BEST
Bioenergy and
Sustainable Technologies



Slurry based Fischer-Tropsch Synthesis
Optimization and further development

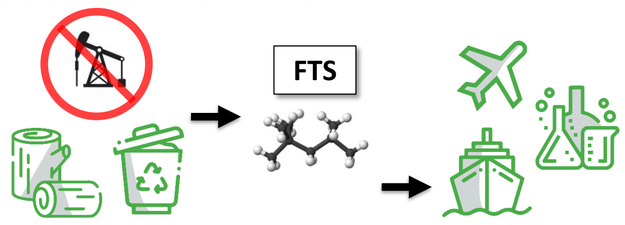
Biorefineries | Syngas Platform Vienna

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Topic

Sustainable aviation fuels (SAF) are seen as one of the key elements in reducing the aviation sector's CO_2 footprint. The production route via **Fischer-Tropsch (FT)** synthesis is one possible solution to produce green fuels and chemicals.

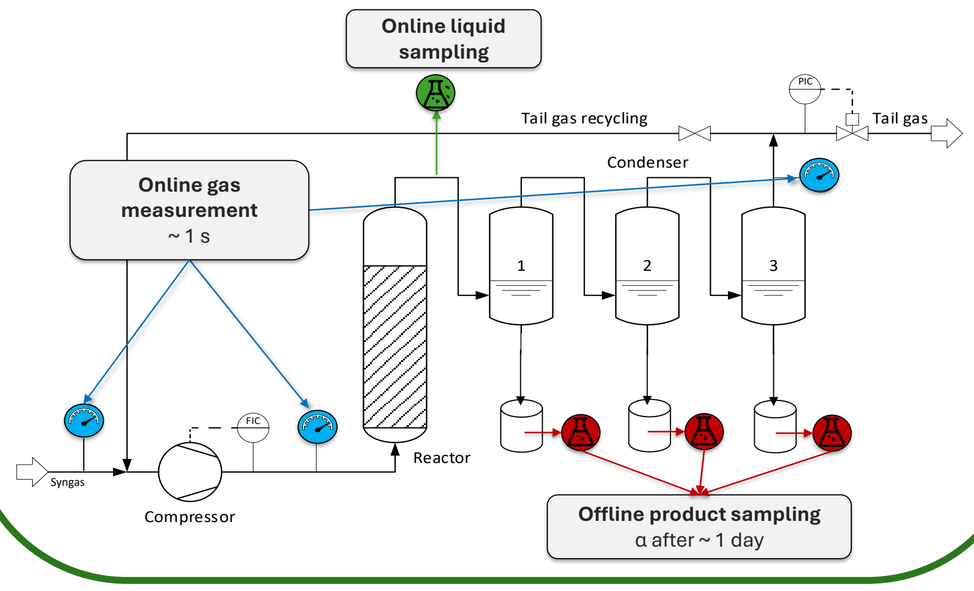


This project focuses on one FT reactor type (SBCR) and how this technology can be optimized to enable a scale-up using non-fossil-based feedstocks.

Scope

Research questions

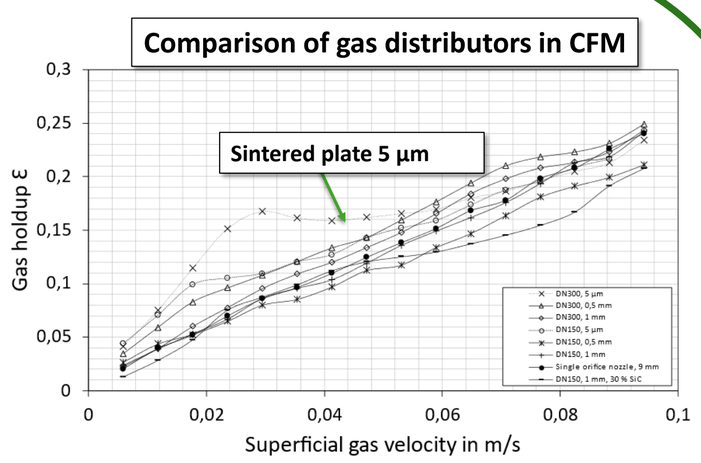
- ✓ Design optimization of the FT demo plant
- ✓ Optimized product recovery
- ✓ Fine particle removal strategies
- ✓ Scale-up to 100 MW plant (TEA)



Ongoing work

Planned cold flow model trials

Hydrodynamic behavior strongly influences FT reactor efficiency. A cold flow model (CFM) is used to study gas distribution effects and optimize reactor performance. Next year, the CFM will be **upgraded** to enable the use of **naphtha** as the **liquid phase** and **differential pressure measurements** will be implemented to improve data precision.



Fine particle removal

To remove fine particles in the FT waxes a filter test rig was constructed and commissioned using water as well as FT waxes from the pilot plant. The **Schumasiv Al_2O_3 filter membrane** with a pore size of 200 nm was able to **separate > 98%** of the contained particles, thereby achieving **pharmaceutical-grade purities**.





Process simulation & TEA

A **process** simulation **model** of the pilot plant was developed in **DWSIM** and validated against experimental data to identify discrepancies and optimize operation The validated model is scaled to **100 MW**, enabling **CAPEX** and **OPEX** calculations to assess economic feasibility.

DWSIM Chemical Process Simulator

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