

Breakout group 1: NO_x Emissions from Combustion

Co-leads: Russell Dickerson, University of Maryland &
JoAnn Lighty, University of Utah
DFO: Angela Nugent, EPA Science Advisory Board Staff

Invited Workshop Participants in attendance:
Jana Compton, US Environmental Protection Agency
Ellis Cowling, North Carolina State University
Jan Willem Erisman, Energy Research Centre of the Netherlands
Richard Haeuber, US Environmental Protection Agency
John Quinn, Constellation Energy
Richard Poirot, Vermont Agency of Natural Resources
Bob Singleton, National Railway Equipment Company

Members of the public:
Jennifer Phelan, Research Triangle Institute International
Alladio Knipping, EPRI

Charge questions:

1. Are the NO_x inputs identified by the committee sufficiently accurate? If not, what other inputs need to be considered?
2. Are the implied control strategies identified by the committee correct, accurate, and practicable? What are the best control strategies?
3. Are the recommended actions suggested by the committee ones that would be the most effective, without further degradation of the environment?
4. Are there other actions that should be taken to decrease NO_x emissions?
5. Should there be a standard that combines both NO_y and NH_x, instead of the current NO₂ standard?

Discussion:

Members of the breakout group noted that the estimates of reactive nitrogen (Nr) were derived from EPA estimates. The group discussed verifying the estimates of Nr air emissions against analyses developed by EPRI and EPA's Clean Air Markets Division. Rick Haeuber of EPA's Clean Air Markets Division provided two documents for the committee's reference (*Acid Rain and Related Programs, 2006 Progress Report*, EPA-430-R-07-011 and *NO_x Budget Trading Program; 2006 Program Compliance and Environmental Result*' EPA-430-R-07-009).

The group noted the importance of clarifying how the committee's estimates of Nr reductions addressed the emissions of oxides of nitrogen (NO_x) reductions that would have reduced by the Clean Air Interstate Rule (CAIR). If CAIR reductions were not included, the goal of decreasing air emissions by 3.5 teragrams might not be sufficient.

The group discussed the potential of mobile sources to reduce emissions of Nr. Participants noted that heavy-loaded motor vehicles, ship transporters, and off-road vehicles other than trains offer opportunities for reductions. They also emphasized the importance of reinstating the controls previously required by CAIR. They discussed changes in technologies that could reduce Nr emissions: a) ships at dock can access port electrification; b) electric forklifts; c) and electrification of cars and truck stocks. Participants also discussed the importance of fuel efficiency and reductions in vehicle-miles traveled. They briefly discussed fire control and noted that prescribed burns for forest fires would reduce NO_x emissions

In regard to whether EPA should introduce a standard that combines both NO_y and NH_x, instead of the current NO₂ standard, participants noted that current monitoring for NO₂ is of minimal value for monitoring Nr or photochemical smog. they recommended that EPA's current NO₂ monitors should also serve as Nr monitors. Data collected could in the future inform a decision about setting a standard for NO_y, ammonium, and ammonia.