

Technical Brief: Functional Prototype 2

Thessaloniki, Greece

Responsible



Partner



Capture and utilization of CO₂ from biogas for subsequent conversion to CH₄ through biological CO₂ hydrogenation

Production Line

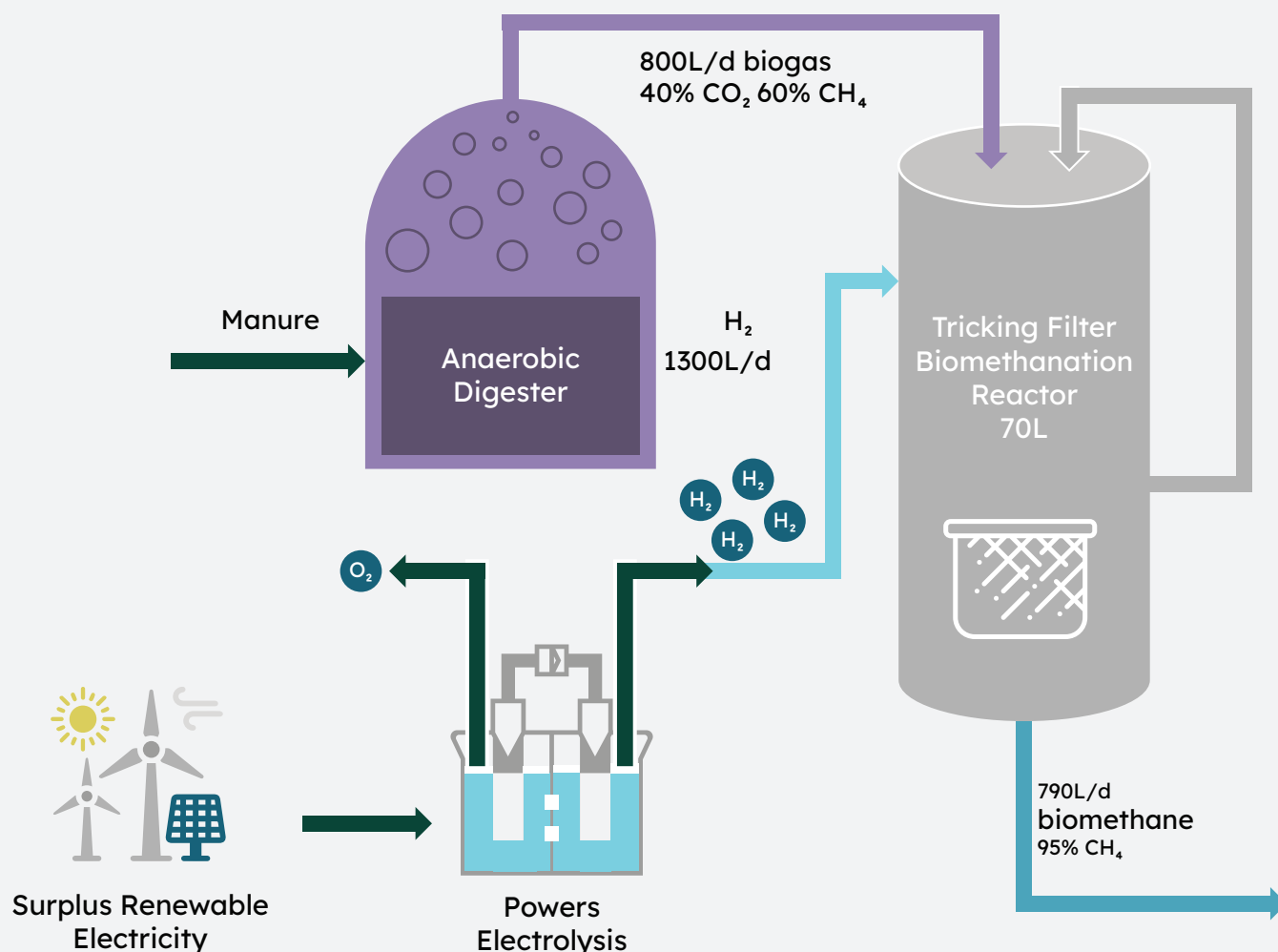
**Anaerobic Digestion
Biogenic Gas CO₂**

End-Product

Biomethane

Technologies

Biological CO₂ hydrogenation



Performance Indicators

CO ₂ capture efficiency target	≥ 95%
Bioenergy efficiency 1 (%BE ₁)	34.99
Bioenergy efficiency 2 (%BE ₂)	11.47
Biomass resource utilization (%BR)	29.30

Targets

- Biogas production: Biogas is produced in a pilot-scale anaerobic digester treating manure and other agro-industrial residues.
- H₂ generation: H₂ is generated via water electrolysis. By using surplus off-peak electricity from renewable sources, the produced H₂ is classified as "green".
- Biomethane production: The produced biogas and generated H₂ are directed to the biomethanation reactor containing a mixed, enriched hydrogenotrophic inoculum. The hydrogenotrophic methanogens metabolize the CO₂ fraction of biogas and the generated H₂ into CH₄, while the CH₄ originally present in the biogas remains unaltered. The final product is biomethane with a CH₄ content of ≥95%.

