5	8.7	5.1
2015	2.8	1.3	7.9	4.0

[23] Environmental Protection Agency, *Rule to Reduce Interstate Transport of Fine Particulate Matter and Ozone (Clean Air Interstate Rule); Revisions to Acid Rain Program; Revisions to NOx SIP Call; Final Rule* (70 *Federal Register* 25162-25405, May 12, 2005).

[24] For more on CAIR, see CRS Report RL32927, *Clean Air Interstate Rule: Review and Analysis*, by (name redacted); also CRS Report RL32273, *Air Quality: EPA's Proposed Interstate Air Quality Rule*, by (name redacted) and (name redacted) (available from the authors).

[25] SO_2 is the subject of numerous provisions of the Clean Air Act: these include the SO_2 NAAQS, New Source Performance Standards (NSPS), Prevention of Significant Deterioration (PSD), Acid Precipitation provisions (Title IV), and mobile source provisions.

[26] For background and discussion of the NOx SIP Call, see CRS Report 98-236 ENR, *Air Quality: EPA's Ozone Transport Rule, OTAG, and Section 126 Petitions—A Hazy Situation?* by (name redacted) and (name redacted) (available from the authors).

Year	NOx Emissions (no cap)	NOx Emissions (with cap)	SO_2 Emissions (no cap)	SO_2 Emission (with cap)
2020	2.8	1.3	7.7	3.3

Source: Environmental Protection Agency, 2005.

BART, CAIR, and Electric Generating Units

Both the regional haze rule and CAIR address emissions of SO_2 and NOx. Although each could control emissions from any major source of these emissions, CAIR is focused on electric generating units, while the regional haze rule is focused on 26 different categories of sources. Therefore, as major sources of SO_2 and NOx, electric generating units become a critical point of interaction between CAIR and the regional haze rule. The contentious issue has been whether BART for EGUs can be and should be superseded by CAIR for affected EGUs.

Determining BART under the Regional Haze Rule

The Clean Air Act explicitly states that BART decisions are to be made according to their impact on visibility. As stated in Section 169A:

> ...each major stationary source ... which, as determined by the State ... emits any air pollutant which may reasonably be anticipated to cause or contribute to any impairment of visibility in any such area, shall procure, install, and operate, as expeditiously as practicable (and maintain thereafter) the best available retrofit technology, as determined by the State ... for controlling emissions from such source for the purpose of eliminating or reducing any such impairment....[27]

EPA originally proposed guidelines to assist states in determining BART in 2001.[28] After portions of the regional haze rule were remanded by the court in the *American Corn Growers v. EPA* decision,[29] EPA revised and re-proposed its BART determination guidelines in May 2004.[30] In particular, the proposed revisions focused on state determinations of individual source contributions, rather than on the collective contribution to visibility impairment as contained in the proposed regional haze rule and 2001 guidelines: "... this reproposal focuses on the use of single source emission modeling for assessing the degree of improvement in visibility from various BART control levels."[31]

Under Section 169A, BART is a plant-by-plant determination made by the state—except for EGUs over 750 Mw in capacity, for which EPA makes the determination. When EPA proposed its May 2004 revisions to the regional haze rule, it proposed to set the default 750 Mw EGU SO_2

[27] *Clean Air Act*, section 169A(4)(b)(2)(A).

[28] 66 *Federal Register* 38108-38135 (July 20, 2001).

[29] *American Corn Growers Association v. EPA*, 291 F. 3d 1 (May 24, 2002, D.C. Cir.). In that case, the court ruled that it is the states, not EPA, who must determine which BART-eligible sources should be subject to BART. Further, the court stated that the regional haze rule tied the states' hands and forced them to require BART controls at sources "without any empirical evidence of the particular source's contribution to visibility impairment in a Class I area."

[30] 69 *Federal Register* 25184-25232 (May 5, 2004).

[31] 69 *Federal Register* 25203 (May 5, 2004).

reduction requirement at 95% removal or emission limitations in the range of 0.1 to 0.15 lb. SO_2 per million Btu. For units between 250 Mw and 750 Mw, EPA proposed a rebuttable presumption that states should require the same limitations. As stated by EPA:

> This presumption would apply unless the State has persuasive evidence that an alternative determination is justified. Our intent is that it should be extrememly [*sic*] difficult to justify a BART determination less than the default control level for a plant greater than 750 Mw, and just slightly less difficult for a plant 750 Mw or smaller.[32]

On July 6, 2005, EPA finalized its guidelines for determining BART.[33] For coal-fired EGUs greater than 200 Mw, the BACT presumptive emissions limit for SO_2 was set at 95% removal or an emissions rate of 0.15 lb. SO_2/mmBtu. NOx BACT presumptive limits for coal-fired EGUs are based on the coal-type burned and the firing configuration. The limits range from 0.15 lb./mmBtu NOx for tangential-fired boilers using subbituminous coal to 0.62 lb./mmBtu NOx for wet-bottom tangential-fired boilers using bituminous coal.[34]

The 1999 regional haze rule also allowed for a trading program for implementing BART *if* the state requesting a trading program submitted analyses demonstrating "that the emissions trading program or other alternative measure will achieve greater reasonable progress than would have resulted from the installation and operation of BART at all sources subject to BART in the State."[35] Under the 1999 regional haze rule, the specific requirements for substituting emissions trading for BART were as follows:[36]

- "The State must demonstrate that this emission trading program ... will achieve greater reasonable progress than would be achieved through the installation and operation of BART." This demonstration must be based on analysis of the visibility improvement that would be achieved in class I areas.
- The trading program must apply to all BART-eligible sources unless the source has an enforceable emission limitation that the EPA and state determines meets BART.
- Emission reductions must occur by 2018 (the first long-term strategy period).
- "A demonstration that the emission reductions resulting from the emission trading program ... will be surplus to those reductions resulting from measures adopted to meet requirements of the CAA as of the baseline date of the SIP."

The proposed 2001 BART guidelines also proposed guidelines for states to assist them in determining the appropriate state emission budgets (or caps) for their trading program to ensure it met the greater reasonable progress requirement.[37] The proposed guidelines would have required dispersion modeling of BART and the trading program to ensure better visibility. Specifically, the modeling should identify (1) the difference in visibility conditions under both approaches for

[32] 69 *Federal Register* 25199 (May 5, 2004).

[33] Environmental Protection Agency, *Regional Haze Regulations and Guidelines for Best Available Retrofit Technology (BART) Determinations; Final Rule*, 70 *Federal Register* 39103-39172 (July 6, 2005).

[34] 70 *Federal Register* 39172 (July 6, 2005).

[35] 64 *Federal Register* 35768 (July 1, 1999).

[36] 64 *Federal Register* 35768 (July 1, 1999).

[37] 66 *Federal Register* 38108-38135 (July 20, 2001).

each class I area; and (2) the average difference in visibility over all class I areas affected by the region's emissions. The analysis would demonstrate greater reasonable progress if (1) visibility does not decline in any class I area; and (2) there is overall improvement in visibility as determined by comparing the average differences over all affected class I areas. These trading program guidelines were re-proposed on May 5, 2004, essentially unchanged.[38]

These alternative program guidelines were not included in the final rule because of a D.C. Circuit Court decision vacating EPA's approval of the WRAP alternative trading program under Section 309 of the regional haze rule (the WRAP Annex Rule).[39] Instead, on July 20, 2005, the EPA proposed new requirements for an emissions trading program that responded to the objections raised by the court. The final rule was published on October 13, 2006.[40] With respect to the alternative trading program, the primary change to the existing guidelines was to bring the program requirement into compliance with the *American Corn Growers v. EPA* decision.[41] Specifically, the revision permits states to use the same BART determination approach to develop a baseline estimate of BART in the alternative program, as it allows for source-by-source BART. As stated by EPA:

> In short, to demonstrate that a trading program or other alternative program makes greater reasonable program than BART, the State can develop an estimate of BART emissions reductions using the same approach that it would use to establish source-by-source BART emission limitations under the BART guidelines.[42]

Substituting CAIR for BART

CAIR is designed to assist states in meeting the $PM_{2.5}$ and 8-hour ozone NAAQS by mitigating interstate air pollution. As a preferred implementation strategy, EPA encourages states to use a trading program to reduce emissions in a cost-effective manner. To set allocations, EPA compared the costs of various control strategies to determine the most cost-efficient allocation scheme. That cost analysis indicated that electric generating units were the most cost-effective source of emission reductions. Thus, like the NOx SIP Call before it, the emissions allocations under the CAIR proposed trading program are based on cost-effectiveness criteria.[43]

EPA opened the issue of substituting CAIR for BART in a supplemental proposed rule published June 10, 2004, that detailed the proposed CAIR model trading program.[44] Among its provisions, the proposed supplemental rule would have permitted electric generating units to use the emission trading program under CAIR to meet the BART requirement imposed by the regional haze rule. To achieve this, EPA proposed to amend the trading program requirements under the regional haze rule. The proposed supplemental rule would have amended and revised the regional haze

[38] 69 *Federal Register* 25184-25232 (May 5, 2004).

[39] *Center for Energy and Economic Development v. EPA* (398 F. 3d 653, 2005).

[40] 71 *Federal Register* 60612-60634 (October 13, 2006).

[41] *American Corn Growers Association v. EPA*, 291 F. 3d 1 (May 24, 2002, D.C. Cir.).

[42] 71 *Federal Register* 60612-60634 (October 13, 2006), p. 60615.

[43] Although, unlike the NOx SIP Call, CAIR focuses solely on electric generating units, where the NOx SIP Call included other sources of cost-effective NOx reductions.

[44] 69 *Federal Register* 32683-32772 (June 10, 2004).

regulation to exempt electric utility sources that comply with the CAIR from the regional haze regulation's BART requirement. Specifically, the CAIR would have:[45]

- Revised Section 308(e)(2) so that sources participating in the CAIR trading program would have been excluded from the requirement that a state demonstrate that its regional haze emission trading program "will achieve greater reasonable progress than would be achieved through the installation and operation of BART."
- Inserted a renumbered Section 308(e)(3) providing that a state's BART-eligible electric generating units that participate in the CAIR trading program would not have to install and operate BART.

Thus, the proposed supplemental CAIR revisions to the regional haze rule would have done two things: (1) exempted states from having to demonstrate that sources complying with the CAIR through its proposed trading program would achieve greater reasonable progress than would be achieved through the installation and operation of BART; and (2) exempted such sources from BART.

In the final CAIR, EPA decided to defer the decision on substituting CAIR for BART for affected units until the BART guidelines are finalized. As stated by EPA:

> The results clearly indicate that the CAIR will achieve greater reasonable progress than BART as proposed, measured by the proposed better-than-BART test. At this time, we can foresee no circumstances under which BART for EGUs could produce greater visibility improvement than the CAIR. However, for the reasons noted in section IX.C.1 above, we are deferring a final determination of whether the CAIR makes greater reasonable progress than BART until the BART guidelines for EGUs and the criteria for BART-alternative programs are finalized.[46]

In the final BART rule, EPA finalized its determination that CAIR achieves greater progress than BART and may be used by states as a BART substitute.[47] In making this determination, EPA notes that "we are not constraining the discretion of States to determine which sources are subject to BART and to make BART determinations. CAIR-affected States are not required to accept our determination that CAIR may substitute for BART."[48]

EPA's Justification

The proposal by EPA to declare CAIR to be better than BART for individual BART-eligible electric generating units had been strongly hinted in its May 2004 proposed revisions to BART guidelines. In that proposal, EPA included a strong statement of support for both employing trading programs to address regional haze, and the use of CAIR as a "better than BART" alternative. As stated by EPA:

[45] *69 Federal Register* 32738 (June 10, 2004).

[46] *Clean Air Interstate Rule*, p. 25304.

[47] 70 *Federal Register* 39137 (July 6, 2005).

[48] 70 *Federal Register* 39143 (July 6, 2005).

> Based on our current evaluation, we believe the [Interstate Air Quality Rule, later CAIR] ... as proposed, is clearly better than BART for those affected EGUs in the affected States which we propose to cover under the IAQR. We thus expect that the final IAQR would satisfy the BART requirements for affected EGUs that are covered pursuant to the final IAQR.[49]

Analysis to support this declaration was provided in the June 2004 proposal supplemental rule for the CAIR trading program, and in the final CAIR.[50] The Bush Administration uses a regional analysis of the visibility improvement resulting from BART and CAIR to justify exempting BART-eligible electric generating units from BART and from the requirement that trading rather than installing BART must yield greater reasonable progress. The two-part test examined the effects of the two programs on 116 class I areas with respect to potential visibility degradation. The analysis concludes that "CAIR emissions reductions in the East produce significantly greater visibility improvements than source-specific BART."[51] On a nationwide basis, EPA states:

> ... the visibility modeling shows that for all 116 class I areas evaluated, the average visibility improvement, on the 20 percent worst days, in 2015 was 0.5 dv [deciview] under the CAIR cap-and-trade program in the East and BART in the West, but only 0.2 dv under the nationwide source-specific BART approach.[52]

Questions

This linking of CAIR to the regional haze rule is based on the programs' common characteristic of controlling sulfur dioxide and nitrogen oxides. EPA use of a proposed collective methodology designed to assist states in determining state emission budgets to justify excluding individual units from undergoing individual state-led BART review has proven contentious. Questions include the following:

- **Visibility impacts on Class I Areas individually and collectively.** Critics contend that EPA's analysis suggesting that "nationwide" the "average" visibility would improve more under a CAIR/BART program than a BART program is inadequate. They observe that Section 169A discusses BART in terms of visibility impairment of "any" class I area—not an average of all 156 class I areas or the 116 (29 in the East) class I areas EPA analyzed for its CAIR determination. EPA cites data limitations for not including other class I areas (5 in the East) in its analysis.[53] With the final BART determination guidelines permitting such an analysis, litigation is likely.
- **Stringency of BART versus CAIR**. On an individual EGU basis, the 95% reduction requirement contained in EPA's BART guidelines is substantially more stringent than the overall 67% reduction in SO_2 emissions from a future 2015 baseline envisioned in CAIR. However, the scope of the two scenarios is different. For EGUs, BART is required nationwide on powerplants over 250 million Btu (thermal input basis) operating in 1977 but not more than 15 years

[49] 69 *Federal Register* 25204 (May 5, 2004).

[50] 70 *Federal Register* 25299-25304 (May 12, 2005).

[51] 70 *Federal Register* 25303 (May 12, 2005).

[52] 70 *Federal Register* 25303 (May 12, 2005).

[53] 69 *Federal Register* 32705, note 34 (June 10, 2004).

old (1962) that may reasonably be anticipated to cause or contribute to any impairment of visibility in any class I area. CAIR's model trading program is a regional scheme focused on all EGUs that are greater than 25Mw within the 23 state $PM_{2.5}$ region.[54]

- **Achieving visibility goals.** As noted above, using an analysis that grafted the CAIR trading program onto an individual BART program for the other 25 BART-eligible categories, EPA argues that CAIR is better than BART. Opponents argue that the analysis is insufficient—that a 1-2 deciview improvement will not achieve the CAA visibility goal. Instead, opponents assert that a 7-9 deciview improvement is necessary to achieve the CAA's visibility goal of preventing any future, and remedying any existing, visibility impairment in class I areas. Achieving such a goal will require BART controls on the level of EPA's proposed default levels, plus controls on additional EGUs such as required under CAIR.

Implications

The Clean Air Act has evolved over time in response to a developing understanding of the environment, new technologies, and changes in the nation's transportation, energy, and industrial sectors. The result has been a patchwork of requirements that are not always consistent—and may even be incompatible—at any given moment. Moreover, implementing regulations change and are added to over time. Although the evolution of the act has resulted in a structure that some consider unwieldy, emissions of most air pollutants have substantially declined, and the number of persons living in areas where pollution exceeds standards has diminished.[55]

From a policy standpoint, EPA has presented the Clean Air Interstate Rule—and the accompanying Mercury (Hg) rule—as a "suite of integrated air actions" to reduce emissions of three pollutants: SO_2, NOx, and Hg. By promulgating guidelines to help states determine appropriate state emissions budgets for their trading program and to exempt sources subject to the CAIR from the individual BART determinations required by Section 169A (visibility impairment), EPA appears to be trying to extend the "suite" to the visibility protection provisions of the CAA. In other words, EPA is endeavoring to transform CAIR from another layer on the already multilayered cake called the Clean Air Act to an integrative program that simplifies the layers.

As discussed, this effort to meld Section 169A (visibility) and Section 109 (NAAQS) implementation strategies based on their common characteristic of controlling sulfur dioxide and nitrogen oxides raises numerous issues. In the Clean Air Act, their only procedural link is the SIP process, but they have different scopes, purposes, and requirements. Because of the happenstance that the timing of the $PM_{2.5}$ NAAQS and the regional haze rules partly coincided, EPA proposed and Congress legislated that the initial implementation schedules of the SIP process for the 1997 $PM_{2.5}$ NAAQS and the SIP process for the regional haze rule be coordinated.

Now EPA is linking the two programs by determining that certain CAIR program provisions can in effect substitute for related but different visibility requirements. Whether it can do this while

[54] 69 *Federal Register* 32709 (June 10, 2004).

[55] For data on air quality trends, see EPA's website at http://www.epa.gov/airtrends/.

accomplishing the express purposes and requirements of both Section 109 and Section169A is subject to debate and possible litigation. By using a collective analysis designed to assist states in determining state emission budgets to justify excluding individual units from undergoing individual state-led BART review, EPA concludes that the CAIR program adequately meets visibility requirements—a conclusion that is contentious. Indeed, opponents of the attempt have described it as regulatory "bait and switch."[56] This conflict is not surprising as EPA is attempting to integrate regulatory provisions that are separate in many essential respects.

It appears the Administration's goal is to redirect CAA compliance strategies toward a market-oriented cap-and-trade program—viewed by many observers as a more cost-effective approach to pollution control than direct regulation (such as the BART program). Such a redirection of compliance approaches has been proposed—and the Title IV acid rain provisions of the CAA are often cited as the preeminent example of its application. Several proposals have focused on electric generating units.[57] One approach is a "multi-pollutant" strategy—a framework based on a consistent set of emissions caps, implemented through emissions trading. In February 2002, the Bush Administration announced a "Clear Skies" multi-pollutant proposal that would amend the Clean Air Act to place emission caps on electric utility emissions of SO_2, NOx, and Hg. Implemented through a tradable allowance program, the emission caps would generally be imposed in two phases: 2008 and 2018. Although different in geographic scope, the Administration's Clean Air Interstate Rule and mercury rule are very similar in terms of reduction requirements as Clear Skies. However, unlike EPA's "suite of integrated air action," Clear Skies contains significant conforming language to avoid conflicts with other CAA provisions such as Section 169A. The Administration has stated its preference for Clear Skies over its regulatory approach.

However, the Congress has yet to move any multi-pollutant proposal to the floor, nor has it given EPA broad authority to reconstitute regulatory approaches into market-oriented ones.[58] EPA's combining of CAIR and BART represents a regulatory initiative to achieve at least a partial step in coordinating regulatory programs under a market-oriented approach. It is possible, however, that a statutory solution could be necessary.

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[56] Felicity Barringer, "Critics Say Clean-Air Plan May Be a Set Back for Parks," *New York Times*, May 31, 2004.

[57] See CRS Report RL32755, *Air Quality: Multi-Pollutant Legislation in the 109th Congress*, by (name redacted) and (name redacted).

[58] In the 109th Congress, S. 131, introduced by Senator Inhofe, is modeled on the Administration's Clear Skies proposal. However, after committee markup, the Senate Environment and Public Works Committee failed to report S. 131 to the floor on a 9-9 tied vote (March 9, 2005). See CRS Report RL33552, *Clean Air Act Issues in the 109th Congress*, by (name redacted).