

Technical Brief: Functional Prototype 3

Copenhagen, Denmark

Responsible



Partner



Capture and Utilisation of a biomass-derived
pyrolysis gas integrated with a syngas
biomethanation

Production Line

Syngas biomethanation

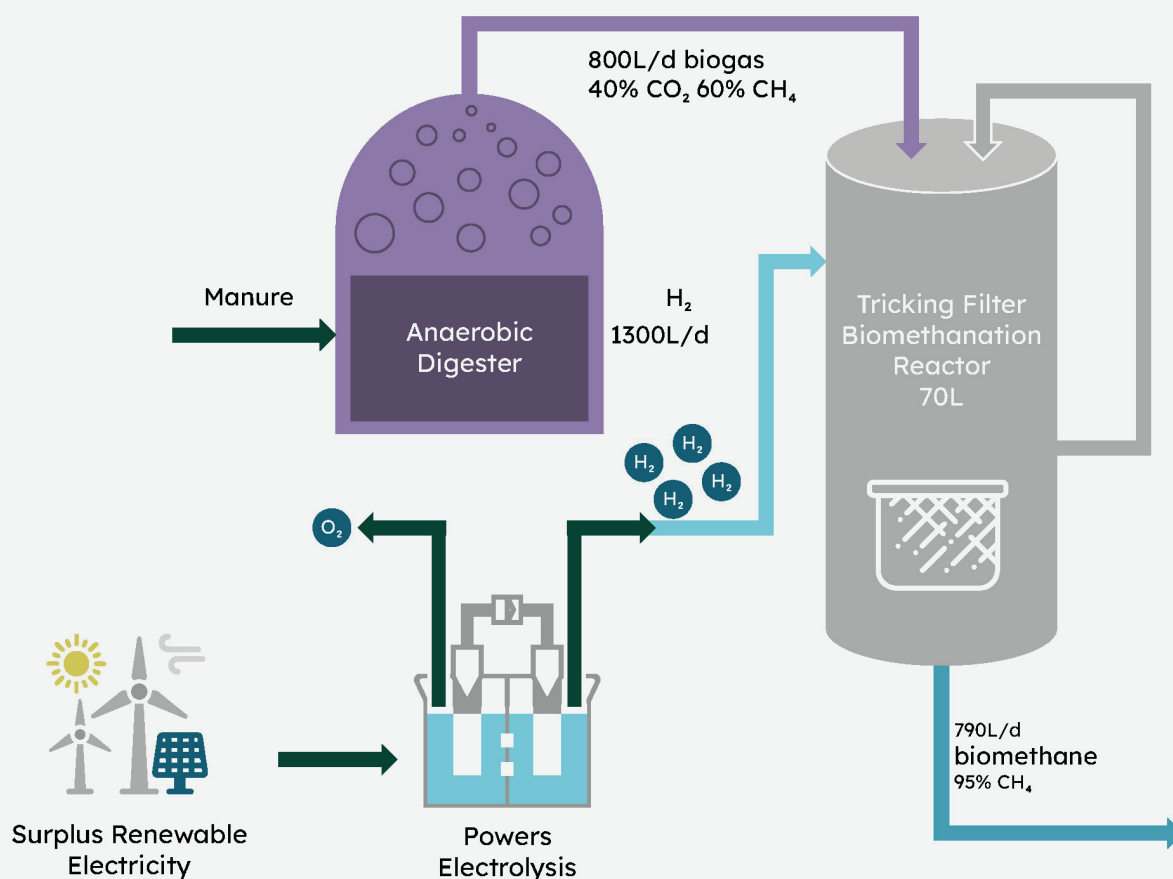
Biogenic Gas: pyrolysis gas

End-Product

**Biomethane
Biochar**

Technologies

**Pyrolysis
Syngas biomethanation**



Performance Indicators

Production capacity target Syngas	816 L gas feed/d
Bioenergy efficiency 1 (%BE₁) <u>Energy content of produced biofuels</u> Energy input in the whole system	24.4%
Bioenergy efficiency 2 (%BE₂) <u>Energy content of produced biofuels</u> Energy content of initial feedstock	32.1%
Biomass resource utilization (%BR) <u>kg products</u> kg initial feedstock	32.9%

Targets

Gas Residence Time optimization

The validation of gas residence times and productivities obtained at lab-scale was prioritized among the experimental campaigns implemented in FP3, as these play a key role in reactor sizing and determining capital investments for further scale-up.

Intermittent operation of the Trickle Bed Reactor

The fluctuations in the availability of "green" H₂ are a critical constraint for the process, requiring to operate the process intermittently. Operating intermittently allows pyrolysis plants to divert the pyrolysis gas to heat and/or power generation or to biomethane depending on excess renewable electricity availability.

Tar tolerance and performance at high tar loading rate

The tar content of pyrolysis gas can inhibit the activity of microbial biofilm communities in the Trickle Bed Reactor. Determining the minimum cleaning/condensation steps is critical for further scaling up the process.

Technical sketch

