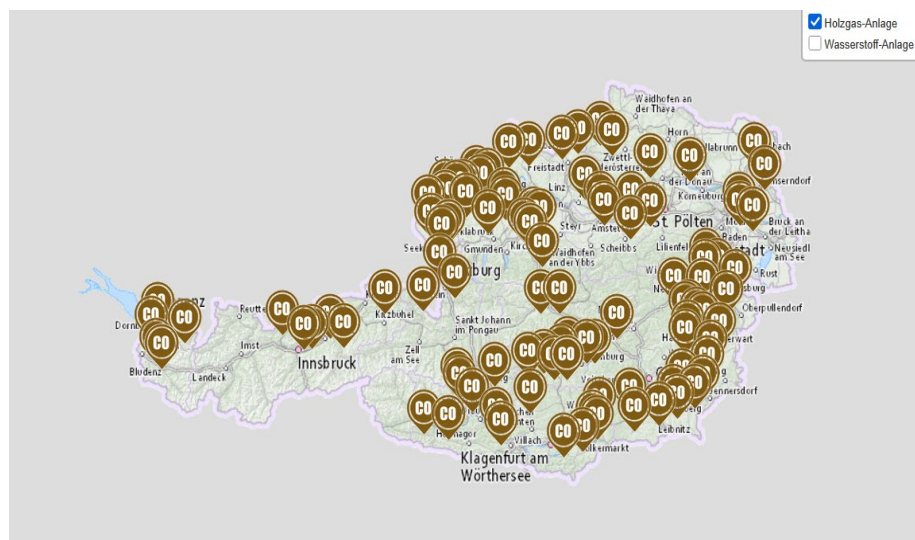




IEA Bioenergy

Technology Collaboration Programme



Austria

Country report

J. Hrbek, BOKU Vienna

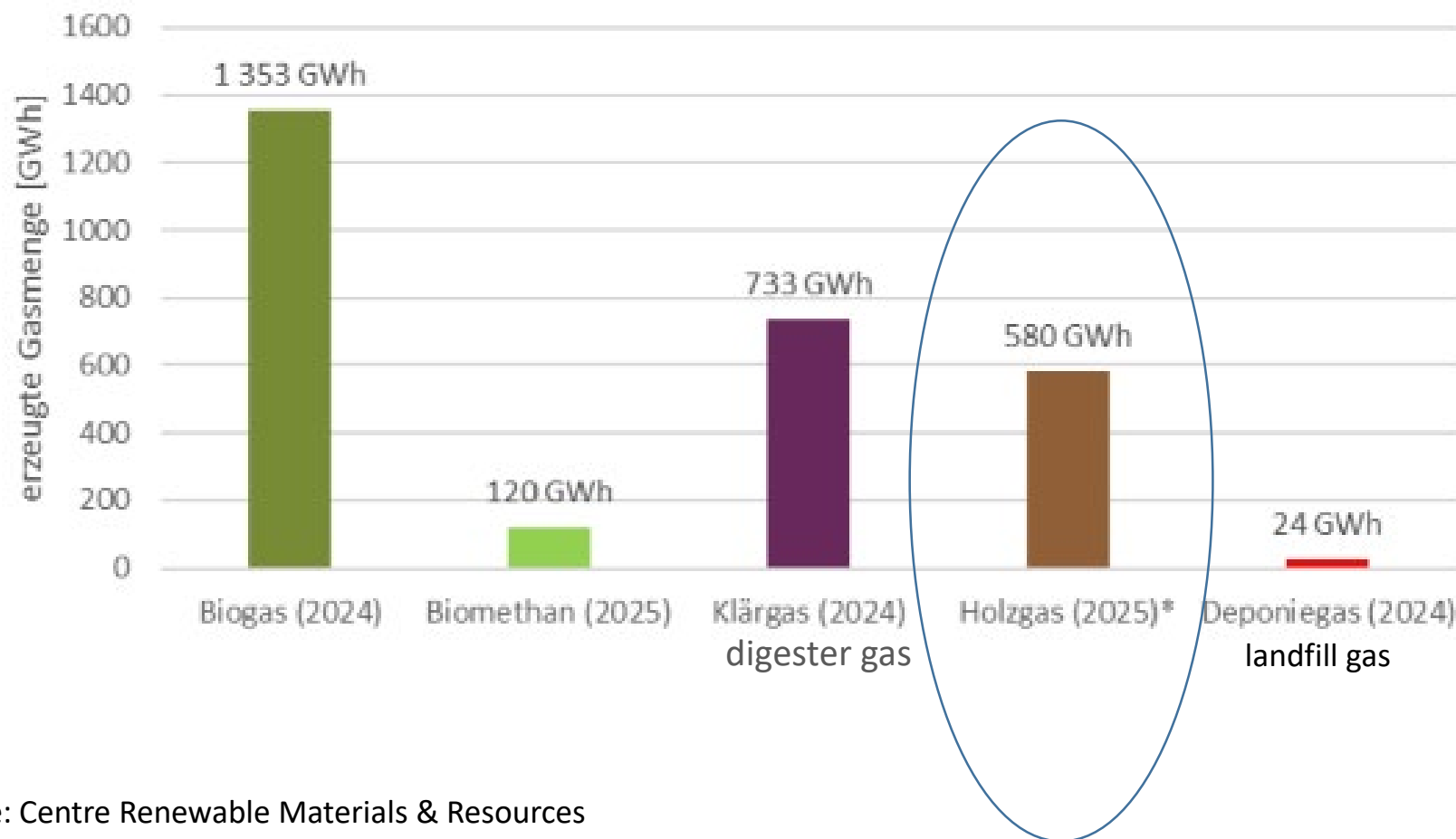
Glasgow, 11. May 2026

The IEA Bioenergy Technology Collaboration Programme (TCP) is organised under the auspices of the International Energy Agency (IEA) but is functionally and legally autonomous. Views, findings and publications of the IEA Bioenergy TCP do not necessarily represent the views or policies of the IEA Secretariat or its individual member countries.

Technology Collaboration Programme

by **iea**

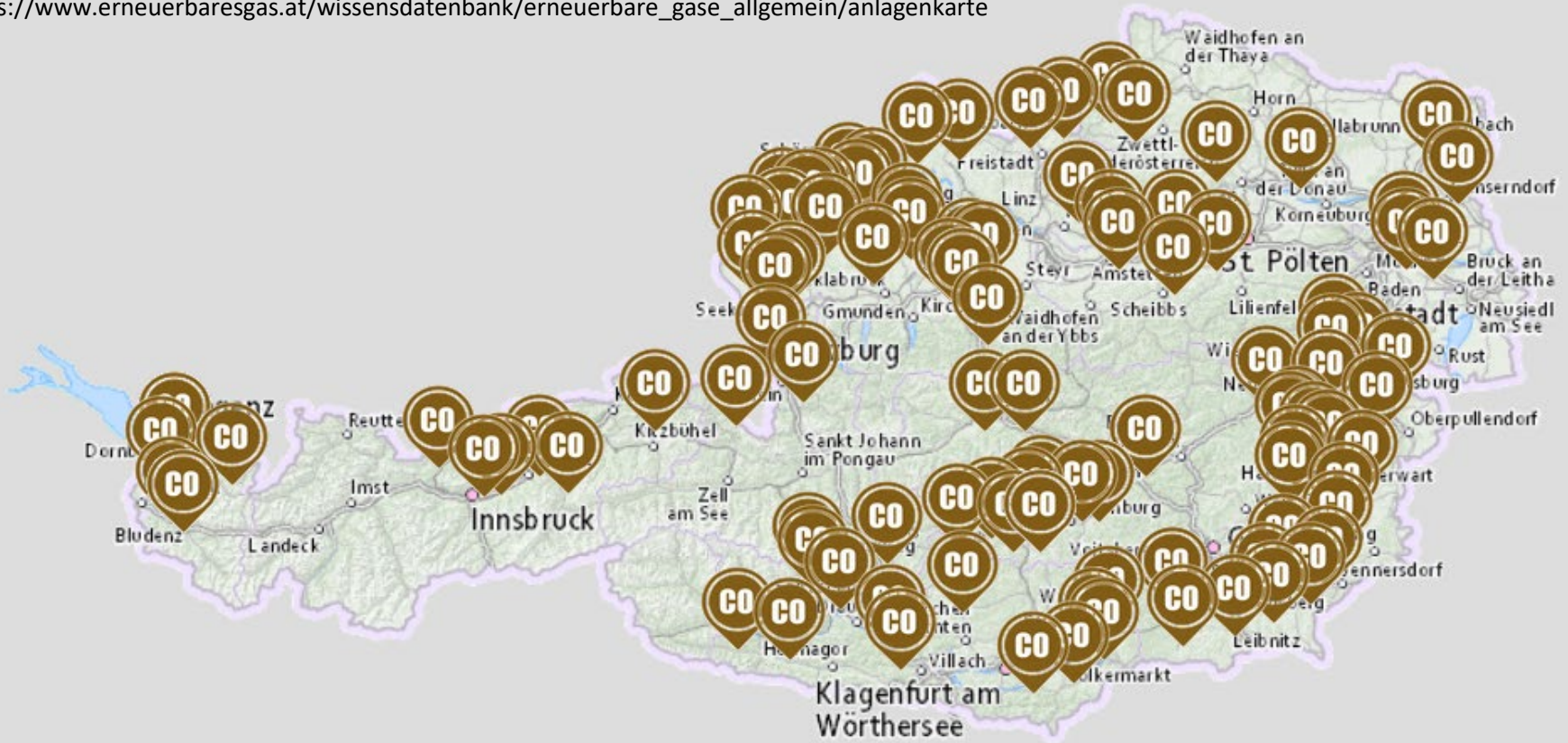
Production of renewable gases in Austria



Source: Centre Renewable Materials & Resources

Producer gas (wood gas) production in AT

https://www.erneuerbaresgas.at/wissensdatenbank/erneuerbare_gase_allgemein/anlagenkarte



Market Report 2025:

https://www.erneuerbaresgas.at/jart/prj3/erneuerbare_gase/data/uploads/SEG%20Marktbericht%202025.pdf

Research on thermal gasification in Austria

- University of Natural Resources and Life Sciences Vienna (BOKU)
- Vienna University of Technology (TU Wien)
- BEST Research
- Graz University of Technology
- MCI Innsbruck - Technology and Life Sciences
- MCI Innsbruck - Josef Ressel Centre
- Güssing Energy Technologies (GET)

Research: Advanced Bioenergy Lab

The **Advanced Bioenergy Lab (ABL)** is a research facility focused on the development and testing of advanced renewable energy carriers.

- Raw material: residues and waste from wood processing and food production
- Gasifier developed at TU Vienna
- Input 1,55 t/h (biomass dry) (8MW)
- Plan: 8 000 OH/year
- Products: liquid fuels (FT) and high purity gases (SNG, hydrogen)

These technologies and products are brought to market maturity at the ABL under real, industry-like conditions, and are produced for the first time in continuous operation and on a pre-industrial scale.

Budget: 60 mio Euro

Universitäten*



Außeruniversitäre und sonstige Einrichtungen*



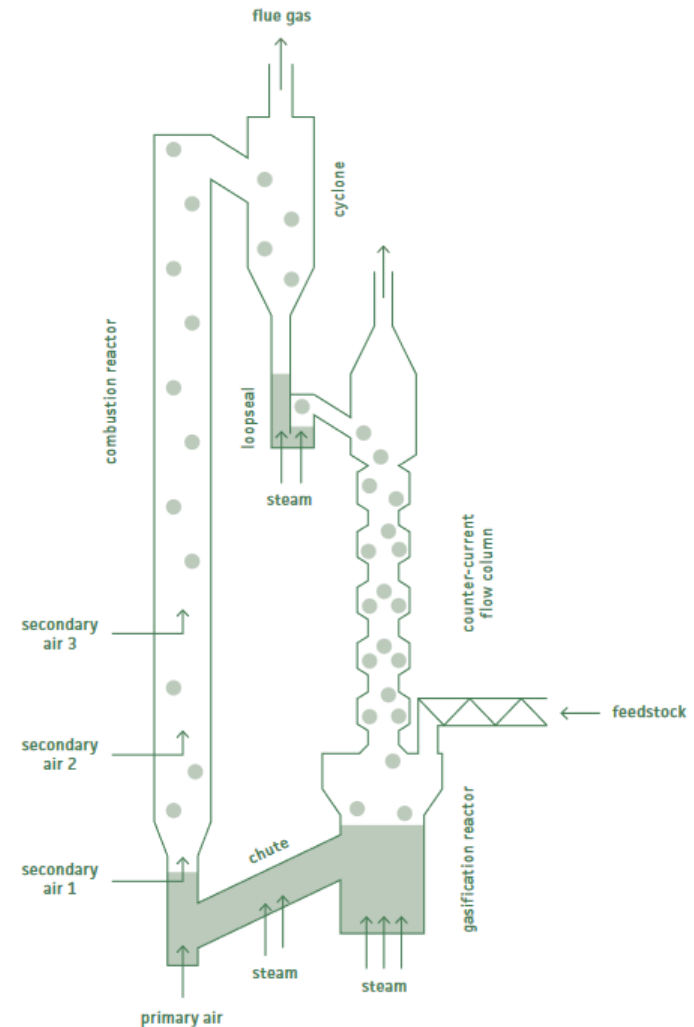
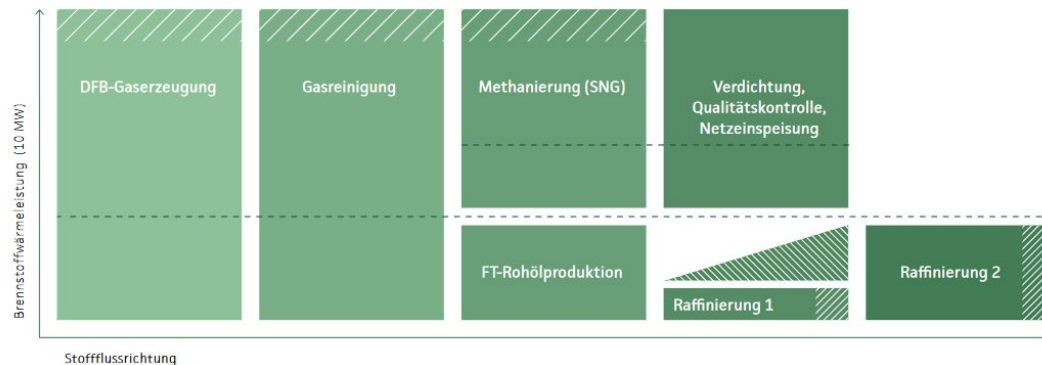
Branchenunterstützung*



Research: Advanced Bioenergy Lab

The **Advanced Bioenergy Lab (ABL)** is a research facility focused on the development and testing of advanced renewable energy carriers.

- Aim: to demonstrate the whole process chain
- Products - Output
 - SNG: 340 Nm³/h
 - FT liquids: 150 l/h



Research: Advanced Bioenergy Lab (ABL)

Status:

- Methanation now under construction (originally planned for the 2nd stage)
- End of May 2026 final investment decision (FID)
- June 2026 – the groundbreaking ceremony
- Further potential partners are welcome

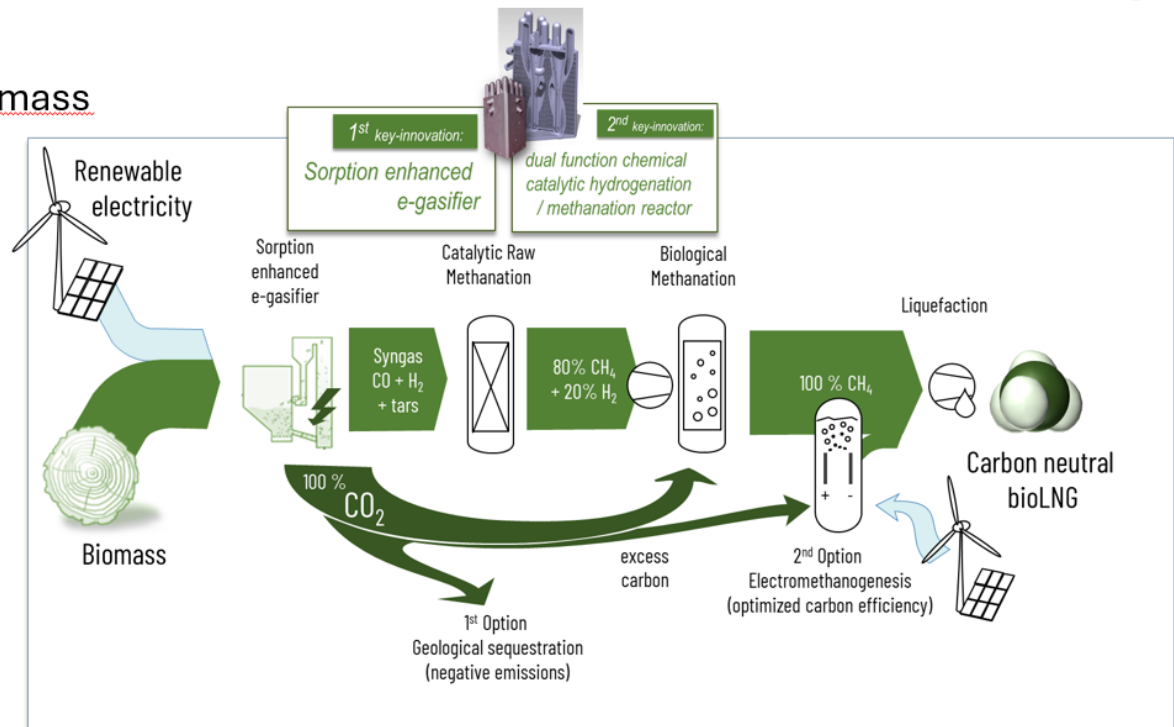
Horizon Europe Project: CarbonNeutralLNG



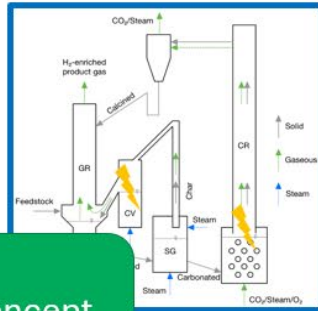
- Project focus: Green LNG from biomass

- The process aims to integrate:

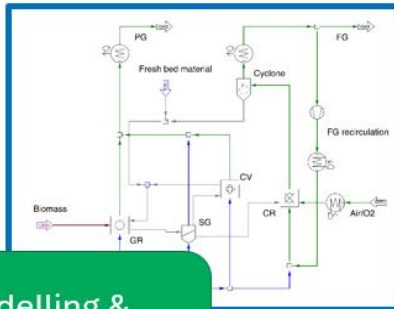
- Electrically-assisted sorption enhanced gasification
- Dual function chemical catalytic methanation
- Biological methanation
- Electromethanogenesis



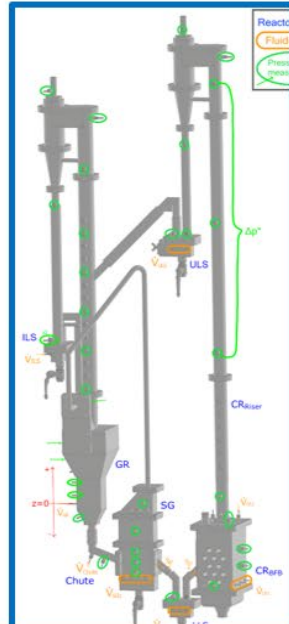
Work @BOKU



Process concept



Modelling &
Simulation



Reactor design

- Biomass gasification
- Char separation
- Electrified calcination



Cold flow model

- Fluid dynamic validation
- Reactor optimization
- Controllability

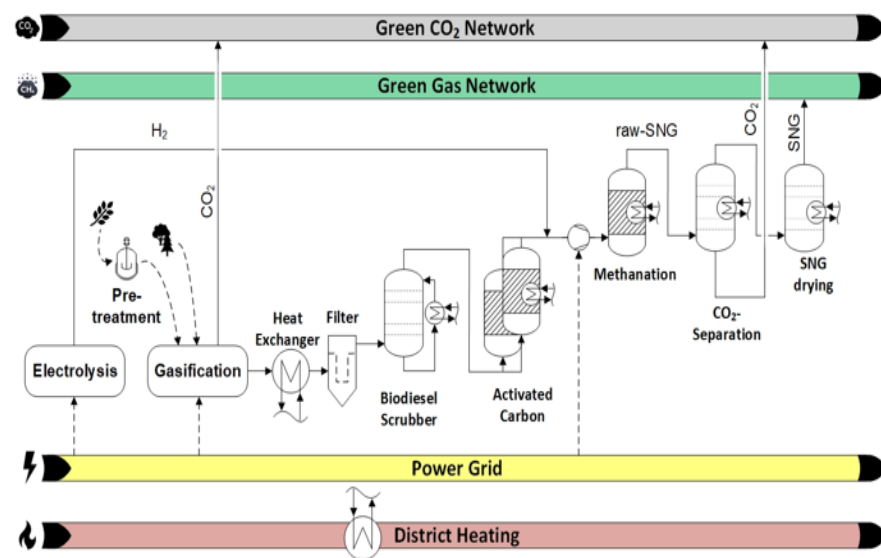


Pilot plant

- 50 kW biomass input
- Hot validation
- Experiments in summer

Integration and optimization of the production of renewable gas from biogenic residues

- **Gasification:** Studies on biogenic residues with low ash-melting points and high volatile content are conducted, tracking tar and deposit tendencies and optimizing operating parameters, additives, and reactor designs for reliable downstream processing.
- **Gas cleaning:** Processes for handling impurities in biogenic residues are developed and tested. Regeneration of gas-cleaning stages are improved for better energy and material efficiency.
- **SNG production:** Methanation and CO₂ capture technologies from refinery processes are too complex and costly for small biomass plants. Their integration into the energy sector could offer significant potential for efficiency gains.



Pretreatment: Hydrothermal Carbonization (HTC)

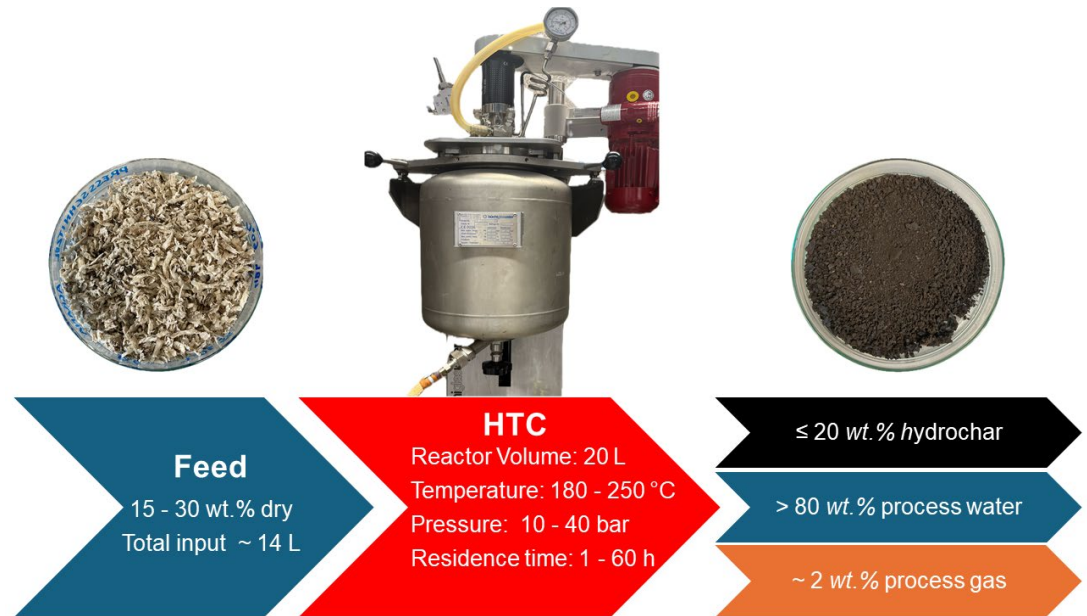
HTC converts wet biomass in a water-based environment into a coal-like solid called hydrochar.

Improvements

- Storage stability and energy density
- Mechanical dewatering instead of thermal drying
- Positive properties for gas production
 - Better ash melting behaviour
 - Less volatiles (lower tar content)

Disadvantages

- Additional process step
- Wastewater treatment



Current work @BOKU

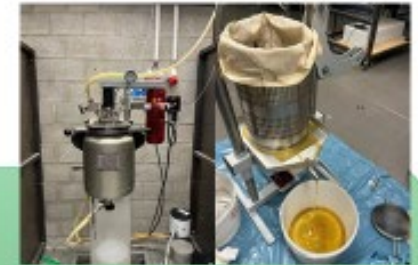
0.6 L Reactor

1. Corn cobs
2. Sugar beet pulp
3. Wheat bran pellets
4. Brewers grains
5. Sunflower husks
6. Reed
7. Spelt husks
8. Grass with lime
9. Grass without lime
10. Spirulina algae
11. Macrophages of the Donau river



20 L Reactor

1. Sunflower husks
2. Sugar beet pulp



Gasification @BOKU

1. Sugar beet pulp
2. Reed (raw material)



**100 kW DFB
Gasification Reactor
@TU Wien**

**1 MW DFB
Gasification Reactor
@BEST**

Diploma Thesis of Stefan Lehner: <https://doi.org/10.34726/hss.2025.131828>

Butterfly project

BUTTERFLY – Biomass Utilized To The Extended portfolio of Renewable Fuels with Large Yields, is a Horizon Europe Innovation Action project that aims to develop an innovative and flexible co-production of renewable and recycled carbon DiMethyl Ether (rDME) and Synthetic Natural Gas (SNG) from waste and residual feedstocks, targeting the off-grid energy supply, the steel industry and heavy transportation.

Coordinated by

TNO innovation
for life

Partners



CELSA



**C.A.R.E. FOR
Engineering**
Carbon Reduction & Emissions

eta florence
renewable
energies



The objectives



Produce advanced biofuels and renewable fuels from waste and residual feedstock



Demonstrate an innovative, efficient and flexible coproduction process



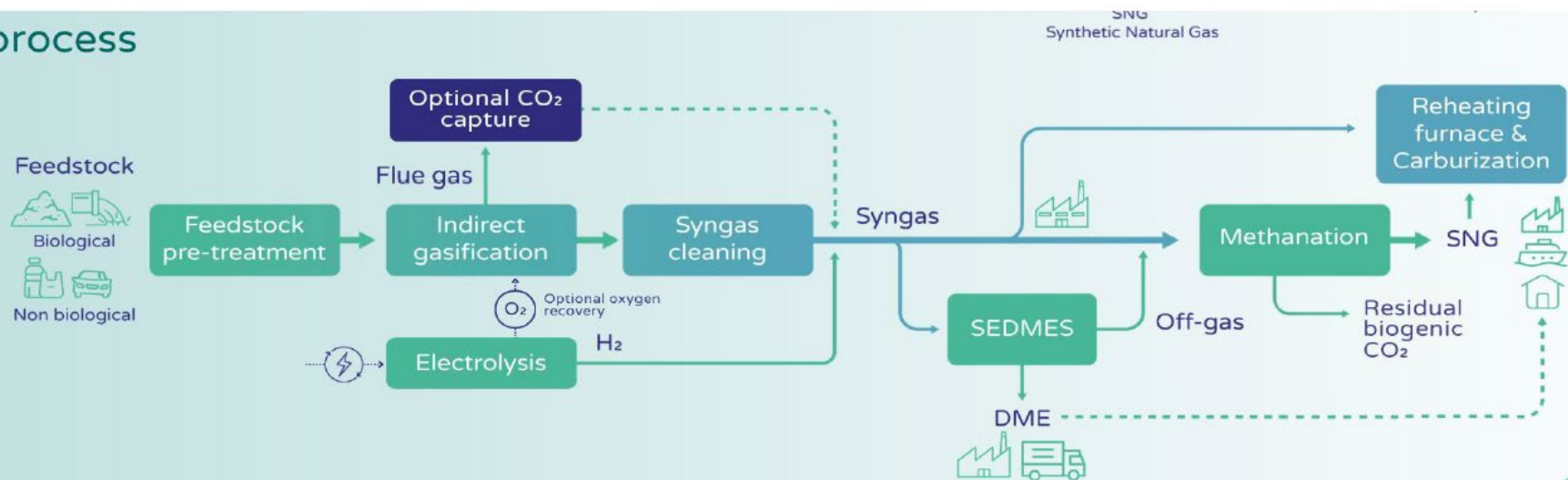
Assess sustainability, define new value chains and business cases

The value chain



Butterfly project - the process

The process



Results



Response to needs for renewable fuels in energy and transport



Reduction of GHG emissions along the value chain



Sustainability and security improvement of the value chains



Scale-up of advanced biofuels and renewable fuels



Comprehensive cost-effective portfolio of value chains for green fuels

Syngas Platform Vienna

Power-to-X pilot

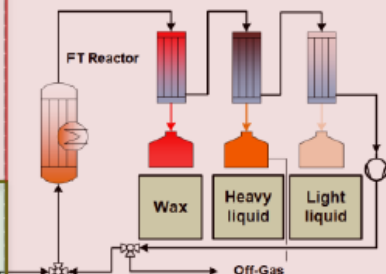
More to follow soon...

Gasification demo

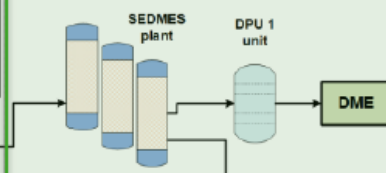
Coarse gas cleaning demo

Fine gas cleaning and conditioning pilot

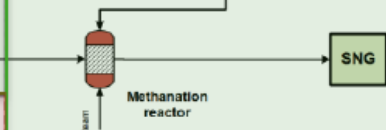
Fischer-Tropsch synthesis pilot



DME synthesis pilot



Fluidized bed methanation pilot



Laboratory with TRL 3-5 test-rigs



Syngas storage



In the scope of BUTTERFLY

Out of scope of BUTTERFLY

Austrian companies

Aichernig Engineering GmbH (former REPOTEC)

<http://www.repotec.at>

Engineering of FICFB gasifiers for CHP, BioSNG and other synthesis (Güssing, Ulm, Göteborg)

INNIO (former GE Jenbacher Energiesysteme AG)

<https://innio.com>

Gas engines for power production

GET- Güssing Energy Technologies

get.ac.at

Research, consulting and engineering, education centre

Güssing Renewable Energy

<http://www.gussingrenewable.com>

FICFB gasification systems

Austrian companies

Small scale gasification - overview



Newsletter highlights

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- Budget 60 mio. Euro
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- Demonstrate an innovative, efficient and flexible coproduction process
- Assess sustainability, define new value chains and business cases

The value chain



Questions?

Jitka.hrbek@boku.ac.at



IEA Bioenergy

Technology Collaboration Programme

www.ieabioenergy.com