Lemvig Biogas - Power to X - Biogas Danmark Konferencen 2021. Vingsted, 08.12.2021

Power to X
CO_2 + brint fra vind-el

1. CO_2 metaniseret med sabatier metoden.

2. Methanol

3. Biologisk proces fra brint og CO_2 til metan.
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4. Biologisk proces til Ravsyre $C_4H_6O_4$

MeGa-stoRE
RT3

CO_2 metaniseret med sabatier metoden

Er afsluttet

Slutrapport findes på lemvigbiogas.com

Project partners:

- GreenHydrogen.dk
- Elplatek A/S
- DTU Mekanik AU Herning
- Lemvig Biogasanlæg A.m.b.A

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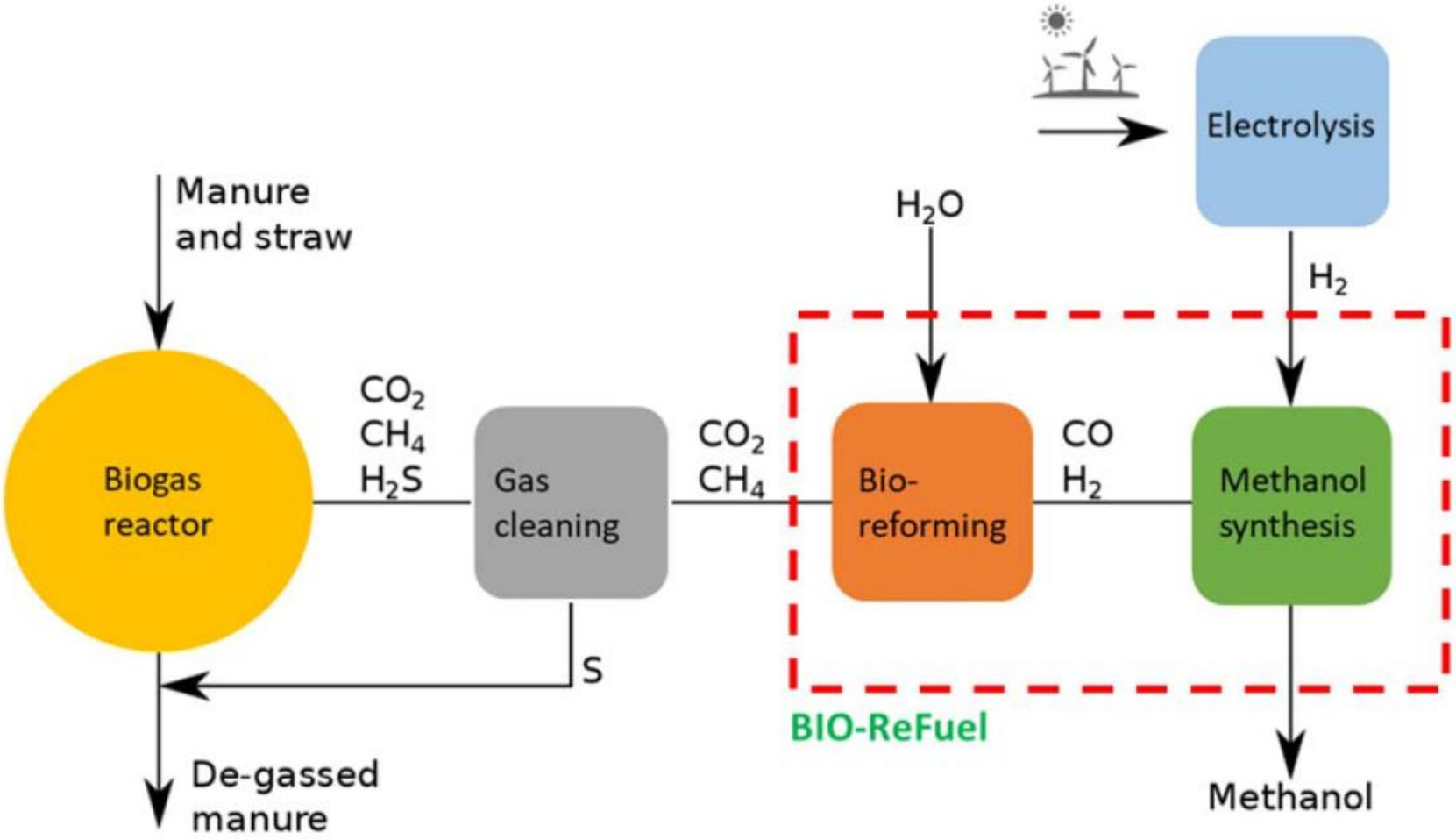
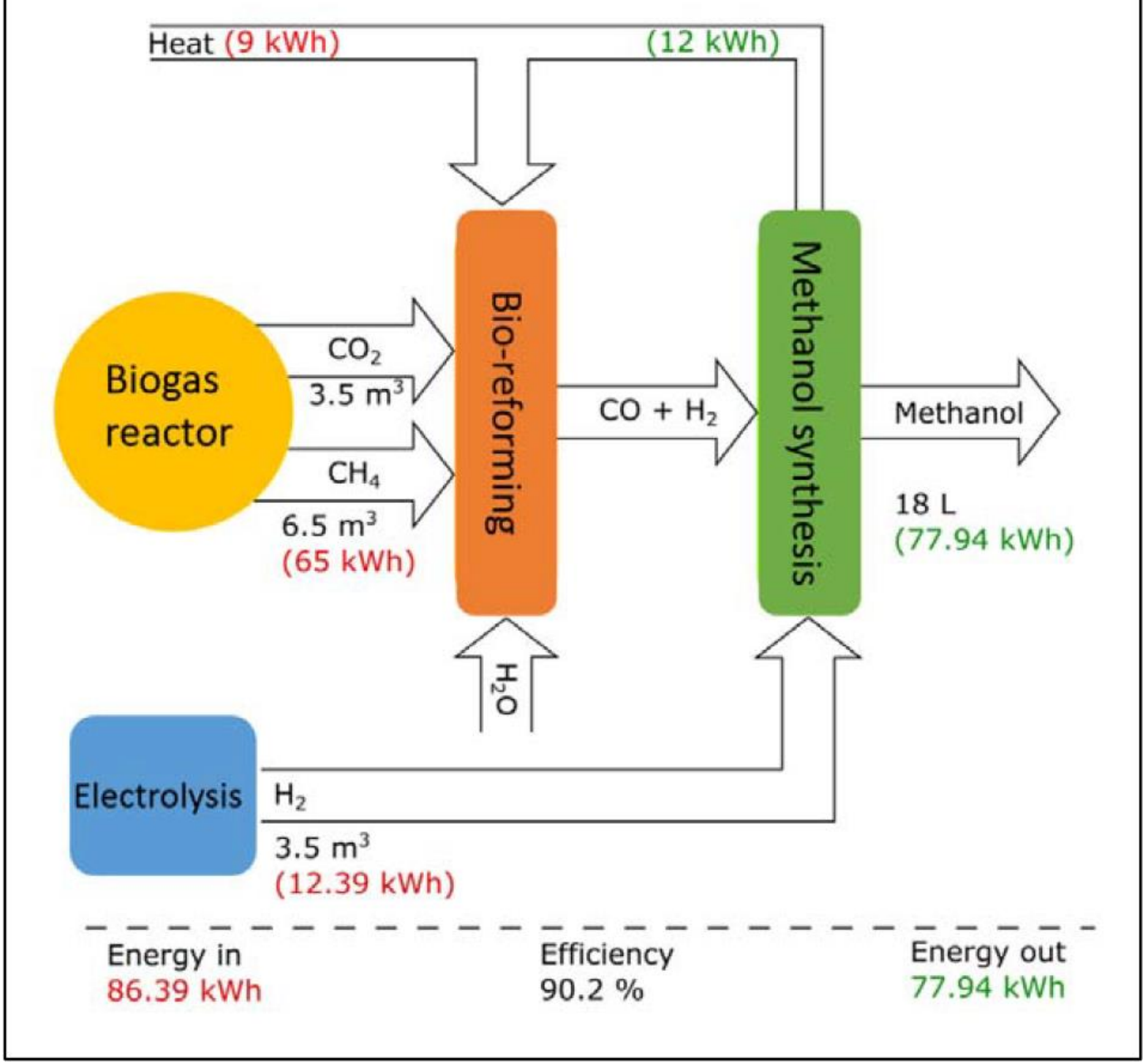
Methanol af biogas





Energibalance

BioReFuel phase 2 – nr. 52497 64019-0600	
Partner:	**Projektudgifter budget kr.:**
DTU Kemi Teknik	
Elplatek A/S	
Union Engineering/Pentair	
Unicat Catalyst Technologies	
Lemvig Biogas	
Bjarke Bitsch (advisory board)	
I alt	16.571.030

Testen ved Lemvig Biogas planlægges til at forløbe fra juni 2022 til april 2023

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Opgradering af CO_2 i biogas med brint – nr. 12465

Vi er med et lille forskningsprojekt med DTU om el-lagring ved at tilsætte brint, lavet af vind-el, direkte til reaktorerne med biogasgylle. Det er en biologisk proces, der ved hjælp af bakterier øger indholdet af metan i biogas.

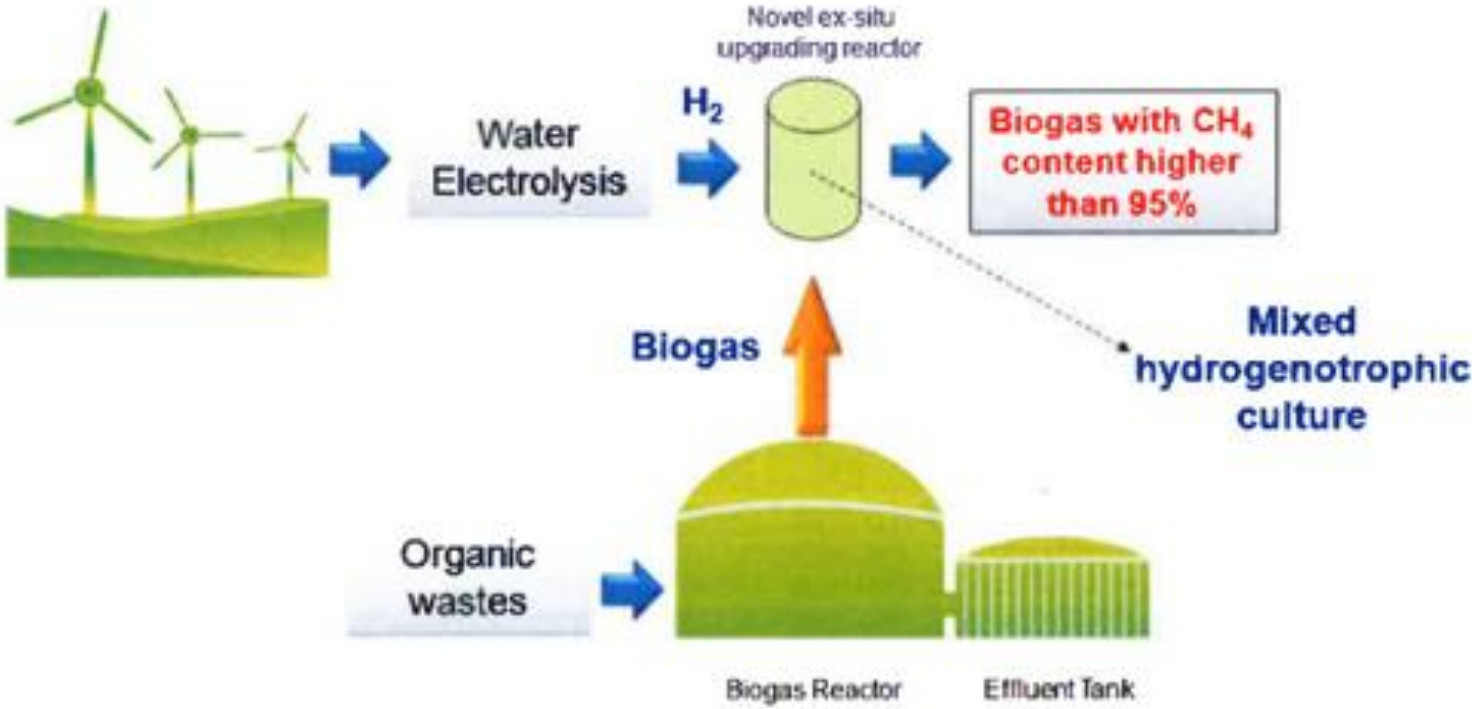


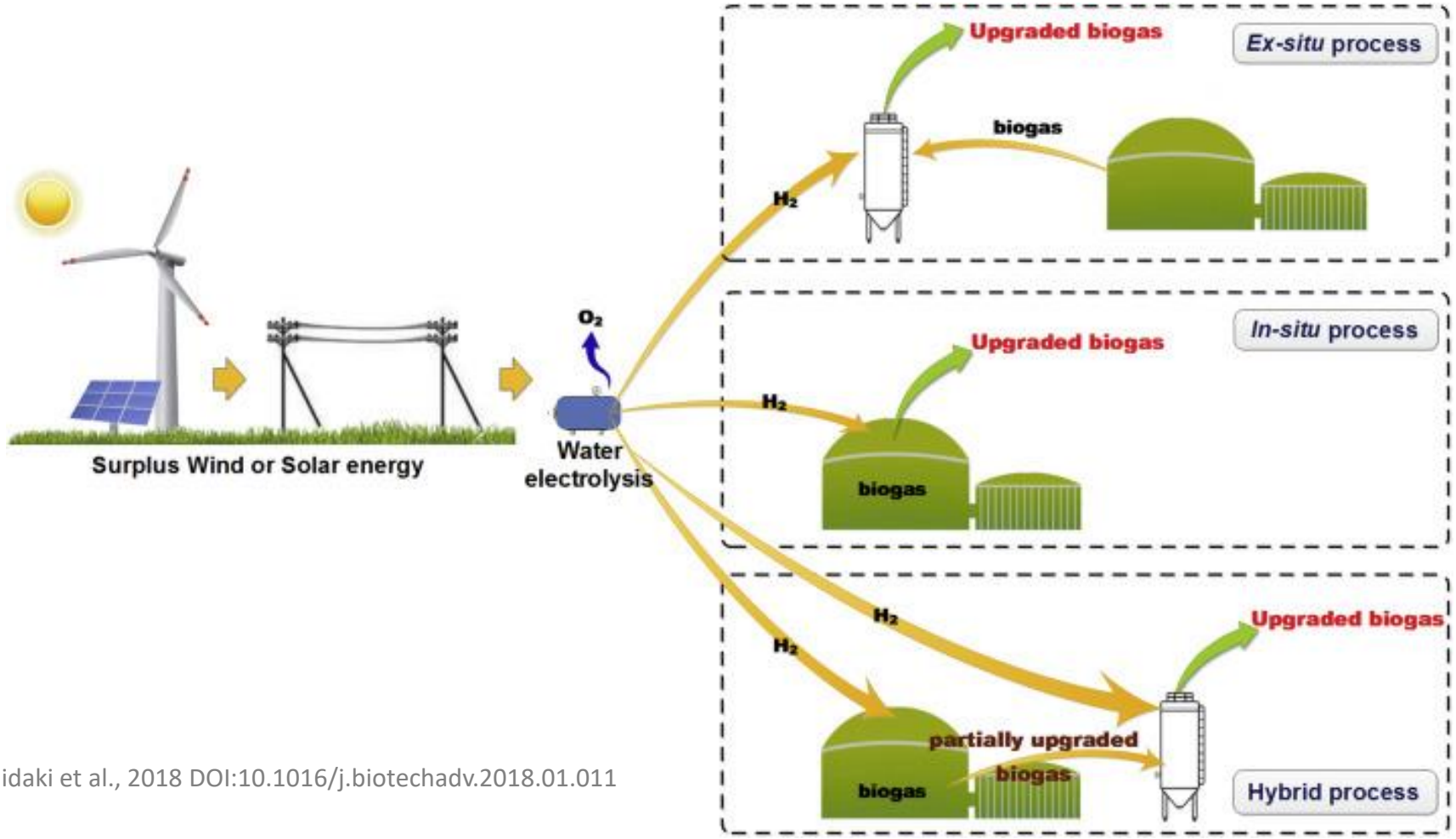
Figure 1. General schematic flow of the proposed ex-situ upgrading technology

Billede af containeren med reaktoren. Inde i den to m høje reaktor er der bakterier fra biogasgyllen. Reaktoren er fyldt af et porøst materiale, som bakterierne kan fastholdes på

Biomethanation

CO_2 together with H_2 could be used by hydrogenotrophic methanogens

$$4H_2 + CO_2 \rightarrow CH_4 + 2H_2O$$



Angelidaki et al., 2018 DOI:10.1016/j.biotechadv.2018.01.011

Published results from operation in Lemvig biogas

Contents lists available at ScienceDirect

Energy Conversion and Management

journal homepage: www.elsevier.com/locate/enconman

Pilot-scale biomethanation in a trickle bed reactor: Process performance and microbiome functional reconstruction

Panagiotis Tsapekos [a], Laura Treu [b,*], Stefano Campanaro [b,*], Victor B. Centurion [c], Xinyu Zhu [a], Maria Peprah [a], Zengshuai Zhang [a], Panagiotis G. Kougias [d], Irini Angelidaki [a]

[a] Department of Chemical and Biochemical Engineering, Technical University of Denmark, Kgs., Lyngby DK-2800, Denmark
[b] Department of Biology, University of Padova, Via U. Bassi 58/b, 35121 Padova, Italy
[c] Microbial Resources Division, Research Center for Chemistry, Biology, and Agriculture (CPQBA), State University of Campinas - UNICAMP, Paulínia, SP CEP 13081-970, Brazil
[d] Soil and Water Resources Institute, Hellenic Agricultural Organisation Demeter, Thermi-Thessaloniki 57001, Greece

•https://doi.org/10.1016/j.enconman.2021.114491

Projekt nr.: 12465

Partner:	Projektudgifter budget kr.:
DTU Environment	
Lemvig Biogas	
I alt	5.933.394

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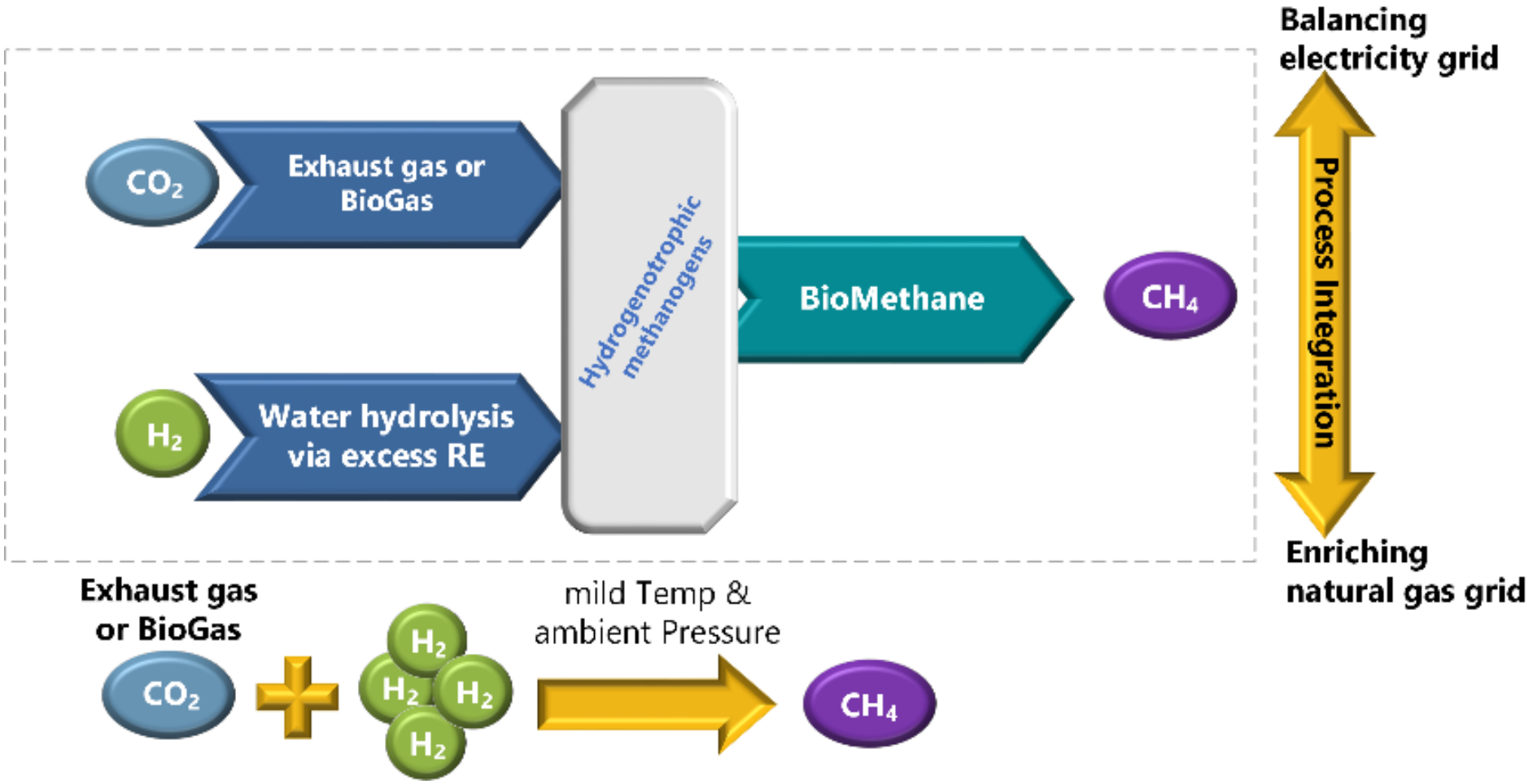
4. Biologisk proces til:
   Metan
   Ravsyre $C_4H_6O_4$

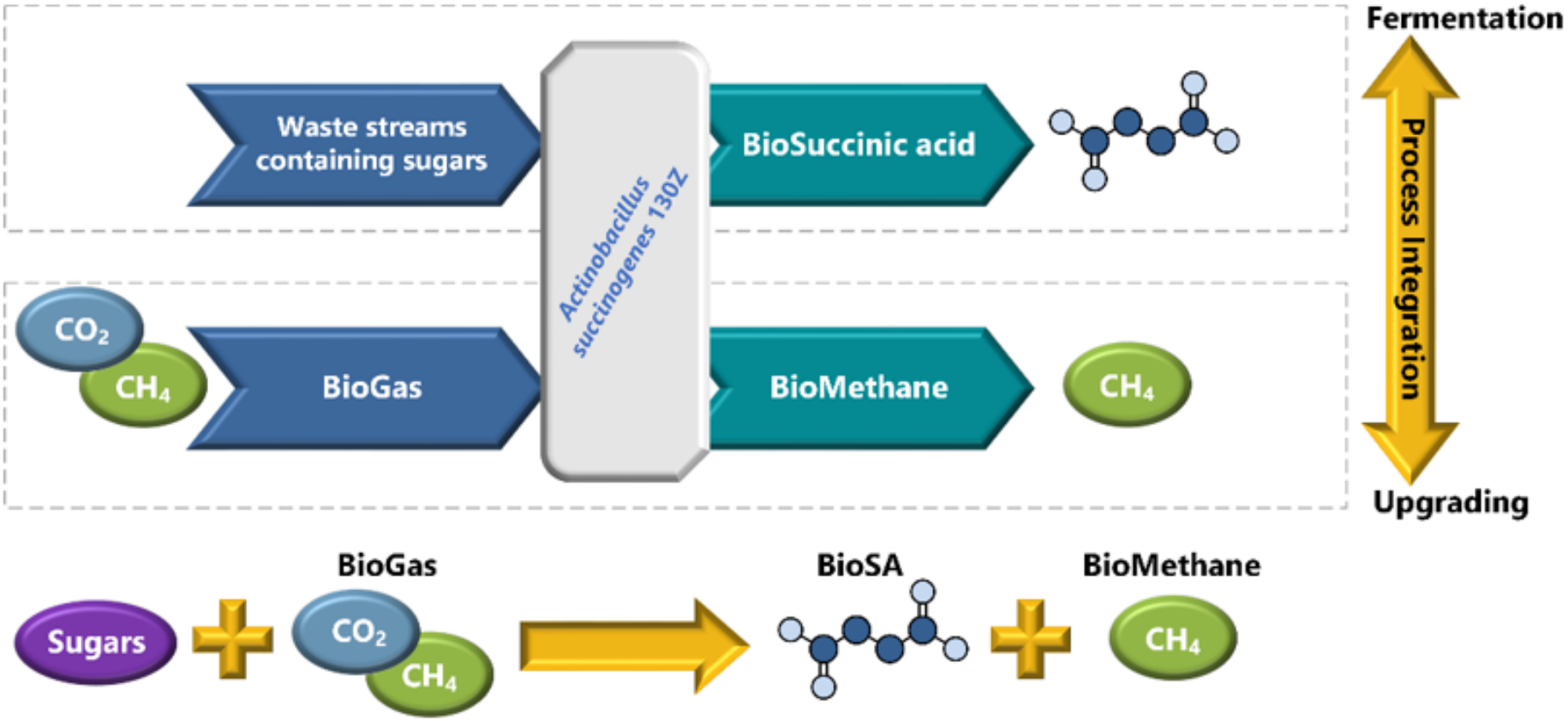
A) Biologisk konvertering af CO_2 til methan CH_4 ved hjælp af brint.

CooCE: DTU projekt nr. 64.021-5002

Harnessing potential of biological CO_2 capture for Circular Economy



B) Produktion af Bio Succinic acid (Ravsyre $C_4H_6O_4$)



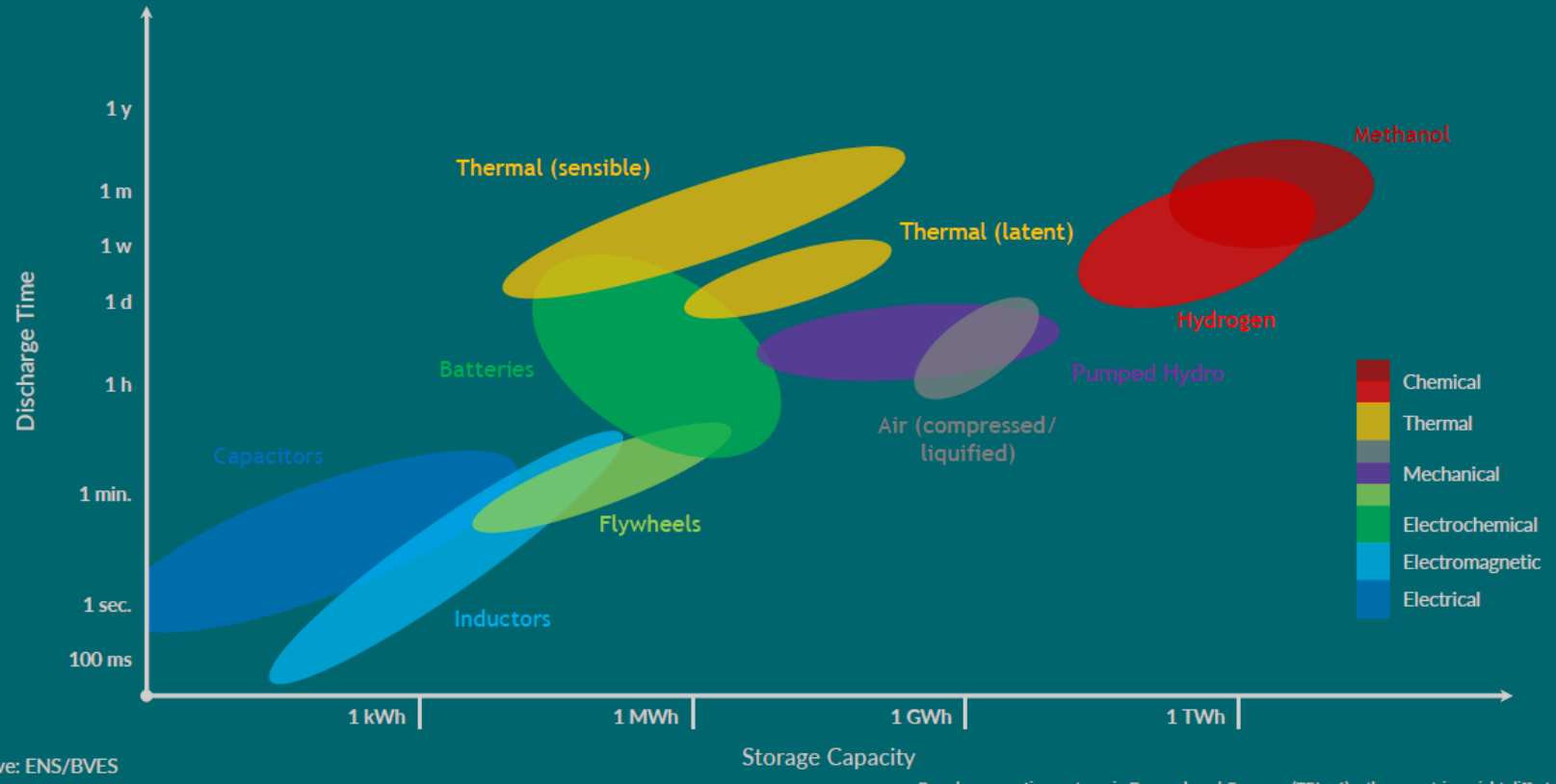
Denne ravsyre kan bruges til produktion af bioplast. Processen er patenteret af DTU.

Harnessing potential of biological CO_2 capture for Circular Economy, nr. 64.021-2006			
Partner:	**Projektudgifter budget DKK.**		
DTU afd. for miljø, cvr. 30060946, DK			
Pond A/S, cvr. 36726725, DK			
Biome Bioplastics, UK			
Hellenic Agricultural organisation – Demeter, GR			
Universitetet i Padova, IT			
BTS biogas SRL, IT			
Euronewpack SRL, IT			
Lemvig Biogas, cvr. 28450850, DK			
I alt	5.630.375		

Tidsplan:

År:	
2021	Start 07.10.2021
2024	Afsluttes oktober 2024

Storage Technologies complement Each Other



Sourve: ENS/BVES

Based on operating systems in Denmark and Germany (TRL >6); other countries might differ!

DaCES Danish Center for Energy Storage

Tak for opmærksomheden

Spørgsmål?

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