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Executive Summary

The NO_x Budget Trading Program (NBP) is a market-based cap and trade program created to reduce emissions of nitrogen oxides (NO_x) from power plants and other large combustion sources in the eastern United States. NO_x is a prime ingredient in the formation of ground-level ozone (smog), a pervasive air pollution problem in many areas of the eastern United States. The NBP was designed to reduce NO_x emissions during the warm summer months, referred to as the ozone season, when ground-level ozone concentrations are highest. This report evaluates progress under the NBP in 2005 by examining emission reductions, comparing changes in emissions to changes in ozone concentrations, and reviewing compliance results and market activity.

2005 Key Results

- **The NBP has successfully reduced ozone season NO_x emissions throughout the region. In 2005, NBP ozone season NO_x emissions were:**
 - 11 percent lower than in 2004 even as power generation increased by 7 percent (primarily due to moving up the seasonal compliance period for 11 Midwestern and Southern states to May 1);
 - 57 percent lower than in 2000 (before implementation of the NBP); and
 - 72 percent lower than in 1990 (before implementation of the Clean Air Act Amendments).
- **Ground-level ozone has improved since the implementation of the NBP.**
 - Ozone formation depends greatly on weather conditions, which can vary significantly from year to year. To get a truer picture of how emission changes impact ozone formation, EPA adjusts ozone concentrations to account for the influences of weather.
 - Average ozone levels in the NBP region have decreased by about 8 percent since 2002. Ground level ozone has improved since the NBP began in 2003.
- There is a strong association between areas with the greatest reductions in NO_x emissions and nearby downwind sites exhibiting the greatest improvements in ozone.
- In 2004, EPA officially designated 103 areas in the eastern United States as 8-hour ozone “nonattainment areas”. These areas were required to improve their ozone air quality with the goal of attaining and maintaining the national air quality standards for ground-level ozone. Based on 2003 to 2005 air monitoring data, ozone air quality improved in all of these areas. Nearly 70 percent of them (68 areas) now have air quality that is better than the level of the standard. The NBP is the major contributor to these improvements.
- **Through a wide range of pollution control strategies and an active NO_x allowance market in 2005, sources achieved over 99 percent compliance with the NBP.**
 - There were 2,570 units affected under the NBP in 2005. Only three NBP sources (four units total) did not hold sufficient allowances.
 - Overall, trading activity increased from 2004 to 2005 with an active market, and allowance prices were slightly lower and somewhat less volatile than in 2004.
 - The flexibility of the NBP provides sources options to reduce NO_x emissions, such as adding NO_x emission control technologies, replacing existing controls with more advanced technologies, or optimizing existing controls.
- **The Clean Air Interstate Rule (CAIR), issued in March 2005, will continue the progress demonstrated by the NBP. CAIR extends this successful cap and trade program to control both ozone and fine particles in 28 eastern states and the District of Columbia.**

Introduction

For more than three decades, the U.S. Environmental Protection Agency (EPA) has worked with state, local, and tribal representatives to reduce emissions that contribute to the formation of ground-level ozone. This pollutant contributes to a number of serious health and ecological effects.

Early ozone management policies focused on reducing ozone by reducing emissions of one of its two key precursors, volatile organic compounds (VOCs). VOCs contribute to ground-level ozone formation by reacting with nitrogen oxides (NO_x) in the presence of sunlight and heat.

Ozone levels have decreased substantially, by 20 percent, since 1980 (www.epa.gov/ozone.html). The downward trend began to slow in the early 1990s. About that time, emerging science indicated that NO_x controls, in addition to VOC controls, might reduce ozone levels more effectively across large regions of the United States.

EPA responded by developing programs to reduce NO_x emissions, including the NO_x State Implementation Plan (SIP) Call in 1998, designed to reduce the regional transport of ozone and ozone-forming pollutants in the eastern half of the United States. All 19 affected states and the District of Columbia chose to meet mandatory NO_x SIP Call reductions through participation in the NO_x Budget Trading Program (NBP), a market-based cap and trade program for electric generating and large industrial units.

The 2004 NBP report, Evaluating Ozone Control Programs in the Eastern United States: Focus on the NO_x Budget Trading Program, concluded that emissions from affected sources decreased by about 50 percent since 2000, before the NBP was implemented. In addition, the report showed that reductions in ozone concentrations in most of the eastern United States more than doubled after implementation of the NBP, beginning in 2003. This 2005 NBP report builds on the previous analyses by assessing continued progress under the program. The report:

- Describes ozone formation, its health and environmental effects, and provides background on the NBP.
- Evaluates the effectiveness of the NBP in 2005 by reviewing emission reductions and corresponding changes in ozone concentrations.
- Examines progress and compliance under the NBP, including market activity, allowance banking and progressive flow control, and compliance options employed by sources under the program.
- Outlines the additional NO_x reductions and ozone improvements expected under CAIR and how it will affect NBP states.