

## Event description

The 11th International Freiberg Conference on Circular Carbon Technologies will take place from 24–29 September 2023 in Rotterdam, Netherlands.

This event is organized by the Institute of Energy Process Engineering and Chemical Engineering (IEC) at the TU Bergakademie Freiberg (Germany). It focuses on the opportunities, challenges and developments in circular carbon and hydrogen technologies for the transition towards a net-zero carbon economy via recirculation of carbon-containing waste streams into the production cycle i.e., Waste-to-Products for decarbonization and zero waste.

We invite you to join us in this event which will provide an interactive discussion forum not only for scientists, specialists, practitioners and diverse stakeholders to exchange latest developments, information and insights for the transition towards a net-zero carbon economy at the nexus of science, technology and society; technology developers and plant operators will also share their current/planned projects as well as operational experiences along the Waste-to-Products value chain.

In addition to the scientific program, the conference will also include the opportunity to participate in exciting technical tours to the Port of Rotterdam, as well as interesting social events designed to facilitate networking and interaction between conference participants.

Topics for oral and poster presentations include:

### (a) Technologies & processes for net zero carbon economy

- Thermo-chemical conversion processes and circular carbon technologies (gasification, co-gasification, pyrolysis, direct liquefaction, integration of renewable H<sub>2</sub>/CO<sub>2</sub>/N<sub>2</sub>, ...);
- Electrification of chemical conversion processes (e.g., application of plasma, electrothermal Joule heating, microwave heating, inductive heating, ...);
- Decarbonizing hydrogen production (e.g., blue H<sub>2</sub> via SMR, ATR, gas POX, gasification; turquoise H<sub>2</sub> via methane pyrolysis; bio-based green H<sub>2</sub> via waste/bio-residue gasification), and its derivatives (e.g., methanol, ammonia, liquid H<sub>2</sub>, bio-SNG, ...);
- Innovative gas treatment and cleaning (e.g., RWGS, next generation amines, plasma tar removal, cryogenic CO<sub>2</sub> removal, ...);
- Innovative synthesis technologies (CO<sub>2</sub>-based syntheses, direct syngas conversion, methanol-to-olefins, methanol-to-aromatics, Fischer-Tropsch synthetic crude, methanol, ethanol, DME, ammonia, bio-gas methanation, ...);
- Technologies for CO<sub>2</sub> management (CO<sub>2</sub> as a feedstock/CCU, direct air capture, local storage and pooling, decentralized capture e.g., on ships, transport and handling, CCS, ...);
- Chemical energy storage Power-to-X (e.g., Power-to-Liquids, E-Fuels, Power-to-Gas, SAF - sustainable aviation fuels, ammonia, methanol, ...);
- High value and long-life carbon products (graphene, carbon fiber, carbon black, graphitic carbon, soil enhancement, construction materials, ...);
- ...

## (b) Concepts & assessments for net zero carbon economy

- Site integration opportunities (e.g., residue pooling from different industries for zero waste and waste-to-products);
- Integration of low-carbon energy carriers (methanol, ammonia, hydrogen replacing fossil fuels in high-temperature processes);
- Innovative power plant concepts for IGCC and polygeneration (Allam cycle, H<sub>2</sub>/NH<sub>3</sub> fueled, fuel cell integration, ...);
- Intersectoral collaboration (e.g., between waste, chemical, recycling, energy, automotive sectors);
- Transfer and adaptation opportunities of existing assets towards net-zero (e.g., SMR, crackers, coal-to-chemicals sites, ...);
- Studies/assessments for net zero carbon economy (e.g., life cycle assessment, techno-economic assessment, socio-political assessment, risk assessment, mass-balance approach, concept evaluations & flow-sheet simulations);
- ...

## (c) Feedstock, treatment & upgrading processes

- Carbon feedstock for Waste-to-Products (e.g., MSW, RDF/SRF, mixed plastic waste residues, sewage sludge, ocean waste, biowaste, agricultural and animal waste, carbon- and glass fiber composites, automobile shredder, ...);
- Carbon abatement for fossil feedstock (e.g., petcoke, oil residues, lignite, high ash high melting coals, ...);
- Feedstock treatment and preparation (collection, sorting, crushing, baling, drying, feeding, deashing, agglomeration, pressurizing, ...);
- Feedstock/product analysis (e.g., LHV, characterization, reaction kinetics, analytics of heterogeneous feedstock, trace components, contaminants, quality limits, ash/slag, detailed hydrocarbon analyses, ...);
- Low temperature conversion processes (e.g., extraction, torrefaction, pyrolysis, ...);
- Upgrading of pyrolysis products (e.g., tars, oils, coke, reforming, upgrading, hydrotreating, refining, ...);
- Utilization of by-products (solid, liquid, gaseous by-products/emissions);
- ...

## (d) Modeling & simulation

- CFD modeling of sub-processes and overall process;
- CFD modeling of reactor designs and different syntheses;
- Process and process chain simulations;
- ...

## (e) Projects, market trends and global developments

- Industrial project development, deployments & operational experiences (e.g., pilot, demonstration, commercial projects);
- Net zero drivers, challenges and business cases – perspectives from industry (e.g., waste management/recycling companies, chemical industries, energy sector, transport sector, hydrogen economy, technology developers, ...);
- Trends and opportunities (zero-waste cities, circular carbon economy, net zero economy, chemical/advanced recycling, hydrogen economy, electrification, CO<sub>2</sub> neutral mobility, ...);
- Networks and initiatives (e.g., national and international networks on zero waste, carbon neutrality, circular economy, hydrogen economy, ...);
- Regulatory boundary conditions (social, economic, regulatory, political) for sustainable carbon conversion to chemicals, transportation fuels and electricity;
- ...

(f) Others

- ...

## Conference Schedule

Sunday 24 September 2023	17:00–19:00	Welcome reception (Loft nhow Hotel)
Monday 25 September 2023	09:00–16:30	Opening ceremony, conference sessions
	18:00–22:00	Conference dinner
Tuesday 26 September 2023	09:00–16:30	Conference sessions
	17:00–19:00	Poster Reception
Wednesday 27 September 2023	09:00–16:00	Conference sessions & closing ceremony
Thursday & Friday 28–29 September 2023	07:30/08:00– 16:00/16:30	Off-site technical tours (optional)

## Registration fees

	EARLY (until 31 July 2023)*	LATE (from 01 August 2023)*
Participant	1050 EUR	1250 EUR
Presenter (Oral/Poster Presentation)	950 EUR	1050 EUR
Members "Circular Carbon Economy Network"	700 EUR	850 EUR
Accompanying Person^ (No Session Entrance)	250 EUR	250 EUR

\*The deadline for early registration is midnight (Central European Summer Time) on 1 August 2023.

^Accompanying persons will not have access to conference sessions or coffee and lunch breaks from 25–27 September 2023. However, they are welcome to join conference participants for the social events (i.e., Welcome Reception on Sunday evening and Conference Dinner on Monday evening).

The registration fee includes the scientific program fee and the social program fee.

The registration fee is excluding VAT.

Scientific Program includes:

- All conference sessions (including poster session)
- Conference materials
- Download of presentations after the conference from the conference website

General Social Program includes:

- Welcome Reception on 24 September 2023
- Conference Dinner on 25 September 2023

## Contact

Please contact the conference office for all enquiries, if you need an invitation letter for visa application or organizing your travel to the conference venue.

Please use the contact form below to contact us.

IEC Organizing Committee

Institute of Energy Process Engineering and Chemical Engineering  
TU Bergakademie Freiberg  
Fuchsmuehlenweg 9 D (Reiche Zeche) / Haus 1  
09599 Freiberg  
Germany

Web: <https://gasification-freiberg.com/>

Email: [ifc2023@gasification-freiberg.com](mailto:ifc2023@gasification-freiberg.com)

Fax: +49 3731 39-4555

Phone:

Dr. Roh Pin Lee: (for questions regarding sponsoring and conference topics)

+49 3731 39-4423

Dr. Sindy Bauersfeld: (for questions regarding conference organization and logistics)

+49 3731 39-4536