

ANNUAL PROJECT REPORT  
AS OF DECEMBER 2001

1. PROJECT SPONSOR:

FirstEnergy Corp.  
76 South Main Street  
Akron, OH 44308

2. PROJECT MANAGER:

Mike Horvath  
Manager Environmental Projects

PHONE:- (330) 384-5964  
EMAIL: [horvath@firstenergycorp.com](mailto:horvath@firstenergycorp.com)

3. OCDO GRANT NO. CDO/D-99-1

4. PROJECT UPDATE, X OR  
FINAL REPORT

5. PROJECT TITLE: Electro Catalytic Oxidation Technolo2v Demonstration Project

6. PROJECT TERM: FROM: 6/01/2000

TO: 2/15/04

7. BUDGET:

<u>CO-SPONSORS NAME</u>	<u>COST -SHARE</u>
<u>OCDO</u>	<u>\$ 3.5mm</u>
<u>FirstEnergy Corp</u>	<u>\$ \$3.4mm</u>
<u>Powerspan Corp</u>	<u>\$ \$5.0mm</u>

**TOTAL PROJECT COST: \$ 11.9mm**

## I. ABSTRACT

### 8. OVERVIEW OF PROJECT & OBJECTNES:

First Energy and Powerspan Corp are sponsoring a project to build a 50 MW commercial demonstration plant of an innovative technology that simultaneously removes nitrogen oxides (NOx), sulfur dioxide (SO<sub>2</sub>), fine particulate matter (PM) and mercury (Hg) from the exhaust gas of coal fired plants. The technology, developed by Powerspan Corp, is called Electro-Catalytic Oxidation™ (ECO). The project was nearly through its Engineering and Procurement phases in 2001, and had actually commenced construction, when Powerspan made a major advance in development of the ECO process substituting ammonia scrubbing in place of its acid scrubbing system. The ECO II process grew out of the effort and problem solving done for ECO I planned for the Eastlake Power Plant.

The second-generation process repeatedly achieves removal of greater than 90% NOx and 95% SO<sub>2</sub> (70% and 50%, respectively in the original ECO process), while maintaining the high removal rates of Powerspan's original ECO process for Hg and PM<sub>2.5</sub>. By incorporating an alternative to the acid scrubbing used in ECO I. ECO II has higher overall scrubbing efficiencies, a reduction in required reactor power, use of standard scrubbing vessel designs, and increased flexibility in materials of construction. Importantly, the efficiency of the second-generation ECO process is not affected by high SO<sub>2</sub> levels and, therefore, the process is more suitable for cleaning flue gas streams from high sulfur coal to meet increasingly stringent environmental regulations.

The work completed during 2001 included:

- Substantial completion of engineering design work for ECO I.
- Generation of Process Flow Diagram, Piping and Instrumentation Diagrams and General Arrangement Drawings for ECO I.
- Substantial procurement of equipment for ECO I (much of which is expected to be used in ECO II).
- Construction groundbreaking.

While the primary objective of the project remains to demonstrate this multi-pollutant technology at a commercial scale and at a capital and operating cost substantially below alternative emission reduction technologies, it is clear that ECO II is a significant improvement upon ECO I. FirstEnergy and Powerspan will discuss with OCDO the opportunity to close out the ECO I project and redirect our efforts on ECO II to be located at the R.E. Burger Power Plant.

### 9. WORK DONE AND CONCLUSIONS:

As noted above, substantial work had been completed on the 50 MW CDU prior to the process advances noted above, including nearly all engineering design work, significant amounts of procurement activity, and construction groundbreaking.

FirstEnergy and Powerspan believe that the ECO I project should be closed out and material and knowledge gained applied to a new project (ECO II) at the R.E. Burger Power Plant.

10. PLANS FOR COMING YEAR:

To be discussed with Ohio Coal Development Office in the immediate future.

## II. HIGHLIGHTS/ACCOMPLISHMENTS

11. Highlights include completion of engineering design work on ECO I, Procurement of ECO I equipment, construction groundbreaking and problem solving associated with the engineering challenges which have led to the development of ECO n as an improved version of the ECO technology.

Additionally, on November 30, 2001 FirstEnergy announced that it had reached an agreement to sell the Eastlake Plant to NRG Energy, Inc., a Minnesota based energy company. FirstEnergy also announced that it would continue to support ECO development by agreeing to construct the 50-megawatt ECO TM Commercial Demonstration Unit at their R.E. Burger Plant in Southeastern Ohio. This is the same location where Powerspan successfully tested the ECO technology and continues to operate a 2-megawatt pilot unit.

## III. ARTICLES/PRESENTATIONS

12. Powerspan will be presenting an update on ECO at Electric Power 2002.