FIELDLAB
INDUSTRIAL
ELECTRIFICATION

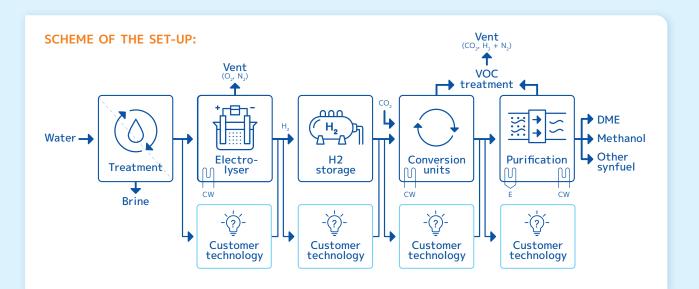Deltalinqs • FME • Innovation Quarter • Port of Rotterdam • TNO • Europese Unie

INDIRECT
CO$_2$-CONVERSION

GENERAL DESCRIPTION:

The synthesis of chemicals, using captured CO$_2$ as carbon source and green hydrogen produced by water electrolysis, would allow the sustainable production of e-fuels or synfuels. These processes have the potential to reduce CO$_2$-emissions in the industry, energy and transportation sectors, while simultaneously providing an option for the chemical storage of renewable electricity. The focus of the Fieldlab Industrial Electrification (FLIE) on indirect CO$_2$-conversion techniques is to optimize these processes together with technology suppliers and industrial end-users. FLIE offers an open environment to demonstrate technologies amidst potential industrial end users, at an industrial relevant scale. To this end, we have to your disposal a 100 kW PEM electrolyser, a sorption enhanced DME synthesis (SEDMES) conversion unit and a purification column.

Validating a technology within the FLIE helps you to mitigate (technical and financial) risks and make informed decisions on how to make your industrial processes more sustainable and futureproof.

SCHEME OF THE SET-UP:

Water → Treatment → Brine

Vent (O$_2$, N$_2$)

Electro-lyser — CW

H$_2$ → H2 storage

CO$_2$ → Conversion units — CW

VOC treatment

Vent (CO$_2$, H$_2$ + N$_2$)

Purification — E — CW → DME, Methanol, Other synfuel

Customer technology (×4)

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SOME EXAMPLE OPPORTUNITIES:

You can validate your technologies, by temporarily replacing or supplementing skids at FLIE (being the customer technology in the set-up scheme). Some testing and validation examples:

- New electrolyser concepts
- Production of synfuels using chemical or microbiological conversion units
- Efficiency of purification skids
- Vulnerabilities towards fluctuations in power supply or feedstock

SPECIFICATIONS:

Characteristics	Flow [Nm^3/h]	Pressure [bar]
Potable water	0.04	4
Instrument air	4.5	6
Bottled N$_2$	2.8	300
Bottled CO$_2$	6	50
PEM electrolyser / H$_2$	20	70
Dimethylether	1.7	
Power supply	~ 50 kW available	
Flare		

WANT TO KNOW MORE?
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