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CLEAN AIR ACT

Emerging Mercury Control Technologies Have Shown Promising Results, but Data on Long-Term Performance Are Limited

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Highlights

Highlights of GAO-05-612, a report to congressional requesters

Why GAO Did This Study

In March 2005, the Environmental Protection Agency (EPA) issued a rule that will limit emissions of mercury—a toxic element that causes neurological problems—from coal-fired power plants, the nation's largest industrial source of mercury emissions. Under the rule, mercury emissions are to be reduced from a baseline of 48 tons per year to 38 tons in 2010 and to 15 tons in 2018.

In the rule, EPA set the emissions target for 2010 based on the level of reductions achievable with technologies for controlling other pollutants—which also capture some mercury—because it believed emerging mercury controls had not been adequately demonstrated. EPA and the Department of Energy (DOE) coordinate research on mercury controls. In this context, GAO was asked to (1) describe the use, availability, and effectiveness of technologies to reduce mercury emissions at power plants; and (2) identify the factors that influence the cost of these technologies and report on available cost estimates. In completing our review, GAO did not independently test mercury controls. GAO provided the draft report to DOE and EPA for comment. DOE said that it generally agreed with our findings. EPA provided technical comments, which we incorporated as appropriate.

www.gao.gov/cgi-bin/getrpt?GAO-05-612.

To view the full product, including the scope and methodology, click on the link above. For more information, contact John Stephenson at (202) 512-3841 or stephensonj@gao.gov.

What GAO Found

Mercury controls have not been permanently installed at power plants because, prior to the March 2005 mercury rule, federal law had not required this industry to control mercury emissions; however, some technologies are available for purchase and have shown promising results in field tests. Overall, the most extensive tests have been conducted on technologies using sorbents—substances that bind to mercury when injected into a plant's exhaust. Tests of sorbents lasting from several hours to several months have yielded average mercury emission reductions of 30-95 percent, with results varying depending on the type of coal used and other factors, according to DOE and other stakeholders we surveyed. Further, the most recent tests have shown that the effectiveness of sorbents in removing mercury has improved over time. Nonetheless, long-term test data are limited because most tests at power plants during normal operations have lasted less than 3 months.

The cost of mercury controls largely depends on several site-specific factors, such as the ability of existing air pollution controls to remove mercury. As a result, the available cost estimates vary widely. Based on modeling and data from a limited number of field tests, EPA and DOE have developed preliminary cost estimates for mercury control technologies, focusing on sorbents. For example, DOE estimated that using sorbent injection to achieve a 70-percent reduction in mercury emissions would cost a medium-sized power plant $984,000 in capital costs and $3.4 million in annual operating and maintenance costs. If this plant did not have an existing fabric filter and chose to install one—an option a plant might pursue to increase the efficiency of mercury removal and reduce related costs—capital costs would increase to about $28.3 million, while annual operating and maintenance costs would decrease to about $2.6 million. Most stakeholders generally expect costs to decrease as a market develops for the control technologies and as plants gain more experience using them. Furthermore, EPA officials said that recent tests of chemically enhanced sorbents lead the agency to believe that its earlier cost estimates likely overstated the actual cost power plants would incur.

Coal-Fired Power Plant

Source: U.S. Department of Energy.