

Cycle 5 – Energy Research Grants

The Shadow Price of CO₂ Emissions for Nebraska Electricity Generating Plants

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ABSTRACT:

Federal regulation of greenhouse gas (GHG) emissions in the United States appears to be imminent. Under any of the legislative or regulatory alternatives currently being considered, power plants would have to pay, directly or indirectly, a price for their GHG discharges. This fact is particularly relevant for Nebraska plants, as most of them rely heavily on fossil fuels for power generation. Although this is widely recognized, there is little quantitative appreciation of the potential cost that Nebraska fossil fueled power plants would have to bear to reduce their GHG emissions. This project seeks to estimate those costs.

To accomplish this, measures of technical and economic efficiency for each power plant will be obtained and the sources of difference in performance across plants will be determined. Using this information, the implicit or shadow price of their GHG emissions -- measured by the difference in costs between a plant with minimal GHG emissions and each of the other plants in the study -- will be calculated. The resulting information is critical if these plants are to take cost-effective actions to reduce their greenhouse gas emissions, such as efficiency upgrades, investment in end-use energy efficiency or investment in renewable energy sources. This information should be quite valuable for power plants' business planning processes. The study will also provide a valuable guide on where efficiency improvements are viable and a comparison with estimates for plants in the rest of the United States.