



**EDISON ELECTRIC
INSTITUTE**

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Executive Director, Environment

February 8, 2010

Submitted via www.regulations.gov to Docket No.: EPA-HQ-OAR-2007-0352

Subject: Proposed Primary National Ambient Air Quality Standard (NAAQS) for Sulfur Dioxide, 74 *Fed. Reg.* 64810 (December 8, 2009)

Dear Sir or Madam:

The Edison Electric Institute (EEI) submits the attached comments on the Environmental Protection Agency (EPA) proposed Primary National Ambient Air Quality Standard (NAAQS) for Sulfur Dioxide (SO₂).

EEI is the association of shareholder-owned electric companies, international affiliates and industry associates worldwide. Our U.S. members serve 95 percent of the ultimate customers in the shareholder-owned segment of the industry, and represent approximately 70 percent of the U.S. electric power industry. The electric power sector generates approximately one-half of the nation's power using the nation's large coal resources, at relatively low cost to support the U.S. economy and millions of jobs.

The electric power sector has invested tens of billions of dollars to reduce its SO₂ emissions from over 17 million tons in 1980 to about 6 million tons in 2009, despite a 70 percent increase in both coal-based and fossil-based electricity generation over the same time period. Further progress in reducing SO₂ emissions will come from compliance with the Clean Air Interstate Rule (CAIR) and a revised Phase 2 CAIR plus likely co-benefits from Maximum Achievable Control Technology (MACT) standards for hazardous air pollutants and revision of other NAAQS.

EPA is currently moving forward with many regulations affecting the power industry. Air quality regulations facing the power industry include the short-term SO₂ standard; CAIR and a revised Phase 2 CAIR; new NAAQS for nitrogen dioxide, ozone and

particulate matter; the Regional Haze/Best Available Retrofit Technology rule; and a MACT regulation. Other power sector regulatory programs will address coal ash, water quality, cooling water withdrawal, and greenhouse gases. The industry, electric customers and the U.S. economy cannot afford to implement stringent rules, such as for a new SO₂ standard, that do not provide real benefits. Further, a tight new short-term SO₂ standard could undermine EPA's marquee Clean Air Act (CAA) program, i.e., the 1990 CAA amendments Acid Rain Program SO₂ cap-and-trade system.

EEI supports regulation that provides real benefits. However, this proposal provides very little benefit as indicated by EPA's own Regulatory Impact Analysis, which shows that the cost of the proposal far outweighs the direct SO₂ reduction benefits. EEI believes that setting a 1-hour standard in the range of 50-100 ppb is *not* supported by the scientific evidence.

EPA also requested comment on a standard of 150 ppb. If the Agency decides that it must establish a new 1-hour standard, EEI recommends a standard of no less than 150 ppb, and agrees with the Agency that it should revoke the current 24-hour and annual primary SO₂ standards.

EEI appreciates the opportunity to provide comments. Questions may be directed to John Kinsman (202-508-5711 or jkinsman@eei.org).

Sincerely,



Quinlan J. Shea, III

QJS:jk



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COMMENTS OF THE EDISON ELECTRIC INSTITUTE

**PROPOSED PRIMARY NATIONAL AMBIENT AIR QUALITY STANDARD
(NAAQS) FOR SULFUR DIOXIDE, 74 Fed. Reg. 64810 (December 8, 2009)**

Docket No. EPA-HQ-OAR-2007-0352

FEBRUARY 8, 2010

The Edison Electric Institute (EEI) submits these comments on the proposed Primary National Ambient Air Quality Standard (NAAQS) for Sulfur Dioxide (SO₂). EPA seeks comment on a new one-hour ambient air standard for SO₂ with a recommended range of 50-100 parts per billion (ppb), while also accepting comments on an alternative range for concentrations as high as 150 ppb.

**ELECTRIC SECTOR SO₂ EMISSIONS HAVE BEEN DRAMATICALLY
REDUCED**

The electric power sector has been reducing emission, especially SO₂, for decades while meeting the nation's ever-increasing demand for energy. These emission reductions have produced environmental benefits. Electric companies and their customers have invested tens of billions of dollars to reduce emissions. As emission levels go lower and lower, questions about the optimal level of emissions that should be allowed become more highly debated and the cost for every incremental emission reduction becomes higher and higher.

The power generation sector has been monitoring SO₂ emissions continuously at every plant for at least 15 years. No other sector can so accurately characterize its emissions and such data.

The electric power sector has cut SO₂ emissions deeply. Using the EPA Clean Air Markets Division website (Quick Reports), ¹ power sector SO₂ emissions have declined from 17.3 million tons (1980) to 15.7 million tons (1990) to 11.2 million tons (2000) to 7.6 million tons (2008). This equates to a 56 percent reduction from 1980 to 2008, *despite a 70 percent increase in both coal-based and fossil-based electricity generation over the same time period* (according to the Energy Information Administration). ²

The updated and likely more stringent version of CAIR, to be finalized by mid-2011, will require a substantial additional investment by the power generation sector to reduce SO₂ emissions. In preparation for meeting new CAIR requirements, based on preliminary data it appears that power sector SO₂ emissions in 2009 declined significantly from 2008 levels, from 7.6 million tons to closer to 6 million tons. Further progress in reducing SO₂ emissions will come from compliance with Maximum Achievable Control Technology (MACT) standards for hazardous air pollutants and revision of other NAAQS.

SO₂ REDUCTIONS HAVE BENEFITED AIR QUALITY AND THE ENVIRONMENT

A recent EPA report on Air Quality Trends ³ evaluates national air quality and emissions trends since 1980. National SO₂ emissions (the total from all sources, including electric power plants) are down 56 and 51 percent, respectively, from 1980 and 1990 to 2008. National SO₂ concentrations (the average monitored level in the outside air) have declined 71 and 59 percent, respectively, from 1980 and 1990 to 2008.

Environmental progress has resulted. EPA's October 2009 report "2008 Environmental Results" ⁴ on the environmental benefits of the acid rain program, finds that emission

¹ <http://camddataandmaps.epa.gov/gdm/index.cfm?fuseaction=emissions.wizard>

² http://www.eia.doe.gov/emeu/aer/pdf/pages/sec8_8.pdf

³ <http://www.epa.gov/airtrends/aqtrends.html>

⁴ http://www.epa.gov/airmarkets/progress/ARP_3.html

reductions (from power plants and other sources) have led to the following improvements in air quality as measured between the two periods of 1989-1991 and 2006-2008:

- Average sulfate concentrations in ambient air have decreased by 38 percent in the Mid-Atlantic, 44 percent in the Midwest, 43 percent in the Northeast, and 28 percent in the Southeast;
- Decreases in wet deposition of sulfate averaged more than 30 percent for the eastern United States; and
- Total sulfur deposition (wet plus dry deposition) declined about 40 percent.

IMPACTS OF THE PROPOSED RULE ON THE ELECTRIC POWER SECTOR

The proposed rule is very important to the power generation sector, which emits about 60 percent of domestic industrial SO₂ emissions. The proposal comes as EPA is currently moving forward on many other air quality regulations facing the power industry --- CAIR and a revised Phase 2 CAIR; new NAAQS for nitrogen dioxide, ozone and particulate matter; the Regional Haze/Best Available Retrofit Technology rule; and Maximum Achievable Control Technology (MACT) standards --- plus regulatory programs addressing coal ash, water quality, cooling water withdrawal, and greenhouse gases. The industry, electric customers and the U.S. economy cannot afford to implement stringent rules that do not provide real benefits.

A tight new short-term SO₂ standard could undermine EPA's marquee Clean Air Act (CAA) program -- the 1990 CAA amendments Acid Rain Program SO₂ cap-and-trade system. This trading system established the paradigm supporting market-based approaches of all kinds, because it has been extremely successful from both environmental and cost-effectiveness perspectives. To undo this landmark EPA program with a highly-questionable and unnecessary short-term SO₂ standard would do damage to the entire concept of market-based control programs.

EPA'S REGULATORY ANALYSIS DOES NOT SUPPORT THE PROPOSED 1-HOUR STANDARD

EPA's Regulatory Impact Analysis for this proposed standard⁵ shows that almost none of the proposed rule benefits would come from reducing adverse health effects associated with SO₂. Virtually all of the benefits come from EPA assuming secondary benefits are related to possible reductions in particulate matter concentrations.

The calculations indicate that at least 99.97% of the benefits are not from direct control of SO₂. For example, at the most stringent standard alternative (50 ppb) the maximum assumed national annual benefits are \$12 million from lower SO₂ concentrations. By contrast, the associated benefits estimated to result from associated reductions in particulate matter levels are \$41 billion. Thus, the RIA finds 3,400 times the level of benefit from assumed indirect reductions in particulate matter than from reductions of SO₂.

Impacts of SO₂ emissions on health risks associated with particulates should be considered separately in the pending particulate matter NAAQS proceeding, for which EPA is scheduled to issue a proposal in November 2010 and a final decision by July 2011.

If EPA continues to rely upon particulate matter co-benefits to drive its NAAQS cost-benefit justifications, it should acknowledge more directly that such benefits are highly uncertain. Regarding particulate matter health effects, the Electric Power Research Institute (EPRI) has implemented state-of-the-air studies, including ARIES, which indicate that claims regarding health effects attributed to particulate matter sulfates are questionable, while other components in the PM mass such as elemental carbon (EC) and organic carbon are more important than assumed. EPRI also questions premature mortality assumptions.⁶

⁵ <http://www.epa.gov/ttn/ecas/regdata/RIAs/pso2full11-16-09.pdf>

⁶ EPRI in a February 2009 document entitled "PM_{2.5} Reductions and Impact on Premature Death: An EPRI Perspective Issue Brief" concludes, regarding estimates of premature mortality attributed to particulate matter, that

It is inappropriate for EPA, rule after rule, to claim particulate matter co-benefits as a major, if not dominant part of the benefit equation. This leads to a situation where the benefits probably are at least quadruple-counted (i.e., particulate matter co-benefits are or likely will be factored into benefit calculations for the SO₂, nitrogen dioxide, and ozone NAAQS; the upcoming CAIR Phase 2 rule; and perhaps even the power sector MACT rule).

As for cost-effectiveness, the agency has not set forth a cogent path forward assessing the impacts of revising one standard on concentrations of other pollutants. All six NAAQS are being reviewed within a short amount of time and presumably all will be tightened. EPA should consider when setting standards and in implementation rules/guidance that

“However, one number does not reflect the high degree of uncertainty associated with each step of the analysis. A more appropriate way to express potential health impacts would be to use a range. Since some models in some studies do not find a statistically significant effect of PM_{2.5} on mortality, the effects range could even include zero.”

EPRI in a document entitled Particulate Matter Toxicology (September 2008) asks “What have we learned through toxicology about the relative toxicity of different PM components?” and concludes regarding our current state of knowledge on the health effects attributable to different PM components:

“Sulfate and acid aerosols: There is little evidence for sulfate-related health effects except at high concentrations (in the mg/m³ range, several orders of magnitude higher than ambient air concentrations), where some effects on pulmonary function have been noted. Some strong acids (for example, H₂SO₄) can cause pulmonary effects, but again, in the mg/m³ concentration range.”

EPRI in a December 2009 document entitled “Air Quality Health Effects Research: Current Status”, concludes that:

“Substantial progress has been made in understanding the effects of air pollution. EPRI research has helped to lead the way in demonstrating that all PM components are not equally toxic, and today there is a growing consensus that EC is one of the most important components in explaining health responses to PM. Because EC itself is relatively inert, it is likely that any signal observed with this component reflects an association with a pollutant that varies with EC because it is emitted from the same source(s). For example, the signal could be due to particle-phase organic compounds emitted from diesel engines, which are a major source of EC.

EPRI’s research has also made it clear that the focus cannot only be on PM; pollutant gases are also tied to health responses and could explain some of the responses that have been attributed to PM. In particular, the organic gases (i.e., volatile or semi-volatile organic compounds; VOCs and SVOCs) need to be considered more comprehensively. This seems particularly important, since as mentioned above, EC and some of these VOCs and SVOCs are emitted from the same source. Therefore, considering both in a holistic and integrative manner may lead to valuable insights into the causative components of air pollution. Clearly, this understanding is critical so that regulation can focus on those sources emitting the most harmful pollutants.”

significant interactions will occur for air quality and implementation decisions, which will complicate, if not undermine, planning and compliance measures.

While cost is not a consideration in establishing a NAAQS, the Administrator can make her own policy judgment weighing the benefits when establishing a NAAQS. Supreme Court Justice Breyer, in *Whitman v. American Trucking Association*, emphasized the considerable latitude the EPA Administrator has in setting a NAAQS at a level that will have small public health risks when viewed in the context of the many other factors that influence health.

PROJECTED HEALTH EFFECTS OF EXPOSURE TO SO₂ DO NOT SUPPORT THE 1-HOUR STANDARD.

EPA clearly focuses its concerns and proposal on protecting exercising asthmatics from elevated short-term SO₂ exposures. The health response, which occurs rarely, is small, transient and quickly reversed. Identical effects commonly occur in response to a variety of situations such as moderate exercise, exposure to cold, or everyday stress. Effects are very small compared. There is no effect on healthy individuals from SO₂ concentrations at or close to those that occur in ambient air. EPA states in the proposal that there is little evidence supporting a long-term effect and thus proposes to, after establishing a 1-hour standard, revoke the 24-hour and annual SO₂ standards.

The Utility Air Regulatory Group (UARG) will submit detailed comments on the scientific justification for the proposed standards. UARG raises many important issues, several of which EEI discusses briefly below. EEI supports the comments of UARG on the proposed rule.

Regarding clinical studies, there is no real change in the underlying data from the previous SO₂ NAAQS review in 1996, but rather an EPA shift in interpretation of the studies. EPA takes an unwarranted jump to assume that responses to higher SO₂ are worse for more severe asthmatics, a conclusion refuted by a study that EPA itself uses to support aspects of its proposal (Linn et al., 1987).

Regarding epidemiology studies, the issue of confounding remains very important and EPA continues to undervalue the uncertainties of measurement error, modeling deficiencies, and co-pollutant effects (i.e., when numerous air pollutants are present, what appears to be an impact from one may in fact be an impact of another). Co-pollutant impacts cannot be evaluated when modeling efforts include only one pollutant and exclude others, which is the case in many of the studies EPA relies upon. UARG in its comments also notes that the proposed rule relies heavily on studies with slightly positive findings that are at the same time not statistically significant.

Finally, the magnitude of the possible effects of SO₂ is very small. UARG in its comments notes that EPA discussed in its Risk and Exposure Analysis (REA) a modeling study for Greene County, Missouri which found that 0.4 percent of exercising (moderately or greater) asthmatic children experienced a single lung function response over the course of an entire year at current air quality levels or at 50-100 ppb SO₂, compared to 0.5 percent at 150 ppb SO₂. There appears to be little difference in health benefits for a 50-100 ppb standard compared to a 150 ppb standard and EPA's risk assessment does not suggest that any of the standards under consideration would significantly reduce risks to asthmatics and asthmatic children from those associated with SO₂ levels currently found in ambient air.

Taken together, these comments demonstrate that EPA does not have a sufficient basis to choose a 50-100 ppb standard. The CAA requires that health effects be projected with a reasonable degree of scientific certainty. The Agency's review and utilization of the information contained in the Integrated Science Assessment and the Risk and Exposure Assessment do not meet the requirements of the CAA and EPA's promulgation of a final standard within the range proposed would be more stringent than necessary and thus arbitrary and capricious.

MONITORING AND OTHER ISSUES

EEl concurs with UARG comments regarding monitoring, data interpretation and exceptional events aspects of the proposed rule.

CONCLUSION

EEI supports regulation that provides real benefits. However, this proposal provides very little benefit as indicated by EPA's own Regulatory Impact Analysis, which shows that the cost of the proposal far outweighs the direct SO₂ reduction benefits. EEI believes that setting a 1-hour standard in the range of 50-100 ppb is not supported by the scientific evidence.

EPA also requested comment on a standard of 150 ppb. If the Agency decides that it must establish a new 1-hour standard, EEI recommends a standard of no less than 150 ppb, and agrees with the Agency that it should revoke the current 24-hour and annual primary SO₂ standards.