



CLEAN AIR RESEARCH PROGRAM

SCIENTISTS DEVELOP AND TEST MULTIPOLLUTANT CONTROL TECHNOLOGIES

Issue:

Historically, the U.S. Environmental Protection Agency's approach to regulating air pollutant emissions has been to target pollutants individually. For example, an industrial source may be subject to separate control requirements for nitrous oxide, sulfur dioxide, and hazardous air pollutant emissions. As a result of these requirements, controls may be implemented and updated by different schedules for each emission component.

These myriad regulations can yield inefficient control strategies. For example, the control technology that is most cost-effective for one particular pollutant may not be cost-effective in the context of other regulated pollutants. Thus, a more integrated, multipollutant regulatory approach may lead to more cost-effective and efficient control strategies.

To this end, EPA is piloting an integrated, multipollutant approach that more comprehensively considers the various types of emissions, technology characteristics, and control options for specific source "sectors" such as cement production or power generation.

Ultimately, a multipollutant approach is expected to lead to more streamlined regulatory requirements that achieve environmental and health goals more cost-effectively than traditional, single-pollutant approaches. Research is needed, however, to support the development of multipollutant regulatory strategies and applications.

Scientific Objective:

EPA's Clean Air Research Program in the Office of Research and Development is developing and testing new technologies and strategies for the

simultaneous control of multiple pollutants. Research efforts are underway and planned to:

- Evaluate the performance and benefits of various control technologies, including scrubbers and sorbents, in removing multiple air pollutants from coal-combustion systems.
- Determine the co-benefit efficiency of existing technologies for the control of other air pollutants.
- Develop modeling tools that will enable air quality managers to consider multipollutant reduction strategies and evaluate the economic and cost implications of various options.
- Determine the performance of novel and existing technologies for multipollutant control that have been developed for application in coal-fired electricity generating units to other industrial sectors (e.g.,

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cement kilns, pulp and paper, etc.)

In addition, EPA is developing computer models that will assist EPA and regulated industries in identifying cost-effective strategies for complying with multipollutant regulations.

Key scientific questions being addressed include:

- What known technologies can be used to reduce multiple pollutants and are reasonably amenable to field application?
- How can existing technologies be modified to provide multipollutant control?
- Are there novel approaches or technologies that can be used to manage multipollutant risks?
- What are the relative costs, performance, and environmental implications of competing multipollutant reduction options?
- What are cost-effective control strategies by which specific industries can comply with multipollutant control requirements?

Application and Impact

EPA's Clean Air Research Program has been a leader in advancing air pollution prevention and control technologies for key industries, utility power plants, waste incinerators, indoor environments and sources of greenhouse gases.

As EPA moves to a sector-based, multipollutant regulatory approach, the expertise in the research program is being tapped to develop new models and tools that can be used by risk assessors and air quality managers to develop more effective strategies to reduce air pollution.

For example, EPA researchers have conducted bench- and pilot-scale work to provide multipollutant capacity to a wet-flue-gas desulfurization (FGD) scrubber used in coal-fired power plants. Through the optimized introduction of an oxidant additive, the scrubber can be used to reduce emissions of nitrogen oxides, mercury, and sulfur dioxides.

EPA researchers have also developed a multipollutant, multi-sector emissions trading model to

analyze and evaluate various air pollution reduction policy options for industrial sectors. An initial effort has focused on the U.S. cement sector. The model enables industries to evaluate their emissions during the various stages of the production process and determine how to keep operating costs down along with associated air emissions. The model is being expanded to include additional sectors, such as pulp and paper as well as iron and steel.

REFERENCES

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CONTACT

Douglas McKinney, EPA's Office of Research and Development, National Risk Management Research Laboratory, 919-541-3006, mckinney.douglas@epa.gov

Nick Hutson, Ph.D., EPA's Office of Research and Development, National Risk Management Research Laboratory, 919-541-2968, hutson.nick@epa.gov

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