

COST AND PERFORMANCE MODELS FOR NO_x CONTROL AT COAL-FIRED POWER PLANTS

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Abstract

The U.S. Environmental Protection Agency (EPA) has announced SIP calls that will require significant reductions in NO_x emissions from coal-fired power plants by 2004. Other legislative proposals introduced in the U.S. Congress have called for additional NO_x emission reductions below current levels. The feasibility and cost of achieving such emission reductions is thus a subject of considerable current interest.

The Integrated Environmental Control Model (IECM) developed for DOE/NETL recently has been expanded to include models for a variety of in-furnace retrofit NO_x control options, in addition to the post-combustion option of selective catalytic reduction. These models are based on a review of recent data, and on the results of pilot plant studies and full-scale installations. The IECM plant-level model uses these models to provide performance, emissions and cost estimates for any user-specified power plant design using site-specific plant parameters and fuel characteristics. Also included are a variety of emission control technology options for particulates and sulfur dioxide. A preliminary mercury control module also has been added recently. A key advantage of this analysis framework is that all technologies and processes are modeled on a consistent basis, accounting for interactions between modules or components. The IECM also has the capability to explicitly quantify the uncertainty in calculated results using probabilistic methods.

The proposed paper will present results illustrating the feasibility and cost of achieving different levels of NO_x control for different plant configurations, boiler types and fuel types using the IECM. The technologies of interest include low-NO_x burners, overfire air, natural gas reburn, selective non-catalytic reduction (SNCR), selective catalytic reduction (SCR), and selected combinations of the above. The uncertainty in current estimates of performance and costs also will be illustrated. The IECM is publically available to help utilities, researchers and analysts achieve NO_x reductions in the most cost-effective manner.