

PURDUE'S ENERGY CENTER AT DISCOVERY PARK is a multidisciplinary academic community that includes faculty from the colleges/schools of Science, Engineering, Technology, Liberal Arts, Management, Consumer and Family Sciences, and Agriculture. The Energy Center comprises nine key research areas: Bioenergy, Clean Coal Energy, Global Partnerships, Hybrid Vehicle Systems, Hydrogen, Nuclear Energy, SEPAE (Social, Economic, and Political Aspects of Energy Use and Policy), Solar Energy, and Wind Energy.

The Energy Center explores ways to increase utilization of the nation's coal resources in a manner that produces near-zero emissions and promotes acceptable environmental standards. Clean Coal Initiative researchers perform a variety of experiments at the Coal Transformation Laboratory. One of the initiative's major research areas is the production and commercialization of transportation fuels from coal using Fisher-Tropsch technology.

CLEAN COAL RESEARCH

John Abraham, College of Engineering—*Mechanical Engineering*

Mahdi Abu-Omar, College of Science—*Chemistry*

Rakesh Agrawal, College of Engineering—*Chemical Engineering*

Bill Anderson, College of Engineering—*Aeronautics and Astronautics Engineering*

Kathy Banks, College of Engineering—*Civil Engineering*

Brian Bowen, Center for Coal Technology Research (CCTR)

Nicholas Delgass, College of Engineering—*Chemical Engineering*

Joseph Francisco, College of Science—*Chemistry*

Steve Heister, College of Engineering—*Aeronautics and Astronautics Engineering*

Hugh Hillhouse, College of Engineering—*Chemical Engineering*

Marty Irwin, Center for Coal Technology Research (CCTR)

Hikka Kenttamaa, College of Science—*Chemistry*

Robert Kramer, Purdue Calumet

Sivakumar Krishnan, College of Engineering—*Mechanical Engineering—IUPUI*

Robert Lucht, College of Engineering—*Mechanical Engineering*

Paul Preckel, College of Agriculture—*Agricultural Economics*

Li Qiao, College of Engineering—*Aeronautics and Astronautics Engineering*

Fabio Ribeiro, College of Engineering—*Chemical Engineering*

Robin Ridgway, Radiological and Environmental Management

Steven Son, College of Engineering—*Mechanical Engineering*

F.T. Sparrow, Professor Emeritus

Arvind Varma, College of Engineering—*Chemical Engineering*

Wallace Tyner, College of Agriculture—*Agricultural Economics*

Yuan Zheng, College of Engineering—*Mechanical Engineering*

PROJECTS

Pyrolysis/Gasification/Fischer-Tropsch Technologies

Energy Center Researchers are pursuing four broad research areas related to clean, responsible use of abundant coal resources

- Gasification, Process Design, Implementation
- Environment and Health Issues
- Usage, Engines and Turbines
- Economics and Policy

Coal Gasification (Kramer)

- Using Indiana coal will increase supply and decrease transportation costs for companies within the state.
- Pyrolysis, Fischer-Tropsch, and other value streams from coal gas including hydrogen and fertilizer production.

Oxy-fuel Combustion (Son, Qiao)

- This technology reduces emissions more quickly and competitively.
- Fundamental combustion characteristics of oxy-fuel combustion such as ignition, flame propagation, emission, etc.

This process bridges the time span until new coal-burning technologies with near-zero emissions develop.

H2CAR™ Process (Hillhouse, Agrawal, Delgass, Ribeiro, et al.)

- H2CAR™ process uses coal or biomass as the feedstock which creates liquid fuel.
- This process releases no additional CO₂ into the atmosphere during the chemical processing system.
- There is no need to sequester CO₂ when using coal.

Advanced Sensors (Lucht)

- A diode-laser-based ultraviolet absorption sensor has been developed and applied for in-situ measurements of elemental mercury in coal exhaust streams (funded by DOE/NETL).

COLLABORATION WITH THE STATE OF INDIANA

The Energy Center hosts Indiana's Center for Coal Technology Research (CCTR), which is funded through the Indiana Office of Energy and Defense Development (OEDD).

- CCTR addresses the vital issue of determining suitable coal technologies which will meet the economic and environmental priorities of Indiana.
- CCTR is funding projects to investigate the benefits from Clean Coal Technologies (CCT) and IGCC (Integrated Gasification Combined Cycle) plants which will burn Indiana coal and provide near-zero emissions power plants.
- Contact Marty Irwin, CCTR director, for more information (765) 494-7414.

CONTACT

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ENERGY CENTER

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