



Thirty-Ninth Annual
INTERNATIONAL PITTSBURGH
COAL CONFERENCE

University of Pittsburgh · Swanson School of Engineering

Virtual

FINAL TECHNICAL PROGRAM

Clean Coal-based Energy/Fuels
and the Environment

September 19-22, 2022

Hosted by:



University of
Pittsburgh

WELCOME!

On behalf of the Conference Advisory Board, Conference Committees, and the University of Pittsburgh, we welcome you to the Thirty-ninth Annual International Pittsburgh Coal Conference, which will be held September 19-22, 2022 Online via Zoom due to COVID-19. The Conference is hosted by the University of Pittsburgh, USA.

The theme of this year's conference "Clean Coal-based Energy/Fuels and the Environment" covers wide spectrum of important topics on energy and environmental issues and technologies, which are directly related to extraction and utilization of coal and its byproducts. This year's Technical Program includes two parallel oral tracks on Tuesday (09-20-2022), two parallel oral tracks on Wednesday (09-21-2022) and two parallel oral tracks on Thursday (09-22-2022). All tracks begin at 8:05 and end at 16:25 each day. The Exhibits will be held September 22, 2022, from 10:15 to 11:35. Detailed information about the technical sessions are available in page 7 of the Technical Program.

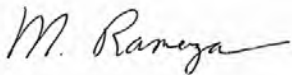
This year's invited Plenary Speakers are: (1) Dr. Jennifer Wilcox: Principal Deputy Assistant Secretary for Fossil Energy; (2) Dr. Brian Anderson: Director, National Energy Technology Laboratory (NETL) - Department of Energy, USA; (3) Mr. Michael J. Nasi, Partner, Environmental & Legislative Practice Group (USA); (4) Mr. Daniel P. Connell, Senior Vice President – Strategy, CONSOL Energy Inc. (USA); (5) Mr. John Wimer, R&D Pathways for Achieving Net-Zero Carbon Energy Systems, National Energy Technology Laboratory (NETL) - Department of Energy, USA; and (6) Mr. Don Stevenson, Vice President, Energy Supply & Conversion at Gas Technology Institute (GTI), (USA).

We express our sincere gratitude to the Plenary Speakers and Moderators for their support and involvement, to all the authors and co-authors of the technical papers and to all the members of the Technical Program Committee. Special thanks go to the topic coordinators, co-chairs and speakers for their invaluable contributions to the 2022 technical program.

As the chair of the Advisory Board of the Conference, I deeply appreciate your participation and interest in this year's Conference and we invite you to join us next year for the Fortieth Annual International Pittsburgh Coal Conference, hopefully in-person.

Sincerely,

Massood Ramezan, Chair



Senior Program Director, Key Logic Systems, USA

The International Pittsburgh Coal Conference

EXECUTIVE DIRECTOR:

Dr. Badie I. Morsi

CONFERENCE OFFICE:

University of Pittsburgh, Swanson School of Engineering
Pittsburgh Coal Conference

3700 O'Hara Street, 940 Benedum Hall, Pittsburgh, PA 15261 USA
Tel: +1-412-624-7440 Email: ipcc@pitt.edu www.pccpitt.org

CONFERENCE OVERVIEW

MONDAY, SEPTEMBER 19, 2022

OPENING REMARKS	08:50 - 9:00
PLENARY SESSION I	09:00 - 10:45
LUNCH	09:45 - 12:00
PLENARY SESSION II	12:00 - 13:45

TUESDAY, SEPTEMBER 20, 2022

CONCURRENT TECH. SESSIONS	08:05 - 09:45
BREAK	09:45 - 09:55
CONCURRENT TECH. SESSIONS	09:55 - 11:35
LUNCH	11:35 - 12:35
CONCURRENT TECH. SESSIONS	12:35 - 14:15
BREAK	14:15 - 14:25
CONCURRENT TECH. SESSIONS	14:25 - 16:05

WEDNESDAY, SEPTEMBER 21, 2022

CONCURRENT TECH. SESSIONS	08:05 - 09:45
BREAK	09:45 - 09:55
CONCURRENT TECH. SESSIONS	09:55 - 11:35
LUNCH	11:35 - 12:35
CONCURRENT TECH. SESSIONS	12:35 - 14:15
BREAK	14:15 - 14:25
CONCURRENT TECH. SESSIONS	14:25 - 16:05

THURSDAY, SEPTEMBER 22, 2022

CONCURRENT TECH. SESSIONS	08:05 - 09:45
BREAK	09:45 - 09:55
CONCURRENT TECH. SESSIONS	09:55 - 11:35
LUNCH	11:35 - 12:35
CONCURRENT TECH. SESSIONS	12:35 - 14:15

Virtual
Exhibit:



U.S. DEPARTMENT OF
ENERGY



NATIONAL
ENERGY
TECHNOLOGY
LABORATORY

Track 1 on Thursday (09-22-2022)	
Exhibit	
10:15 - 11:35	<p style="color: red; font-weight: bold;">“Doing Business With NETL”</p> <p>Thomas Sarkus, Sr. Managerial & Technical Advisor Science & Technology Strategic Plans & Programs</p>

Times listed are Eastern Daylight Savings Time USA (Local Pittsburgh, PA, USA)

CONFERENCE OVERVIEW

MONDAY, SEPTEMBER 19, 2022

08:50-09:00 OPENING REMARKS (Prof. Badie Morsi)

PLENARY SESSION I

9:00-10:45

Moderators: Dr. Massood Ramezan and Prof. Richard Bajura

9:00 - 9:30 - **Dr. Brian Anderson**

Director, National Energy Technology Laboratory, (NETL) - Department of Energy, USA

" Integrated Carbon Management Solutions to Enable the Transformation to a Net-Zero Energy Future"

9:30 - 10:00 - **Mr. John Wimer**

Deputy Director, Science & Technology, DOE-NETL (USA)

"R&D Pathways for Achieving Net-Zero Carbon Energy Systems"

10:00 – 10:30 - **Mr. Michael Nasi**

Partner, Environmental & Legislative Practice Group (USA)

"GLOBAL ENERGY REALITY CHECK: The Essential Role of Carbon Capture, Utilization & Storage (CCUS) Given that Energy Deprivation is Neither a Moral nor Practical Climate Strategy"

PLENARY SESSION II

12:00 - 13:45

Moderators: Mr. Thomas Sarkus and Mr. Richard Winschel

12:00 - 12:30 - **Dr. Jennifer Wilcox**

Fossil Energy and Carbon Management, DOE (USA)

"The Role of Carbon Capture in Meeting Net-Zero Carbon Goals"

12:30-13:00 - **Mr. Daniel Connell**

Senior Vice President – Strategy CONSOL Energy Inc. (USA)

"Sustainability Driven by Innovation"

13:00 -13:30 - **Mr. Don Stevenson**

Vice President, Energy Supply & Conversion GTI Energy (USA)

"The Role for Coal Gasification in the Global Energy Transition"

Times listed are Eastern Daylight Savings Time USA (Local Pittsburgh, PA, USA)

Virtual Conference FAQ's

All participants are expected to conduct themselves in a professional and respectful manner during the conference and abide by all applicable University policies and procedures. While this conference is a public discussion, participants may not record any session.

How do I join a session?

Conference staff will email the Zoom meeting details to all paid conference attendees the day before the conference. It is recommended that you test Zoom before the conference.

How do I ask a question during a session?

To submit a question to the speaker, type it into the Zoom chat box. The session co-chair will read questions from the chat to the speaker.

I am giving an oral presentation, what do I need to do during my session?

Please sign in to the Zoom session 10-15 minutes before your scheduled presentation time. At the start of your scheduled presentation time the session co-chair will announce your presentation and conference staff will play your pre-recorded video presentation. Following the video there will be 5 minutes of live question and answer. The session co-chair will read you any questions submitted in the chat by session attendees. Audio is required (video is optional).

I am giving a poster presentation, what do I need to do during my session?

At the start of your scheduled presentation time the session co-chair will announce your poster and conference staff will display your poster for 20 minutes. After all posters in your session have been displayed, there will a combined question and answer session for all posters in that session. Please sign in to the Zoom session 10-15 minutes before your scheduled Q&A time. The session co-chair will read to you any questions submitted in the chat by session attendees. Audio is required (video is optional).

Oral Presentation Sessions

	(Day - 1) - Tuesday (09/20/2022)		(Day - 2) - Wednesday (09/21/2022)		(Day - 3) - Thursday (09/22/2022)	
	Track 1	Track 2	Track 1	Track 2	Track 1	Track 2
8:00 - 8:05	Opening Session		Opening Session		Opening Session	
8:05 - 8:25	Gasification Technologies - 1 (Session 1)	Coal Science - 1 (Session 2)	Carbon Management - 1 (Session 9)	Value-Added Products from Coal - 1 (Session 10)	Combustion Technologies - 1 (Session 17)	Clean Coal and Gas to Fuels (Session 18a)
8:25 - 8:45						
8:45 - 9:05						
9:05 - 9:25						
9:25 - 9:45						
9:45 - 9:55	Break					
9:55 - 10:15	Gasification Technologies - 2 (Session 3)	Coal Science - 2 (Session 4)	Carbon Management - 2 (Session 11)	Value-Added Products from Coal - 2 (Session 12)	Combustion Technologies - 2 (Session 19)	Sustainability and the Environment - 1 (Session 20a)
10:15 - 10:35					NETL EXHIBIT	
10:35 - 10:55						Coal Mining, Preparation and Handling (Session 20b)
10:55 - 11:15						
11:15 - 11:35	Lunch					
11:35 - 12:35	Gasification Technologies - 3 (Session 5a)	Coal Science - 3 (Session 6a)	Carbon Management - 3 (Session 13)	Value-Added Products from Coal - 3 (Session 14)	Power Plants - 1 (Session 21)	Energy Storage (Session 22)
12:35 - 12:55		Clean Coal Demonstration and Commercial Projects - 1 (Session 6b)				
12:55 - 13:15						
13:15 - 13:35						
13:35 - 13:55						
13:55 - 14:15						
14:15 - 14:25	Break					
14:25 - 14:45	Gasification Technologies - 4 Session (7a)	Clean Coal Demonstration and Commercial Projects - 2 (Session 8)	Carbon Management - 4 (Session 15a)	Rare Earth Elements (Session 16)	Power Plants - 2 (Session 23)	
14:45 - 15:05	Coal Bed Methane and Shale Gas (Session 7b)		Coal Ash Management (Session 15b)			
15:05 - 15:25						
15:25 - 15:45						
15:45 - 16:05						
16:05 - 16:25						

Times listed are Eastern Daylight Savings Time USA (Local Pittsburgh, PA, USA)

TECHNICAL PROGRAM—ORAL PRESENTATIONS

ORAL SESSIONS

Tuesday, September 20

08:00—16:05

SESSION 1

GASIFICATION TECHNOLOGIES—1

Francis Lau and Gary Stiegel

8:05 Performance Testing of a Moving-Bed Gasifier Using Coal, Biomass, and Waste Plastic Blends to Generate White Hydrogen, George Booras, and Rolf E. Maurer, and David P. Thimsen, Hamilton Maurer International, Inc., Hudson, IL, USA, and Alberto Pettinau and Simone Meloni, Sotacarbo-Società Tecnologie Avanzate Low Carbon S.p.A., Carbonia, ITALY.

8:25 Study on the mineral transformation and catalytic mechanism of petroleum coke gasification based on ash addition, Congming Yu, Dunxi Yu, Huazhong University of Science and Technology, Wuhan, CHINA

8:45 Rule of heat and mass transfer during the pyrolysis process of organic solid waste particles, Yuan Mengli, Song Yuncai, Feng Jie, Key Laboratory of Coal Science and Technology, Taiyuan University of Technology, Taiyuan, CHINA

9:05 Effect of pyrolysis conditions on physiochemical properties of petroleum coke and its subsequent gasification reactivity, Mo Cai, Dunxi Yu, Huazhong University of Science and Technology, Wuhan, CHINA

9:25 Effect of microwave dehydration and upgrading on lignite thermal conversion characteristics, Lichao Ge, Han Jiang, Tianhong Zhou, Dongyang Li, Jie Tang, Jingwen Miao, College of Energy and Electrical Engineering, Hohai University, Nanjing, CHINA

SESSION 2

COAL SCIENCE—1

Leslie Ruppert and Brian Shaffer

8:05 Analysis of high temperature behavior of crystal components in ash of Vietnam coal using XRD and TEM, Hung Nguyen, Masahiro Katou, Yu Tsuchimori, Tadanori Hashimoto, Masakatsu Nomura, and Atsushi Ishihara, Mie University, Tsu City, Mie pref, JAPAN.

8:25 Effect of microwave irradiation on spontaneous combustion and high temperature combustion characteristics of Shenmu bituminous coal, Siyi Peng, Lele Feng, School of Safety Engineering, China

University of Mining and Technology, Xuzhou, CHINA

8:45 Research on the surface composition and interfacial structural model of macerals, Erqing Deng, Shiyong Zhao, Xi'an University of Science and Technology, Xi'an, Shaanxi Province, CHINA, and Yihong Li, Shaanxi Coal Industry Chemical New Energy Co., Ltd, Shaanxi Province, CHINA

9:05 New Method to Estimate Kinetic Parameters in Distributed Activation Energy Model (DAEM) by Using Neural Network, Shinji Wakimoto, Yoshiya Matsukawa, Yui Numazawa, Yohsuke Matsushita, Hideyuki Aoki, Department of Chemical Engineering, Tohoku University, Japan

9:25 Hydrodynamics modelling of the spray drying process within a laboratory-scale, semi-dry FGD scrubber, Letsabisa Lerotholi, Raymond C. Everson, Burgert B. Hattingh, Hein W.J.P. Neomagus, North-West University, Potchefstroom, SOUTH AFRICA, Ignus Le Roux, Aerotherm, Block B, Deus Exorno, Bondev Park, Eldoraigane, Centurion, SOUTH AFRICA, Lawrence Koech and Hillary L. Rutto, Vaal University of Technology, Vanderbijlpark Campus, Private, Vanderbijlpark, SOUTH AFRICA, and Preya Sukdeo, Group Technology Engineering, Eskom Holdings SOC Ltd, Sunninghill, SOUTH AFRICA

SESSION 3

GASIFICATION TECHNOLOGIES—2

Francis Lau and Gary Stiegel

9:55 Evaluation of the conditioning effect of an RO-plant saline solution on the resistivity of South African fly ash, Dheneshree Lalla, Burgert B. Hattingh, Gregory Okolo, Hein W.J.P. Neomagus, North-West University, SOUTH AFRICA, and Pieter Swart, Howden Holdings (Pty) Ltd, Johannesburg, SOUTH AFRICA and Ebrahim Patel, Eskom Holdings SOC Ltd, Sunninghill 2191, SOUTH AFRICA.

10:15 Gasification: A Viable Choice for Production of Clean Hydrogen, Dave Lyons, U.S. DOE, National Energy Technology Laboratory, Morgantown, WV, USA

10:35 OVERVIEW OF doe/FECM R&D for clean hydrogen production, Jai-woh Kim, Dave Lyons, DOE, USA

10:55 A Novel Two Stage Gasification Reactor for Generating H₂-Rich High Calorific Value Gas by Low Grade Coals, Shirish Kumar Sharma, Anand M Shivapuji, S.Dasappa, Indian Institute of Science, Bangalore, INDIA

11:15 Rheology and Phase Behavior of Coal-Plastic-Biomass Mixtures for Entrained Flow Gasification, Logan Hughey, and Kevin

J. Whitty, Dept. of Chemical Engineering, The University of Utah, Salt Lake City, UT, USA

SESSION 4

COAL SCIENCE—2

Leslie Ruppert and Allan Kolker

9:55 DEPOLYMERIZATION OF COAL UNDER MILD CONDITIONS VIA REDOX REACTION BY OXYGEN AND FORMIC ACID, Jie Ren, Ryuichi Ashida, Motoaki Kawase, Kyoto University, Department of Chemical Engineering Nishikyo-ku Kyoto-daigaku Katsura, Kyoto, Japan. Koji Sakai, and Noriyuki Okuyama, KOBE STEEL, Ltd., Mechanical Engineering Research Laboratory, Shinhamma, Arai-cho, Takasago-city, Hyogo, Japan

10:15 The role of hydrous pyrolysis pretreatment on the synthetic graphitization of lower-rank bituminous coal, Peng Luo, Yuegang Tang, Ruiqing Li, College of Geoscience and Surveying Engineering, China University of Mining and Technology (Beijing), Beijing, China

10:35 Study on Influence of Sulfur in Coal on Graphitization of Coal, Ruiqing Li, Yuegang Tang, Suning Liu, Liping Xue, Xiaoting Xu, Cong Chen, College of Geoscience and Surveying Engineering, China University of Mining and Technology (Beijing), Beijing, CHINA

10:55 Preliminary Field Tests of Pyrolyzed Coal as a Soil Amendment, Resham B. Thapa, Peter D. Stahl, Samir Budhathoki, Sean X. Tang, Bouzeriba Alsunuse, University of Wyoming, Laramie, WY, United States

11:15 Performance and Economic Analysis of Lignite Coal Dewatering with Supercritical Carbon Dioxide, Sai Kiran Hota, Andrew J. Lutz, Srujan Rokkam, Quang Truong, Advanced Cooling Technologies, Inc. Lancaster, PA, USA; Zheng Yao, Lehigh University Energy Research Center, Bethlehem, PA, USA; Bhima Sastri, Director, Crosscutting R&D and Systems Integration, U.S. Department of Energy, Office of Fossil Energy, Germantown, MD, USA

SESSION 5

GASIFICATION TECHNOLOGY—3

Francis Lau and Alberto Pettinau

12:35 Modeling Ash Partitioning in Slagging Ash Conversion Systems, Shuchita Patwardhan, David Stadem, Steve Benson, Gautham Krishnamoorthy, Microbeam Technologies, Inc., Grand Forks, ND, USA

12:55 Making Coal Relevant for Small Scale Applications: Modular Gasification for Syngas/Engine CHP Applications in Challenging Environments, Brent J

TECHNICAL PROGRAM—ORAL PRESENTATIONS

Sheets, Director Petroleum Development Laboratory, University of Alaska Fairbanks Fairbanks, Alaska, USA, Michael Welch, Mayor, City of North Pole, Alaska, USA, Randy Hobbs, President, Hobbs Industries Palmer, Alaska, USA, Charles Ward, Superintendent, Aurora Power, Fairbanks, Alaska, USA, Harvey Goldstein, PE, Worley Engineering, Reading, PA, USA, Rolf Maurer, President, HMI International, Inc., Illinois, USA

13:15 Commercial-scale trial feeding waste activated sludge to a sasol fixed bed dry bottom gasifier, Andrei Koekemoer, Sasol Research and Technology, Sasolburg, South Africa

13:35 Pyrometamorphism from Underground Coal Gasification, Lehloholo Mokhahlane, University of the Witwatersrand, Johannesburg, South Africa.

13:55 A Study on Gasification Behavior of Soma Coal in a Bubbling Fluidized Bed Gasifier, Ayşe Tarakçıoğlu, Chemical Engineer, General Directorate of Turkish Coal Enterprises, Ankara, TÜRKİYE

SESSION 6a

COAL SCIENCE - 3

Allan Kolker and Brian Shaffer

12:35 Prototype Fabrication, Mechanical Testing, and Material Characterization of Coal-Based Bricks & Blocks (CBBs), James Heim II, and Randy Vander Wal, Penn State University, University Park, PA, USA

12:55 Evaluation of the product quality and market suitability of synthetic gypsum produced from Eskom's wet flue gas desulphurization (FGD) process, Shuaib Gaibie, Naushaad Haripersad, Eskom Holdings SOC Ltd, Sunninghill, SOUTH AFRICA; Walter Schmitz, University of the Witwatersrand, Braamfontein, Johannesburg, SOUTH AFRICA; Burgert B. Hattingh, and Naldo Meyer, North-West University, Potchefstroom, SOUTH AFRICA; Pieter Swart, Howden Holdings (Pty) Ltd, Johannesburg, SOUTH AFRICA.

13:15 Making large-scale construction of complex structures more accessible with PyMOL, Jonathan Mathews, the Pennsylvania State University, University Park, PA, USA; and Pilsun Yoo, and Stephan Irle, Computational Science and Engineering Division, Oak Ridge National Laboratory, Oak Ridge, TN, USA

13:35 Phase Mapping using Images from Backscattered Electron Imaging and Energy Dispersive Spectroscopy of Ash, David Stadem, Alex Benson, and Steve Benson,

Microbeam Technologies, Inc., Grand Forks, ND, USA

SESSION 6b

CLEANCOAL DEMONSTRATION AND COMMERCIAL PROJECTS - 1

Tom Sarkus and Dan Connell

13:55 Engineering and Design of the 1.5 Million Tonnes per Annum Post-combustion CO2 Capture Facility at the China Huaneng Longdong Energy Base, Hanming Liu, Shisen Xu, Haifeng Qin, Ping Xiao, Shiwang Gao, Lianbo Liu, Hongwei Niu, Dongfang Guo, Huanjun Wang, Yuanxue Zhang, China Huaneng Group Clean Energy Research Institute, Changping District, Beijing, CHINA

SESSION 7a

GASIFICATION TECHNOLOGIES - 4

Francis Lau and Alberto Pettinau

14:25 Strategic Importance of Coal Gasification For Türkiye, Aktan, Metin; Turkish Coal Enterprises, Yenimahalle Ankara TÜRKİYE

SESSION 7b

COAL BED METHANE AND SHALE GAS

Dick Winschel and Richard Bajura

14:45 A NOVEL COAL STRUCTURE INDEX AND ITS IMPLICATIONS FOR HYDRAULIC FRACTURING, Dameng Liu, China University of Geosciences, Beijing, CHINA, and Yingjin Wang, Hefei University of Technology, Hefei, CHINA

15:05 Study on Coal Methane Adsorption Behavior Under Variation Temperature and Pressure-Taking Shanxi Maozequ Mine Coal in China for Example, Li Dong, Zhang Xuemei, Ma Qinghua, Hao Jinyuan, Energy and Chemical Engineering Research center, Xi'an Siyuan University, Xi'an, China, and Hao Jinyuan, School of Chemical Engineering and Technology, Xi'an Jiaotong University, Xi'an, China

15:25 Experiment of low frequency vibration to increase the production of coalbed methane well, Shao Xianjie, You Zunyan, Gao Wenlong, Han Senwei, Lin Jingyu, Yanshan University, Qinhuangdao, Hebei, CHINA, and Liu Shuyan, Dong Changqing, Management Center of National Nature Reserve of geological relics in Liujiang Basin, Qinhuangdao, Hebei, CHINA

15:45 Hydrocarbon generation

potential of the Permian shales, India: Insinuation from source rock evaluation and kerogen-kinetics, Deependra Pratap Singh, Vivek Singh, Bodhisatwa Hazra, Pradeep K Singh, CSIR- Central Institute of Mining and Fuel Research, Barwa Road campus, Dhanbad, India, and David A Wood, DWA Energy Limited, Lincoln, United Kingdom

SESSION 8

CLEAN COAL DEMONSTRATION AND COMMERCIAL PRODUCTS - 2

Tom Sarkus and Dan Connell

14:25 Permitting the First Carbon Storage Hub in the United States, Jeremy Leierzapf, Dave Riestenberg, Advanced Resources International, Inc, Knoxville, TN, USA; and Richard Esposito, Southern Company, Wilsonville, AL, USA

14:45 The 21st Century Hybrid Gas / Coal Concept Power Plant: FEED Study for Planned Hybrid Gas Turbine and USC Coal Boiler Concept (HGCC) Plant with Post Combustion Carbon Capture and Energy Storage System at City, Water, Light and Power, Les Gioja, Kevin C Obrien, Chinmoy Baroi, Stephanie Brownstein, Sebastiano Giardinella, David Hazlebeck III, Lance Schideman, Bajio Varghese Kaleeckal, University of Illinois at Urbana-Champaign, Champaign, IL, USA; Brandon Hursh, Kiewit Engineering Group Inc., Lenexa, KS, USA; Sunggu Kang, Doosan Heavy Industries and Construction, La Porte, TX, USA; and PJ Becker, City Water Light and Power (CWLP), Springfield, IL, USA

15:05 Lessons Learned from Major DOE Projects, Thomas A. Sarkus, National Energy Technology Laboratory, USA

15:25 An Update on Design Optimization to Develop an Innovative Clean Energy Solution Using Waste Coal and Biomass with Carbon Dioxide Capture and Storage, Stephen E. Winter, Daniel P. Connell, Jacqueline M. Fidler, CONSOL Energy Inc., Canonsburg, PA, USA

15:45 Dynamic Decarbonization Through the Melding of Prescriptive Maintenance and Minimally Invasive Condenser Treatments, Vinod Veedu, Matthew Nakatsuka, Sumil Thapa, Alexander Ventura, Phuong Dinh, Oceanit, Houston, TX, USA

TECHNICAL PROGRAM—ORAL PRESENTATIONS

ORAL SESSIONS

Wednesday, September 21

08:00—16:05

SESSION 9

CARBON MANAGEMENT - 1

Nick Siefert and Alberto Pettinau

08:05 3D micro-structural changes of an artificial flow channel in wellbore cement under geologic CO₂ storage conditions: combined effect of effective stress and flow, Manguang Gan, Liwei Zhang, Yan Wang, Kaiyuan Mei, Xiaojuan Fu, Hejuan Lei, Xiaochun Li, State Key Laboratory of Geomechanics and Geotechnical Engineering, Institute of Rock and Soil Mechanics, Chinese Academy of Sciences, Wuhan, CHINA; and Xiaowei Cheng, School of New Energy and Materials, Southwest Petroleum University, Chengdu, CHINA, and Mingxing Bai, Department of Petroleum Engineering, Northeast Petroleum University, Daqing, CHINA

08:25 Study on the conversion mechanism of thermal plasma non-catalytic CH₄-CO₂ reforming system to syngas, Zhou Yang, Fan Lulu, Meng Xianliang, Zhao Jianqiao, Chu Ruizhi, Li Yusai, China University of Mining and Technology, Xuzhou, Jiangsu Province, PR CHINA

08:45 Effect of support on the catalytic performance of Ni-MgO/X catalysts for carbon dioxide reforming of methane, Hui-Min Gao, Yu-Bin Zhang, Jie-Ying Jing, Wen-Ying Li, Taiyuan University of Technology, Taiyuan, CHINA

09:05 CO₂ Capture from Flue Gas over DEA-functionalized Activated Semi-coke, Ze-Min Zhao, Xue-Wei Zhang, Jie-Ying Jing, Wen-Ying Li, Taiyuan University of Technology, Taiyuan, CHINA

09:25 Reservoir Rocks Interacting with CO₂/Brine under Subsurface CO₂ Sequestration Conditions, Yee Soong, B. H. Howard, D. Crandall, P. Wang, L. Dalton, and I. Haljasmaa, US DOE/NETL, Pittsburgh, PA, U.S.A.

SESSION 10

VALUE-ADDED PRODUCTS FROM COAL - 1

Dick Winschel and Atsushi Ishihara

08:05 Study on affecting factors of dehydration during one-step preparation of

9-fluorenylmethanol, Junli Liu, Yafei Qiao, Cuiping Ye, Wenying Li Taiyuan University of Technology, Jinzhong, China

08:25 Effect of Alkali on Density, Compressive Strength and Thermal Conductivity of Char-Based Concrete Bricks, Hua Yu, Chooikim Lau, Md. Tarik Hossain, Kam Ng, University of Wyoming, Laramie, WY, USA

08:45 Effect of Carbonization Temperature on the Properties of Carbon-based Structural Unit, Md Tarik Hossain, Chooikim Lau, Hua Yu, Kam Ng, Maohong Fan, University of Wyoming, Laramie, WY, USA

09:05 Field Trial of Anthracite Coal-Based Activated Carbon for Mercury Emissions Reduction in Flue Gas from Power Generation Unit, Guanrong Song, Zheng Yao, Julio Bravo, Tanumoy Banerjee, Lida Yan, Carlos E. Romero, Lehigh University Energy Research Center, Bethlehem, PA, USA; Tom Lowe, Greg Driscoll, Boyd Kreglow, Blaschak Anthracite Corporation, Mahanoy City, PA, USA; and Harold Schobert, Schobert International LLC, Jordan, MN, USA

09:25 Unexpected high Extraction of Oxygen Rich Subbituminous PRB Coal with Renewable Carbon Solvents to Produce Materials for Asphalt Markets, Jeramie J. Adams, Wyatt Philips, Western Research Institute, WY, USA; and Louis C. Muller, Paul Behrens, Richard Horner, University of Wyoming School of Energy Resources, Laramie, WY, USA

SESSION 11

CARBON MANAGEMENT - 2

Nick Siefert and Alberto Pettinau

09:55 Design the 1st ISO Verified Carbon Capture Unit in the World for Carbon XPRIZE Competition, Walid EIMoudir, Ahmed Aboudheir, Lin Li, Neil Rathva, Delta Cleantech Inc., Regina, Saskatchewan, CANADA

10:15 Test Campaigns at ERTF Carbon Capture Pilot Plant, Ahmed Aboudheir, Walid EIMoudir, Lin Li, Neil Rathva, Delta Cleantech Inc., Regina, Saskatchewan, CANADA

10:35 Directly-Spun Epoxy-Crosslinked PEI Chemisorption Fiber Sorbents (CHEFS) for Direct Air Capture (DAC) of CO₂, Qiuming Wang, Walter C. Wilfong, Fan Shi, McMahan Gray, Shouliang Yi, U.S Department of Energy, National Energy Technology Laboratory (NETL), Pittsburgh, PA, UNITED STATES

10:55 Developing Gigatonne Scale CO₂ Storage Infrastructure in the U.S., Traci Rodosta, John Litynski, Darin Damiani, U.S. Department of Energy, Office of Fossil Energy and Carbon Management, SW Washington DC,

USA

11:15 Pilot-scale (0.5MW) study for the alkalized alumina sorbent based post-combustion CO₂ capture, Fei Yi, TDA Research, Inc., Golden, CO, USA.

SESSION 12

VALUE-ADDED PRODUCTS FROM COAL - 2

Dick Winschel and Atsushi Ishihara

09:55 Design for Carbon Conversion Product Pathways with Nuclear Power Plant Integration, Elizabeth K. Worsham, Botros N. Hanna, L. Todd Knighton, Idaho National Laboratory, Idaho Falls, ID, USA

10:15 Status of NETL's Carbon Ore Processing Program, Joseph Stoffa, National Energy Technology Laboratory, Morgantown, WV, USA

10:35 Graphitic Carbons from Plasma Upgraded Coal Tars, Akshay Gharpure, Randy Vander Wal, Penn State University, University Park, PA, USA; and Vignesh Viswanathan, Aayush Mantri, George Skoptsov, H Quest Vanguard, Inc., Pittsburgh, PA, USA

10:55 Filament Formation and Melt Spinning of Coal-Based Mesophase Pitch for Carbon Fiber Production, George Frank, Ruben Sarabia Riquelme, Matthew Weisenberger, Rodney Andrews, University of Kentucky Center for Applied Energy Research, USA

11:15 Optimization of Direct Coal Liquefaction Conditions for the Production of Mesophase Pitch, Rachel Kaplan, John McHugh, Justin Lacy, Matthew C. Weisenberger, University of Kentucky Center for Applied Energy Research, KY, USA

SESSION 13

CARBON MANAGEMENT - 3

Nick Siefert and Bingyun Li

12:35 Advanced Ceramic Membranes/Modules for Ultra Efficient Hydrogen (H₂) Production/Carbon Dioxide (CO₂) Capture for Coal-Based Polygeneration Plants: Fabrication, Testing and CFD Modeling, Mohammad Bazmi, Kristian Jessen, Theodore T. Tsotsis, University of Southern California, Los Angeles, CA, USA; Doug Parsley, Richard Ciora, Media and Process Technology, Inc., Pittsburgh, PA, USA

12:55 Review of techno-economic analysis studies using physical solvents for pre-combustion CO₂ capture, Kathryn Smith, Nicholas Siefert, National Energy Technology Laboratory, Pittsburgh, PA, USA; Husain

TECHNICAL PROGRAM—ORAL PRESENTATIONS

Ashkanani, Chemical Engineering Department, Kuwait University, Kuwait; and Badie Morsi, University of Pittsburgh, Pittsburgh, PA, USA

13:15 Investigation of potential cycling reaction mechanisms in CO₂ solvents, Zhenghong Bao, Qingyang Li, Novruz G. Akhmedov, Benjamin A. Li, Jingxin Wang, Bingyun Li, West Virginia University, Morgantown, WV, USA; and Badie Morsi, University of Pittsburgh, Pittsburgh, PA, USA

13:35 Pilot plant performance and process simulation of a hydrophobic physical solvent for pre-combustion CO₂ capture, Nicholas Siefert, Kathryn Smith, Robert Thompson, Jeffrey Culp, Wei Shi, Kevin Resnik, David Hopkinson, National Energy Technology Laboratory, Pittsburgh, PA, USA; Michael Swanson, Joshua Stanislawski, University of North Dakota Energy and Environmental Research Center, Grand Forks, ND, USA; Husain Ashkanani, Chemical Engineering Department, Kuwait University, Kuwait; and Badie Morsi, University of Pittsburgh, Pittsburgh, PA, USA

13:55 Techno-Economic Analysis of The Pre-Combustion CO₂ Capture Process using Artificial Neural Network, Husain Ashkanani, Chemical Engineering Department, Kuwait University, Kuwait; Rui Wang, Wei Shi, Nicholas S. Siefert, Robert L. Thompson, Kathryn Smith, Janice A. Steckel, Isaac K. Gamwo, David Hopkinson, Kevin Resnik, and Badie I. Morsi, U.S. Department of Energy, National Energy Technology Laboratory, Pittsburgh, PA, USA

SESSION 14

VALUE-ADDED PRODUCTS FROM COAL - 3

Evan Granite and Dan Connell

12:35 Application and Development of X-MAT® Carbon Core Composites for Building Components, William Easter, X-MAT CCC, Bluefield, WV, USA; and Bruce Mutter, Director, CART, Bluefield, WV, USA

12:55 Manufacture of Carbon Foam in Continuous Process at Atmospheric Pressure, Rudolph Olson, CFOAM LLC, Triadelphia, WV, USA; and Dan Connell, CONSOL Energy, Canonsburg, PA, USA

13:15 Development of Competitive Supercapacitor Electrodes of Diverse Compositions from Coal Extract, Robert E. F. Cincotta, Anastasia M. Barnes, and Katie Li-Oakey, University of Wyoming, Laramie, WY, USA

13:35 Developing a Coal to Products Technology Portfolio, Charles S. Hill, Christopher Yurchick, Grant Hazle, Garrett W. Lindemann, Ramaco Carbon, Ranchester, WY,

USA; and Jim Dietz, President, TwoPoint Solutions, Sewickley, PA, USA

13:55 Understanding the molecular architecture of mesophase pitches to generate a better carbon fiber precursor, Aparna Annamraju, Oak Ridge National Laboratory, Oak Ridge, TN, USA; Ryan M Paul, Fredric Vautard, Nidia C Gallego, Carbon and Composites Group Chemical Sciences Division; Samartha Bhagia, Biomaterials and Biomass Characterization Group Biosciences Division; Shannon Mark Mahurin, Nanomaterials Chemistry Group Chemical Sciences Division; Ercan Cakmak, Neutron and X-ray Scattering and Thermophysics Group Materials Science and Technology Division; Mark A Arnould, Macromolecule and Nanomaterials Group Center for Nanophase Materials Sciences; Edgar Lara-Curzio, Oak Ridge National Laboratory, Oak Ridge, TN, USA

SESSION 15a

CARBON MANAGEMENT - 4

Nick Siefert and Bingyun Li

14:25 TEA OF A UNIQUE TWO-PATHWAYS PROCESS FOR CO₂ CAPTURE FROM POST-COMBUSTION APPLICATIONS USING TWO AMINO ACID SALTS, Rui Wang, Badie Morsi, University of Pittsburgh, Pittsburgh, PA, USA; Husain Ashkanani, Chemical Engineering Department, Kuwait University, Kuwait; and Bingyun Li, West Virginia University, Morgantown, WV, USA

SESSION 15b

COAL ASH MANAGEMENT

Eric Grol and Allan Kolker

14:45 Spectroscopy-based Analysis of Fly Ash Interaction with Air-entraining Agents in Concrete, Yongjun Chen, E S Arun Thamba, Hisham Menkara, PhosphorTech Corporation, Kennesaw, GA, USA

15:05 Development of Sorbents for Boron Capture from Coal Combustion Impoundment Leachates, John Findley, Jan Steckel, Evan Granite, NETL, PA, USA

15:25 Adsorption Properties of Functional Coal Combustion Residuals as Environmental & Energy Catalysts, Yongjun Chen, E S Arun Thamba, Hisham Menkara, PhosphorTech Corporation, Kennesaw, GA, USA

SESSION 16

RARE EARTH ELEMENTS

Evan Granite and Allan Kolker

14:25 Preliminary Review of Rare Earth Element (REE) Contents of Coal of the Southern Appalachian Basin, Ibrahim Okunlola, Rona Donahoe, Department of Geological Sciences, University of Alabama, Tuscaloosa, USA

14:45 The Department of Energy's Advances Towards a Sustainable CM/REE Supply Chain, Savannah Rice, Oak Ridge Institute for Science and Education, USA; Anna Wendt, Grant Bromhal, Evan Granite, Maryanne Alvin, Department of Energy, USA

15:05 Multi-bed Adsorption Study for the Fractionation of Critical Metals from Acid Mine Drainage, Walter Chris Wilfong, Qiuming Wang, Fan Shi, McMahan Gray, U.S. Department of Energy, National Energy Technology Laboratory (NETL), Pittsburgh, PA UNITED STATES

15:25 NdFeB Permanent Magnets: Sector Usage Translated to Rare Earth Oxide Demand, Randy Vander Wal, Penn State University, USA

15:45 Yampa Coal Field Revisited – Rare Earth Elements and Critical Minerals, Allan Kolker, Brian N. Shaffer, Leslie F. Ruppert, U.S. Geological Survey, National Center, Reston, VA, USA; and Charles N. Thompson, Thompson Geo Service, Inc., CO, USA

16:05 Material Intensities and Growth Rates versus Supply Chain Constraints, Randy Vander Wal, Penn State University, USA

SESSION 17

COMBUSTION TECHNOLOGIES - 1

Steve Jeon and Evan Granite

08:05 Study on mineral transformation during the thermal conversion of Zhundong high-alkali coal via FactSage software, Lin Zhao, Chang'an Wang, Ruijin Sun, Defu Che, Jiaotong University, Xi'an, China

08:25 Evaluation on physicochemical properties of BRDF for utilization as fuel in thermal power plant, Kyeong-Ho Kim, Tae-Yong Jeong, Seung-Mo Kim, Byoung-Hwa Lee, Chung-Hwan Jeon, Pusan National University, Busan, Korea

08:45 Overview on Mercury Control Options for Coal-Burning Power Plants, Evan J. Granite, United States Department of Energy, Office of Fossil Energy & Carbon Management, USA

TECHNICAL PROGRAM—ORAL PRESENTATIONS

ORAL SESSIONS

Thursday, September 22
08:00—16:05

09:05 Mitigation of Aerosol Impacts from Coal Combustion processes, Temitope Bankefa, Junior Nasah, Michael Mann, Joshua Oluwayomi, UND, Grand Forks, ND, USA; Srivats Srinivasachar, Teagan Nelson, Envergenx LLC, Sturbridge, MA, USA; Steve Benson, Microbeam Technologies, Grand Forks, ND, USA; and Nicole Nguyen, Barr Engineering, Minneapolis, MN, USA

09:25 CFD study of a 100 kW flame burning coal water slurry made from fine coal, Fei Yi, TDA Research, Inc., Golden, CO, USA

SESSION 18

CLEAN COAL AND GAS TO FUEL

Dan Connell and Andreas Richter

08:05 Phenanthrene Hydrogenation Saturation over Ni-Co/NiAl₂O₄ Catalyst, Yu Chen, Ze Li, Jie-Ying Jing, Jie Feng, Wen-Ying Li, State Key Laboratory of Clean and Efficient Coal Utilization, Taiyuan University of Technology, Taiyuan, CHINA

08:25 Effect of pore structure on Ni₂P/Al₂O₃ catalyst for hydrogenation saturation of phenanthrene, Ze Li, Yu Chen, Jieying Jing, Jie Feng, Wenyong Li, State Key Laboratory of Clean and Efficient Coal Utilization, Taiyuan University of Technology, Taiyuan, CHINA

08:45 Road Map for Producing SNG from Thar Coal in Pakistan, Farid A Malik, FC College, A Chartered University, Lahore, Pakistan

09:15 Thermo-catalytic Decomposition of Methane to Produce Hydrogen Fuel Using Carbon as Catalyst, Mpila Nkiawete, Randy Vander Wal, The Pennsylvania State University, University Park, PA, USA

SESSION 19

COMBUSTION TECHNOLOGIES - 2

Alberto Pettinau and Evan Granite

09:55 Influence of various conditioning agents on the fly ash resistivity of South African power plant fly ashes, Gregory N. Okolo, Burgert B. Hattin, Hein W.J.P. Neomagus, North-West University, Potchefstroom, SOUTH AFRICA

SESSION 20a

SUSTAINABILITY AND THE ENVIRONMENT

Massood Ramezan and Richard Bajura

09:55 Manufacturing and Life Cycle Assessment of Char-based Concrete Bricks, Chooikim Lau, Hua Yu, Md. Tarik Hossain, Kam Ng, Anthony Denzer, Richard Horner, University of Wyoming, Laramie, WY, USA

10:15 Heat treatment of pyrite from southern Brazil to produce pyrrhotite – Coal Valorization Project of Santa Catarina State Research Funding Agency (FAPESC), Julia Meller Mendes Silva, Michael Peterson, Adriano Michael Bernandin, Alexandre Gonçalves Dal Bó, Marta Valéria Guimarães de Souza Hoffmann, Paula Tramontim Pavei, Mariani Nazario Sebastião, Mariana de Souza Pereira, Vinicius Fernandes Cunha, José Cleber Nikoski Damásio, Julia Panato da Rosa, Thuani Gesser Müller, Avenida Universitária, Criciúma, BRAZIL

SESSION 20b

COAL MINING, PREPARATION AND HANDLING

Dick Winschel and Guven Onal

10:35 Dynamic Simulation to Optimize the DM Cyclone Production System with IDEAS, Hainan Wang, Jun Zhang, Liaoning Technical University, Fuxin city, Liaoning Province, China; and Jie Wang, Deng-feng Xie, Tangshan Institute, CCRI, Tangshan City, Hebei Province, China

10:55 A coupled flow - geomechanics study on the effectiveness of methane drainage in multi-seam coal mine with the use of long-reach directional drilling, Stephen Małgorzata Słota-Valim, Wiesław Szott, Piotr Łetkowski, Piotr Rucinski, Krzysztof Milek, Oil and Gas Institute - National Research Institute, Kraków, POLAND

11:15 COAL RECOVERY FROM SLURRY RESIDUE IN TKI ÖMERLER WASHING PLANT, Stephen Barış SARIKAYA, General Directorate of Turkish Coal Enterprises, Ankara, TURKEY

SESSION 21

POWER PLANTS - 1

Ting Wang and Eric Grol

12:35 Dynamic Simulation for Boiler Fault Detection and Diagnosis Using AI, Xinsheng Lou, Ben Sargent, Tim Braun, Abhinaya Joshi, GE Steam Power,

Windsor, CT, USA; and Yiwei Fu, Fred Xue, GE Research, Niskayuna, NY, 15213

12:55 HIGH-FIDELITY DYNAMIC MODELING OF A COAL-FIRED STEAM POWER PLANT, Tim Braun, Lionel Lambert, Nikolaus Schuermann, Abhinaya Joshi, Xinsheng Lou, GE Steam Power, Windsor, CT, USA; and Aditya Kumar, GE Research, Niskayuna, NY, USA

13:15 Dust Control Improvements Help Winterize Your Coal Handling System, David Lodewyck, CDG Engineers, St.Louis, MO, USA

13:35 Distributed Coaxial Cable Sensors for in-situ Condition Based Monitoring of Coal-Fired Boiler Tubes, Xinyu Jiao, Yongji Wu, Xuran Zhu, Mahabubur Rahman, Tanuj Gupta, Dustin T Gravley, Dock R Houston, Huijuan Zhao, Hai Xiao, Clemson University, Clemson, SC, USA; Chethan K Acharya, Southern Company Birmingham, AL, USA; Tuan Nguyen, Southern Company Birmingham, AL, USA; and Susan Maley, Electric Power Research Institute, Charlotte, NC, USA

13:55 Use of Deposition Probe to Collect Boiler Tube Deposit, Eric Kolb, John Newcomb, Shuchita Patwardhan, Alex Benson, Steve Benson, Microbeam Technologies, Inc., Grand Forks, ND, USA

SESSION 22

ENERGY STORAGE

Massood Ramezan and Richard Bajura

12:35 Techno-economic Analysis of Thermal Energy Storage Systems Integrated with a Power Plant, Mahfuja A. Khuda, Nenad Sarunac, Javad Khalesi, UNCC Charlotte, Charlotte, NC, USA; Carlos Romero, Tanumoy Banderjee, Lehigh University, Bethlehem, PA, USA; and Rick Mancini, Pramod Kulkarni, and Joel Berger, Customized Energy Solutions, Philadelphia, PA, USA

12:55 Estimating Subsurface Hydrogen Storage Potential Across the U.S. Based on Data for Existing Natural Gas Storage Reservoirs, Angela Goodman, Greg Lackey, Foad Haeri, Nicolas Huerta, NETL, Pittsburgh, PA, USA; Nicolas Huerta, Pacific Northwest National Laboratory, Richland, WA, USA; and Thomas A. Buscheck, Joshua A. White, Lawrence Livermore National Laboratory, Livermore, CA, USA

13:15 Coal as Value-Added for Lithium Battery Anodes, Kyle Marcus, William Easter, Walter Sherwood, Semplastics EHC LLC, Oviedo, FL, USA

13:35 Renewable Methanol Production from Carbon Dioxide and Green Hydrogen: A Techno-Economic Assessment, Alberto Pettinau, Andrea Porcu, Stefano Sollai, Mauro Mureddu, Francesca Ferrara, Sotacarbo S.p.A.,

TECHNICAL PROGRAM—ORAL PRESENTATIONS

SESSION 23

POWER PLANTS - 2

Ting Wang and Eric Grol

14:25 Mitigation of Aerosol Induced Fouling from Coal Combustion, Nicole Nguyen, Barr Engineering Co., Ann Arbor, MI, USA

14:45 Baseline Cost and Performance Assessment of Low-Rank Coal-Fueled Power Plants with Carbon Capture and Sequestration, Robert James, Travis Shultz, Tommy Schmitt, Marc Turner, Mark Woods, NETL, Pittsburgh, PA, USA; and Matthew Oakes, Jacob Konrade, Mark Bleckinger, Mike Sturdivan, Black & Veatch Corporation, Overland Park, KS, USA

15:05 HIGH CO₂ CAPTURE RATE COST AND PERFORMANCE BASELINE RESULTS FOR NATURAL GAS COMBINED CYCLES (NGCC), Robert James, Timothy Fout, Travis Shultz, Tommy Schmitt, Sarah Leptinsky, Marc Turner, Sydney Hughes, Alexander Zoelle, Charles W. White, Mark Woods, NETL, USA

15:25 Visible Light Communications for Power Plant Applications, Ethan Linderman, Jeffrey S. Viperman, University of Pittsburgh, Pittsburgh, PA, USA; and Rupen Panday, Benjamin Chorpene, National Energy Technology Laboratory, US Dept. of Energy, Morgantown, WV, USA

15:45 Review of Natural Gas Liquefaction Processes and Refrigeration Cycles, Shisir Acharya, Ting Wang, University of New Orleans, New Orleans, LA, USA

ADVISORY BOARD & INTERNATIONAL VICE CHAIRS

ADVISORY BOARD

Dr. Massood Ramezan, Chair,
KeyLogic Systems, Inc., USA

Prof. Richard Bajura, West Virginia
University, USA

Prof. Tarunjit Butalia, The Ohio State
University, USA

Dr. Steve Carpenter, Managing Partner,
Carpenter Global, LLC

Dr. Daniel Connell, CONSOL Energy Inc.,
USA

Mr. John Duddy, HTI, USA

Dr. Evan Granite, U.S. DOE/NETL, USA

Prof. Atsushi Ishihara, MIE University,
JAPAN

Mr. Andrew Kramer, Gas Technology
Institute, USA

Dr. Holly Krutka, University of Wyoming,
USA

Mr. Francis Lau, EverBright & Associates,
USA

Dr. Wenhua Li, NICE, CHINA

Dr. Rolf Maurer, Hamilton Maurer
International, USA

Prof. Badie I. Morsi, University of
Pittsburgh, USA

Prof. Masakatsu Nomura*, Osaka
University, JAPAN

Prof. Güven Önal, Istanbul Technical
University, TURKEY

Dr. Alberto Pettinau, Sotacarbo S.p.A.,
ITALY

Dr. Andreas Richter, Freiberg University
of Mining & Technology, GERMANY

Dr. Daniel Roberts, CSIRO, AUSTRALIA

Dr. Leslie Ruppert, U.S. Geological Survey,
USA

Mr. Thomas Sarkus, U.S. DOE/NETL, USA

Mr. Brian Shaffer, U.S. Geological Survey,
USA

Dr. Aleksander Sobolewski, Institute for

Chemical Processing of Coal, POLAND

Mr. Don Stevenson, GTI Energy, USA

Mr. Gary Stiegel, Consultant, USA

Dr. Johan van Dyk, GTI, USA

Prof. Ting Wang, University of New
Orleans, USA

Mr. Richard Winschel, Longbridge Energy
Consulting, USA

*Emeritus

INTERNATIONAL VICE-CHAIRS

Prof. Atsushi Ishihara, MIE University,
JAPAN

Prof. Chung-Hwan Jeon (Steve Jeon),
Pusan National University, SOUTH KOREA

Dr. Wenhua Li, CHN Energy, CHINA

Dr. Daniel Roberts, CSIRO, AUSTRALIA

Prof. Aleksander Sobolewski, Institute for
Chemical Processing of Coal, POLAND

Dr. Johan van Dyk, GTI, USA

2022 SESSION CO-CHAIRS

Prof. Richard Bajura, West Virginia
University, USA

Dr. Evan Granite, U.S. DOE/NETL, USA

Mr. Eric Grol, U.S. DOE/NETL, USA

Dr. Allan Kolker, U.S. Geological Survey,
USA

Mr. Francis Lau, EverBright & Associates,
USA

Prof. Bingyun Li, West Virginia University,
USA

Dr. Alberto Pettinau, Sotacarbo S.p.A.,
ITALY

Dr. Massood Ramezan, KeyLogic Systems,
Inc., USA

Dr. Leslie Ruppert, U.S. Geological Survey,
USA

Mr. Thomas Sarkus, U.S. DOE/NETL, USA

Mr. Brian Shaffer, U.S. Geological Survey,
USA

Dr. Nicholas Siefert, U.S. DOE/NETL, USA

Prof. Ting Wang, University of New
Orleans, USA

Mr. Richard Winschel, Longbridge Energy
Consulting, USA

Prof. Atsushi Ishihara, MIE University,
JAPAN

Prof. Chung-Hwan Jeon (Steve Jeon),
Pusan National University, SOUTH KOREA

CONFERENCE PROCEEDINGS

Orders can be placed online (pccpitt.org) or send a check payable to “University of Pittsburgh”, specify the year and quantity, and mail to:

Pittsburgh Coal Conference
University of Pittsburgh
3700 O’Hara Street, 940 Benedum Hall
Pittsburgh, PA 15261, USA

Online Access: No shipping cost

Flash Drive Shipping: All Years \$5.00 Domestic and International

Year, Edition and Cost

1st Annual - 1984	\$30.00
2nd Annual - 1985	\$30.00
3rd Annual - 1986	\$30.00
4th Annual - 1987	\$30.00
5th Annual - 1988	\$30.00
6th Annual - 1989	\$30.00
7th Annual - 1990	\$30.00
8th Annual - 1991	\$30.00
9th Annual - 1992	\$30.00
10th Annual - 1993	\$30.00
11th Annual - 1994	\$30.00
12th Annual - 1995	\$30.00
13th Annual - 1996	\$30.00
14th Annual - 1997	\$30.00
15th Annual - 1998	\$30.00
16th Annual - 1999	\$30.00
17th Annual - 2000	\$30.00
18th Annual - 2001	\$30.00
19th Annual - 2002	\$30.00
20th Annual - 2003	\$30.00
21st Annual - 2004	\$30.00
22nd Annual - 2005	\$30.00
23rd Annual - 2006	\$30.00
24th Annual - 2007	\$30.00
25th Annual - 2008	\$30.00
26th Annual - 2009	\$30.00
27th Annual - 2010	\$30.00
28th Annual - 2011	\$30.00
29th Annual - 2012	\$30.00
30th Annual - 2013	\$30.00
31st Annual - 2014	\$30.00
32nd Annual - 2015	\$30.00
33rd Annual - 2016	\$30.00
34th Annual - 2017	\$30.00
35th Annual - 2018	\$30.00
36th Annual - 2019	\$50.00
37th Annual - 2020	\$50.00
38th Annual - 2021	\$50.00
39th Annual - 2022	\$50.00



ANNOUNCING

**Fortieth ANNUAL
INTERNATIONAL
PITTSBURGH COAL CONFERENCE**

Hosted by:



**Location: TÜYAP Exhibition and Convention Center
Istanbul, Turkey**

Date: October 4-6, 2023

Abstracts must be submitted by April 30, 2023. Please submit an abstract including title, topic area, authors, affiliations, and contact information via email to:

ipcc@pitt.edu

PCC WEBSITE: www.pccpitt.org