

PROJECT facts

Environmental and
Water Resources

11/2006

U.S. DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY
NATIONAL ENERGY TECHNOLOGY LABORATORY



LONG-TERM DEMONSTRATION OF SORBENT ENHANCEMENT ADDITIVE TECHNOLOGY FOR MERCURY CONTROL

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Background

The 2005 Clean Air Mercury Rule will require significant reductions in mercury emissions from coal-fired power plants. The combustion of subbituminous coals typically results in higher fractions of elemental mercury emissions than the combustion of bituminous coals. This complicates mercury capture efforts, particularly for technologies using powdered activated carbon (PAC) injection, because elemental mercury is not readily captured by PAC injection alone. In short, unmodified PACs are better suited for bituminous coals than for subbituminous coals.

Various proprietary sorbent enhancement additives (SEA) have been developed to increase the mercury reactivity of PACs, and perhaps fly ash as well, leading to greater mercury capture.

Primary Project Goal

The goal of the project is to determine the ability of SEAs – alone (to increase adsorption by fly ash) or in combination with PACs – to achieve greater than 90 percent mercury removal from coal combustion flue gases.



Kansas City Power & Light's Hawthorn Plant



PARTNERS

University of North Dakota
Energy and Environmental
Research Center
Grand Forks, ND

Babcock & Wilcox Company
Barberton, OH

PERIOD OF PERFORMANCE

05/31/2006 to 08/30/2008

COST

Total Project Value
\$2,969,202

DOE/Non-DOE Share
\$2,217,652 / \$751,550

ADDRESS

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Objectives

- Perform field testing of several SEAs and PACs at coal-fired power plants burning a subbituminous Powder River Basin coal and an eastern bituminous coal.
- Conduct baseline mercury emission tests followed by parametric tests to determine whether the SEAs and PACs, alone or in combination, can achieve greater than 90 percent mercury removal.
- Conduct longer-term tests to determine whether greater than 90 percent mercury removal can be maintained for at least three months at each power plant.

Accomplishments

This recently awarded project is still in the initial planning stages.

Benefits

Sorbent enhancement additives will enable coal-fired power plants, especially those burning subbituminous coals, to achieve greater than 90 percent mercury removal, thereby assuring compliance with federal and state mercury legislation and reducing potentially harmful atmospheric mercury emissions. The technologies and practices developed in this project will facilitate cost-effective mercury reduction across a broad range of power plants.

Planned Activities

- Field, parametric, and long-term testing of two sorbent enhancement additives (SEA1 and SEA2-T2) at Kansas City Power & Light's Hawthorn Unit 5, which burns subbituminous Powder River Basin Coal.
- Data collection, analysis and reduction from the Hawthorn Plant.
- Field, parametric, and long-term testing of the sorbent enhancement additive SEA2-T2 at Louisville Gas & Electric Company's Mill Creek Unit 4, which burns bituminous coal.
- Data collection, analysis, and reduction from the Mill Creek Plant.