If alternatively, EPA were to adopt an 0.10 μg/m³ as the air quality criterion, Oklahoma and North Dakota would also receive annual NO_X budgets. The proposed annual State EGU NO_X budgets for all 30 States based on the proposed methodology are presented in Table VI–11 below.

TABLE VI–11.—30-STATE AND DISTRICT OF COLUMBIA ANNUAL EGU NO_X BUDGETS

State	30-State NO_X budget 2010 (tons)	30-State NO_X budget 2015 (tons)
Alabama	67,415	56,179
Arkansas	24,916	20,763
Delaware	5,039	4,199
District of Columbia	215	179
Florida	115,490	96,242
Georgia	63,568	52,973
Illinois	73,614	61,345
Indiana	102,283	85,236
Iowa	30,454	25,378
Kansas	32,433	27,027
Kentucky	77,929	64,941
Louisiana	47,333	39,445
Maryland	26,604	22,170
Massachusetts	19,624	16,353
Michigan	60,199	50,166
Minnesota	29,300	24,417
Mississippi	21,930	18,275
Missouri	56,565	47,137
New Jersey	9,894	8,245
New York	52,448	43,707
North Carolina	55,756	46,463
North Dakota	26,570	22,141
Ohio	101,693	84,744
Oklahoma	41,293	34,411
Pennsylvania	84,543	70,452
South Carolina	30,892	25,744
Tennessee	47,734	39,778
Texas	224,183	186,819
Virginia	31,083	25,903
West Virginia	68,227	56,856
Wisconsin	39,040	32,533
Total	1,668,268	1,390,223

There are two different metrics that EPA could use for determining alternate State EGU NO_X budgets. These metrics include:

(1) Pro-rated emissions levels (budgets based on reductions in emissions levels),

(2) Pro-rated share of Output (kwh) (budgets based on their output (same lb/kwh rate)).

We solicit comment on the use of these different methods.

There are options for implementing the heat input-based budget and the two different metrics in determining actual State budgets. Budgets could be based on projected levels (calculated by taking historical level and applying growth rates, or directly taking levels projected by IPM).

The methodology used in the NO_X SIP Call (setting State budgets by applying State-specific growth rates for heat input) is an example of this approach. (67 FR 21868; May 1, 2002) Alternatively, it would be possible to use heat input or output as projected directly by IPM in the setting of budgets. This would have the benefit of being consistent with the methodology for determining cost. We would also have projections for relevant years, and there would be little disconnect between the years used to develop growth rates and the years to which growth rates are applied. However, under such a methodology, it would be difficult to adjust budgets if we receive comments about missing units. We solicit comment on these options.

As noted above, EPA proposes that Connecticut contributes significantly to ozone nonattainment areas, but not to fine particle nonattainment areas. Thus, Connecticut would not be subject to proposed annual SO_2 and NO_X controls, but would be subject to ozone season-only NO_X control requirements. We propose an ozone-season EGU NO_X control level of 4,360 tons in 2010 and about 3,633 tons in 2015.

If Connecticut (or any State subject to an existing NO_X ozone season-only budget program) chooses to participate in the interstate trading program proposed today, that State would need to operate under an annual NO_X cap rather than ozone season only. Interstate trading is discussed in more detail in section VIII of this preamble. The EPA proposes an annual NO_X control level of about 9,283 tons in 2010 and 7,735 tons in 2015, if Connecticut were to participate in today's proposed interstate trading program on an annual basis.

The EPA calculated these proposed levels using the 1999 Acid Rain Program reported heat inputs for Connecticut. The ozone-season level was calculated by multiplying the reported ozone-season heat inputs by 0.15 lb/mmBtu for 2010 and 0.125 lb/mmBtu for 2015. The proposed annual level was determined by multiplying the reported annual heat input by 0.15 lb/mmBtu for 2010 and 0.125 lb/mmBtu for 2015. We reviewed reported Acid Rain Program heat inputs for the years 1999 through 2002, and selected 1999 data for calculating these proposed levels because the 1999

Connecticut heat input was higher than the other 3 years considered, and this is similar to the way the regionwide proposed control levels were calculated.

The EPA also takes comment on an alternate way to calculate a NO_X budget for Connecticut that would be entirely consistent with the way that the budgets were calculated for other States. Under this methodology, EPA would calculate region wide NO_X budgets for both the ozone season and non ozone season using State by State heat input data for the highest year between 1999 and 2002 and multiplying it by 0.15 lbs/mmBtu for 2010 and 0.125 lbs/mmBtu for 2015. Both ozone season and non-ozone season State budgets would be calculated by giving States their pro-rated share of the budget based on annual heat input from the years 1999 to 2002. For States required to make year-round reductions, their budgets would be based on the sum of their ozone-season and non-ozone season heat input. For a State such as Connecticut that was only required to make ozone-season reductions, its ozone-season budget would be based upon its share of the ozone-season budget. If Connecticut decided to participate on an annual basis, its budget would be calculated like all other States.

E. Budgets for Use by States Choosing To Control Non-EGU Source Categories

While EPA is not proposing to assume any emissions reductions from other source categories (*e.g.*, non-EGU stationary sources, area sources and mobile sources), States may elect to obtain some or all of the required emissions reductions from other source categories. In this case, EGUs within the State would not be able to participate in the cap and trade programs.

If a State chooses to obtain some but not all of its required reductions from EGUs, it would set an EGU SO_2 budget and/or an EGU NO_X budget, at some level higher than shown in Tables VI–9 and VI–10. The State must also (1) develop baseline emissions sub-inventories for all non-EGU sectors for 2010 and 2015, (2) divide the portion of the required emissions reductions that it will not obtain from EGUs (*i.e.*, the difference between its selected EGU budget for SO_2 or NO_X and the budget listed in Tables VI–9 or VI–10) among the non-EGU source sectors in any manner it chooses, (3) subtract these emissions reductions from the corresponding emissions sub-inventories to arrive at the emissions budget for each sector, and (4) adopt measures that are projected to achieve those budgets. Compliance with all of these control measures would be enforceable. Section VII explains the role of emission budgets for non-EGU sectors in more detail. We plan to propose in the SNPR requirements to ensure the accuracy of the baseline emission sub-inventories.

We believe it is unlikely that any State will choose to obtain all or part of the required SO_2 and NO_X emission reductions from sources other than EGUs, but we do wish to offer States this alternative if equal reductions can be obtained. The SNPR will propose specific emission reductions for this purpose, or provisions for determining these emission reduction quantities. Once these are determined, the four steps described in the previous paragraph will apply.

F. Timing and Process for Setting Baseline Inventories and Sub-Inventories

In the NO_X SIP Call, EPA promulgated a NO_X emission reduction requirement for each State (as we propose here for SO_2 and NO_X). We also promulgated baseline sub-inventories for each State for five sectors (EGU, non-EGU, area, non-road, and highway) which summed to an overall baseline inventory. Finally, the NO_X SIP Call rule contained a table of State-by-State NO_X emissions budgets, developed by subtracting the required NO_X emission reduction from the overall baseline NO_X inventory.

Today, we are proposing specific EGU budgets for affected States for the purposes of the model trading program, but we are not proposing any baseline sub-inventories. There is no need for baseline sub-inventories to be established by rule for States choosing to participate in the model trading programs. As explained in section VI.E above, we propose that if a State chooses to obtain some of the required emission reductions from non-EGU sources, the baseline sub-inventories and the sector budgets should be developed by the State itself and be subject to EPA approval as part of the transport SIP. In this way, baseline sub-inventories and sector budgets will reflect updates to newer emission estimation methods, more recent data on current emissions, and updated projection methods. This will increase the certainty that the required emission reductions will be achieved in practice.

We invite comment at this time on what assumptions and methods for establishing sector inventories should be specified in the supplemental proposal and final rule. In the NO_X SIP Call, for example, we said that emissions reductions from subsequent Federal rules must be incorporated into the baseline sector inventories. Clear rules regarding determination of historical emissions, development of growth factors, estimation of rule effectiveness, and credibility of State-adopted measures may also be needed.

Section IV, above, presents the baseline emission projections that have been used in the air quality modeling that supports today's proposal. We will be updating these baseline inventories for the final rule to incorporate newer data and methods.

G. Comment on Emissions Caps and Budget Program

While EPA's analysis indicates that the availability of boilermaker labor will be a limiting factor in first phase scrubber installations, the Agency is soliciting comment on this analysis. In particular, we're asking for comment on whether there might be alternative post-combustion technologies that could reduce SO_2 emissions in a manner equally cost-effective as scrubbers, but that wouldn't require as much boilermaker labor. Examples might include multi-pollutant technologies (boilermaker labor might be less constrained if single technologies can be installed to reduce both SO_2 and NO_X). We also solicit comment on whether advanced coal preparation processes might provide highly cost effective emission reductions. We solicit comment on whether such alternative technologies will be commercialized by 2010, and what the costs will be.

In addition, EPA seeks comment on whether other factors such as other EPA regulatory actions will create an increase in boilermaker demand earlier than today's proposal (pre-2007), resulting in growth in the number of boilermakers that could be used to install controls required under this program in 2007 and beyond. We solicit comments on whether other factors might increase demand for boilermakers in advance of 2007, and what these factors would be.

As noted above, EPA is proposing to require SO_2 and NO_X to be reduced by similar percentages in the first phase of today's proposed rule, given the limited supply of labor to install controls at electric generating units. An alternative would be to give priority to SO_2 control in the first phase, and postpone summertime NO_X reductions for a couple of years. This would focus limited labor resources on SO_2 control to reduce the sulfate component of $PM_{2.5}$ as quickly as possible. This approach could achieve more early $PM_{2.5}$ reductions and might help some $PM_{2.5}$ nonattainment areas attain earlier. On the one hand, based on the analysis

of section XI, the quantified benefits from $PM_{2.5}$ control are generally larger than those for ozone. Nevertheless, the tradeoff would be that ozone reductions under the interstate air quality rule would be postponed. Because many ozone areas will be required to attain in 2010, fewer projected ozone nonattainment areas would be helped by the interstate air quality rule. A number of areas required to attain in 2010 (and perhaps some 2013 areas as well) would incur greater local control costs to attain on time, or achieve less improvement in ozone levels. We request comment on the relative merits of the proposed approach and this alternative, considering public health, costs, and equity. More generally, EPA seeks comment on the mix of first phase SO_2 and NO_X reductions that represents the proper balance between the goals of reducing $PM_{2.5}$ transport and ozone transport in the near term.

Additionally, EPA seeks comment on the level of the second phase caps and the resulting division of responsibility between local and interstate transport sources. Would a less stringent or more stringent level of transport control lower total costs of attainment, or better address equity issues? Has EPA identified the appropriate level of control as highly cost effective? Should the Agency reduce the second-phase reductions (or raise the second-phase caps) for NO_X and SO_2, and thereby leave more of the emissions reductions burden to the individual States preparing plans for meeting air quality standards in each nonattainment area? Or should the second-phase emissions reductions be increased (or the caps be made lower) in an effort to give more help to States through regional controls that achieve greater reductions and benefits while remaining cost effective? For example, rather than basing the 2015 caps on a 65 percent reduction from title IV levels, should they be based on a 55 percent reduction or a 75 percent reduction?

The EPA also requests comment on the timing of each phase of the cap and trade program. Regarding the first phase, EPA notes that the January 1, 2010 NO_X compliance date occurs after the last ozone season that influences the attainment status of the "moderate" 8-hour ozone nonattainment areas that will receive an attainment date no later than April 2010. We also note that its analysis indicates that the level of control in the first phase is constrained by the amount of control equipment that can be installed by a limited labor force, and providing an earlier compliance deadline might reduce the reductions feasible in the first phase. We request comment on whether the first phase deadline should be as proposed, or adjusted earlier or later, in light of these competing factors.

For SO_2, if States choose to control EGUs through the model cap and trade program, emissions banking provides incentives that lead to steadily declining emissions and thus results in additional benefits before the 2010 and 2015 reductions. However, it appears that it would help several States to reach attainment by CAA deadlines if the second phase emissions cap went into effect earlier, especially for NO_X. This needs to be balanced against the ability of the power industry to do substantially more at that time. The EPA is soliciting comment on the timing of the second phase.

The EPA strongly encourages each State to consider reserving a portion of its allowance budget for an auction. Proceeds from the auction would be fully retained by the State to be used as they see fit. Some possible suggestions for auction revenue that States may want to choose will be further explored in a supplemental notice. For example, a State could develop a program that uses the revenue to provide incentives for additional local reductions within nonattainment areas.

The EPA sees benefits in requiring States to reserve a portion of their budgets for auction, but has concerns about whether such a requirement would intrude on State prerogatives.[8] We solicit comment on this issue.

H. Budgets for Federally-Recognized Tribes

In the 1990 CAA amendments, Congress recognized our obligation to treat Tribes in a manner similar to States. Currently, we are not aware of any EGUs in Indian country in the eastern and central U.S. that could potentially be affected by the interstate air quality rule.

The Tribal air programs are relatively new and Tribes are just now establishing their capacity to develop air quality management plans and beginning to participate in national policy setting processes such as this rulemaking. In addition, past Federal policy limited the economic development and thus the number of emissions sources that might otherwise have been built on Tribal lands. However, many Tribes are currently encouraging economic development on their lands, particularly in the area of energy generation.

In the NO_X SIP Call, EPA did not explicitly consider the issue of Tribal lands and we made no specific provisions for them. One consequence is that Tribal implementation plans—even ones that cover new or existing sources on Tribal lands—apparently are not subject to any of the requirements of the NO_X SIP Call rule. We now realize that we should adopt specific provisions for Tribal lands in today's proposed rulemaking. For States, which have substantial emissions now and corresponding impacts on nonattainment in other States, we have focused in this proposal on what emissions reductions are needed to eliminate existing significant contributions to nonattainment. For Tribes, since there are few sources on Tribal lands now and no EGUs, we should consider what increases are possible without causing significant contributions to nonattainment in State lands and other Tribal lands.

Title IV SO_2 allowances have been provided to EGUs. Because there are no EGUs on Tribal lands, title IV allowances have not been awarded to any EGUs on Tribal lands. Additionally, without EGUs there is no historical heat input for use in calculating an allowance budget for NO_X for Tribal lands. In our discussions prior to this proposal, Tribal representatives have expressed concern that budgets based on existing emissions effectively exclude them from the program unless Tribes buy allowances from the surrounding States. If Tribes do buy allowances, they will be effectively subsidizing the development and inadequate environmental planning of surrounding States. In this rulemaking, we are taking into consideration the past inequities created by Federal policy and traditionally depressed development in Indian country, as well as the need to make progress in air quality.

We are not proposing specific provisions for Tribal lands today. We invite comment generally and on the following specific questions regarding allowance allocation to Tribes:

(1) Should allowance budgets for Tribes be created by the rule separately from State allowance budgets, or be deducted from the proposed State budgets? On what basis or criteria should either approach be implemented?

(2) Alternatively, should the rule set an allowance pool for Tribes in the aggregate with some further process by EPA or by the Tribes collectively to allocate the allowances to specific Tribes? Should the allowance allocation issues be deferred entirely to separate action(s) later? Should any immediate or

[8] *See Virginia* v. *EPA*, 108 F.3d 1397 (D.C. Cir. 1997).

eventual allocations to individual Tribes be based on current emissions, existing contracts for new sources, population, land base, or some other factor(s)? Some Tribes may have concerns that deferral of allowance allocations to individual Tribes does not adequately recognize the sovereignty of individual Tribal nations. There may also be concern that continued uncertainty in the allowances available to the individual Tribes may discourage planning for development.

(3) Should allowances be tradeable among Tribes once allocated? Should they be bankable?

(4) Because the SIPs do not generally apply in Indian country, the system for regulating sources on Tribal land for purposes of limiting transport will need to be implemented through either a Tribal implementation plan or a Federal implementation plan. We invite comment on the best mechanism to implement the budgets.

We recognize that information on economic development and potential for growth may be sensitive for the Tribes to share with EPA or a public docket. We request input from the Tribes on how to determine the allowance needs for the Tribes.

VII. State Implementation Plan Schedules and Requirements

This section describes the dates for submittal and implementation of the interstate transport SIPs that today we propose to require, and discusses those dates in the context of the attainment dates and SIP submittal requirements for the downwind nonattainment areas. In addition, this section describes the required SIP elements that we propose today.

A. State Implementation Plan Schedules

1. State Implementation Plan Submission Schedule

Clean Air Act section 110(a)(1) requires each State to submit a SIP to EPA "within 3 years * * * after the promulgation of a [NAAQS] (or any revision thereof)." Section 110(a)(2) makes clear that this SIP must include, among other things, the "good neighbor" provisions required under section 110(a)(2)(D). These provisions may be read together to require that each upwind State submit, within three years of a NAAQS revision, SIPs that address the section 110(a)(2)(D) requirement.

The $PM_{2.5}$ and 8-hour ozone NAAQS revisions were issued in July 1997. More than 3 years have already elapsed since promulgation of the NAAQS, and States have not submitted SIPs to address their section 110(a)(2)(D) obligations under the new NAAQS. We further recognize that until recently, there was substantial uncertainty as to whether each NAAQS would be remanded to EPA, and that this uncertainty would, as a practical matter, render more complex the upwind States' task of developing transport SIPs.

In addition, today's proposal makes available a great deal of data and analysis concerning air quality and control costs, as well as policy judgments from EPA concerning the appropriate criteria for determining whether upwind sources contribute significantly to downwind nonattainment under section 110(a)(2)(D). We recognize that States would face great difficulties in developing transport SIPs without these data and policies. In light of these factors and the fact that States can no longer meet the original three-year submittal date, we are proposing that SIPs to reduce interstate transport, as required by this proposal, be submitted as expeditiously as practicable, but no later than 18 months from the date of promulgation. The EPA intends to promulgate today's proposed rule between approximately December 2004 and June 2005. In this case, the SIPs required today would be due between approximately July and December 2006.

By comparison, in the NO_X SIP Call rulemaking, EPA provided 12 months for the affected States to submit their SIP revisions. One of the factors that we considered in setting that 12-month period was that upwind States had already, as part of the Ozone Transport Assessment Group process begun three years before the NO_X SIP Call rulemaking, been given the opportunity to consider available control options.

Since today's proposal requires affected States to control both SO_2 and NO_X emissions, and to do so for the purpose of addressing both the $PM_{2.5}$ and 8-hour ozone NAAQS, we believe it is reasonable to allow affected States more time than was allotted in the NO_X SIP Call to develop and submit transport SIPs. Since we plan to finalize this rule no later than mid-2005, SIP submittals would be due no later than the end of 2006. Under this schedule, upwind States' transport SIPs would be due before the downwind States' $PM_{2.5}$ and 8-hour ozone nonattainment SIPs, under CAA section 172(b). We expect that the downwind States' 8-hour ozone nonattainment area SIPs will be due by May 2007, and their nonattainment SIPs for $PM_{2.5}$ by January 2008.[88]

The SIP submittal date proposed today should be considered in the context of the downwind nonattainment area SIP submittal schedules and attainment dates. Under CAA section 172(b), the downwind nonattainment SIPs are due no later than three years after the designations. The EPA expects to designate $PM_{2.5}$ areas by December 31, 2004, and to require the nonattainment area SIPs by three years of the designation. The EPA is required to designate 8-hour ozone areas by April 15, 2004, with an effective date of May 2004, and to require the nonattainment area SIPs by three years of the designation.

Accordingly, today's proposal requires the submittal of the upwind transport SIPs before the downwind nonattainment area SIPs will be due. This sequence is consistent with the provisions of both section 110(a)(1)–(2), which provides that the submittal period for the transport SIPs runs from the earlier date of the NAAQS revision; and section 172(b), which provides that the submittal period for the nonattainment area SIPs runs from the later date of designation.

The earlier submittal date for transport SIPs is also consistent with sound policy considerations. The upwind reductions required today will facilitate attainment planning by the downwind States. Further, most of the downwind States that will benefit by today's rulemaking are themselves upwind contributors to problems further downwind, and, thus, are subject to the same requirements as the States further upwind. The reductions these downwind States must implement due to their additional role as upwind States will help reduce their own $PM_{2.5}$ and 8-hour ozone problems on the same schedule as emissions reductions for the upwind States.

2. Implementation Schedule

Section 110(a)(2)(D) requires SIPs to "contain adequate provisions * * * prohibiting * * * [emissions that] will * * * contribute significantly to nonattainment in * * * any other State. * * *" The phrase "will * * * contribute significantly" suggests that EPA should establish the significance of the emissions' contribution, and require their prohibition, as of a time in the future. However, the provision does not, by its terms, indicate the applicable date in the future; nor does it address the future period of time.

For today's proposal, EPA believes that determining significant

[88] The actual dates will be determined by relevant provisions in the CAA and EPA's interpretation of these provisions published in upcoming implementation rules for the $PM_{2.5}$ and 8-hour ozone NAAQS.

contribution as of 2010, and requiring implementation of the reductions by January 1, 2010, is a reasonable application of the statutory provisions. As discussed in section VI, emissions controls for EGUs may be feasibly implemented by that time. As a result, January 1, 2010 is the date by which we can confidently predict that highly cost-effective emission reductions from EGUs can begin, considering cost broadly to encompass many factors, including engineering feasibility and electricity supply reliability risks.

Emissions reductions by this date will also provide significant air quality benefits to the downwind nonattainment areas. We expect that the attainment date for numerous downwind areas will be 2010 or later, so that these reductions will facilitate attainment. For ozone nonattainment areas, the reductions will reduce the amount of nonattainment. For $PM_{2.5}$ nonattainment areas, the reductions will have the same effect, and help bring those areas into attainment. Indeed, we believe that the anticipation of the optional trading program beginning in 2010 will create incentives for reductions in SO_2 emissions prior to that date. Therefore, today's proposal will have benefits for progress towards attainment with the $PM_{2.5}$ NAAQS in the years between finalization of this rule and 2010. Further discussion of these air quality benefits is included in section IX.

As discussed in section VI, feasibility considerations warrant deferring a portion of the emissions reductions to 2015. As discussed in section IX, these reductions will provide air quality benefits at that time, as well, and, as in the case with the 2010 emission reductions, we expect that the anticipation of tighter controls will likely lead to SO_2 emissions reductions prior to 2015.

B. State Implementation Plan Requirements

Today's proposal requires States to submit SIPs that contain controls sufficient to eliminate specified amounts of emissions. The EPA determined these amounts through the application of highly cost-effective controls to the EGU source category. The amount of the emissions reduction is determined by comparing the amount of EGU emissions in the base case—that is, in the absence of controls—to the amount of emissions after implementation of the controls. Section VI contains a more detailed discussion of the process for determining the amounts of emissions in the base case.

As noted elsewhere, EPA is gathering information concerning certain other source categories. However, EPA does not, at present, have information upon which to propose a determination that any other source categories may achieve specific emissions reductions at a cost that could be considered highly cost effective.

To achieve the required amount of emissions reductions, States may impose emission limits on other sources—in addition to EGUs—if they choose. The EPA is considering what additional requirements are needed to ensure that these limits are met. Overarching considerations include whether the requirements (i) provide certainty that all emissions that EPA determined to contribute significantly will be eliminated both at the State and regional level; (ii) ensure that contributions will continue to be eliminated in future years; and (iii) ensure that the control requirements can be feasibly implemented.

The EPA considered two main approaches to the SIP requirements: a budget (*i.e.*, cap) approach, and an emission reduction approach. The EPA is proposing a hybrid approach that we believe incorporates the best elements of both approaches while minimizing the shortfalls of both approaches.

1. The Budget Approach

In its most rigorous form, a budget approach would require a statewide cap, that is, the capping of aggregate emissions from all source categories in each State. Mechanisms would be set up to ensure that the overall budget was not exceeded. These mechanisms could require individual source categories to meet sub-budgets or could provide for emission shifting between source categories. Subjecting each State throughout the region to aggregate emissions budgets would provide great certainty that the amount of emissions identified as contributing significantly to nonattainment had been eliminated. This approach would also assure that the significant contribution was fully addressed for future years because any increase in activity across all emission sources would have to occur within the budget, that is, without generating additional emissions. If all States applied such an approach, it would also assure that emissions from a source within a given source category would be permanently reduced and not merely shifted to another source within the region, as could occur if sources in one State were controlled under a budget but similar sources in another State were not.

A less rigorous approach would require enforceable budgets for only some source categories, namely, those that were required to make the emissions reductions. Under this approach, there would be less certainty that all States will continue to not contribute significantly (in terms of the air quality component) in future years because growth in overall emissions may still occur.

The U.S. EPA and State environmental agencies have successfully applied budget approaches to certain source categories and groups of source categories. For instance, the title IV requirements of the CAA applied a SO_2 budget to most large EGUs. The Ozone Transport Commission (OTC) NO_X budget trading program applied an ozone season NO_X budget to large EGUs and non-EGU boilers and turbines, and many States have adopted the same approach to meet the requirements of the NO_X SIP Call.[89] These successes demonstrate that budget programs can work for large stationary sources. These types of sources can accurately monitor emissions at the unit level, and these sources are manageable in number, so that overall emissions can be determined using this unit level data.

On the other hand, there has been virtually no experience with budget programs for mobile and area sources, due to challenges in accounting for emissions from these types of sources. Emissions from these sources are typically estimated using emission factors and estimated emission data, so that there is much less certainty about the accuracy of these amounts of emissions. Additionally, monitoring at the unit level and tracking unit level emissions would be much more difficult because of the large number of small sources involved.

As noted above, EPA believes that there are benefits from requiring a State to impose a cap on EGUs. We also believe that there would be benefits from requiring a State to impose a cap on any source category on which the State imposes controls. One benefit would be a permanent limit on the amount of emissions from that category to assure the reductions in emissions that significantly contribute to nonattainment in affected downwind States. We solicit comment on the approach of requiring States to impose caps on any source categories which the State chooses to regulate under the rule proposed today.

[89] These budget approaches authorize trading among sources, but other control methodologies, such as emission rate controls, may also authorize trading. See U.S. EPA, "Improving Air Quality with Economic Incentive Programs," (January 2001).

2. The Emissions Reduction Approach

Under the emissions reduction approach, SIPs must impose control requirements that typically consist of an emission rate limit or, possibly, application of a specified type of technology, but not an emissions cap. These control requirements, when implemented by the affected sources in the implementation years, must result in the amount of emission reductions that EPA required through the highly cost-effective calculations described in section VI.

This approach is most useful when a State chooses to apply the control requirements to a source category for which current source-monitoring methods do not permit specific emissions quantification for each source, and for which shifts in emissions-generating activity are unlikely to result from the control program. This limitation in the methodology may result because, among other possible reasons, (i) the source's emissions generating activities are of a type for which no accurate quantification methodology exists; (ii) such a methodology would be unreasonably expensive to apply to the source; or (iii) the sources are too numerous.

Even so, to ensure that the desired emissions reductions are achieved, this methodology requires accurate baseline emission estimates, which, as a practical matter, may be difficult to develop in light of the uncertainties in estimating emissions from the affected source types. If the baseline estimates are high, States may achieve credit for emissions reductions they will not in fact achieve (by reducing emissions to a certain emission rate from the incorrectly high baseline emission rate). Additionally, while this approach may assure similar emissions reductions to the budget approach in the early years following implementation, growth in activity levels in the controlled source categories would likely lead to growth in emissions in later years, which in turn may adversely affect downwind nonattainment areas.

Although the emissions reduction approach has limitations, EPA believes it is the most workable approach for some source categories, such as mobile and area sources, for which there is little or no experience in using the budget approach and for which the available emissions quantification techniques are too imprecise to support the budget approach.

3. The EPA's Proposed Hybrid Approach

The EPA proposes today to require each affected State to submit a SIP containing control requirements that will assure a specified amount of emissions reductions. These amounts would be computed with reference to specified control levels for EGUs, which EPA has determined to be highly cost effective.

States may meet their emissions reduction requirements by imposing controls on any source category they choose. If they choose the EGU source category, they must impose a cap because this category may feasibly implement a cap. If States choose to get emissions reductions from other source categories, they may implement the emissions reduction approach, that is, they need not implement caps, but rather may implement other forms of controls. Even so, EPA strongly encourages States to control source categories for which workable budget programs can be developed, and to require the budget approach for those sources to which it can feasibly be applied.[90]

The EPA is proposing specific requirements that States must meet, depending on which source categories they choose to control. These requirements are intended to provide as much certainty as possible that the controls will eliminate the amounts of significant contributions.

a. Requirements if States Choose To Control EGUs

As explained above, States must apply the budget approach if they choose to control EGUs. That is, they must cap EGUs at the level that assures the appropriate amount of reductions. We believe that this is the preferable approach for complying with today's proposed rule.

Moreover, as discussed in sections VI and VIII, States that choose to allow their EGUs to participate in EPA-administered interstate SO_2 and NO_X emissions trading program must adhere to EPA's model trading rules, which we intend to propose in the SNPR. For SO_2 sources, these rules will require the States to allocate control obligations to sources in a manner that mirrors the sources' title IV allowance allocations, although EPA is considering certain variations that are described in section VI.

With respect to monitoring, recordkeeping, and reporting requirements, most EGUs are already subject to the requirements of 40 CFR part 75 to demonstrate compliance with the title IV SO_2 provisions. In addition, many EGUs are also subject to part 75 due to SIP requirements under the NO_X SIP Call. The EPA believes that part 75 provides accurate and transparent accounting of emissions from this source category. Therefore, EPA proposes to require States, if they apply controls to EGUs, to subject EGUs to the requirements of part 75.

As explained in sections VI and VIII, today's proposed SO_2 emissions reductions requirement, when applied to EGUs subject to the title IV allowance programs, would result in a cap that, in turn, would create surplus title IV allowances. These surplus allowances, if allowed to be traded, may have adverse impacts in and outside of the States directly affected by today's proposal. In particular, the large number of these allowances that become available may depress their price, which may lead to even more of them being purchased and used in States not affected by today's proposed rule.

To prevent these impacts, EPA is proposing that SIPs assure that the State's title IV allowances exceeding the emissions that the State's EGUs may emit under the rule proposed today are not used in a manner that undermines the rule proposed today. As a practical matter, SIPs may need to require the retirement or elimination of certain of the title IV allowances. The number of retired or eliminated allowances may well equal the difference between the number of title IV allowances allocated to a State and the SO_2 budget that the State sets for EGUs under today's proposed rule. For example, assume that a State's EGUs are allocated a total 5,000 SO_2 allowances under title IV (each allowance authorizes one ton of SO_2 emissions). Assume further that today's proposed rule requires the State to reduce its SO_2 emissions by 2,500 tons. Assume even further that the State chooses to achieve all of the required reductions from EGUs, beginning January 1, 2010. Under these circumstances, the SIP must include a mechanism to retire or eliminate the remaining 2,500 allowances.

The EPA believes that this proposed requirement to retire or eliminate surplus allowances applies regardless of whether or not a State participates in the EPA-managed trading system. If the State does not participate in the EPA-managed trading system, it may choose

[90] It should be noted that even if a State uses a budget approach for a source category within the State, it is possible that production may shift to another part of the transport region, so that the State's claimed emission reductions may in fact simply represent emissions shifted to another part of the transport region.

the specific method to retire or eliminate surplus allowances from its sources. If it chooses the EPA-managed trading system, it must adhere to the provisions of the model trading rule, which are broadly outlined in section VIII.

States may allow EGUs to demonstrate compliance with the State EGU SO_2 emission budget by using (i) allowances that were banked (that is, issued for years earlier than the year in which the source is demonstrating compliance), or (ii) title IV allowances from the same year purchased from sources in other States.

b. Requirements if States Choose To Control Sources Other Than EGUs

If a State chooses to require emissions reductions from only EGUs, then its SIP revision submitted under the rule proposed today need contain only provisions related to EGUs, as described above. The State need not adopt or submit, under the rule proposed today, any other provisions concerning any other source categories.[91]

On the other hand, if a State chooses to require emissions reductions from sources other than EGUs, the State must adopt and submit SIP revisions, and supporting documentation, designed to quantify the amount of reductions from the sources and to assure that the controls will achieve that amount of reductions. The EPA is not proposing today that the State be required to cap those sources. However, EPA solicits comment on whether to require States that choose to control sources other than EGUs to cap those sources.

To demonstrate the amount of emissions reductions from the controlled sources, the State must take into account the amount of emissions attributable to the source category both (i) in the base case—that is, in the implementation year (2010 and 2015) without assuming SIP-required reductions from that source category under today's proposed rule—and (ii) in the control case. Both scenarios (base case and control case) are necessary to determine the amount of emissions reductions that will result from the controls. As noted above, section VI contains a more detailed discussion of the process for determining the amounts of emissions in the base case.

The EPA intends to propose in the SNPR monitoring, recordkeeping, and reporting requirements for sources other than EGUs. Further, EPA intends to include proposed rule language for these requirements. Commenters will have an opportunity to comment following publication of the SNPR. As a result, EPA is not soliciting comment on this subject now. Even so, EPA intends to consider any comments submitted on this subject that commenters may wish to submit.

[91] Of course, the State may be obligated to submit SIP revisions covering other source categories under applicable CAA provisions other than section 110(a)(2)(D).

VIII. Model Cap and Trade Program

In today's action, we are outlining multi-State cap and trade programs for SO_2 and NO_X that States may choose as a cost-effective mechanism to achieve the required air emissions reductions. Use of these cap and trade programs will not only ensure that emissions reductions under the proposed rulemaking are achieved, but also provide the flexibility and cost effectiveness of a market-based system. This section provides background information, a description of the cap and trade programs, and an explanation of how the cap and trade programs would interface with other State and Federal programs. It is EPA's intent to propose model SO_2 and NO_X cap and trade rules in a future SNPR that States could adopt.

By adopting the model rules, States choose to participate in the cap and trade programs, which are a fully approvable control strategy for achieving emissions reductions required under today's proposed rulemaking. Should a State choose to participate in the cap and trade programs, EPA's authority to cooperate with and assist the State in the implementation of the cap and trade program(s) would reside in both State law and the CAA. With respect to State law, any State that elects to participate in the cap and trade programs as part of its SIP will be authorizing EPA to assist the State in implementing the cap and trade program with respect to the regulated sources in that State. With respect to the CAA, EPA believes that the Agency's assistance to those States that choose to participate in the cap and trade programs will facilitate the implementation of the programs and minimize any administrative burden on the States. One purpose of title I of the CAA is to offer assistance to States in implementing title I air pollution prevention and control programs (42 U.S.C. 101(b)(3)). In keeping with that purpose, section 103(a) and (b) generally authorize EPA to cooperate with and assist State authorities in developing and implementing pollution control strategies, making specific note of interstate problems and ozone transport. Finally, section 301(a) grants EPA broad authority to prescribe such regulations as are necessary to carry out its functions under the CAA. Taken together, EPA believes that these provisions of the CAA authorize EPA to cooperate with and assist the States in implementing cap and trade programs to reduce emissions of transported SO_2 and NO_X that contribute significantly to ozone and $PM_{2.5}$ nonattainment.

To inform the current rulemaking process, EPA recently hosted two workshops in July and August of 2003 to listen to States and multi-State air planning organization's experience with the NO_X SIP Call program to date: What has worked well, what may not have worked well, and what could be improved. (The EPA Web site[92] provides information on these workshops.) Workshops such as these have played an important role in the development and implementation of the NO_X SIP Call and will help in the development of this rule.

This section in today's action describes, on a generally conceptual level, the cap and trade program. EPA will publish, in a future SNPR, a more detailed description of the proposed rules, as well as model rules. As a result, EPA is not soliciting comment on this section in today's action. Interested persons will have a full opportunity to comment on all aspects of this cap and trade program through the SNPR. Even so, EPA recognizes that continued stakeholder input on the cap and trade programs described in this section may be useful concerning the programmatic implications of addressing multiple environmental issues (*i.e.*, $PM_{2.5}$ and ozone) with synchronized cap and trade programs for SO_2 and NO_X. Accordingly, EPA intends to review comments that may be submitted on all of the program elements described in today's NPR.

A. Application of Cap and Trade Approach

1. Purpose of the Cap and Trade Programs and Model Rules

In the cap and trade programs, EPA is proposing to jointly implement with participating States a capped market-based program for EGUs to achieve and maintain an emissions budget consistent with the proposed rulemaking. Specifically, EPA has designed today's proposal to assist States in their efforts to: (1) Improve air quality and achieve the emissions reductions required by the proposed rulemaking; (2) offer compliance flexibility for regulated sources; (3) reduce compliance costs for sources controlling emissions; (4)

[92] *http://www.epa.gov/airmarkets/business/noxsip/atlanta/atl03.html.*

streamline the administration of programs to reduce multiple pollutants for States; and (5) ensure that emission reductions are occurring and that results are publicly available. In addition to realizing these benefits of a cap and trade program, EPA also seeks to create as simple a regulatory regime as possible by applying a single, comprehensive regulatory approach to controlling multiple pollutants across multiple jurisdictions.

Beyond choosing to use a cap and trade program, State adoption of the model rule would ensure consistency in certain key operational elements of the program among participating States. Uniformity of the key operational elements across the region is necessary to ensure a viable and efficient cap and trade program with low transaction costs and minimum administrative costs for sources, States, and EPA. (These necessary elements are discussed in section B.3.). States will continue to have flexibility in other important program elements (*e.g.*, allowance allocations, inclusion of additional measures to address persistent local attainment issues).

2. Benefits of Participating in a Cap and Trade Program

a. Advantages of Cap and Trade Over Command-and-Control

When designed and implemented properly, a cap and trade program offers many advantages over traditional command-and-control and project-by-project emission reduction credit trading programs. There are several advantages of a well-designed cap and trade system that include: (1) Control of emissions to desired levels under a fixed cap that is not compromised by future growth; (2) high compliance rates; (3) lower cost of compliance for individual sources and the regulated community as a whole; (4) incentives for early emissions reductions; (5) promotion of innovative compliance solutions and continued evolution of generation and pollution control technology; (6) flexibility for the regulated community (without resorting to waivers, exemptions and other forms of administrative relief that can delay emissions reductions); (7) direct legal accountability for compliance by those emitting; (8) coordinated program implementation that efficiently applies administrative resources while enhancing compliance; and (9) transparent, complete, and accurate recording of emissions. These benefits result primarily from the rigorous framework established by a cap and trade program that provides flexibility in compliance options available to sources and the monetary reward associated with avoided emissions in a market-based system. The cost of compliance in a market-based program is reduced because sources have the freedom to pursue various compliance strategies, such as switching fuels, installing pollution control technologies, or buying emission allowances from a source that has over-complied. Since reducing emissions to levels below the allocations for a source allows them to sell excess allowances on the market, this program promotes cost effective pollution prevention, and encourages innovations in less-polluting alternatives and control equipment.

A market-based system that employs a fixed, enforceable tonnage limitation (or cap) for a source or group of sources provides the greatest certainty that a specific level of emissions will be attained and maintained. With respect to transport of pollution, an emissions cap also provides assurance to downwind States that emissions from upwind States will be effectively managed over time. The capping of total emissions of pollutants over a region and through time ensures achievement of the environmental goal while allowing economic growth through the development of new sources or increased use of existing sources. In an uncapped system (where, for example, sources are required only to demonstrate that they meet a given emission rate) the addition of new sources to the regulated sector or an increase in activity at existing sources can increase total emissions even though the desired emission rate control is in effect.

In addition, the reduced implementation burden for regulators and affected sources benefits taxpayers and those who must comply with the rules. This streamlined administration allows a relatively small number of government employees to successfully manage the emissions of many sources by (1) minimizing the necessity for case-by-case decisions, and (2) taking full advantage of electronic communication and data transfer to track compliance and develop detailed inventories of emissions and plant operations.

b. Application of the Cap and Trade Approach in Prior Rulemakings

i. Title IV

Title IV of the CAA Amendments of 1990 established the Acid Rain Program, a program that utilizes a market-based cap and trade approach to require power plants, to reduce SO_2 emissions by 50 percent from 1980. At full implementation after 2010, emissions will be limited, or capped, at 8.95 million tons in the contiguous United States. The Acid Rain SO_2 Program is widely acknowledged as a model air pollution control program because it provides significant and measurable environmental and human health benefits with low implementation costs.

Individual units are directly allocated their share of the total allowances—each allowance is an authorization to emit a ton of SO_2—based upon historical records of the heat content of the fuel that they combusted in 1985–1987. Units that reduce their emissions below the number of allowances they hold, may trade excess allowances on the open market or bank them to cover emissions in future years. Allowances may be purchased through the open market or at EPA-managed auctions. Each affected source is required to surrender allowances to cover its emissions each year. Should any source fail to hold sufficient allowances, automatic penalties apply. In addition to financial penalties, sources either will have allowances deducted immediately from their accounts or, if this would interfere with electric reliability, may submit a plan to EPA that specifies when allowances will be deducted in the future.

The Acid Rain Program requires affected sources to install systems that continuously monitor emissions. The use of continuous emissions monitoring systems (CEMS) is an important component of the program that allows both EPA and sources to track progress, ensure compliance, and provide credibility to the cap and trade component of the program.

While title IV does provide for an Acid Rain Permit, this is a simple permit that does not incorporate source specific requirements, but rather requires the source to comply with the standard rules of the program. The Acid Rain Permit has been easily incorporated into the title V permit process and does not require the typically resource intensive, case-by-case review associated with other permits under command-and-control programs.

The Acid Rain Program has achieved major SO_2 emissions reductions, and associated air quality improvements, quickly and cost effectively. In 2002, SO_2 emissions from power plants were 10.2 million tons, 41 percent lower than 1980.[93] (2002 Acid Rain Progress

[93] U.S. EPA, EPA Acid Rain Program: 2002 Progress Report (EPA 430–R–03–011), November 2003. Available at *http://www.epa.gov/airmarkets/cmprpt/arp02/2002report.pdf.*

Report.) These emission reductions have translated into substantial reductions in acid deposition, allowing lakes and streams in the Northeast to begin recovering from decades of acid rain. In addition, substantial improvements in air quality have occurred under the Acid Rain Program. Fine particle exposures have been reduced, providing significant benefits to public health. These benefits include the annual reduction of thousands of premature mortalities, thousands of cases of chronic bronchitis, thousands of hospitalizations for cardiovascular and respiratory diseases.

Cap and trade under the Acid Rain Program has created financial incentives for electricity generators to look for new and low-cost ways to reduce emissions, and improve the effectiveness of pollution control equipment, at costs much lower than predicted. The cap on emissions, automatic penalties for noncompliance, and stringent emissions monitoring and reporting requirements ensure that environmental goals are achieved and sustained, while allowing for flexible compliance strategies which take advantage of trading and banking. The level of compliance under the Acid Rain Program continues to be uncommonly high, measuring over 99 percent.

ii. Ozone Transport Commission NO_X Budget Program

The Ozone Transport Commission's (OTC) NO_X Budget Program was a cap and trade program to reduce NO_X emissions from power plants and other large combustion sources in the Northeast. The OTC was established under the CAA Amendments of 1990 to help States in the Northeast and Mid-Atlantic region meet the NAAQS for ground-level ozone. The NO_X Budget Program set a regional budget on NO_X emissions from power plants and other large combustion sources during the ozone season (from May 1 through September 30) beginning in 1999.

The OTC NO_X Budget Program has significantly reduced NO_X emissions from large combustion facilities in the Northeast and Mid-Atlantic region with total regional emissions in 2002 approximately 60 percent below 1990 levels; well under target levels. Significant reductions in ozone season NO_X emissions have occurred in all States across the region. In addition, the emission reductions have proven to be cost effective with the cost of NO_X allowances stabilized below original projections.[94]

The OTC States generally folded their SIP requirements under the OTC NO_X Budget Program into the SIP revisions they submitted with the NO_X SIP Call. The NO_X Budget Program was incorporated into the NO_X SIP Call. The 2003 ozone season marked the first year of compliance with the NO_X SIP Call for the OTC States.

iii. NO_X SIP Call

The NO_X SIP Call, finalized in 1998, requires ozone season (*i.e.*, summertime) NO_X reductions across a region which includes most of the OTC States and southeastern and midwestern States that were found by EPA to have sources that contribute significantly to another State's ongoing ozone NAAQS nonattainment problems. The NO_X SIP Call proposed a cap and trade program as a way to make cost-effective NO_X reductions. Each of the States required to submit a NO_X SIP under the NO_X SIP Call chose to adopt the cap and trade program regulating large boilers and turbines. Each State based its cap and trade program on a model rule developed by EPA. This model rule included key elements such as the use of continuous emissions monitoring (CEMS) and 40 CFR part 75 monitoring and reporting requirements, and a single party that is legally responsible for compliance. Some States essentially adopted the full model rule as is, while other States adopted the model rule with changes to the sections that EPA specifically identified as areas in which States may have some flexibility. The NO_X SIP Call cap and trade program, modeled closely after the OTC NO_X Budget Program takes effect in 2004. When it does so, it expands from the OTC States to eleven additional States in 2004. The EPA intends to draw heavily upon this and other experience in developing model SO_2 and NO_X cap and trade programs.

c. Regional Environmental Improvements Achieved Using Cap and Trade Programs

One concern with emissions trading programs is that the flexibility associated with trading might allow sources or groups of sources to increase emissions, resulting in areas of elevated pollution or "hot spots." The environmental results observed under the Acid Rain Program have instead indicated that the combination of trading with a stringent emissions cap results in substantial reductions throughout the region, with the greatest reductions achieved in the areas where pollution was originally the highest.

Since 1990, SO_2 and sulfate concentrations at CASTNET sites have been reduced substantially in the areas where concentrations were highest before the Acid Rain Program. (Acid Rain Program Progress Report 2002). All sites in the East showed reductions in SO_2 and sulfate 3 year average concentrations between 1990–1992 and 2000–2002. The largest decreases in SO_2 concentrations were observed at sites where SO_2 emissions and monitored SO_2 concentrations were highest before the program (from Illinois, to northern West Virginia, across Pennsylvania, to western New York). CASTNET sites throughout the broader eastern region also show a substantial reduction in sulfate concentrations, with the largest decreases in sulfate levels occurring along the Ohio River Valley from Illinois to West Virginia, Pennsylvania, and the mid-Atlantic states.

Independent analyses, in addition to those conducted by EPA, have shown that emissions trading under this type of program has not resulted in the creation of "hot spots" because trading has resulted in emissions reductions being achieved in areas where emissions were highest before the program.[95] The Environmental Law Institute, Environmental Defense, and the Massachusetts Institute of Technology's Center for Energy and Environmental Policy have all examined emissions trading under the Acid Rain Program and none have concluded that the program has resulted in hot spots of high emissions. To the contrary, the highest emitting sources have tended to reduce emissions by the greatest amount. This is the case, in part, because trading occurs under a nationwide cap that represents a reduction in total emissions and improvements in regional air quality. The flexibility of a cap and trade system provides a mechanism for achieving established emission goal(s)at lowest possible cost. The most cost effective opportunities for reductions are at the larger, more efficient coal-fired units that have modest (or no) controls and are geographically dispersed.

Further support for trading actually reducing "hot spots" was found by Resources for the Future. Resources for the Future, a non-partisan environmental advocacy group,

[94] Ozone Transport Commission. NO_X Budget Program 1999–2002 Progress Report, March 2003. Available at *http://www.epa.gov/airmarkets/otc/otcreport.pdf.*

[95] Environmental Law Institute (*http://www.epa.gov/airmarkets/articles/so2trading-hotspots_charts/pdf*), Environmental Defense (*http://www.environmentaldefense.org/documents/645_SO2.pdf*) and MIT's Center for Energy and Environmental Policy Research (*http://web.mit.edu/ceepr/www/2003-015.pdf*).

modeled air quality and health benefits under the trading program and under a non-trading scenario and found that trading actually resulted in additional benefits because emissions reductions took place in areas where they were more environmentally effective.[96]

Cap and trade programs are designed to reduce emissions of numerous polluting sources by significant amounts over large geographic areas. The trading mechanism does not replace the requirement to meet the NAAQSs at the local level, but rather helps achieve this requirement through significant reductions in background pollution. Thus, State and local governments will continue to have the obligation and the authority under the CAA to assure that the NAAQS are met.

Nearly 10 years of experience with the Acid Rain Program for SO_2 has clearly demonstrated that market-based cap and trade programs are an effective vehicle for achieving broad improvements in air quality by reducing emissions of a regionally transported air pollutant. More recently, the OTC's regional NO_X program also has shown the value of a cap and trade approach for NO_X reductions. The more stringent SO_2 and NO_X caps proposed in this rulemaking will build on this track record of success.

B. Considerations and Aspects Unique to the SO_2 Cap and Trading Program

1. SO_2 Cap and Trade Program Overview

This section of today's proposal outlines an SO_2 cap and trade program which builds upon the concepts applied in the cap and trade programs described in section VIII.A. This section discusses elements unique to the proposed SO_2 trading program, paying particular attention to those aspects that significantly differ from the corresponding provisions in existing programs. (Additional details on the SO_2 and NO_X trading program may be found in section VIII.D, which describes major program elements that must be consistent across States in order for EPA to implement a trading program.)

While key considerations and program elements are outlined in today's proposed rule, a complete model cap and trade rule will be proposed by EPA in a future SNPR. In addition to a model rule, the SNPR will address other issues such as allocations and voluntary measures for States to address persistent local non-attainment issues.

The proposed SO_2 cap and trade program would apply to the large power generators in the transport region. (See section VI of today's rule for a discussion of the emission budgets and the core sources.) States would have some flexibility to include other sources or source categories in the trading program should they demonstrate their ability to measure the emissions from these other sources to the same standards required of the core trading sources.

The units affected by today's SO_2 rule are already regulated by EPA. EPA is committed to a transition that ensures continued environmental progress, preserves the integrity of existing emission trading markets, and minimizes confusion and cost for the public, sources and regulators. Section VIII.B.2 below discusses the interactions between today's proposal and existing programs by presenting analysis and implementation options. A discussion of the applicable sources is contained in section VIII.D.1.

2. Interactions With Existing Title IV Acid Rain SO_2 Cap and Trade Program

As discussed above, title IV of the CAA requires reductions in SO_2 emissions from power plants to abate acid rain and improve public health using a cap and trade approach. Further, title I of the CAA requires EPA to help States develop and design implementation plans to meet the NAAQS. To achieve that end, today's action proposes a regional rule to reduce ambient concentrations of $PM_{2.5}$, as mandated by the CAA. The SO_2 program establishes a model cap and trade system for reducing emissions that States can adopt in order to help meet the NAAQS.

As EPA developed this regulatory action, great consideration was given to interactions between the existing title IV program and a rulemaking designed to achieve significant reductions in SO_2 emissions beyond title IV. Requiring sources to reduce emissions beyond the title IV mandates has implications for the existing title IV SO_2 program which are both environmental and economic. In the absence of a method for incorporating the statutory requirements of title IV, a rule that imposes a tighter cap on SO_2 emissions for a particular region of the country would likely result in an excess supply of title IV allowances and the potential for increased emissions in the area not subject to the more stringent emission cap. The potential for increased emissions exists in the entire country for the years prior to the proposed implementation deadline and would continue after implementation for any areas not affected by the proposed rule. These excess emissions could negatively affect air quality, disrupt allowance markets, and erode confidence in cap and trade programs.

In view of the significant reductions in SO_2 emissions under title IV of the CAA, the large investments in pollution controls that firms have made under title IV that enable companies to sell excess emissions reductions, and the potential for emissions increases, it became a priority to think of ways to preserve the environmental benefits achieved through title IV and maintain the integrity of the title IV market for SO_2 allowances.

In addition, EPA does not have authority to remove the statutory requirements of title IV and must work within the context of the existing CAA to further reduce emissions of SO_2 through a new rule. Title IV has successfully reduced emissions of SO_2 using the cap and trade approach, eliminating millions of tons of SO_2 from the environment. Building off this existing program to further improve air quality by requiring additional reductions of SO_2 emissions is appropriate.

The EPA has developed an approach to incorporate the title IV SO_2 market to ensure that the desired reductions under this rule are achieved in a manner consistent with the previously stated environmental goals. The following sections provide more detail on EPA's initial analysis of the interactions between the title IV Acid Rain program and this proposal outlines a solution for creating a rule that builds off of title IV.

Initial Analysis

Initial analytical work shows that a more stringent cap on SO_2 emissions in the eastern part of the country, that is separate from the title IV cap, would create an excess supply of title IV allowances nationwide as sources in that eastern region comply with a tighter requirement than title IV and no longer need as many title IV allowances. As a result of this excess supply, all title IV allowances would lose value. This impact on the title IV market results in (1) an incentive to use all banked title IV allowances prior to implementation of the rule as firms anticipate the value of allowances dropping essentially to zero and (2) emission increases outside the region after rule implementation because those sources would be able to obtain title IV allowances at essentially no cost.

b. Emissions Increases Prior to Implementation of the Proposed Rule

The EPA expects that the number of banked (*i.e.*, the retention of unused

[96] *http://www.rff.org/CFDOCS/disc_papers/PDF_files/9925.pdf*

allowances from one calendar year for use in a later calendar year) title IV allowances will be in the millions of tons at the end of 2009 in the absence of the rule. The actual number of allowances banked will depend upon future economic growth and the independent decisions of the sources between now and 2010, and EPA will continue to evaluate emissions trends and the bank prior to finalizing the rule. Should the rule not permit the use of banked title IV allowances in the program, the banked allowances would likely be expended during the years prior to implementation of the rule. This could cause over 1 million tons per year of additional SO_2 emissions, nationwide, that could be emitted above levels projected in the absence of a rule.

c. Consideration for Emissions Shifting Outside the Control Region

Title IV sources outside the more stringently regulated region would be able to obtain title IV allowances from sources affected by the rule at very low cost after the commencement of the program. The flow of inexpensive, abundant allowances out of an area with more stringent emission control requirements is referred to as "leakage" and would likely result in increased emissions outside the region. In essence, sources outside of the region would not face a binding title IV constraint on their emissions of SO_2 due to the potential availability of abundant allowances provided by sources inside of the control region. Though certain State and local requirements or physical constraints would mitigate the problem of emissions increases outside the region, meaningful increases would be a possibility. Emissions increases outside the region would worsen air quality in those areas and could potentially negate some of the reductions achieved in the region.

The potential for leakage is dependent upon the size of the region. The large eastern trading region proposed in today's rule—which is based upon addressing $PM_{2.5}$—is not likely to result in significant leakage because the region is large enough to take advantage of the physical limitations in the electricity grid that prevent large power movements from the East to the West (or vice versa) through the Western Interconnect.

d. Desired Outcomes in the Design of the Cap and Trade Rule

The proposed cap and trade program will be designed to meet three primary goals: (1) Achieving environmental goals; (2) preserving and potential strengthening of allowance trading markets; and (3) providing the flexibility to incorporate additional jurisdictions and types of sources in the future, while maintaining the integrity of the cap and allowance markets.

First and foremost, the proposed cap and trade program must be designed to improve air quality to protect the public's health and the environment. To accomplish this, the program must address the potential for emission leakage, require credible emission monitoring and reporting, and provide for source accountability.

Preservation of the benefit of the title IV allowance market (*i.e.*, a solution that would maintain or even increase the economic value of title IV allowances) would eliminate the incentive to increase emissions prior to the start of the program and ease the administrative transition. Incorporating title IV creates incentives for earlier reductions by title IV sources and may create incentives for title IV sources not included in the rule to maintain, or even reduce, emissions of SO_2 both before and after the rule goes into effect. In addition, it sends a clear signal to sources that have already made investments in pollution control equipment that the allowance market is sound and will continue to operate.

The proposed cap and trade solution must provide opportunities for incorporating additional sources (*e.g.*, non-title IV sources, other source categories) and States, during promulgation and in the future. Designing a cap and trade program that can include these additional sources creates the potential to achieve additional environmental benefit and/or reduce the program's total cost.

e. Discussion of Possible Solutions

The EPA explored several options for addressing the coordination of title IV and the proposed rule consistent with the objective of minimizing emissions increases and providing a mechanism of allocating allowances to sources lacking any title IV allocations. One option would establish a separate cap and trade program for SO_2 that would require the retirement of surplus title IV allowances for the rule (*i.e.*, the difference between total title IV allocations and the trading budget for a given State under the rule). Sources would have to comply with both programs independently, and States would have flexibility in allocating the newly created allowances to non-title IV sources. Although this option could be designed so as to maintain the value of title IV allowances once the new cap and trade program begins under the rule, thus minimizing leakage, it would not address banked title IV allowances accumulated before implementation of the program, resulting in possible emissions increases prior to rule implementation.

Another option would allow for conversion of title IV allowances into separate allowances under a new cap and trade program. This conversion would be applied at a specific ratio (*e.g.*, two-to-one) that yields the desired emission reductions, and could be applied to both banked and current title IV allowances. By complying with the rule and submitting more than one title IV allowance for every ton emitted, a source would be in compliance with both programs. New allowances could be created to give States flexibility with SO_2 allocations, but the conversion ratio would need to be adjusted to incorporate these new allowances. This solution presents some challenges, such as establishing the proper conversion ratio and the need to adjust the cap under the rule to account for the converted allowances. In addition, the uncertainty surrounding how many banked allowances would be converted poses challenges when designing the cap and trade rule.

f. Proposed Approach

A third option and the approach proposed here best addresses the three principles identified above. It would require sources to use title IV allowances directly for compliance with the rule in a way that maintains the downward trend in emissions throughout the country, preserves the existing SO_2 allowance market, and allows the inclusion of non-title IV sources, now and in the future.

Title IV sources in the region would be required to comply with the rule by using more than one title IV allowance for every ton emitted (*e.g.*, a two-to-one ratio). EPA would propose to amend the title IV rules in a future SNPR so that sources that comply with the rule would be deemed in compliance with title IV since by submitting allowances at a greater than one-to-one ratio, a source would be going beyond what title IV required. The requirement to submit more than one allowance for every ton emitted is, in effect, a reduction of the title IV cap. The specific ratio would be determined based on the amount of emissions to be allowed for the region. The ratio, in essence, would reflect the cap levels and determine the ultimate emissions in the region. Section VIII.B.3 below, discusses a methodology that could be used to provide allowances to EGUs that were not allocated allowances under title IV.

While EPA is not currently proposing to require sources other than EGUs to be part of the cap and trade program, EPA

believes that this approach could also allow other sources to participate in the cap and trade program. States electing to include additional sources could develop mechanisms to provide them with access to allowances through auctions or direct allocations. (This is discussed in greater detail in section VIII.B.3.)

i. Using Pre-2010 Banked Title IV Allowances in Proposed SO_2 Cap and Trade Program

Under the proposed approach, title IV allowances could be banked before the 2010 implementation date for use in the new program. Pre-2010 title IV allowances banked prior to 2010 could be used at a one-to-one ratio for compliance at any time. This provides incentives to reduce emissions before the 2010 implementation date because sources would want to ease the transition to the more stringent caps in 2010 and thereafter. However, it should be noted that these allowances could then be used in later years, delaying the amount of time until the ultimate cap level is achieved.

ii. Proposed Ratios and the Phasing of the Caps

The proposed SO_2 program would allow: (1) Pre-2010 allowances to be used at a one-to-one ratio; (2) 2010 through 2014 allowances to be used at a two-to-one; and (3) 2015 and later allowances to be used at a three-to-one ratio. Since title IV allowances are already identified by serial numbers that indicate the year the allowance is first allowed to be used, it is possible to use different retirement ratios for allowances of different vintages. The progressively more stringent, phased-in nature of the rule will be reflected in the proposed cap and trade program by adjusting the ratio for retiring allowances in each phase. EPA developed these ratios to achieve the emissions reductions as described in section VI with careful consideration given to the title IV bank, State EGU budgets, and phasing in order to create ratios that are consistent with the objectives of the rule. The ratios, in effect, tighten the existing title IV cap.

States choosing to participate in the cap and trade program must require sources to submit title IV allowances at the ratios set in the model rule.

The EPA projects that using 2010 to 2014 vingtage title IV allowances at a ratio of two-to-one and post 2014 allowances at a ratio of three-to-one in the second phase will produce the desired emission reductions for SO_2. These ratios are projected to lead sources to bank roughly an additional 10.5 million allowances prior to 2010. Vintage year allowances 2009 and earlier are projected to be used starting in 2010 at an average rate of 1.3 million per year.

The value of title IV allowances is projected to increase to $400 during the first phase, and to fall to $330 during the second phase, according to EPA modeling. In other words, sources in the region would face a marginal cost of $805 per ton of emissions in the first phase at a two-to-one ratio and $989 in the second phase at a three-to-one ratio. The marginal cost numbers presented here are generated from EPA modeling of this rule, looking specifically at the interactions with title IV.

3. Allowance Allocations

a. Statewide Cap and Trade Budgets

Today's rule proposes statewide EGU SO_2 emission budgets (detailed in section VI) that States may allocate. Discretion in the allocation of this budget to title IV units (which constitute a majority of the EGUs) that already receive allowances under title IV is somewhat limited for States because the existing title IV SO_2 allocation provisions explicitly allocate allowances to specific units. Therefore, as a practical matter, States that wish to participate in an EPA-managed interstate trading program will not have as much flexibility in developing their SO_2 allocation methodology for title IV units that already receive allowances than they will with NO_X allocations.

b. Determination of SO_2 Allowance Allocations for EGUs Not Receiving Title IV Allowances

As discussed in section VI (Statewide Emissions Budgets), States will have the flexibility to address equity issues for newer units that do not receive title IV allowances. However, as mentioned above, because title IV allocates virtually all of the Acid Rain Program allowances directly to individual sources, any State electing to provide allowances to newer sources would have to develop a mechanism that creates an excess of allowances after the initial allocation. One potential remedy is a mechanism that creates a State-managed pool of allowances from EGUs within that State by either: (1) Requiring in-State EGUs that receive title IV allowances to surrender allowances at a rate tighter than today's rule retirement ratio and transferring this overage to the State (*e.g.*, an EGU would retire 2 allowances and surrender 1 allowance for every ton emitted); or, (2) tightening the retirement ratio for in-State EGUs that receive title IV allowances and providing for EPA to create new SO_2 allowances, the total being equal to or less than the overage, that are issued to the new sources (*e.g.*, an EGU would retire 3 allowances for every ton emitted and EPA would issue a new SO_2 allowance to the new source). EPA intends to assist States by providing a more detailed discussion of allocation alternatives in a future SNPR.

Should States decide to allocate allowances to these newer EGUs, States would be given latitude in determining how they would distribute them from the pool of allowances for EGUs that receive title IV allowances. States may choose to hold an allowance auction or distribute allowances directly to sources. Should a State decide to allocate allowances, it would have flexibility in selecting the method upon which the allocation share is determined. Common methods for allocating allowances include:

(1) Actual emissions (in tons) from the unit,

(2) Actual heat input (in mmBtu) of the unit, and

(3) Actual production output (in terms of electricity generation and/or steam energy) of the unit.

Each of these options has variations, including the use of allowance set-asides, and may be implemented with allocations performed on a permanent or an updating basis.

The details of specific allocation options will be presented in greater detail in the future SNPR.

C. Consideration and Aspects Unique to the NO_X Cap and Trade Program

1. NO_X Cap and Trade Program Overview

The NO_X cap and trade program would be substantially similar, in its basic requirements and procedures, to the SO_2 cap and trade program described above. However, some components of a proposed NO_X cap and trade program are unique to its implementation in the context of existing regional NO_X control programs. This section describes those unique components. Because the authority for the existing NO_X cap and trade programs exists at the State level and are not constrained by intricate title IV interactions, States may have more flexibility to revise their existing rules than they would have in complying with the proposed SO_2 program. Section VIII.D discusses elements of the cap and trade programs that are common to both the SO_2 and NO_X programs.

2. Interactions with the NO_X SIP Call Cap and Trade Program and the Title IV NO_X Program

This section discusses specific implementation issues related to transitioning from existing regional NO_X control programs to today's proposed NO_X cap and trade program.

a. Geographic Scope

States in the Proposed Region. Ideally, the NO_X and SO_2 cap and trade program regions would be identical. However, the geographic boundaries of the NO_X cap and trade program must be related to the contribution made by emissions sources to the interstate transport of NO_X as it affects non-attainment of $PM_{2.5}$ and ozone standards. While the $PM_{2.5}$ standard of most interest is annual, the ozone standard is an 8-hour duration with exceedances in the summer season. Therefore, EPA is proposing a NO_X trading region that applies to those States affected by the $PM_{2.5}$ finding; a region which encompasses virtually the same region as would be affected by the ozone findings with the exception of the State of Connecticut. Furthermore, EPA is proposing to allow the State of Connecticut, which is required to reduce only summertime NO_X emissions to address ozone under today's action, to participate in the EPA-managed NO_X cap and trade program on an annual basis. In addition, EPA proposes to allow other States currently participating in EPA-managed, ozone season, NO_X cap and trade programs to join the year-round NO_X cap and trade program on an annual basis. If States chose to participate on an annual basis, EPA will determine corresponding annual budgets.

States Outside the Proposed Region with Existing Regional NO_X Cap and Trade Programs. There are three States that participate in the existing regional NO_X trading market that would not be affected by today's proposed ozone or $PM_{2.5}$ rules: New Hampshire (as part of the OTC), and Massachusetts and Rhode Island (as part of the NO_X SIP Call). These States would be allowed and encouraged to voluntarily participate in the NO_X cap and trade program under today's rules in order to minimize administrative burden and simplify compliance for sources. Both the OTC and NO_X SIP Call are ozone season only compliance programs. Any States choosing to participate in an EPA-managed program proposed today, would be required to participate on an annual basis if they choose to participate in the proposed NO_X cap and trade program.

b. Seasonal-to-Annual Compliance Period

The NO_X SIP Call regulates NO_X emissions during an "ozone season" that lasts from May 1 through September 30. The proposed rule requires annual NO_X reductions. As explained in section VI, EPA analysis shows that under the proposed annual caps, EGUs in the NO_X SIP Call region would emit less during the ozone season than they were allowed to emit under the NO_X SIP Call.

c. Revision of Existing State NO_X SIP Call Rules

The EPA plans to design the model cap and trade rule in such a way that States that are part of the NO_X SIP Call will be able to modify their State rules to include the new provisions and new NO_X caps, and States that are not currently part of the NO_X SIP Call will be able to adopt the model rule language for the new program. Transition issues, such as new NO_X caps and applicability will be discussed thoroughly in the SNPR.

d. Retention of Existing Title IV NO_X Emission Rate Limits

Title IV requires coal-fired EGUs to meet average annual NO_X emission rates. These requirements would remain in effect after the 2010 compliance deadline for this proposed rule. EPA analysis shows that under the more stringent NO_X cap of today's rule, the title IV NO_X limits would not be binding for most units. Therefore, the limits would not interfere with the ability of the NO_X trading market to find the least-cost reductions. However, without a statutory change, the title IV NO_X program remains in effect and sources would have to continue to comply with its administrative requirements.

e. The NO_X Allowance Banking

The NO_X emission allowance trading market being administered by EPA for the NO_X SIP Call States has been active and we wish to make the transition to the NO_X program proposed today as simple as possible. For that reason, any entity holding existing NO_X allowances will be able to bank them and carry them forward into the new, proposed cap and trade program. While EPA believes it is important to provide this compliance flexibility for sources, it is unlikely that many sources will take advantage of this mechanism because the projected future value of NO_X allowances under the proposed cap and trade program is less than under the existing NO_X cap and trade programs.

3. NO_X Allocations

Within each State participating in the proposed NO_X cap and trade program, the statewide EGU budget (described in section VI of today's proposal) would form the basis for NO_X allocations. Unlike SO_2 allocations that are heavily dictated by the interaction between the proposed SO_2 cap and trade program and title IV, there are many allocation options that States could consider for distributing NO_X allowances.

There is a variety of allocation approaches that address equity issues and provide opportunities for States to encourage specific behaviors. This would include flexibility in how often the allocations are updated (*i.e.*, a one-time permanent allocation or one that is periodically updated) and the process metric upon which the allocation share is determined. As described below in section VIII.D.4, States participating in an EPA-managed program would be required to be consistent in the deadline for finalizing their source-by-source allocation.

The details of specific allocation options will be more fully developed and presented in detail in the future SNPR.

4. Joining Both SO_2 and NO_X Cap and Trade Programs for States Voluntarily Participating

The participation by States in both the EPA-managed NO_X cap and trade program and the EPA-managed SO_2 program offers administrative advantages to EPA and, we think, maximizes cost-effectiveness to the sources. We encourage each State to participate in both programs, and we think that, as a practical matter, many States will elect to do so.

We would like, in the SNPR, to propose to require that States that elect to participate in the EPA-managed NO_X cap and trade program be required to participate in the EPA-managed SO_2 program, and vice-versa. However, we are concerned that this requirement may be considered to intrude upon the prerogatives of the States in developing their SIPs.[97] We solicit comment on this question.

D. Cap and Trade Program Aspects That Are Common to Both the SO_2 and NO_X Programs

Sections VIII.B and VIII.C discussed key considerations that are unique to the proposed SO_2 and NO_X cap and trade programs, respectively. This section presents elements of a cap and trade program that must be a part of a

[97] *See Virginia* v. *EPA*, *108 F.3d 1397 (D.C. Cir. 1997).*

State's rule—for both the SO_2 and NO_X programs—if it wishes to participate in the regional cap and trade program. As noted earlier, EPA intends to provide a detailed discussion and propose model rules in the future SNPR. Although EPA is not soliciting comment on the discussion in this section VIII, and instead will provide a full opportunity to comment on the SNPR, EPA recognizes that some may wish to comment on today's discussion. As such, commenters are encouraged to focus on the implications of addressing multiple environmental problems (*i.e.*, PM2.5 and ozone).

1. Applicability

Applicability, or the group of sources that the regulations will affect, must be similar from State-to-State to minimize confusion, administrative burdens, and emission leakage.

a. Core Applicability

As discussed in section VI, we have determined State EGU emission reduction requirements (which are sometimes referred to as "budgets") assuming reductions from large EGUs (*e.g.* boilers and turbines serving an electrical generator with a nameplate capacity exceeding 25MW and producing power for sale). States must include these core sources if they wish to participate in the regional cap and trade program. While States have discretion to achieve the required reduction levels by regulating other sources, EPA analysis identified EGUs as appropriate candidates for achieving the mandated reductions. If a State chooses to regulate other source categories, EPA is proposing that these source categories can be included in the cap and trade program only if EPA and the State agree that each source category can meet all of the requirements that are mandated for EGUs (*e.g.*, monitoring according to 40 CFR part 75 and the ability to clearly assign legal responsibility for compliance).

Once a unit is classified as an EGU for purposes of this rule, the unit will remain classified as an EGU regardless of any future modifications to the unit. If a unit serving a generator that initially does not qualify as an EGU (based on the nameplate capacity) is later modified to increase the capacity of the generator to the extent that the unit meets the definition of EGU, this unit shall be considered an EGU for purposes of this rule. This approach is proposed to prevent sources from derating units for the purpose of avoiding regulation.

2. Allowance Management System, Compliance, Penalties, and Banking

The allowance management system, compliance, penalties and banking are all components of the accounting system that enables the functioning of a cap and trade program. An accurate, efficient accounting system is critical to an emissions trading market. Transparency of the system, allowing all interested parties access to the information contained in the accounting system, increases the accountability for regulated sources and contributes to reduced transaction costs of transferring allowances by minimizing confusion and making allowance information readily available.

In order to guarantee the equitable treatment of all affected sources across the trading region, the elements included in this section need to be incorporated in the same manner in each State that participates in the cap and trade program.

a. Allowance Management

The EPA intends to propose a model cap and trade rule that will be reasonably consistent with the existing allowance tracking systems that are currently in use for the Acid Rain Program under title IV and the NO_X Budget Trading Program under the NO_X SIP Call. These two systems are called the Allowance Tracking System (ATS) and the NO_X Allowance Tracking System (NATS), respectively. Under the cap and trade rule, the SO_2 program and the NO_X program would remain separate trading programs maintained in ATS and NATS. Both ATS and NATS would remain as automated systems used to track SO_2 and NO_X allowances held by affected units under the cap and trade program, as well as those allowances held by other organizations or individuals. Specifically, ATS and NATS would track the allocation of all SO_2 and NO_X allowances, holdings of SO_2 and NO_X allowances in accounts, deduction of SO_2 and NO_X allowances for compliance purposes, and transfers between accounts. The primary role of ATS and NATS is to provide an efficient, automated means of monitoring compliance with the cap and trade programs. ATS and NATS also provide the allowance market with a record of ownership of allowances, dates of allowance transfers, buyer and seller information, and the serial numbers of allowances transferred.

b. Compliance

Compliance in the cap and trade program consists of the deduction of allowances from affected facilities' accounts to offset the quantity of emissions at the facilities for each compliance period. Currently under the Acid Rain and regional NO_X cap and trade programs, compliance is assessed at the unit level. Some flexibility is allowed in the NO_X program through the use of overdraft accounts. Both EPA and the regulated community find that, in practice, overdraft accounts and their use can be quite complicated and do not significantly reduce the burden of unit-level accounting. EPA is considering an approach that assesses compliance at the facility level in the proposed cap and trade program. More discussion of this option will be included in the future SNPR.

c. Penalties

The EPA plans to propose a system of automatic penalties should a facility not obtain sufficient NO_X or SO_2 allowances to cover emissions for the compliance period. In order to offset this deficiency in allowances, a facility must surrender allowances allocated for a future year equal in amount to the deficiency in allowances for the current compliance period. In addition, EPA will propose that an automatic penalty be imposed in addition to this offset in order to provide a strong incentive for facilities to hold sufficient allowances. The automatic penalty provisions will not limit the ability of the permitting authority or EPA to take enforcement action under State law or the CAA, but will establish for the regulated community the immediate, minimum economic consequences of noncompliance.

d. Banking

Banking is the retention of unused allowances from one calendar year for use in a later calendar year. Banking allows sources to make reductions beyond required levels and "bank" the unused allowances for use later. Generally speaking, banking has several advantages: it can encourage earlier or greater reductions than are required from sources, stimulate the market and encourage efficiency, and provide flexibility in achieving emissions reduction goals. On the other hand, it may result in banked allowances being used to allow emissions in a given year to exceed the cap and trade program budget. Banking of allowances from the Acid Rain and regional NO_X cap and trade programs into the proposed cap and trade program is discussed above in section VIII.B.2.f(i) for Acid Rain and above in section VIII.C.2.e. for the NO_X SIP Call.

Based on the experience of both the SO_2 and NO_X cap and trade programs,

EPA plans to propose in the future SNPR that the banking of allowances after the start of the cap and trade program be allowed with no restrictions.

3. Accountability for Affected Sources

Key to the success of existing cap and trade programs and the integrity of the allowance trading markets has been clear accountability for unit emissions. This takes the form of affected units officially designating a specific person (and alternate) as responsible for the official certification of all allowance transfers and emissions monitoring and reporting as submitted to EPA in quarterly compliance reports. With each quarterly submission, this responsible party must certify that: the monitoring data were recorded in compliance with the monitoring and reporting requirements, including quality assurance testing and missing data procedures; and, the emission and operational reports are true, accurate, and complete.

The cap and trade program to be proposed in the future SNPR will include provisions to provide for the same strict standards for source accountability established in the Acid Rain Program and the NO_X SIP Call. This will include provisions for the establishment of an Authorized Account Representative. Adoption of these provisions will be required by all States that wish to participate in the cap and trade program.

4. Allowance Allocation Timing

The SNPR will propose requirements for when a State would finalize allowance allocations for each control period in the cap and trade program and submit them to EPA for inclusion into the ATS and NATS. The timing requirements ensure that all units would have equal and sufficient time to plan for compliance for each control period and equal time to trade allowances. The requirement would also contribute to the efficient administration of the trading program. By establishing this schedule at the outset of the cap and trade program, both the States and EPA would be able to develop internal procedures for effectively implementing the allowance provisions of the trading program. The timing requirements would ensure that EPA would be able to record in the ATS and NATS the allowance allocations for the budget units in all participating States at the same time for each control period.

5. Emissions Monitoring and Reporting

Monitoring and reporting of an affected source's emissions are integral parts of any cap and trade program. Consistent and accurate measurement of emissions ensures each allowance actually represents one ton of emissions and that one ton of reported emissions from one source is equivalent to one ton of reported emissions from another source. This establishes the integrity of the allowance and instills confidence in the market mechanisms which are designed to provide sources with flexibility in achieving compliance. Given the variability in the type, operation and fuel mix of sources in the cap and trade program, EPA believes that to ensure the needed accuracy and consistency, emissions must be monitored continuously. For many sources, this accuracy and consistency is achieved through the use of continuous emissions monitors (CEMS); however, alternative monitoring methodologies are appropriate for certain types of sources. The continuous emissions monitoring methods must also incorporate rigorous quality assurance procedures (*e.g.*, periodic testing to ensure continued accuracy of the measurement method). Additionally, in order to account for all emissions at all times, provisions for estimating emissions during times when monitors are unavailable because of planned and unplanned outages are also necessary. Part 75 of the Acid Rain regulations (40 CFR part 75) sets forth monitoring and reporting requirements for both SO_2 and NO_X mass emissions and includes the additional provisions necessary for a cap and trade program. Part 75 is used in both the Acid Rain and NO_X SIP Call programs.

In an effort to ensure program integrity, EPA proposes to require States to include year round part 75 monitoring and reporting for SO_2 and NO_X for all sources. Monitor certification deadlines and other details will be specified in the model cap and trade rule. The EPA believes that emissions will then be consistently and accurately monitored and reported from unit to unit and from State to State.

Part 75 also specifies reporting requirements. The EPA proposes to require year-round, quarterly reporting of emissions and monitoring data from each unit at each affected facility. The EPA proposes a single quarterly report. The single report will include hourly emissions information for both SO_2 and NO_X emissions on a quarterly basis in a format specified by the Agency. The reports must be in an electronic data reporting (EDR) format and be submitted to EPA electronically using EPA's Emissions Tracking System (ETS). This coordinated reporting requirement is necessary to ensure consistent review, checking, and posting of the emissions and monitoring data at all affected sources, which contributes to the integrity and efficacy of the trading program.

Many sources affected by this rulemaking are already meeting the requirements of part 75. Impacts on different types of sources will be discussed thoroughly in the SNPR.

E. Inter-Pollutant Trading

Cap and trade programs can incorporate mechanisms for interpollutant trading when more than one pollutant contributes to the same environmental problem. While the proposed cap and trade programs would control SO_2 to address $PM_{2.5}$ and NO_X for both $PM_{2.5}$ and ozone, EPA solicits comment on whether SO_2 allowances and NO_X allowances should be interchangeable, and if so, at what ratio should the allowances be interchangeable. The main advantage of inter-pollutant trading is that it presents regulated entities with more flexibility in meeting compliance, thus reducing the costs of compliance. If the relative air quality impact of the two pollutants on the environmental issue (*i.e.*, $PM_{2.5}$ or ozone)is known, then inter-pollutant trading set at this ratio will achieve the same total air quality impact. There are many technical difficulties involved with incorporating an effective inter-pollutant trading mechanism, and EPA solicits opinions on the feasibility of addressing these concerns:

(1) What should be the exchange rate (*i.e.*, the transfer ratio) for the two pollutants?

(2) How can this transfer ratio best reflect the goals of achieving $PM_{2.5}$ and ozone attainment in downwind States?

(3) How would inter-pollutant trading accommodate the different geographic regions covered for SO_2 and NO_X under the proposed rule?

IX. Air Quality Modeling of Emissions Reductions

A. Introduction

In this section, we describe the air quality modeling performed to determine the projected impacts on $PM_{2.5}$ and 8-hour ozone of the regional SO_2 and NO_X emissions reductions in today's proposal. The regional emissions reductions are associated with State emissions budgets in 2010 and 2015, as explained in section VI. The impacts of the regional reductions in 2010 and 2015 are determined by comparing air quality modeling results for each of these regional control scenarios to the modeling results for the corresponding 2010 and 2015 Base Case

scenarios. A description of the 2010 and 2015 Base Cases is provided in section IV. Note that neither the Base Cases nor the regional control strategy scenarios include any of the local control measures discussed in section IV. Also note that the 2015 Base Case does not include any 2010 emissions reductions from the regional strategy.

The 2010 and 2015 regional strategy budgets cover emissions from the power generation sector in 29 eastern States plus the District of Columbia that contribute significantly to both $PM_{2.5}$ and ozone nonattainment in downwind States.[98] These annual SO_2 and NO_X budgets are provided in section VI.

As described in section VI, EPA modeled a two-phase cap and trade strategy for SO_2 and for NO_X using the IPM to assess the impacts of the budgets in today's proposal. For the purposes of air quality modeling, we used a scenario that assumes a 48-State SO_2 trading area and SO_2 allowances. Most of the SO_2 emissions reductions in this scenario occur in the 28-State and DC control region; there are only small changes in nearly States not affected by today's proposal.[99] We do not expect these latter changes to actually occur; but, because they are only small changes, the results of using this IPM scenario are expected to be very similar to the actual results of today's proposal. For NO_X, EPA modeled a NO_X trading scenario covering 31 States, DC, and the eastern half of Texas. The 31 States include Arkansas, Iowa, Louisiana, Minnesota, Missouri, and all other States to the east of these five States. Thus, the modeled strategy does not match the NO_X reductions required in today's proposal for Kansas and western Texas. In addition, the modeled strategy includes NO_X reductions in Maine, New Hampshire, Rhode Island, and Vermont which do not have any required reductions in today's proposal.

Phase 1 of the regional strategy is forecast to reduce total EGU SO_2 emissions in the 28-States plus DC by 40 percent in 2010. Phase 2 is forecast to provide a 44 percent reduction in EGU SO_2 emissions compared to the Base Case in 2015. When fully implemented, we expect today's proposed rule to result in more than a 70 percent reduction in EGU SO_2 emissions compared to current emissions levels. The net effect of the strategy on total SO_2 emissions in the 28-State plus DC region, considering all sectors of emissions, is a 27 percent reduction in 2010 and a 28 percent reduction in 2015. For NO_X, Phase 1 of the strategy is forecast to reduce EGU emissions by 44 percent and total emissions by 10 percent in the 28-States plus DC region in 2010. In Phase 2, EGU NO_X emissions are projected to decline by 53 percent in 2015. Total NO_X emissions are projected to be reduced by 14 percent in 2015. The percent change in emissions by State for SO_2 and NO_X in 2010 and 2015 for the regional strategy are provided in the Air Quality Modeling Technical Support Document (AQMTSD).[100]

B. The $PM_{2.5}$ Air Quality Modeling of the Proposed Regional SO_2 and NO_X Strategy

The PM modeling platform described in section IV was used by EPA to model the impacts of the proposed SO_2 and NO_X emissions reductions on annual average $PM_{2.5}$ concentrations. In brief, we ran the REMSAD model for the meteorological conditions in the year of 1996 using our nationwide modeling domain. Modeling for $PM_{2.5}$ was performed for both 2010 and 2015 to assess the expected effects of the proposed regional strategy in each of these years on projected $PM_{2.5}$ design value concentrations and nonattainment. The procedures used to project future $PM_{2.5}$ design values and nonattainment are described in section IV. The projected design values for each nonattainment county for the 2010 and 2015 scenarios are provided in the AQMTSD. The counties that are projected to be nonattainment for the $PM_{2.5}$ NAAQS are listed in Table IX–1 for the 2010 Base Case and the 2010 regional strategy scenario and in Table IX–2 for the 2015 Base Case and 2015 regional strategy scenario. The projected 2010 Base Case and control scenario $PM_{2.5}$ design values are provided in Table IX–3. The projected 2015 Base Case and control $PM_{2.5}$ design values are provided in Table IX–4. Concerning the future baseline concentrations, we expect improvement beyond 2015 based on the fact that the bank will be used up and further reductions are expected from the Heavy Duty Diesel Engines and Land-based Non-road Diesel Engines rules. Also, even those counties that remain nonattainment in 2015 after the controls in today's rule will benefit from air quality improvements and lower concentrations of fine particles as a result of the SO_2 and NO_X emissions reductions in this rule.

TABLE IX–1.—PROJECTED $PM_{2.5}$ NONATTAINMENT COUNTIES FOR 2010 BASE CASE AND REGIONAL STRATEGY SCENARIOS

State	2010 base case projected $PM_{2.5}$ nonattainment counties	2010 regional strategy case projected $PM_{2.5}$ nonattainment counties
AL	DeKalb, Jefferson, Montgomery, Russell, Talladaga	Jefferson, Russell, Talladaga.
CT	New Haven	None.
DC	Washington DC	None.
DE	New Castle	None.
GA	Clarke, Clayton, Cobb, DeKalb, Floyd, Fulton, Hall, Muscogee, Paulding, Richmond, Wilkinson.	Clarke, Clayton, Cobb, DeKalb, Floyd, Fulton, Muscogee, Wilkinson.
IL	Cook, Madison, St. Clair, Will	Cook, Madison, St. Clair.
IN	Clark, Marion	None.
KY	Fayette, Jefferson	None.
MD	Baltimore City	None.
MI	Wayne	Wayne.
MO	St. Louis	None.
NY	New York (Manhattan)	New York (Manhattan).
NC	Catawba, Davidson, Mecklenburg	None.

[98] In addition, summer season only EGU NO_X controls are proposed for Connecticut which significantly contributes to ozone, but not $PM_{2.5}$ nonattainment in other States.

[99] The modeled scenario reduces EGU emissions in the five New England States not covered by today's proposal by less than 3,000 tons per year. In the 15 States located to the west of the region covered by today's proposal, total EGU SO_2 emissions decline by 17 percent.

[100] "Air Quality Modeling Technical Support Document for the Proposed Interstate Air Quality Rule" (January 2004), can be obtained from the docket for today's proposed rule: OAR–2003–0053.

TABLE IX–1.—PROJECTED $PM_{2.5}$ NONATTAINMENT COUNTIES FOR 2010 BASE CASE AND REGIONAL STRATEGY SCENARIOS—Continued

State	2010 base case projected $PM_{2.5}$ nonattainment counties	2010 regional strategy case projected $PM_{2.5}$ nonattainm counties
OH	Butler, Cuyahoga, Franklin, Hamilton, Jefferson, Lawrence, Mahoning, Scioto, Stark, Summit, Trumbull.	Cuyahoga, Hamilton, Jefferson, Scioto, Stark.
PA	Allegheny, Berks, Lancaster, York	Allegheny.
SC	Greenville	None.
TN	Davidson, Hamilton, Knox, Roane, Sullivan	Knox.
WV	Brooke, Cabell, Hancock, Kanawha, Marshal, Wood	None.

TABLE IX–2.—PROJECTED $PM_{2.5}$ NONATTAINMENT COUNTIES FOR 2015 BASE CASE AND REGIONAL STRATEGY SCENARIOS

State	2015 base case projected $PM_{2.5}$ nonattainment counties	2015 regional strategy case projected $PM_{2.5}$ nonattainme counties
AL	Jefferson, Montgomery, Russell, Talladaga	Jefferson, Russel.
CT	New Haven	None.
GA	Clarke, Clayton, Cobb, DeKalb, Floyd, Fulton, Hall, Muscogee, Richmond, Wilkinson.	Clayton, DeKalb, Fulton.
IL	Cook, Madison, St. Clair	Cook.
IN	Clark, Marion	None.
KY	Jefferson	None.
MD	Baltimore City	None.
MI	Wayne	None.
NY	New York County (Manhattan)	Wayne.
OH	Butler, Cuyahoga, Franklin, Hamilton, Jefferson, Scioto, Stark, Summit	None.
PA	Allegheny, York	Cuyahoga, Hamilton, Jefferson, Scioto.
TN	Hamilton, Knox	Allegheny.
WV	Brooke, Cabell, Hancock, Kanawha, Wood	Knox.
		None.

TABLE IX–3.—PROJECTED $PM_{2.5}$ DESIGN VALUES FOR THE 2010 BASE CASE AND REGIONAL STRATEGY SCENARIOS

State	County	2010 base case	2010 regiona control strategy
Alabama	DeKalb	15.22	13.9
Alabama	Jefferson	20.03	18.8
Alabama	Montgomery	15.69	14.6
Alabama	Russell	17.07	15.7
Connecticut	Talladega	16.44	15.2
Delaware	New Haven	15.43	14.5
District of Columbia	New Castle	15.43	14.1
Georgia	District of Columbia	15.48	13.7
Georgia	Clarke	17.04	15.5
Georgia	Clayton	17.73	16.4
Georgia	Cobb	16.80	15.5
Georgia	DeKalb	18.26	16.9
Georgia	Floyd	16.99	15.6
Georgia	Fulton	19.79	18.3
Georgia	Hall	15.62	14.2
Georgia	Muscogee	16.68	15.4
Georgia	Paulding	15.40	14.1
Georgia	Richmond	15.99	14.6
Illinois	Wilkinson	16.68	15.5
Illinois	Cook	17.90	16.9
Illinois	Madison	16.41	15.3
Illinois	St. Clair	16.31	15.1
Indiana	Will	15.21	14.2
Indiana	Clark	15.86	14.3
Kentucky	Marion	15.89	14.3
Kentucky	Fayette	15.21	13.5
Maryland	Jefferson	15.79	14.2
Michigan	Baltimore City	16.58	14.8
Missouri	Wayne	18.78	17.6
New York	St. Louis City	15.25	14.1
North Carolina	New York	16.30	15.2
North Carolina	Catawba	15.26	13.8
	Davidson	15.52	14.2

TABLE IX–3.—PROJECTED $PM_{2.5}$ DESIGN VALUES FOR THE 2010 BASE CASE AND REGIONAL STRATEGY SCENARIOS—Continued

State	County	2010 base case	2010 regional control strategy
North Carolina	Mecklenburg	15.18	13.92
Ohio	Butler	16.01	14.53
Ohio	Cuyahoga	19.13	17.68
Ohio	Franklin	16.69	15.04
Ohio	Hamilton	17.75	15.96
Ohio	Jefferson	18.04	16.06
Ohio	Lawrence	15.48	13.67
Ohio	Mahoning	15.39	13.76
Ohio	Scioto	18.40	16.33
Ohio	Stark	17.09	15.19
Ohio	Summit	16.35	14.71
Ohio	Trumbull	15.13	13.56
Pennsylvania	Allegheny	19.52	16.92
Pennsylvania	Berks	15.39	13.84
Pennsylvania	Lancaster	15.46	13.71
Pennsylvania	York	15.68	13.93
South Carolina	Greenville	15.06	13.75
Tennessee	Davidson	15.36	13.92
Tennessee	Hamilton	16.14	14.74
Tennessee	Knox	18.36	16.60
Tennessee	Roane	15.18	13.69
Tennessee	Sullivan	15.24	13.77
West Virginia	Brooke	16.60	14.77
West Virginia	Cabell	16.39	14.41
West Virginia	Hancock	16.69	14.85
West Virginia	Kanawha	17.11	14.81
West Virginia	Marshall	15.53	13.25
West Virginia	Wood	16.30	14.15

TABLE IX–4.—PROJECTED $PM_{2.5}$ DESIGN VALUES FOR THE 2015 BASE CASE AND REGIONAL STRATEGY SCENARIOS

State	County	2015 base case	2015 regional control strategy
Alabama	Jefferson	19.57	18.11
Alabama	Montgomery	15.35	14.05
Alabama	Russell	16.68	15.05
Alabama	Talladega	15.97	14.57
Connecticut	New Haven	15.13	14.13
Georgia	Clarke	16.46	14.58
Georgia	Clayton	17.26	15.49
Georgia	Cobb	16.28	14.37
Georgia	DeKalb	17.93	16.22
Georgia	Floyd	16.51	14.71
Georgia	Fulton	19.44	17.62
Georgia	Hall	15.05	13.16
Georgia	Muscogee	16.31	14.71
Georgia	Richmond	15.51	13.82
Georgia	Wilkinson	16.40	14.88
Illinois	Cook	17.52	16.40
Illinois	Madison	16.03	14.88
Illinois	St. Clair	15.91	14.67
Indiana	Clark	15.40	13.69
Indiana	Marion	15.31	13.79
Kentucky	Jefferson	15.32	13.57
Maryland	Baltimore City	16.11	14.20
Michigan	Wayne	18.28	17.06
New York	New York (Manhattan)	15.82	14.69
Ohio	Butler	15.39	13.77
Ohio	Cuyahoga	18.58	17.05
Ohio	Franklin	16.18	14.46
Ohio	Hamilton	17.07	15.15
Ohio	Jefferson	17.49	15.51
Ohio	Scioto	17.62	15.49
Ohio	Stark	16.42	14.52
Ohio	Summit	15.78	14.14
Pennsylvania	Allegheny	18.64	16.09

TABLE IX–4.—PROJECTED $PM_{2.5}$ DESIGN VALUES FOR THE 2015 BASE CASE AND REGIONAL STRATEGY SCENARIOS—Continued

State	County	2015 base case	2015 regional control strategy
Pennsylvania	York	15.13	13.2
Tennessee	Hamilton	15.63	13.9
Tennessee	Knox	17.73	15.5
West Virginia	Brooke	16.10	14.2
West Virginia	Cabell	15.70	13.7
West Virginia	Hancock	16.18	14.3
West Virginia	Kanawha	16.45	14.1
West Virginia	Wood	15.58	13.4

The results of the air quality modeling indicate that 61 counties in the East are expected to be nonattainment for $PM_{2.5}$ in the 2010 Base Case. Of these 61 counties, 38 are projected to come into attainment in 2010 following the SO_2 and NO_X emissions reductions resulting from the regional controls in today's proposal. The 23 counties projected to remain nonattainment after the application of the regional strategy are expected to experience a sizeable reduction in $PM_{2.5}$ from this strategy, which will bring them closer to attainment. Specifically, the average reduction in these 23 residual 2010 nonattainment counties is 1.50 $\mu g/m^3$ with a range of 0.93 to 2.60 $\mu g/m^3$.

In 2015, the SO_2 and NO_X reductions in today's proposal are expected to reduce the number of $PM_{2.5}$ nonattainment counties in the East from 41 to 13. The regional strategy is predicted to provide large reductions in $PM_{2.5}$ in those 13 residual nonattainment counties. Specifically, the average reduction in these 13 residual 2015 nonattainment counties is 1.70 $\mu g/m^3$ with a range of 1.00 to 2.54 $\mu g/m^3$.

Thus, the SO_2 and NO_X emissions reductions which will result from today's proposal will greatly reduce the extent of $PM_{2.5}$ nonattainment by 2010 and beyond. These emissions reductions are expected to substantially reduce the number of $PM_{2.5}$ nonattainment counties in the East and make attainment easier for those counties that remain nonattainment by substantially lowering $PM_{2.5}$ concentrations in these residual nonattainment counties.

C. Ozone Air Quality Modeling of the Regional NO_X Strategy

The EPA used the ozone modeling platform described in section IV to model the impacts of the proposed EGU NO_X controls on 8-hour ozone concentrations. In brief, we ran the CAMx model for the meteorological conditions in each of the three 1995 ozone episodes using the Eastern U.S. modeling domain. Ozone modeling was performed for both 2010 and 2015 to assess the projected effects of the regional strategy in each of these years on projected 8-hour ozone nonattainment.

The results of the regional strategy ozone modeling are expressed in terms of the expected reduction in projected 8 hour design value concentrations and the implications for future nonattainment. The procedures used to project future 8-hour ozone design values and nonattainment are described in section IV. The projected design values and exceedance counts for each nonattainment county for the 2010 and 2015 scenarios are provided in the AQMTSD. The counties that are projected to be nonattainment for the 8-hour ozone NAAQS are listed in Table IX–5 for the 2010 Base Case and the 2010 regional strategy scenario and in Table IX–6 for the 2015 Base Case and 2015 regional strategy scenario. The projected 2010 Base Case and control scenario 8-hour ozone design values are provided in Table IX–7. The projected 2015 Base and control 8-hour ozone design values are provided in Table IX–8.

TABLE IX–5.—PROJECTED 8-HOUR OZONE NONATTAINMENT COUNTIES FOR 2010 BASE CASE AND REGIONAL STRATEGY SCENARIOS

State	2010 base case projected 8-hour ozone nonattainment counties	2010 regional strategy case projected 8-hour ozone nonattainment counties
AR	Crittenden	Crittenden.
CT	Fairfield, Middlesex, New Haven	Fairfield, Middlesex, New Haven.
DC	Washington, DC	Washington, DC.
DE	New Castle	New Castle.
GA	Fulton	Fulton.
IL	None	None.
IN	Lake	Lake.
MD	Anne Arundel, Baltimore, Cecil, Harford, Kent, Prince Georges.	Anne Arundel, Baltimore, Cecil, Harford, Kent, Prince Georges.
MI	None	None.
NJ	Bergen, Camden, Cumberland, Gloucester, Hudson, Hunterdon, Mercer, Middlesex, Monmouth, Morris, Ocean.	Bergen, Camden, Cumberland, Gloucester, Hunterdon, Mercer, Middlesex, Monmouth, Morris, Ocean.
NY	Erie, Putnam, Richmond, Suffolk, Westchester	Erie, Putnam, Richmond, Suffolk, Westchester.
NC	Mecklenburg	Mecklenburg.
OH	Geauga, Summit	Geauga.
PA	Allegheny, Bucks, Delaware, Montgomery, Philadelphia	Bucks, Delaware, Montgomery, Philadelphia.
RI	Kent	Kent.
TX	Denton, Harris, Tarrant	Denton, Harris, Tarrant.
VA	Arlington, Fairfax	Arlington, Fairfax.

TABLE IX–5.—PROJECTED 8-HOUR OZONE NONATTAINMENT COUNTIES FOR 2010 BASE CASE AND REGIONAL STRATEGY SCENARIOS—Continued

State	2010 base case projected 8-hour ozone nonattainment counties	2010 regional strategy case projected 8-hour ozone nonattainment counties
WI	Kenosha, Racine, Sheboygan	Kenosha, Racine, Sheboygan.

TABLE IX–6.—PROJECTED 8-HOUR OZONE NONATTAINMENT COUNTIES FOR 2015 BASE CASE AND REGIONAL STRATEGY SCENARIOS

State	2015 base case projected 8-hour ozone nonattainment counties	2015 regional strategy case projected 8-hour ozone nonattainment counties
AR	Crittenden	None.
CT	Fairfield, Middlesex, New Haven	Fairfield, Middlesex, New Haven.
DC	Washington, DC	Washington, DC.
DE	None	None.
GA	None	None.
IL	Cook	None.
IN	Lake	Lake.
MD	Anne Arundel, Cecil, Harford	Anne Arundel, Cecil, Harford.
MI	Macomb	None.
NJ	Bergen, Camden, Gloucester, Hunterdon, Mercer, Middlesex, Monmouth, Morris, Ocean.	Bergen, Camden, Gloucester, Hunterdon, Mercer, Middlesex, Monmouth, Ocean.
NY	Erie, Richmond, Suffolk, Westchester	Erie, Richmond, Suffolk, Westchester.
NC	None	None.
OH	Geauga	None.
PA	Bucks, Montgomery, Philadelphia	Bucks, Montgomery, Philadelphia.
RI	Kent	None.
TX	Harris	Harris.
VA	Arlington, Fairfax	Arlington.
WI	Kenosha, Sheboygan	Kenosha.

TABLE IX–7.—PROJECTED 8-HOUR OZONE DESIGN VALUES FOR THE 2010 BASE CASE AND REGIONAL STRATEGY SCENARIOS

State	County	2010 base case	2010 regional control strategy
Arkansas	Crittenden	86	86
Connecticut	Fairfield	94	94
Connecticut	Middlesex	91	91
Connecticut	New Haven	92	92
District of Columbia	District of Columbia	88	88
Delaware	New Castle	87	86
Georgia	Fulton	86	85
Indiana	Lake	87	86
Maryland	Anne Arundel	91	91
Maryland	Baltimore	85	85
Maryland	Cecil	90	90
Maryland	Harford	93	93
Maryland	Kent	89	88
Maryland	Prince Georges	86	85
New Jersey	Bergen	88	87
New Jersey	Camden	93	92
New Jersey	Cumberland	86	85
New Jersey	Gloucester	95	95
New Jersey	Hudson	85	84
New Jersey	Hunterdon	89	89
New Jersey	Mercer	98	98
New Jersey	Middlesex	95	95
New Jersey	Monmouth	89	89
New Jersey	Morris	88	87
New Jersey	Ocean	105	104
New York	Erie	90	89
New York	Putnam	85	85
New York	Richmond	90	89
New York	Suffolk	90	90
New York	Westchester	86	85
North Carolina	Mecklenburg	85	86
Ohio	Geauga	88	88
Ohio	Summit	85	84

TABLE IX–7.—PROJECTED 8-HOUR OZONE DESIGN VALUES FOR THE 2010 BASE CASE AND REGIONAL STRATEGY SCENARIOS—Continued

State	County	2010 base case	2010 regional control strategy
Pennsylvania	Allegheny	85	84
Pennsylvania	Bucks	97	97
Pennsylvania	Delaware	87	86
Pennsylvania	Montgomery	90	89
Pennsylvania	Philadelphia	92	92
Rhode Island	Kent	89	88
Texas	Denton	87	87
Texas	Harris	100	100
Texas	Tarrant	88	87
Virginia	Arlington	88	88
Virginia	Fairfax	87	87
Wisconsin	Kenosha	94	93
Wisconsin	Racine	86	85
Wisconsin	Sheboygan	90	89

TABLE IX–8.—PROJECTED 8-HOUR OZONE DESIGN VALUES FOR THE 2015 BASE CASE AND REGIONAL STRATEGY SCENARIOS

State	County	2015 base case	2015 regional control strategy
Arkansas	Crittenden	85	83
Connecticut	Fairfield	94	93
Connecticut	Middlesex	89	88
Connecticut	New Haven	90	89
District of Columbia	District of Columbia	86	85
Illinois	Cook	85	84
Indiana	Lake	87	86
Maryland	Anne Arundel	87	86
Maryland	Cecil	86	85
Maryland	Harford	89	88
Michigan	Macomb	86	84
New Jersey	Bergen	87	86
New Jersey	Camden	91	90
New Jersey	Gloucester	93	92
New Jersey	Hunterdon	87	86
New Jersey	Mercer	96	95
New Jersey	Middlesex	92	92
New Jersey	Monmouth	87	86
New Jersey	Morris	85	83
New Jersey	Ocean	102	101
New York	Erie	88	86
New York	Richmond	87	87
New York	Suffolk	89	89
New York	Westchester	86	85
Ohio	Geauga	85	83
Pennsylvania	Bucks	95	94
Pennsylvania	Montgomery	89	88
Pennsylvania	Philadelphia	91	90
Rhode Island	Kent	85	84
Texas	Harris	99	98
Virginia	Arlington	87	86
Virginia	Fairfax	85	84
Wisconsin	Kenosha	93	91
Wisconsin	Sheboygan	86	84

In the 2010 Base Case (*i.e.*, without the emissions reductions called for in today's proposal), 47 counties in the East are forecast to be nonattainment for ozone. With the implementation of the proposed regional NO_X strategy, three of the 47 2010 Base Case nonattainment counties are forecast to come into attainment. Of the 44 counties that are projected to remain nonattainment in 2010 after the regional controls, 12 are projected to be within 2 ppb of attainment (*i.e.*, counties that have design values of 85 or 86 ppb).

In 2015, the number of nonattainment counties is expected to decline from 34 counties in the Base Case to 26 counties after the NO_X emissions reductions in today's proposal. The proposed regional NO_X strategy is projected to reduce nonattainment ozone design values in the East by 1 to 2 ppb in all but three of the 34 2015 Base Case nonattainment counties. Of the 26 counties that are

forecast to remain nonattainment in the control case, ten are projected to be within 2 ppb of attainment. Thus, our modeling indicates that by 2010 and 2015 the NO_X controls in today's proposal will reduce ozone concentrations throughout the East and help bring areas into attainment with the 8-hour ozone NAAQS.

X. Benefits of Emissions Reductions in Addition to the PM and Ozone NAAQS

This proposed action will result in benefits in addition to the enumerated human health and welfare benefits resulting from reductions in ambient levels of PM and ozone. These other benefits occur both directly, from the reductions in NO_X and SO_2, and indirectly, through reductions in co-pollutants, such as mercury. For example, reductions in emissions of NO_X and SO_2 will contribute to substantial visibility improvements in many parts of the eastern U.S. where people live, work, and recreate, including mandatory Federal Class I areas such as the Great Smoky Mountains. Reductions in NO_X and SO_2 emissions from affected sources will also reduce acidification and eutrophication of water bodies. The potential for reductions in nitrate contamination of drinking water is another possible benefit of the rule. This proposal will also reduce acid and particulate deposition that damages cultural monuments and other materials. Reduced mercury emissions will lessen mercury contamination in lakes that can potentially reduce both human and wildlife exposure through consumption of contaminated fish. In contrast to the benefits discussed, it is also possible that this proposal will lessen the benefits of passive fertilization for forest and terrestrial ecosystems where nutrients are a limiting factor and for some croplands.

This rule will improve visibility in the transport region. Visibility impairment is widespread and expected to continue (67 FR 68251, November 8, 2002) and this proposed rule will help to improve visibility. We provide a limited assessment of the economic value of expected improvements in visibility at some Federal Class I areas in section XI.

The following section presents information on three categories of public welfare and environmental impacts related to reductions in emissions from affected sources: reduced acid deposition, reduced eutrophication of water bodies, and reduced human health and welfare effects due to deposition of mercury. A more thorough discussion of these effects is provided in "Benefits of the Proposed Interstate Air Quality Rule (January 2004)."

A. Atmospheric Deposition of Sulfur and Nitrogen—Impacts on Aquatic, Forest, and Coastal Ecosystems

Atmospheric deposition of sulfur and nitrogen, more commonly known as acid rain, occurs when emissions of SO_2 and NO_X react in the atmosphere (with water, oxygen, and oxidants) to form various acidic compounds. These acidic compounds fall to earth in either a wet form (rain, snow, and fog) or a dry form (gases and particles). Prevailing winds can transport acidic compounds hundreds of miles, often across State and national borders. Acidic compounds (including small particles such as sulfates and nitrates) cause many negative environmental effects, including acidifying lakes and streams, harming sensitive forests, and harming sensitive coastal ecosystems.

1. Acid Deposition and Acidification of Lakes and Streams

Acid deposition causes acidification of lakes and streams. The effect of atmospheric deposition of acids on freshwater and forest ecosystems depends largely upon the ecosystem's ability to neutralize the acid. Acid Neutralizing Capacity (ANC), a key indicator of the ability of the water and watershed soil to neutralize the acid deposition it receives, depends largely on the watershed's physical characteristics: geology, soils, and size. Waters that are sensitive to acidification tend to be located in small watersheds that have few alkaline minerals and shallow soils. Conversely, watersheds that contain alkaline minerals, such as limestone, tend to have waters with a high ANC. Areas especially sensitive to acidification include portions of the Northeast (particularly the Adirondack and Catskill Mountains, portions of New England, and streams in the mid-Appalachian highlands) and Southeastern streams.

Quantitative impacts of this proposal on acidification of water bodies have been assessed. Modeling for this proposed rule indicates lakes in the Northeast and Adirondack Mountains would improve in acid buffering capacity. Specifically, no lakes in the Andirondack Mountains are projected to be categorized as chronically acidic in 2030 as a result of this proposal. In contrast, twelve percent of these lakes are projected to be chronically acidic without the emissions reductions envisioned in this proposal. For Northeast lakes in general, 6 percent of the lakes are anticipated to be chronically acidic before implementation of this proposal. The IAQR is expected to decrease the percentage of chronically acidic lakes in the Northeast to 1 percent.

2. Acid Deposition and Forest Ecosystem Impacts

Current understanding of the effects of acid deposition on forest ecosystems focuses on the effects of ecological processes affecting plant uptake, retention, and cycling of nutrients within forest ecosystems. Research results from the 1990s indicate documented decreases in base cations (calcium, magnesium, potassium, and others) from soils in the northeastern and southeastern United States are at least partially attributable to acid deposition. Losses of calcium from forest soils and forested watersheds have now been documented as a sensitive early indicator of soil response to acid deposition for a wide range of forest soils in the United States.

Although sulfate is the primary cause of base cation leaching, nitrate is a significant contributor in watersheds that are nearly nitrogen saturated. Base cation depletion is a cause for concern because of the role these ions play in surface water acid neutralization and their importance as essential nutrients for tree growth (calcium, magnesium and potassium).

In red spruce stands, a clear link exists between acid deposition, calcium supply, and sensitivity to abiotic stress. Red spruce uptake and retention of calcium is impacted by acid deposition in two main ways: leaching of important stores of calcium from needles and decreased root uptake of calcium due to calcium depletion from the soil and aluminum mobilization. These changes increase the sensitivity of red spruce to winter injuries under normal winter conditions in the Northeast, result in the loss of needles, slow tree growth, and impair the overall health and productivity of forest ecosystems in many areas of the eastern United States. In addition, recent studies of sugar maple decline in the Northeast link low base cation availability, high levels of aluminum and manganese in the soil, and increased levels of tree mortality due to native defoliating insects. This proposal will improve acid deposition in the transport region, and is likely to have positive effects on the health and productivity of forest systems in the region.

3. Coastal Ecosystems

Since 1990, a large amount of research has been conducted on the impact of nitrogen deposition to coastal waters.

Nitrogen is often the limiting nutrient in coastal ecosystems. Increasing the levels of nitrogen in coastal waters can cause significant changes to those ecosystems. In recent decades, human activities have greatly accelerated nitrogen nutrient inputs, causing excessive growth of algae and leading to degraded water quality and associated impairments of estuarine and coastal resources for human uses.

It is now known that nitrogen deposition is a significant source of nitrogen to many estuaries. The amount of nitrogen entering estuaries due to atmospheric deposition varies widely, depending on the size and location of the estuarine watershed and other sources of nitrogen in the watershed. There are a handful of estuaries where atmospheric deposition of nitrogen contributes well over 40 percent of the total nitrogen load; however, in most estuaries for which estimates exist, the contribution from atmospheric deposition ranges from 15 to 30 percent. The area with the highest deposition rates stretches from Massachusetts to the Chesapeake Bay and along the central Gulf of Mexico coast.

In 1999, National Oceanic and Atmospheric Administration (NOAA) published the results of a 5-year national assessment of the severity and extent of estuarine eutrophication. An estuary is defined as the inland arm of the sea that meets the mouth of a river. The 138 estuaries characterized in the study represent more than 90 percent of total estuarine water surface area and the total number of U.S. estuaries. The study found that estuaries with moderate to high eutrophication conditions represented 65 percent of the estuarine surface area.

Eutrophication is of particular concern in coastal areas with poor or stratified circulation patterns, such as the Chesapeake Bay, Long Island Sound, and the Gulf of Mexico. In such areas, the "overproduced" algae tends to sink to the bottom and decay, using all or most of the available oxygen and thereby reducing or eliminating populations of bottom-feeder fish and shellfish, distorting the normal population balance between different aquatic organisms, and in extreme cases causing dramatic fish kills. Severe and persistent eutrophication often directly impacts human activities. For example, fishery resource losses can be caused directly by fish kills associated with low dissolved oxygen and toxic blooms. Declines in tourism occur when low dissolved oxygen causes noxious smells and floating mats of algal blooms create unfavorable aesthetic conditions. Risks to human health increase when the toxins from algal blooms accumulate in edible fish and shellfish, and when toxins become airborne, causing respiratory problems due to inhalation. According to the NOAA report, more than half of the nation's estuaries have moderate to high expressions of at least one of these symptoms—an indication that eutrophication is well developed in more than half of U.S. estuaries.

This proposal is anticipated to reduce nitrogen deposition in the IAQR region. Thus, reductions in the levels of nitrogen deposition will have a positive impact upon current eutrophic conditions in estuaries and coastal areas in the region.

B. Human Health and Welfare Effects Due to Deposition of Mercury

Mercury emitted from utilities and other natural and man-made sources is carried by winds through the air and eventually is deposited to water and land. In water, Hg is transformed to methylmercury through biological processes. Methylmercury, a highly toxic form of Hg, is the form of Hg of greatest concern for the purpose of this rulemaking. Once Hg has been transformed into methylmercury, it can be ingested by the lower trophic level organisms where it can bioaccumulate in fish tissue (*i.e.*, concentrations in predatory fish build up over the fish's entire lifetime, accumulating in the fish tissue as predatory fish consume other species in the food chain). Thus, fish and wildlife at the top of the food chain can have Hg concentrations that are higher than the lower species, and they can have concentrations of Hg that are higher than the concentration found in the water body itself. Therefore, the most common form of exposure to Hg for humans and wildlife is through the consumption of contaminated predatory fish, such as: commercially consumed tuna, shark, or other saltwater fish species and recreationally caught bass, perch, walleye or other freshwater fish species. When humans consume fish contaminated with methylmercury, the ingested methylmercury is almost completely absorbed into the blood and distributed to all tissues (including the brain); it also readily passes through the placenta to the fetus and fetal brain.

Based on the findings of the National Research Council, EPA has concluded that benefits of Hg reductions would be most apparent at the human consumption stage, as consumption of fish is the major source of exposure to methylmercury. At lower levels, documented Hg exposure effects may include more subtle, yet potentially important, neurodevelopmental effects. Some subpopulations in the U.S., such as: Native Americans, Southeast Asian Americans, and lower income subsistence fishers, may rely on fish as a primary source of nutrition and/or for cultural practices. Therefore, they consume larger amounts of fish than the general population and may be at a greater risk to the adverse health effects from Hg due to increased exposure. In pregnant women, methylmercury can be passed on to the developing fetus, and at sufficient exposure may lead to a number of neurological disorders in children. Thus, children who are exposed to low concentrations of methylmercury prenatally may be at increased risk of poor performance on neurobehavioral tests, such as those measuring attention, fine motor function, language skills, visual-spatial abilities (like drawing), and verbal memory. The effects from prenatal exposure can occur even at doses that do not result in effects in the mother. Mercury may also affect young children who consume fish contaminated with Hg. Consumption by children may lead to neurological disorders and developmental problems, which may lead to later economic consequences.

In response to potential risks of consuming fish containing elevated concentrations of Hg, EPA and FDA have issued fish consumption advisories which provide recommended limits on consumption of certain fish species for different populations. EPA and FDA are currently developing a joint advisory that has been released in draft form. This newest draft FDA–EPA fish advisory recommends that women and young children reduce the risks of Hg consumption in their diet by moderating their fish consumption, diversifying the types of fish they consume, and by checking any local advisories that may exist for local rivers and streams. This collaborative FDA–EPA effort will greatly assist in educating the most susceptible populations. Additionally, the reductions of Hg from this regulation may potentially lead to fewer fish consumption advisories, which will benefit the fishing community.

We are unable to quantify changes in the levels of methylmercury in fish associated with reductions in mercury emissions for this proposal. While it is beneficial to society to reduce mercury, we are unable to quantify and provide a monetized estimate of benefits at this time due to gaps in available information on emissions, fate and transport, human exposure, and health impact models. However, this proposal is anticipated to decrease annual EGU mercury emissions by 10.6 tons in 2010 or approximately 23.5 percent, by 11.8 tons in 2015 or 26.3 percent, and by

14.3 tons or 32 percent in 2020. Emission reduction percentage decreases are based upon expected mercury emissions changes from fossil-fired EGUs larger than 25 megawatt capacity.

XI. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review

Under Executive Order 12866 (58 FR 51735, October 4, 1993), the Agency must determine whether a regulatory action is "significant" and therefore subject to Office of Management and Budget (OMB) review and the requirements of the Executive Order. The Order defines "significant regulatory action" as one that is likely to result in a rule that may:

1. Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or Tribal governments or communities;

2. Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

3. Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

4. Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

In view of its important policy implications and potential effect on the economy of over $100 million, this action has been judged to be an economically "significant regulatory action" within the meaning of the Executive Order. As a result, today's proposal was submitted to OMB for review, and EPA has prepared documents entitled "Benefits of the Proposed Interstate Air Quality Rule" (January 2004), "Economic and Energy Impact of the Proposed Interstate Air Quality Rule" (January 2004), and other related technical support documents collectively referred to here as the "economic analyses."

1. Summary of Economic Analyses

The economic analyses provide several important analyses of impacts on public welfare. These include an analysis of the social benefits, social costs, and net benefits of the regulatory scenario. The economic analyses also address issues involving small business impacts, unfunded mandates (including impacts for Tribal governments), environmental justice, children's health, energy impacts, and requirements of the Paperwork Reduction Act (PRA). Many of the analyses summarized below are preliminary. The EPA intends to update these analyses as part of the SNPR.

a. Benefit-Cost Analysis

The benefit-cost analysis concludes that substantial net economic benefits to society are likely to be achieved as a result of the reduction in emissions occurring as a result of this rulemaking. The results detailed below show that this rule would be highly beneficial to society, with annual net benefits in 2010 of approximately $55 billion, ($58 billion benefits compared to social cost of approximately $3 billion) and net benefits in 2015 of $80 billion ($84 benefits compared to social costs of $4 billion). All amounts are reflected in 1999$. As discussed in section IX, we did not complete air quality modeling that precisely matches the IAQR region. We anticipate that any differences in estimates due to the modeling region analyzed should be small.

i. Control Scenario

Today's proposed rulemaking sets forth requirements for States to eliminate their significant contribution to down-wind State's nonattainment of the ozone and PM2.5 NAAQS. In order to reduce this significant contribution, EPA is proposing to require that certain States reduce their emissions of SO_2 and NO_X. Those quantities were derived by calculating the amount of emissions of SO_2 and NO_X that EPA believes can be controlled from large EGUs in a highly cost-effective manner. For a more complete description of the reduction requirements and how they were calculated, see section VI of today's rulemaking.

While the emission reduction requirements were developed assuming highly cost-effective controls on EGUs, States are free to obtain the emissions reductions from other source categories. For purposes of analyzing the impacts of the rule, EPA is assuming the application of the controls that it has identified to be highly cost effective on all EGUs in the transport region.

ii. Cost Analysis and Economic Impacts

For purposes of today's proposal, EPA analyzed the costs using the IPM. The IPM is a model that EPA has used to analyze the impacts of regulations on the power sector. A description of the methodology used to model the costs and the results can be found in section VI. More details can be found in "Economic and Energy Impact of the Proposed Interstate Air Quality Rule" (January 2004).

iii. Human Health and Welfare Benefit Analysis

Our analysis of the health and welfare benefits anticipated from this proposed rule are presented in this section. Briefly, the analysis projects major benefits from implementation of the rule in 2010 and 2015. As described below, thousands of deaths and other serious health effects would be prevented. We are able to monetize annual benefits of approximately $58 billion in 2010 and $84 billion in 2015 (1999$) of those benefits.

Table XI–1 presents the primary estimates of reduced incidence of PM and ozone related health effects for the years 2010 and 2015 for the regulatory control strategy. In interpreting the results, it is important to keep in mind the limited set of effects we are able to monetize. Specifically, the table lists the PM and ozone related benefits associated with the reduction of ambient PM and ozone levels. These benefits are substantial both in incidence and dollar value. In 2010, we estimate that there will be approximately 9,600 fewer premature deaths annually associated with PM2.5, and the rule will result in 5,200 fewer cases of chronic bronchitis, 13,000 fewer non-fatal heart attacks, 8,900 fewer hospitalizations (for respiratory and cardiovascular disease combined); and result in significant reductions in days of restricted activity due to respiratory illness (with an estimate of 6.4 million fewer cases). We also estimate substantial health improvements for children from reduced upper and lower respiratory illness, acute bronchitis, and asthma attacks. Ozone health related benefits are expected to occur during the summer ozone season (usually ranging from May to September in the Eastern U.S.). Based upon modeling for 2010, ozone-related health benefits are expected to include 1,000 fewer hospital admissions for respiratory illnesses, 120 emergency room admissions for asthma, 280,000 fewer days with restricted activity levels, and 180,000 fewer days where children are absent from school due to illnesses. While we did not include separate estimates of the number of premature deaths that would be avoided due to reductions in ozone levels, recent evidence has been found linking short-term ozone exposures with premature mortality independent of PM exposures. Recent reports by Thurston and Ito (2001) and the World Health Organization (WHO) support an independent ozone mortality impact,

and the EPA Science Advisory Board has recommended that EPA reevaluate the ozone mortality literature for possible inclusion in the estimate of total benefits. Based on these new analyses and recommendations, EPA is sponsoring three independent meta-analyses of the ozone-mortality epidemiology literature to inform a determination on inclusion of this important health endpoint. Upon completion and peer-review of the meta-analyses, EPA will make its determination on whether and how benefits of reductions in ozone-related mortality will be included in the benefits analysis for the final interstate air quality rule.

Table XI–2 presents the estimated monetary value of reductions in the incidence of health and welfare effects. PM-related health benefits and ozone benefits are estimated to be approximately $56.9 billion and $82.4 billion annually in 2010 and 2015, respectively. Estimated annual visibility benefits in Southeastern Class I areas brought about by the IAQR are estimated to be $880 million in 2010 and $1.4 billion in 2015. All monetized estimates are stated in 1999$. Table XI–3 presents the total monetized benefits for the years 2010 and 2015. This table also indicates with a "B" those additional health and environmental effects that we were unable to quantify or monetize. These effects are additive to the estimate of total benefits, and EPA believes there is considerable value to the public of the benefits that could not be monetized. A listing of the benefit categories that could not be quantified or monetized in our estimate is provided in Table XI–4.

In summary, EPA's primary estimate of the annual benefits of the rule is approximately 58 + B billion in 2010. In 2015, total monetized benefits are approximately $84 + B billion annually. These estimates account for growth in real gross domestic product (GDP) per capita between the present and the years 2010 and 2015. As the table indicates, total benefits are driven primarily by the reduction in premature fatalities each year, which account for over 90 percent of total benefits.

TABLE XI–1.—ESTIMATED REDUCTIONS IN INCIDENCE OF HEALTH EFFECTS

Endpoint	Constituent	2010 estimated reduction	2015 estimated reduction
Premature Mortality—Adult	$PM_{2.5}$	9,600	13,000
Mortality—Infant	$PM_{2.5}$	22	29
Chronic Bronchitis	$PM_{2.5}$	5,200	6,900
Acute Myocardial Infarction—Total	$PM_{2.5}$	13,000	18,000
Hospital Admissions—Respiratory	$PM_{2.5}$, Ozone	5,200	8,100
Hospital Admissions—Cardiovascular	$PM_{2.5}$	3,700	5,000
Emergency Room Visits—Respiratory	$PM_{2.5}$, Ozone	7,100	9,400
Acute Bronchitis	$PM_{2.5}$	12,000	16,000
Lower Respiratory Symptoms	$PM_{2.5}$	140,000	190,000
Upper Respiratory Symptoms	$PM_{2.5}$	490,000	620,000
Asthma Exacerbation	$PM_{2.5}$	190,000	240,000
Acute Respiratory Symptoms (MRADs*)	$PM_{2.5}$, Ozone	6,400,000	8,500,000
Work Loss Days	$PM_{2.5}$	1,000,000	1,300,000
School Loss Days	Ozone	180,000	390,000

*MRADs = minor restricted activity days.

TABLE XI–2.—ESTIMATED MONETARY VALUE OF REDUCTIONS IN INCIDENCE OF HEALTH AND WELFARE EFFECTS

(Millions of 1999 dollars)

Endpoint group	Constituent	2010 estimated monetary value of reductions	2015 estimated monetary value of reductions
Premature Mortality—Adult	$PM_{2.5}$	$53,000	$77,000
Mortality—Infant	$PM_{2.5}$	130	180
Chronic Bronchitis	$PM_{2.5}$	1,900	2,700
Acute Myocardial Infarction—Total	$PM_{2.5}$	1,100	1,500
Hospital Admissions—Respiratory	$PM_{2.5}$, Ozone	85	130
Hospital Admissions—Cardiovascular	$PM_{2.5}$	78	110
Emergency Room Visits—Respiratory	PM2.5, Ozone	2.0	2.6
Acute Bronchitis	$PM_{2.5}$	4.3	5.7
Lower Respiratory Symptoms	$PM_{2.5}$	2.3	3.0
Upper Respiratory Symptoms	$PM_{2.5}$	13	17
Asthma Exacerbation	$PM_{2.5}$	8.0	10
Acute Respiratory Symptoms (MRADs*)	$PM_{2.5}$, Ozone	320	440
Work Loss Days	$PM_{2.5}$	140	170
School Loss Days	Ozone	13	28
Worker Productivity	Ozone	8.0	17
Visibility—Southeastern Class I Areas	Light Extinction	880	1,400
TOTAL + B**		$58,000	$84,000

B = non-monetized benefits
*MRADs = minor restricted activity days.
**Note total dollar benefits are rounded to the nearest billion and column totals may not add due to rounding.

2. Benefit-Cost Comparison

Based upon Table XI–3, the estimated social costs to implement the proposed rule emission reductions in 2010 and 2015 are $3 and $4 billion annually, respectively (1999$). Thus, the net benefit (social benefits minus social costs) of the program is approximately $55 + B billion annually in 2010 and $80 + B billion annually in 2015. Therefore, implementation of the proposed rule is expected to provide society with a net gain in social welfare based on economic efficiency criteria.

TABLE XI–3.—SUMMARY OF ANNUAL BENEFITS, COSTS, AND NET BENEFITS OF THE INTERSTATE AIR QUALITY RULE

(Billions of 1999 dollars)

Description	2010	2015
Social Costs [a]	2.9	3.7
Social Benefits [b, c]		
Ozone-related benefits	0.1	0.1
PM-related health benefits	56.8 + B	82.3 + B
Visibility benefits	0.9	1.4
Annual Net Benefits (Benefits-Costs) [b, c, d]	$55 + B	$80 + B

Notes:

[a] Note that costs are the estimated total annual costs of reducing pollutants including NO_X and SO_2 in the IAQR region.

[b] As the table indicates, total benefits are driven primarily by PM related health benefits. The reduction in premature fatalities each year accounts for over 90 percent of total benefits. Benefits in this table are associated with NO_X and SO_2 reductions.

[c] Not all possible benefits or disbenefits are quantified and monetized in this analysis. B is the sum of all unquantified benefits and disbenefits. Potential benefit categories that have not been quantified and monetized are listed in Table XI–4.

[d] Net benefits are rounded to nearest billion. Columnar totals may not sum due to rounding.

Every benefit-cost analysis examining the potential effects of a change in environmental protection requirements is limited to some extent by data gaps, limitations in model capabilities (such as geographic coverage), and uncertainties in the underlying scientific and economic studies used to configure the benefit and cost models. Deficiencies in the scientific literature often result in the inability to estimate quantitative changes in health and environmental effects, such as potential increases in premature mortality associated with increased exposure to carbon monoxide. Deficiencies in the economics literature often result in the inability to assign economic values even to those health and environmental outcomes that can be quantified. While these general uncertainties in the underlying scientific and economics literatures (that can cause the valuations to be higher or lower) are discussed in detail in the economic analyses and its supporting documents and references, the key uncertainties which have a bearing on the results of the benefit-cost analysis of this proposed rule include the following:

- The exclusion of potentially significant benefit categories (such as health and ecological benefits of reduction in mercury);
- Errors in measurement and projection for variables such as population growth and baseline incidence rates;
- Uncertainties in the estimation of future year emissions inventories and air quality;
- Variability in the estimated relationships of health and welfare effects to changes in pollutant concentrations;
- Uncertainties in exposure estimation;
- Uncertainties in the size of the effect estimates linking air pollution and health endpoints;
- Uncertainties about relative toxicity of different components within the complex mixture of PM;
- Uncertainties associated with the effect of potential future actions to limit emissions.

Despite these uncertainties, we believe the benefit-cost analysis provides a reasonable indication of the expected economic benefits of the proposed rulemaking in future years under a set of reasonable assumptions.

There are a number of health and environmental effects that we were unable to quantify or monetize. A full appreciation of the overall economic consequences of the proposed rule requires consideration of all benefits and costs expected to result from the proposed rule, not just those benefits and costs which could be expressed here in dollar terms. A listing of the benefit categories that could not be quantified or monetized in our estimate are provided in Table XI–4. These effects are denoted by "B" in Table XI–3 above, and are additive to the estimates of benefits.

We are unable to quantify changes in levels of methylmercury contamination in fish associated with reductions in mercury emissions for this proposal. However, this proposal is anticipated to decrease annual EGU mercury emissions nationwide by 10.6 tons in 2010 or approximately 23.5 percent, by 11.8 tons in 2015 or 26.3 percent, and by 14.3 tons or 32 percent in 2020. Emission reduction percentage decreases are based upon expected mercury emissions changes from fossil-fired EGUs larger than 25 megawatt capacity. In a separate action today, EPA is proposing to regulate mercury and nickel from certain types of electric generating units using the maximum achievable control technology (MACT) provisions of section 112 of the CAA or, in the alternative, using the performance standards provisions under section 111 of the CAA. This proposal will have implications for mercury reductions, and potential interactions may exist between the rulemakings.

TABLE XI–4.—ADDITIONAL NON-MONETIZED BENEFITS OF THE PROPOSED INTERSTATE AIR QUALITY RULE

Pollutant	Unquantified and/or nonmonetized effects
Ozone Health	Premature mortality.[a]
	Increased airway responsiveness to stimuli.
	Inflammation in the lung.
	Chronic respiratory damage.
	Premature aging of the lungs.
	Acute inflammation and respiratory cell damage.
	Increased susceptibility to respiratory infection.
	Non-asthma respiratory emergency room visits.
Ozone Welfare	Decreased yields for commercial forests.
	Decreased yields for fruits and vegetables.
	Decreased yields for commercial and non-commercial crops.
	Damage to urban ornamental plants.
	Impacts on recreational demand from damaged forest aesthetics.
	Damage to ecosystem functions.
PM Health	Low birth weight.
	Changes in pulmonary function.
	Chronic respiratory diseases other than chronic bronchitis.
	Morphological changes.
	Altered host defense mechanisms.
	Non-asthma respiratory emergency room visits.
PM Welfare	Visibility in many Class I areas.
	Residential and recreational visibility in non-Class I areas.
	Soiling and materials damage.
	Damage to ecosystem functions.
Nitrogen and Sulfate Deposition Welfare	Impacts of acidic sulfate and nitrate deposition on commercial forests.
	Impacts of acidic deposition on commercial freshwater fishing.
	Impacts of acidic deposition on recreation in terrestrial ecosystems.
	Reduced existence values for currently healthy ecosystems.
	Impacts of nitrogen deposition on commercial fishing, agriculture, and forests.
	Impacts of nitrogen deposition on recreation in estuarine ecosystems.
	Damage to ecosystem functions.
Mercury Health	Neurological disorders.
	Learning disabilities.
	Developmental delays.
	Potential cardiovascular effects.*
	Altered blood pressure regulation.*
	Increased heart rate variability.*
	Myocardial infarction.*
	Potential reproductive effects in adults.*
Mercury Deposition Welfare	Impact on birds and mammals (e.g., reproductive effects).
	Impacts on commercial, subsistence, and recreational fishing.
	Reduced existence values for currently healthy ecosystems.

Notes:
[a] Premature mortality associated with ozone is not separately included in this analysis.
* These are potential effects as the literature is either contradictory or incomplete.

B. Paperwork Reduction Act

The EPA intends to discuss the possible information collection burdens of this action in the SNPR. Assuming that States choose to use the optional trading program detailed in section VIII, the EPA anticipates that the impact on sources will be very small. Under these circumstances, the majority of the sources subject to today's rule are subject to the title IV Acid Rain Program and many sources are already subject to the NO_X SIP Call. For sources subject to both of these programs, EPA does not anticipate any additional monitoring or reporting costs. For more detail on the monitoring and reporting costs for sources not currently subject to the title IV Acid Rain Program and or the NO_X SIP Call *see,* "Monitoring and Reporting Costs Under the Proposed Interstate Air Quality Rule" (January 2004).

Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

An Agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations are listed in 40 CFR part 9 and 48 CFR chapter 15.

C. Regulatory Flexibility Act

The Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*) (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (Public Law No. 104–121) (SBREFA), provides that whenever an agency is required to publish a general notice of proposed rulemaking, it must prepare and make available an initial regulatory flexibility analysis, unless it certifies that the proposed rule, if promulgated, will not have "a significant economic impact on a substantial number of small entities."

5 U.S.C. 605(b). Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of today's rule on small entities, small entity is defined as: (1) A small business that is identified by the North American Industry Classification System (NAICS) Code, as defined by the Small Business Administration (SBA); (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less that 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field. Table XI–5 lists entities potentially impacted by this proposed rule with applicable NAICS code.

TABLE XI–5.—POTENTIALLY REGULATED CATEGORIES AND ENTITIES

Category	NAICS code [1]	Examples of potentially regulated entities
Industry	221112	Fossil fuel-fired electric utility steam generating units.
Federal government	[2] 22112	Fossil fuel-fired electric utility steam generating units owned by the Federal government.
State/local/Tribal government	[2] 22112	Fossil fuel-fired electric utility steam generating units owned by municipalities.
	921150	Fossil fuel-fired electric utility steam generating units in Indian Country.

[1] North American Industry Classification System.
[2] Federal, State, or local government-owned and operated establishments are classified according to the activity in which they are engaged.

According to the SBA size standards for NAICS code 221112 Utilities-Fossil Fuel Electric Power Generation, a firm is small if, including its affiliates, it is primarily engaged in the generation, transmission, and or distribution of electric energy for sale and its total electric output for the preceding fiscal year did not exceed 4 million megawatt hours.

Courts have interpreted the RFA to require a regulatory flexibility analysis only when small entities will be subject to the requirements of the rule.[101] This rule would not establish requirements applicable to small entities. Instead, it would require States to develop, adopt, and submit SIP revisions that would achieve the necessary SO_2 and NO_X emissions reductions, and would leave to the States the task of determining how to obtain those reductions, including which entities to regulate. Moreover, because affected States would have discretion to choose the sources to regulate and how much emissions reductions each selected source would have to achieve, EPA could not predict the effect of the rule on small entities. Although not required by the RFA, the Agency intends for the SNPR to conduct a general analysis of the potential impact on small entities of possible implementation strategies.

D. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995(Public Law 104–4)(UMRA), establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and Tribal governments and the private sector. Under section 202 of the UMRA, 2 U.S.C. 1532, EPA generally must prepare a written statement, including a cost-benefit analysis, for any proposed or final rule that "includes any Federal mandate that may result in the expenditure by State, local, and Tribal governments, in the aggregate, or by the private sector, of $100,000,000 or more * * * in any one year." A "Federal mandate" is defined under section 421(6), 2 U.S.C. 658(6), to include a "Federal intergovernmental mandate" and a "Federal private sector mandate." A "Federal intergovernmental mandate," in turn, is defined to include a regulation that "would impose an enforceable duty upon State, Local, or Tribal governments," section 421(5)(A)(i), 2 U.S.C. 658(5)(A)(i), except for, among other things, a duty that is "a condition of Federal assistance," section 421(5)(A)(i)(I). A "Federal private sector mandate" includes a regulation that "would impose an enforceable duty upon the private sector," with certain exceptions, section 421(7)(A), 2 U.S.C. 658(7)(A).

Before promulgating an EPA rule for which a written statement is needed under section 202 of the UMRA, section 205, 2 U.S.C. 1535, of the UMRA generally requires EPA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective, or least burdensome alternative that achieves the objectives of the rule.

The EPA intends to prepare a written statement for the SNPR consistent with the requirements of section 202 of the UMRA Furthermore, as EPA stated in the proposal, EPA is not directly establishing any regulatory requirements that may significantly or uniquely affect small governments, including Tribal governments. Thus, EPA is not obligated to develop under section 203 of the UMRA a small government agency plan. Furthermore, in a manner consistent with the intergovernmental consultation provisions of section 204 of the UMRA, EPA carried out consultations with the governmental entities affected by this rule.

For several reasons, however, EPA is not reaching a final conclusion as to the applicability of the requirements of UMRA to this rulemaking action. First, it is questionable whether a requirement to submit a SIP revision would constitute a Federal mandate in any case. The obligation for a State to revise its SIP that arises out of section 110(a) of the CAA is not legally enforceable by a court of law, and at most is a condition for continued receipt of highway funds. Therefore, it is possible to view an action requiring such a submittal as not creating any enforceable duty within the meaning of section 421(5)(9a)(I) of UMRA (2 U.S.C. 658 (a)(I)). Even if it did, the duty could be viewed as falling within the exception for a condition of Federal assistance under section 421(5)(a)(i)(I) of UMRA (2 U.S.C. 658(5)(a)(i)(I)).

As noted earlier, however, notwithstanding these issues, EPA plans to prepare for the SNPR the statement that would be required by UMRA if its statutory provisions applied, and the EPA has consulted with governmental entities as would be required by UMRA. Consequently, it is not necessary for EPA to reach a conclusion as to the applicability of the UMRA requirements.

E. Executive Order 13132: Federalism

Executive Order 13132, entitled "Federalism" (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure "meaningful and timely input by State and local officials in the development of

[101] *See Michigan* v. *EPA*, 213 F.3d 663, 668–69 (D.C. Cir. 2000), *cert. den.* 121 S.Ct. 225, 149 L.Ed.2d 135 (2001). An agency's certification need consider the rule's impact only on entities subject to the rule.

regulatory policies that have federalism implications." "Policies that have federalism implications" is defined in the Executive Order to include regulations that have "substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government."

This proposed rule does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. The CAA establishes the relationship between the Federal government and the States, and this rule does not impact that relationship. Thus, Executive Order 13132 does not apply to this rule. In the spirit of Executive Order 13132, and consistent with EPA policy to promote communications between EPA and State and local governments, EPA specifically solicits comment on this proposed rule from State and local officials.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

Executive Order 13175, entitled "Consultation and Coordination with Indian Tribal Governments" (65 FR 67249, November 9, 2000), requires EPA to develop an accountable process to ensure "meaningful and timely input by Tribal officials in the development of regulatory policies that have Tribal implications." This proposed rule does not have "Tribal implications" as specified in Executive Order 13175.

This proposed rule concerns the implementation of the rules that address transport of pollution that causes ozone and PM2.5. The CAA provides for States and Tribes to develop plans to regulate emissions of air pollutants within their jurisdictions. The proposed regulations clarify the statutory obligations of States and Tribes that develop plans to implement this rule. The TAR gives Tribes the opportunity to develop and implement CAA programs, but it leaves to the discretion of the Tribe whether to develop these programs and which programs, or appropriate elements of a program, they will adopt.

This proposed rule does not have Tribal implications as defined by Executive Order 13175. It does not have a substantial direct effect on one or more Indian Tribes, since no Tribe has implemented an air quality management program at this time. Furthermore, this proposed rule does not affect the relationship or distribution of power and responsibilities between the Federal government and Indian Tribes. The CAA and the TAR establish the relationship of the Federal government and Tribes in developing plans to attain the NAAQS, and this proposed rule does nothing to modify that relationship. Because this proposed rule does not have Tribal implications, Executive Order 13175 does not apply.

Assuming a Tribe is implementing such a plan at this time, while the proposed rule would have Tribal implications upon that Tribe, it would not impose substantial direct costs upon it, nor would it preempt Tribal law. As provided above, EPA has estimated that the total annual costs for the rule as implemented by State, Local, and Tribal governments is approximately $3 billion in 2010 and $4 billion in 2010 (1999$). There are currently very few emissions sources in Indian country that could be affected by this rule and the percentage of Tribal land that will be impacted is very small. For Tribes that choose to regulate sources in Indian country, the costs would be attributed to inspecting regulated facilities and enforcing adopted regulations.

Although Executive Order 13175 does not apply to this proposed rule, EPA consulted with Tribal officials in developing this proposed rule. The EPA has encouraged Tribal input at an early stage. Also, the EPA held periodic meetings with the States and the Tribes during the technical development of this rule. In addition, EPA held three calls with Tribal environmental professionals to address concerns specific to the Tribes. These discussions have given EPA valuable information about Tribal concerns regarding the development of this rule. The EPA has provided briefings for Tribal representatives and the newly formed National Tribal Air Association (NTAA), and other national Tribal forums. Input from Tribal representatives has been taken into consideration in development of this proposed rule. The EPA specifically solicits additional comment on this proposed rule from Tribal officials.

G. Executive Order 13045: Protection of Children From Environmental Health and Safety Risks

Executive Order 13045, "Protection of Children from Environmental Health Risks and Safety Risks" (62 FR 19885, April 23, 1997) applies to any rule that (1) is determined to be "economically significant" as defined under Executive Order 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, Section 5–501 of the Order directs the Agency to evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency.

This proposed rule is not subject to the Executive Order because it does not involve decisions on environmental health or safety risks that may disproportionately affect children. The EPA believes that the emissions reductions from the strategies proposed in this rulemaking will further improve air quality and will further improve children's health.

H. Executive Order 13211: Actions That Significantly Affect Energy Supply, Distribution, or Use

Executive Order 13211 (66 FR 28355, May 22, 2001) provides that agencies shall prepare and submit to the Administrator of the Office of Regulatory Affairs, OMB, a Statement of Energy Effects for certain actions identified as "significant energy actions." Section 4(b) of Executive Order 13211 defines "significant energy actions" as "any action by an agency (normally published in the **Federal Register**) that promulgates or is expected to lead to the promulgation of a final rule or regulation, including notices of inquiry, advance notices of final rulemaking, and notices of final rulemaking (1) (i) that is a significant regulatory action under Executive Order 12866 or any successor order, and (ii) is likely to have a significant adverse effect on the supply, distribution, or use of energy; or (2) that is designated by the Administrator of the Office of Information and Regulatory Affairs as a "significant energy action." This proposed rule is a significant regulatory action under Executive Order 12866, and this proposed rule may have a significant adverse effect on the supply, distribution, or use of energy. We have prepared a Statement of Energy Effects for this action, which may be briefly summarized as follows:

If States choose to obtain the emission reductions required by this rule by regulating EGUs, EPA projects that approximately 3100 MWs of coal-fired generation may be retired earlier than the generation would have been retired absent today's proposed rule-making. We do not believe that this rule will have any other impacts that exceed the significance criteria. The EPA projects that the average annual electricity price

will increase by about 2 percent in 2010, and about 3 percent in 2015.

The EPA believes that a number of features of today's rulemaking serve to reduce its impact on energy supply. First, by allowing the use of a trading program, overall cost and thus impact on energy supply is reduced. Second EPA has provided adequate time for EGUs to install the required controls.

The use of a capped trading program to reduce emissions of SO_2 and NO_X is also consistent with the President's National Energy Policy.

I. National Technology Transfer Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise practical. Voluntary consensus standards are technical standards (*e.g.*, materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. The NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

In the SNPR, EPA will include regulatory language concerning monitoring, recordkeeping, and recording provisions that will apply to certain source categories if States choose to require reductions from them. These provisions may involve technical standards that may implicate the use of voluntary consensus standards. Therefore, EPA will address the NTTAA in the SNPR.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires Federal agencies to consider the impact of programs, policies, and activities on minority populations and low-income populations. According to EPA guidance,[102] agencies are to assess whether minority or low-income populations face risk or a rate of exposure to hazards that is significant and that "appreciably exceeds or is likely to appreciably exceed the risk or rate to the general population or to the appropriate comparison group."

In accordance with Executive Order 12898, the Agency has considered whether this proposed rule may have disproportionate negative impacts on minority or low income populations. Because the Agency expects this proposed rule to reduce pollutant loadings and exposures generally, negative impacts to these sub-populations which appreciably exceed similar impacts to the general population are not expected.

[102] U.S. Environmental Protection Agency. "Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses" (Review Draft). Office of Federal Activities. July 12, 1996.

List of Subjects

40 CFR Part 51

Administrative practice and procedure, Air pollution control, Intergovernmental relations, Nitrogen dioxide, Ozone, Particulate matter, Reporting and recordkeeping requirements, Sulfur oxides, Volatile organic compounds.

40 CFR Part 72

Acid rain, Administrative practice and procedure, Air pollution control, Electric utilities, Intergovernmental relations, Nitrogen oxides, Reporting and recordkeeping requirements, Sulfur oxides.

40 CFR Part 75

Acid rain, Air pollution control, Electric utilities, Nitrogen oxides, Reporting and recordkeeping requirements, Sulfur oxides.

40 CFR Part 96

Administrative practice and procedure, Air pollution control, Nitrogen oxides, Reporting and recordkeeping requirements.

Dated: December 17, 2003.

Michael O. Leavitt,

Administrator.

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