





9th International Freiberg Conference
 on IGCC & XtL Technologies
Closing the Carbon Cycle
3-8 June 2018
Berlin, Germany

Program

Sunday 3 June 2018	
18:00 – 20:00	Zoo Terrasse, Intercontinental Berlin – Registration & Welcome Evening
Monday 4 June 2018	
09:00 – 09:15	Room Pavillon – Opening Ceremony
	<p>Bernd Meyer, Institute of Energy Process Engineering and Chemical Engineering, TU Bergakademie Freiberg – Germany</p> <p>Prof. Dr.-Ing. Bernd Meyer is Director of the Institute of Energy Process Engineering and Chemical Engineering (IEC) and Professor for Energy Process Engineering and Thermal Waste Treatment (EVT) at the TU Bergakademie Freiberg, Germany. Between 2008 and 2015, he was also the elected Rector (President) of the TU Bergakademie Freiberg. After receiving his doctoral degree, Prof. Meyer gained extensive R&D as well as industry experience through his work in the Brennstoffinstitut Freiberg (DBI), Rheinbraun AG, and Schwarze Pumpe. Prof. Meyer has received different honorary doctorates and professorships from different universities around the globe. Over the course of his career, he has published over 250 scientific papers with more than 100 patents. Since 2017, Prof. Meyer is also the head of the business unit Chemical Conversion Processes at the Fraunhofer Institute for Microstructure of Materials and Systems (IMWS) in Halle, Germany.</p>
09:15 – 10:20	Room Pavillon – Plenary Speakers
	<p>Christian Ehler, Member of the European Parliament – Germany</p> <p>Dr. Ehler was born in 17 August 1963 in Munich, Germany. He holds a degree in journalism and economic as well as a PhD in political science. Until 2010, Dr. Ehler held the position of Managing Director of Biotech GmbH. In the European Parliament Dr. Ehler is a member of the Committee on Industry, Research and Energy, the Subcommittee on Security and Defense and a substitute member of the Committee on Foreign Affairs and special Committee on Terrorism. Dr. Christian Ehler has served as the European Parliament's Rapporteur for the Horizon 2020 Rules for Participation and Clean Sky 2, as well as shadow for Juncker's Investment Plan, EFSI. He is the initiator of the ITRE working group on Horizon 2020 allowing a closer parliamentary scrutiny of Horizon 2020's implementation. http://www.ehler.eu</p>
	<p>Jürgen Ude, State Secretary in the Ministry of Economy, Science and Digitalization, State of Sachsen-Anhalt – Germany</p> <p>Dr. Jürgen Ude was born in Magdeburg in 1958. After studying Materials Technology in Magdeburg, he started his career as research associate at the office for standardization, metrology and product examination. After receiving a doctorate in engineering in 1991 Dr. Ude worked as research associate for Materials Technology at the University Magdeburg and then led the research department of Metallwerke Harzgerode GmbH. From 1999 until 2016 he worked as managing director of the corporation for business development and innovation Harzgerode and from 2008 until 2016 as managing director of the Innovation and Start-Up-Center Magdeburg. Since January 2017 he is acting State Secretary in the Ministry of Economy, Science and Digitalization of the State of Sachsen-Anhalt. Dr. Ude is married and has two children.</p>
	<p>Lars Kulik, RWE Power AG, Essen and Köln – Germany</p> <p>Dr. Lars Kulik is Member of the Executive Board and CTO of the Lignite Division of RWE Power AG, RWE's Company for Power Production from Lignite and Nuclear. He is responsible for the whole lignite value chain from mining to delivery of power and refined lignite products. Dr. Kulik is also member of several interest groups like DEBRIV, Euracoal and VRB. He studied mining and earned his doctorate at RWTH Aachen. In 1992, he joined RWE Power AG, working as an executive engineer in the staff and mining departments of the company's opencast mines. This was followed by several years of work as a planning expert in the company's headquarters and as head of department in the Hambach mine. In the year 2004, he became head of the Opencast Mine Planning and Approval division. In January 2010, he took over responsibility for lignite planning and development, which comprised not only medium and long-term tasks for the opencast mines including clearing of the area to be mined and land rehabilitation but also overarching issues of site development for power stations and upgrading plants. Since August 2016, he has been responsible for lignite as a member of the RWE Generation SE/RWE Power AG Executive Board.</p>

Monday 4 June 2018

08:30 – 17:20	<i>Wintergarten</i> – Registration & Posters					
09:00 – 09:15	<i>Room Pavillon</i> – Opening Ceremony: Bernd Meyer					
09:15 – 10:20	<i>Room Pavillon</i> – Plenary Session, Chair: Andrew Minchener					
09:15 – 09:40	Christian Ehler, Member of the European Parliament – Germany Jürgen Ude, State Secretary in the Ministry of Economy, Science and Digitalization of the State of Sachsen-Anhalt – Germany					
09:40 – 10:00	The Future Orientation of the Rhenish Lignite – Backbone of supply security and more (Lars Kulik, CTO of RWE Generation SE and RWE Power AG – Germany)					
10:00 – 10:20	Demands on conversion technologies for the sustainable utilization of carbon sources (Bernd Meyer, TU Bergakademie Freiberg – Germany)					
10:20 – 11:30	Group Picture + Coffee Break + Poster Session					
11:30 – 12:50	Room Pavillon – Session 1: Low carbon economy, Chair: Reinhold Elsen		Room Bellevue – Session 2: Low temperature conversion, Chair: Steffen Krzack		Room Tegel – Session 3: Power generation cycles, Chair: Hubert Hoewener	
11:30 – 11:50	01-1	Germany's R&D strategy and lighthouse projects for a low carbon economy (t.b.d., BMBF - Germany)	02-1	Direct hydrothermal liquefaction (HTL) of high-moisture lignite under subcritical and supercritical water conditions (Krzysztof Kapusta, Central Mining Institute – Poland)	03-1	Energy system analysis for evaluation of sector coupling technologies (Kristin Boblenz, TU Bergakademie Freiberg – Germany)
11:50 – 12:10	01-2	The de-carbonization potential of hybrid energy system for coal chemical industry in China (Qianqian Chen, CAS Shanghai Advanced Research Institute – China)	02-2	Catalytic low temperature conversion of hydrocarbon containing feedstocks (Mathias Seitz, HS Merseburg – Germany)	03-2	Selection of a commercial gasifier for the coal-based Allam cycle (Jason Laumb, Energy & Environmental Research Center – USA)
12:10 – 12:30	01-3	Carbon value chains in support of hydrogen energy systems (Daniel Roberts, CSIRO – Australia)	02-3	In-situ catalytic upgrading of coal pyrolysis tar with CO ₂ reforming of methane (Haoquan Hu, Dalian University of Technology – China)	03-3	Development of supercritical CO ₂ cycle for power generation (Qian Zhu, IEA Clean Coal Centre – United Kingdom)
12:30 – 12:50	01-4	Perspectives for clean coal technologies application in Poland (Aleksander Sobolewski, Institute for Chemical Processing of Coal – Poland)	02-4	The application of torrefaction technology for recycling the bio-sludge formed during anaerobic digestion of bio-waste containing lignin (Olga Larina, Joint Institute for High Temperatures of the Russian Academy of Sciences – Russia)	03-4	Effect of H ₂ S contamination on SOFC performance at different pressure conditions (Koji Kuramoto, National Institute of Advanced Industrial Science and Technology – Japan)
12:50 – 13:50	Lunch					
13:50 – 15:30	Room Pavillon – Session 4: Gasification progress, Chair: Christopher Higman		Room Bellevue – Session 5: Process modeling (1), Chair: Adam Klimanek		Room Tegel – Session 6: Mineral matter (1), Chair: Stefan Guhl	
13:50 – 14:10	04-1	HT-L Gasification Technology from CECO (Hao Wei, Changzheng Engineering Co., Ltd. – China)	05-1	Data validation and reconciliation of entrained-flow gasification with Aspen Plus (Karsten Covella, AIR LIQUIDE Forschung und Entwicklung GmbH – Germany)	06-1	Prediction of ash fusion behavior from ash composition for entrained-flow gasification (Martin Graebner, AIR LIQUIDE Forschung und Entwicklung GmbH – Germany)
14:10 – 14:30	04-2	SE dry-fed coal gasification technology (Zhigang Yang, SINOPEC Europe Office – Germany)	05-2	An intelligent method to correlate data for coal gasification simulation (Wenbin Zhang, Changzheng Engineering Co., Ltd. – China)	06-2	Flow properties and crystallization behaviors of coal ash slag at different atmospheres (Jin Bai, CAS Institute of Coal Chemistry – China)
14:30 – 14:50	04-3	Development of the 2200 t/d Shening gasification technology: combination of fundamental research and engineering development (Jianping Kuang, Ningxia Shenyao Technology Co., Ltd – China)	05-3	3D Eulerian-Lagrangian simulation of a lab scale fixed bed gasifier (Massoud Massoudi Farid, TU Bergakademie Freiberg – Germany)	06-3	Development of models and databases for modeling of slag properties (Michael Müller, Forschungszentrum Jülich GmbH – Germany)
14:50 – 15:10	04-4	Update on particulate control devices in Kemper County IGCC project (Xiaofeng Guan, Southern Company – USA)	05-4	Analysis of slag thickness in entrained flow gasification of biomass at the bioliq® plant (Sofien Cavnol, AIR LIQUIDE Forschung und Entwicklung GmbH – Germany)	06-4	Influence of silica and alumina (SiO ₂ + Al ₂ O ₃) on thermal conductivity of synthetic coal slags (Qian Wang, Tsinghua University – China)
15:10 – 15:30	04-5	CHOREN entrained flow gasification – Update of technology and projects (Henry Hempel, Choren Industrietechnik GmbH – Germany)	05-5	Comparison of dynamic behaviors between crystallized and glassy slags on the wall of an entrained coal gasifier (Mukyeong Kim, Sungkyunkwan University – South Korea)	06-5	A new prediction method for the viscosity of the molten coal slag (Jie Zhou, East China University of Science and Technology – China)
15:30 – 16:00	Coffee Break + Poster Session					

16:00 – 17:20	Room Pavillon – Session 7: Power-to-X (1), Chair: Roland Dittmeyer	Room Bellevue – Session 8: Mercury and activated carbon, Chair: Frans Waanders	Room Tegel – Session 9: Gas purification, Chair: Mario Kuschel
16:00 – 16:20	07-1 Demonstration of modular production of CO ₂ -neutral liquid fuel (Peter Pfeifer, Karlsruhe Institute of Technology – Germany)	08-1 Closing the active carbon cycle - Regeneration of spent activated carbon for resource optimization (Jumoke Oladejo, University of Nottingham, Ningbo – China)	09-1 Evaluation of dry acid gas removal process on bench scale test facility coupled with syngas produced by O ₂ -CO ₂ gasifier (Makoto Kobayashi, Central Research Institute of Electric Power Industry – Japan)
16:20 – 16:40	07-2 New approaches for the generation of synthetic motor fuels (Peter Seifert, TU Bergakademie Freiberg – Germany)	08-2 Suitability of activated carbons for mercury adsorption and influence of material properties on mercury adsorption mechanism (Stefan Thiel, TU Bergakademie Freiberg – Germany)	09-2 Toolbox for dry syngas cleaning at high temperatures and high pressures (Robert Mai, Karlsruhe Institute of Technology – Germany)
16:40 – 17:00	07-3 Synchrotron based operando characterization of Ni- and Co-based P2X catalysts (Marc-André Serrer, Karlsruhe Institute of Technology – Germany)	08-3 Effect of occurrence mode of Hg on volatility during pyrolysis process (Lingmei Zhou, China University of Mining & Technology Beijing – China)	09-3 Clean coal technology on hot gas clean-up process with a moving granular bed filter (Shu-San Hsiau, National Central University – Taiwan)
17:00 – 17:20	07-4 "Power-to-X": Fuel quality - Potential of P2X-Fischer-Tropsch products in aviation (Sophie Jürgens, German Aerospace Center – Germany)	08-4 Mercury release and speciation in chemical looping gasification of coal (Qingjie Guo, Ningxia University – China)	09-4
19:00 – 22:00	Conference Dinner *		

*The Conference Dinner will take place at TV Tower Berlin. For participants who would like to walk with the organization committee and take the subway together to the TV Tower, please meet at the hotel lobby at 18:00. Our evening will begin with a reception in the lobby of the Berlin TV Tower followed by dinner in the rotating restaurant "Sphere" which is situated 207 meters above the city in the TV Tower.



For participants who have registered for the alternative Conference Dinner on the luxury city yacht MS "Bellevue" for an exclusive river cruise, you are welcome to board the city yacht from 18:00. At 18:30, the MS "Bellevue" will depart from the pier directly behind the conference hotel and take the guests on a tour through Berlin's inner city. Please note that seats on the river cruise are limited hence only participants who have pre-registered and received a confirmation from us can take part in this alternative Conference Dinner.



Tuesday 5 June 2018

09:00 – 10:05

Room Pavillon – Plenary Speakers



Roland Dittmeyer, Karlsruhe Institute of Technology – Germany

Prof. Dr.-Ing. habil. Roland Dittmeyer has an academic background in Chemical Engineering. He held different positions at Erlangen-Nürnberg University and Karlsruhe University. Since 2009 he is Full Professor and Head of the Institute for Micro Process Engineering at Karlsruhe Institute of Technology (<http://www.imvt.kit.edu>). Previously he was with DECHEMA e.V. in Frankfurt am Main for more than 10 years where he was head of the research group Technical Chemistry and Member of the Board of Directors of the Karl-Winnacker-Institute. His research interests include catalytic reaction engineering, modeling in chemical reaction engineering, multifunctional reactors, catalysis in fuel cells, inorganic membranes for separation of gases and vapors, and micro process engineering. He authored or co-authored more than 120 scientific publications and holds 8 patents. He is board member of the working party on Chemical Reaction Engineering and chairman of the working party on Micro Process Engineering at DECHEMA/ProcessNet.



Ralf B. Wehrspohn, Fraunhofer IMWS – Germany

In 1990 Ralf B. Wehrspohn started his studies of physics at Carl-von-Ossietzky-University Oldenburg, completing his degree with the diploma thesis in physics at the University of Oldenburg and the École Polytechnique, Palaiseau, France. From 1995 to 1997 he prepared his European PhD at the University of Oldenburg and the École Polytechnique, France, concentrating on the preparation and optical characterization of amorphous silicon thin films, electrochemistry of crystalline and amorphous silicon and spectroscopy and transport measurements. In 1998 he worked as Fellow at the Philips Research Laboratories, Redhill, England, on thin film transistors for flat panel displays. Later in 1999 he changed to Max-Planck-Institute of Microstructure Physics, Halle, Germany, as group leader of the porous material/photonic crystal group before he started as Full Professor in Experimental Physics and head of the Nanophotonic Materials Group at the University of Paderborn, Germany, in 2003. Since June 2006 Ralf Wehrspohn has been working as Full Professor in Experimental Physics of the University of Halle-Wittenberg and as Director of Fraunhofer Institute for Microstructure of Materials and Systems (former Fraunhofer Institute for Mechanics of Materials) at Halle/Saale, Germany. He has received the outstanding young inventor award of the German Science Foundation and is one of the TR100 nominated by the MIT Technology Review in 2003. Ralf Boris Wehrspohn is author of more than 100 publications in international journals and co-inventor of nine patents. Since January 2006 he has been editor of Applied Physics A.



Yong Wang Li, Synfuels China Technology Co.,Ltd. – China

Prof. Dr. Yong Wang Li holds the position of Founding Manager in Synfuels China Technology Company Limited. He also holds the positions of Director in the National Engineering Laboratory of Indirect Coal Liquefaction, Director in National Research Centre for Clean Fuels and Deputy Director in the State Key Laboratory of Coal Conversion. Prof. Li is engaged in fundamental research in the fields of quantum chemistry, molecular simulation, catalysis, kinetics and process simulation related to the coal conversion processes, process development of coal/gas to liquids and related unit operation and application of new technologies in process engineering. Around 100 researchers and scientists plus 60 degree students, and more than 400 engineers have been successfully integrated within Synfuels China's platform of around 1000 employees. All his personal efforts are on scientific and technology development through integrating the financial power of the market and guided by limited government support. Prof. Li has published more than 200 scientific papers, obtained more than 60 authorized patents and one software copyright for Fischer-Tropsch synthesis process analysis. He has been honored with many awards including the Science and Technology Innovation Award, National Award in Technology Advances and Innovation, Outstanding Science and Technology Achievement Award etc.

Room Pavillon – Krüger Foundation (Sponsor of the Krüger Poster Reception)

Tuesday 5 June 2018

09:00 – 17:30	<i>Wintergarten</i> – Registration & Posters			
09:00 – 10:05	Room Pavillon – Plenary Session , Chair: Bernd Meyer			
09:00 – 09:20	Synthetic fuels from carbon dioxide and renewable electrical energy enabled by compact microchannel reactors (Roland Dittmeyer, Karlsruhe Institute of Technology – Germany)			
09:20 – 09:40	Low-emission carbon chains by integration of renewable hydrogen – Research and demonstration activities in (Central) Germany (Ralf B. Wehrspohn, Fraunhofer IMWS – Germany)			
09:40 – 10:00	Fischer-Tropsch synthesis: Its industrial application and its future fate (Yong Wang Li, Synfuels China Technology Co.,Ltd. – China)			
10:00 – 10:05	Short film introducing the Krüger Foundation (Sponsor of the Krüger Poster Reception)			
10:05 – 10:30	Coffee Break + Poster Session			
10:30 – 12:10	Room Pavillon – Session 10: Circular economy perspectives, Chair: David Harris	Room Bellevue – Session 11: Pilot plants & operations (1), Chair: Martin Gräbner	Room Tegel – Session 12: Gasification kinetics, Chair: Jason Laumb	Room Dahlem – Session 13: UCG, Chair: Raymond Everson
10:30 – 10:50	10-1 The plastics challenge: Present and future possibilities for closing the carbon cycle in plastics recycling – a recycler’s point of view (Ansgar Fendel, Remondis – Germany)	11-1 Results of test campaigns in IEC’s pilot-scale slagging fixed-bed gasifier (Denise Klinger, TU Bergakademie Freiberg – Germany)	12-1 In-situ investigation of single-particle gasification in CO ₂ and H ₂ O (Felix Küster, TU Bergakademie Freiberg – Germany)	13-1 Carbon sourcing for Xtl and gasification based power generation (Duncan Seddon, Duncan Seddon & Associates Pty. Ltd. – Australia)
10:50 – 11:10	10-2 Sustainability assessment of selected concepts to close the carbon cycle (Witold-Roger Pogonietz, Karlsruhe Institute of Technology – Germany)	11-2 The BioTfuel project - An advanced B-XTL technology (Norbert Ullrich, thyssenkrupp Industrial Solutions – Germany)	12-2 Temperature and gas concentration measurements with spontaneous raman scattering (SRS) for coal gasification (Marcus Junghanns, Friedrich-Schiller-University Jena – Germany)	13-2 In-situ gasification of shallow lignite: Results of an EU study for a potential demonstration site in Romania (Torsten Gorka, DMT GmbH & Co. KG – Germany)
11:10 – 11:30	10-3 Synchronization of renewable energy- and grid extension (Marion Wilde, Ministry of Economic Affairs and Energy State of Brandenburg – Germany)	11-3 The technology development of dry reforming of methane at SARI (Yuhan Sun, CAS Shanghai Advanced Research Institute – China)	12-3 New high pressure TGA instrument for coal pyrolysis and gasification measurement under application relevant conditions (Frieder Dreisbach, TA Instruments – Germany)	13-3 Hydrogen rich syngas production via underground coal gasification from Turkish Lignite (Mesut Gür, Istanbul Technical University – Turkey)
11:30 – 11:50	10-4 Waste gasification: Key technology for closing the carbon cycle (Friedemann Mehlhose, TU Bergakademie Freiberg – Germany)	11-4 The bioliq® entrained-flow gasifier – Optimizing the central process unit in a sustainable biomass-to-liquid process (Mark Eberhard, Karlsruhe Institute of Technology – Germany)	12-4 Experimental investigation on entrained flow gasification of Bituminous coal, Lignite and their blend (Tobias Netter, TU Munich – Germany)	13-4 Carbon management in the exergy UCG™ technology: Mechanisms, efficiency, and costs (Michael S. Blinderman, Ergo Exergy Technologies Inc. – Canada)
11:50 – 12:10	10-5 Circular economy in the last Italian coal mine (Fabrizio Pisanu, Carbosulcis S.p.A. – Italy)	11-5 High-pressure entrained flow gasification of biomass and Victorian brown coal (Shubhadeep Banik, Pennsylvania State University – USA)	12-5 Gasification characteristics of Indian high-ash coal, petcoke, and their blends in an entrained-flow reactor (Sankar Bhattacharya, Monash University – Australia)	13-5 The use of vortex gas separation in UCG (Johan Brand, African Carbon Energy – South Africa)
12:10 – 13:10	Lunch			

13:10 – 14:50	Room Pavillon – Session 14: Power-to-X (2), Chair: Manfred Wirsum		Room Bellevue – Session 15: Process modeling (2), Chair: Andreas Richter		Room Tegel – Session 16: Mineral matter (2), Chair: Michael Müller		Room Dahlem – Session 17: Gasification process characteristics, Chair: Markus Reinmüller	
13:10 – 13:30	14-1	CO2 hydrogenation to fuel and chemicals (Hui Wang, CAS Shanghai Advanced Research Institute – China)	15-1	Reforming using DC discharge in a catalyst fixed bed: Evaluation of a new concept (Petr Nikrityuk, University of Alberta – Canada)	16-1	Solidification in gasifier slags (Daniel Schwitalla, TU Bergakademie Freiberg – Germany)	17-1	Study on the dominant factors of catalysis of inherent iron in coal for char gasification (Atsushi Ikeda, Central Research Institute of Electric Power Industry – Japan)
13:30 – 13:50	14-2	CO2 utilization in biomass derived syngas for the synthesis of oxygenates (Mahmud Arman Kibria, Monash University – Australia)	15-2	Simplified process model for CFB combustion of different biomass as part of an assistance system for emission reduction (Daniel Bernhardt, TU Dresden – Germany)	16-2	Influence of silicon network former on microstructure and viscosity of synthetic coal slags (Weiwei Xuan, University of Science and Technology Beijing – China)	17-2	Study on effects of ash on the evolution of physical and chemical structures of char during CO2 gasification (Xiaopeng Zou, East China University of Science and Technology – China)
13:50 – 14:10	14-3	Movable modular plant operation on CO2 hydrogenation to CH4 coupled with renewables (Claudia Bassano, ENEA – Italy)	15-3	CFD modelling of a large-scale MILD-OXY combustion boiler for CO2 reduction (Adam Klimanek, Silesian University of Technology – Poland)	16-3	Effects of pressure and CO concentration on Petcoke mineral transformations for slag viscosity correlation development (Shubhadeep Banik, Pennsylvania State University – USA)	17-3	Catalytic gasification of crushed coke and structural characteristics (Qingjie Guo, Ningxia University – China)
14:10 – 14:30	14-4	Enhancement of alkaline pressure electrolysis system performance (Ulrich Fischer, Brandenburg University of Technology – Germany)	15-4	CFD modeling of coal drying in impact dryer (Joanna Bigda, Institute for Chemical Processing of Coal – Poland)	16-4	Effect of water vapor on coal ash slag viscosity under gasification condition (Lingxue Kong, CAS Institute of Coal Chemistry – China)	17-4	The effect of carbon dioxide partial pressure on the gasification rate and pore development of Highveld coal chars at elevated pressures (Hein Neomagus, North-West University – South Africa)
14:30 – 14:50	14-5	Novel Fe catalysts and their CO2 to hydrocarbon conversions (Gregory Knowles, Monash University – Australia)	15-5	Numerical study on the effect of CO addition on OH* chemiluminescence in laminar methane-oxygen inverse diffusion flames (Xueli Chen, East China University of Science and Technology – China)	16-5	Analysis of slag leaching characteristics of HT-L gasification (Li Lv, Changzheng Engineering Co., Ltd. – China)	17-5	Synergetic effect of NA-FE binary catalyst on steam gasification of Mongolian low rank coals (Enkhsaruul Byambajav, National University of Mongolia – Mongolia)
14:50 – 15:20	Coffee Break + Poster Session							

15:20 – 17:00	Room Pavillon – Session 18: Concepts & processes, Chair: Daniel Roberts		Room Bellevue – Session 19: Integrated assessment (1), Chair: Andrew Minchener		Room Tegel – Session 20: Pyrolysis and hydro-gasification, Chair: Mathias Seitz		Room Dahlem – Session 21: Pre-treatment and feeding, Chair: Friedemann Mehlhose	
15:20 – 15:40	18-1	Evaluation of a new biomass-to-liquid process from wood chips to motor fuels (Ralph-Uwe Dietrich, German Aerospace Center – Germany)	19-1	Sustainability assessment in R&D of Power-to-X technologies (Dominik Poncette, Karlsruhe Institute of Technology – Germany)	20-1	Effect of calcium-based additives on coal char with biomass ash catalytic hydro-gasification (Xingjun Wang, East China University of Science and Technology – China)	21-1	Custom tailored gasifier feed pumps (Daniel Nägel, FELUWA Pumpen GmbH – Germany)
15:40 – 16:00	18-2	Hydrogen separation from coke oven gas - the unused potential (Mateusz Hajdun , JSW Innowacje S.A. – Poland)	19-2	Technological and environmental evaluation of the production of organic platform chemicals from different feedstock (Florian Keller, TU Bergakademie Freiberg – Germany)	20-2	High pressure drop-tube pyrolysis of brown coal and its kinetics (Kevin Günther, TU Bergakademie Freiberg – Germany)	21-2	Investigation on the effect of moisture content on conveying and resistance characteristics of dense-phase pneumatic conveying (Zhen Liu, Tsinghua University – China)
16:00 – 16:20	18-3	Renewable methanol production and use through reversible solid oxide cells and recycled CO ₂ hydrogenation (Francesco Lonis, University of Cagliari – Italy)	19-3	A systematic evaluation of political considerations associated with the utilization of carbon feedstock alternatives for the German chemical industry (Alexander Scheibe, University of Luxembourg – Luxembourg)	20-3	Effect of simulated coal gas on tar production during coal pyrolysis (Haoquan Hu, Dalian University of Technology – China)	21-3	Pressurized steam fluidized bed drying (PSFBD) of Lignite - State of the development and selected results of 15 years (Matthias Merzsch, Brandenburg University of Technology – Germany)
16:20 – 16:40	18-4	TorrGas process development for the production of catalytic grade syngas and engineered carbon from torrefied biomass (Robin Post van der Burg, Torrgas – Netherlands)	19-4	Alternative carbon feedstock for the chemical industry: challenges posed by the human dimension in the social-technical system (Roh Pin Lee, TU Bergakademie Freiberg – Germany)	20-4	A numerical approach for displaying molecular composition profiles of species occurred during lignin de-volatilization upon heating (Koyo Norinaga, Nagoya University – Japan)	21-4	Dynamic characterization of the flow-ability of granular materials flowing down a narrow channel (Ningsheng Wang, East China University of Science and Technology – China)
16:40 – 17:00	18-5	Pilot plant gasification – Fixed bed & entrained flow (Alexander Laugwitz, DBI Virtuhcon GmbH – Germany)	19-5	Lay perceptions of carbon dioxide utilization technologies in the United Kingdom and Germany: An exploratory qualitative interview study (Christopher Jones, University of Surrey – United Kingdom)	20-5	Development of a predictive caking model for application in fixed-bed gasification (John Bunt, North-West University – South Africa)	21-5	Lignocellulose pre-treatment for co-gasification with coal (Johann Görgens, Stellenbosch University – South Africa)
17:00 – 18:30	Wintergarten – Krüger Poster Reception							

Wednesday 6 June 2018

09:00 – 15:20	<i>Wintergarten</i> – Registration							
09:00 – 10:40	Room Pavillon – Session 22: Pilot-plants & operations (2), Chair: Aleksander Sobolewski		Room Bellevue – Session 23: Alternative feedstocks, Chair: Jens Hannes		Room Tegel – Session 24: Syngas utilization, Chair: Peter Seifert			
09:00 – 09:20	22-1	HTW™-Gasification of high volatile bituminous coal (David Krause, TU Darmstadt – Germany)	23-1	Addressing technical barriers to urban waste-to-energy in Australia (Daniel Roberts, CSIRO – Australia)	24-1	Catalyst and process development for methanol conversion to hydrocarbons (Jianguo Wang, CAS Institute of Coal Chemistry – China)		
09:20 – 09:40	22-2	Gasification of Lignite in O ₂ and CO ₂ atmosphere at different ER and different O ₂ partial pressures with a pilot scale bubbling fluidized bed gasifier (Serhat Gül, TUBITAK MRC Energy Institute – Turkey)	23-2	Process analysis of the low-quality fuels gasification, integrated with coal boiler (Tomasz Chmielniak, Institute for Chemical Processing of Coal – Poland)	24-2	Syngas derived from steel mill gases for methanol synthesis: Simulation and close-to-practice lab (Kai Girod, Fraunhofer UMSICHT – Germany)		
09:40 – 10:00	22-3	Gasification of sewage sludge in the Freiberg COORVED lab scale unit for in-situ recovery of Phosphorus (Tobias Ginsberg, RWE Power AG – Germany)	23-3	Gasification of wet waste biomass in supercritical water, selected examples (Nikolaos Boukis, Karlsruhe Institute of Technology – Germany)	24-3	Direct production of green fuels and value-added chemicals via syngas conversion (Liangshu Zhong, Shanghai Advanced Research Institute – China)		
10:00 – 10:20	22-4	Experimental study of syngas generated from biomass pellet in an interconnected fluidized-bed gasifier (Yau-Pin Chyou, National Chung Hsing University – Taiwan)	23-4	Studies on the chemical composition and physicochemical characterization of upgraded tyre pyrolysis oil (TPO) for application in engine and furnaces (Vasudeva Madav, National Institute of Technology, Karnataka – India)	24-4	Highly selective Fischer-Tropsch synthesis for production of jet fuel from syngas (Santosh Gangwal, Southern Research Institute – USA)		
10:20 – 10:40	22-5	Investigation of the load change behavior of biomass SER steam gasification in a 200 kWth pilot plant for SNG production (Marcel Beirow, University of Stuttgart – Germany)	23-5	Thermal utilization of organic adhesions – Pyrolysis as a synergetic and integrated production system for waste management and resource recovery (PYRAL AG – Germany)	24-5	Direct synthesis of dimethyl ether (DME) from renewable resources (Marcus Friedel, DBI - Gastecnologisches Institut gGmbH – Germany)		
10:40 – 11:10	Coffee Break + Poster Session							
11:10 – 12:50	Room Pavillon – Session 25: Integrated assessment (2), Chair: Witold-Roger Pogonietz		Room Bellevue – Session 26: Process modeling (3), Chair: Petr Nikrityuk		Room Tegel – Session 27: Mineral matter (3), Chair: Jin Bai	Room Dahlem – Session 28: CCS & CCU, Chair: Martin Gall		
11:10 – 11:30	25-1	Techno-economic analysis of syngas and electric power production in first of a kind industrial gasification plant fed by biomass and agro-industrial residues (Gabriele Calí, Sotacarbo S.p.A. – Italy)	26-1	Numerical study of different burner configurations for high pressure coal gasification process in an entrained flow 200 MW Siemens like gasifier (Thomas Förster, TU Bergakademie Freiberg – Germany)	27-1	Thermochemical software tools for research and practice: FactSage, ChemApp and SimuSage (Stephan Petersen, GTT-Technologies – Germany)	28-1	CO ₂ capture technologies – ready for full scale demonstration (Svein G. Bekken, Gassnova SF – Norway)
11:30 – 11:50	25-2	Technology for synthetic gasoline (Mario Kuschel, Chemieanlagenbau Chemnitz GmbH – Germany)	26-2	CFD simulations of an industrial-scale entrained flow gasifier: Influence of gasifier design and operating conditions (Stefan DeYoung, TU Munich – Germany)	27-2	Monitoring the feedstock quality of coal conversion processes by means of ETV-ICP OES (Daniela Vogt, TU Bergakademie Freiberg – Germany)	28-2	Steady-state process simulation of an IGCC power plant with CO ₂ capture – a comparison of using biomass and Victorian brown coal (Mahmud Arman Kibria, Monash University – Australia)
11:50 – 12:10	25-3	Techno-Economic assessment of polygeneration based on fluidized bed gasification (Christian Heinze, TU Darmstadt – Germany)	26-3	Modeling of hot flow field in an entrained-flow gasifier with single or flat flame burner (Zhen Liu, National Institute of Clean and Low-Carbon Energy – China)	27-3	Thermo-Optical Measuring method (TOM) – A high efficient tool for the analysis and optimization of coal firing process (Andreas Diegeler, Fraunhofer ISC – Germany)	28-3	The structural and adsorption properties of typical South African unmineable coal seams relevant to carbon dioxide storage (Raymond Everson, North West University – South Africa)
12:10 – 12:30	25-4	Minimizing the effects of coal mining on the environment (Lesley Sloss, IEA Clean Coal Centre – United Kingdom)	26-4	Experimental and numerical evaluation of fluidized bed gasification (Jan May, TU Darmstadt – Germany)	27-4	Investigation of sintering reactions in the anhydrite-quartz system using in situ hyperspectral Raman imaging (Nadine Böhme, University of Bonn – Germany)	28-4	Development of energy-saving CO ₂ capture with phase separation absorbent (Koyo Norinaga, Nagoya University – Japan)

12:30 – 12:50	25-5	Production and supply chain costs of internationally traded coals (Paul Baruya, IEA Clean Coal Centre – United Kingdom)	26-5	Detailed deposition characteristics around burner plane in an impinging entrained-flow coal gasifier (Zhicun Xue, East China University of Science and Technology – China)	27-5	Experimental investigation of alkali release during pyrolysis and gasification of coal (Florian Kerscher, TU Munich – Germany)	28-5	Closing the carbon cycle by CO ₂ utilization (Qian Zhu, IEA Clean Coal Centre – United Kingdom)
12:50 – 13:50	Lunch							
13:50 – 14:50	Room Pavillon – Session 29: Feedstock upgrading and mixing, Chair: Denise Klinger		Room Bellevue – Session 30: Ash utilization, Chair: Haim Cohen		Room Tegel – Session 31: Carbon materials & products, Chair: John Bunt		Room Dahlem – Session 32: Plasma gasification, Chair: Felix Baitalow	
13:50 – 14:10	29-1	Upgrading low-grade biomass feedstocks to unlock use for gasification (Sander Grootjes, Energy research Centre of the Netherlands – Netherlands)	30-1	Coal fly ash use rather than disposal (Anne Carpenter, IEA Clean Coal Centre – United Kingdom)	31-1	The effect of particle size on the performance of low smoke fuels in coal stoves (Frans Waanders, North-West University – South Africa)	32-1	Production of synthesis gas from methane by high temperature (Dmitry Subbotin, Russian Academy of Sciences – Russia)
14:10 – 14:30	29-2	Pore structure and reactivity evolution of lignite during the upgrading process by supercritical carbon dioxide extraction (Hongjun Li, East China University of Science and Technology – China)	30-2	Effective methods for managing coal by-products towards CO ₂ emissions reduction (Nikolaos Koukouzas, Centre for Research and Technology Hellas – Greece)	31-2	New markets for Wyoming powder river basin coal by addressing carbon management (Richard Horner, University of Wyoming – USA)	32-2	Investigation of biomass gasification with non-thermal plasma (Yin Pang, Friedrich-Alexander-University Erlangen-Nürnberg – Germany)
14:30 – 14:50	29-3	Effect of CO ₂ on the characteristics of soot derived from coal rapid pyrolysis (Qinghua Chang, East China University of Science and Technology – China)	30-3	Coal ash: The new golden treasure (Haim Cohen, Ariel University at Samaria – Israel)	31-3	Influence of draff as coking additive on the quality of lump coke using non-baking coals (Franz Fehse, TU Bergakademie Freiberg – Germany)	32-3	Plasma gasification of Uranium-Containing solid fuels (Alexandr Ustimenko, NTO Plasmotechnics LLC (R&D) – Kazakhstan)
14:50 – 15:20	Room Pavillon – Closing Ceremony: Bernd Meyer							

Poster Session Program	
Poster 01	Absorption of components in bio-oil on coal and its effects on stability and rheology of coal/bio-oil slurries (Ping Feng, China University of Mining & Technology (Beijing) – China)
Poster 02	Application and proposed research of gasification technology with carbonaceous materials (Zhen Liu, National Institute of Clean-and-Low-Carbon Energy – China)
Poster 03	Applications of metal-organic framework structures in VPSA technology for CO ₂ capture (Izabela Majchrzak-Kucęba, Czestochowa University of Technology – Poland)
Poster 04	Behavior of mineral matter in biomasses and residual materials studied by different ashing methods (Markus Reinmüller, TU Bergakademie Freiberg – Germany)
Poster 05	Chemical looping gasification of Yang Chang non-coking coal using CuFe ₂ O ₄ as oxygen (Qingjie Guo, Ningxia University – China)
Poster 06	CO ₂ emission free hydrogen reduction technology for production of high purity nickels by Two-Stage fluidized bed reactors (Young Ok Park, Korea Institute of Energy Research – South Korea)
Poster 07	Commercialization of emerging environmental sustainability technologies: Case study based on CCU&S (Douglas Brauer, Design Assurance Sciences-MudTurtle Industries, LLC – USA)
Poster 08	Concept studies for a new synthesis process for production of kerosene from CO ₂ and renewable H ₂ (Ludwig Seidl, TU Bergakademie Freiberg – Germany)
Poster 09	Conditioning of coke oven gas: Catalytic removal of oxygen traces (Thomas Wiesmann, Fraunhofer UMSICHT – Germany)

Poster Session Program

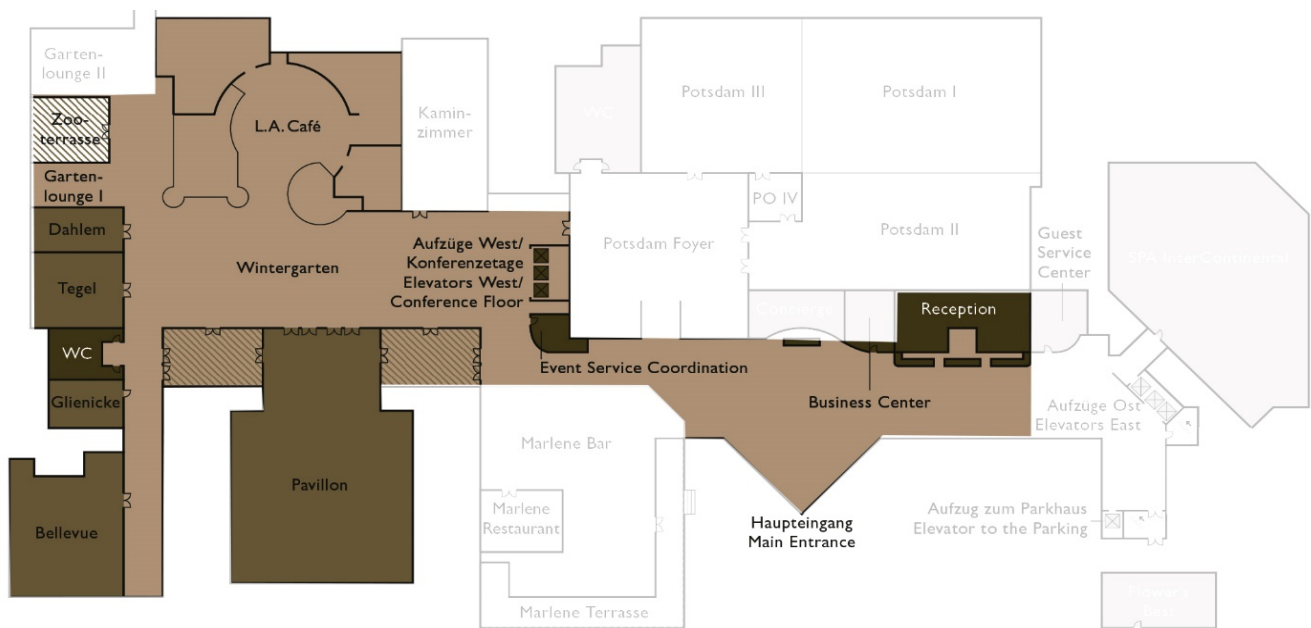
Poster 10	Development and validation of a reduced one-dimensional model for accelerated simulation of coal gasification (Mathias Hartwich, TU Bergakademie Freiberg – Germany)
Poster 11	Development of reusable mercury sorbent for Oxy-fuel IGCC power generation attaining efficient separation of carbon dioxide (Hiroyuki Akiho, Central Research Institute of Electric Power Industry – Japan)
Poster 12	Drying of lignite under low temperature fluidization (Xueshuai Zhu, China University of Mining & Technology (Beijing) – China)
Poster 13	Effect of CaO/Na ₂ O weight ratio on viscosity-temperature characteristics of coal ash slag under gasification condition (Lingxue Kong, CAS Institute of Coal Chemistry – China)
Poster 14	Effect of mineral additives on preparation of activated carbon for methane decomposition to hydrogen (Haoquan Hu, Dalian University of Technology – China)
Poster 15	Highly stable Nickel-Cobalt bimetallic silicides as hydrodesulfurization catalysts (Xiao Chen, Dalian University of Technology – China)
Poster 16	Hydrodynamics of fluidized beds: quality requirements for validation experiments (Lukas Porter, TU Bergakademie Freiberg – Germany)
Poster 17	Influence of pyrolysis pressure and heating rate on char reactivity (Pavel Osipov, Ural Federal University – Russia)
Poster 18	Measurement and characterization of Tars from IEC's British Gas/Lurgi (BGL) pilot gasifier (David Scheithauer, TU Bergakademie Freiberg – Germany)
Poster 19	Method of comprehensive coal deposits ranking for underground coal gasification technology based on technological and Geo-Economic assessment (Alexey Belov, Far Eastern Federal University – Russia)
Poster 20	Non-oxidative catalytic conversion of methane to benzene in a dual circulating fluidized bed reactor system (Zhanguo Zhang, National Institute of Advanced Industrial Science and Technology – Japan)
Poster 21	Novel amine-type sorbent mediated adsorption process technologies for CO ₂ post combustion capture (Gregory Knowles, Monash University – Australia)
Poster 22	Particle residence time and residence time distribution measurements in a pressurized drop tube reactor (Sascha Rußig, TU Bergakademie Freiberg – Germany)
Poster 23	Pilot scale operation and economic evaluation of CO ₂ capture over solid sorbents from flue gas (Lei Li, CAS Institute of Coal Chemistry – China)
Poster 24	Potential of flexible polygeneration plants in Germany based on energy system simulations (Sebastian Miehl, TU Munich – Germany)
Poster 25	Preparation and characteristic of coal based activated carbon (Qingjie Guo, Ningxia University – China)
Poster 26	Preparation of different copper and zinc oxide-based nanocatalysts and their application in CO ₂ hydrogenation to methanol (Mauro Mureddu, Sotacarbo S.p.A. – Italy)
Poster 27	Preparation of NiW carbides with citric acid and its catalytic performance for hydrogenation of aromatics in coal tar (Haiyong Zhang, China University of Mining & Technology (Beijing) – China)
Poster 28	Products of oil shale pyrolysis (Svetlana Saltykova, Saint-Petersburg Mining University – Russia)
Poster 29	Reduced order modeling and optimization for non-catalytic partial oxidation of natural gas (Yury Voloshchuk, TU Bergakademie Freiberg – Germany)
Poster 30	Removal of small content Sulfur compounds and Mercury contained in Coal-Derived gas for IGFC (No-Kuk Park, Yeungnam University – South Korea)
Poster 31	Selective hydrogenolysis of dibenzofuran to biphenyl catalyzed by highly efficient Pt-Mo/MgO catalyst (Changhai Liang, Dalian University of Technology – China)
Poster 32	Small-scale engineered high flexibility gasifier (Santosh Gangwal, Southern Research Institute – USA)
Poster 33	Steam plasma gasification technology (Aleksei Tverskoi, Plazarium – Germany)
Poster 34	Synthesis of sorbents from fly ash - an innovative approach towards a circular economy (Aleksandra Ściubidło, Czestochowa University of Technology – Poland)
Poster 35	The Interaction of hydrodynamics and chemical reactions in bubbling fluidized beds: A numerical investigation (Philip Rößger, TU Bergakademie Freiberg – Germany)
Poster 36	Upgrading fine coal by air winnowing: A novel dry beneficiation technique (Quentin Campbell, North-West University – South Africa)
Poster 37	Valuable substances made of CO ₂ and water - Process simulation of a PtL plant in Heroya/Norway (Ulf Lehmann, EDL Anlagenbau Gesellschaft mbH – Germany)

Technical Tours	
Thursday 7 June 2018	
07:00 – 18:00	● Technical Tour 1: Lignite First-Hand <i>Welzow South plus Power Plant "Schwarze Pumpe"</i>
07:30 – 18:00	● Technical Tour 2: High-Tech Wood Production <i>World's leading wood-based panel producer Kronospan</i>
Friday 8 June 2018	
08:00 – 14:00	● Technical Tour 3: Adamant Innovations (half day) <i>Cement manufacturer CEMEX in Rüdersdorf</i>
08:00 – 17:00	● Technical Tour 3: Adamant Innovations (full day) <i>Cement manufacturer CEMEX in Rüdersdorf and SIEMENS gas turbine innovation centre Siemensstadt</i>

*The technical tours will be departing from the InterContinental Berlin. Arrival time back in the InterContinental Berlin from the technical tours will be dependent on traffic conditions. Please note that traffic conditions in and around Berlin can be difficult and the potential for traffic jams is high especially in the evening when we return from the technical tours back to Berlin.

**Technical tours will include refreshments. Full day technical tours will include lunch and refreshments.

Floor Plan (InterContinental)



Please note that the program is prepared in American English. Presentation titles in British English are therefore edited to ensure consistency in the language used in the conference abstract book.

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TU Bergakademie Freiberg
Institute of Energy Process Engineering and Chemical Engineering
Fuchsmuehlenweg 9, 09599 Freiberg, Germany
Phone: +49 3731 39- 4511, Fax: +49 3731 39-4555
Email: gasification@iec.tu-freiberg.de, Web: www.gasification-freiberg.com