PROJECT facts

DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY

ADVANCED power SYSTEMS

# LSR TECHNOLOGIES—DEVELOPING A CORE SEPARATOR FOR SUPERIOR PARTICULATE AIR TOXICS CONTROL

## PRIMARY PROJECT PARTNER

**LSR Technologies, Inc.**
Acton, MA

## MAIN SITE

**LSR Technologies, Inc.**
Acton, MA

## TOTAL ESTIMATED COST

**$2,329,800**

## COST SHARING

| | |
|---|---|
| **DOE** | **$1,615,500** |
| **Non-DOE** | **$714,300** |

## Project Description

Harmful substances listed in the Clean Air Act Amendments of 1990 include the group of hazardous air pollutants (HAPs) associated with fine particles. By finding ways to remove these fine particles from combustion products, coal-fired power plants can substantially reduce the emission of hazardous pollutants.

In partnership with the U.S. Department of Energy and a group of research institutes, engineering companies, and utilities, Massachusetts-based LSR Technologies is developing a highly innovative particulate-control technology called the Electrostatically Enhanced Core Separator (EECS). An EECS feasibility study supported by the Electric Power Research Institute has demonstrated that the system has high potential for being a breakthrough technology.

The EECS scale-up development program involves testing both laboratory and field prototypes. At the culmination of the project, the EECS team will field-demonstrate an EECS unit rated at 6 megawatts. Southern Research Institute will perform field testing to evaluate the removal of particulates and key HAPs, and Sargent & Lundy, a leading engineering consultant, will complete an economic assessment for a utility-size EECS unit.

## Program Goal

Tighter environmental standards to take effect in the year 2000 will require U.S. coal-based power plants to be much cleaner and more efficient than today's technology allows. DOE's goal is to develop by 2010 power systems that are at least 10 times cleaner, and at least 50% more efficient, than current coal-burning plants. DOE's Advanced Power Systems program also seeks to accelerate the commercialization of highly efficient, affordable technologies that support the use of coal—by far the Nation's most abundant energy resource—as a reliable energy source.

By delivering the most cost-effective particulate control available for a majority of performance specifications, LSR's Electrostatically Enhanced Core Separator supports the goal of the Advanced Power Systems program.

## Project Partners

**SOUTHERN COMPANY SERVICES, INC.**
Birmingham, AL
(demonstration site and cofunding)

**SOUTHERN RESEARCH INSTITUTE**
Birmingham, AL
(field testing)

**SARGENT & LUNDY ENGINEERS**
Chicago, IL
(economic assessment)

**ELECTRIC POWER RESEARCH INSTITUTE**
Palo Alto, CA
(advising, consulting, and cofunding)

# LSR Technologies—Developing a Core Separator for Superior Particulate Air Toxics Control

## CONTACT POINTS

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## Project Benefits

Developing a highly efficient particulate air toxics control system is of vital importance to coal-based power producers, who will have to comply with increasingly stringent air-quality standards over the next few years. The ideal particulate air toxics control system would be superior to other control devices, including conventional electrostatic precipitators (ESPs), in both performance and cost. It should also be able to collect effectively either wet or dry particles.

The Electrostatically Enhanced Core Separator (EECS) shows evidence of achieving all of these goals:

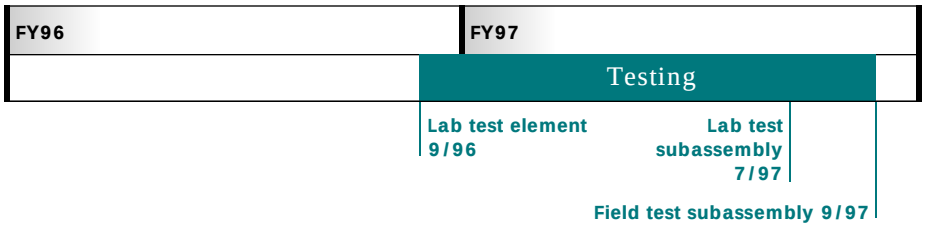
- Unlike ESPs, the tested laboratory-scale EECS is practically insensitive to the electrical properties of dust particles. Therefore, the EECS can be used to control a much broader range of dust emissions than can ESPs.
- The EECS system virtually eliminates dust reentrainment. (Dust reentrainment is the single largest failing of conventional ESPs.)
- The specific collection-area requirements for the EECS are reduced by more than an order of magnitude from conventional systems. Smaller collection areas mean that EECS systems can be built smaller, and at lower cost, than ESPs. (Alternatively, an EECS system will do a far more effective job of controlling air toxics than an ESP system of identical size.)
- Based on an economic analysis performed by Sargent & Lundy Engineers, the EECS is the most cost-effective particulate-control device for most performance specifications.

## Cost Profile (Dollars In Thousands)

| | Prior Investment | FY95 | FY96 | FY97 | Future Funds |
|---|---|---|---|---|---|
| Department of Energy * | — | $162 | $162 | $162 | $1,129.5 |
| Private Sector Partners | — | $48.9 | $48.9 | $48.9 | $567.6 |

* Appropriated Funding

## Key Milestones

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