



Program

Monday 19 September 2022

18:00 – 21:00 Terra Mineralia, Freiberg – Registration & Welcome Evening

Tuesday 20 September 2022

08:30 – 16:30 Foyer Schlossplatzquartier – Registration, Posters & Exhibition

09:00 – 10:00 Opening Ceremony Bernd Meyer & Martin Gräbner, Institute of Energy Process Engineering and Chemical Engineering, TU Bergakademie Freiberg – Germany, Auditorium

10:00 – 10:10 Group Picture

10:10 – 10:40 Coffee Break + Poster Session

10:40 – 12:00 **Session 1: Gasification Technologies,**
Chair: Christopher Higman,
 Auditorium **1**

Session 2: CFD,
Chair: Andreas Richter,
 Seminar room 2 **2**

10:40 – 11:00 01-1 High temperature conversion of sewage sludge and waste – Pilot plants, current status and initial operation results (Tobias Ginsberg, RWE Power AG - Germany)

02-1 Effect of operating parameters on performance and hydrogen production in entrained flow gasifier (Hyungtae Kim, Pusan National University - Republic of Korea)

11:00 – 11:20 01-2 Torrgas gasification technology for bioSNG production (Robert Berends, Torrgas - The Netherlands)

02-2 Co-gasification of coal and other carbon-based fuels (Johannes Scherer, TU Bergakademie Freiberg, IEC - Germany)

11:20 – 11:40 01-3 Overview on GTI Energy gasification technologies: Present and future (Zach El Zahab, GTI Energy - United States)

02-3 Resolving biomass combustion in industrial furnaces (Daniel Louw, University of Luxembourg - Luxembourg)

11:40 – 12:00 01-4 CHOREN entrained flow gasification – update of technology and projects (Björn Wolf, CHOREN Industrietechnik GmbH - Germany)

02-4 CFD modeling of biomass entrained flow gasification: Implementing Langmuir-Hinshelwood kinetics for intrinsic char reaction rates (Sebastian Wilhelm, Technical University of Munich - Germany)

12:00 – 13:00 Lunch

13:00 – 14:20 **Session 3: Plasma Gasification,**
Chair: Martin Gräbner,
 Auditorium **3**

Session 4: CFD & Data Science,
Chair: Zach El Zahab,
 Seminar room 1 **4**

Session 5: LCA & TEA,
Chair: Andrew Minchener,
 Seminar room 2 **5**

13:00 – 13:20 03-1 Waste gasification's Tesla moment is now – turning hydrogen „fool cells” into „jewel cells” (Francis Eboh, Boson Energy - Luxembourg)

04-1 DCS & AI for waste-incineration- and biomass-plants (Frank Gebhardt, UNIPER Technologies GmbH - Germany)

05-1 Life cycle assessments of environmental and climate impacts of chemical recycling technologies – Towards a systemic approach for transparency and comparability (Florian Keller, TU Bergakademie Freiberg, IEC - Germany)

13:20 – 13:40 03-2 Production of renewable hydrogen for clean transportation by means of plasma gasification. Case study of a commercial project in Lancaster, CA. (Sylvain Motycka, SG H2 Energy Global LLC - United States)

04-2 A reference data set for model validation of hydrodynamics in bubbling fluidized beds: PIV and pressure measurements (Lukas Porter, TU Bergakademie Freiberg, IEC - Germany)

05-2 A techno economic analysis for the R-GAS partial-oxidation (POX) reactor for high-purity hydrogen production (Zach El Zahab, GTI Energy - United States)

13:40 – 14:00 03-3 Plasma gasification of unsorted biomedical waste in various agents (Alexandr Ustimenko, Plasmatechnics R&D LLP - Kazakhstan)

04-3 Development of predictive models for a CFD reactive flow system based on machine learning algorithms (Mohsen Gharib, Fraunhofer IMWS - Germany)

05-3 A business case for chemical recycling? – Recommendations for techno-economic assessment of chemical recycling technologies (Raoul Voss, TU Munich - Germany)

14:00 – 14:20 03-4 Process simulation of plasma-assisted entrained flow gasification for hydrogen-rich syngas production (Sebastian Bastek, TU Munich - Germany)

04-4 CFD modeling of heat transport in fixed-bed synthesis processes (Shreyas Rohit Srinivas, TU Bergakademie Freiberg, CIC Virtuhcon - Germany)

05-4 Preliminary evaluation of the sustainability of residual municipal waste-to-chemicals technology (Lidia Lombardi, Niccolò Cusano University Rome - Italy)

14:20 – 14:50 Coffee Break + Poster Session

14:50 – 16:30		Session 6: Fluidized Bed Gasification, Chair: Jason Laumb, Auditorium	6	Session 7: Feedstock and Thermal Treatment, Chair: Steffen Krzack, Seminar room 1	7	Session 8: Integrated Waste Concepts, Chair: Stefanie Eiden, Seminar room 2	8
14:50 – 15:10	06-1	Gasification of waste biomass and municipal waste – IChPW experience (Tomasz Iluk, Institute for Chemical Processing of Coal - Poland)		07-1	Energy valorization of biochar from hydrothermal liquefaction (HTL) of municipal sewage sludge through co-gasification with biomass and waste feedstocks (Krzysztof Kapusta, Central Mining Institute - Poland)	08-1	Integrated biomass gasification options for ethanol facilities (Jason Laumb, University of North Dakota, EERC - United States)
15:10 – 15:30	06-2	Pilot-scale study of RDF gasification in pilot-scale HTW®2.0 gasifier (Elyas Moghaddam, GIDARA Energy - The Netherlands)		07-2	Decontamination of non-recyclable municipal solid waste and pre-processing for U-GAS® gasification (Matthew Davidson, GTI Energy - United States)	08-2	Development of poly-generation systems using various fuels (coal, wastes) with CO ₂ capture (Satoshi Umemoto, Central Research Institute of Electric Power Industry (CRIEPI) - Japan)
15:30 – 15:50	06-3	High temperature Winkler gasification in 500 kWth scale: Influence of SRF co-gasification on syngas quality and performance of gas cleaning steps (Jens Kaltenmorgen, TU Darmstadt - Germany)		07-3	NIR real time chemical analysis of coal or biomass for process control of gasification processes (Petra Mühlen, SpectraFlow Analytics AG - Switzerland)	08-3	Net-carbon-negative hydrogen production using biomass blends and carbon capture (Joshua Stanislawski, University of North Dakota, EERC - United States)
15:50 – 16:10	06-4	Challenges in gasification of non-standard feedstock in fluidized beds (Tim Schulzke, Fraunhofer UMSICHT - Germany)		07-4	Tailor-made mechanical refinement of raw materials and residues for thermo-chemical conversion (Franz Fehse, TU Bergakademie Freiberg, ITUN - Germany)	08-4	Development of a turbo-compound-system in performance with a gasification process for the utilization of biogenic residues and waste materials (Luis Wunder, TU Dresden - Germany)
16:10 – 16:30	06-5	Optimization of the internal circulation principle for waste gasification (Ronny Schimpke, TU Bergakademie Freiberg, IEC - Germany)		07-5	The eco slin process chain and its core technology – double fired fixed bed gasification (André Schmidt, ATNA Industrial Solutions GmbH - Germany)	08-5	New method for conversion of agriculture and organic wastes into clean fuels (Narangerel Janchig, Institute of Chemistry and Chemical Technology, MAS - Mongolia)
18:30 – 21:00 Conference Dinner + IEC Technical Tour, IEC Reiche Zeche, Freiberg							

Wednesday 21 September 2022

08:30 – 17:10	Foyer Schlossplatzquartier – Registration, Posters & Exhibition
09:00 – 10:30	Industry Panel Session: Chemical Recycling in Transforming Industries, Chair: Bernd Meyer & Martin Gräbner, Auditorium
09:00 – 09:10	Sustainability drives BASF. BASF drives sustainability (Markus Weber, BASF SE - Germany)
09:10 – 09:20	Covestro will become fully circular (Stefanie Eiden, Covestro Deutschland AG - Germany)
09:20 – 09:30	Research & development at RWE Power - Approaches to circular carbon economy (Jens Hannes, RWE Power AG - Germany)
09:30 – 09:40	HyRes technology – heavy oil pyrolysis as a link for closing the carbon cycle by gasifying the pyrolysis residues from the processing of used oils and lubricants (Andreas Schüppel, Puraglobe Holding GmbH - Germany)
09:40 – 09:50	Pyrolysis 360° - recycled aluminum and green hydrogen for a complete circular economy within flexible packaging (Markus Reissner, PreZero Pyral GmbH - Germany)
09:50 – 10:00	Enabling circular supply chains, decarbonization, and carbon removal in low disposal cost markets with sustainable aviation fuels (Stephen Johnson, Illinois Clean Fuels - United States)
10:00 – 10:30	Panel Discussion
10:30 – 11:00	Coffee Break + Poster Session

11:00 – 12:40	Session 9: Chemical Recycling Concepts, <i>Chair: Martin Gall,</i> Auditorium		Session 10: China Development (HYBRID), <i>Chair: Roh Pin Lee / Jin Bai,</i> Seminar room 2	
11:00 – 11:20	09-1	Waste gasification as future solution to waste incineration – an outlook (Berend Vreugdenhil, TNO - The Netherlands)	10-1	Technologies for carbon-containing waste to resources: Applications and prospects (Fuchen Wang, East China University of Science and Technology - China)
11:20 – 11:40	09-2	Chemical recycling of wastes via synthesis gas to liquid energy carriers (Matthias Müller-Hagedorn, Air Liquide Forschung und Entwicklung GmbH - Germany)	10-2	The pyrolysis and gasification of organic solid waste to produce high-quality liquid fuels, carbon materials and syngas (Huiyan Zhang, Southeast University - China)
11:40 – 12:00	09-3	Closing of carbon cycle by waste gasification for circular economy implementation in Poland (Joanna Bigda, Institute for Chemical Processing of Coal - Poland)	10-3	R&D of co-gasification of coal and other feedstock in China (Xudong Song, Ningxia University - China)
12:00 – 12:20	09-4	Mixed Solid Waste Gasification – Reality at Commercial Scale (Matthias Schmidt, Enerkem - Canada)	10-4	Biomass gasification in China: Development and challenges (Huacai Liu, Guangzhou Institute of Energy Conversion - China)
12:20 – 12:40	09-5	Chemical recycling - 30 years of research and development - Status today (Reinhard Schu, EcoEnergy Gesellschaft für Energie- und Umwelttechnik mbH - Germany)	10-5	Design improvement of the key gasification equipment using selective laser melting technology (Wei Fu, TU Bergakademie Freiberg, IEC - Germany)
12:40 – 13:40	Lunch			
13:40 – 15:00	Session 11: Kinetics, <i>Chair: Makoto Kobayashi,</i> Auditorium		Session 12: Mineral Matter 1, <i>Chair: Stefan Guhl,</i> Seminar room 2	
13:40 – 14:00	11-1	Characterization of single-particle reactions of alternative carbonaceous feedstocks in O ₂ , H ₂ O and CO ₂ (Felix Küster, TU Bergakademie Freiberg, IEC - Germany)	12-1	Software and data for thermochemical calculations in the area of waste gasification (Stephan Petersen, GTT-Technologies - Germany)
14:00 – 14:20	11-2	Kinetics modeling and thermodynamic study of various polyethylene terephthalate materials using thermogravimetric analysis (Shouzhuang Li, Aalto University - Finland)	12-2	Thermodynamic modeling of the slag behavior in an entrained flow gasifier (Johan van Dyk, GTI Energy - South Africa)
14:20 – 14:40	11-3	Studies on the structural development of different fuel types during high-temperature entrained flow gasification (Tobias Netter, TU Munich - Germany)	12-3	Investigations on the release of phosphorous species during (co-)gasification of sewage sludge (Marcel Siepmann, Forschungszentrum Jülich - Germany)
14:40 – 15:00	11-4	Characterizing gasification feedstock materials by high pressure thermogravimetric analysis (Thomas Paschke, TA Instruments – Germany)	12-4	Coal combustion and gasification residues as efficient scrubbing reagent for toxic chemical wastes and its potential incorporation in industrial concrete (Haim Cohen, Ariel University - Israel)
15:00 – 15:30	Coffee Break + Poster Session			
15:30 – 16:50	Session 13: Components & Downstream Processes, <i>Chair: Jens Hannes,</i> Auditorium		Session 14: Mineral Matter 2, <i>Chair: Johan van Dyk,</i> Seminar room 2	
15:30 – 15:50	13-1	Air Liquide Engineering & Construction's low-carbon syngas solutions focusing on gasification technologies (Alexander Roesch, Air Liquide Global E&C Solutions - Germany)	14-1	Development and application of a database of physical properties for multicomponent oxide melts (Guixuan Wu, GTT-Technologies - Germany)
15:50 – 16:10	13-2	Flexible operation of dry sulfur removal process for poly-generation system (Makoto Kobayashi, Central Research Institute of Electric Power Industry (CRIEPI) - Japan)	14-2	Comparison of the behavior of inorganic constituents in chemical looping gasification of pre-treated straw and woody biomass (Michael Müller, Forschungszentrum Jülich GmbH - Germany)
16:10 – 16:30	13-3	Some aspects for methanol and CO ₂ (Maximilian Vicari, BASF SE - Germany)	14-3	Effect of phosphorus and secondary phases on slag viscosity (Stefan Guhl, TU Bergakademie Freiberg, IEC - Germany)
16:30 – 16:50	13-4	50 years of gasification in Vřesova (Zdenek Jonat, SUAS Vřesova - Czech Republic)		
16:50 – 17:10	Closing Ceremony Bernd Meyer & Martin Gräbner, Institute of Energy Process Engineering and Chemical Engineering, TU Bergakademie Freiberg – Germany, Auditorium			

Poster Session Program

Poster 01	Study of tire char steam gasification with the use of catalyst based on biomass ashes under various pressures (Piotr Soprych, AGH University of Science and Technology - Poland)
Poster 02	Scenario-based evaluation of the utilization of waste and biogenic residues for sector coupling via polygeneration (Andreas Hanel, Technical University of Munich - Germany)
Poster 03	Development and testing of process approaches for the gasification of nuclear graphite for the optimal separation of radioactive contamination (Sergei Shalnev, TU Bergakademie Freiberg, IEC - Germany)
Poster 04	Mongolian low-rank coal pyrolysis and char gasification with CO ₂ (Narangereel Janchig, Institute of Chemistry and Chemical Technology, MAS - Mongolia)
Poster 05	Hydrothermal carbonization of Green Harvesting Residues (GHR) from sugar cane: Effect of temperature and water/GHR ratio on thermal and combustion performance (Alexsander Portilla Amaguaña, Chemical Engineering School - Colombia)
Poster 06	TGA-DSC combined coal analysis as a tool for reactivity and mechanism of coal (Aviv Hassid, Ariel University - Israel)
Poster 07	Gasification kinetics of low-grade waste under high-pressure entrained flow conditions (Weiss Naim, Technical University of Munich - Germany)
Poster 08	STEEP evaluation of technological and resource alternatives for carbon feedstock to support a raw materials transition in the German Industry (Roh Pin Lee, TU Bergakademie Freiberg, IEC - Germany)
Poster 09	»Waste4Future« – From waste to raw material (Philipp Rathsack, Fraunhofer IMWS - Germany)
Poster 10	Next generation high temperature conversion technologies for future energy demands at the Center for Efficient High Temperature Processes and Materials Conversion (ZeHS) (Ronny Schimpke, TU Bergakademie Freiberg, IEC - Germany)
Poster 11	Synthesis gas from sewage sludge gasification as CO ₂ -neutral fuel for the energy intensive industry (Alexander Neagos, KOPF SynGas GmbH & Co. KG - Germany)
Poster 12	Fluidized-bed gasification of wastes and syngas processing (Ville Nikkanen, VTT, Technical Research Centre of Finland - Finland)
Poster 13	In situ flame monitoring using an additively manufactured probe system for the gasification process (Wei Fu, TU Bergakademie Freiberg, IEC - Germany)
Poster 14	»SBV mono« – Chemical recycling of carbonaceous waste by slagging fixed-bed gasification (Jörg Kleeberg, Fraunhofer IMWS - Germany)

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.

Thursday 22 September 2022

Technical Tours

Technical Tour 1 (08:00–11:00)	Becker Umweltdienste
Technical Tour 2 (10:00–16:30)	Becker Umweltdienste & AWVC Abfallwirtschaftsverband Chemnitz
Technical Tour 3 (08:00–16:00)	Becker Umweltdienste & Puraglobe

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