Discover the Power

Illinois Coal Research Program

ILLCI

ILLINOIS CLEAN COAL INSTITUTE

Energy Research for a Cleaner Environment

Illinois Coal Research Program

ILLINOIS COAL

Discover the Power
Governor Rod Blagojevich

Department of Commerce and Economic Opportunity
  Director: Jack Lavin

Office of Coal Development
  Chief: Bill Hoback

Illinois Clean Coal Institute
  Director: Ronald H. Carty
Office of Coal Development Programs

- Coal Education Program
- Coal Revival Program (New Generation)
- Coal Competitiveness Program (20% cost-share)
- Coal Demonstration Program (50% cost-share)
- Coal Research and Development Program (ICCI)
The ICCI, under the direction of DCEO/OCD, will promote the development and application of new and/or improved technologies that contribute to the economic and environmentally sound use of Illinois coal.
Funded R&D Projects

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<th>Year</th>
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Active Program Areas

- Advanced Coal Mining Technologies.
- Coal Preparation and Coal Production Business Practices.
- Coal Combustion and Gasification Systems.
  - Coal Combustion
  - Flue Gas Cleaning
  - Coal Gasification
- Coal Residuals Management.
- Coal Bed Methane.
- Carbon Dioxide Sequestration.
Advanced Coal-Mining Technologies

- **Respirable Dust Control**
  - Coal wetability and surfactant efficiency tests
  - Lab and field tests of a two-filter scrubber

- **Reduction of Mining Costs**
  - Developed mine simulation package
  - Industrial engineering studies on battery-powered shuttle car
  - Plans for a battery-powered surge car
  - Reducing Out-of-seam Dilution through modeling and training

- **Productivity Training Program**
  - Industrial engineering and sensitivity analysis
  - Mine specific training at 7 mines

- **Aeromagnetic/Seismic Surveys**
  - Dike detection technologies
Coal Preparation and Coal Production Business Practices

- **New Fine Coal Cleaning Circuit**
  - Motorless-Rotorless flotation cells
  - ISGS washer to replace skimmer paddles
  - Intelligent filter press

- **Fine Coal Processing Equipment**
  - Pansep screening technology
  - G cell processing technology
  - Steel belt filter dewatering technology

- **Optimize Cleaning Systems**
  - Applying genetic algorithms
  - Developing and applying enhanced coal quality simulation

- **Dry Separation Technology**
  - Testing FGX dry separation technology on Illinois coal
Coal Combustion/Gasification

- **Oxygen Combustion**
  - NO\textsubscript{x}, SO\textsubscript{x} and flue gas reductions & enhanced CO\textsubscript{2} capture

- **HyMelt Gasification Process**
  - Site selection in East St. Louis
  - Large-scale experimental testing in Sweden

- **Zero Emission Gasification**
  - Thermodynamic simulation
  - Experimental studies in a High Pressure Thermogravimetric Analyzer

- **Membrane Reactor for Direct Hydrogen Production**
  - Test membranes to use in a coal gasifier for selective removal of H\textsubscript{2}

- **Sulfur Sorbents**
  - Optimize sorbent composition & study sorbent regenerability

- **SCR Catalysts for Mercury Control**
  - Effects of chlorine and sulfur on mercury speciation
  - PRB versus Illinois coal comparison
Coal Residuals Management

- **Fired Bricks with Fly Ash**
  - Test runs on display at Museum of Science and Industry in Chicago
  - Commercialization efforts ongoing

- **Autoclaved Aerated Concrete (AAC) with Fly Ash**
  - Developing building codes that include AAC

- **Ceramic Tiles with Fly Ash**
  - Optimizing mix composition
  - Demonstration runs with commercial type equipment

- **Wall Board with FGD material**
  - Developing light-weight, paperless wall board

- **High-Carbon Fly Ash & Coal Prep Waste in Cement Manufacturing**
  - Large-scale commercial demonstrations

- **Underground Placement of CCB’s**
Coal Bed Methane
CO₂ Sequestration

Viability of CBM Production in Illinois
- Analyze gas flow properties and sorption isotherms of Illinois coal
- Analyze volumetric strain due to CBM production and CO₂ sequestration

Geological Carbon Sequestration Properties
- Test hole drilling and studies
- Enhanced CBM, oil and gas recovery

Ventilation Air Methane
- Mine ventilation surveys
- VAM oxidization equipment