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Second generation biomass gasification: The Syngas Platform Vienna – current status

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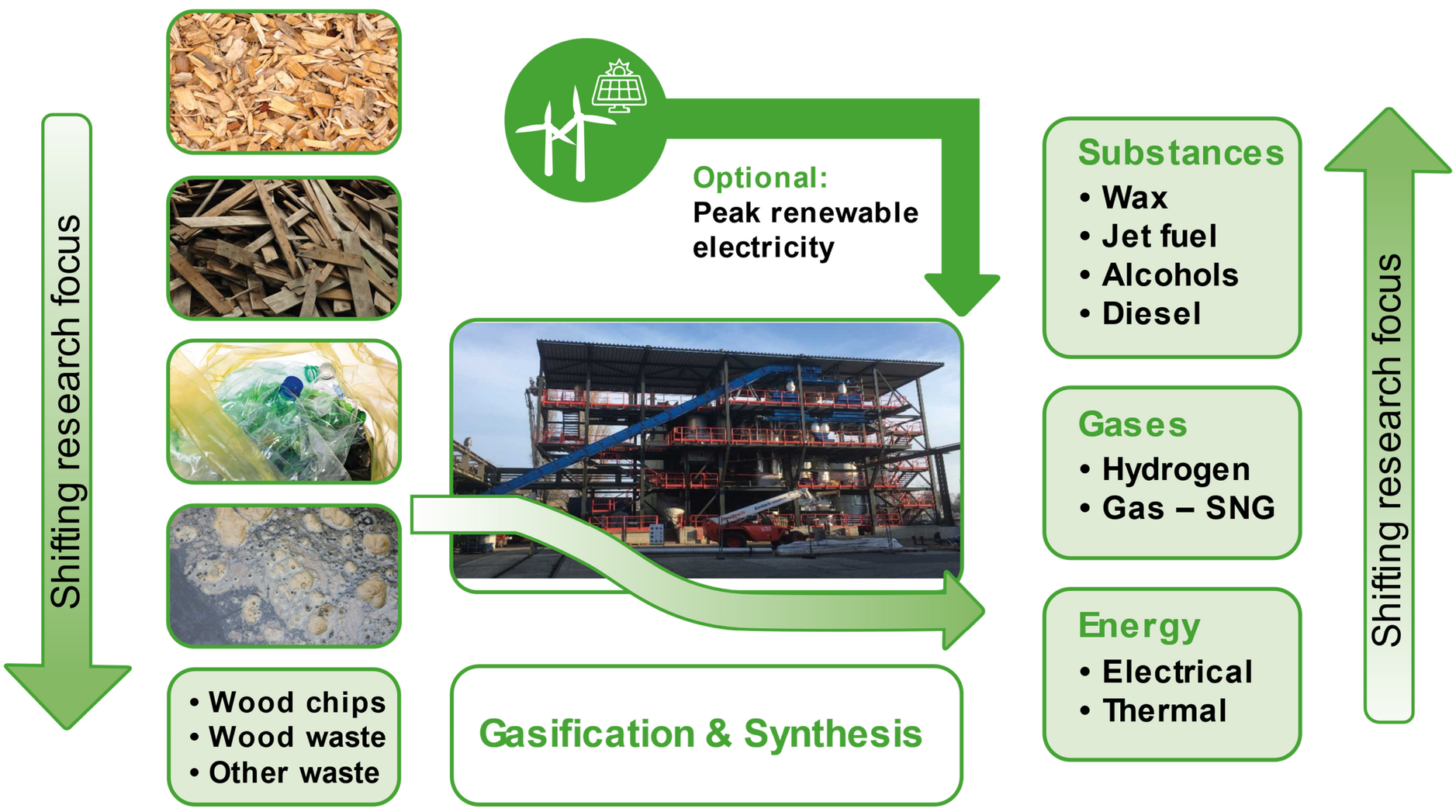
Area 1.3 Biorefineries
Syngas Platform Technologies

Description

Steam gasification in a dual fluidized bed (DFB) reactor has already been developed in the power sector from lab- to commercial-scale for woody biomass as feedstock. A trend towards utilizing feedstock of lower quality, such as low-grade biomass, biogenic residues or waste drives the development of the technology in terms of reactor design, gas cleaning and optimizing operation parameters. Additionally, the need for production of sustainable end products more valuable than electricity and heat leads to the embedding of DFB gasification into complete process chains.
We currently operate such a comprehensive biorefinery for the conversion for biogenic residues and waste. An advanced reactor design for DFB steam gasification has been implemented at a capacity of 1 MW thermal fuel input for long-term operation. The plant is part of the Syngas Platform Vienna, which consists of a full process chain combining waste gasification with a downstream Fischer-Tropsch-synthesis pilot plant. In addition, a slip stream of the product gas can be used in a connected laboratory for research in the fields of advanced gas cleaning and syntheses.
While numerous desirable feedstocks, such as low-grade biomass, biogenic residues or waste have been shown to be suitable in small-scale experiments and equally numerous synthetic pathways for the product gas exist, this has not yet been demonstrated in an integrated process chain. Thus, we aim to demonstrate such an integrated process chain from biogenic residues and waste to a valuable end product using our Syngas Platform Vienna.



Available infrastructure

- 1 MW DFB steam gasifier
- 1 barrel/day Fischer Tropsch plant
- Lab-scale Fischer Tropsch plant
- Lab-scale aqueous phase reformer
- Novel gas cleaning testing skid
- Measurement infrastructure

Already demonstrated fuels

- Wood pellets + wood chips (incl. full-chain demonstration with Fischer Tropsch synthesis)
- Forest residues (2 qualities)
- Bark
- Rejects from paper recycling

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