Clean Air Task Force
American Lung Association
American Lung Association of Metropolitan Chicago
American Lung Association of New York State
Appalachian Mountain Club
Conservation Law Foundation
Environment Northeast
Group Against Smog and Pollution
Hoosier Environmental Council
National Environmental Trust
National Parks Conservation Association
Natural Resources Council of Maine
Natural Resources Defense Council
Ohio Environmental Council
Southern Alliance for Clean Energy
Southern Environmental Law Center
United States PIRG Education Fund

March 30, 2004 [Corrected April 2, 2004]

VIA Express Mail and e-mail

U.S. Environmental Protection Agency
Air Docket
1301 Constitution Ave., NW
Room B108
Mail Code: 6102T
Washington, DC 20004

Attention: Docket ID No. OAR-2003-0053

Re: Comments on Proposed Rule to Reduce Interstate Transport of Fine Particulate Matter and Ozone (Interstate Air Quality Rule), 69 Fed. Reg. 4566 (January 30, 2004).

Dear Administrator Leavitt:

The Clean Air Task Force ("CATF"), on behalf of the undersigned citizens' groups and on its own behalf, appreciates the opportunity to comment on EPA's Proposed Rule to Reduce Interstate Transport of Fine Particulate Matter and Ozone, published in the Federal Register on January 30, 2004 at 69 Fed. Reg. 4566 ("Interstate Air Quality Rule" or "IAQR").

The undersigned environmental and public health organizations are actively engaged in national, regional and local efforts to reduce harmful air pollution from fossil fuel fired-power plants, and have thousands of members who live and work in states impacted by that pollution. EPA's IAQR proposal would require substantial reductions in emissions of sulfur dioxide ("SO_2") and nitrogen oxides ("NOx") from power plants throughout the eastern United States. Those emissions are responsible for substantial public health and environment damage, and can be transported substantial distances downwind.

The Clean Air Act ("CAA" or the "Act") requires state implementation plans ("SIPs") to include measures that adequately address transported pollution, and EPA has a duty to enforce these requirements. EPA's proposed IAQR, however, does not fulfill that duty. In order to protect public health adequately, and to allow many areas around the country that will be in violation of the ozone and fine particulate ("$PM_{2.5}$") National Ambient Air Quality Standards ("NAAQS") to attain those standards, EPA must tighten the emission caps and make them effective several years earlier than proposed. Tighter and earlier emission caps are feasible and highly cost-effective, and are therefore required under the Act and governing regulatory precedent and policy.

I. Overview

Today, fossil fuel-fired power plants remain—despite much attention and concern in recent years—the largest source of industrial air pollution in the country. These emissions are harmful in their own right, but through atmospheric interactions they are also primary contributors to ozone smog and fine particle soot, both of which are extremely harmful to human health and the environment. For example, fine particle pollution resulting from US power plant emissions cuts short the lives of over 30,000 people per year.[1]

Many areas throughout the East and Midwest will not meet EPA's 1997 health-based air quality standards for $PM_{2.5}$ and 8-hour ozone when nonattainment designations finally become effective this year.[2] In order for many Eastern nonattainment areas to have a realistic chance of meeting those standards and improving the health of their citizens, steep reductions in transported power plant emissions of SO_2 and NOx are absolutely necessary. Furthermore, those reductions need to occur during the next several years to allow states to meet the attainment deadlines required by the Clean Air Act—that is, by 2009 for $PM_{2.5}$ and a range of years concentrated in the 2009-2013 timeframe for 8-hour ozone. Not only will earlier and steeper reductions allow states to

[1] Clean Air Task Force/Clear the Air, *Death, Disease, & Dirty Power: Mortality and Health Damage Due to Air Pollution from Power Plants*, October 2000, p3, available on line at http://www.catf.us/publications/reports/death_disease_dirty_power.php.

[2] The $PM_{2.5}$ and 8-hour ozone NAAQS revisions were promulgated in 1997 (62 Fed. Reg. 38652 and 62 Fed. Reg 38856, July 18, 1997), almost seven years ago, but nonattainment areas have yet to be finally designated by EPA for either NAAQS.

attain the PM and ozone NAAQS, but they will also deliver substantial additional public health benefits resulting from lower ambient pollution levels.

Although EPA's proposed IAQR will reduce power plant emissions, it does not go far enough or fast enough. As these comments will show (see CATF alternate analysis set forth *infra* in Section V hereof), more can be done to protect public health and to allow states to achieve attainment—and it can be done in a feasible, cost-effective manner. Therefore, EPA must:

- reduce the annual control region SO_2 cap to about 1.84 million tons (approximately equivalent to a 2 million ton nationwide cap);
- make the SO_2 reductions effective in one phase, by 2009;
- reduce the annual control region NOx cap in two phases to about 1.04 million tons (approximately equivalent to a 1.25 million ton nationwide cap);
- accelerate the second phase of the NOx reductions to 2012.

A. Basic Structure and Approach

The Clean Air Act requires states to include in their NAAQS implementation plans "adequate provisions…prohibiting…any source or other type of emissions activity within the State from emitting any air pollutant in amounts which will…contribute significantly to nonattainment in…any other State with respect to any such national primary or secondary air quality standard…." Section 110(a)(2)(D). If a state does not meet that requirement on its own, EPA must require it to do so.[3] Thus, once EPA has determined that transported pollution significantly contributes to downwind nonattainment problems, it must require that pollution to be eliminated.

In the NOx SIP Call[4], EPA established a basic two-step approach to addressing transport under Section 110 (a)(2)(D). There, EPA first conducted an air quality assessment to determine those states whose emissions are significantly contributing to downwind nonattainment. Second, EPA determined that the portion of transported emissions that "contributed significantly" to attainment problems and thus had to be abated were those emissions that could be controlled through the application of highly cost-effective pollution control measures.[5]

EPA has thoroughly documented the extensive effect of transported air pollution on downwind public health and welfare and resulting NAAQS attainment problems.[6] In

3 Section 110(k)(5) of the Act provides in pertinent part : "Whenever the Administrator finds that the applicable implementation plan for any area is substantially inadequate to …comply with any requirement of this chapter, the Administrator shall require the State to revise the plan as necessary to correct such inadequacies."

4 "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. 57356 (October 27, 1998) ("NOx SIP Call").

5 See, e.g, 63 Fed. Reg. 57356 at 57399-401.

6 See, e.g., IAQR, 69 Fed. Reg. at 4575-4609; see also 63 Fed. Reg. 57356 *et.seq.*

this case, EPA has shown that in the absence of regional reductions in NOx and SO_2 emissions, widespread ozone and $PM_{2.5}$ nonattainment will be experienced in the East, South and Midwest. More specifically, EPA has found that NOx and SO_2 emissions from 28 states plus DC contribute significantly to nonattainment of the $PM_{2.5}$ NAAQS in other states. However, as we will discuss in detail below, EPA's assessment of the level of emissions that may be controlled through highly cost-effective measures is arbitrary and a serious misapplication of the principle as it was used in the NOx SIP Call.

The Clean Air Act also requires states to achieve attainment "as expeditiously as practicable."[7] EPA's proposed IAQR, however, will not provide the reductions in transported emissions needed by downwind nonattainment areas in time to allow states to meet this requirement. As explained below, EPA's delay in implementing the reductions is apparently based on arbitrary and unsupported assumptions regarding boilermaker labor availability.

Although both the stringency and timing of the SO_2 and NOx emission reductions are inadequate and unlawful, we do support the basic structure of the IAQR. We agree with EPA that the control of both regional and local reductions is a more cost-effective, balanced, and reasonable approach to addressing nonattainment than relying on local reductions alone. Actually, neither local controls nor regional controls alone will do the job—both are needed for areas to achieve attainment pursuant to the requirements of the Clean Air Act.

We support EPA's focus on NOx and SO_2 as the pollutants to target now for reduction in the IAQR. While there are other $PM_{2.5}$ precursor emissions that must be controlled, none are as susceptible presently to regional control through a Section 110 SIP call as NOx and SO_2.

EPA predicts that the IAQR will produce important public health and environmental benefits and is dramatically cost-effective. According to EPA, by 2015 the proposed rule will annually prevent about 13,000 premature deaths, 18,000 heart attacks, over 8 million cases of acute respiratory symptoms and over one-and one-half million work and school days lost to illness.[8] EPA estimates that benefits exceed costs by about 21 to 1 (an estimate which omits many substantial benefits that were not included because EPA could not reduce them to a fixed monetary value). In fact, this enormous benefit-cost ratio makes clear that there is ample room for more stringent emissions limits in the IAQR. In other words, the public heath benefits that will flow from a tighter rule will still exceed costs by an overwhelming margin. From both a human and economic point of view, such large benefits should not be foregone.

We also generally support EPA's proposal to give the states the option of implementing the rule through a cap and trade program applied to power plant emissions, although we differ with EPA on the stringency and timing of those caps. We expect to

[7] Clean Air Act, Section 172(a)(2).
[8] 69 Fed. Reg. at 4644-47.

provide further comment on cap and trade issues once EPA has released specifics of its proposal, promised later this spring.

B. Stringency and Timing of Emissions Caps

EPA must tighten both the stringency and the timing of the proposed caps. The Clean Air Act requires, and the record abundantly supports, earlier and more substantial SO_2 and NOx reductions from the electric power sector, as these are necessary, feasible and highly cost-effective.

As a preliminary matter, EPA's choice of a minimum $PM_{2.5}$ state contribution threshold of 0.15 *u*g/m^3 is not supported by the record. EPA should adopt its alternative threshold, that is, 0.10 *u*g/m^3, as we discuss in greater detail *infra* in Section VI hereof.

EPA's selection of SO_2 and NOx regional cap levels is arbitrary and capricious and fails to ensure attainment as expeditiously as practicable consistent with Section 172 (a) of the Act, even in conjunction with additional state and local control measures that are more costly, difficult and less readily achievable. Although the Agency purports to base its chosen level on the approach to cost-effectiveness used in the NOx SIP Call, it does not do so. In fact, EPA does not determine any level of highly cost effective reductions for SO_2, but rather simply pre-selects a control level, and then attempts to justify it on general and ill-defined cost-effectiveness grounds. This is not the approach that EPA used in the NOx SIP Call. Rather, it appears that EPA simply designed its IAQR proposed control level to approximate those contained in the Bush administration's "Clear Skies" legislative proposal. Implementing the current Clean Air Act based upon, and constrained by, a not yet enacted legislative proposal—rather than the requirements of the Act and sound analysis and data—is the essence of arbitrary action.

EPA must apply the approach to determining an appropriate control level that it actually used in the NOx SIP Call. Application of that approach leads to a determination that "highly cost-effective" controls are those that achieve the "greatest feasible emission reductions"[9] but cost on average up to $2000 per ton of SO_2 removed and up to $2500 per ton of NOx removed.[10] As our analysis discussed *infra* in Section V will demonstrate, regional annual control caps for power plants of 1.84 million tons for SO_2 and 1.04 million tons for NOx are well within these limits for highly cost-effective controls.[11]

EPA states in its IAQR proposal that it is important to address transport "as early as possible." [12] We agree completely. But EPA's proposal does not do that. EPA's proposed 5-year delay in fully implementing the SO_2 cap is particularly unsupportable. States must achieve the $PM_{2.5}$ NAAQS "as expeditiously as practicable," but no later than

[9] NOx SIP Call, 63 Fed. Reg. at 57399: "[T]he required emission levels…were determined based on the application of NOx controls that achieve the greatest feasible emissions reductions while still falling within a cost-per-ton-reduced range that EPA considers to be highly cost-effective."
[10] Unless otherwise noted, all cost figures are in 1999$.
[11] *See* CATF analysis of the costs and benefits of a similar alternate control scenario, *infra*, in Section V hereof.
[12] 69 Fed. Reg. at 4579.

late 2009 or early 2010. Because compliance is measured by a 3-year average value, controls should be largely in place in 2006-07, long before EPA's proposed 2015 IAQR implementation date. Such delay is not allowed by law and not justified by an implied hypothetical (though highly speculative) shortage of boilermakers or any other relevant policy considerations. Nor is it acceptable to delay full implementation of the NOx cap until 2015.

C. Regional Haze

EPA has requested comment on a number of issues related to the relationship between the IAQR and regional haze requirements, including those in the Regional Haze Rule[13] ("RHR") and the proposed BART Guidelines.[14] EPA asks several questions that can be boiled down to whether the IAQR emission reductions satisfy either of two RHR requirements:

1. that states achieve reasonable progress towards the national visibility goal in the 2018 time frame; and
2. that certain BART eligible sources install BART controls.

Our simple answer to both of these questions is "NO."

RHR requirements are separate and independent from IAQR, and as a matter of both law and policy, EPA cannot substitute one set of requirements for the other. Under the RHR and BART Guidelines, states must analyze visibility conditions in Class I areas located both within their own boundaries and within other states in which their emissions are contributing to visibility impairment, and must develop plans leading to natural visibility conditions within 60 years in all Class I areas with visibility impairment to which they contribute. This analysis must include, during the first planning period, the identification of all major sources subject to BART requirements. Nothing in the IAQR changes that.

Of course, IAQR emission reductions can and should be considered by a state in developing its approach to achieving natural visibility by 2064, along with reductions of visibility impairing emissions from other national, regional and local programs. But the RHR remains an additional requirement, aimed only at visibility improvement in Class I areas, and a state's obligations to comply with the terms and process set out in the RHR cannot be altered or avoided by the IAQR.

D. Section 126 Petitions

The Agency also requests comment on its statements regarding potential state petitions under Section 126 of the Act. It is premature to prejudge potential state petitions to EPA seeking emission reductions of NOx and SO2 under Section 126. For

[13] EPA, "Regional Haze Regulations," 64 Fed. Reg. 35714 (July 1, 1999).
[14] EPA, "Proposed Guidelines for Best Available Retrofit Technology (BART) Determinations Under the Regional Haze Regulations," 66 Fed. Reg. 38108 (July 20, 2001) (hereafter "BART Guidelines").

one thing, as the courts have recognized, Sections 126 and 110(a) provide separate and independent processes for requiring regional emission reductions, and action under one section cannot void action under the other. Furthermore, the IAQR does not, and legally cannot, target specific sources, and does not take the individualized needs and circumstances of each downwind state separately into account, as a state Section 126 petition can do. EPA must not attempt in this rulemaking to short-circuit or prejudge any Section 126 petitions it may receive from individual states.

II. Power Plant Emissions Endanger Public Health and Welfare and Must be Substantially Reduced

As stated above, power plants remain a major a source of NOx and SO_2 emissions, which react in the atmosphere to form other unhealthful secondary pollutants such as ground-level ozone and fine particulate matter such as sulfate and nitrate. EPA estimates that by 2010, power plants will be responsible for fully two-thirds of the SO_2 emissions and about one-fourth of the NOx emissions in the region of the eastern and midwestern US impacted by EPA proposed rulemaking.[15]

A. Public Health Impacts

Over 3000 new studies assembled for the 2001 EPA review of Air Quality Criteria for Particulate Matter link particulate matter with numerous adverse human health effects.[16] As summarized by EPA in several recent rulemakings, including the IAQR, these effects include "premature mortality, aggravation of respiratory and cardiovascular disease (as indicated by increased hospital admissions, emergency room visits, absences from school or work, and restricted activity days), lung disease, decreased lung function, asthma attacks, and certain cardiovascular problems such as heart attacks and cardiac arrhythmia."[17] Three major cohort studies including new studies sponsored by the Health Effects Institute—an EPA-industry jointly funded group—have consistently associated fine particulate matter with premature death throughout the United States.[18]

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[15] See IAQR, 69 Fed.Reg. 4566 at 4610.

[16] U.S. EPA (2001) Air Quality Criteria for Particulate Matter, Second External Review Draft; EPA Office of Research and Development, March 2001. See also detailed information gathered by EPA online at http://www.epa.gov/ttn/naaqs/standards/pm/s_pm_index.html.

[17] See 69 Fed. Reg. at 4571; see also 66 Fed. Reg. 5002 at 5018. More detailed information on the link between particulate matter and cardiac arrhythmia and increased incidence of cardiovascular disease is discussed in: Liao, D., Creason, J, Shy, C., Williams, R, Watts, R. and Szweidinger, R (1999). *Daily variation of particulate air pollution and poor cardiac autonomic control in the elderly*, Environmental Health Perspectives, v. 107, no. 7, p. 521-525.

[18] See, e.g.,

Pope, C.A., Thun, M.J., Namboordiri, M.M. and Dockery, D.W., et al.; *Particulate Air Pollution as a Predictor of Mortality in a Prospective Study of U.S. Adults.* 151 American Journal of Respiratory and Critical Care Medicine (1995). Available online at http://ajrccm.atsjournals.org/search.shtml.

CATF, on behalf of the Clear the Air power plant campaign, recently commissioned Abt Associates to quantify the health impacts of fine particulate pollution from power plants. This study, and the CATF/Clear the Air report that accompanied it[19], are available online at http://www.catf.us/publications/index.php. The Abt Associates study estimated that about 30,000 premature deaths per year are associated with power plant particulate matter alone.[20]

EPA also has discussed in recent rulemakings the harm to human health resulting from ozone. In brief, short-term exposure to ozone smog can cause a myriad of harmful human upper and lower respiratory system effects, including chest pain, coughing, throat irritation, shortness of breath, reduced lung function, inflammation and other changes of lung tissue, increased hospital admissions and emergency room visits, impaired immune systems, and exacerbation of asthma-related symptoms.[21] Effects of longer term ozone exposure described by EPA include inflammation of and damage to the lining of the lungs, transient pulmonary function responses, transient respiratory symptoms, effects on exercise performance, increased airway responsiveness, increased susceptibility to respiratory infection, increased hospital and emergency room visits and transient pulmonary respiratory inflammation.[22] Recent studies also suggest that ozone is associated with stunted lung development in children.[23] And some studies have suggested that ozone may be associated with premature mortality independent of PM exposure.[24] EPA is currently reviewing key new health information suggesting the association between elevated ozone levels and the development of new-onset asthma,

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Krewski, D., Burnett, R.T., Goldberg, M.S., Hoover, K., Siemiatycki, J., Jerrett, M., Abrahamowicz, A. and White, W.H., *Reanalysis of the Harvard Six Cities Study and the American Cancer Society Study of Particulate Matter and Mortality;* Special Report to the Health Effects Institute, Cambridge, MA (July 2000).

Samet, J.M., Dominici, F., Zeger, S.L., Schwartz, J. and Dockery, D.W.; *National Morbidity, Mortality and Air Pollution Study, Part II: Morbidity, Mortality and Air Pollution in the United States;* Health Effects Institute Research Report No. 94, Cambridge MA (June 2000).

Dockery, D.W., Pope, C.A., Xu, S. and Spengler, J.D., et al; *An Association Between Air Pollution and Mortality in Six U.S. Cities;* 329 New England J. Medicine 1753-59 (1993). Available online at http://nejm.org/content/1993/0329/0024/1753.asp.

[19] CATF/Clear the Air, *Death, Disease, & Dirty Power: Mortality and Health Damage Due to Air Pollution from Power Plants*, October 2000.

[20] Abt Associates (2000), *The Particulate-Related Health Benefits of Reducing Power Plant Emissions*, Bethesda MD, available online at http://www.catf.us/publications/reports/Abt_PM_report .

[21] See 69 Fed. Reg. at 4571; see also EPA's "Control of Air Pollution from New Motor Vehicles: Heavy-Duty Engines and Vehicle Standards and Highway Diesel Sulfur Control Requirements," 66 Fed. Reg. 5002 at 5012-13 (January 18, 2001); and EPA's "Control of Emissions of Air Pollution From Nonroad Diesel Engines and Fuel," 68 Fed. Reg. 28328 at 28346-347 (May 23, 2003) (hereafter "HD Nonroad Rule").

[22] See 69 Fed. Reg. at 4571, 66 Fed. Reg. at 5017.

[23] Plopper, C.G., Fanucci, M.V., Evans, M.J., Larson, S.P., Schelegle, E.S., Joad, J.P., Pinkerton, K.E., VanWinkle, L.S., Gershwin, L.J., Miller, L.A., Wu, R., Buckpitt, A.R., and Hyde, D.M. 2001. *Air pollution effects in a primate model of asthma*. Abstract and presentation, HEI Annual Conference, Washington DC; Program and Abstracts; Health Effects Institute, Cambridge MA, 02139

[24] Thurston, G.D. and Ito, K. (2000) *Epidemiological Studies of ozone exposure effects,* in Air Pollution and Health, S.T. Holgate Ed. Academic Press

increased hospital admissions for young children, increased school absences and premature mortality.[25]

B. Public Welfare Impacts

Power plant emissions also contribute to numerous adverse welfare and environmental effects. These include acid deposition, watershed eutrophication and nitrification, and visibility impairment and regional haze. EPA summarizes these effects in the IAQR, and others have done so as well.[26]

III. EPA's Proposed Caps on Power Plant SO_2 and NOx Emissions are Inadequate to Protect Public Health and to Allow NAAQS Attainment and Must be Strengthened.

The severe harm to human health and the environment described above demand the most substantial reductions in regional power plant emissions of SO_2 and NOx that are feasible and cost-effective. The nonattainment provisions of the Clean Air Act require no less. EPA's proposal does not accomplish this—tighter caps for both pollutants are quite feasible and highly cost-effective, and EPA must require them. Specifically, as previously indicated, we believe EPA must limit regional SO_2 emissions to 1.84 million tons annually and regional NOx emissions to 1.04 million tons annually.[27]

A. Tighter Control Levels on Regional Power Plant Emissions of SO_2 and NOx are Feasible.

Emissions control technology for SO_2 emissions is well demonstrated and established, and has been commercially available for decades.[28] Wet and dry flue gas desulfurization (FGD) technologies have been available for over 30 years, and routinely achieve SO_2 control efficiencies of 90 to 95+%.[29] In conjunction with its 1999 regional haze rulemaking, EPA proposed in its 2001 BART Guidelines a presumption that "an SO_2-control level in the 90—95% range is generally achievable" for uncontrolled boilers

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[25] 68 Fed. Reg. at 28347. See also 69 Fed. Reg. at 4644-45.

[26] 69 Fed. Reg. at 4571-72, 4642-43, and 4645-47.
See also, CATF/Clear the Air, *Unfinished Business: Why the Acid Rain Problem is not Solved,* Oct. 2001, available online at http://www.catf.us/publications/reports/acid_rain_report.php; and
CATF/Clear the Air, *Out of Sight: Power Plant Emissions and Haze in Our National Parks*, Sept. 2000, available online at http://www.catf.us/publications/reports/out_of_sight.php.

[27] Based on the relative percentage of national 2002 power plant NOx and SO_2 emissions that were within the IAQR, the recommended regional caps are equivalent to a 2.0 million ton national SO_2 cap, and a 1.25 million ton national NOx cap.

[28] See, e.g., 69 Fed. Reg. at 4612.

[29] See, e.g., 69 Fed. Reg. at 4612; Srivastava, R.K., and Jozewicz, W., *Controlling SO_2 Emissions: Analysis of Technologies*, EPA/600/SR-00/093, November 2000.

and thus should be considered to be best available retrofit technology for purposes of controlling visibility-impairing SO_2 emissions.[30]

Reductions in power plant NOx emissions in the 90% range are also feasible using selective catalytic reduction (SCR) technology.[31] SCR technology for NOx control, although much more recent than FGD control for SO_2, is now in widespread use in the utility industry and is proving to be reliable and effective. EPA reports that "[o]perating data available from many plants indicate that the 90% NOx removal rate has been met or exceeded at these plants."[32]

B. Tighter Control Levels on Regional Power Plant Emissions of SO_2 and NOx are Highly Cost-Effective.

1. Arbitrary departure from governing methodology

In the 1998 NOx SIP Call, EPA determined an appropriate level for reductions of regional NOx emissions by examining the cost-effectiveness of feasible control measures.[33] EPA purports to use that same methodology in the IAQR, but it does not in fact do so. As a result, the proposed IAQR contains unreasonably and unlawfully lenient emission caps for SO_2 and NOx. These caps do not follow from a rational application or appropriate evaluation of cost-effectiveness data. Rather, they simply appear to approximate the equivalent national caps in the Bush Administration's "Clear Skies Initiative" (CSI) proposal.[34] For the reasons discussed below, the IAQR's emissions control requirements and methodologies that drove their development are arbitrary, capricious and an abuse of the Agency's discretion.

As explained below, EPA determined in the NOx SIP Call that "highly cost-effective" controls were those with a cost-effectiveness (measured in terms of average cost per ton of pollutant removed) equivalent to or slightly greater than that of controls that had already been implemented or planned, while achieving the greatest feasible emissions reductions. This is the legally governing standard that should determine the "greatest feasible emissions reductions" and "highly cost-effective" controls for the IAQR too, in order to ensure attainment as expeditiously as practicable consistent with CAA §§ 110 and 172.

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[30] BART Guidelines, 66 Fed. Reg. at 38130.
[31] See, e.g., 69 Fed. Reg. at 4612.
[32] 69 Fed. Reg. at 4612.
Also, a recent report by Northeast States for Coordinated Air Use Management (NESCAUM) stated: "Recent experience with actual SCR installations and vendor representations concerning expected system performance suggest that future SCR installation—especially when coupled with advanced low-NOx burner technology—can be expected to consistently deliver reductions in excess of 90 percent." NESCAUM, Power Companies Efforts to Comply with NOx SIP Call and Section 126: Progress Report, May 2001, available online at http://www.nescaum.org/resources/reports/index.html.
[33] NOx SIP Call ,63 Fed. Reg. at 57399-402.
[34] S.485, "The Clear Skies Act of 2003."

Specifically, EPA determined in the NOx SIP Call that "highly cost-effective" controls were those that "achieve the greatest feasible emissions reduction but still cost no more than $2000 per ton of ozone season NOx emissions removed (in 1990 dollars), on average."[35] EPA determined the $2000/ton average cost figure based on "NOx emissions controls that are available and of comparable cost to other recently undertaken or planned NOx measures."[36] EPA set out the costs of those recent measures that it considered in the following table:[37]

Table 1.--Average Cost-effectiveness of NO[X] Control Measures Recently Undertaken [1990 dollars]

Control measure	Cost per ton of NO[X] Removed
NO[X] RACT	150-1,300
Phase II Reformulated Gasoline	fn52 4,100
State Implementation of the Ozone Transport Commission Memorandum of Understanding	950-1,600
New Source Performance Standards for Fossil Steam Electric Generation Units	1,290
New Source Performance Standards for Industrial Boilers	1,790

fn52 Average cost representing the midpoint of $ 2,180 to $ 6,000 per ton. This cost represents the projected additional cost of complying with the Phase II RFG NO[X] standards, beyond the cost of complying with the other standards for Phase II RFG.

Significantly, the cost of all of these measures (except for the Ph II RFG costs, which EPA explained were not strictly comparable to the other costs) fall below the $2000/ton figure for highly-cost effective measures.

Although EPA states that it "proposes to use this approach" in the IAQR,[38] it proceeds in a significantly different manner. First of all, EPA here does not apply the principle of highly-cost effectiveness as it was used in the NOx SIP Call—that is, a mechanism to ensure that controls that obtain the "greatest feasible emissions reductions" are not significantly less cost-effective than other control measures recently implemented or planned. In fact, EPA does not determine a level of highly-cost effective controls for SO_2 at all. Its selection in the IAQR proposal of SO_2 control levels costing between $700 and 800 on average[39] thus has no reference to either the "greatest feasible emissions reduction" principle or the "highly cost-effective" principle, and is arbitrary and capricious. With respect to NOx, EPA does reaffirm in the IAQR that measures costing on average less than $2500/ton (in 1999$, equivalent to the $2000/ton in 1990$ figure established in the NOx SIP Call) would be considered highly cost-effective.[40] However, EPA then selects NOx control levels that it estimates will cost between $700-800/ton on

[35] 63 Fed. Reg. at 57399.
[36] 63 Fed. Reg. at 57400.
[37] 63 Fed. Reg. at 57400.
[38] 69 Fed. Reg. at 4612.
[39] 69 Fed. Reg. at 4613.
[40] 69 Fed. Reg. at 4614.

an annual basis.[41] Again, these levels have no rational relationship with either of the above-mentioned NOx SIP Call principles and are arbitrary and capricious.

In addition, to the extent that EPA considers "highly cost-effectiveness" at all in determining SO_2 and NOx control levels in the IAQR, it does so in an unlawful manner. Rather than determining a cost range for other recently undertaken measures and finding that most of the measures within that range are "highly cost-effective"—as EPA did in the NOx SIP Call—here, in the IAQR, EPA labels those costs as merely "cost-effective," and then continues:

> "EPA believes that controls with costs towards the low end of the range may be considered to be highly cost effective because they are self-evidently more cost effective than most other controls in the range."[42]

This rationale – and its departure from the NOx SIP Call approach above – are arbitrary, capricious and an abuse of the Agency's discretion.[43] If followed to its ultimate conclusion, it means that the only truly highly cost-effective controls would be none at all.

As indicated above, EPA in the NOx SIP Call examined the average cost-effectiveness of a range of NOx control measures recently undertaken at that time – ranging from NOx RACT to new source performance standards (NSPS) to other SIP measures. 63 Fed. Reg. at 57400, Table 1. Most of those measures had a lower average cost than the cost of the control level chosen. In contrast, the IAQR proposal also provides a range of average control costs in place or to be undertaken, but the vast majority of those are higher than the $700-800 figures upon which the proposal establishes its control levels. The proposal does not rationally explain why it is appropriate from a legal, policy, air quality, public health, economic or statistical perspective to determine the greatest feasible emissions reductions upon figures that are at the lowest ends of the range of average control costs identified.

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[41] 69 Fed. Reg. at 4614-15. EPA also calculates somewhat higher average cost figures for ozone season only caps, but those are relevant only for CT, since the NOx caps for all of the other affected states are all based on full year reductions.

[42] 69 Fed. Reg. at 4613.

[43] EPA's statement does not explain or even discuss the sweeping departure from the rationale and approaches employed in the NOx SIP Call. The statement is purely conclusory – even calling its assertion "self evident." Worse, the statement is simply wrong as a factual matter, due to its abuse of the concept of cost effectiveness. The statement asserts that controls with costs toward the low end of the range are highly cost effective "because they are self-evidently more *cost effective* than most other controls in the range." 69 Fed. Reg. at 4613. It is plain what the proposal means, however, is that these low range costs are simply *cheaper* – that being the only proposition that is "self-evident." Cheap, however, is not the same as cost-effective. These cheaper costs come at the expense of EPA's legal obligations, the specific objectives of the Clean Air Act, and the province of this rulemaking -- abating significant contributions to nonattainment from transported pollution, in order to achieve attainment as expeditiously as practicable. True cost-effectiveness considers cost in meeting these objectives, whereas the IAQR proposal abandons these objectives in favor of minimizing cost as much as possible. This is arbitrary, capricious and an abuse of discretion.

It is absolutely clear that in NOx SIP Call EPA did NOT determine a range of costs for recent control measures, and then simply state that costs on the very low end of the range were "highly" cost-effective, as the Agency does in its IAQR proposal. Rather, as stated above, EPA determined in its earlier rulemaking that most or all of the measures within the cost range were highly cost-effective. EPA explained its rationale for this approach as follows:

> "With few exceptions, the average cost-effectiveness of these measures is representative of the average cost-effectiveness of the types of controls EPA and States have needed to adopt most recently because their previous planning efforts have already taken advantage of opportunities for even cheaper controls. The EPA believes that the cost-effectiveness of measures that EPA or States have adopted, or proposed to adopt, forms a good reference point for determining which of the available additional NOX control measures can most easily be implemented by upwind States whose emissions impact downwind nonattainment problems." [emphasis supplied] 63 Fed. Reg. at 57400.

The $2,000/ton figure selected by EPA was in *excess* of the average cost-effectiveness amounts identified by the Agency (see 63 Fed. Reg. at 57400, Table 1) precisely because state and local air quality planners had already taken advantage of the opportunities for these cheaper controls.

This approach makes perfect sense in the context of determining an appropriate level for regional emission reductions. Simply put, measures that have already been proposed or implemented are likely to be more cost-effective than other local measures that are feasible and still cost-effective but more expensive and difficult to implement.[44]

The IAQR proposal, however, subverts this prior practice, rationale, and logic in a manner that is arbitrary and capricious. Control levels for NOx and SO_2 with average costs in the range of $700-$800 clearly do not achieve the "greatest feasible emissions reductions." These cost figures are substantially less than what EPA determined to be highly cost effective 6 years ago; substantially less than the average cost effectiveness of other NOx control measures examined by the agency 6 years ago (63 Fed. Reg. at 57400, Table 1); substantially less than the average cost of other control measures identified by EPA in the proposal today (69 Fed. Reg. at 4613-4615); and even more substantially less

[44] We note that EPA primarily based its determination of "highly cost-effective" controls in the NOx SIP Call on average costs rather than incremental or marginal costs. EPA explained that the use of average costs were appropriate in view of the additional flexibility provided to sources by a cap and trade approach to implementation. 63 Fed. Reg. at 57399. Of course, the proposed IAQR will also utilize a cap and trade program, so average rather than marginal costs should be the primary focus of a cost-effectiveness determination here as well. In fact, we believe that it is arbitrary and capricious for EPA to switch its primary focus from average to marginal costs in the IAQR without an adequate explanation of why its previous approach in the NOx SIP Call is no longer valid.

than numerous other measures we have identified that states have either adopted or are proposing to adopt (see discussion *infra* in Section III.B.3).[45]

The IAQR's selection of these control costs results in an establishment of "greatest feasible emissions reductions" that are no such thing; EPA has radically short changed the emissions reductions that should be considered the greatest feasible by abandoning and manipulating the cost effectiveness methodology employed in the NOx SIP Call. As discussed earlier, this outcome flows inexorably from the Agency's irrational and unlawful decision to work backwards from the politically created cap levels in a legislative proposal, rather than working forward from an honest analysis of highly cost effective controls, alternative state and local control costs, and greatest feasible emissions reductions. Accordingly, the proposal is arbitrary, capricious and an abuse of discretion.

In fact, EPA's approach in the IAQR proposal to require only the lowest cost of those controls that have been implemented elsewhere was explicitly rejected by EPA in the NOx SIP Call. In the SIP Call—unlike this proposal—EPA considered and costed out several alternative control levels. It explicitly considered—and rejected—a more lenient control level than the 0.15 lb/mmBtu level chosen: "A regionwide level of 0.20 lb/mmBtu was rejected because though it resulted in an average cost-effectiveness of less than $2000 per ton, the air quality benefits were less than those for the 0.15 lb/mmBtu level which was also less than $2000 per ton."[46]

This, too, makes clear that EPA's IAQR proposal arbitrarily fails to consider the critical factor of "greatest feasible emission reductions" achievable by the proposal. Stated differently, EPA fails to consider the amount of air quality benefits to be produced by the rule. After all, at its root cost-effectiveness does not simply mean the lowest cost—rather, it implies a consideration of both costs and effects (benefits). Thus, normally a measure can be considered cost-effective if it produces greater benefits than costs. EPA's IAQR proposal is certainly more than "highly cost-effective" by nearly any measure. EPA has conducted a monetary cost-benefit analysis of the IAQR proposal that does not include many costs because EPA does not have an acceptable method for quantifying them in monetary terms.[47] As a result, benefits, and the resultant cost-effectiveness, are likely substantially understated. Even so, EPA calculates that the benefits of its proposal exceed costs by a factor of about 21 to 1.[48] Thus, even were EPA's proposal to be strengthened to the point where it doubled or tripled in cost, it

[45] In fact, EPA states: "These reductions are among the lowest cost EPA has ever observed in NOx control actions…." 69 Fed. Reg. at 4614. Such reductions clearly come nowhere near to representing the "greatest feasible emission reduction" as required by controlling Clean Air Act precedent and policy.
[46] 63 Fed. Reg. 57401. We note that EPA rejected a more stringent control level that cost slightly less than $2000/ton. However, that rejection was based in large part on EPA's concern that such a level might be difficult to implement or result in electric system reliability problems. In this context, it must be remembered that SCR then was a much less proven technology than it is now, and that FGD is now.
[47] 69 Fed. Reg. at 4645-47.
[48] 69 Fed. Reg. at 4644-46.

would still be considered by most to be highly cost-effective.[49] EPA's failure to require tighter emission controls will result in thousands of additional premature deaths, billions of dollars in social costs, but relatively insignificant increased costs to the power sector.[50]

In sum, EPA must apply in the IAQR the approach to selecting an emission control level that it actually used in the NOx SIP Call. That is, it must establish a control level that is both highly-cost effective and achieves the greatest feasible emissions reduction. EPA has confirmed its finding in the NOx SIP Call that a NOx control level with an average cost of up to $2500/ton is highly cost effective. Although EPA did not make any finding of a highly cost-effective level for SO_2 control, it did find that the cost range for BACT determinations was between $500 and $2100 a ton.[51] Pursuant to the approach used in the NOx SIP Call, measures with costs at or slightly above the high end of this range would be considered "highly cost-effective." Controls on SO_2 emissions costing on average less than approximately $2000/ton would meet this criterion.

2. NOx and SO_2 Control Costs.

In the NOx SIP Call and many other recent rulemakings, EPA has evaluated alternative levels of controls and has estimated their cost. But EPA did not do that in the IAQR. Thus the only information in the proposed IAQR that indicates what the cost-effectiveness of a tighter (or looser) SO_2 or NOx regional power plant cap would be is reflected by the marginal cost curves for NOx and SO2 reductions found in the IAQR proposal, EPA's January 28, 2004 Memorandum to the Docket entitled "Analysis of the Marginal Cost of SO2 and NOx Reductions" ("Marginal Cost Memo") and EPA's IPM runs.[52] EPA's marginal cost curves (EPA provides no average cost curves in the IAQR) show that reducing national EGU SO_2 emissions to an aggregate of 2.0 million tons in 2010 would have a marginal cost of slightly higher than $2000/ton. However, a 2.0 million ton national cap required as part of a national cap and trade program along the lines proposed in the IAQR, would leave SO_2 emissions in 2010 substantially in excess of 2 million tons, due primarily due to the large number of banked allowances in the Title IV Acid Rain Program.[53] As discussed below, EPA estimated several years ago in its "Straw Proposal" presentation to EEI that a 2010 national SO_2 power plant cap of 2 million tons would result in SO_2 emissions of about 4.5 million tons in 2010 and about

[49] According to several alternate reduction scenario analyzed by CATF and discussed in greater detail in Section V *infra*, tighter emission caps and/or schedules would produce billions of dollars of additional benefits, far in excess of additional costs, with benefit/cost ratios of 12 to 1and greater.
[50] *Id.*
Furthermore, EPA admits as much: "The selected approach was well below the point at which there would be significant diminishing returns on the dollars spent for pollution control." 69 Fed. Reg. at 4614.
[51] 69 Fed. Reg. at 4613.
[52] 69 Fed. Reg. at 4613-16.
[53] According to EPA, as of the end of 2002, there were about 8.65 million banked SO2 allowances. EPA's Acid Rain Progress Report, November 2003, Figure 5 at p.4, available online at EPA's website.

3.0 million tons in 2015.[54] According to EPA's marginal cost curve, reduction of SO_2 emissions to a national level of 3 million tons in 2015 would have a marginal cost of about $1100/ton.

CATF engaged ICF Consulting to estimate the emissions and costs of regional SO_2 and NOx emission cap levels and dates tighter than those proposed in the IAQR—that is, a 1.84 million ton SO_2 regional cap in 2009 and a 1.04 ton NOx regional cap effective in 2012 (Alternate Control Scenario). ICF used the same version of the Integrated Planning Model (IPM) used by EPA in the IAQR. The methodology used in that analysis and the results thereof are discussed in detail *infra*, at Section V hereof. For now, we simply note that the average cost of the emissions reductions in the Alternate Control Scenario resulting from the ICF IPM runs were about $1150 per ton of SO_2 reduced in 2010 and $1050 per ton of combined NOx and SO_2 reduced in 2015.[55] These are well within the "highly cost-effective" parameters of $2000/ton for SO_2 and $2500/ton for NOx developed earlier.

Other analyses that have been performed also provide important information on likely SO_2 reduction costs, information that is consistent with the CATF/ICF Alternate Control Scenario analysis. Several years ago, MSB Energy Associates of Middleton, WI performed an analysis for CATF estimating the cost of SO_2 removal from US coal-fired power plants. This is a detailed plant-by-plant analysis of the cost of controlling SO_2 emissions from all 495 coal-fired power plants in the US through the application of FGD technology.[56] The analysis is based on standard fixed and variable control costs and 1999 plant operations and emissions; the cost per ton of SO_2 removed is expressed in 2001 dollars.[57] A more detailed explanation of the methodology and sources used in the MSB analysis are found in Appendix 1 attached hereto. The results are reproduced below:

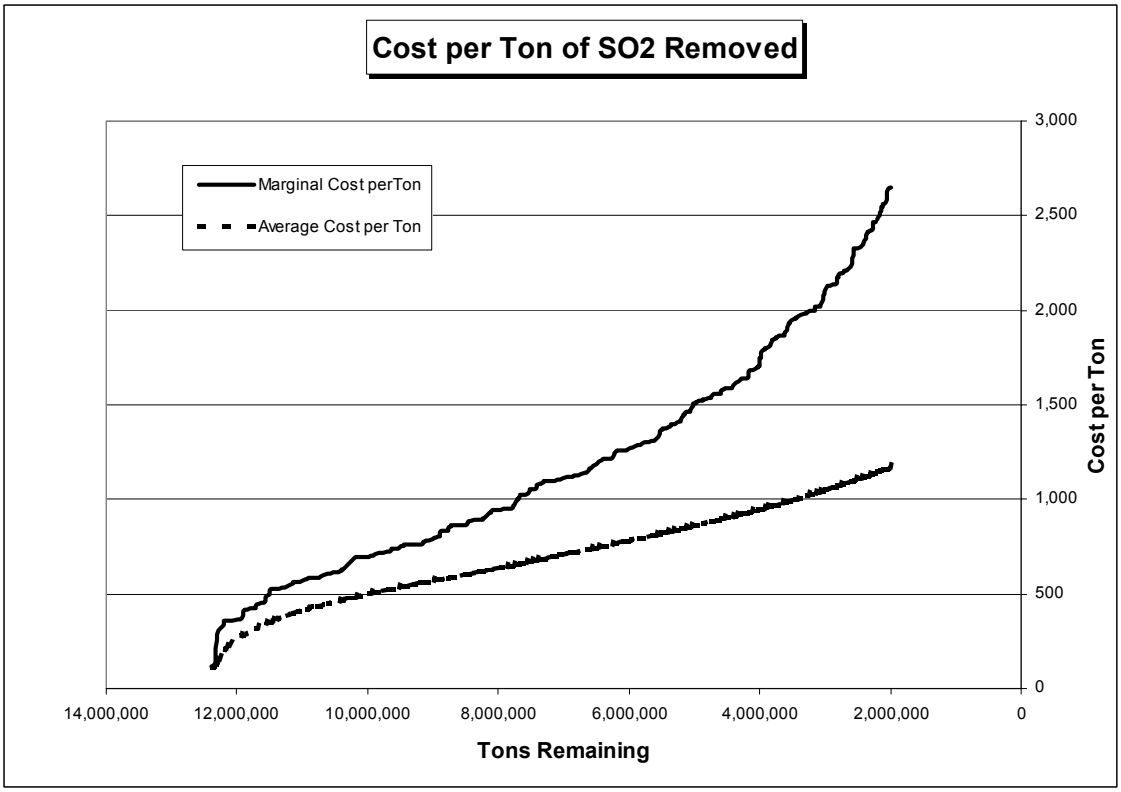
Figure III-1

[54] U.S. EPA, "Discussion of Multi-Pollutant Strategy," Meeting with EEI, September 18, 2001; "Comparison of Requirements Under Business-as-Usual and the Straw Proposal," pp. 10, 14. Available at http://www.cleartheair.org/currentstatus.pdf (EPA 2001 EEI Presentation).

[55] We could not determine separate cost-effectiveness for NOx and SO_2 reductions in 2015, but even if one assumes that ALL of the 2015 emission reduction costs were attributed to SO_2, the average cost would be only about $1,400 per ton removed.

[56] Because the analysis does not account for the fact that owners have access to control options other than FGDs, and will likely use them if they are cheaper, the costs reported by MSB are likely to be on the high side. Thus, the MSB analysis estimates the cost of actually reducing emissions to a certain level, rather than setting a cap in an allowance trading program at a certain level.

[57] In 1999, EPA reported that national SO_2 emissions from all Title IV units were 12,452,307 tons. SO_2 emissions from coal-fired power plants were 11,836,806 tons, or 95% of the total.



This analysis indicates that the average cost of reducing SO_2 emissions at US power plants (through the use of scrubbers exclusively) to an aggregate of 2.0 million tons is about $1150/ton, and the marginal cost of doing so is slightly above $2500/ton. Again, due to the use of banked allowances, if a national cap and trade program were employed along the lines proposed in the IAQR, a 2.0 million ton national cap would result in SO_2 emissions in 2010 of about 4.5 million tons.[58] Thus, the cost of a 2 million ton cap in 2010 would be lower than the cost of reducing actual emissions to 2 million tons in the same time frame. The MSB analysis shows that the cost of reducing power plant SO_2 emissions to 4.5 million tons is about $900/ton on an average basis and $1600/ton on a marginal basis. Therefore, the cost of a 2.0 million ton national SO_2 cap in 2010 should be well within the highly effective average cost limit of $2000/ton.

EPA in other venues has evaluated various levels of regional and national power plant controls. One such EPA evaluation occurred as part of the regulatory package revising the ozone and PM NAAQS in 1997. There, EPA prepared an economic analysis of coordinated implementation of these two NAAQS. This Regulatory Impact Analysis (1997 RIA)[59] estimated the incremental costs and benefits by 2010 of control measures

[58] EPA 2001 EEI Presentation at pp. 10, 14.

[59] Innovative Strategies and Economics Group, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, July 17, 1997, *Regulatory Impact Analysis for the Particulate Matter and Ozone National Ambient Air Quality Standards and Proposed Regional Haze Rule,* available on the Internet at http://www.epa.gov/ttn/oarpg/naaqsfin/ria.html.

intended to implement the new 8-hour ozone NAAQS, followed by those implementing the new $PM_{2.5}$ NAAQS. EPA estimated implementation costs and benefits in 2010 for a partial attainment scenario and a full attainment scenario.[60] We need not get into all of the details of that comprehensive analysis here. What is relevant here is that EPA assumed and evaluated certain control measures for the electric utility sector as part of those analyses, including a national cap and trade program that reduced the annual SO_2 emissions. In its "partial attainment scenario," EPA assumed no additional power plant NOx controls beyond the NOx SIP Call (which it included in its base case). For SO_2, however, EPA assumed a national cap and trade program that would reduce the annual Title IV cap by 60% in 2005, to 3.58 million tons.[61] EPA estimated that resulting total national emissions would be as follows:[62]

- CAA baseline utility NOx emissions— 3.6 million tons
- CAA baseline utility SO_2 emissions— 9.7 million tons
- Post-control utility SO_2 emissions— 5.25 million tons.[63]

In the 1997 RIA, EPA also discussed a "full attainment scenario," consisting of a mixture of specified and unspecified control measures that might be applied to attain the NAAQS, and estimated resulting emission reductions. The specified measures included the following from the utility sector:[64]

- 90% SO_2 reduction over Title IV, with a NOx limit at 0.10 lb/MMBTU;
- 95% SO_2 reduction over Title IV, with a NOx limit at 0.05 lb/MMBTU.[65]

These measures produced the following projected incremental reductions (beyond residual emissions from the partial attainment scenario) of national utility NOx and SO_2 emissions in 2010:[66]

- 90% SO_2 reduction, with NOx limit at 0.10 lb/MMBTU—
  - 2.4 million tons additional SO_2 reductions, leaving residual national utility SO_2 emissions at about 2.8 million tons
  - 300,000 tons NOx reductions
- 95% SO_2 reduction, with NOx limit at 0.05 lb/MMBTU—
  - 2.9 million tons additional SO_2 reductions, leaving residual national utility SO_2 emissions at about 2.4 million tons
  - 600,000 tons NOx reductions.

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[60] *See, e.g.*, 1997 RIA at ES-5—10; 1997 RIA, Table 6.5.
[61] *See* 1997 RIA at 5-5—8.
[62] *See* 1997 RIA at 6-19, 6-22; *see also*, App. F-1 at F-9.
[63] These figures compare closely with national SO_2 levels projected by EPA in the IAQR. See, e.g., Economic & Energy Analysis for the Proposed IAQR, Jan. 28, 2004, Table 1 at 2 (hereafter "Economic & Energy Memo").
[64] 1997 RIA, App. F-1 at F-9.
[65] While the SO_2 reductions are national, it appears that the NOx reductions were tied to the OTAG process, and thus are ozone season reductions within the OTAG area.
[66] 1997 RIA, App. F-1 at F-9.

As part of this analysis, EPA estimated that the average incremental cost (i.e., marginal cost) effectiveness of the 90% and 95% SO_2 reduction scenarios would respectively be $1360 and $1720 per ton of SO_2 removed (1990$).[67] Thus, when converted to 1999 dollars, the marginal cost of the 90% SO_2 reductions would be about $1700/ton and of the 95% SO_2 reductions would be about $2150/ton, about equal to or less than the average cost $2000/ton cut-off for highly effective control measures.[68]

In September, 2001, EPA made a presentation to EEI in which it discussed its so-called "Straw Proposal" for power plant reductions.[69] This proposal included analysis of the following national power plant emission caps and emissions:

> SO_2—2.0 million ton national cap in 2010, resulting in national power plant emissions of:
>
> 4.5 million tons in 2010,
> 3.0 million tons in 2015, and
> 2.3 million tons in 2020.[70]
>
> NOx—1.25 million ton national cap in 2012, resulting in national power plant emissions of:
>
> 1.6 million tons in 2010, and
> 1.25 million tons in 2015.[71]

In this presentation, EPA estimated the marginal cost of reducing national power plant SO_2 emissions to 3.0 million tons in 2015 via a 2.0 million ton national cap in 2010 at slightly higher than $1000 per ton.[72] This is substantially below the $2000 per ton average cost cut-off for "highly cost effective" SO_2 reductions recommended above. As demonstrated by the MSB analysis discussed above, the average cost of that level of reductions would be even lower. The marginal cost of reducing national power plant NOx emissions to a level of 1.25 million tons in 2015 via a 1.25 million ton 2010 cap was estimated to be about $1450 per ton.[73] Again, this level is comfortably below the $2500 per ton average cost cutoff for "highly cost effective" NOx reductions discussed above.

There are several other ways to look at the adequacy of the proposed IAQR reductions. First of all, Resources for the Future recently conducted a study of the cost-

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[67] 1997 RIA, App. F-1 at F-9.

[68] EPA estimated the marginal cost of the additional seasonal NOx reductions at greater than $2000/ton, but did not give average cost figures, so no meaningful comparison can be made. Such is not the case with SO_2—since the marginal cost of the deeper reduction levels are near or below the $2000/ton average cost cut-off, the average cost of those deeper reductions will be well below the cut-off, as the MSB analysis discussed above demonstrates.

[69] EPA 2001 EEI Presentation, at 10.

[70] *Id* at 10, 14.

[71] *Id* at 10, 16.

[72] *Id* at 14, 20. EPA estimated that the 2.0 million ton SO_2 cap would produce 2010 emissions of 4.5 million tons at a marginal cost of less than $1000/ton.

[73] *Id* at 21. EPA estimated that the 1.25 million ton NOx cap would produce 2010 emissions of 1.6 million tons at a marginal cost of less than $1000/ton.

effectiveness of US power plant emission reductions that is described in the paper entitled "Efficient Emission Fees in the U.S. Electricity Sector" ("RFF Study").[74] In this study, RFF estimated the marginal costs and marginal benefits of reductions in US power plant emissions, including SO_2 and NOx, and then determined the emission level at which those costs and benefits were roughly equal. RFF calls this level the "efficient fee" level; until that level of reductions is reached, additional emission reductions will produce additional benefits in excess of additional costs and thus are economically efficient.

As stated in the study, "[t]he estimates are obtained by coupling a detailed simulation model of the U.S. electricity markets with an integrated assessment model that links changes in emissions with atmospheric transport, environmental endpoints and valuation of impacts."[75] We note that RFF's methodology for estimating the benefits of emission reductions is different from that used by EPA and the estimated benefits are substantially below those of EPA.[76] We wish to be clear that we believe EPA's method for estimating benefits in the IAQR is quite conservative, supportable and appropriate. Nevertheless, the RFF Study, even when using dramatically lower benefit estimates, still found that the level of power plant SO_2 emissions where the marginal costs of reductions were equivalent to the marginal benefits is lower than that set forth in the IAQR.

Specifically, RFF found that the "central estimate of marginal benefits equal marginal costs at $3500, or about 1.1 million tons of national SO_2 emissions in the year 2010[77]. As estimated above, the marginal cost of a 2 million ton national SO_2 cap has been estimated by EPA at less than $1000 per ton in 2010, dramatically below the point where the RFF Study found that additional costs of further reductions are greater than additional benefits.

Finally, because the IAQR is fundamentally based on the legal premise that those emissions that are contributing significantly to downwind nonattainment must be eliminated, it is important to evaluate what impact the IAQR would likely have on the nonattainment problem in downwind states. Using EPA projections of the impact of the IAQR on $PM_{2.5}$ design values in $PM_{2.5}$ nonattainment areas, EPA estimates that in 2010 61 counties in the IAQR region are expected to be in $PM_{2.5}$ nonattainment. Following implementation of the IAQR in 2010, 23 of those counties are expected to remain nonattainment, and even after 2015, about 6 years after the 2009 $PM_{2.5}$ attainment date, there will still be 13 counties in nonattainment.

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[74] Banzhaf, S., Burtraw, D. and Palmer, K., "Efficient Emission Fees in the U.S. Electricity Sector," Resources for the Future, October 2002, available online at http://www.rff.org. According to co-author Burtraw, this study is being peer-reviewed and will be published in a forthcoming issue of Resource and Energy Economics.

[75] RFF Study at p. 2. A more detailed description of the study is available in the paper itself.

[76] For example, RFF uses $2.25 million for the value of a statistical life, where EPA used a VSL of $5.5. million in the IAQR. Compare RFF Study at p.8 to EPA's "Benefits of the Proposed Interstate Air Quality Rule," at p.1-7.

[77] RFF Study at 12. See also Fig. 2a at p.22.

Using the results of EPA modeling and projections in the IAQR docket, we have estimated the contribution to the $PM_{2.5}$ design value of each nonattainment county in 2010, and then compared these data to the impact of the IAQR in 2010 and 2015 in each of those counties.[78] The results, which are attached hereto as Appendix 2, indicate that:

- total interstate air quality impacts contributed to 2010 "base case" downwind nonattainment counties range from a low of 4.31 *u*g/m^3 to a high of 7.36 *u*g/m^3, or from about 28% and 41% of that county's $PM_{2.5}$ design value;
- the portion of the interstate air quality contribution remedied by the IAQR in 2010 ranges from about 18% to 37%, and is below 30% in most areas;
- the portion of the interstate air quality contribution remedied by the IAQR in 2015 ranges from about 20% to 38%, and is between 25-35% in most areas;
- for counties projected by EPA to be in $PM_{2.5}$ nonattainment in 2010, the IAQR eliminates an average of less than 26% of the total interstate contribution; and
- for counties projected by EPA to be in $PM_{2.5}$ nonattainment in 2015, the IAQR eliminates an average of 30% of the total interstate contribution.

In sum, the IAQR is expected to reduce the impact of transport on $PM_{2.5}$ air quality in downwind nonattainment areas by a relatively small percentage. More substantial reductions of transported power plant emissions will be needed to help bring these areas into attainment.

In view of the above, we urge EPA to adopt IAQR regional power plant emissions caps equivalent to a 2 million ton national SO_2 cap and a 1.25 million ton NOx cap. These reductions are highly cost-effective, are needed to protect public health and must be required by EPA to allow many areas a realistic opportunity to reach attainment.

3. Cost-effectiveness data for other state and local emissions reductions

EPA's failure to require in the IAQR the greatest feasible emissions reductions that are highly cost effective would force state and local jurisdictions to resort to control measures with average costs far in excess of the IAQR's average cost. We identified the following representative sample of control measure costs to demonstrate the degree to which EPA is departing from the NOx SIP Call, saddling states and locals with far greater cost impositions on local businesses, and failing to ensure that attainment will be achieved as expeditiously as practicable.

[78] Specifically, we summed the out—of –state transport contributions to each downwind nonattainment county's annual $PM_{2.5}$ concentration (using EPA's zero-out modeling results in Appendix H of the Technical Support Document for the IAQR Air Quality Modeling Analyses), and then compared that to the projected IAQR impacts (shown in Tables IX-3 and IX-4 of the IAQR, 69 Fed. Reg. at 4637-39).

Texas Emission Reduction Plan (TERP) – Incentives Grants for Reducing Emissions[79]

- The Texas Council of Environmental Quality's Emissions Reduction Inventive Grants Program provides grants to eligible projects in nonattainment areas and affected counties. The grants offset the incremental costs associated with reducing emissions of NOx from high-emitting internal combustion sources.

- Cost-effectiveness of a project, other than a demonstration project, may cost up to **$13,000 per ton of NOx** emissions reduced in the eligible counties for which the project is propose. Infrastructure activities are excluded from the $13,000 per ton cost-effectiveness limit.

	Projected Project Cost Per Ton NOx Reduction
Grants Projects FY 2002-2003	Majority of projects $6,000 to $12,118
Eligible Application Recommended for Funding FY 2004 – 1st Round	Majority of projects $11,000 to $12,998

Washington D.C. Metro Area - MWCOG[80]

Analysis of Potential Reasonably Available Control Measures ("RACM"): Area, Non-Road, and Mobile Sources

- The cost to an affected area of any alternative emissions reduction program to offset internal combustion stationary sources significantly exceeds the cost to the stationary source of the equivalent emissions reduction. The potential emissions reduction of RACM projects may not exceed that of high-emitting stationary sources.

- Projects Determined to be "Economically Feasible" or "Possible" by MWCOG:

Source Category		Measure	Cost ($/ton NOx)
Area Sources	L1	Control Locomotive Idling	$1,250

[79] Texas Natural Resource Conservation Commission. Texas Emission Reduction Plan (TERP) – Incentives Grants for Reducing Emissions. Projects Selected for Funding to Date: http://www.tnrcc.state.tx.us/oprd/sips/grants.html.

[80] Metropolitan Washington Council of Governments. http://www.mwcog.org/uploads/committee-documents/z1ZZXg20040217144350.pdf.

	G6	Preference for low-emissions lawn & garden equipment	$7,238
	S4	Reduce idling by airport GSE	$3,155
Mobile Sources	B6	Bicycle Racks in DC	$9,017
	E3	Telecommuting Centers	$7,279
	E10	Government Actions (ozone action day similar to snow day)	$5,030
	F3	Permit Right Turn on Red	$1,245
	O4	Employer Outreach (Private Sector)	$3,542
	O6	Mass Marketing Campaign	$2,393
	T1	Transit Prioritization	$8,480

Finally, we note that EPA reviewed potential applications of local controls of PM precursor emissions to determine the extent to which such controls could solve the ozone and $PM_{2.5}$ nonattainment problems.[81] As part of that analysis, EPA listed a variety of control measures, and in some cases, their costs, that it believed would be appropriate to model for their air quality impact.[82] In the 290 county study, EPA listed a variety of local NOx control measures with costs ranging from $150/ton to $10,000/ton NOx removed.[83] The emission-weighted average cost per ton of the measures for which costs are listed is about $2545/ton, consistent with our position that regional NOx controls with average costs below $2500 per ton be considered highly cost effective.

IV. EPA Must Implement Regional Emissions Reductions Earlier than Proposed

A. EPA's Proposed Implementation Dates do not Meet CAA Attainment Requirements and do not Adequately Protect Public Health and Welfare.

We agree with EPA's stated intention to require "implementation of the reductions on a schedule that will provide air quality benefits as soon as feasible to as

[81] 69 Fed. Reg. at 4596-99; EPA's Technical Support Document for the IAQR Air Quality Modeling Analyses (January 2004) ("AQMTSD") at 46-56, App. I—L.
[82] *Id.*

[83] In EPA's study of local measures in the IAQR, it listed several local SO_2 reduction measures, but did not provide costs for any of them.

many nonattainment areas as possible."[84] EPA's actions, however, do not match its words—its proposal would delay full implementation of the emission caps for over a decade, until 2015, and the projected emission reductions would not be fully realized until sometime after 2015 and likely after 2020. More timely reductions are clearly feasible, and EPA must require them to avoid thousands of premature deaths and billions of dollars in unnecessary social costs, and to meet its obligations under the Clean Air Act to facilitate timely NAAQS attainment.

By EPA's own estimates, the IAQR as proposed will produce monetizable benefits of $55 billion per year for the phase 1 reductions in 2010, and $80 billion per year for both phases in 2015—these benefits will primarily result from avoided premature death due to PM exposure. Substantial amounts of additional benefits will accrue—benefits that are very real but for which EPA has not estimated a monetary value. These "nonmonetizable" benefits include reduction of various human health effects resulting from ozone exposure, including premature death; damage from ozone to forests, farm crops and other plants resulting in decreased yields; various human health effects resulting from PM exposure such as pulmonary and respiratory problems and emergency room visits; visibility impairment in national parks and other areas; damage from acid rain; nitrification and resulting harm to coastal wetlands; and neurological and other harm from mercury to human and animal health. These projected benefits are truly overwhelming. The costs, however, are minimal by comparison (and much more completely quantified)—$2.9 billion in 2010 and $3.7 billion in 2015. This results in a monetizable benefit to cost ratio of over 21 to 1 for both phases of proposed reductions.[85]

EPA must offer an absolutely compelling reason to justify the delay in taking action to realize such overwhelming public health and welfare benefits. It has not done so.

EPA's proposed delay in fully implementing the emission caps until 2015 is also completely inconsistent with the NAAQS attainment deadlines that flow directly from the Clean Air Act. Section 172(a)(2) of the Act requires that every area designated by EPA as nonattainment for the $PM_{2.5}$ NAAQS must achieve attainment "*as expeditiously as practicable*, but no later than 5 years from the date such area was designated nonattainment" [emphasis supplied].

EPA indicates in the IAQR that it expects to designate $PM_{2.5}$ nonattainment areas by December 31, 2004. [86] It is now required by law to do so, with designations to become effective by January 31, 2005.[87] Therefore, the attainment date for the $PM_{2.5}$ NAAQS will be as expeditiously as practicable, but no later than January 31, 2010. The latest attainment dates for the 8-hour ozone standard[88] are not as easy to predict, due to

[84] 69 Fed. Reg. at 4616.
[85] Because additional reductions will continue to occur after 2015 as banked allowances are gradually used up, actual benefits will continue to grow after 2015, as will the benefit to cost ratio.
[86] See IAQR, 69 Fed. Reg. at 4624.
[87] Consolidated Appropriations Act for FY 2004, Public Law 108-199 (January 23, 2004).
[88] Again, the fundamental requirement for 8-hour ozone attainment is that it be "as expeditiously as practicable." Sections 172(a) and 181(a) of the Act.

the interplay of Subparts 1 and 2 of Part D of the Act and the decision of the US Supreme Court in *Whitman v. American Trucking Ass'ns*, 121 S. Ct. 903 (2001). First of all, EPA is required by a consent decree with several environmental and other organizations to finalize 8-hour ozone designations for effect in May, 2004.[89] Therefore, attainment dates for 8-hour ozone areas established pursuant to Subpart 1 (i.e., Section 172(a)(2)) of the Act will be no later than May 2009. Attainment dates for 8-hour ozone areas established under Subpart 2 (Section 181(a)) are less clear, but based on EPA's pronouncements thus far, it appears that the attainment dates will be 2007 for marginal areas, 2010 for moderate areas, and 2013 for serious areas.[90] It must be remembered that both the 8-hour ozone and the $PM_{2.5}$ NAAQS are effectively structured in the form of three year averages. Therefore, in order to assure attainment by the attainment date, emissions must be controlled three years before that date (delay will require overcontrol).

In summary, likely attainment and emission control dates can be summarized as follows:

NAAQS Classification	**Latest Attainment Date**	**Control Date**
$PM_{2.5}$	January 2010	2007
8-hour ozone—Subpart 1	May 2009	2006
8-hour ozone—Marginal (Subpart 2)	May 2007	2004
8-hour ozone--Moderate (Subpart 2)	May 2010	2007
8-hour ozone--Serious (Subpart 2)	May 2013	2010

It is plain to see that IAQR reductions that are not required until 2015 will not be of any assistance in helping states meet applicable PM or ozone attainment dates.

It must be stressed that failure to meet attainment dates is not simply a legal technicality—the NAAQS are health-based standards and failure to achieve them has serious adverse consequences for human health and the environment. At this point, it is almost a full seven years ago that EPA—in 1997—found that the NAAQS for both ozone and PM needed to be strengthened in order to protect the health of US citizens. EPA proposes now that full implementation of the IAQR emission reductions not be required until 2015, eleven years from now. These are the very same reductions that EPA has determined in the IAQR are necessary for states to have a reasonable opportunity to attain those standards. But EPA's proposal only requires reductions that states need to attain the ozone and PM NAAQS twenty years—approximately an entire generation—after EPA determined the existing standards were inadequate. Again, EPA has offered no justification that would come close to supporting such additional delay in cleaning up the massive air pollution caused by the nation's power plants.[91]

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[89] *American Lung Ass'n, et al. v. Whitman,* Docket No. 02-2239 (DC Cir. 2002).

[90] See, e.g., Proposed Rule to Implement the 8-Hour Ozone NAAQS, 68 Fed. Reg. 32802 (June 3, 2003), and accompanying draft regulatory text (July 31, 2003), available online at http://www.epa.gov/ttn/naaqs/ozone/o3imp8hr/proprule.html.

[91] In view of the continuing human health and environmental damage caused by power plants, the feasibility and cost-effectiveness of reducing those emissions, and the long delay to date of implementing the ozone and PM NAAQS, extension of the attainment dates under Sections 172 (a)(2) or 181(a)(5) cannot be justified as a matter of either law or policy. Such an extension would be contrary to the requirement that

B. EPA's Proffered Justification for Implementation Delay Lacks any Rational Basis.

EPA states in the IAQR that it is proposing to assign January 1, 2015 as the final compliance date because "engineering and financial factors suggest that only a portion of the emissions reductions that EPA considers highly cost effective can be achieved by January 1, 2010" [emphasis supplied].[92] We initially stress that EPA never actually makes a finding that full implementation of the emissions reductions in 2010 is not feasible or practicable. In the absence of such a finding, the delay in implementation has no basis, rational or otherwise. Furthermore, the only implied "engineering and financial reason" for delaying full implementation of the IAQR for a full five years—from 2010 to 2015—that EPA attempts to support to any degree is a projected shortage of boilermakers in the 2008-09 time frame.[93,94] This implied projection is entirely speculative, inconsistent with past EPA findings, and simply lacks any rational basis. In any event, such projection can not justify a delay anywhere near as long as EPA proposes. Rather, it appears to be another ad hoc attempt by EPA to justify a power plant transport rule that is not significantly more stringent that the Bush administration's CSI proposal.

First of all, EPA does not provide a rational basis for its implied projection of a boilermaker shortage, but rather bases its projection on a number of highly questionable and unsupported assumptions. Essentially, EPA assumes that:

- the number of available boilermakers will match the 2005 membership goal of the boilermakers union;
- there will be no growth in boilermakers after 2005;
- power plant owners will—in the face of this hypothetical looming boilermaker shortage—plan their pollution control projects to achieve the 2010 reductions in

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attainment be achieved "as expeditiously as practicable." It is certainly completely unjustifiable to propose delayed IAQR implementation dates on the present assumption that attainment dates will simply be extended when they are violated.

[92] 69 Fed. Reg. at 4585. The Agency also says that it "has determined that for engineering and financial reasons, it would take substantial time to install the projected controls that would be necessary to reach the ultimate control levels proposed." *Id.* at 4616.

[93] See, e.g., 69 Fed. Reg. at 4617; Memo to the IAQR Docket entitled "An Analysis of the Impact of Boilermaker Labor Availability on the Installation of Pollution Control Equipment," January 28, 2004 (hereafter, "Boilermaker Memo").

We note that EPA acknowledges that, in the absence of any limitations on boilermaker labor and reasonably-priced capital, there would be enough time to install enough EGU controls to achieve the emissions reductions proposed for 2015 by 2010 instead, since "3 years is enough time to install controls on all the units required." 69 Fed. Reg. at 4617.

[94] EPA implies that there may be a lack of reasonably-priced financing to allow full implementation by 2010, but again, never says so, and provides absolutely no support for such an implication. Rather, EPA simply says: "The EPA recognizes that the power sector will need to devote large amounts of capital to meet the control requirements of the first phase….We believe that deferring the second phase to 2015 will provide enough time for companies to…raise additional, reasonably-priced capital needed to install controls." 69 Fed. Reg. at 4617. Such general assertions do not provide a rational basis for either a finding of inadequate capital in 2010 (which EPA does not make), or a 5-year delay in implementing the IAQR.

> such a way that requires all of the boilermaker work to be done in an 18 month period between 2008 and 2009.[95]

First, EPA's assumption that there will be approximately 28,000 boilermakers available in 2005 is reasonable and supported only to the extent that it is limited to union boilermakers. However, by projecting the boilermaker supply exclusively on union members, EPA assumes that only union boilermakers will be available to work on projects implementing the IAQR controls. The assumption is unsupported in the record and is in fact erroneous. Not all boilermakers are unionized. Indeed, at least 30,000 non-union craft workers, many of them boilermakers, work in the electric utility industry in this country.[96] The Institute of Clean Air Companies (ICAC), the nonprofit organization of companies that actually supply the materials and services needed to implement air pollution controls, has just issued a study assessing the adequacy of boiler maker supply to implement the IAQR entitled "IAQR Projected Control Technologies can be Installed by 2010" (ICAC Study).[97] The ICAC Study finds that a portion of the total retrofit work can be performed by non-union labor.[98] More specifically, the study finds:

> [S]ome states have less union presence than others which means that less union labor is used in certain States than in others. This means that the labor pool for skilled crafts such as boilermakers, electricians, etc., is larger than merely the national number for union members. . . . It is estimated that merit shop workers will help reduce demand by 30-40% in non-union areas. For the IAQR, there are ten states that have traditionally relied on non-union labor.[99]

The availability of those non-union boilermakers alone reveals that EPA has underestimated the number of boilermakers who will be available to install the controls used to comply with this rule.

Second, EPA's assumption that there will be no further growth in the boilermaker population in the face of a substantial increase in demand for their services over the next 5 to 10 years lacks substantial basis and is arbitrary and capricious. It is not only inherently at odds with common sense and accepted economic theory, but also contradicted by other analysis, including EPA's own recent study of the issue. EPA found in its October 2002 study entitled "Engineering and Economic Factors Affecting

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[95] 69 Fed. Reg. at 4617; Boilermaker Memo.
[96] William G. Krizan, "Market Gyrations Make Hitting Targets for Skilled Crafts an Art," *Engineering News-Record*, Dec. 3, 2002.
[97] The ICAC Study is available online at www.icac.com. We hereby incorporate the entire ICAC study by reference. A copy of the study is being submitted to the IAQR rulemaking docket contemporaneously with the submission of these comments. We have also attached a copy hereto as Appendix 8.
[98] ICAC Study at 8.
[99] ICAC Study at 5.

the Installation of Control Technologies for Multipollutant Strategies,"[100] adequate reason to believe that the number of boilermakers should continue to increase after 2005:

> "Since boilermakers earn more money than most other craft trades and the demand for boilermakers should be steady and increasing, it is reasonable to expect that the growth in boilermaker numbers experienced these last few years should continue for many more years. To assess the impact of this, it was assumed that the boilermakers in the U.S. continue to grow at the 5.3 percent pace that the [boilermakers union] has set as a minimum growth target."[101]

EPA then projected that there would be about 36,250 boilermakers in 2010, and 46, 930 in 2015.[102] EPA also found "that the number of boilermakers may actually grow more quickly than what was assumed," due in part to the fact that boilermaker number actually grew faster in recent years than the union's minimum target.[103] In sum, EPA's 2002 report is consistent with what one would rationally assume: that is, that if demand for boilermakers is increased, the supply will grow to match it. EPA's contrary assumption in the IAQR is premised solely on the fact that the IAQR is a regulatory rather than a legislative mandate. EPA provides absolutely no support for this premise. Furthermore, EPA's premise ignores the uncertainty and potential for litigation associated with either legislation or regulation, assumes without foundation that such uncertainty will in and of itself cause boilermaker labor growth to completely cease beyond 2005, and is inconsistent with EPA's estimate that only 35% of boilermaker labor is involved in environmental work (so that the majority of boilermaker supply would be unaffected by any perceived regulatory uncertainty).

EPA's assumption of stagnant boilermaker supply is also directly contradicted by projections by the trade and industry. First of all, the boilermakers' union has already noted the imminent increase in demand that will result from this rule.[104] Second, The ICAC study finds that "the air pollution control industry is able to quickly respond to environmental regulations that require a surge of control installations in a short period of time,"[105] and goes on to say:

> The boilermaker membership grew by over 10,000 members in a two year period during the NOx SIP call from 16,000 to almost 27,000 members. In a similarly short period of time, it is reasonable to assume that the

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[100] EPA, Final Report: Engineering and Economic Factors Affecting the Installation of Control Technologies for Multipollutant Strategies, EPA-600/R-02/073 (October 2002), available online at http://www.epa.gov/air/clearskies/pdfs/multi102902.pdf (hereafter "Engineering Report").
[101] Engineering Report at 45. See also p. 43, where EPA noted that increased boilermaker demand could be met by workers in closely allied fields moving into utility boilermaker work quickly.
[102] Engineering Report, Table 6-4, at 46.
[103] Engineering Report at 46.
[104] "Demand for Skilled Craftsmen Will Increase," *The Boilermaker Reporter*, Vol. 42, No. 5 (Dec. 2003), at 3-4.
[105] ICAC Study at 2.

> boilermaker membership could increase from its current number of 26,000 members to 30,000 by October 2007.[106]

In view of the above, EPA's assumption that boilermaker labor supply will grow at over 5% per year until 2005 and then abruptly stop growing is arbitrary and capricious.

Third, EPA's assumption that electric utilities will have to install all the controls necessary to comply with this rule in a single eighteen-month period is not supported in the record and is arbitrary and capricious.[107] To begin with, since the Agency published its IAQR proposal, it has moved up the projected promulgation date for this rule by six months.[108] Moreover, EPA does not have to give states eighteen months to submit SIPs; the states could prepare and submit their SIPs in twelve months. As noted by the ICAC Study:

> As recently as a few years ago, EPA allowed States 12 months to submit their SIPs under the NOx SIP call requirements. Since all of the affected States are currently participating in the Acid Rain Program, a national SO2 trading program, and all but ten States are participating in the NOx SIP call, a northeastern regional NOx trading program, it will be easier for States to complete their rules. Additionally, the affected sources have been monitoring and reporting their emissions and complying with SO2 trading programs for almost 10 years and with NOx trading programs for 6 years so they are familiar with market based cap and trade programs.[109]

In addition, EPA will be preparing a model cap and trade rule for states to adopt in the event they elect to meet their budgets through the control of EGU emissions, so states will not need to create the program themselves.

In view of the above, 12 months lead time to develop SIPs should be adequate. Therefore, electric utilities should have thirty months, rather than eighteen months, to install the controls needed to comply with this rule.

Furthermore, EPA offers no data to support its assertion that even after electric utilities begin pollution control installations, it will take them fifteen months to reach the point at which they engage the services of boilermakers.[110] Moreover, EPA's assertion is contradicted by the ICAC Study, which finds "it is reasonable to assume that the

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[106] ICAC Study at 8. *See also* Sanyal, A., and Ellison, W., "Lessons Learned from SCR Experience of Coal-Fired Units in Japan, Europe, and USA; Are These Enough?" 2002 Conference on Selective Catalytic Reduction and Non-Catalytic Reduction for NOx Control, Pittsburgh, PA, May 15-16, 2002.
[107] 69 Fed. Reg. at 4617; Boilermaker Memo at 1.
[108] ICAC Study at 5.
[109] ICAC Study at 5-6.
[110] 69 Fed. Reg. at 4617; Boilermaker Memo at 2.

boilermaker construction work will start sooner than 15 months after States have finalized their SIPs."[111] In fact, ICAC finds that even a conservative assumption would hold that five percent of the control installations would begin within six months of SIP approval.[112]

Based on the assumptions of boilermaker supply in EPA's 2002 Engineering Report, there will be adequate boilermaker labor to implement the proposed IAQR SO_2 cap in 2010 and the second phase of the NOx cap in 2012. First, as we have indicated above, EPA's assumption that all of the boilermaker work to implement a 2010 cap must be performed over an 18 month period between March 2008 and October 2009 is completely unreasonable and without rational basis; we will, however, include that assumption in the following analysis.[113] Thus, of the 33,558 boilermakers in 2008-09 per EPA's Engineering Report, we will assume with EPA (solely for the purpose of the following analysis) that only 35% or 11,745 boilermakers will be available to work on pollution control projects.[114] Because EPA assumes that boilermaker work on pollution controls will occur over an 18 month period, this translates to a 2008-09 supply of about 17,618 boilermaker years. EPA projects that approximately 63 GW of additional scrubber capacity will be needed to meet IAQR Phase 1 and 2 SO_2 requirements by 2015, and 24 GW of additional SCR capacity will be needed to meet IAQR Phase 1 NOx requirements by 2010.[115] For purposes of estimating boilermaker demand, we will assume a worst-case scenario where requiring the final IAQR emission caps now proposed for 2015 to be implemented in 2010 and 2012 (for NOx Phase 2) means that a total of 66 GW of additional scrubbers and 27 GW of additional SCR must be installed over 18 months in the 2008-09 time frame. Using EPA figures, this means that 14,732 boilermaker years would be required to install all of these controls by a 2010 implementation date. Thus, the predicted 2008-09 supply of 17,618 boilermaker-years will be more than enough to meet the required demand to implement the accelerated caps.[116]

In fact, the ICAC study, which assumes a somewhat lower number of available boilermakers, also concludes that there will be enough boilermaker labor to implement, by 2010, the emissions reductions that the IAQR proposes to require by 2015.[117]

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[111] ICAC Study at 9.
[112] *Id.*.
[113] Boilermaker Memo at 3. This assumption is also inconsistent with EPA's Engineering Report where EPA "conservatively assumed" that retrofits occur over a 31 -36 month period. See Engineering Report at Table 6-4, note 2, p. 46, also pp. 41, 45.
[114] Boilermaker Memo at 2. Again, this assumption is unreasonably rigid and unrealistic—the boilermakers will work where needed, and if pollution control projects to comply with lawful regulatory requirements receive the high priority that they should, a much greater percentage than 35% of boilermakers would likely be put to work installing pollution controls.
[115] See Economic & Energy Memo, Table 2 at p.3.
[116] Of course, there would be no problem in meeting the demand created by the 2012 NOx cap; boilermakers would be freed up from work meeting the 2010 requirements in time to begin work on NOx controls in March 2010.
[117] ICAC Study at 1.

Furthermore, both EPA's own Engineering Report and the ICAC Study set forth a number of factors that undermine and contradict EPA's assumptions in the IAQR regarding the adequacy of future boilermaker labor supply. The most fundamental of these considerations is EPA's obvious, but completely accurate, observation that "increasing demand for boilermakers that would result from a multipollutant rule should stimulate more workers to enter the trade."[118] Others include:

- skilled labor from closely allied trades, such as iron and steelworkers (union has 150,000 members), especially those who had been boilermakers in the past, could likely move into boilermaker work fairly quickly;[119]
- the Canadian boilermaker's union has 4,000 members, some of which could work on IAQR implementation projects;[120]
- boilermakers in the unions shipbuilding division (about 30,00 members) could, depending on industry conditions, move over to the construction division quickly;[121]
- fewer boilermakers may be needed than EPA estimated because its "analysis does not consider any of the synergies or efficiencies that have been demonstrated to occur on multiple unit retrofits or multiple-technology retrofits;"[122]
- boilermaker population may grow more quickly than EPA assumed in the Engineering Report, based on the recent annual growth rate of 6.7%;[123] and
- EPA's analysis "also neglects [to consider] overtime, which would reduce the demand for [the number of] workers somewhat."[124]
- Faster, modular construction could reduce demand for boilermaker labor by up to 30% on particular projects.[125]

EPA's failure to consider these factors in the IAQR renders its proposed delay in implementation of the emission reductions arbitrary and capricious.

Finally, assuming solely for the purposes of argument that EPA is able provide an adequate and rational basis to support a projected boilermaker shortage in 2010 (which it clearly has not done to date), that can in any event not justify a 5 year delay in fully implementing the IAQR caps. Any delay could not last longer than the period during

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[118] Engineering Report at 43. See also ICAC Study at 3-4.
[119] *Id.*
[120] ICAC Study at 3.
[121] Engineering Report at 43. See also ICAC Study at 3-4.
[122] Engineering Report at 41, 46.
[123] Engineering Report at 46. See also ICAC Study at 3, 7: "The boilermaker membership grew by over 10,000 members in a two year period during the NOx SIP Call from 16,000 to almost 27,000 members." This works out to an average increase of over 30% per year.
[124] Engineering Report at 46.
[125] ICAC Study at 4. ICAC further observes: "The decision to use modular construction is typically driven by cost so as the labor demand increases, the pressure to perform modular construction will likely increase with it. Modularization will look especially favorable in states that have deregulated electricity markets." *Id.*

which boilermaker labor was inadequate, and could not serve to delay installation of controls for which boilermaker labor was available. By EPA's own analysis, any such shortage would end in late 2009 shortly before the conclusion of the Phase 1 work, and therefore a delay in implementing the remaining emission reductions longer than 1 ¾ years, to beyond October 2011, could not be justified.[126]

We stress that every year of delay in implementing strong power plant control requirements means more death, disease and environmental damage, which may be quantified in the tens of billions of dollars. We urge EPA to implement the IAQR as promptly as feasible, but no later than the end of 2009 for SO_2, January 2010 for the first phase of NOx reductions, and January 2012 for the second phase of NOx reductions.

V. CATF Analysis of Alternate Control Scenario

As indicated above, EPA did not evaluate any alternative emission scenarios to its proposal in the IAQR. Such an evaluation is an important piece of any significant rulemaking, and EPA has included such analysis in many of its recent rulemakings, including the NOx SIP Call and its recent nonroad heavy-duty diesel engine proposal.[127] EPA's failure to do so here contributes to the arbitrary nature of EPA's proposed IAQR control levels.

In fact, according to Executive Order 12866 (Economic Analysis of Federal Regulations), the economic analysis (EA) that the Agency prepares should satisfy the requirements of the "Unfunded Mandates Reform Act of 1995" (P.L. 104-4). Executive Order 12866 goes on to say that the EA should show that the Agency has considered the most important alternative approaches to the problem and provide the agency's reasoning for selecting the proposed regulatory action over such alternatives. The proposed IAQR does not identify the required regulatory alternatives, and EPA has failed to analyze any alternatives for relative cost effectiveness.

Executive Order 12866 also requires that the benefits and costs of each alternative must be measured against a baseline. Executive Order 12866 requires that "in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach." Because EPA has failed to identify any regulatory alternatives to its set of proposed caps, it also has failed to perform the required comparison of the costs and benefits of any alternatives.

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[126] As explained above, EPA has created the hypothetical boilermaker shortage by a number of insupportable assumptions, including the assumption that all boilermaker work on scrubber and SCR projects will take place in the same 18 month time frame. Thus, EPA compresses all of the Phase 1 boilermaker work into 18 months, between March 2008 and October 2009. Thus, by October 2009 the boilermakers will be finished with the Phase 1 work. Even assuming they all then take a 3 month vacation, they will be ready to start work on Phase 2 projects in January 2010, completing their work by July 2011, in plenty of time for an October 2011 compliance date.

[127] See, e.g., 63 Fed. Reg 57356 et seq.; HD Nonroad Rule, 68 Fed. Reg. 28328 et. seq.

In order to demonstrate that deeper and/or earlier reductions of NOx and SO_2 emissions are feasible and highly cost-effective, and that such reductions will provide substantial additional human health and NAAQS attainment benefits, CATF, with the assistance of ICF Consulting and MSB Energy Associates, has evaluated the benefits and costs of tighter emission caps and schedules than proposed by EPA in the IAQR. This alternate scenario is a regional annual EGU SO_2 cap of 1.84 million tons effective in 2009, with a regional annual EGU NOx cap of 1.04 million tons effective in 2012 ("Alternative Control Scenario").

Alternate Control Scenario Analysis Methodology.

In conducting this analysis, we have endeavored to use whenever possible methods and procedures used by EPA, taking into consideration the time and resource constraints under which we were working.[128] Specifically, ICF Consulting evaluated the Alternative Control Scenario using the same Integrated Planning Model (IPM) used by EPA in the IAQR IPM runs (EPA216_IAQR_2003, etc.).[129] The only modifications made to the EPA runs were the timing and levels of the emission caps; we also used a control region matching EPA's proposed IAQR control region of 28 states plus DC.[130] This model predicts emission levels and costs of the Alternative Control Scenario. CATF then determined incremental emission reductions and costs by comparing the emissions and costs from EPA's IAQR proposal and to those from the Alternative Control Scenario.

In order to estimate incremental benefits resulting from the Alternate Control Scenario, CATF estimated avoided deaths from $PM_{2.5}$ exposure by utilizing modeled values for avoided deaths per ton of SO_2 pollution removed generated from EPA's benefits analysis in the IAQR. CATF directly applied these estimates to the SO_2 emissions inventories derived from the IPM runs for the Alternative Control Scenario. The estimated incremental health benefits were converted to dollar benefits by applying EPA's IAQR estimate of the value of a statistical life (VSL) to the number of estimated avoided deaths. This approach results in an underestimation of the incremental benefits of the Alternate Control Scenario, since there are many benefits from reduced $PM_{2.5}$ levels in addition to avoided premature death, some of which may be reduced to a monetary value and some of which may not. Nevertheless, avoided deaths do provide a useful basis for benefit comparison, because EPA estimates that 90% of total monetizable

[128] Air quality modeling and analysis of the type EPA used in the IAQR is quite complex, expensive and time-consuming. In addition, the comment period for the IAQR has been limited to 60 days, and some of EPA's IAQR modeling and other supporting analysis was not publicly available until after the IAQR publication in the Federal Register on January 30, 2004.

[129] In its January 28, 2004 Memo to the Docket entitled "Analysis of the Marginal Cost of SO_2 and NOx Reductions," EPA states "IPM is a more sophisticated model of the power sector developed by ICF that EPA uses for much of its analysis of the power sector."

[130] The modeled results submitted by EPA for "the purpose of preliminarily evaluating" the proposed IAQR modeled a policy and control areas that do not precisely match the proposed IAQR control region (see discussion at 69 Fed. Reg. at 4615). EPA states that "a very similar result is expected" to modeling the actual IAQR proposal. Because our analysis matches EPA's IAQR control region, it does not precisely match EPA's analysis included in the IAQR proposal; however, as EPA states, very similar results are expected.

benefits from reduced $PM_{2.5}$ exposure are attributable to avoided deaths.[131] This methodology has been developed by EPA for use in situations where time and resource constraints preclude detailed modeling such as EPA's recent recreational engine rulemaking.[132] CATF's application of the methodology is described in further detail in Appendix 3 attached hereto.

In addition, CATF has also estimated the incremental $PM_{2.5}$ attainment benefits resulting from its Alternate Control Scenario. This analysis is based on a simple, unpublished methodology suggested to CATF by EPA staff for estimating changes in nonattainment. This approach approximates the county level $PM_{2.5}$ concentration for CATF's Alternate Control Scenario using a linear regression for each U.S. county in the IAQR control region. A county's $PM_{2.5}$ level was specifically based on a regression between two known REMSAD modeled PM data points (base case 2010 versus IAQR 2010 and base case 2015 versus IAQR 2015) against changes in total annual national SO_2 emissions, where changes in SO_2 emissions were assumed proportional to changes in secondary aerosol formation. Implicit in the use of this regression technique is the assumption that the spatial distribution of SO_2 emissions across the US do not change in any drastic way as the total emissions vary. In this way, for each of the different SO_2 totals, a new estimated $PM_{2.5}$ concentration was calculated for each county. Those counties with concentrations greater than or equal to 15.05 ppm were determined to be in "nonattainment." This methodology is described in greater detail in Appendix 4 attached hereto.

Finally, CATF has estimated the costs of its Alternate Control Scenario, as described in Appendix 5 hereto.

Alternate Control Scenario Analysis Results

The results of the CATF analysis of the Alternate Control Scenario are summarized below.[133] They demonstrate that tighter and earlier caps on EGU SO_2 and NOx emissions are feasible, highly cost-effective, and produce substantial incremental benefits well in excess of incremental costs. The Alternate Control Scenario contains SO_2 emission control levels and dates that are identical to those that we argue in these comments EPA must require in order to fulfill its legal obligations under the Clean Air Act (i.e., 1.84 million ton regional SO_2 cap in 2009). We note that the NOx requirements differ somewhat in that the Alternate Control Scenario contains a single-phase 1.04 million ton regional NOx cap effective in 2012, but does not include the first phase IAQR NOx cap of 1.6 million tons in 2010. However, because both health and attainment benefits were estimated in our analysis from SO_2 emissions alone, the difference in NOx

[131] See, e.g., 69 Fed. Reg. at 4645.

[132] See, e.g., Section 10.2.1 of EPA's "Final Regulatory Support Document: Control of Emissions from Unregulated Nonroad Engines," EPA420-R-02-022, in support of its rule entitled "Control of Emissions From Nonroad Large Spark-Ignition Engines and Recreational Engines (Marine and Land-Based)," 67 Fed. Reg. 68241 (November 8, 2002), available online at http://www.epa.gov/otaq/regs/nonroad/2002/r02022k.pdf.

[133] A more detailed summary and cost specifications for the Alternate Control Scenario (IPM run CATF-16) are set forth in Appendix 6 hereto.

reductions is not material. Thus, the benefits of the Alternate Control Scenario are estimated to be equivalent those expected from the emissions controls we urge EPA to adopt in these comments.

National EGU emissions projected in the Alternate Control Scenario are as follows:

- SO_2 emissions are expected to be reduced to 2.8 million tons by 2010 and 2015—
  - a reduction of over 7 million tons of SO_2 from EPA's 2010 base case,
  - a reduction of about 3.2 million tons of SO_2 from EPA's IAQR 2010 proposal, and
  - a reduction of about 2.6 million tons of SO_2 from EPA's IAQR 2015 proposal;
- NOx emissions are expected to be reduced to 1.9 million tons by 2015—
  - a reduction of about 2.1 million tons of NOx from EPA's 2015 base case, and
  - a reduction of about 300,000 tons of NOx from EPA's IAQR 2015 proposal.

As shown in Table V-1 below, estimated PM-related avoided deaths resulting from CATF's Alternate Control Scenario are almost twice as great as those resulting from EPA's IAQR proposal.

Table V-1

	2010 Avoided Deaths	**2015 Avoided Deaths**
EPA IAQR	9,600	13,000
CATF Alternate Control Scenario	18,000	22,000

The monetized benefits of the estimated PM-related mortality associated with the two regulatory options in 2010 and 2015 (above) are summarized in Table V-2 below. As would be expected from the comparative premature mortality benefits shown above, the benefits resulting from CATF's Alternate Control Scenario are almost twice as great as those resulting from EPA's IAQR proposal.

Table V-2

	2010 Avoided Deaths Benefit [1999 dollars]	2015 Avoided Death Benefits [1999 dollars]
EPA IAQR	$53 billion	$77 billion
CATF Alternate Control Scenario	$99 billion	$129 billion

CATF's Alternate Control Scenario also improves substantially over EPA's IAQR proposal in terms of achieving attainment, as summarized in Table V-3.[134]

Table V-3

	2010 Number of Remaining Counties in Nonattainment	Population in Nonattainment Counties Based on Year 2000 pop.(millions)	2015 Number of Remaining Counties in Nonattainment	Population in Nonattainment Counties Based on Year 2000 pop. (millions)
EPA Base Case	61	31.1	41	24.2
EPA IAQR	23	17.4	13	13.9
CATF Alternate Control Scenario	7	11.2	5	10.3

In addition to the substantially higher monetary benefits that result from our Alternative Control Scenario, there are significant additional mercury co-benefits resulting from tighter NOx and SO_2 caps. Table V-4 summarizes the results of the IPM run used by EPA to assess costs and benefits of the proposed IAQR and the mercury co-benefits that would be achieved with the CATF Alternative Control Scenario.

[134] Detailed information comparing projected 2010 and 2015 design values and nonattainment counties for EPA's base case, IAQR and CATF Alternate Control Scenario are shown in Appendix 7 hereto.

Table V-4

Year	National Mercury Emissions from EPA IAQR (tons)	Percent Reduction in Mercury Emissions from 1999 Baseline	National Mercury Emissions from Alternative Control Scenario (tons)	Percent Reduction in Mercury Emissions from 1999 Baseline
2005	48.5	0	47	0
2010	42.2	12	35	27
2015	40.7	14	25	48
2020	38.1	20	25	48

Finally, the costs of the Alternate Control Scenario are summarized below:

- Total incremental costs (compared to EPA's base case) are $8.16 billion in 2010 and $8.97 billion in 2015. EPA's IAQR comparable IPM outputs show a difference in cost from base to IAQR of $3.4 billion in 2010 and $4.1 billion in 2015;
- Comparing these costs to the benefits from Table V-2 above produces a benefit to cost ratio of 12 to 1 in 2010 and over 14 to 1 in 2015;
- The average cost per ton of SO_2 and NOx (averaged together) removed is $1125/ton in 2010 and $1,050/ton in 2015;
- Calculating the cost effectiveness of SO_2 reductions on a worst case basis—by assuming that the costs of both SO_2 and NOx reductions are attributable to SO_2—produces an average cost of $1150/ton in 2010 and $1400/ton in 2015.

In sum, the results of the Alternate Control Scenario show that these tighter, earlier control levels will save thousands of lives and produce billions of dollars in benefits to society. They will also continue to produce benefits that far outstrip costs. In fact, they will produce $130 billion in societal benefits (from avoided deaths alone) in 2015, at a cost of only $8 billion to the utility industry. Furthermore, these tighter, earlier controls will reduce the number of attainment areas projected from both EPA's base case and IAQR proposal. Finally, this scenario demonstrates that such tighter control levels are feasible, highly cost-effective and therefore must be required by EPA to comply with the Clean Air Act.

VI. Other Issues

A. Geographical Coverage of the Proposed Emission Caps.

As indicated above, we do not support a minimum $PM_{2.5}$ state contribution threshold of 0.15 ug/m^3. There is no rational basis for choosing such a threshold. Rather, EPA should adopt its alternative threshold, that is, 0.10 ug/m^3. Due to NAAQS rounding definitions, this represents the smallest increment that can make the difference between

compliance and violation of the NAAQS. As EPA noted in the IAQR, the US Court of Appeals for the DC Circuit upheld EPA's use of a low minimum state contribution threshold level in the NOx SIP Call, and in so doing, the Court observed that in the context of a pollutant that has some adverse health effects at every level (both ozone and PM are in this category), "it is hard to see why *any* ozone-creating emissions should not be regarded as fatally "significant" under section 110(a)(2)(D)(i)(I)."[135] A threshold of 0.10 *u*g/m^3 is consistent with the DC Circuit's reasoning; a threshold of 0.15 *u*g/m^3 is not. Furthermore, application of this threshold will expand the coverage of the emission caps slightly to include the additional upwind states of North Dakota and Oklahoma. More importantly, it will also slightly increase the reductions of NOx and SO_2 emissions required by the IAQR in 2010, by about 92,000 tons of NOx and 148,000 tons of SO_2.[136] Given the severe human health and environmental impacts of $PM_{2.5}$ and its precursor emissions, we urge EPA to adopt the alternative contribution threshold, thereby strengthening the rule.

We also note that EPA did not evaluate many states in the western US for their potential contribution to ozone and $PM_{2.5}$ nonattainment problems. We believe that EPA should analyze the contribution of all 48 states in the continental US, and include any state in the IAQR whose emissions are found to contribute to downwind nonattainment in excess of the minimum threshold.

B. Regional Haze

EPA has requested comment on a number of questions on the relationship between the IAQR and regional haze requirements, including those in the Regional Haze Rule (RHR). EPA's questions can be boiled down to whether the IAQR emission reductions satisfy either of two RHR requirements:

1. that states achieve reasonable progress towards the national visibility goal in the 2018 time frame; and
2. that certain BART eligible sources install BART controls.

As stated previously, EPA cannot use the IAQR emission reductions to simply declare that states need not comply (or are presumed to have complied) with applicable RHR and BART requirements.

RHR requirements are separate and independent from those in the IAQR, and as a matter of both law and policy, EPA cannot substitute one set of requirements for the other. Under the RHR and BART Guidelines, states must analyze visibility conditions in Class I areas located both within their own boundaries and within other states in which

[135] IAQR, 69 Fed. Reg. at 4584. *Michigan v. EPA,* 213 F.3d 663, 678 (D.C. Cir. 2000), *cert. denied,* 532 U.S. 904 (2001).

[136] Compare Oklahoma and North Dakota 2010 emissions in IAQR Table IV-1 and IV-2 with the projected Okalahoma and North Dakota SO_2 budgets on page 4620 and NOx budgets in Table VI-11. We note that both North Dakota and Oklahoma emissions would have a meaningful impact on several urban areas in Illinois, including Chicago. See AQMTSD, App. H.

their emissions are contributing to visibility impairment, and must develop plans leading to natural visibility conditions within 60 years in all Class I areas with visibility impairment to which they contribute. This analysis must include, during the first planning period, the identification of all major sources subject to BART requirements. Nothing in the IAQR changes that.

Of course, IAQR emission reductions can and should be considered by a state in developing its approach to achieving natural visibility by 2064, along with reductions of visibility impairing emissions from other national, regional and local programs. But the RHR remains an additional requirement, aimed only at visibility improvement in Class I areas, and a state's obligations to comply with the terms and process set out in the RHR cannot be altered or avoided by the IAQR.

In addition, BART must be installed on those power plants that are BART-eligible, are shown to impact visibility and otherwise are appropriate for application of BART under applicable RHR and BART Guideline provisions. Both as a matter of law and policy, the IAQR cannot serve as a means to exempt any power plant from BART that otherwise would be required to install BART under the RHR and BART Guidelines. In this context it is important to note that the proposed reductions of individual power plant emissions under the IAQR are not as stringent as those that would likely be required by application of BART. Therefore, power plants that are relatively close to Class I areas would not have their emissions reduced under the IAQR to levels required by BART. As a result, the impact on visibility in Class I areas from those particular plants following IAQR implementation would be greater than their impact assuming that BART was applied under the Agency's visibility regulations.[137] Such a result is clearly unlawful and unacceptable.

C. Section 126 Petitions

It is premature to prejudge potential state petitions to EPA seeking emission reductions of NOx and SO_2 under Section 126. For one thing, as the courts have recognized, Sections 126 and 110(a) provide separate and independent processes for requiring regional emission reductions, and action under one section cannot void action under the other. As the DC Circuit Court of Appeals has stated, sections 126 and 110 are "independent statutory tools to address the problems of interstate pollution transport."[138] Furthermore, the IAQR does not, and legally cannot, target specific sources, and does not take the individualized needs and circumstances of each downwind state separately into account, as a state Section126 petition can do. Finally, compliance timeframes under the

[137] Furthermore, we note that nothing in the IAQR requires power plants whose emissions impact Class I areas to reduce their emissions period or to levels required by BART. The location of these reductions is important. Any trading program created under the RHR must not only produce greater emissions reductions but also achieve more visibility improvement than source by source BART reductions. There is no guarantee that a trading program under IAQR will deliver better than BART visibility benefits let alone make reasonable progress toward fulfilling the national visibility goal. It is unacceptable for EPA to allow the IAQR to serve as a substitute for a trading program states may choose to develop to reduce visibility impairment in Class I areas in order to meet BART and RHR requirements.

[138] *Appalachian Power Co. v. EPA,* 249 F.3d 1032, at 1046 (DC Cir 2001).

two sections are substantially different, as the DC Circuit has stressed.[139] EPA must not to attempt in this rulemaking to short-circuit or prejudge any Section 126 petitions it may receive from individual states.

D. Cap and Trade Program

As stated earlier, EPA has not yet proposed its cap and trade program for implementing the IAQR. Once EPA does so, we will offer comments.

We would, however, like to provide our preliminary views on several subjects. First, EPA has indicated that it intends to allow the year around NOx trading program to be serve as compliance for the ozone season requirements of the NOx SIP Call. If EPA proceeds along these lines, it needs to structure the program to ensure that none of the NOx reductions required by the NOx SIP Call during the ozone season are lost due to shifting of reductions from the ozone season to the non-ozone season.

Second, we urge EPA to adopt some mechanism to reduce the use of excess of banked SO_2 allowances to comply with IAQR caps after 2010. At that point, PM and many ozone areas should have achieved attainment, and it is important to increase actual reductions at that point rather than to allow banked allowances to be used indefinitely. EPA could accomplish this through the use of a "flow-control" mechanism as used by OTC, it could require the retirement of some allowances, or it could gradually increase the ratio of allowances required to offset each ton of emissions as time went on.

Third, after EPA's NOx SIP Call encouraged states to adopt innovative incentive programs for energy efficiency and renewable energy (EERE) projects in the states' NOx trading programs. At least six states have adopted EERE allowance set-aside programs in their regulations implementing the NOx SIP Call: Indiana, Maryland, Massachusetts, New Jersey, New York and Ohio. These are important, innovative market-driven incentive programs that will produce significant environmental benefits. Also, EPA encouraged and many states provided allowance set-asides for new, much cleaner sources such as combined-cycle gas turbine plants. We urge the US EPA to ensure that these programs are not adversely affected by the IAQR's cap and trade proposal.

VII. Conclusion

In conclusion, EPA's proposal is not sufficiently stringent or timely to adequately protect public health or to provide timely and adequate emission reductions to allow nonattainment areas to achieve attainment of the PM and ozone NAAQS as expeditiously as practicable. EPA must end the long delay in adequately cleaning up power plant emissions by finalizing a stronger rule as soon as possible. Specifically, we urge the Agency to issue a rule by October 31, 2004 that includes that following adjustments to EPA's January 30, 2004 proposal:

[139] *Id.,* 249 F.3d at 1047.

- reduces the annual control region SO_2 cap to about 1.84 million tons (approximately equivalent to a 2 million ton nationwide cap);
- makes the reductions effective in one phase, by 2009;
- reduces the annual control region NOx cap in two phases to about 1.04 million tons (approximately equivalent to a 1.25 million ton nationwide cap);
- accelerates the second phase of the reductions to 2012;
- adopts a minimum threshold for state significant downwind contribution at 0.10 ug/m^3, rather than the 0.15 ug/m^3 threshold proposed, thereby slightly expanding the coverage of the emissions caps and the scope of the reductions;
- follows the approach in the NOx SIP Call, and include reductions of SO_2 and NOx from large stationary sources in calculating the IAQR state budgets;
- preserves the integrity of the Regional Haze Rule and BART Guidelines, by allowing projected emissions from the IAQR to be considered by states in formulating and implementing their plans to make reasonable progress towards achieving natural visibility by 2064, but preserving intact the RHR requirements that states follow the process and conduct the analysis necessary to ensure that such progress is being achieved, and the requirement that BART be installed on all individual sources for which it is appropriate under the Agency's BART Guidelines.

Respectfully submitted,

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