Executive Summary

The U.S. Department of Energy (USDOE), in partnership with the U.S. Environmental Protection Agency (USEPA), selected Illinois for a pilot initiative, the Air-Energy Integration Initiative, to demonstrate how state energy and environment officials can work together on policies that improve air quality while addressing energy goals. Under this initiative, energy officials from the Illinois Department of Commerce and Economic Opportunity (DCEO) and environment officials from the Illinois Environmental Protection Agency (IEPA) collaborated to examine the air emissions reductions associated with the Illinois Sustainable Energy Plan proposed by Governor Blagojevich in February 2005. The project not only sought to demonstrate collaborative and innovative approaches to using energy efficiency and renewable energy (EERE) technologies to reduce or prevent air emissions, but also to quantify the avoided emissions and provide replicable tools, models and strategies that other states can implement.

Because of the regional nature of the electrical grid, to analyze the impact of Illinois energy policies the study modeled the economic dispatch of a large portion of the Eastern Interconnect power grid, including most of PJM and the Midwest ISO, and other neighboring control areas. The analysis showed that the Illinois Sustainable Energy Plan will produce significant and measurable environmental benefits:

- The Illinois Sustainable Energy Plan will reduce emissions of nitrogen oxides (NOx), sulfur dioxide (SO_2), mercury (Hg), carbon dioxide (CO_2) and other pollutants in Illinois and in numerous other states.

- Less than half of the emissions reductions would occur in Illinois, since many of the marginal plants that would be displaced by energy efficiency and renewable energy technologies in Illinois are located outside of the state.

- More than half of the generation displaced out-of-state, however, is located upwind of Illinois (Iowa, Missouri, Wisconsin), thus contributing toward improved air quality in Illinois.

- Although less than half of the emissions reductions would occur in Illinois, the reductions are still significant. Total Illinois power plant emissions of CO_2 would be reduced by 4.32%, SO_2 emissions would be reduced by 2.87%, NOx emissions would be reduced by 2.11% and Hg emissions would be reduced by 0.71%.

- While the emissions reductions are less in the five-month ozone season than in the rest of the year, the Illinois Sustainable Energy Plan would produce some ozone season benefits and contribute in a modest way towards ozone attainment both in Illinois and across the eastern U.S.

- Coal, which generally yields the highest emissions rates for NOx, SO_2, Hg and CO_2, is the primary fuel displaced, along with some oil and natural gas used in plants serving peak load. Natural gas generation in Illinois, however, increases slightly to address local transmission congestion and short-term changes in availability of wind.

Projected Reductions in Emissions in Fossil Fuel-Fired Plants within the Study Area Due to Energy Plan Implementation, 2007 – 2013*

Area	SO_2 (tons)	NOx (tons)	Hg (lbs)	CO_2 (tons)
Illinois	51,020	4,909	238	16,155,650
Seven State Area**	51,670	7,334	354	18,821,400
Remainder of Study Area	53,062	5,704	168	8,695,001
Total	**155,753**	**17,946**	**760**	**43,672,051**

* Emissions reductions from Illinois' Clean Air Interstate Rule and Illinois' Mercury Rule have been deducted to avoid double counting of emissions benefits
** Includes Iowa, Indiana, Kentucky, Michigan, Missouri, Ohio and Wisconsin

The Illinois Air-Energy Integration Initiative serves as a model for other states in the Midwest and across the country:

- Working cooperatively, energy agencies and environmental agencies can more effectively achieve state energy and environmental goals.

- Energy policies, such as the Renewable Portfolio Standard and Energy Efficiency Portfolio Standard proposed in the Illinois Sustainable Energy Plan, can help states improve air quality and reduce overall environmental compliance costs.

- Other states and regions could employ the dispatch modeling approach used in this study to ensure that the full benefits of energy efficiency and renewable energy measures are understood and to justify claiming credit in their air quality plans for improvements to air quality both within the state and regionally.

- The study found that only by using a regional model of the electrical grid could the impact on air quality be accurately assessed. A simpler state-level analysis would overestimate the in-state benefits but at the same time underestimate the regional air quality benefits.