H2020 CCUS/Alternative fuels workshop CINEA, 23/24 September 2021

CO_2 Utilisation via 3D printed reactor and solid oxide cell technologies

Vesna Middelkoop, Lamiaa Biaz, Adriana Diaz

www.co2fokus.eu

The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement n. 838061

info@co2fokus.eu

Project concept

The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement n. 838061

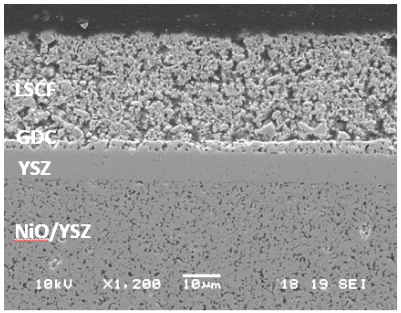
Key Performance Indicators (KPI)	State-of-art	CO2Fokus
Energy efficiency (MJ/ton) DME	2300[#]	20-30% reduction
Catalyst & reactor design	TRL 3-4	TRL 6
Catalyst durability (hrs)	10^2	10^3
Pressure (bar)	30-70	30
Temperature (°C)	280	250
CO_2/H_2 feed (N L/h) 4.5 kW stack	30/100	500/1500 or larger by numbering up
DME yield (%)	20-25	>30 (multichannel reactor)
CO_2 conversion (%), H_2 conversion	30	>30, 60
Overall H_2 conversion (%)	50	50

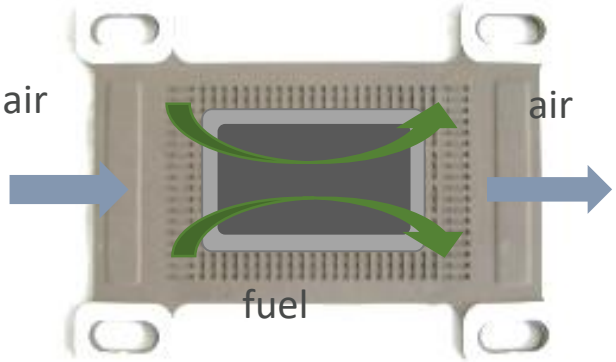
A cutting-edge technology to directly convert industrial CO_2 into DME using:

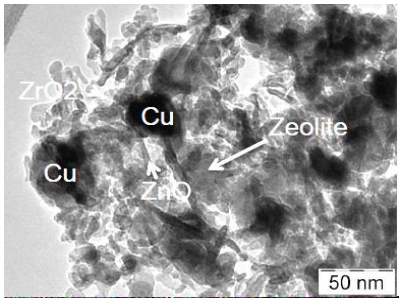
- 3D printed multichannel reactors
- solid oxide electrolyser
- integrating them in industrial environment with CO_2 point source at end-user facilities

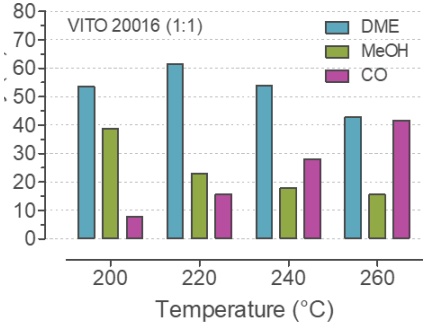
Main results achieved so far

The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement n. 838061



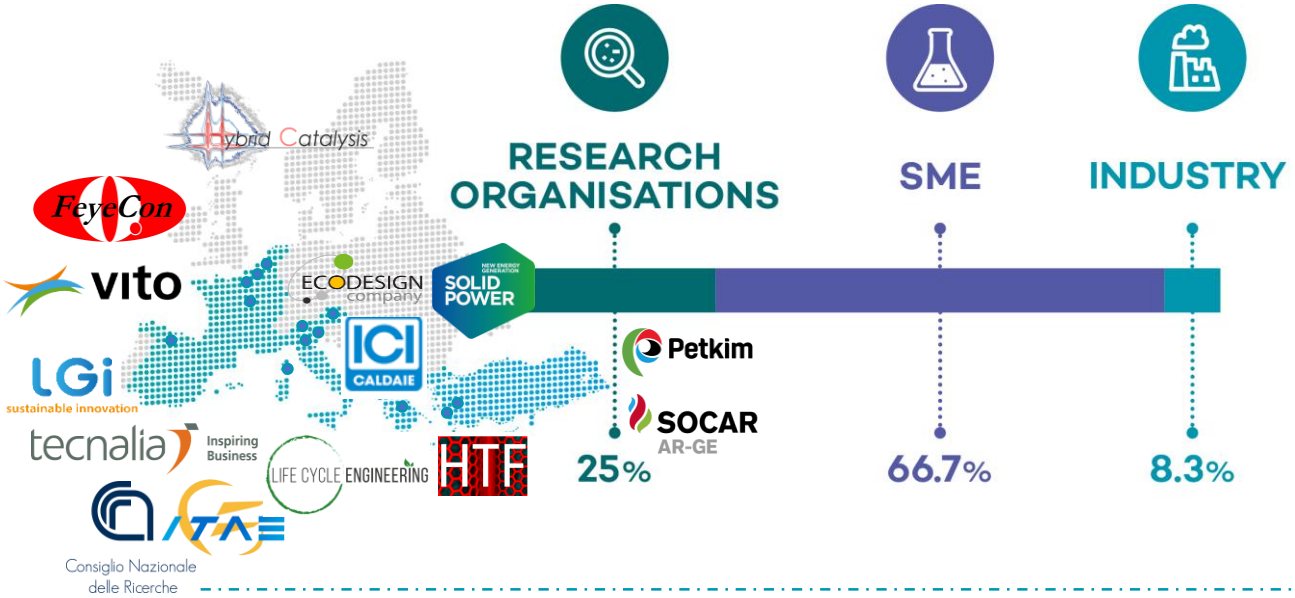




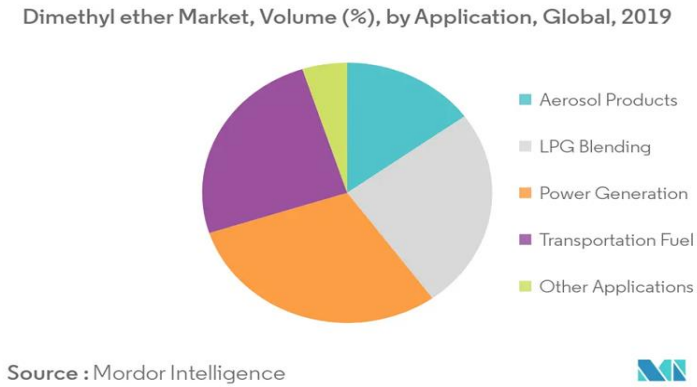


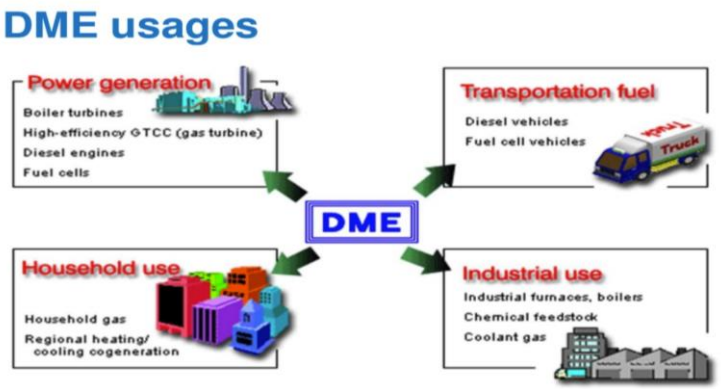
Expected impact

The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement n. 838061



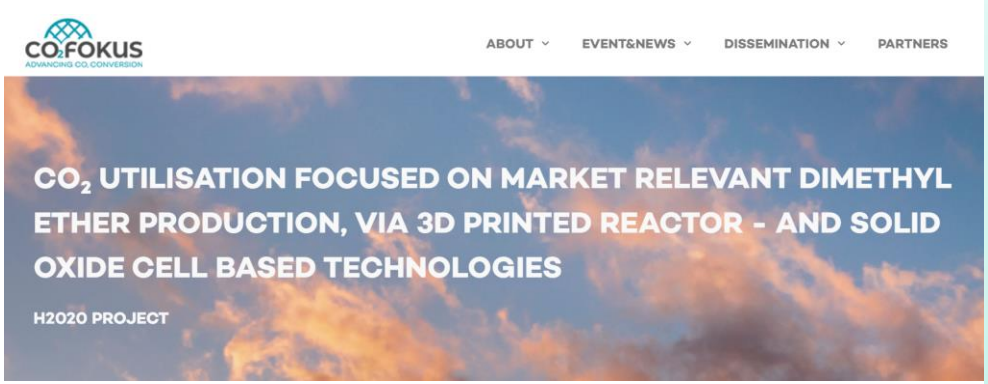
- Forging a long-term partnership among the partners and stakeholders
- Leadership in developing materials and systems that provide modular sustainable solutions
- strengthening cross-sectoral collaboration along the value chain

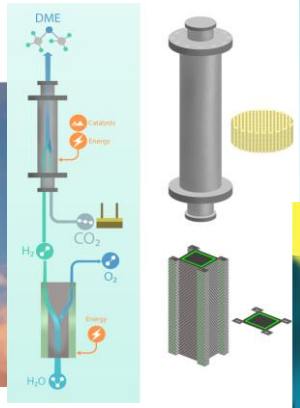




The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement n. 838061

Project website, newsletter, video, events





Potential ideas for collaboration with other projects

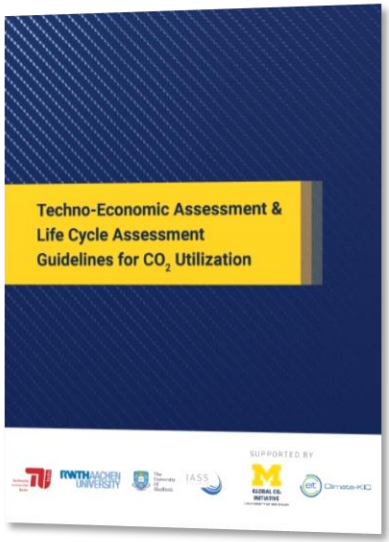
The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement n. 838061

- **Further collaboration with CINEA-funded sister projects and beyond**
  successful example: online CCU Workshop, Feb 2021

- **Joint CCS/CCU/Alternative Fuels Workshops and stakeholder engagement**
  including final project conference

- **Analysis of the business environment**:
  market trends, opportunities and
  barriers to market entry, stakeholders' analysis , PESTEL analyses

- **Joint aspects of Techno-Economic Assessment & Life Cycle Assessment**
  based on Guidelines for CO2 Utilization (v1.1) from the Global CO2 Initiative, University of Michigan:
  https://deepblue.lib.umich.edu/handle/2027.42/162573



CO2FOKUS
ADVANCING CO_2 CONVERSION

Looking forward to interfacing with other sister projects!!

Any questions, speak to:

vesna.middelkoop@vito.be
lamiaa.biaz@lgi-consulting.com
diaz@ecodesign-company.com

The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement n. 838061