

# Forty-First Annual International Pittsburgh Energy and Carbon Management Conference (PECMC) (Virtual)

**October 07-09, 2024**

## Call-for-Papers

**Abstracts Deadline: August 31, 2024**

**“Technology Innovation and Transition to Cleaner Energy”**

## Participating Organizations

*Ajou University, SOUTH KOREA  
Commonwealth Scientific and Industrial  
Research Organisation (CSIRO),  
AUSTRALIA  
CONSOL Energy Inc., USA  
Freiberg University of Mining &  
Technology, GERMANY  
Gas Technology Institute (GTI), USA  
Hamilton Maurer International, USA  
HTI, USA  
Institute for Chemical Processing of Coal,  
POLAND  
Istanbul Technical University, TURKEY  
KeyLogic Systems, Inc., USA  
Longbridge Energy Consulting, USA  
MIE University, JAPAN*

*National Institute of Clean and Low-  
Carbon Energy (NICE), CHINA  
Osaka University, JAPAN  
Penn State University, USA  
Sotacarbo S.p.A., ITALY  
Southern University of Science and  
Technology, CHINA  
The Ohio State University, USA  
U.S. DOE/NETL, USA  
U.S. Geological Survey, USA  
University of Kentucky, USA  
University of New Orleans, USA  
University of Pittsburgh, USA  
University of Wyoming, USA  
West Virginia University, USA*



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University of  
**Pittsburgh**

# Call for Papers

## 41<sup>st</sup> Annual International Pittsburgh Energy and Carbon Management Conference (PECMC)

The Conference will be held **virtually October 07-09, 2024.**

The Conference was founded in the early 1970s to address global shortages of energy. This year, we are switching gears to focus on the benefits of using clean energy and carbon management technologies to minimize the effects of climate change. Our faithful conference attendees, who have been successful in developing and using a fossil fuel-based economy over the years, are now focusing on mitigating the global temperature rise impacted by mankind's reliance upon fossil fuels and the resultant greenhouse gas emissions. For example, the Conference is dealing with both the energy and non-energy uses of fossil fuels in conjunction with carbon management to meet the ambitious Net Zero emissions scenario by the year 2050. In this pathway, in addition to the main pillars of decarbonization, including energy efficiency & conservation, renewables, nuclear, low-emissions fuels, and carbon capture & storage technologies, there are cross-cutting enablers, such as innovation, international collaboration, and digitalization, which could accelerate progress by strengthening policy or providing more effective technological solutions. (For more background information on the world's energy system including energy supply & transportation, uses of energy, and managing demand & emissions, visit the International Energy Agency website <https://www.iea.org/energy-system>.)

**Conference Theme:** "Technology innovation and transition to cleaner energy" surrounding the continued utilization of primary energy resources coupled with carbon management to better enable and transition to the future clean energy market.

### Abstracts Submission

Abstracts of potential papers may be submitted in all program topics. The abstract must include sufficient and adequate information for evaluation by the Technical Program Committee of the conference.

An abstract template is available here:  
<https://www.engineering.pitt.edu/subsites/conferences/pcc/pittsburgh-coal-conference/conference/2023-conference/abstract-template/>

Please submit an abstract by email to [ipcc@pitt.edu](mailto:ipcc@pitt.edu).  
**The deadline is August 31, 2024.**

### Note to Authors

The PECMC does not provide any financial support to contributing authors. Benefits from participation include the privilege of presenting papers at the conference and publication of the papers in the Conference Proceedings for worldwide distribution.

Conference Website: <http://www.pccpitt.org>

**Please contact the Conference Coordinator with any questions.**

### Conference Proceedings

The proceedings of the PECMC-2024 will be published online after the conference.

For a paper to be included in the conference proceedings, a paid registration of the presenter must be received and a complete manuscript in English, must be sent by email to the conference office prior to the conference date.

Proceedings of the previous International Pittsburgh Coal conferences are available and can be purchased online:

<https://www.engineering.pitt.edu/subsites/conferences/pcc/pittsburgh-coal-conference/Proceedings/orderform/>

### Oral Presentations & Posters

All presentations will take place online via Zoom.

Oral Presentations: Each author is allowed 20 minutes including a 5-minute Q&A period.

Presenter Instructions are available here:  
<https://www.engineering.pitt.edu/subsites/conferences/pcc/pittsburgh-coal-conference/conference/presenter-instructions/>

Conference Coordinator, Rebecca Bauroth

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Please call us and you may leave a voice message. We will return your call ASAP.

# Program Topics

## 1. Gasification Technologies

- Industrial Applications, Economics and Environmental Issues
- Underground Coal Gasification (UCG)
- Syngas to Power (Gas Turbines, Fuel Cells)
- Gasification Science and Modeling/Systems Analysis
- Synthesis gas clean up, Novel Gasification Technologies and Concepts
- Co-Gasification of Coal, biomass, wastes and other Carbon-Based Fuels
- Polygeneration

## 2. Clean Demonstration and Commercial Projects

- Existing and planned clean coal major demonstrations (process and technology demonstrations)
- Existing and planned clean coal commercial projects (fully integrated systems) and trends
- Industrial-scale and utility-scale carbon capture and carbon storage projects
- Energy storage demonstrations Commercially available technology reviews/updates
- Financing, business and risk management strategies for major demonstration and commercial projects
- Regulatory impacts on major demonstration and commercial projects
- Insurance strategies for CO<sub>2</sub> capture and geologic storage

## 3. Combustion Technologies

- Industrial applications and environmental Issues
- Flue gas clean up and ash chemistry
- Modeling and economic evaluation
- Combustion technology advancements (Pulverized Coal, Fluidized Beds, Co-Firing, etc.)
- Novel Combustion and Cycle Technologies (Oxyfuel, Chemical looping, CO<sub>2</sub> Cycles, etc.)
- Basic studies, materials, and instrumentation

## 4. Clean Coal and Gas to Fuels

- Coal-To-Liquids fuels, CTL (Direct Liquefaction, Fischer-Tropsch, MTG, DME, etc.)
- Gas-To-Liquid, GTL
- Substitute Natural Gas (SNG)
- Syngas to chemicals/materials

## 5. Carbon Management

- Pre-combustion capture
- Post-combustion capture
- Direct Air Capture (DAC)
- CO<sub>2</sub> Storage (Monitoring, Mitigation and Verification; Storage: Depleted Oil/Gas Reservoirs, Aquifers, Basalt, Coal Bed Methane)
- Transportation infrastructure issues
- Legal and regulatory issues
- Carbon dioxide Utilization (to chemicals/fuels)

## 6. Value-Added Products from Coal

- Nano-carbons
- Fibers
- Composites
- 3D Printing
- Additive Manufacturing
- Electrodes
- Capacitors
- Construction Materials
- Concretes
- Thermal Insulators
- Activated Carbons
- Tars, Cokes and Pitches
- Chemicals
- Covetics and other carbon alloys

## 7. Energy Storage

- Chemical (Hydrogen, Ammonia, Methanol)
- Thermal (Thermochemical, Sensible, Latent)
- Mechanical (Compressed Air, Pumped Hydro)
- Electrochemical (Batteries: Flow, Li-ion, Lead Acid)
- Other (Geothermal)

## 8. Clean Hydrogen

- Production
- Transportation
- Storage
- Utilization

## 9. Coal Bed Methane and Shale Gas

- Geology
- Exploration
- Resources and reserves
- Drilling and production
- Completion methods
- Gas quality and processing
- Abating methane emissions from gas and coal production
- Economics and outlook

# Program Topics (continued)

## 10. Power Plants

- Thermodynamic and economic analysis
- Boiler technology and design
- Steam turbine technology Heat Recovery Steam Generator (HRSG)
- Condenser design and operation
- Cooling tower design and improvements
- Water treatments
- Post combustion gas cleaning
- IGCC integration and components Oxy-fuel combustion plants
- Organic Rankine Cycle (ORC)
- Combined Heating and Power (CHP)
- Power plants operation and maintenance experiences
- Any other or innovative new cycles

## 11. Critical Minerals and Rare Earth Elements (REE) in Fossil Fuel Derived Solids and Liquids

- Critical minerals and rare earth elements in coal and petroleum fuels
- Critical mineral and rare earth element chemistry in power systems
- Mining waste
- Fly ash and slag
- Separation methods
- Rare earth geochemistry
- Measurement and characterization: challenges and solutions
- Modeling
- Mining and recovery methods in industry
- Status of supply and trade
- Emerging issues

## 12. Coal Ash Management

- Ash pond reclamation
- Extension of landfills over ash ponds
- Long-term recovery of materials from ash ponds
- Secondary uses of closed ash ponds
- Coal Combustion Residuals (CCRs) landfill management
- Beneficial uses of CCRs
- Critical mineral and rare earth element extraction from CCRs

## 13. Coal Science

- Chemistry
- Geoscience/coal resources
- Trace elements/emission
- Coal processing
- Coal utilization
- Coal utilization by-products (Ash, Fertilizers, etc.)

## 14. Renewables and Energy Efficiency

- Wind power
- Solar Energy
- Hydropower
- Biofuels
- Geothermal
- Energy efficiency and conservation
- Hybrids of renewable & fossil energy

## 15. Coal Mining, Preparation, and Handling

- Coal seam and coal mine methane/gas management in coal mines
- Geological issues related to coal mining/properties of coal-measure, rocks/ground behavior
- Coal mining and reclamation
- Mine safety

## 16. Sustainability and Environment

- Energy production and water use –conservation and recycle
- Life Cycle Analysis (LCA) or Energy Production Systems (EPS)
- Energy production and the environment
- Energy sustainability – efficiency and conversation to reduce GHG