

ELECTRO-FUELS, KEY TO SUSTAINABLE FUEL AVAILABILITY



RESTRICTED



INTERNAL



PUBLIC



01



ENGIE - The hydrogen economy enabler

A few words on the company

ENGIE operates in 31 countries

IN 2022:

- 96,400 employees
- €93.9 billion revenue
- EBIT of €9.0bn
- 3.9GW installed renewables capacity added
- €5.5 billion growth Capex
- 492 biomethane production units connected to ENGIE's networks in France
- Further progress on coal exit, coal represents 2.6% of centralised generation capacity

EBIT WORLDWIDE



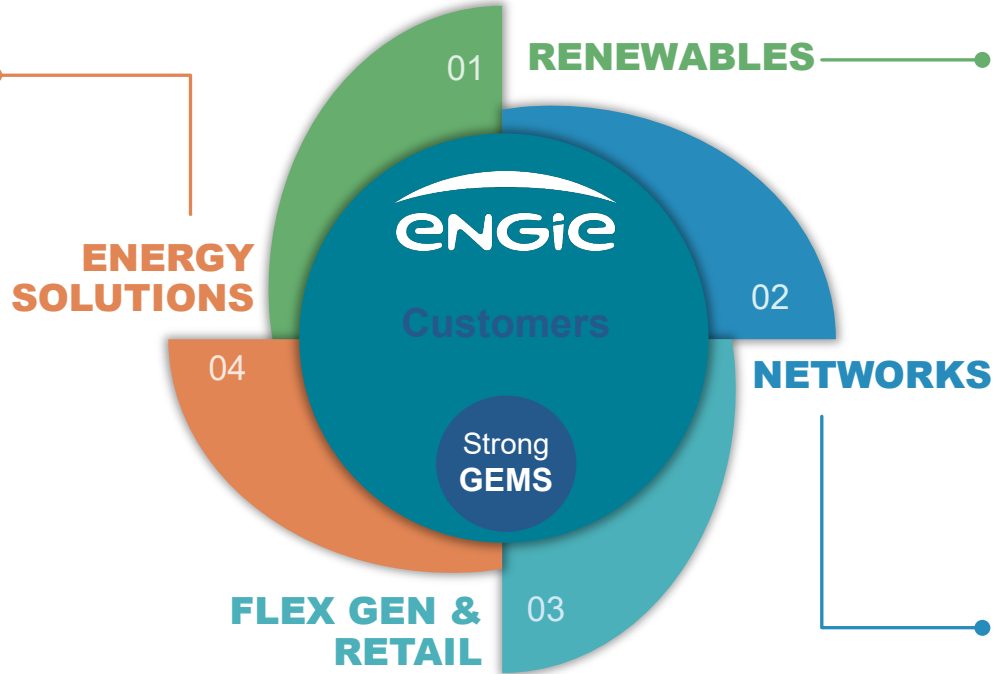
OUR BUSINESSES:

- RENEWABLES
- NETWORKS
- ENERGY SOLUTIONS
- FLEX GEN & RETAIL
- NUCLEAR
- OTHERS (including GLOBAL ENERGY MANAGEMENT & SALES)

Strong Ambitions for 2030

+8 GW
of distributed infrastructures
by 2025 (vs. 2020)

~4 GW
of hydrogen capacity by 2030
~10GW
of batteries capacity by 2030



50 GW > **80 GW**
in 2025 in 2030

~10 TWh
of biomethane production per
year in Europe by 2030

4 GW production

700 km pipeline

1 TWh Underground storage capacity



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Electro-Fuels ENGIE approach

How to accelerate green H₂ development

Focussing on sectors where willingness to pay exists.

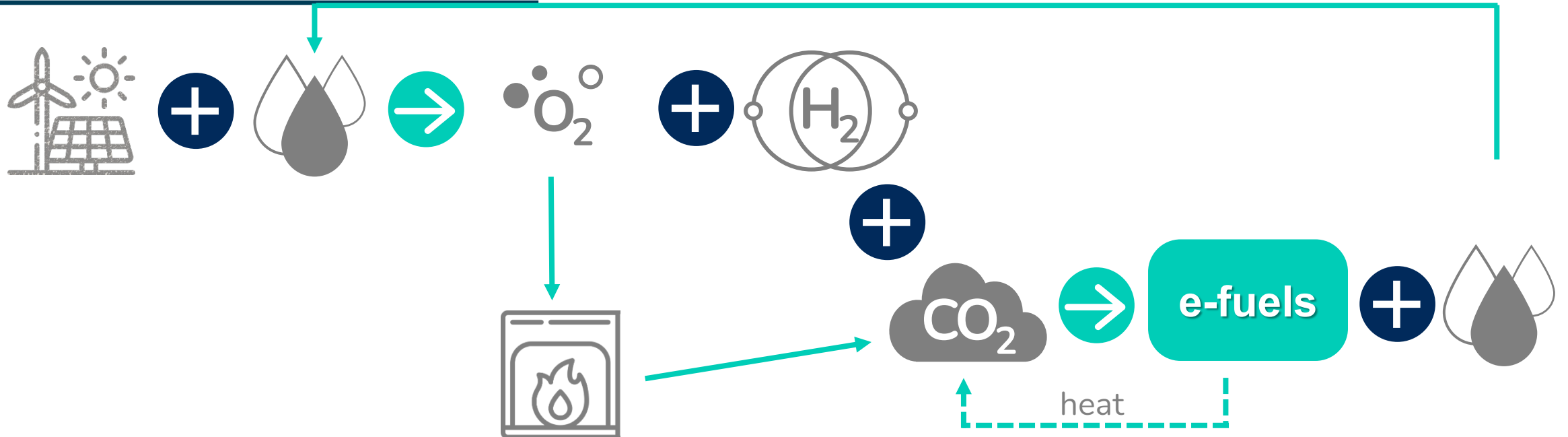
Market mostly driven by regulations targeting the transport sector in Europe. Other sectors and geographies target parity with fossil alternative (after subsidies and carbon pricing)

	Existing grey H ₂ users	Industry conversion to H ₂	E-fuels
Markets	Refining / fertilizers / chemicals	Steel / high temperature processes	Aviation / maritime / heavy duty land transport
Drivers	Carbon pricing Renewable H ₂ mandates Client's expectations	Carbon pricing Client's expectations	Renewable H ₂ mandates Carbon pricing Client's expectation
Requirements	Renewable H ₂ (refining) Low carbon (other sectors)	Low carbon	Renewable H ₂
Premium	Medium green premium Refining impacted by H ₂ mandates in the transport sector	Low green premium Target cost parity with fossil alternative + carbon pricing	High green premium Due to penalties for non-incorporation of renewable fuels

New renewable H₂ mandate in the industry (RED III) could push premiums for renewable H₂ in the industry in the future

E-fuels What and Why

Defined in EU as “Renewable Fuels from Non Biological Origin” (RFNBO)



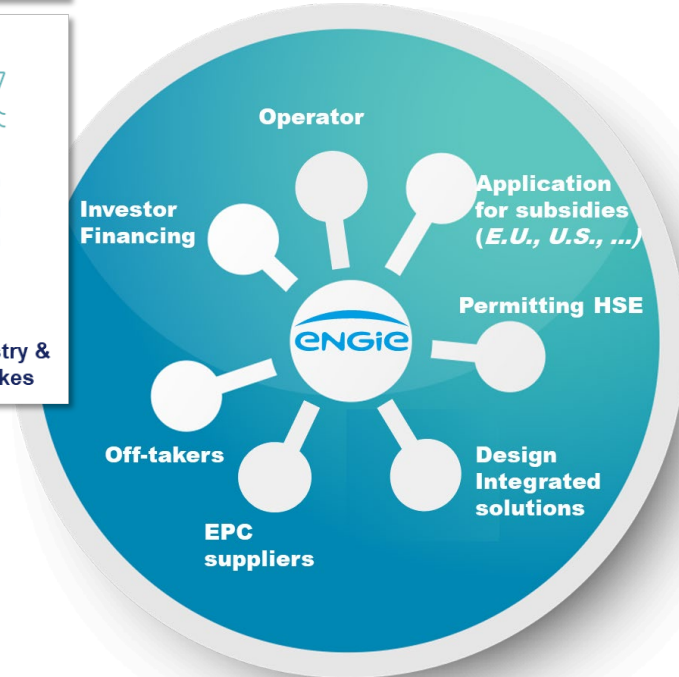
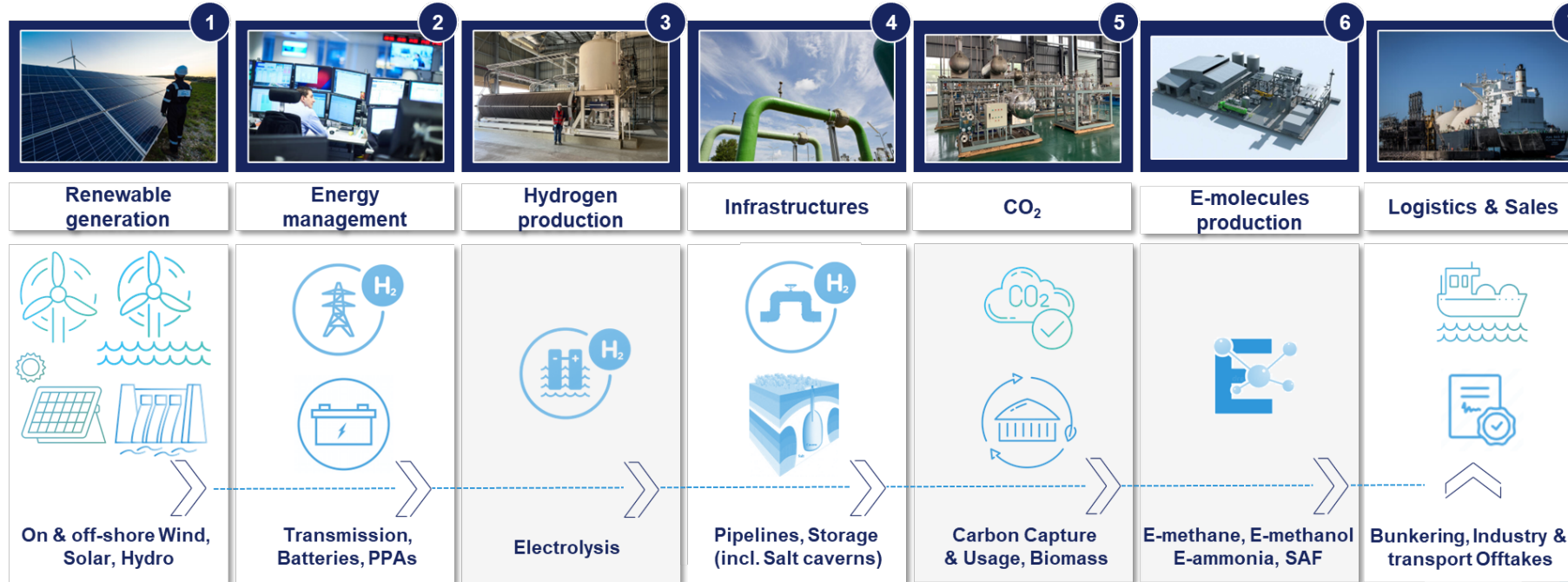
Why e-fuels:

- Uses **existing infrastructure** to store, transport & distribute
- **No capex** needed for offtakers: drop-in fuels
- **High energy density** \Rightarrow easy to manipulate and can be used in aviation and shipping
- **Local gas production** \Rightarrow together with biomethane, it decreases the dependency toward gas import.

\Rightarrow Highly integrated with existing industrial clusters (O_2 , CO_2 , heat)

ENGIE, an industrial developer, investor and operator

ENGIE partners with key players to develop the green fuel & chemical industry (methane, methanol, SAF, ammonia and more).



Among others...



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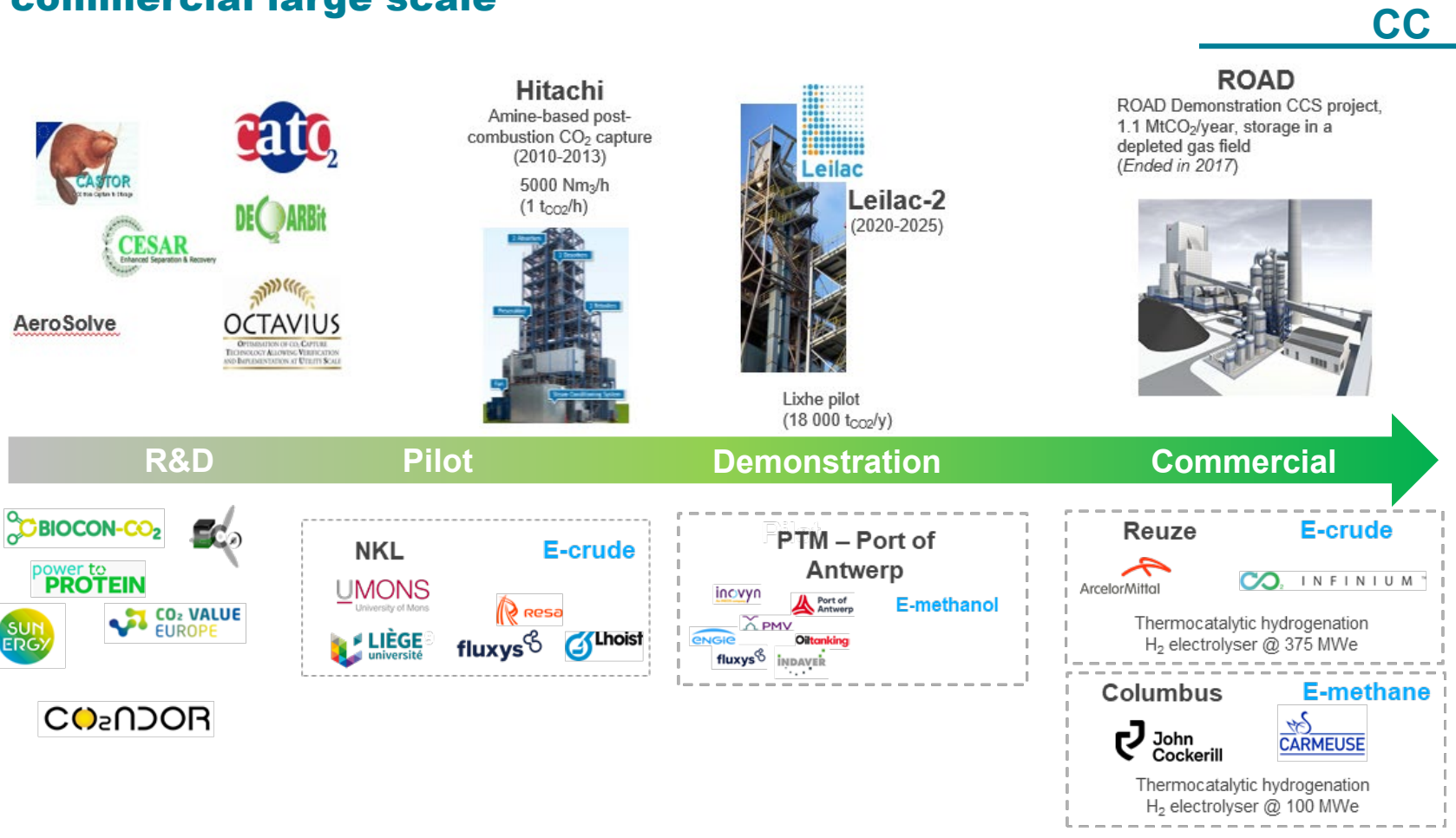


ENGIE Projects in Electro-Fuels & Chemical

e-Methane, e-Methanol and e-crudes

CC and CCU Expertise

ENGIE develops CO₂ capture, reuse and valorization from collaborative projects to commercial large scale



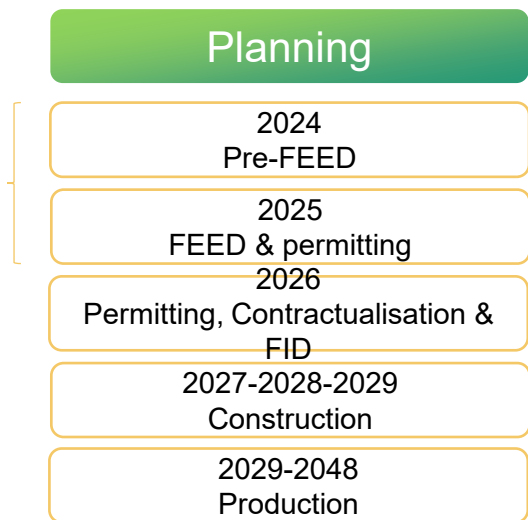
CC

ENGIE in CO₂

- ✓ Provide high quality expertise on CO₂ and pollutants emissions qualification, monitoring & reduction
- ✓ Develop CO₂ capture and valorisation to fuels and chemicals
- ✓ Develop CO₂ capture & use to increase circularity of assets or industries

CCU

CO₂ circular economy hub in Dunkirk



ReuZe project :
CO₂ valorization and production of ultra-low carbon fuel (efuel)



>500 M€
Investment*

Avoidance of
570 000
t/year of CO₂*

385 MW
Electrolyzer*

2500 bbl /d
of eKerozene + Naphtha

2029
Project COD



Integrated project allowing to re-use by-products

REUZE PROJECT

