



Fakultät für Ingenieurwesen
Facoltà di Ingegneria
Faculty of Engineering

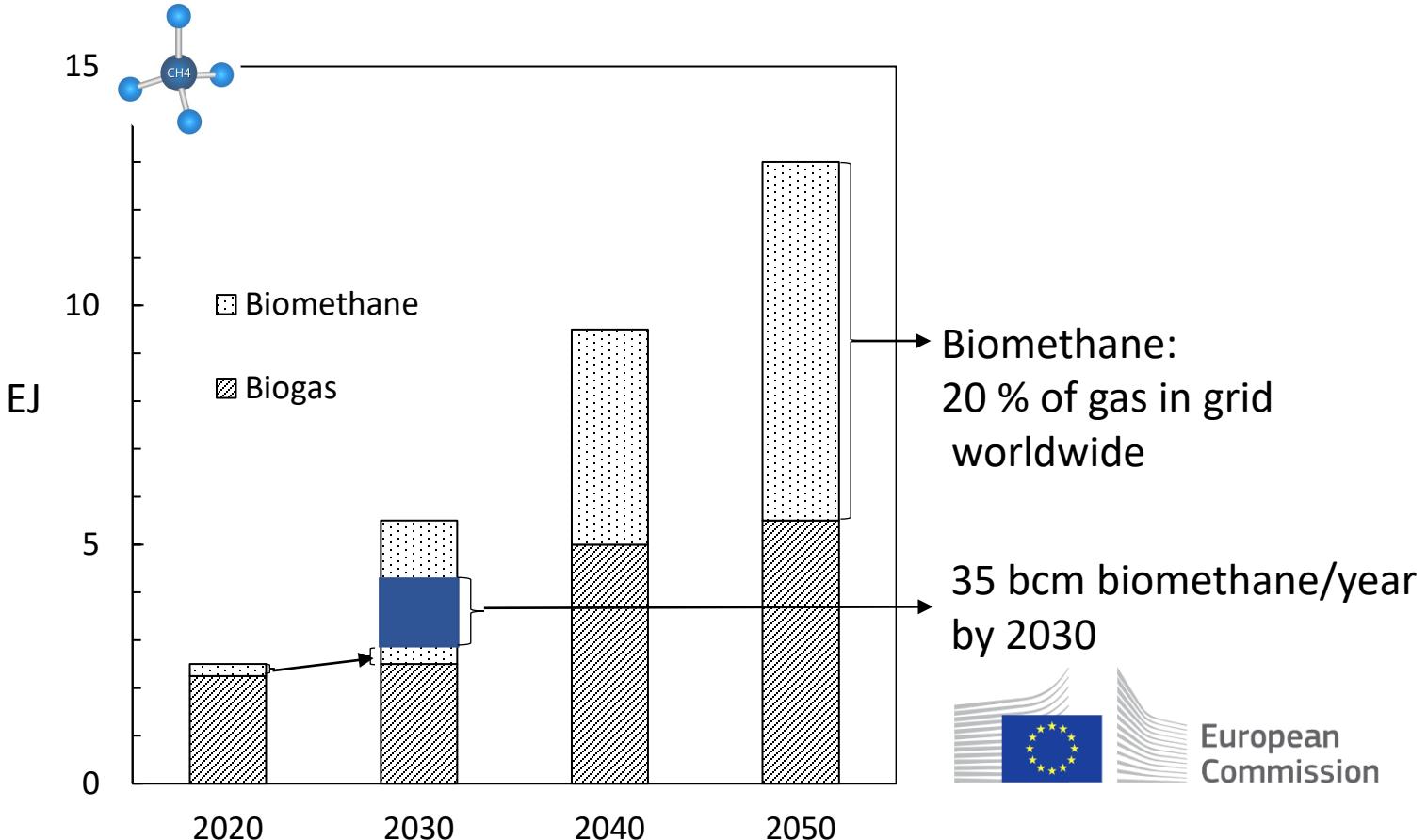


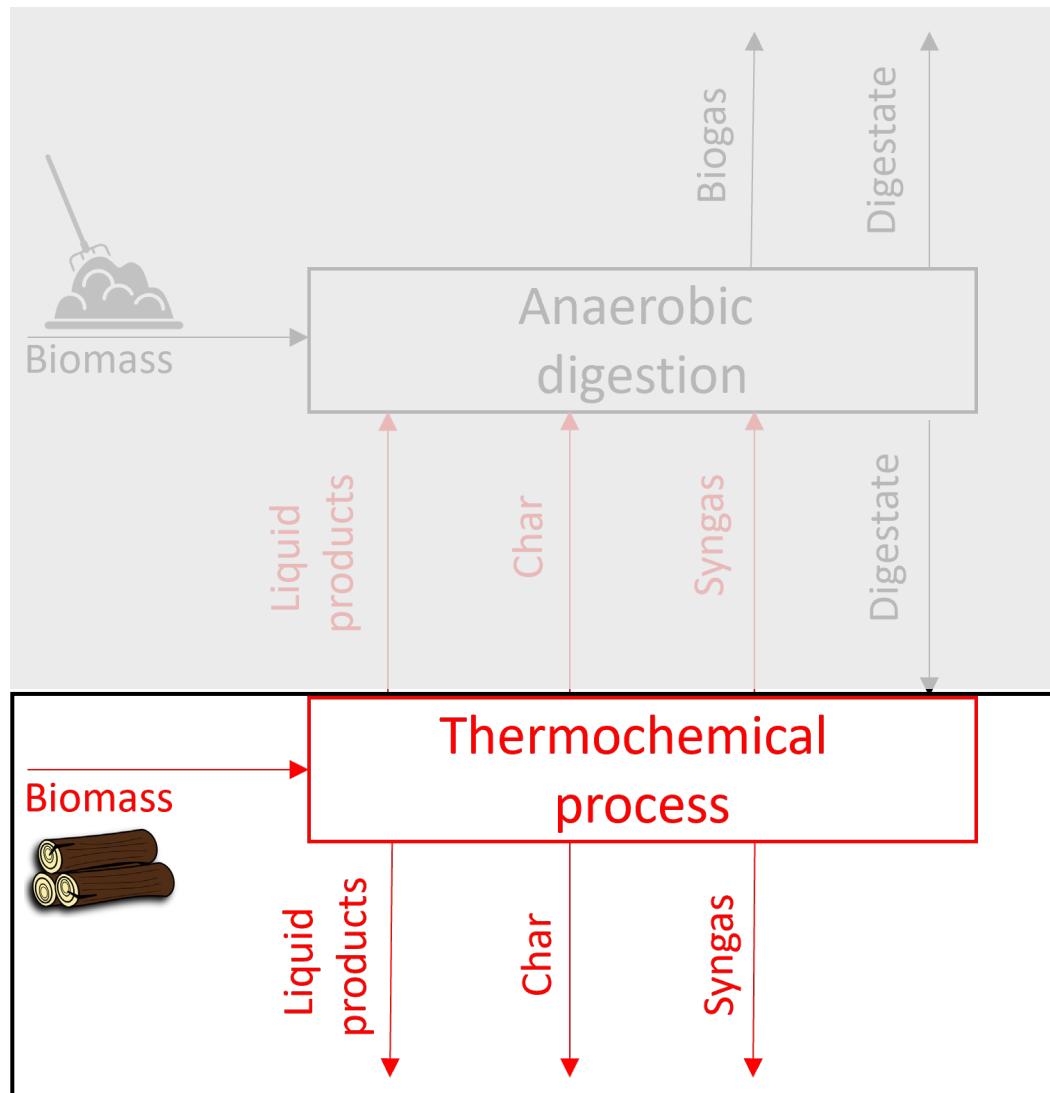
Towards in situ syngas biomethanation: experimental analysis and modeling of a CSTR co- digesting syngas and manure

27/06/2024

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I. Angelidaki, M. Baratieri

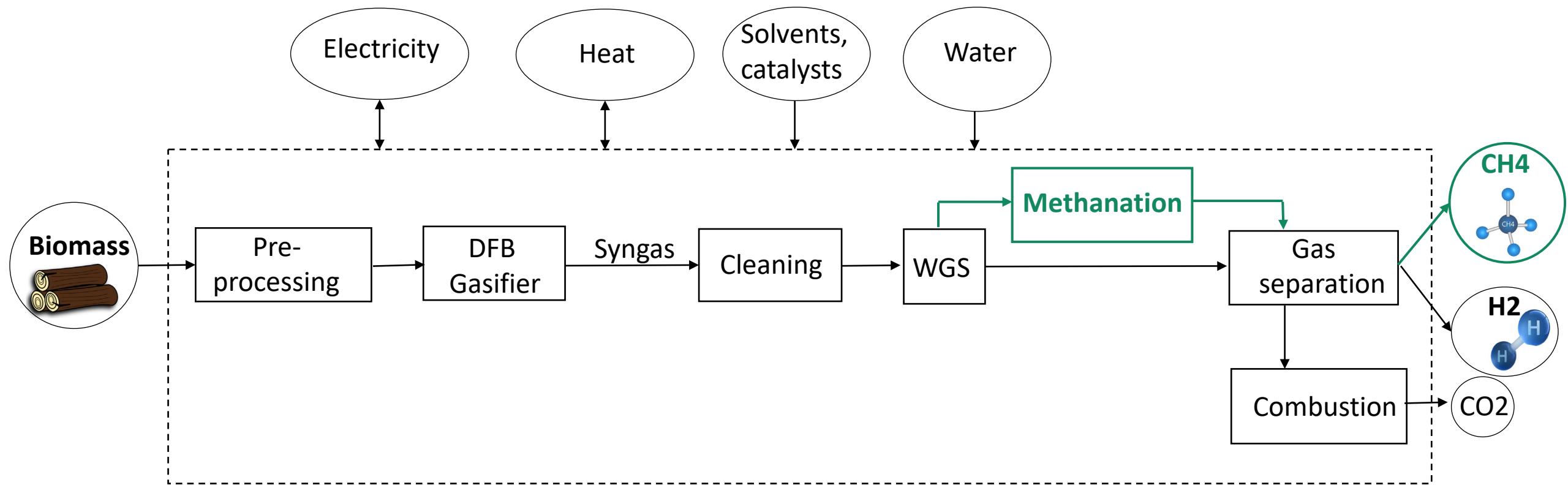


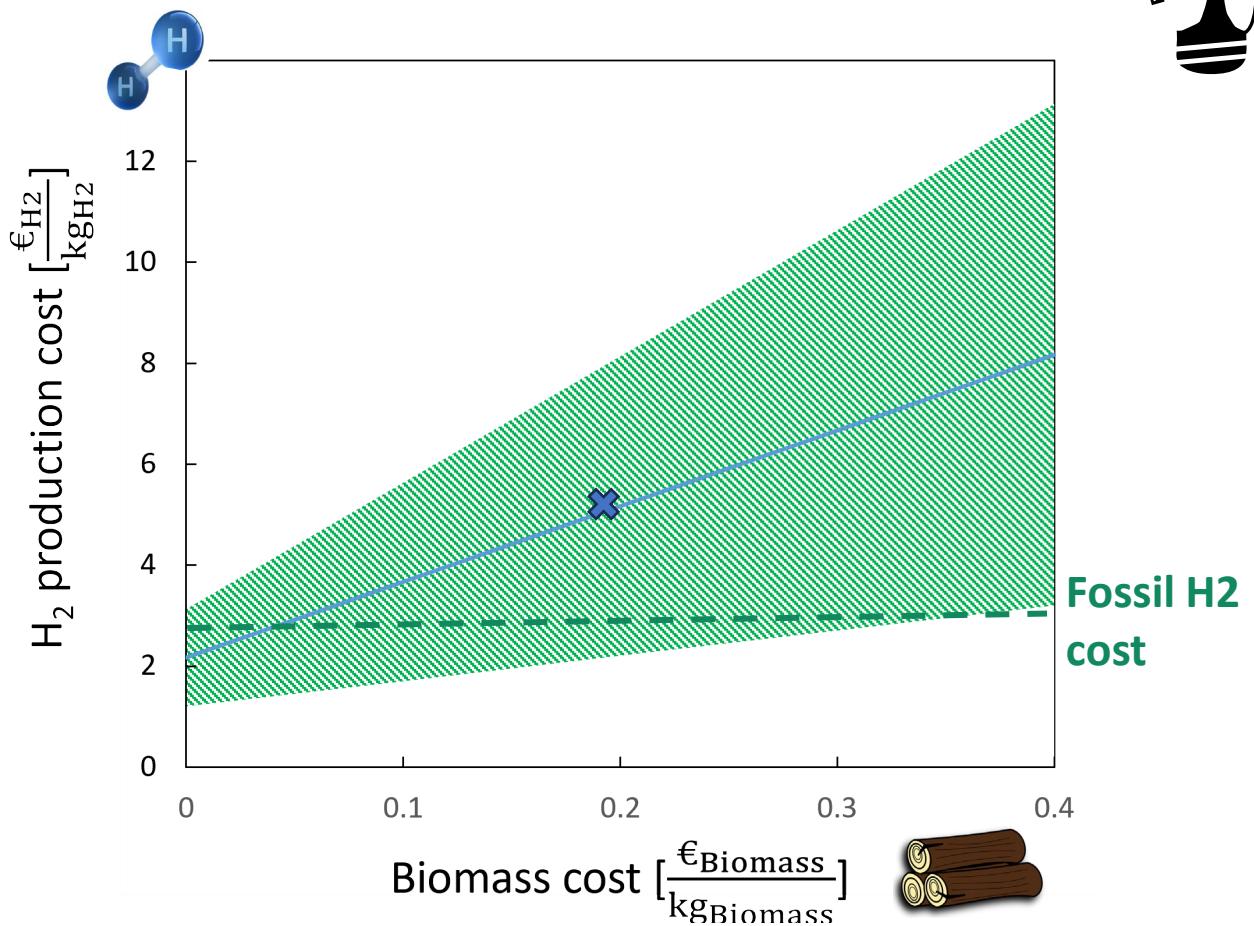
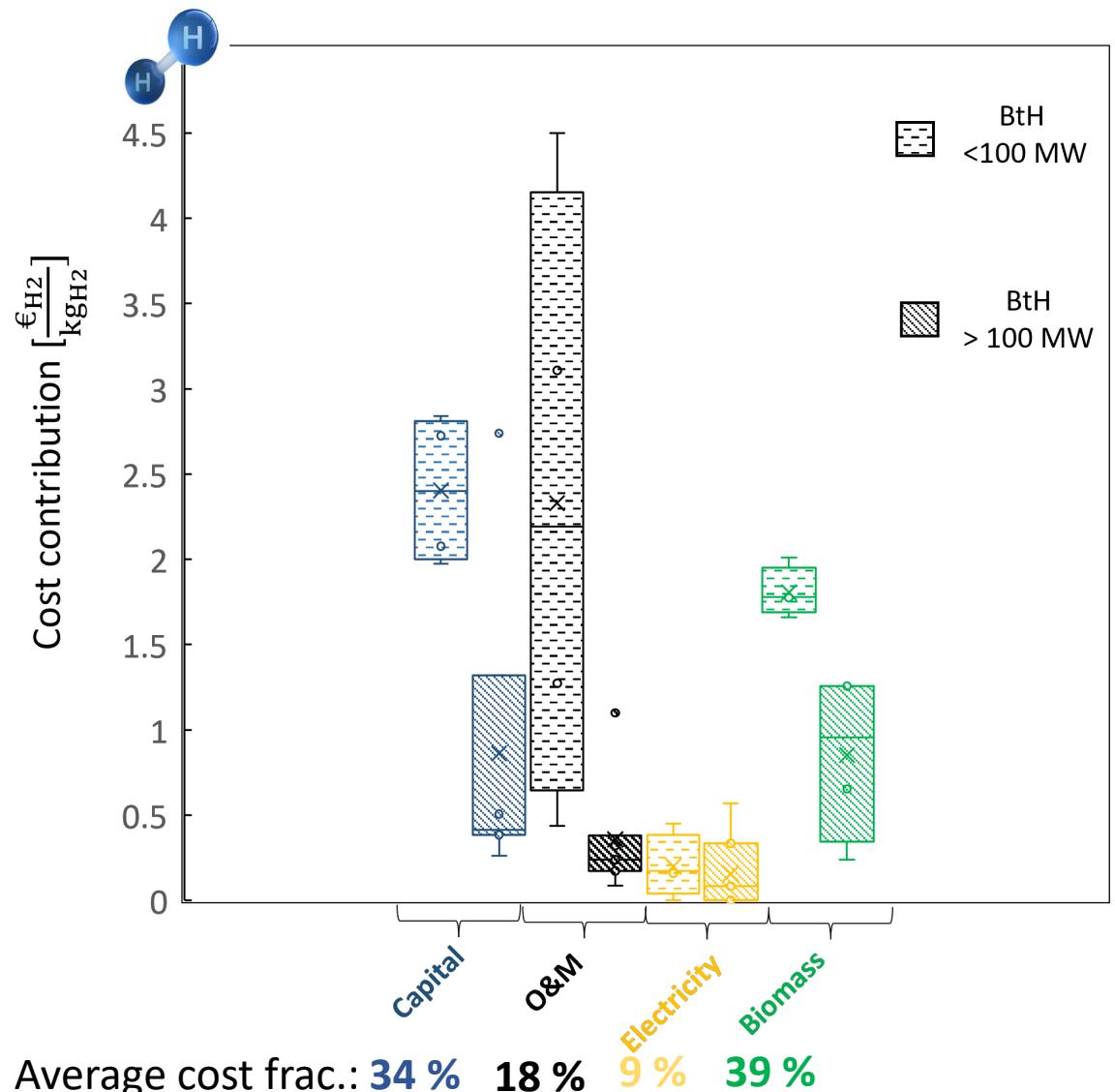


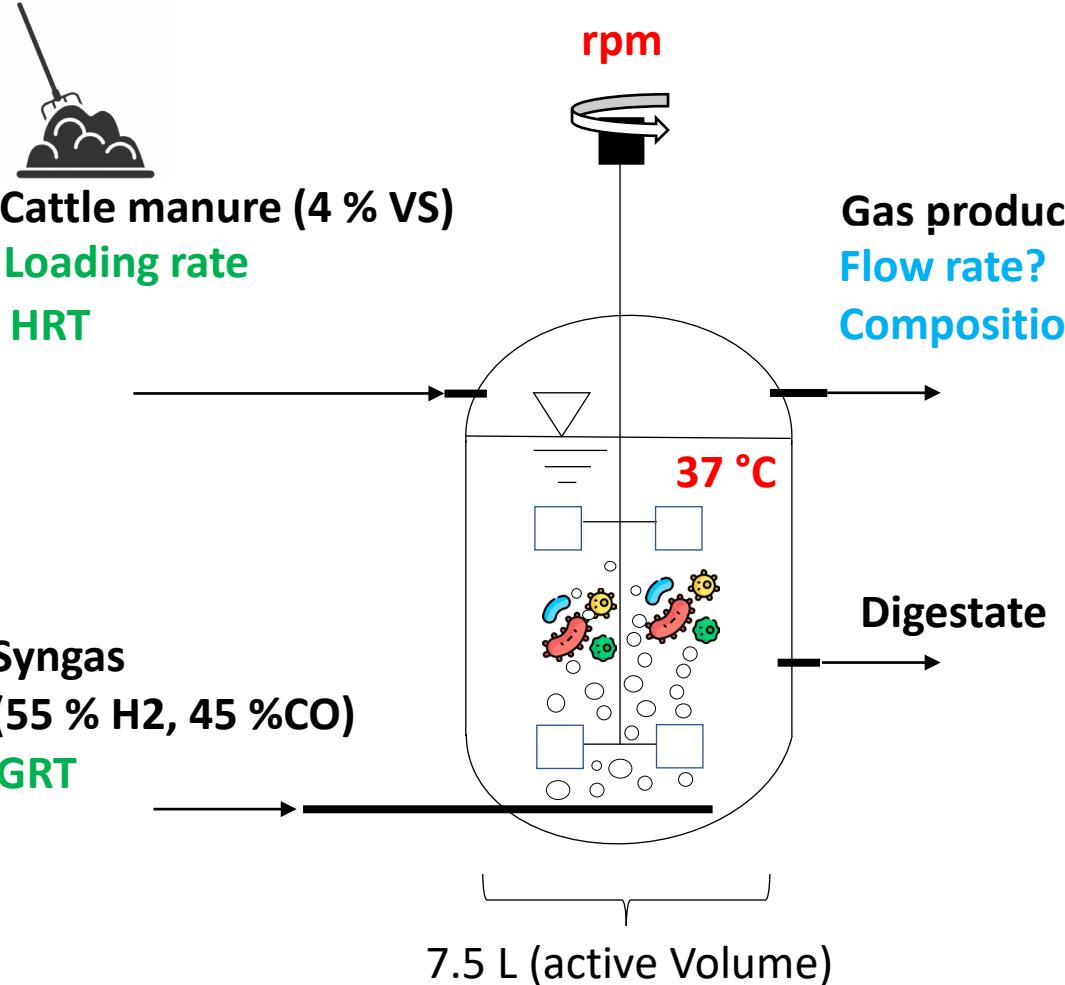
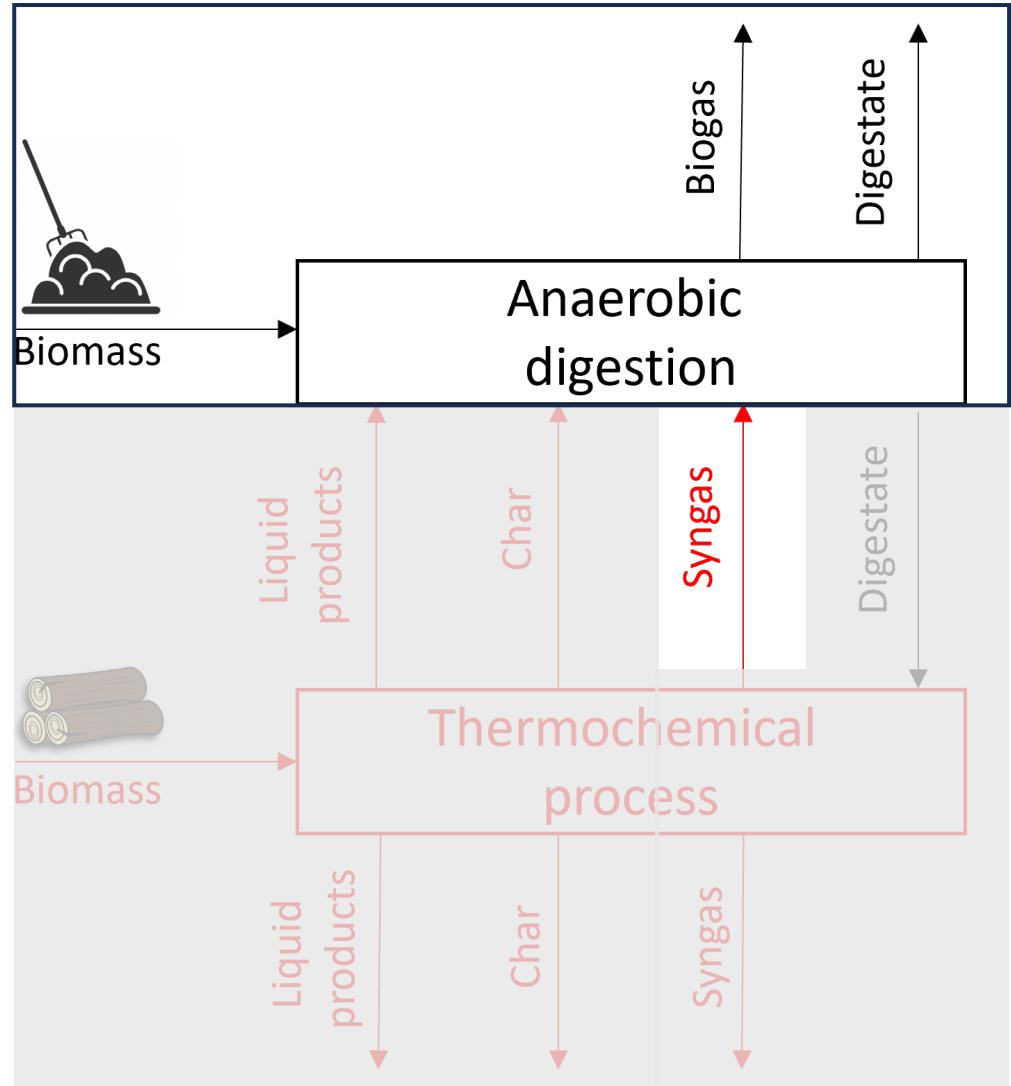


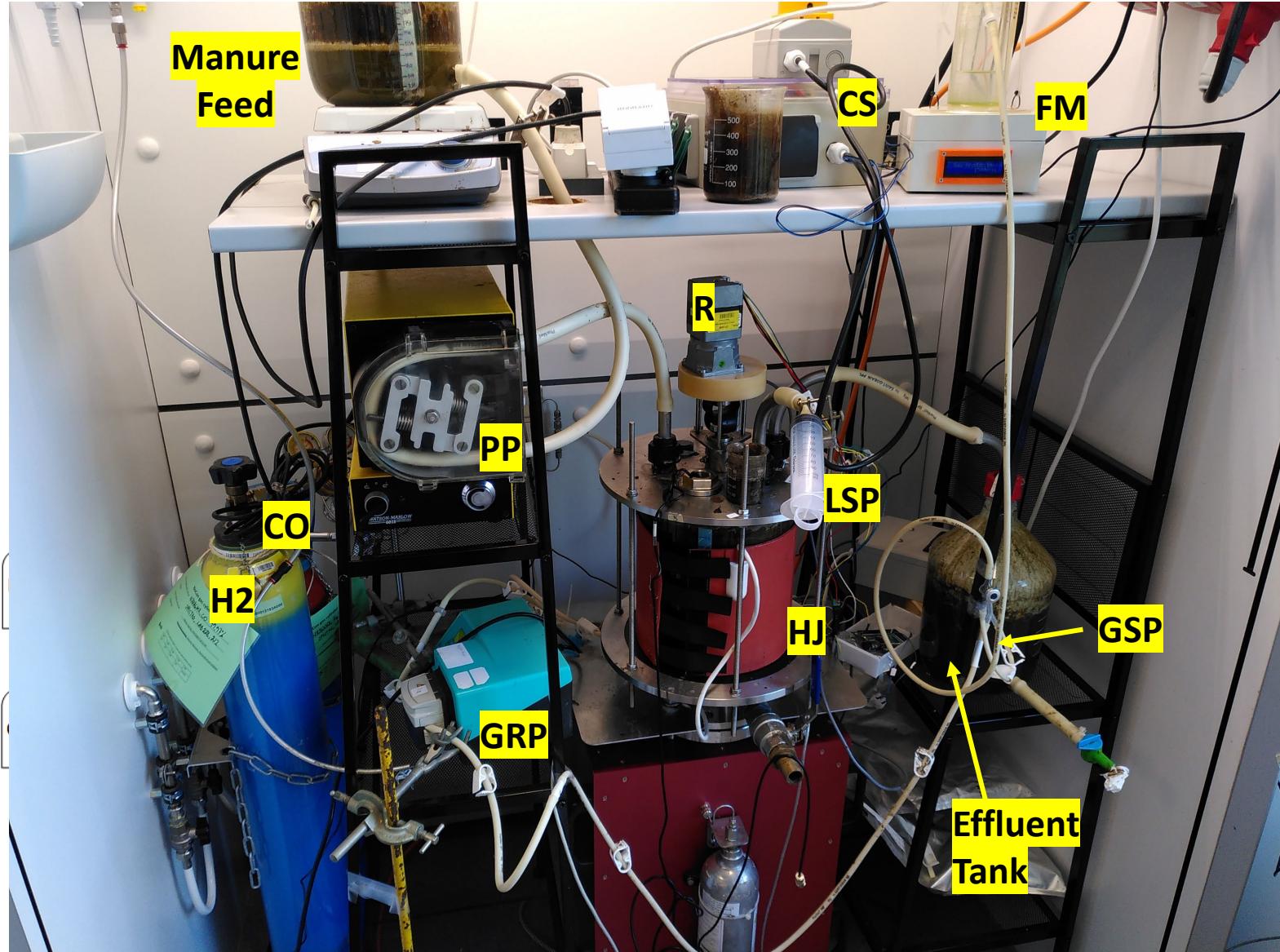


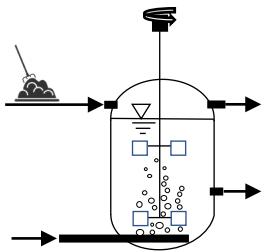
Biomass-to-hydrogen/methane generic flowsheet:





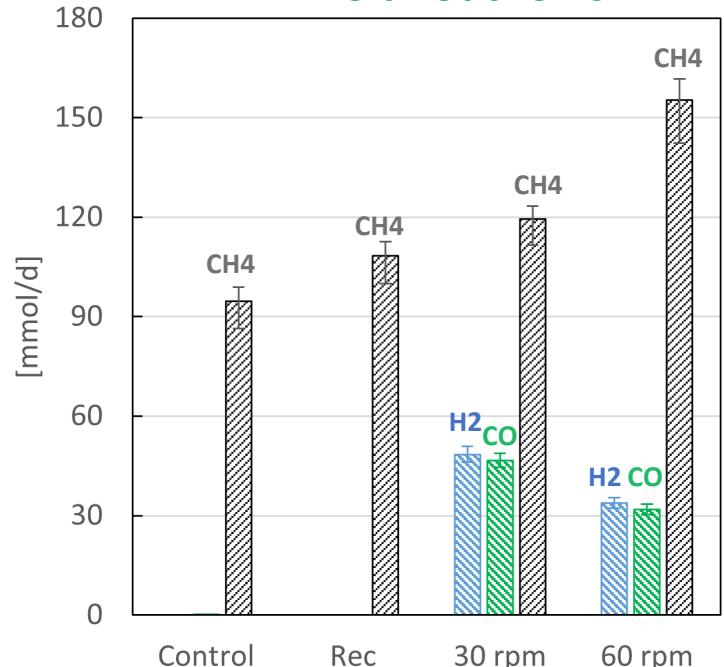




**AD manure:**

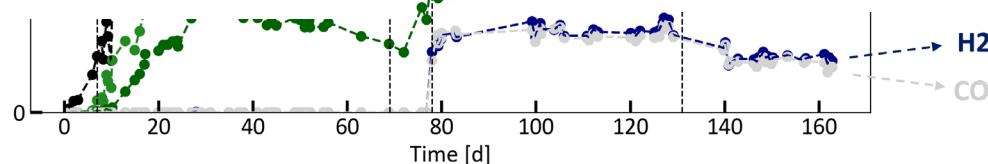
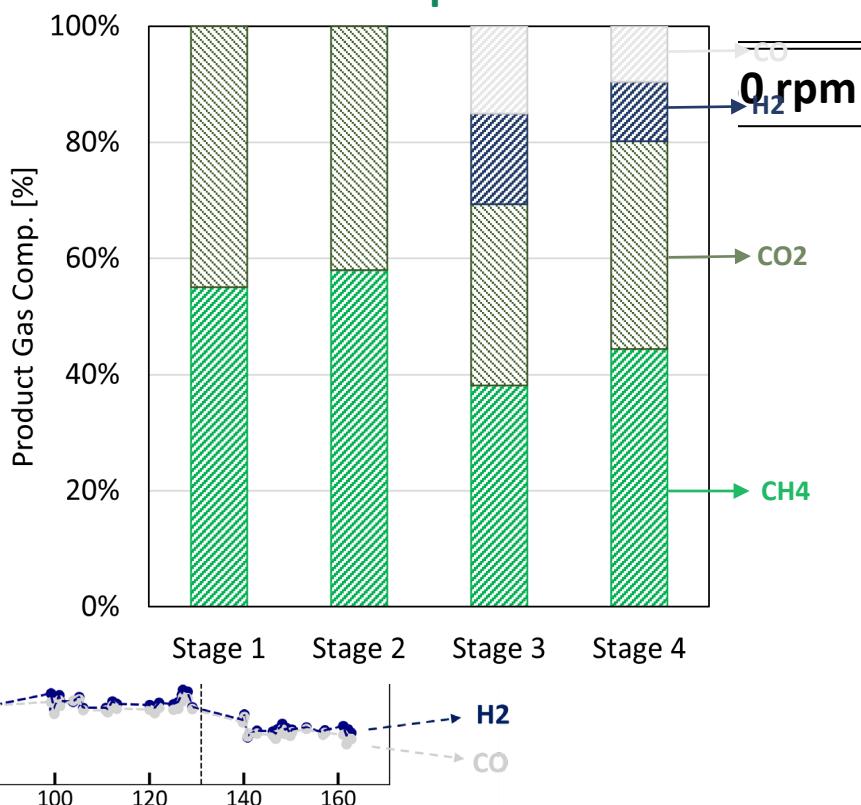
HRT = 20 d

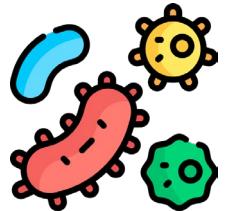
OLR = 2 g_VS/(L*d)

Molar outflows**+ gas rec. 400 ml/min:****+ gas injection:**Comp.: 55% H₂, 45% CO

Gas load: 0.432 L/(L*d)

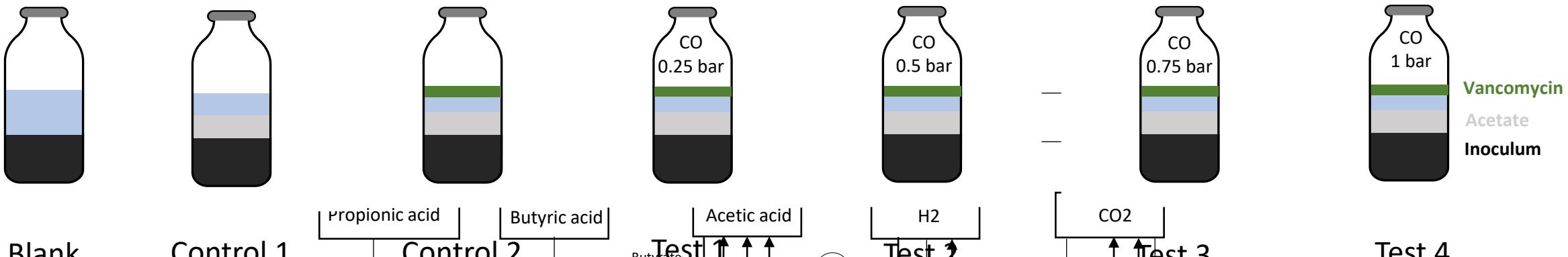
GRT: 2.32 d

Gas composition



CO inhibition test aceticlastic methanogenesis:

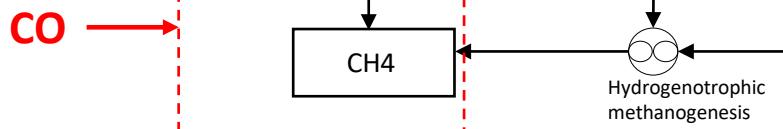
37 °C

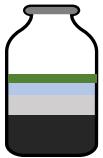
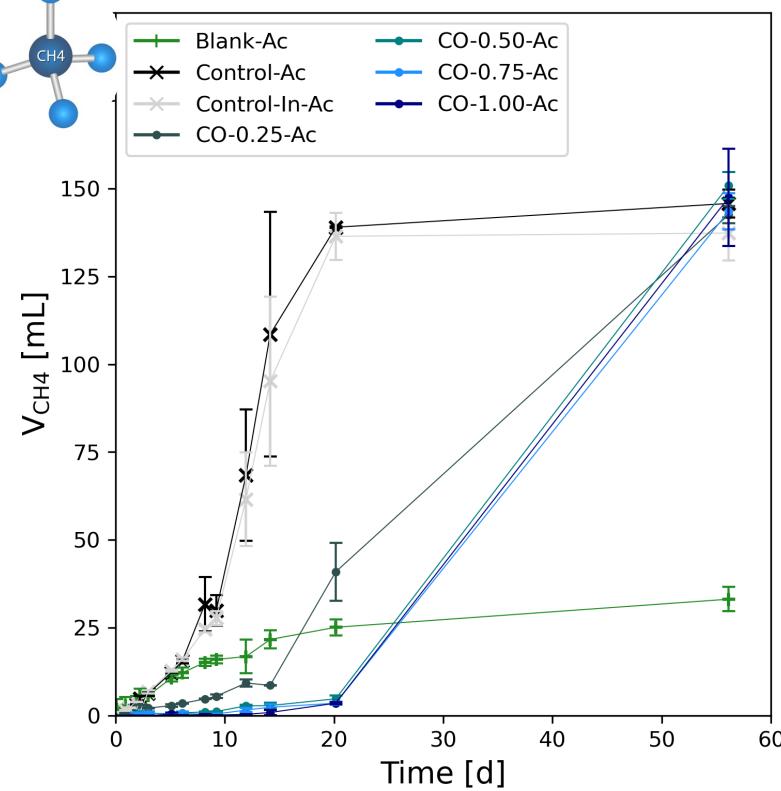
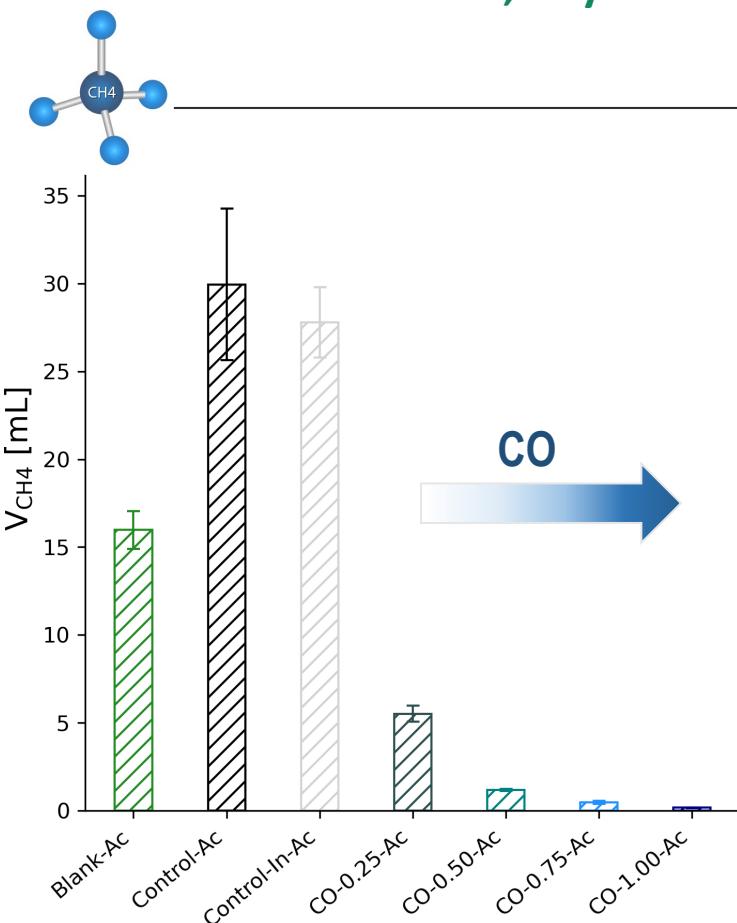


Biological conversion

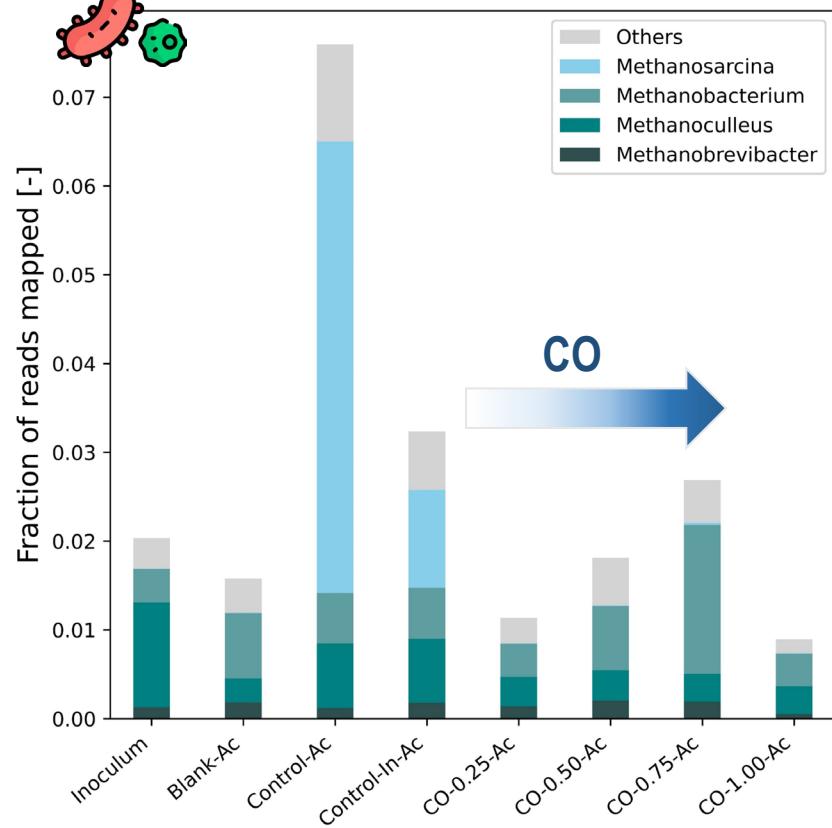
Substrate/Product

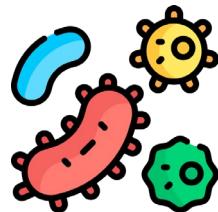
CO



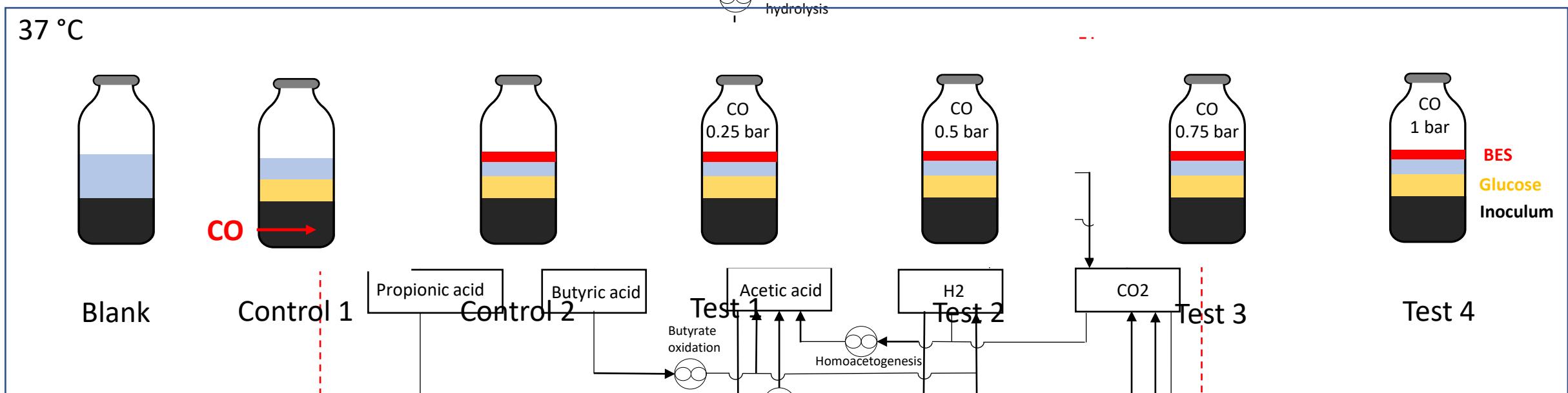
Cumulative CH₄:Cumulative CH₄, Day 9:

Archaea, Day 9:



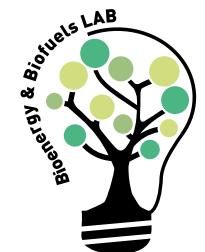


37 °C

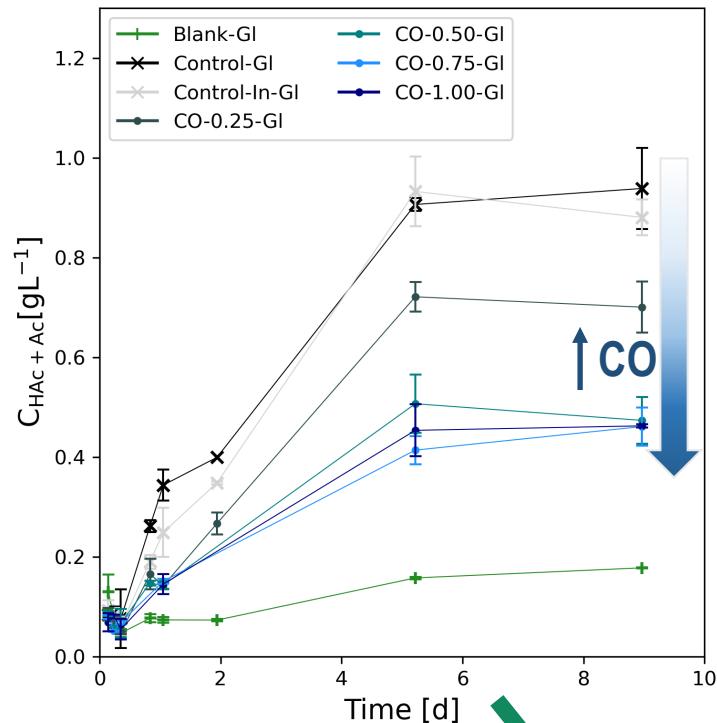


Biological conversion

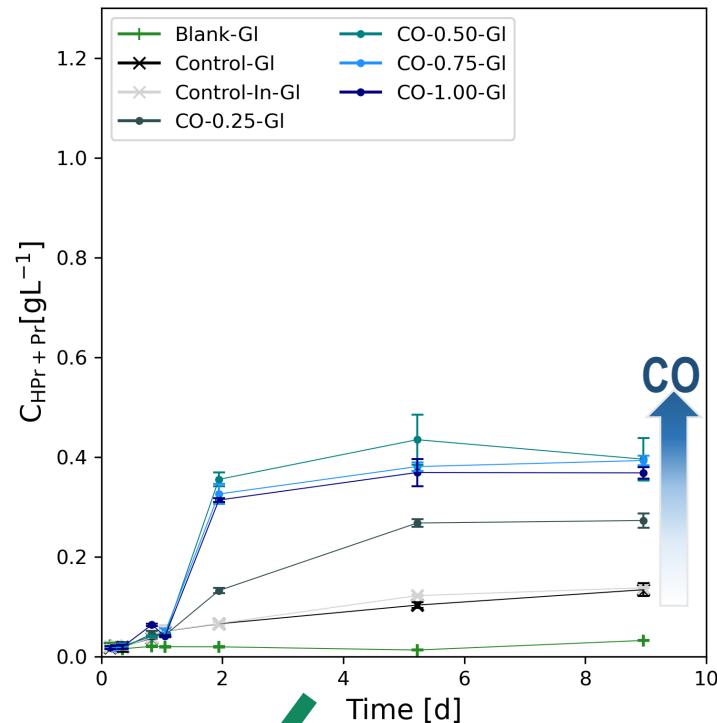
Substrate/Product



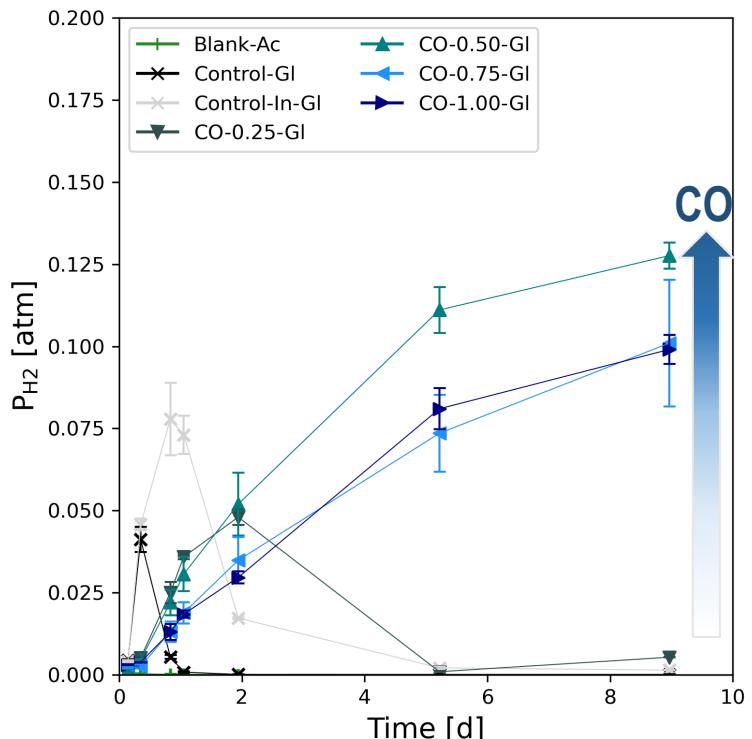
Acetate:



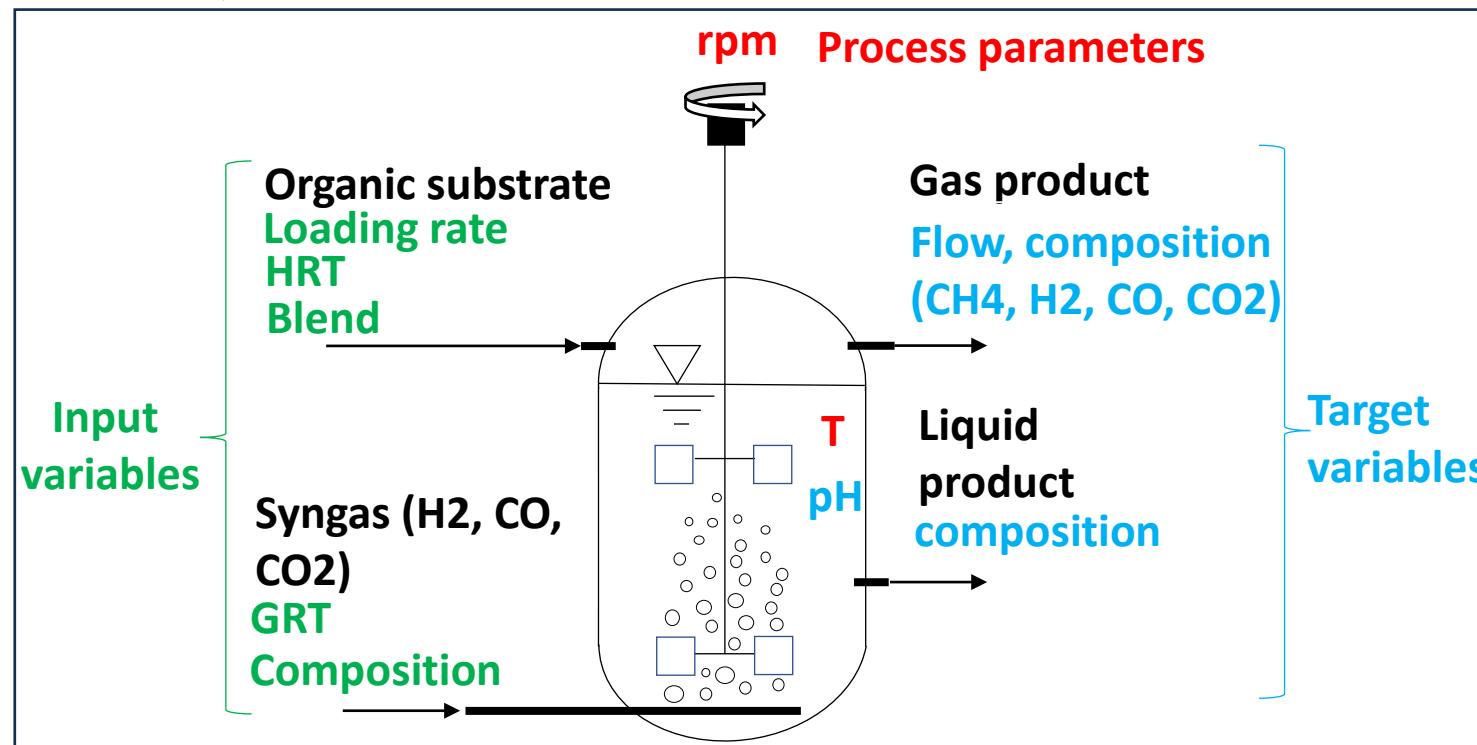
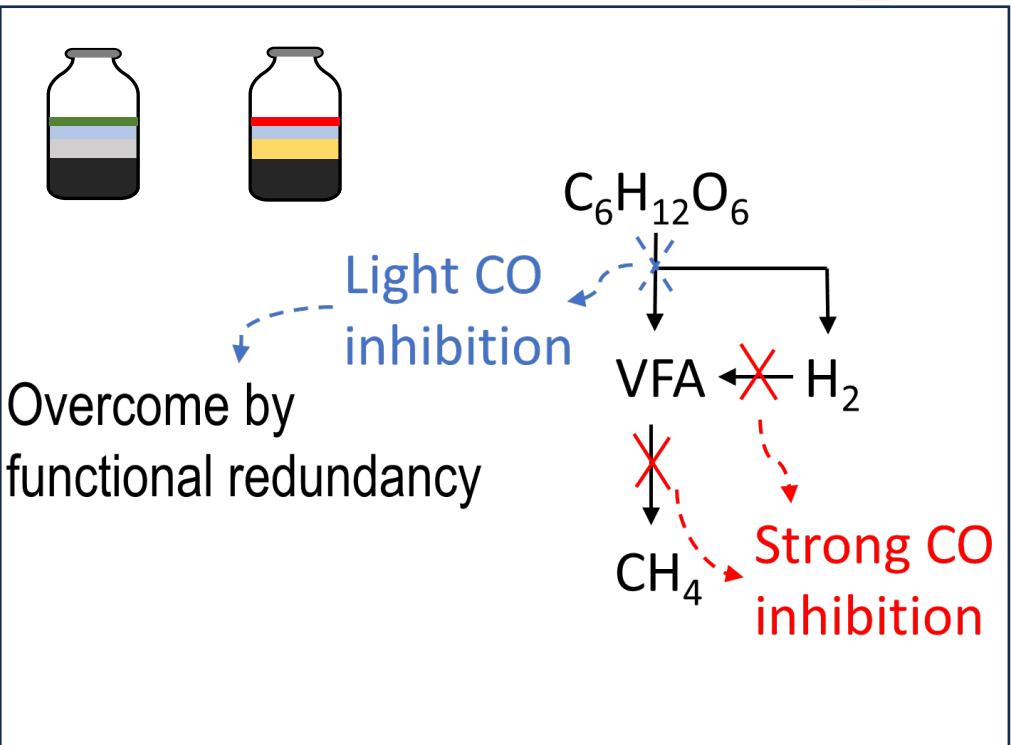
Propionate:



H2:

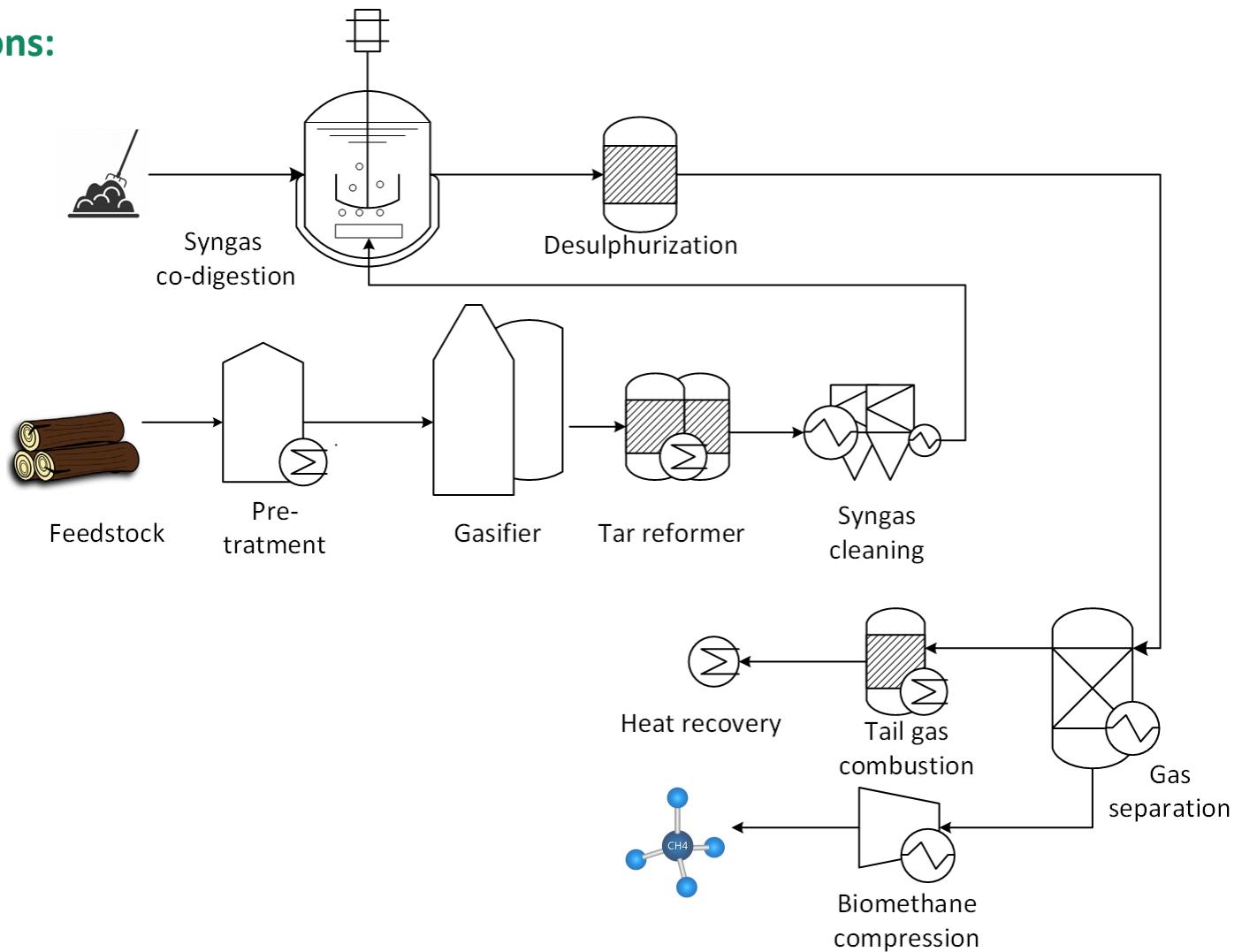


Functional redundancy effect
Enrichment *Anaerotignum* spp.





Future process evaluations:





Thank you for your attention!

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Faculty of Engineering

Technical
University of
Denmark

