Event description

Under the European waste hierarchy of reduce, reuse, recycle, recovery and landfilling, the focus on recycling of packaging waste has been placed on mechanical recycling. As this reaches its limits in addressing mixed plastic waste streams, global interest in chemical recycling is growing. To date, global project deployments in this area have predominantly focused on the pyrolysis of plastic waste to produce liquids (i.e. pyrolysis oil as naphtha substitute). Increasingly, international awareness is growing that chemical recycling – especially in the form of waste gasification – has applicability beyond plastic waste streams.

Waste gasification offers an alternative to incineration and landfilling for the large quantities of mixed, unsorted, contaminated and challenging waste fractions which are not suitable for mechanical recycling or pyrolysis. In enabling the use of such carbon-containing waste fractions as alternative feedstock to conventional resources (i.e. crude oil, natural gas, coal) for chemical production, it has the potential to make a substantial contribution to the transition towards a low carbon, circular and hydrogen economy. Moreover, the integration of renewable electricity in gasification also enables a lowering of the CO_2 footprint and facilitates the storage of energy in products. Despite this potential, numerous socio-technological-economical-ecological-political questions and issues associated with the development and project deployment of waste gasification remain to be answered/resolved.

In view of its potential contribution to the decarbonization and sustainability transformation of carbon intensive industries, chemical recycling in the form of waste gasification thus forms the focus of the **"2022 International Freiberg Conference on Waste Gasification – Syngas & Hydrogen from Challenging Secondary Feedstock"** which will be taking place from **19-21 September 2022 in Freiberg, Germany**.

The event focuses on the opportunities, challenges and developments in thermo-chemical conversion of a wide range of challenging carbon-containing waste streams into synthesis gas and/or hydrogen for chemical utilization. It provides an interactive discussion forum for specialists and practitioners as well as stakeholders to exchange information and insights about new developments from research and technology developers as well as current/planned projects and operational experiences by plant operators along the Waste-to-Products value chain.

Topics for oral and poster presentations include:

(a) Feedstock & treatment processes

- Mixed, unsorted, contaminated and challenging carbon-containing feedstock for waste gasification (MSW, RDF/SRF, mixed plastic waste residues, sewage sludge, ocean waste, biowaste, agricultural and animal waste, carbon- and glass fiber composites, automobile shredder, petcoke, oil residues, …),
- Waste treatment and preparation (collection, sorting, crushing, agglomeration, baling, torrefaction, …),
- Mechanical-physical (drying, feeding, deashing, …) and thermo-chemical conversion processes (e.g. LHV, reaction pathways, reaction kinetics),
- Analytics, characterization and quality control of heterogeneous feedstock, trace components, contaminants, feedstock quality limits,
- …

(b) Conversion processes, technologies & products

- Waste gasification processes and technologies (entrained-flow, fluidized-bed, fixed-bed, plasma, combined processes, integration of renewable H_2, CO_2, N_2, …),
- Adaptations for special waste streams,
- Adaptations for chemical products (e.g. Methanol, Ethanol, DME, FT, MtO, Ammonia) and hydrogen,
- Waste feeding and pressurizing, ash/slag treatment, post-gasification, waste water free operation,
- Electrification of conversion processes and technologies (e.g. application of plasma, microwave heating, inductive heating),
- Emissions, waste water and solid disposals,
- Downstream processes for syngas and H_2 utilization,
- …

(c) Modeling & integrated assessment

- CFD modeling of sub-processes and overall process,
- Concept evaluations and flow sheet simulation of waste gasification, process stages and value-chain (TEA – Techno-economic analyses, LCA – life cycle assessments),
- Risk assessment,
- Pros and cons analysis, scenario studies,
- …

(d) Projects, trends and experiences

- Industrial project development, industrial demonstration projects, industrial operation experience,
- Perspectives from gasification technology developers, …
- Perspectives and needs from waste providers, (petro)chemical industries, recycling industries, hydrogen economy, wood industries, automobile industries, agriculture industries, retail, business and trade, farming, …Trends and drivers (zero-waste cities, circular carbon economy, chemical/advanced recycling, hydrogen economy, electrification, ….),
- National/global boundary conditions (social, economic, regulatory, political),
- …

This conference is organized by the Institute of Energy Process Engineering and Chemical Engineering (IEC) at the TU Bergakademie Freiberg (Freiberg, Germany), and supported by the Fraunhofer Institute for Microstructure of Materials and Systems IMWS Branch Lab "Circular Carbon Technologies" and the German Network for a Circular Carbon Economy (NK2 Network).

Conference Schedule

Monday 19th September 2022	10:00 – 14:40	Compact waste gasification training course (limited to 20 participants)
	19:00 – 21:00	Welcome reception & tour of Terra Mineralia
Tuesday 20th September 2022	09:00 – 16:00	Opening ceremony, conference sessions & technical tour of IEC's gasification pilot facilities
	18:00 – 22:00	Conference dinner at Reiche Zeche
Wednesday 21st September 2022	09:00 – 16:00	Conference sessions & closing ceremony
Thursday 22nd September 2022	09:00 – 16:00	Technical tours to external facilities (optional)

Registration fees

	Registration fee
Participant	720 EUR
Presenter (Oral/Poster Presentation)	620 EUR
Members "Circular Carbon Economy Network"	360 EUR
Accompanying Person^ (No Session Entrance)	150 EUR
Technical Tour - complete day	180 EUR
Technical Tour – half day	120 EUR

^Accompanying persons will not have access to conference sessions or coffee and lunch breaks from 20–21 September 2022. However, they are welcome to join conference participants for the social events (i.e. Welcome Reception on Monday evening and Conference Dinner on Tuesday evening).

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

Scientific program fee and the fees for the Technical Tour are not liable to VAT, pursuant to § 4 Nr. 22a, German VAT Act (UStG).
19% German VAT applies for the social program fee and the fee for accompanying persons.

Scientific Program includes:

- All conference sessions (including poster session)
- Conference materials
- Download of presentations after the conference from the conference website
- Technical tour of IEC's facilities

General Social Program includes:

- Welcome Reception on 19 September 2022
- Conference Dinner on 20 September 2022