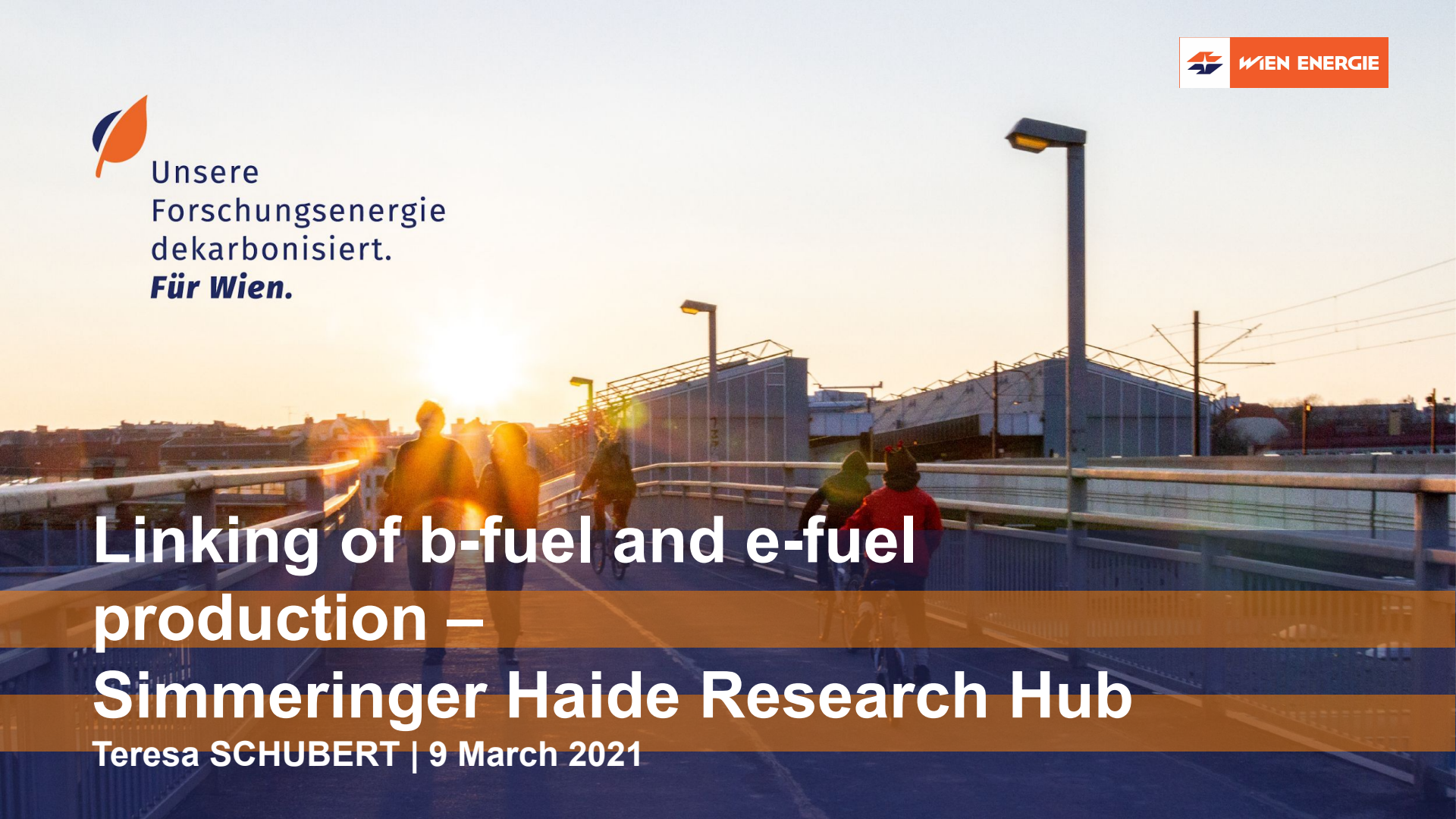

Linking of b-fuel and e-fuel production – Simmeringer Haide Research Hub

Teresa SCHUBERT | 9 March 2021

Agenda

- Wien Energie
- Simmeringer Haide Research Hub
- Waste2Value
- Linking b-fuel and e-fuel production

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Wien Energie

We supply 2,000,000 people with power, gas, heating and cooling energy

1.000 e-charging stations in Greater Vienna area

Leading Energy provider of Austria

30 civic power plants

Austria‘s largest solar power producer

District heating energy for 410,000 households and 7,200 business customers

Our power plants stabilize the grid – up to 200 times per year

Energy from 900,000 tons of waste

Wien Energie Portfolio

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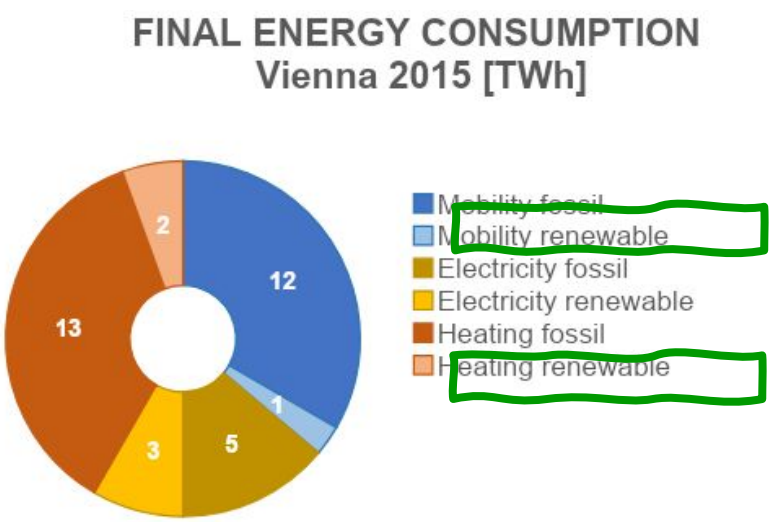
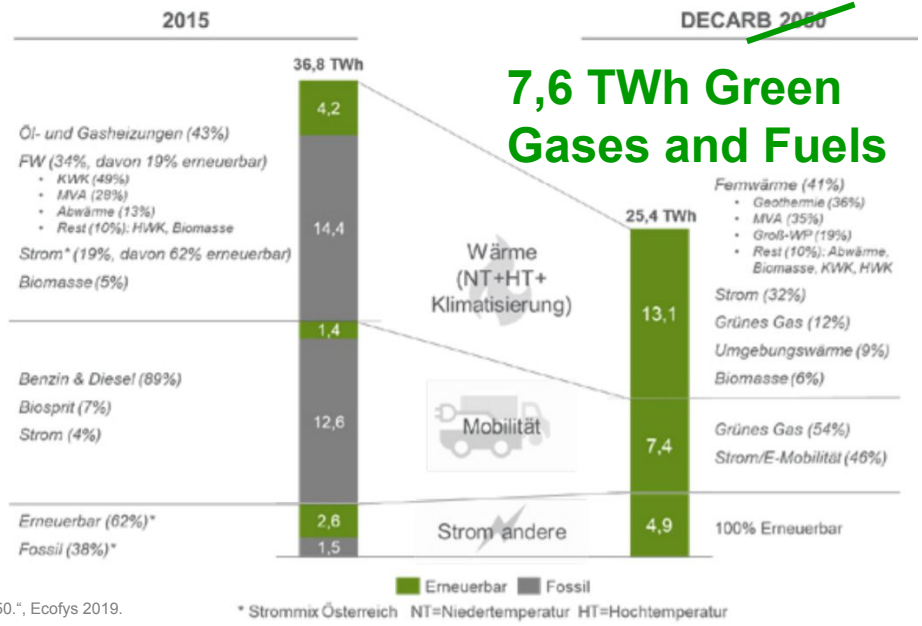
Simmeringer Haide Research Hub
Motivation Wien Energie

Overall aim: decarbonization of Vienna‘s energy system





Source: „Strom. Wärme. Mobilität. Szenarien für die Dekarbonisierung im Großraum Wien bis 2050.“, Ecofys 2019.

Simmeringer Haide Research Hub
Motivation Wien Energie

Technology development and know-how to

- Provide Green gases for existing infrastructure (CHP, peak load boilers, gas grid)
- Enlarge product portfolio
- Enable sector coupling (power/heat/mobility/chemical industry)
- Upgrade waste utilization (from “waste-to-energy“ to „waste-to-value“)

CO_2 capture

Green Fuels

Green Hydrogen

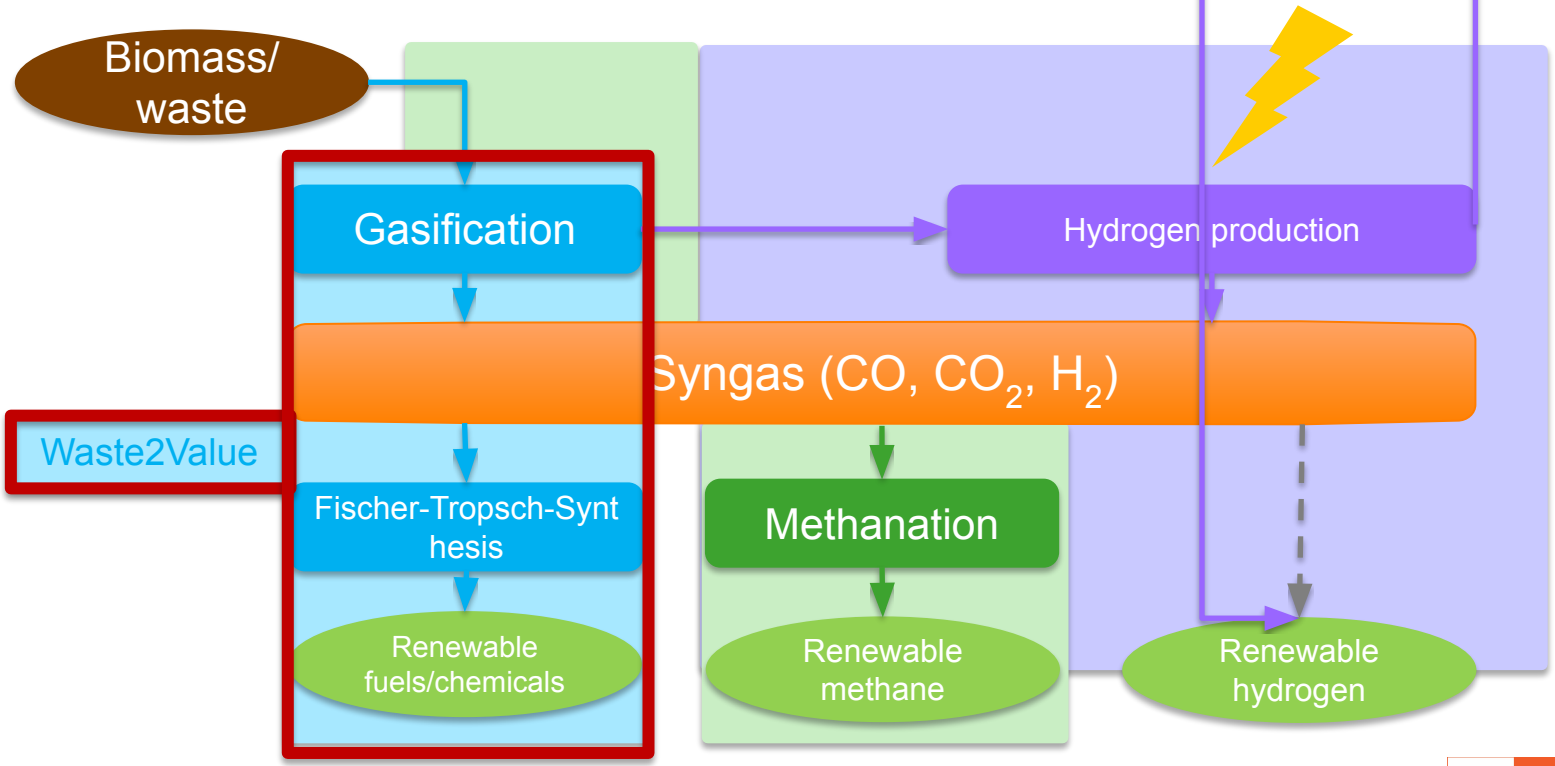
Establishing a sustainable research site

Green Methane

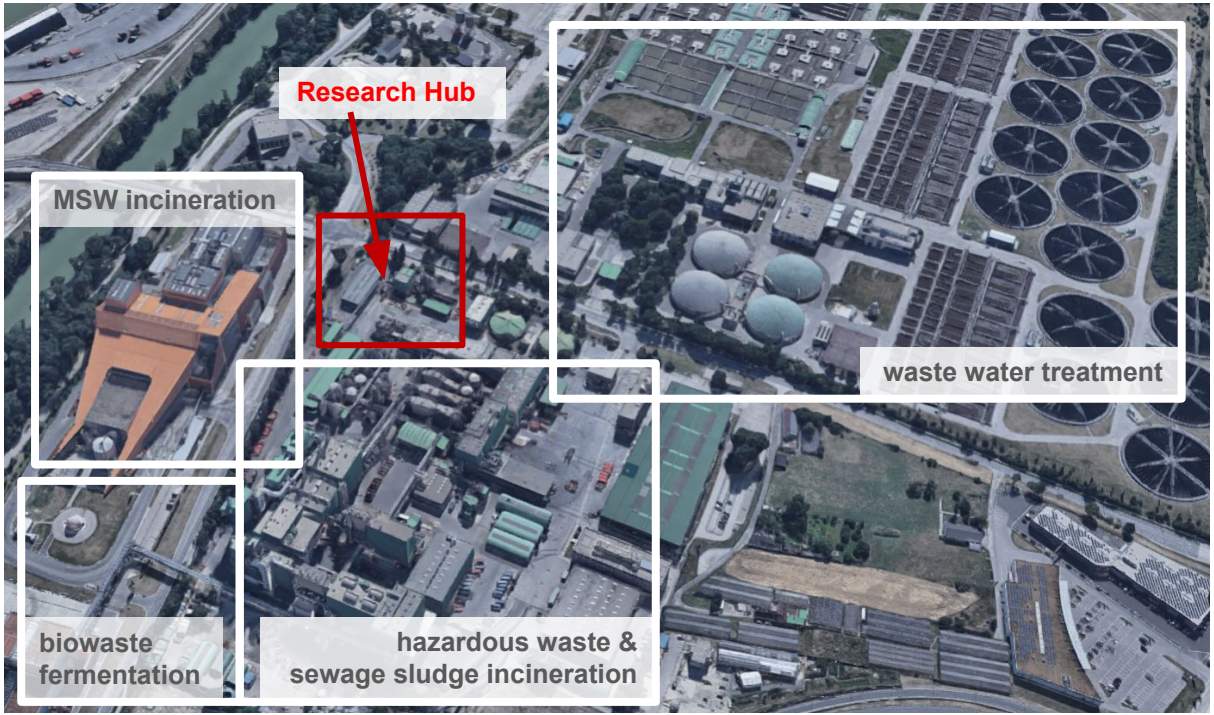
Green Chemicals

Waste utilization

Simmeringer Haide Research Hub Modules



Simmeringer Haide Research Hub
The location



Site‘s benefits:

- Land and area zoning
- Official permits
- Free area (app. 2,500 m²)
- Street-sided connection
- Gas grid connection
- Environmental protection facilities
- Availability of biogenic/fossil wastes, green CO_2

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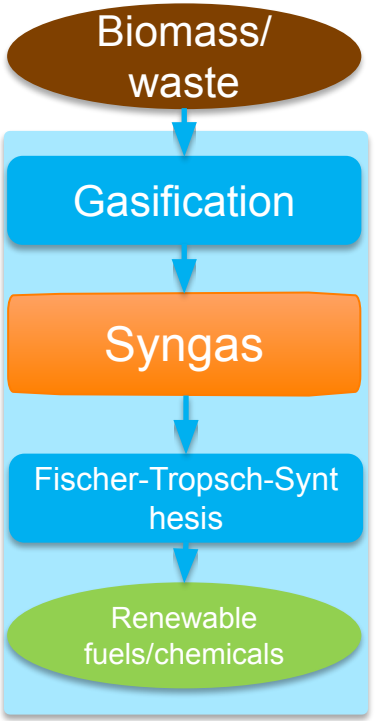
Waste2Value
Aims and scope

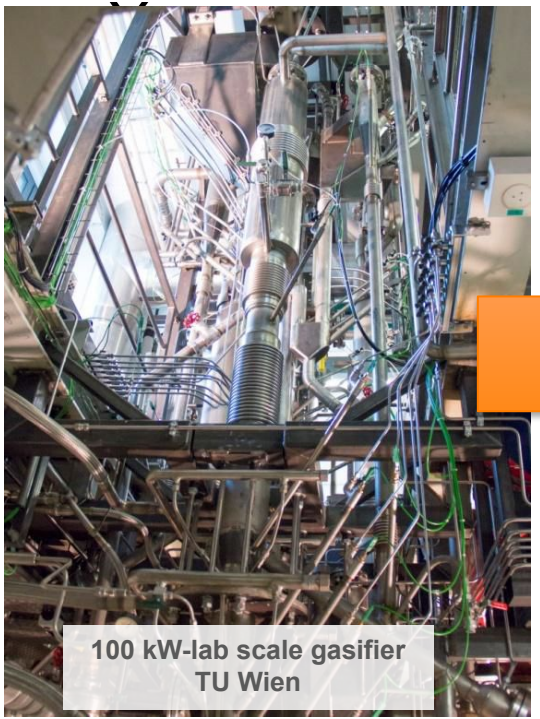
- First **module** to utilize biomass and waste to decarbonize the city‘s energy system
- Demonstration of **full chain** –gasification of different feedstocks and Fischer-Tropsch synthesis
- **1 MW** dual-fluidized bed steam gasifier
- Gaining know-how for **tendering, building, commissioning, operation** and **maintenance**
- Development of feasible **business cases**

Waste2Value
Project overview

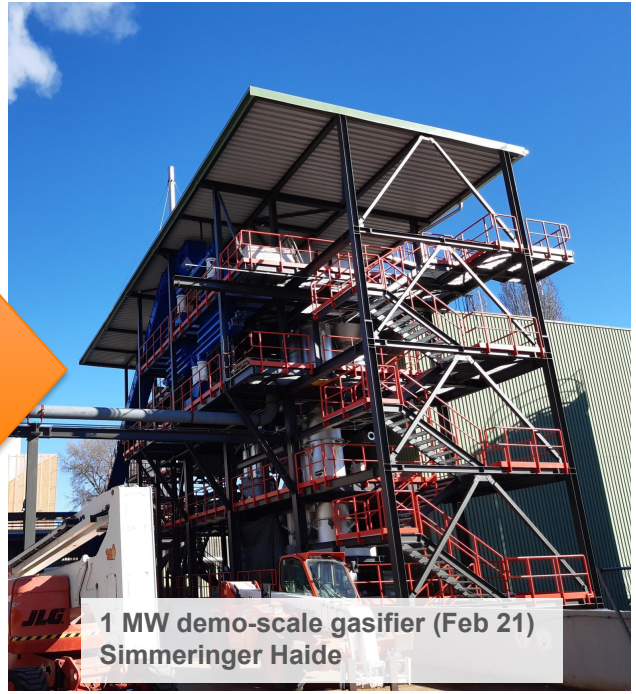
Research focus	Conversion of biomass and biogenic residues to fuels, chemicals (and hydrogen) by steam gasification and Fischer-Tropsch synthesis
Project budget	9 Mio. EUR
Funding programme	AUT / FFG (COMET)
Funding period	04/2019 – 03/2023 (4 years)
Performance data (input / output)	DFB gasification: 1.000 / 750 kW Fischer-Tropsch synthesis: 300 / 200 kW



Waste2Value Status



100 kW-lab scale gasifier
TU Wien



1 MW demo-scale gasifier (Feb 21)
Simmeringer Haide

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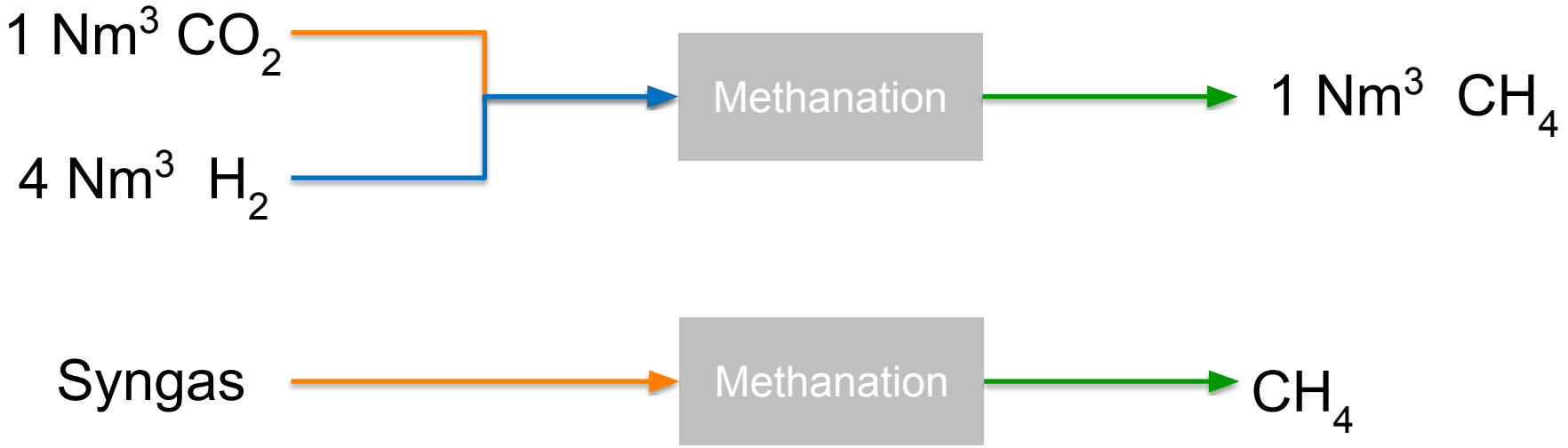
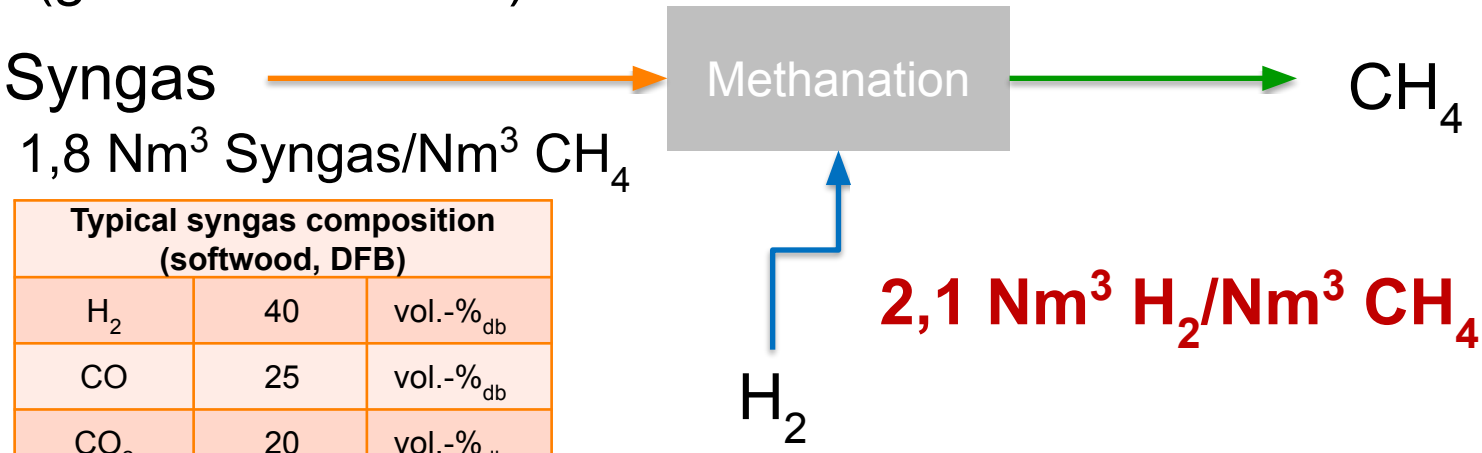
Linking b-fuel and e-fuel production
Green methane from methanation

Renewable **methane** essential energy carrier for DECARB (gas infrastructure)



Linking b-fuel and e-fuel production
Syngas methanation

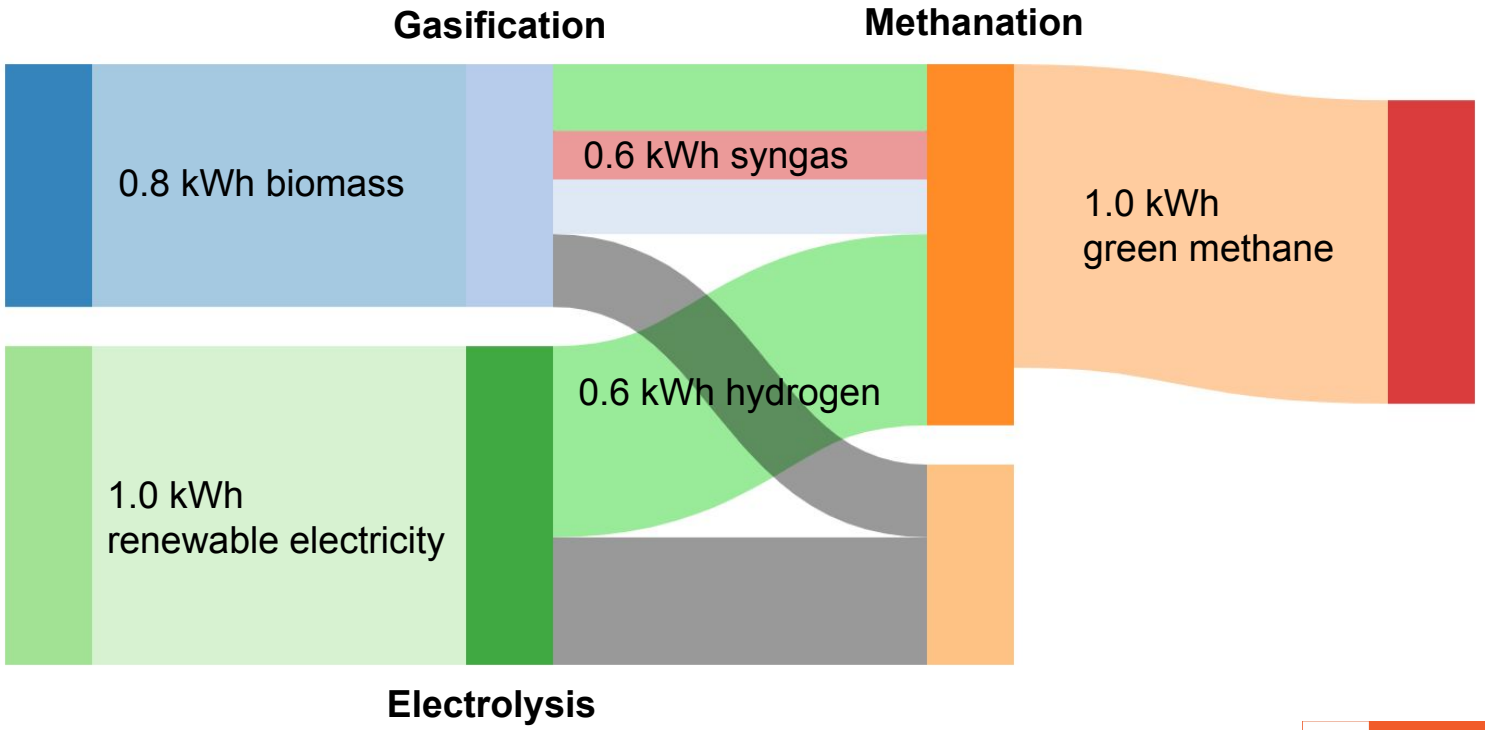
Renewable **methane** essential energy carrier for DECARB (gas infrastructure)



Typical syngas composition (softwood, DFB)		
H_2	40	vol.-%$_{db}$
CO	25	vol.-%$_{db}$
CO_2	20	vol.-%$_{db}$
CH_4	10	vol.-%$_{db}$

Source: Fuchs, J., Schmid, J. C., Müller, S., & Hofbauer, H. (2019). Dual fluidized bed gasification of biomass with selective carbon dioxide removal and limestone as bed material: A review. *Renewable and Sustainable Energy Reviews*, *107*, 212-231.

Linking b-fuel and e-fuel production
Energy Sankey



Linking b-fuel and e-fuel production Benefits

- Potential pathway towards green methane
- Utilization of waste/biomass to obtain green methane
- Integration of renewable hydrogen from water electrolysis
- □ Flexibilization of the overall system, reduction of renewable electricity demand, integration of different markets

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