



RESEARCH GROUP:

Future Energy Technology

Email: hermann.hofbauer@tuwien.ac.at

Web: <http://www.vt.tuwien.ac.at>

Phone: +43 1 58801 166300

Fax: +43 1 58801 16699

Project Groups of „Future Energy Technology“:



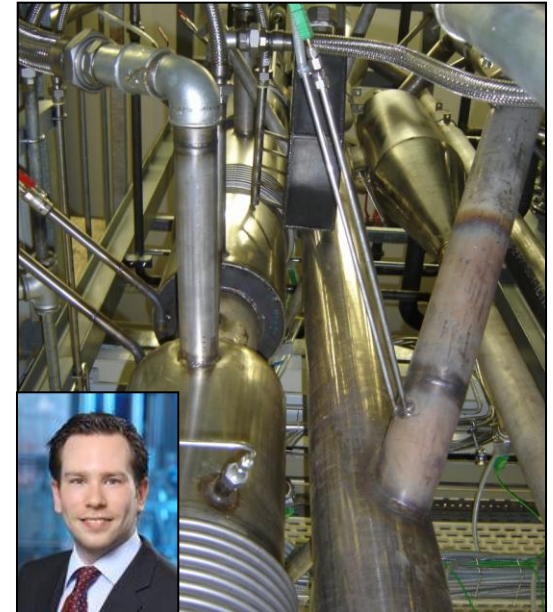
Univ.Prof. DI Dr. Hermann Hofbauer
Head of Research Group
“Future Energy Technology”
Contact: hermann.hofbauer@tuwien.ac.at



Project Group:
Gasification & Gas Cleaning
Contact: johannes.schmid@tuwien.ac.at



Project Group:
Synthetic Biofuels
Contact: reinhard.rauch@tuwien.ac.at



Project Group:
Zero Emission Technologies
Contact: stefan.penthor@tuwien.ac.at

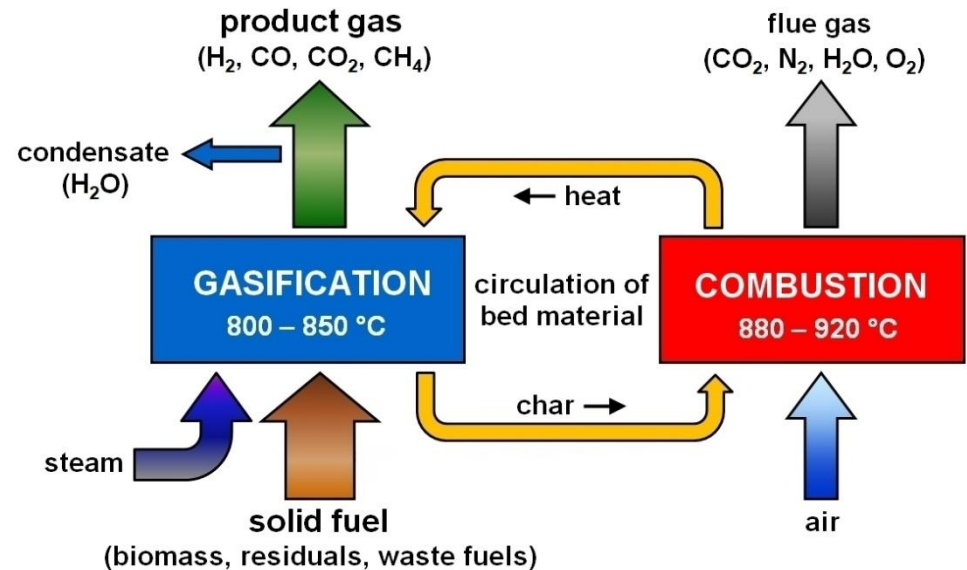
Gasification & Gas Cleaning

The GGC team focuses on projects from the energy technology sector with a specification on gasification technologies as well as catalytic tar removal from producer gas originating from thermo-chemical hydrocarbon conversion processes.

Mission: Development of fuel flexible, high efficient gasification technologies for the production of high quality syngas.

Research topics:

- Dual fluidized bed steam gasification of biomass, coal, waste materials
- Producer gas adaptation by catalytically active bed material
- Catalytic reforming of hydrocarbons in secondary units
- Research and development on novel of gas cleaning technologies



Gasification & Gas Cleaning



wood



agricultural waste



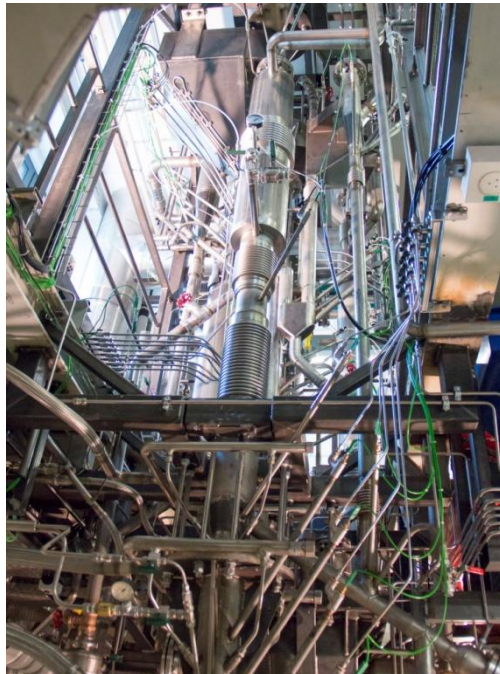
coal



industrial residues



waste fractions



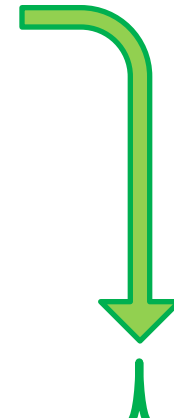
Results with the 100 kW test plant at TU Wien:

- Development and research on novel gasification processes
- Measurement results and data validation with simulation tool
- Detailed process knowledge with various fuel types and fuel mixtures
- Data for the design of gas cleaning equipment
- Scaling possibility to industrial sized plants, minimizing of technological risks

Gasification & Gas Cleaning

Consulting plant engineering projects:

- Design and conceptual consultancy
- Mass and energy balances of industrial sized plants
- Input for the basic engineering phase
- Support due to the commissioning of plants
- Optimization on plant operation



heat



electricity



hydrogen



fuels



synthetic natural gas



Synthetic Biofuels

R&D Focus

Group Mission:

Development of processes for the conversion of lignocellulosic biomass to synthetic biofuels and chemicals as:

- **Fischer Tropsch Synthesis for production of diesel and kerosene**
- **Methanation for production of synthetic natural gas (BioSNG)**
- **Synthesis of mixed alcohols**
- **Production of hydrogen from biomass**

R&D Approaches:

- **Development of new and efficient reactors for the synthesis itself (e.g. slurry reactors)**
- **integration of the synthesis into the whole process chain, including gasification and gas treatment**
- **Performing tests with real synthesis gas from biomass using slip streams from biomass CHPs**

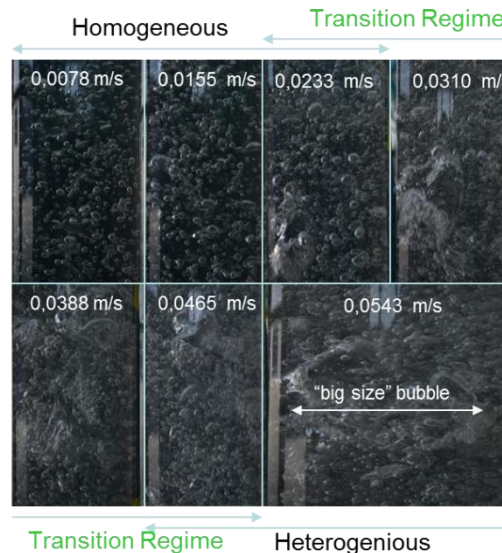
Synthetic Biofuels

Recent R&D topics:

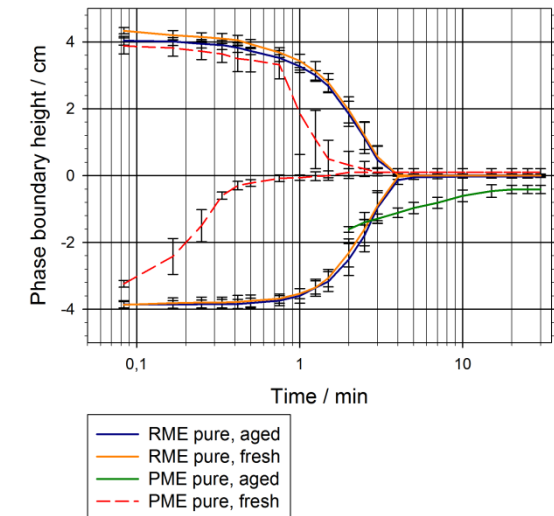
- **Winddiesel as hybrid process for combination of Wind energy with biomass**
- **InnoGasClean, where the optimisation of the RME scrubber is investigated**
- **Representation of Austria in IEA Bioenergy Task 33 Thermal Gasification of Biomass**



FT synthesis, where the load changes are done for Winddiesel



Investigation the fluidynamics of bubble reactor



Phase separation behaviour of different organic liquids and testing the aging effects

Zero Emission Technologies

R&D Focus Group Mission:

Optimization and development of processes that substantially reduce GHG emissions

R&D Approaches:

- **Development of efficient CO₂ capture technologies**
- **Energy efficiency increase in industrial processes**
- **Substitution of fossil fuels**

Recent R&D topics:

- **Chemical looping combustion and reforming**
- **Gas separation via continuous temperature swing adsorption**
- **Analysis and optimization of industrial fluidized bed combustors**

Zero Emission Technologies

Team: Chemical Looping Combustion

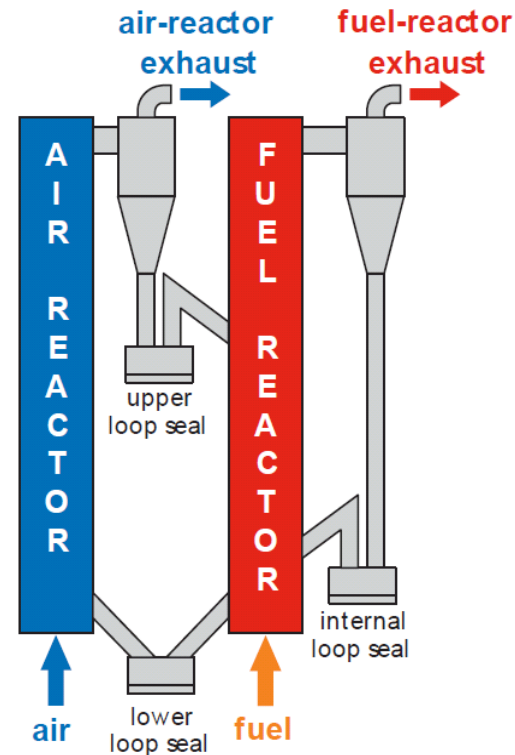
Chemical looping combustion and reforming processes with inherent CO₂ capture without significant energy penalty.

Methods:

- Modelling and Simulation
- Cold flow model studies
- Continuous chemical looping operation
- Oxygen carrier testing and characterization

Facilities:

- Continuous 120 kW pilot plant
(Dual Circulating Fluidized Bed system)
- Cold flow models of fluidized bed systems
- Validated modeling tools for scale-up
and feasibility studies



Contact:
stefan.penthor@tuwien.ac.at

Zero Emission Technologies

Team: Temperature Swing Adsorption

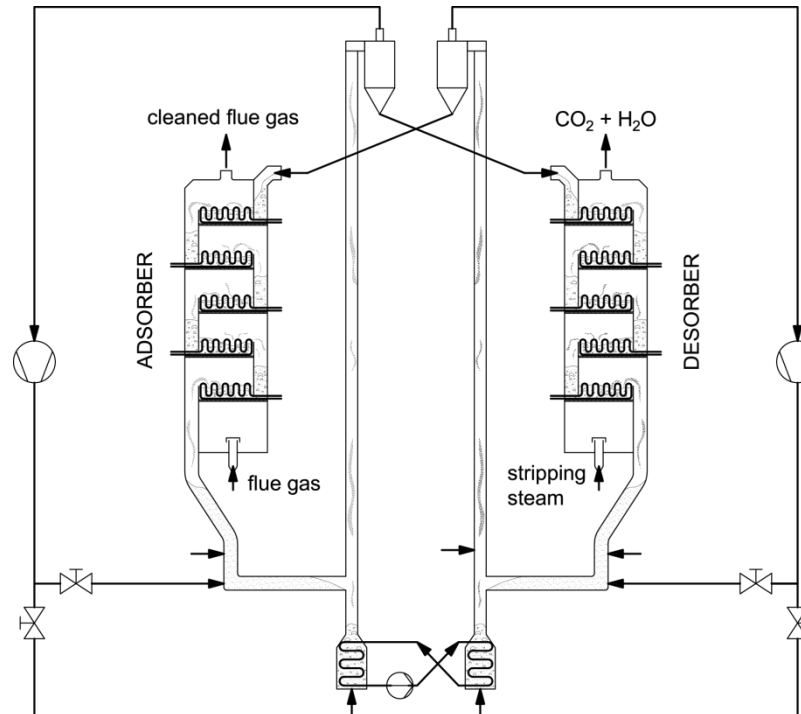
Application of multi-stage fluidized bed columns in novel TSA reactor concept for efficient gas separation

Methods

- Modelling and Simulation
- Cold flow model studies
- Continuous adsorption tests
- Adsorbent characterization and Testing

Facilities

- Continuous bench scale unit
- Mobile Lab for on-site testing
- Cold flow model
- Lab-scale fixed/fluid bed reactor



Contact:
gerhard.schoeny@tuwien.ac.at

Univ.Prof. Dipl.-Ing. Dr. Hermann Hofbauer

Email: hermann.hofbauer@tuwien.ac.at

Web: <http://www.vt.tuwien.ac.at>

Phone: +43 1 58801 166300

Fax: +43 1 58801 16699

