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Submitted via e-mail to a-and-r-Docket@epa.gov

Subject: Docket ID No. EPA-HQ-OAR-2001-0017

(National Ambient Air Quality Standards for Particulate Matter;
Proposed Rule, 71 Fed. Reg. p. 2620-708, January 17, 2006)

Edison Electric Institute (EEI) appreciates this opportunity to comment on EPA's proposed standards for particulate matter. EEI is the premier trade association for U.S. shareholder-owned electric companies, and serves international affiliates and industry associates worldwide. Our U.S. members serve almost 95 percent of the ultimate customers in the shareholder-owned segment of the industry and nearly 70 percent of all electric utility ultimate customers in the nation, and generate over 70 percent of the electricity produced by U.S. electric utilities. These comments focus upon EPA's proposal regarding fine particle (PM_{2.5}) National Ambient Air Quality Standards (NAAQS).

AIR EMISSIONS ARE DECLINING AND AIR QUALITY IS IMPROVING

Electric power plants and other sources have been making dramatic reductions in emissions for decades while supplying the nation's ever-increasing demand for energy and consumer products. Between 1970 and 2004, U.S. gross domestic product increased 187 percent, vehicle miles traveled increased 171 percent and energy consumption increased 47 percent, and U.S. population grew by 40 percent. Since 1970 total emissions of the six principal air pollutants dropped by 54 percent.¹ The electric power sector has cut emissions associated with fine particulate matter – sulfur dioxide (SO₂) and nitrogen oxides (NO_x) – by more than 40 percent since 1980.

Whether EPA tightens the fine particle standards as proposed or leaves the current standards in place, air quality will continue to dramatically improve. The Clean Air Interstate Rule (CAIR) will require power plants in 29 eastern states and the District of Columbia to cut SO₂ emissions an additional 40 percent from today's levels by 2010, and 70 percent when fully implemented. NO_x emissions will be cut an additional 50 percent by 2010, and 60 percent when fully implemented.² The power sector is on track to reduce its SO₂ and NO_x emission rates (lb/MWh) by more than 90 percent (compared to 1980 levels) upon implementation of EPA's CAIR, Clean Air Mercury Rule (CAMR) and Clean Air Visibility Rule (CAVR).

¹ See <http://www.epa.gov/airtrends/2005/econ-emissions.html>

² William Wehrum, U.S. Environmental Protection Agency, Testimony before Senate Environment & Public Works Committee, November 19, 2005.

These amount to huge pollution cuts already in the pipeline, some ordered just within this past year. We think that EPA should give them a chance to work and consider whether they deliver benefits for reducing particulate matter before seeking additional emissions reductions. In fact, if any association between PM_{2.5} and health effects exists, existing regulations to reduce emissions from many sectors would mitigate this effect.

EPA'S SCIENCE SUPPORTING THE PROPOSAL IS QUESTIONABLE

24-Hour Primary Standards for Fine Particles

These comments focus on the EPA proposal to reduce the 24-hour (short-term) PM_{2.5} standard, a measure of the concentration of particles less than 2.5 microns in diameter in the air, from 65 to 35 micrograms per cubic meter.

EEl supports the establishment of air quality standards based on a complete and thorough review of the current body of scientific literature. Unfortunately, we do not believe EPA has conducted such a review. The Administrator's proposal is undermined by the major uncertainties noted by EPA in the proposal,³ which are so substantial that they render questionable the basis for tightening the standards:

"Having reached this decision to propose a level of 35 ug/m³ for the 24-hour PM_{2.5} standard based on the approach to interpreting the available evidence described above, the Administrator recognizes that other approaches to selecting a standard level have been presented to the Agency. These other approaches reflect alternative views, principally expressed in public comments to date, as to the appropriate interpretation of the scientific evidence and the appropriate policy response in light of that interpretation. One such view focuses very strongly on the uncertainties inherent in the epidemiologic and toxicologic studies and the quantitative risk assessment as the basis for concluding that no change to the current 24-hour PM_{2.5} standard of 65 ug/m³ is warranted. Such commenters prefer greater weight, for example, on issues related to the sensitivity in the magnitude and statistical significance of relative risks reported in studies using different statistical models, noting that further research is needed to inform modeling strategies that will appropriately adjust for temporal trends and weather variables in time-series studies. Additional uncertainties arise from the potential confounding by co-pollutants, and the potential differential toxicity of components within the mix of fine particles. These commenters suggest that the magnitude of risks associated with fine particle exposures have decreased since the last review. Some such commenters also focus on considerations such as the absence of clear evidence from toxicologic studies and from studies focused on elucidating specific physiologic mechanisms by which PM_{2.5} may be causing the observed effects. Such commenters recognize a need for a 24-hour PM_{2.5}

³ 71 Fed. Reg. pg. 2650, February 17, 2006

standard, but consider the evidence to be too uncertain overall to warrant any tightening of the standard and instead believe the appropriate policy response in light of this uncertainty is to retain the current level of the 24-hour standard.

Other commenters who also focus strongly on the uncertainties inherent in the epidemiologic and toxicologic studies and the quantitative risk assessment reach a somewhat different conclusion as to the appropriate policy response in light of these uncertainties. This group of commenters sees a basis for lowering the level of the 24-hour $PM_{2.5}$ standard, but does not believe that a level as low as $35 \text{ ug}/\text{m}^3$ is warranted. Such commenters note that while many of the studies within the range of air quality from approximately $39 \text{ ug}/\text{m}^3$ up to the level of the current standard of $65 \text{ ug}/\text{m}^3$ report statistically significant results, only a few such studies independently evaluated confounding by co-pollutants. This lack of a broader assessment of co-pollutants, together with other types of uncertainties as noted above, leads such commenters to conclude that a standard level selected from below this range is not warranted, and that the appropriate policy response is to select a standard level from within the range of about 40 to $65 \text{ ug}/\text{m}^3$.

Despite these uncertainties, EPA's proposal makes clear that the risks estimated to be associated with ambient $PM_{2.5}$ have not increased since the present standards were set.

Furthermore, the information presented by agency staff to the Administrator and the Agency's science advisors for their review was highly selective. In other words, EPA staff "cherry-picked" the science, overemphasizing certain epidemiological studies that claim an association between fine particles and health effects, while giving short shrift to studies that suggest $PM_{2.5}$ presents little or no health concern. An influential EPA staff memo,⁴ which characterized the mortality risk of fine particles over short time periods and was clearly influential in targeting $35 \text{ ug}/\text{m}^3$, omitted ten studies that show mostly no effect or mixed effects of $PM_{2.5}$. When the complete set of studies – from EPA's particulate matter Criteria Document – is considered, only three out of about 20 show consistently statistically significant effects of $PM_{2.5}$. Even if EPA ignores the great majority of the studies and focuses only on three, these three studies suggest the need for a more modest tightening of the standard – one of the three studies suggests that the 24-hour standard should be set at about $60 \text{ ug}/\text{m}^3$, (i.e., just below the current level of $65 \text{ ug}/\text{m}^3$) and two suggest setting the standard at about $40 \text{ ug}/\text{m}^3$.

EPA's proposal inappropriately dismisses evidence that co-pollutants confound the oft-reported associations between $PM_{2.5}$ and mortality/morbidity endpoints. Citing its own Criteria Document for authority, EPA asserts that "effect estimates for associations between mortality and morbidity and various PM indices are generally robust to

⁴ M. Ross and J. Langstaff, Updated statistical information on air quality data from epidemiological studies, EPA memorandum, January 28, 2005

confounding, while recognizing that disentangling the effects attributable to various pollutants within an air pollution mixture is challenging.”⁵

Also of crucial importance is the failure to identify specific types of particles, or other pollutants present in the air along with fine particulate matter, that may be more significantly associated with health concerns. EPA recognizes the significance of this issue, consistent with a National Academy of Sciences panel⁶ and EPA’s own Office of Inspector General,⁷ but asserts it does not know at this time which of the many substances that comprise fine particulate matter might be causing a problem. However, without knowledge of which of the components of PM_{2.5} are of greatest health importance, EPA and states cannot develop strategies to reduce emissions and achieve desired health benefits with any degree of certainty. Given this uncertainty, the lower end of the range of estimated health benefits for strategies targeting sub-components of PM_{2.5} (e.g., sulfates and nitrates) could be zero.

EPA’s proposal relies on epidemiological studies that have not included comprehensive air quality monitoring to allow identification of many of the components that may be associated with health effects. In contrast, EPRI’s Aerosol Research and Inhalation Epidemiology Study (ARIES) includes measurement of more types of air pollution, including numerous components of particulate matter, than any other study. ARIES also is examining more health endpoints – mortality, emergency department visits, ambulatory care visits, cardiac arrhythmias in defibrillator patients, and heart rate variability – in subsets of individuals. ARIES’ provides insight into the relative toxicity of those various pollutants that other studies cannot. The larger the number of observations, the greater the power of a study to identify a small effect. Findings to date, which cover four years of health and air quality data, show statistically significant associations with a number of air pollution parameters, including carbon-containing particulate matter, metals, and criteria gases.^{8,9,10,11} There are no consistent associations with sulfates, which are commonly associated with coal combustion. Thus, ARIES shows that utility emissions have not been found, with reasonable scientific certainty, to cause adverse health effects.

⁵ 71 Fed. Reg. pg. 2634, February 17, 2006

⁶ National Research Council. Research priorities for airborne particulate matter: IV: Continuing research progress. 2004. Washington, DC: National Academy Press.

⁷ U.S. Environmental Protection Agency, Office of Inspector General. "EPA Needs to Direct More Attention, Efforts, and Funding to Enhance Its Speciation Monitoring Program for Measuring Fine Particulate Matter." Report No. 2005-P-00004. February 2005.

⁸ Metzger, K.B., et al. 2004. Ambient air pollution and cardiovascular emergency department visits. *Epidemiology* 15 (1): 43-56.

⁹ Peel, J.L., Tolbert, P.E., Klein, M., Metzger, K., Flanders, W.D., Todd, K., Mulholland, J., Ryan, P.B., and Frumkin, H. 2005. Ambient air pollution and respiratory emergency department visits. *Epidemiology* 16:164-174.

¹⁰ Sinclair, A.H. and Tolsma, D. 2004. Associations and lags between air pollution and acute respiratory visits in an ambulatory care setting: 25-month results from the Aerosol Research and Inhalation Epidemiology Study (ARIES). *J. Air Waste Manage. Assoc.* 54:1212-1218.

¹¹ Klemm, R.J., Lipfert, F.W., Wyzga, R.E., and Gust, C. 2004. Daily mortality and air pollution in Atlanta: two years of data from ARIES. *Inhal Toxicol* 16 (Supp 1):131-141.

Numerous other studies also find no association between sulfates and mortality.^{12,13,14} Additional scientific literature questions the potential health benefits of controlling power plant emissions. For example, Schlesinger & Cassee (2003) note that the current toxicological data base “does not support a role for secondary inorganic aerosols [i.e., sulfates, nitrates, and sulfuric acid aerosol] in adverse health outcomes noted in the epidemiological studies.”¹⁵

Moreover, EPA staff recently noted that “[t]he toxicological data available today provide little basis for concluding that these specific PM constituents (sulfates and acid aerosols) have substantial respiratory effects at current ambient levels of exposure.”¹⁶

As another example of the different opinions of the potential health threats of air pollution, Grahame and Schlesinger¹⁷ (2005) state that “it seems implausible that secondary sulfate would be the cause of adverse health impacts associated with PM_{2.5}, since a large group of people appears to be unaffected by secondary sulfate and other components of regional air masses.” They cite a well-known study – the ACS follow-up study (Pope et al., 2002)¹⁸ – that reports a significant, positive association between increases in annual PM_{2.5} concentrations and mortality endpoints (cardiopulmonary, lung cancer, and all-cause) only for those people with a high school education or less. Grahame and Schlesinger then ask “Why is it, then, that only those people with low socioeconomic status (SES) might be adversely affected by PM_{2.5} levels? People with lower SES are exposed to almost an order of magnitude more traffic near their homes (Reynolds et al., 2001),¹⁹ and live closer to large industrial sites and are exposed to more industrial air pollution (Jerrett et al., 2001).”²⁰

EEl anticipates submitting supplemental comments on this topic for the record.

¹² M. Lippmann, et al., Association of Particulate Matter Components with Daily Mortality and Morbidity in Urban Populations, August 2000. Health Effects Institute Research Report No. 95.

¹³ K. Ito, “Associations of Particulate Matter Components with Daily Mortality and Morbidity in Detroit, Michigan” in Revised Analyses of Time-Series Studies of Air Pollution and Health, May 2003. Health Effects Institute.

¹⁴ Lipfert, et al., “The Washington University –EPRI Veterans Cohort Mortality Study: Preliminary Results,” 12 *Inhalation Toxicology*, Supp. 4, 41-73 (2000).

¹⁵ R.B. Schlesinger & F. Cassee, “Atmospheric Secondary Inorganic Particulate Matter: the Toxicological Perspective as a Basis for Health Effects Risk Assessment,” 15 *Inhalation Toxicology* 197-235 (2003).

¹⁶ EPA, Air Quality Criteria for Particulate Matter 7-69 (June 2004 Draft)

¹⁷ Grahame, T., Schlesinger, R. "Evaluating the health risk from secondary sulfates in eastern North American regional ambient air particulate matter." *Inhalation Toxicology*. 2005 Jan; 17(1):15-27

¹⁸ Pope, C. A., et al. 2002. Lung cancer, cardiopulmonary mortality, and long-term exposure to fine particulate air pollution. *J. Am. Med. Assoc.* 287(9):1132–1141.

¹⁹ Reynolds, P., Elkin, E., Scalf, R., Von Behren, J., and Neutra, R. R. 2001. A case-control pilot study of traffic exposures and early childhood leukemia using a geographic information system. *Bioelectromagnetics Suppl.* 5:S58–S68.

²⁰ Jerrett, M., Burnett, R. T., and Brook, J. R. 2001. AGIS—environmental justice analysis of particulate air pollution in Hamilton, Canada. *Environ. Plan. A* 33:955–973.

Legitimate health concerns must be addressed. But moving ahead with a plan that may not, in fact, address them is in no one's best interest.

Annual Primary Standard for Fine Particles

EPA proposes to revise the form of the annual PM_{2.5} standard to base the standard on the highest community-oriented monitor in an area and to eliminate spatial averaging. EPA seeks comment on lowering the annual primary PM_{2.5} standard of 15 ug/m³.

EEl supports maintaining the annual standard at 15 ug/m³ and maintaining the current provisions for spatial averaging. The science does not support lowering the annual standard. In fact, the evidence that EPA cites of statistically significant associations between long-term PM_{2.5} exposure and premature mortality is limited to a subset of the population with no more than a high school education, raising the likelihood of the reported association with mortality actually being related to some factor other than PM_{2.5}.

Secondary Standard for Fine Particles

A multitude of federal regulatory actions are underway that will provide visibility benefits, including Title IV of the 1990 Clean Air Act Amendments (the Acid Rain Program's SO₂ control program for electric generators), plus new rules to implement the existing PM_{2.5} and 8-hour ozone standards, the 2005 CAIR, the 2005 CAVR finalizing the Best Available Retrofit Technology (BART) guidelines, and the regional haze program requirements. These are more than adequate to protect and improve visibility. EEl does not believe that the need for a revised secondary PM_{2.5} NAAQS has been demonstrated.

WHILE THE SCIENCE IS HIGHLY UNCERTAIN, THE COSTS OF NEW REGULATIONS TO THE PUBLIC ARE REAL

As cited above, EPA's Inspector General has recognized the potential folly of heading down the road to further regulation without adequate guidance as to what should be regulated. In the Office of Inspector General report, it was determined that by 2010 industry would spend \$37 billion annually to reduce ambient PM_{2.5} concentrations, despite the fact that EPA has inadequate PM_{2.5} speciation data to help ensure that reductions are made by the right sources.

The consequences of being classified as "non-attainment" for a National Ambient Air Quality Standard are far-reaching and severe. They go beyond the tens of billions of dollars in costs to industry each year that impact consumers in the form of higher costs for energy and consumer goods. A non-attainment designation discourages new industry from locating within such areas and may prevent existing industries from expanding, both of which have significant impacts on jobs and local economies. The additional requirements imposed on industrial sources within these areas may cause some facilities to shut down and relocate, leading to an erosion of jobs. Lost jobs,

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wages and increased costs for energy and consumer products create an adverse real-world impact that is much more concrete than the uncertain benefits of the proposed standards.

An analysis for the American Petroleum Institute of the impact of the proposed standards, based on 2004-2005 air quality data, finds that 441 counties would fail the proposed 24-hour standard alone. This is about 250 more counties than EPA estimates, because EPA 1) only counts those counties with monitors and does not include the other nearby counties that would be dragged into non-attainment by being in the same Metropolitan Statistical Area, and 2) uses projected air quality data for a later time period with greater air quality improvements than exist during the years upon which actual non-attainment designations will be made. Public health is paramount, but let's be sure we're providing the public with the health benefits they expect before we lower the boom on local economies

CONCLUSION

The science supporting EPA's proposed tightening of the PM_{2.5} standard remains inconsistent and uncertain, while the potential costs to consumers are very real. EPA should allow states to implement the existing standard, which they must meet by 2010, before moving the regulatory goal posts yet again. In the meantime, EPA should follow through on the National Academy of Sciences' recommendation that the agency identify the potentially harmful components of particulate matter to ensure we are tackling the right pollutants.

EI appreciates this opportunity to discuss our views on EPA's proposed particulate matter standards. If you have any questions, please contact me at 202/508-5711 (jkinsman@eei.org) or Steve Lomax at 202/508-5710 (slomax@eei.org)

Sincerely yours,

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