

# Recent EPA Regulatory Actions and Effects on NO<sub>x</sub> Controls

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## Summary

Recent EPA regulatory actions will lead to the installation of additional post-combustion NO<sub>x</sub> controls on coal-fired electric generating units in the United States. This presentation will focus on the Clean Air Interstate Rule (CAIR), and discuss related EPA actions including the Clean Air Visibility Rule (CAVR) and Clean Air Mercury Rule (CAMR).

Air pollution can travel hundreds of miles and cause health and environmental problems on regional or national scales. National Ambient Air Quality Standards (NAAQS) set limits on air pollutants of concern to public health, such as ozone and particulate matter. Attaining the NAAQS will require a combination of emission reductions from local sources and regional sources. The NO<sub>x</sub> SIP Call Budget Trading Program and Acid Rain Program were implemented to address regional ozone and acid rain and have resulted in substantial reductions of nitrogen oxides (NO<sub>x</sub>) and sulfur dioxide (SO<sub>2</sub>) emissions.

NO<sub>x</sub> and SO<sub>2</sub> contribute to formation of fine particles (PM<sub>2.5</sub>) and NO<sub>x</sub> contributes to formation of ozone. PM<sub>2.5</sub> and ozone are associated with thousands of premature deaths and illnesses each year; additionally, these pollutants reduce visibility and damage sensitive ecosystems.

EPA evaluated updated air quality and emissions data since promulgating the NO<sub>x</sub> SIP Call and determined that some areas will still have difficulty meeting the 8-hour ozone NAAQS after full implementation of the NO<sub>x</sub> SIP Call. EPA determined that further NO<sub>x</sub> controls are warranted to ensure continued progress toward attainment.

On March 10, 2005, EPA issued CAIR, which will dramatically reduce air pollution that moves across state boundaries. EPA found that 28 eastern states and the District of Columbia contribute significantly to downwind nonattainment of the NAAQS for PM<sub>2.5</sub> and/or 8-hour ozone. CAIR requires these states to revise their state implementation plans (SIPs) to include control measures to reduce annual emissions of NO<sub>x</sub> and SO<sub>2</sub> for PM<sub>2.5</sub> purposes and/or ozone season emissions of NO<sub>x</sub> for ozone purposes.

The emission reductions required by CAIR will be implemented in two phases. The first phase commences in 2009 for NO<sub>x</sub> and 2010 for SO<sub>2</sub>, the second phase commences in 2015 for both pollutants. The emission reductions are based on declining regionwide emissions caps. CAIR includes model rules for interstate emissions cap-and-trade programs for annual NO<sub>x</sub> and SO<sub>2</sub> emissions and ozone season NO<sub>x</sub> emissions from large electric generating units (EGUs). States can choose to adopt the model rules and require their EGUs to participate in the interstate emissions trading programs to achieve the required reductions in a flexible and cost-effective manner, or can develop state rules to obtain the required reductions using a different mechanism of the state's choosing. These model cap-and-trade programs are based on the successful Acid Rain and NO<sub>x</sub> SIP Call Budget Trading programs.

About two-thirds of CAIR states are covered by the NO<sub>x</sub> SIP Call Budget Trading Program which requires ozone season NO<sub>x</sub> reductions. EPA expects that in the first CAIR phase, much of the NO<sub>x</sub> reductions will be achieved by NO<sub>x</sub> SIP Call units with SCR that will operate the controls year-round instead of during the ozone season only. During the second, more stringent CAIR phase, additional post-combustion NO<sub>x</sub> controls will be installed.

In an action related to CAIR, on June 15, 2005, EPA issued CAVR, which requires emission controls called best available retrofit technology (BART) for certain utility and industrial facilities emitting air pollutants that reduce visibility by causing or contributing to regional haze (including PM<sub>2.5</sub> and compounds that contribute to PM<sub>2.5</sub> formation such as NO<sub>x</sub> and SO<sub>2</sub>). States must determine which facilities need to install BART controls and the type of controls the facilities must use. CAVR includes guidance for states to use in these determinations, and for large EGUs the CAVR guidance recommends specific emissions limits for NO<sub>x</sub> and SO<sub>2</sub>. For NO<sub>x</sub>, the recommendation for units in the NO<sub>x</sub> SIP Call area is to extend use of ozone season controls to year-round, and outside the NO<sub>x</sub> SIP Call area, to use post-combustion NO<sub>x</sub> controls (or a specified

emission rate). BART controls are likely to be installed by late 2013 or early 2014. EPA analysis concluded that CAIR controls are “better than BART” for EGUs in CAIR states; a state that adopts under CAIR the model emissions cap-and-trade programs for NO<sub>x</sub> and SO<sub>2</sub> can choose to apply CAIR controls as a substitute for BART.

In another action related to CAIR, on March 15, 2005, EPA issued CAMR, which will permanently cap and reduce mercury (Hg) emissions from coal-fired power plants nationwide. CAMR establishes performance standards limiting Hg emissions from new and existing coal-fired power plants and creates an Hg emissions cap-and-trade program that will reduce utility emissions of Hg in two phases. The first phase cap is based on co-benefit emission reductions – that is, Hg reductions that will be achieved by installing NO<sub>x</sub> and SO<sub>2</sub> controls for CAIR that also reduce Hg; the second phase subjects coal-fired power plants to a tighter emissions cap. The first CAMR phase commences in 2010 and the second in 2018. CAMR includes a model rule for an interstate Hg emissions cap-and-trade program for large EGUs (similar to the CAIR model rules) that states can choose to adopt to achieve the required reductions. Unlike CAIR (under which states have flexibility in the sources to control) CAMR requires that states control EGUs. New coal-fired power plants also must meet stringent new source performance standards in addition to being subject to the emission caps.

On March 15, 2006, EPA took several additional actions related to CAIR. EPA added Delaware and New Jersey to CAIR for PM<sub>2.5</sub>. The Agency also took final action on reconsideration of certain elements of CAIR as a result of petitions EPA received after promulgating CAIR. Additionally, EPA promulgated federal implementation plans (FIPs) for all CAIR states; the FIPs adopt the CAIR model trading rules and will serve as federal backstops for CAIR until each state has an approved SIP in place. EPA also made minor revisions of the CAIR and acid rain program regulations. And, EPA took final action in response to a petition from North Carolina that asked EPA to establish controls for NO<sub>x</sub> and/or SO<sub>2</sub> emissions in 13 states.

CAIR, CAVR and CAMR together provide a nationwide multi-pollutant strategy that is projected to reduce SO<sub>2</sub> and Hg emissions by more than 70% and NO<sub>x</sub> emissions by more than 60% from 2003 emissions levels. These regulatory actions will help areas attain the PM<sub>2.5</sub> and 8-hour ozone NAAQS, and provide for one of the largest investments in pollution control technology in history.