

Environmental impact of the Sustainable Aviation Fuel FT-SPK from biomass gasification

Doris Matschegg¹
 Marilene Fuhrmann¹
 Dina Bacovsky¹
 Christoph Strasser¹
 Tobias Stern²

¹ BEST GmbH

² University of Graz

AREA 3 - Sustainable Supply
 and Value Cycles

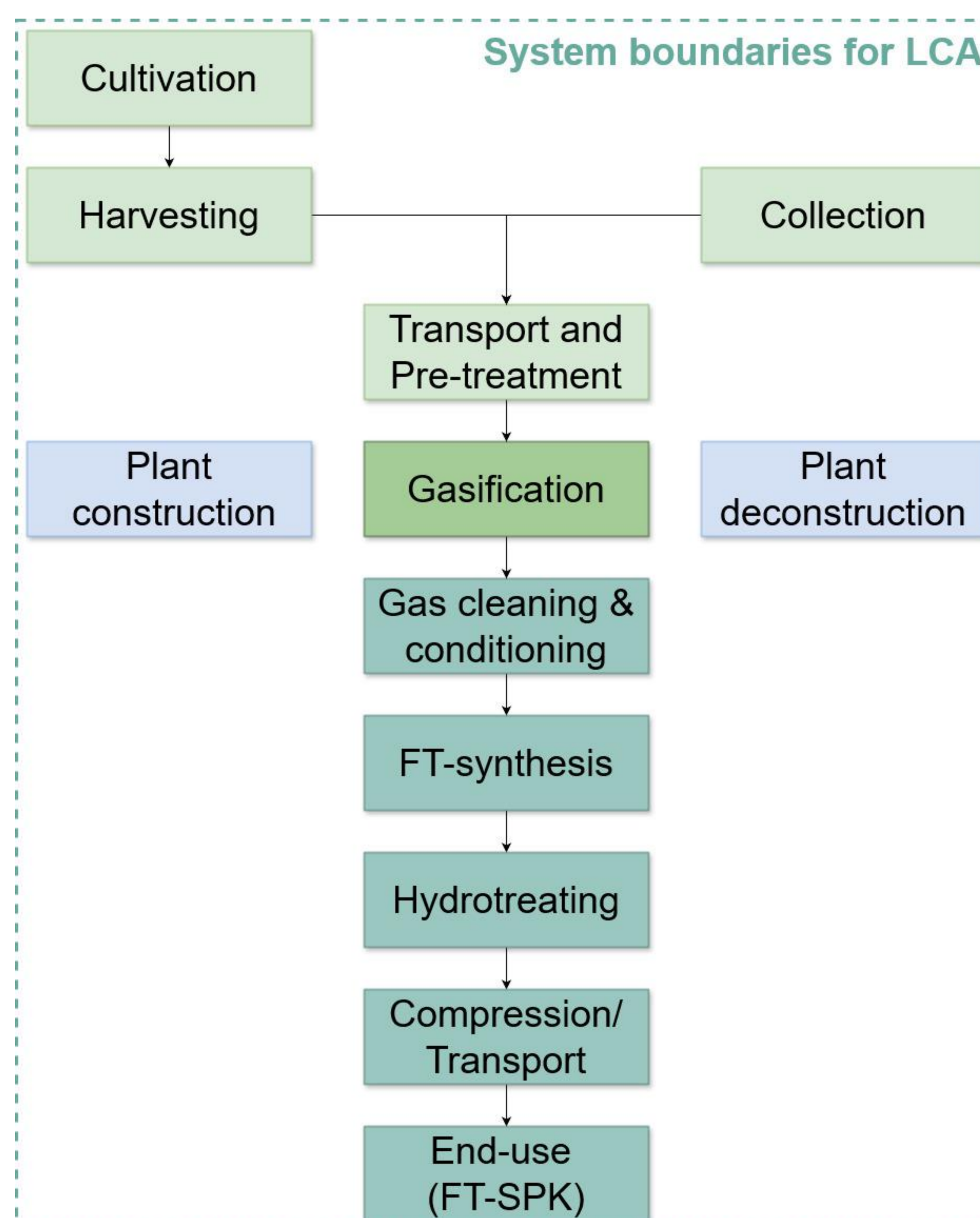
Introduction

The aviation sector is responsible for about 2% of global GHG emissions. Sustainable Aviation Fuels (SAF) are considered as one of the most important measures to defossilise this sector. One promising SAF is Fischer-Tropsch synthetic paraffinic kerosene (FT-SPK), produced via gasification of biogenic residues. This pathway offers advantages in terms of CO₂ emission reduction and feedstock flexibility.

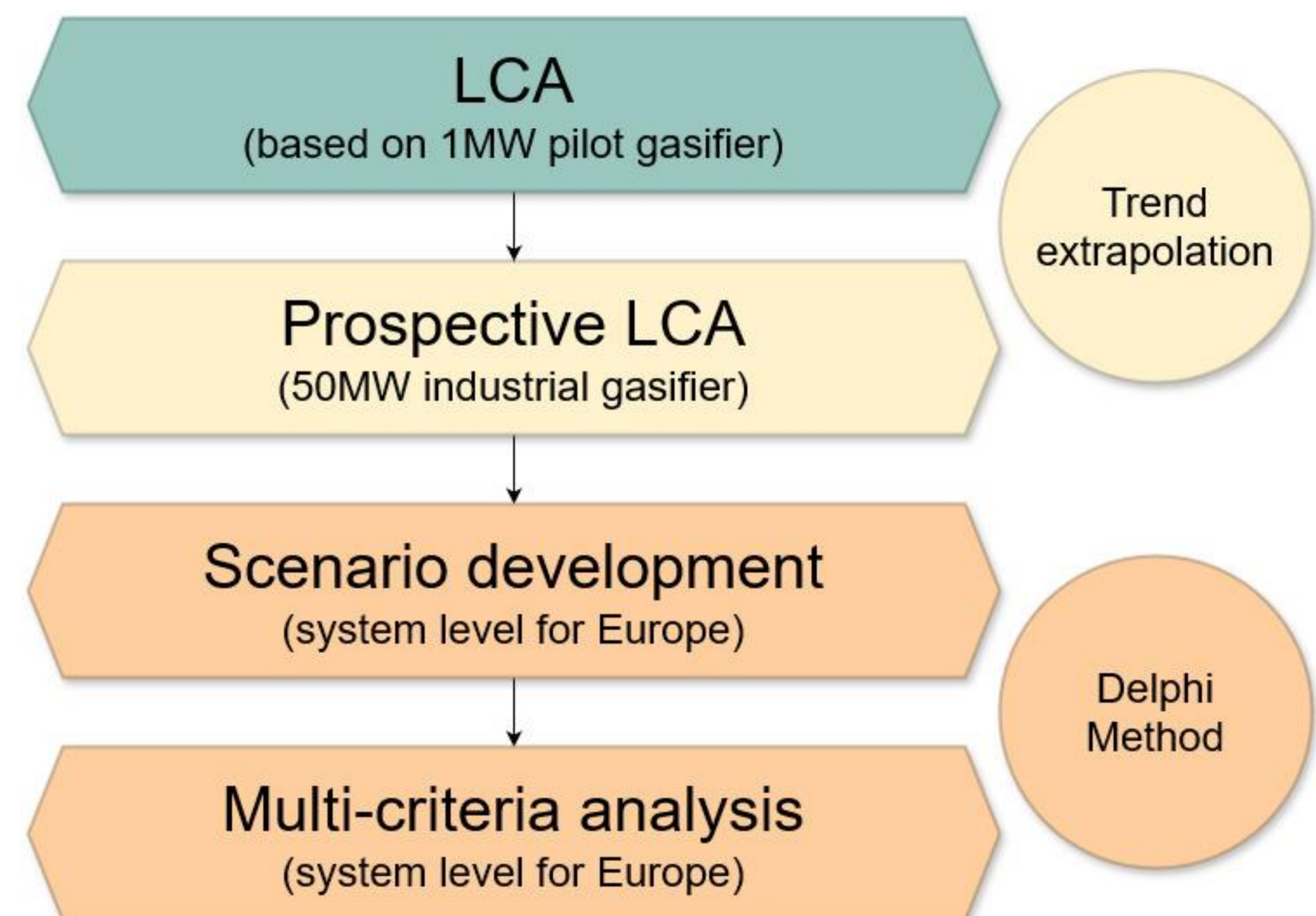
There is a significant disparity between projected demand for SAF and its potential production. To meet the ambitious binding blending mandates of the ReFuelEU Aviation Initiative (6% by 2030, 34% by 2040, 70% by 2050), SAF production must expand rapidly. The project AssessSAF is focusing on the gasification-FT pathway and its contribution to the European climate targets with regard to aviation.

Objectives

1. Assess the environmental impact of FT-SPK produced via dual fluidized bed steam gasification of biogenic residues obtained from a 1 MW pilot gasifier.
2. Assess the environmental impact of FT-SPK produced in an upscaled 50 MW gasifier.
3. Assess the overall environmental and socio-technical impact of FT-SPK when multiplying industrial scale biomass gasification in Europe.



Research design



Novelty

Due to the rapidly increasing relevance of SAF, there are already a number of studies on their environmental impact and the gasification-FT pathway has been successfully demonstrated. Nevertheless, the project AssessSAF will be a valuable addition to the SAF research field due to the following considerations:

- The data required for calculations will be obtained from the **real operation** of a 1MW pilot gasifier and a 1 barrel per day FT plant (Syngas Platform Vienna).
- The feedstock of interest will be **biogenic residues**, which may include bark, sewage sludge, and industry residues.
- The **gas cleaning** steps will be considered in detail, as they are expected to be more complex when using residual feedstock.
- The **environmental and socio-technical impacts** of FT-SPK will be evaluated at system level for Europe.

Expected results

It is essential to assess the complex interactions between technology, nature and society in order to foster sustainable development. The overall goal of SAF is to defossilise the aviation industry. The project AssessSAF is defined to ascertain to which extent FT-SPK can contribute to European defossilisation targets, taking the principles of sustainable development into account.

Acknowledgement

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