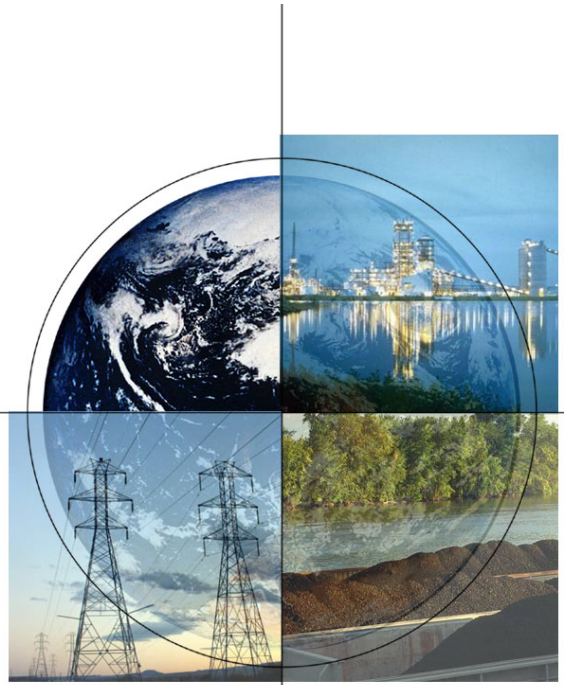
# Innovations for Existing Plants Program



## DOE/NSF EPSCoR Conference 2005

**June 14-16, 2005**

**Morgantown, WV**

**Thomas J. Feeley, III, Technology Manager**
**National Energy Technology Laboratory**

# IEP Goals and Objectives

- **Enhance environmental performance of existing fleet of coal power plants and advanced power systems**
- **Objectives**
  - Develop low-cost, integrated technology to control emissions/releases (air, water, and solids) to the environment
  - Provide high-quality scientific and technical information on environmental issues for use in regulatory and policy decision making

***Directly supports President's Clear Skies Initiative and other environmental regulations***

# IEP Environmental Drivers

- Mercury (CAMR)
- PM2.5 and ozone (CAIR)
- NOx
- Coal byproducts use and disposal
- Water availability and quality impacts
- Air-water interface
- Acid gas emissions

# IEP R&D Components

- **Air**
  - Cost effective control technology for Hg, NOx, fine particulates, and acid gases
  - Ambient air quality monitoring
  - Atmospheric chemistry and transport
- **Water**
  - Power plant water management (availability and quality)
- **Byproducts**
  - Environmental characterization and re-use applications

# Current IEP R&D Focus

- Field testing of mercury control technologies
- Bench- and pilot-scale development and testing of advanced combustion control NOx technologies
- Characterization of fate of mercury and other trace metals in coal utilization byproducts
- Bench- and pilot-scale development and testing of innovative water management technologies and concepts

# IEP Scientific Challenges

- **Mercury**
  - Improved understanding of capture of Hg on sorbents (e.g., activated carbon) and across wet scrubbing systems
    - Fundamental chemistry and model development
- **NOx**
  - Non-ammonia reagents for SCR systems
  - Non-$SO_2$ oxidation/high-Hg oxidation catalysts

# IEP Scientific Challenges

- **Coal Utilization Byproducts**
  - Fundamental understanding of bound between Hg and other trace elements and fly ash/sorbent surfaces
  - Fate of Hg in synthetic gypsum from wet scrubbing systems

- **Water**
  - Advanced heat-transfer materials for dry cooling systems
  - Improved technologies for detection and treatment of trace elements

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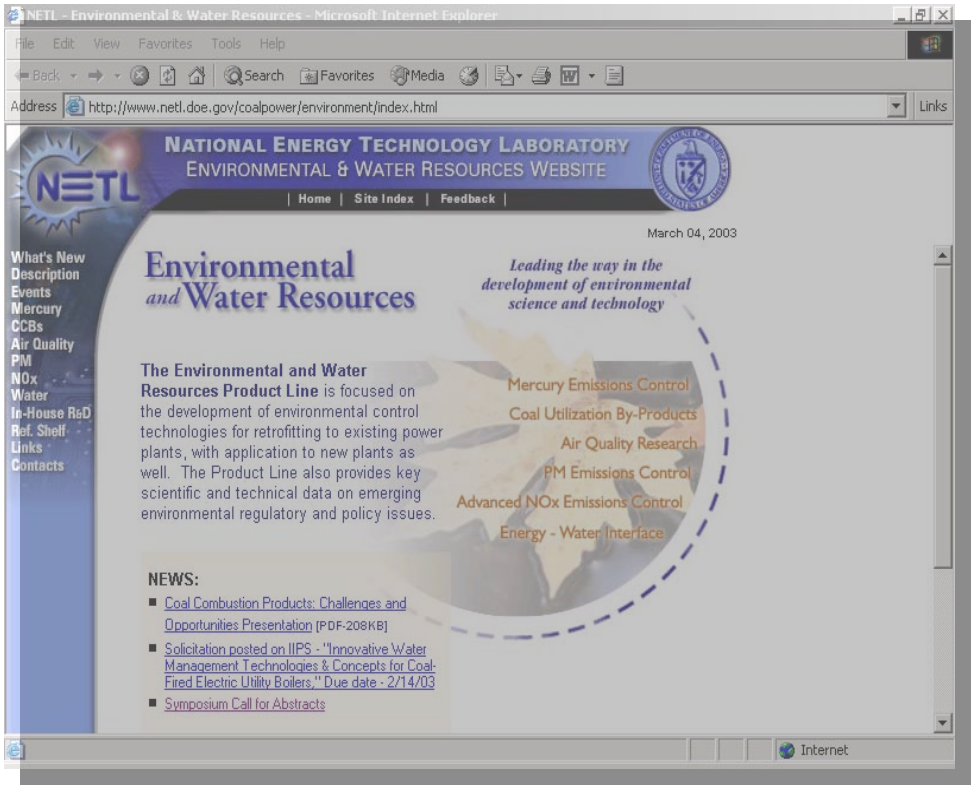


*To find out more about DOE-NETL's environmental control technology R&D activities visit us at:*

***www.netl.doe.gov/coal/E&WR***