

these actions to avoid the high retrofit costs and delays in obtaining a major NSR permit. If necessary, owners or operators can and will limit their activities to those that do not trigger major NSR, and will take enforceable restrictions on fuel use or other actions to avoid major NSR. This results in some decline in efficiency and capacity, as the EPA's base case modeled, but the units would likely remain viable electric generating units for years without triggering BACT requirements. Thus, we believe our base case represents a far more realistic assessment of what would happen under current major NSR rules than the dramatic BACT reductions presented by these commenters.

Furthermore, while some of the facilities may be modified and subjected to control, nationwide emissions as estimated in the model runs would still rise to the level of the Acid Rain cap for SO₂. To the degree these modifications come at facilities that are otherwise projected to be controlled because of existing SO₂ and NO_x requirements, there would be no difference in effect between the model runs and alternative scenarios. We agree with the commenter who noted that the recent analysis and the estimated impact on emissions is consistent with the previous EPA report in 1989. Our recent analysis confirms that efficiency improvements have the potential to result in environmental benefits that offset (or more than offset) emissions increases from improved availability, but that previous major NSR rules discouraged these improvements.

Regarding the applicability of our analysis to non-utility sectors, we continue to believe that our conclusions are valid for all sectors, and further, that the effects from the electric utility industry dominate those from other sectors. We acknowledge that the results for the SO₂ cap for utilities cannot be extended to non-utilities that are not similarly capped. However, our model runs for NO_x reflected the absence of a cap, and are therefore valid for other uncapped sectors. Thus in the case of industrial boilers, which behave similarly to utilities, we would expect to see similar efficiency improvements and availability improvements occurring in tandem, resulting in either modest increases or decreases. Because the overall emissions from this sector are significantly smaller than for utilities, the modeled effects for utilities are expected to dominate the analysis.

For other industrial sectors, we do not anticipate that emissions increases will result from equipment replacement activities that qualify as RMRR under today's rule. While some efficiency

improvements may result, the overall effect of these improvements will not be to induce greater demand and greater emissions, in contrast to the effect shown by the modeling for utilities (*i.e.*, demand for other industrial sectors depends on independent factors). Indeed, without increased demand, efficiency improvements that lower emissions per unit of output would result in a decrease in emissions.

A number of commenters raised concerns that EPA had not analyzed the impact of the final rule on industries other than for electric utilities. We have, thus, supported further efforts to analyze empirically the effects of this rule. This work is included in the Regulatory Impact Analysis (RIA) for the final rule. Even the experts involved in this analysis emphasize that empirical assessments of the costs, emissions, and other economic and environmental effects of this rule are extremely difficult to perform, particularly when generalizing beyond the specific industrial sector and type of facility involved. The analysis would have to simulate a great many decisions made by each plant involving routine maintenance under a variety of policy scenarios. There is simply no credible way to make these assessments for the entire economy or for an entire sector. Hence, with the exception of the electric utility industry model, we relied on a case study approach to gain insights as to how this rule affects particular industrial sectors.

A series of case studies were analyzed by an EPA contractor to estimate the overall impact of the final rule on six different industrial sectors (automobile manufacturing, carbon black manufacturing, natural gas transmission, paper and pulp mills, petroleum refining and pharmaceutical manufacturing). The analysis was designed to examine effects of the final rule, but it is important to note that the case studies were performed prior to decisions on the exact form and content of the final rule. For example, the selection of process units for each of the industries may not be an accurate depiction concerning how a particular industry's operations should be separated into process units under the final rule. As such, none of these characterizations should be taken as EPA's position on appropriate process units for a given industry. (Information on that subject can be found in Section III.F of the preamble and in the final rule for selected industries.) In addition, in costing out replacement activities in the different industries, the contractor made assumptions regarding which costs needed to be included and how

multiple replacement activities should be grouped that may not be consistent with the final rule. Again, these assumptions on the part of the contractor should not be interpreted as EPA's conclusions of how their rules should be applied to such replacement activities in these industries.

Even with these caveats, the case studies provide useful insight into the potential effects of the final ERP. The six industries are significant sources of air pollution emissions and are very diverse in terms of their types of operations, their existing maintenance, repair and replacement strategies, and the range of potential replacement costs at some of their process units. This diversity is important because the final rule will impact a great many industrial sectors and individual process units which are extremely varied in terms of their maintenance, repair and replacement strategies. For example, issues related to safety, reliability and availability will vary greatly across these industries. The need to assure that the electricity and natural gas supply is reliable and available is critical to ensuring the safety of the public in the hottest and coldest times of the year, and it is critical to the operation of the nation's infrastructure, to the degree they do not have backup power generation, devoted to public health (*e.g.*, drinking water, sewage treatment, food refrigeration, hospitals). Thus, strategies related to maintenance, repair and replacement at existing facilities are critical to ensure that vital electric utilities and natural gas transmission continue uninterrupted. As we are clarifying what activities fall within the ERP, owners or operators at these facilities will be able to make decisions on when and how to conduct RMRR activities based on engineering judgement.

The case studies conclude that equipment replacement activities vary widely within these industries for the process units selected. Across the industries, the studies estimated that equipment replacement activities could range in percentage by over an order of magnitude. By establishing a threshold at 20 percent of the replacement cost of the process unit, we believe we have set a reasonable standard that allows most replacements to proceed unimpeded as long as the other safeguards are met. At the same time, under the 20 percent threshold, the most capital-intensive replacements would be subject to case-by-case review. The data from these case studies clearly indicate that 20 percent would function well as the dividing line between those replacement activities that automatically qualify under the