



# ***ILLINOIS CLEAN COAL INSTITUTE***

*Energy Research for a Cleaner  
Environment*

## **Illinois Coal Program**

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**ILLINOIS  
COAL**

*Discover the Power*

[www.icci.org](http://www.icci.org)

**Governor Rod Blagojevich**

**Department of Commerce and Economic Opportunity**

**Director: Jack Lavin**

**Office of Coal Development**

**Chief: Bill Hoback**

**Illinois Clean Coal  
Institute**

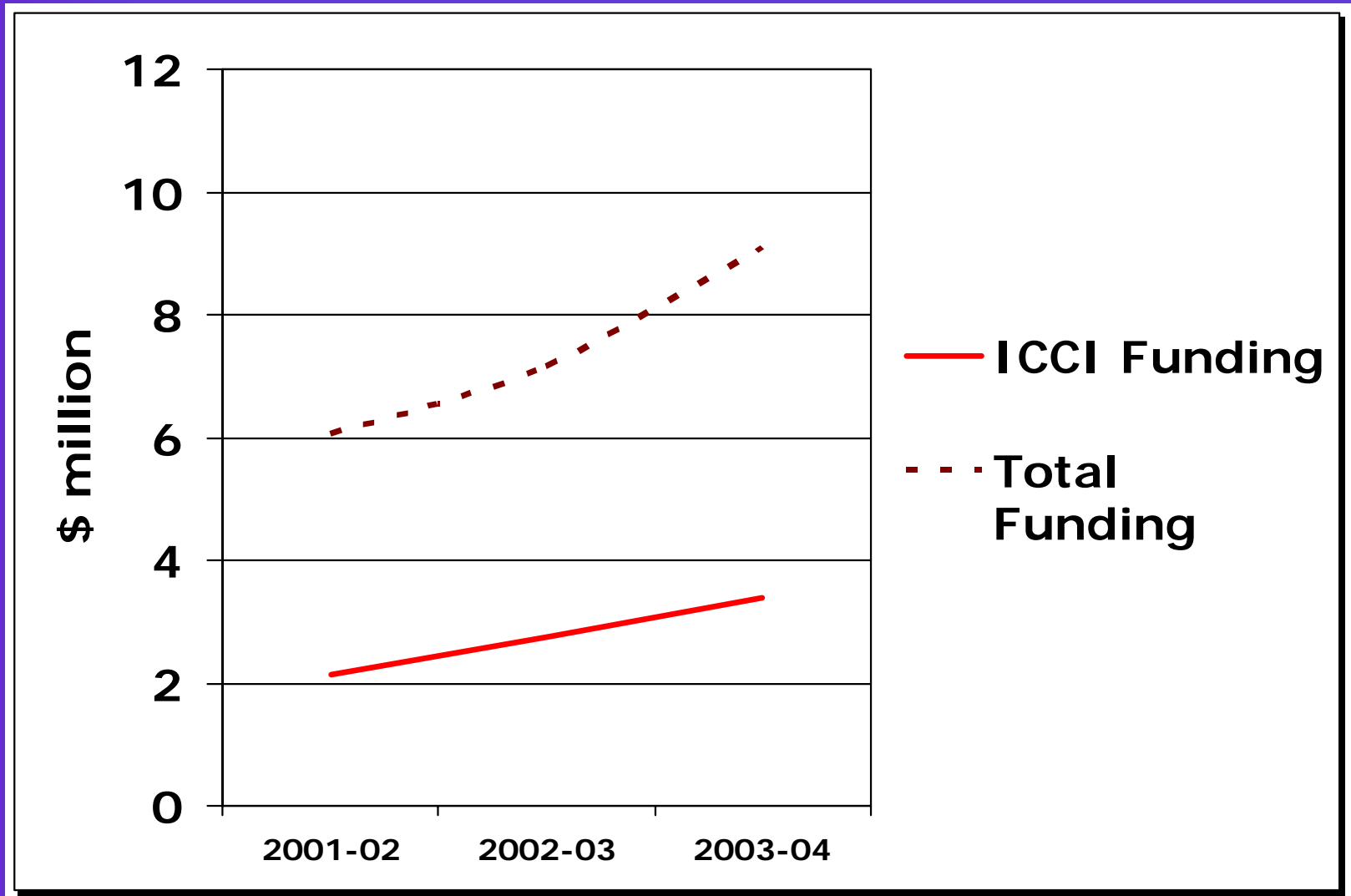
**Director: Ronald H. Carty**

# Office of Coal Development Programs

- Coal Research and Development Program (ICCI)
- Coal Competitiveness Program
- Coal Demonstration Program
- Coal Revival Program
- Coal Education Program



## Funded R&D Projects



# Currently 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 – Chugh, SIUC**
  - Coal watability and surfactant efficiency tests
  - Lab and field tests of two filter scrubber
- **Reduction of Mining Costs – Chugh, SIUC**
  - Developed mine simulation package
  - Industrial engineering studies on a new battery-powered shuttle car
  - Plans for a battery-powered surge car
  - Reducing Out-of-seam Dilution (OSD) through modeling and training
- **Productivity Training Program – Kroeger, SIUC**
  - Industrial engineering and sensitivity analysis
  - Mine specific training at 7 mines
- **Aeromagnetic/Seismic Surveys – Silverman, Peabody**
  - Dike detection technologies

# Coal Preparation and Coal Production Business Practices

- **New Fine Coal Cleaning Circuit – Khan, ISGS**
  - Motorless-Rotorless flotation cells
  - ISGS washer to replace skimmer paddles
  - Intelligent filter press
- **Fine Coal Processing Equipment – Mohanty, SIUC**
  - Pansep screening technology
  - G cell processing technology
  - Steel belt filter dewatering technology
- **Optimize Cleaning Systems – Mahajan/Chugh, SIUC**
  - Applying genetic algorithms
  - Developing and applying enhanced coal quality simulation
- **Dry Separation Technology – Villines, S Coal**
  - Testing FGX dry separation technology on Illinois coal

# Coal Combustion/Gasification

- **Oxygen Combustion – Marin, Air-Liquide**
  - NO<sub>x</sub>, SO<sub>x</sub> and flue gas reductions
  - Enhanced CO<sub>2</sub> capture
- **HyMelt Gasification Process – Renner, EnviRes**
  - Site selection in East St. Louis
  - Large-scale experimental testing in Sweden
- **Zero Emission Gasification – Lau, GTI**
  - Thermodynamic simulation
  - Experimental studies in a High Pressure Thermogravimetric Analyzer (HPTGA) unit
- **Sulfur Sorbents – Slimane, GTI**
  - Optimize sorbent composition
  - Study sorbent regenerability
- **SCR Catalysts for Mercury Control – Srivastava, US EPA**
  - Effects of chlorine and sulfur on mercury speciation
  - PRB versus Illinois coal comparison

# Coal Residuals Management

- **Fired Bricks with Fly Ash – M. Chou, ISGS**
  - Test runs on display at Museum of Science and Industry in Chicago
  - Commercialization efforts ongoing
- **Autoclaved Aerated Concrete (AAC) with Fly Ash – J. Chou, ISGS**
  - Developing building codes that include AAC
  - Production test runs at a commercial plant
- **Ceramic Tiles with Fly Ash – Mishulovich, CTL**
  - Optimizing mix composition
  - Demonstration runs with commercial type equipment
- **Wall Board with FGD material – Malhotra, SIUC**
  - Developing light-weight, paperless wall board
  - Testing wall board properties
- **High-Carbon Fly Ash & Coal Prep Waste in Cement Manufacturing – Bhatti, CTL**
  - Large-scale commercial demonstrations
- **Underground Placement of CCB's – Chugh, SIUC**

# Coal Bed Methane CO<sub>2</sub> Sequestration

- **Viability of CBM Production in Illinois – Harpalani, SIUC**
  - Analyze gas flow properties and sorption isotherms of Illinois coal
  - Analyze volumetric strain due to CBM production and CO<sub>2</sub> sequestration
- **Geological Carbon Sequestration Properties – Finley, I SGS**
  - Test hole drilling and studies
  - Enhanced CBM, oil and gas recovery
- **Ventilation Air Methane – Harpalani, SIUC**
  - Mine ventilation surveys
  - VAM oxidization equipment