



Power-to-X

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CEO Kassø E-methanol & Solar Park
A EE and Mitsui & Co Joint Venture



Kassø
Integrated PV and e-
methanol facility
Denmark

About European Energy



Svindbæk
32 MW
Denmark

Facts about European Energy



18

We have offices in 18 different countries



29

We have development activities in 29 countries



735

We are more than 735 employees working at European Energy



10

We have developed operational wind parks in 10 different countries



10

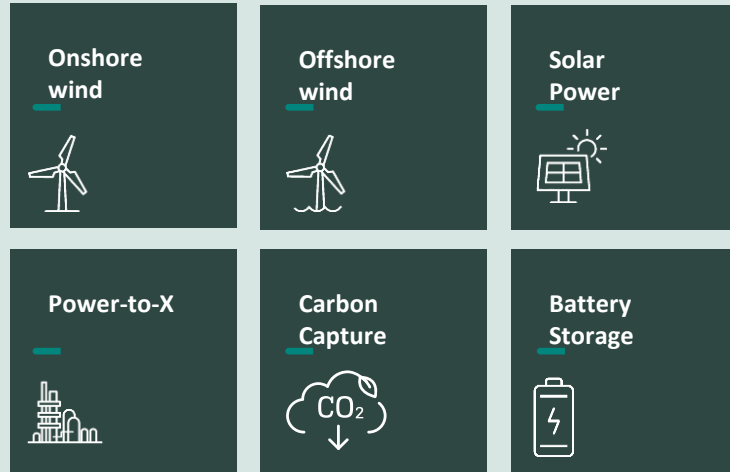
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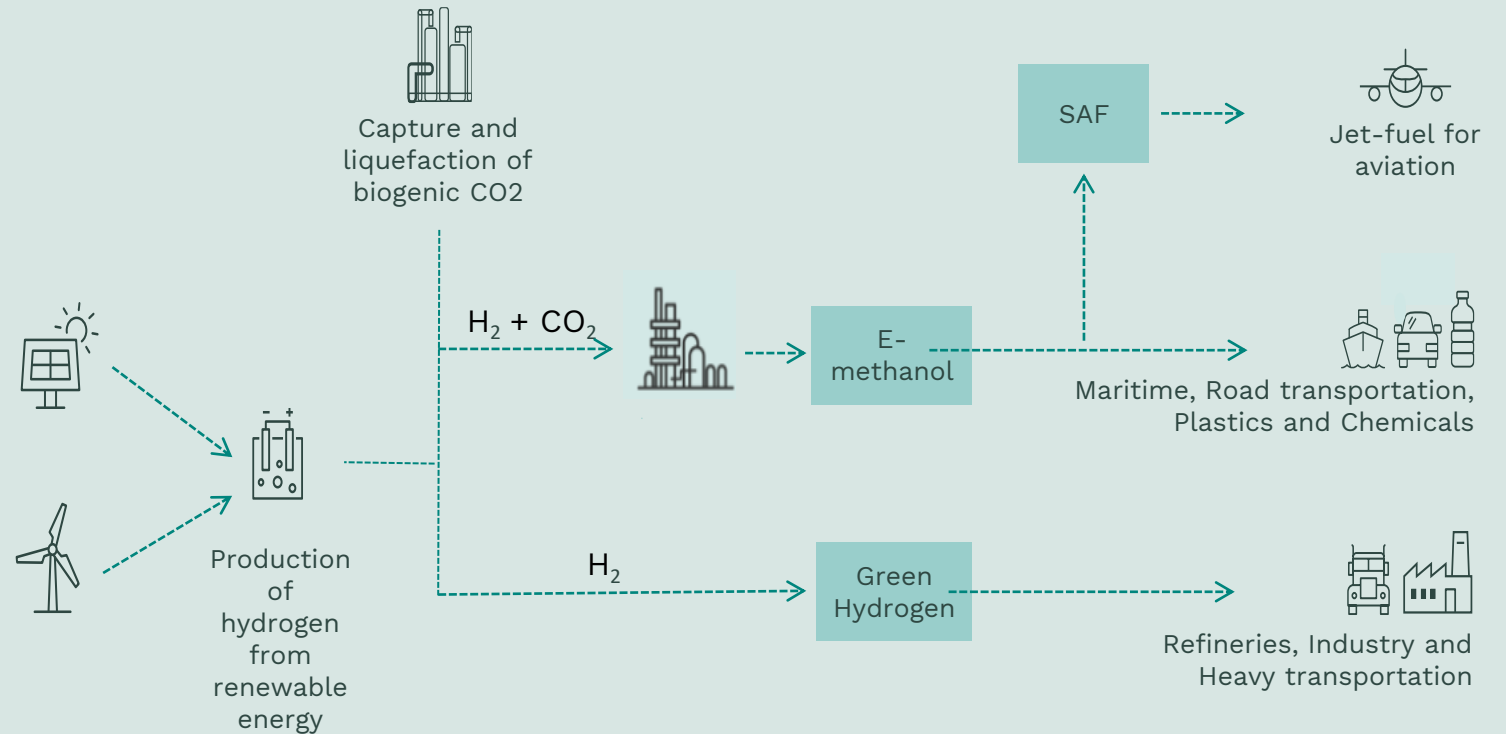
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We are constructing two Power-to-X plant in Denmark

Power-to-X in European Energy includes the entire value chain



European Energy's 6 pillars



Pipeline of + 30 GW worldwide

Hands on knowledge: Different electrolyzer technologies tested at our sites

Our group company Ammongas supplies CO2-capture equipment

We are constructing worlds largest e-methanol plant in Kassø

We are constructing a hydrogen plant in Denmark Måde

EE will prototype-test methanol-to-SAF production in 2024/25

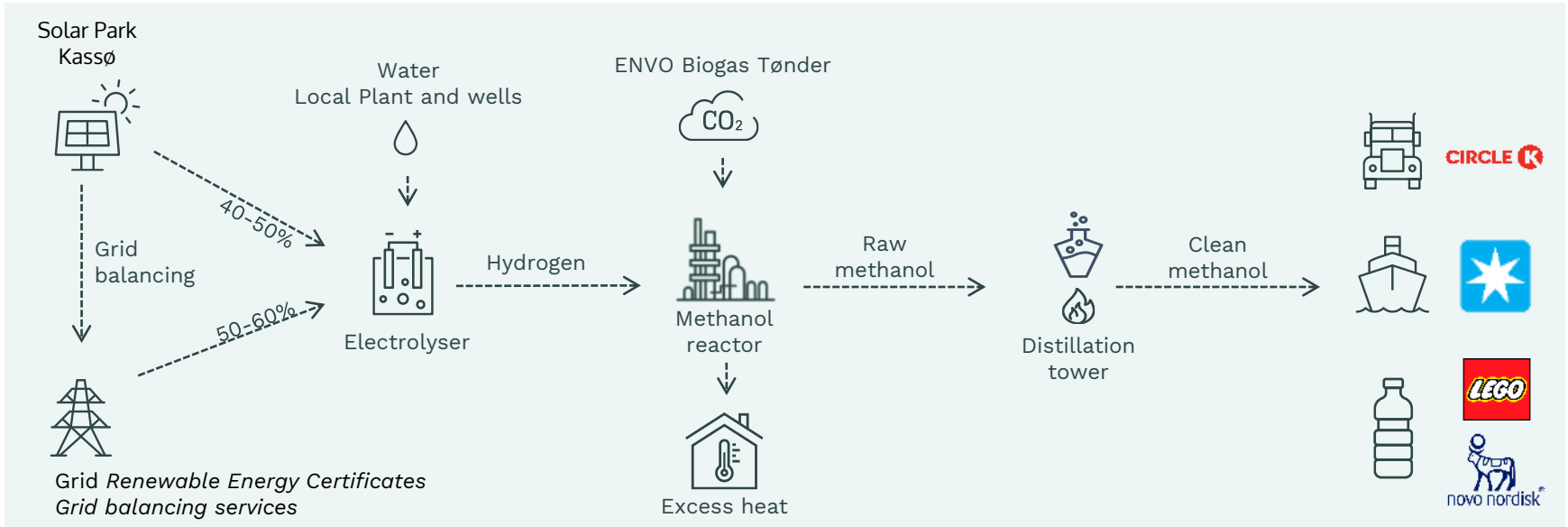


World's largest commercial e-methanol plant in 2024
Co-located with North Europe's largest Solar Park 300 MWDCp
Kassø, Denmark

Our e-methanol plant in Kassø, Denmark

Input (consumption)	
Water	~90.000 tons
Electricity	~360-380 GWh
Biogenic CO ₂	~45.000 tons
Output (production)	
Hydrogen	~6300 tons
Raw methanol	~50.000 tons
Clean methanol	~32.000 tons (nom. cap. 42.000)
Excess heat	~50 GWh

How we produce e-methanol in Kassø



Sector coupling

Power supply

Power sourced from own 304MW solar farm and from the grid → robust and cost-optimal power supply

Grid Balancing

52 MW PEM electrolyser from Siemens Energy capable of fast ramp times → flexible operation with the ability to provide grid balancing services

Excess heat

Excess heat produced from production process delivered to the district heating grid to supply approx. 3300 households

Utilization

E-methanol from the plant is shipped out from Port of Åbnerå to be used across three different sectors for the benefit of the green transition

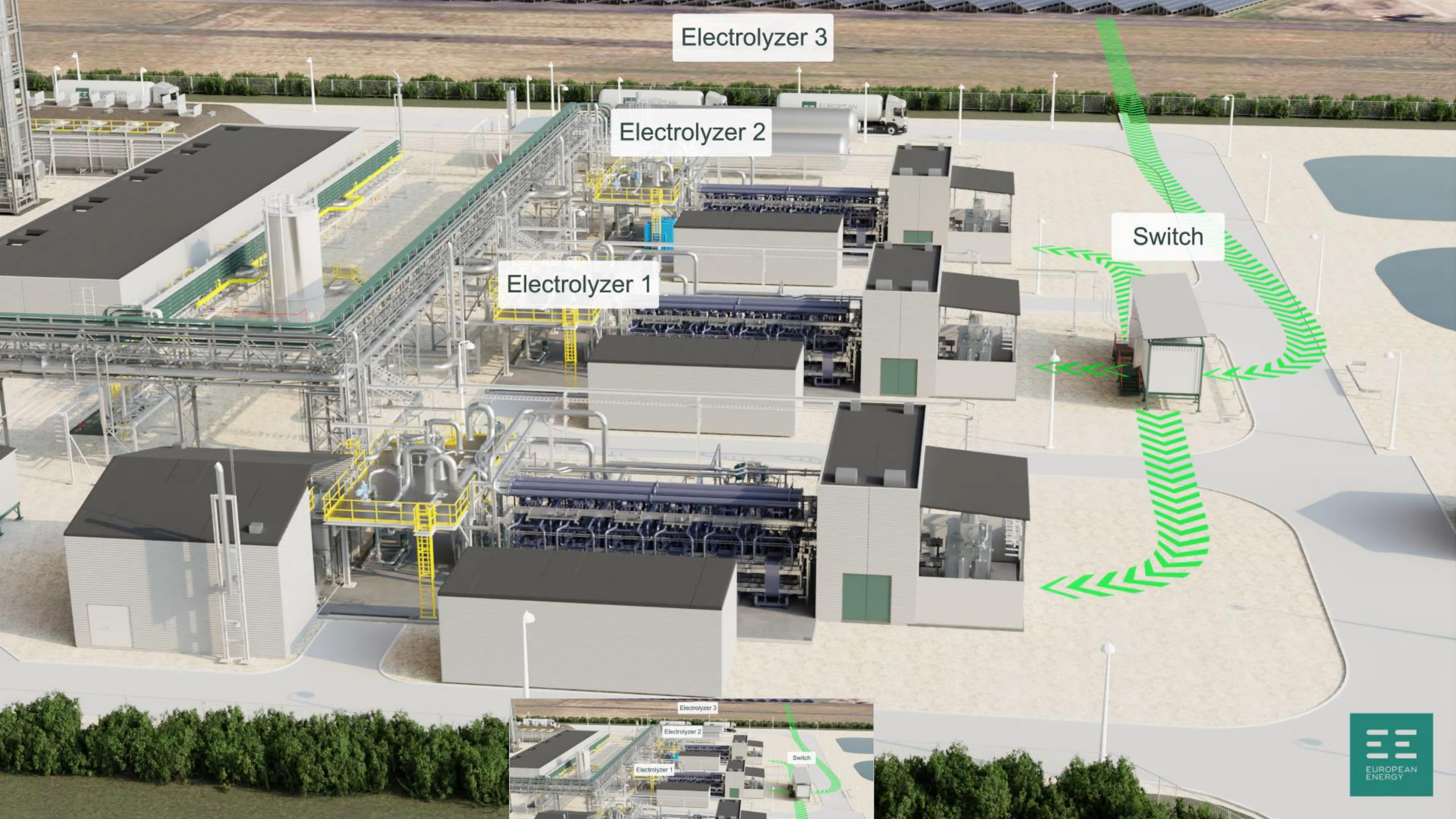
Milestones

- ✓ Final Investment Decision
- ✓ All permits secured
- ✓ Offtake agreements signed for e-methanol
- ✓ Methanol plant detailed design completed
- ✓ Construction initiated and on-track
- ☐ First methanol, 2024

Power-to-X

Our Kassø Power-to-X plant is in full construction with first drop in Q3





Electrolyzer 3

Electrolyzer 2

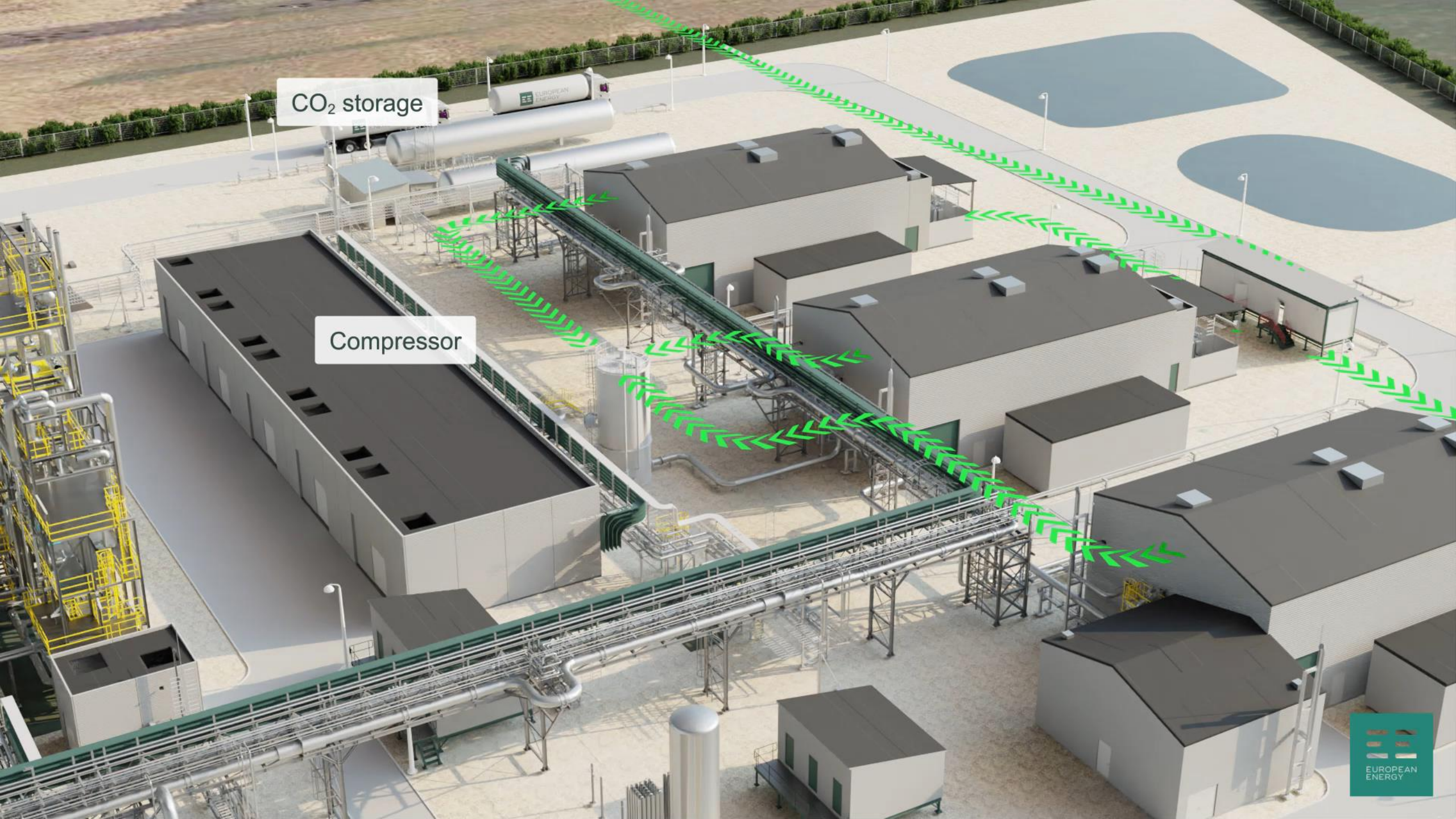
Electrolyzer 1

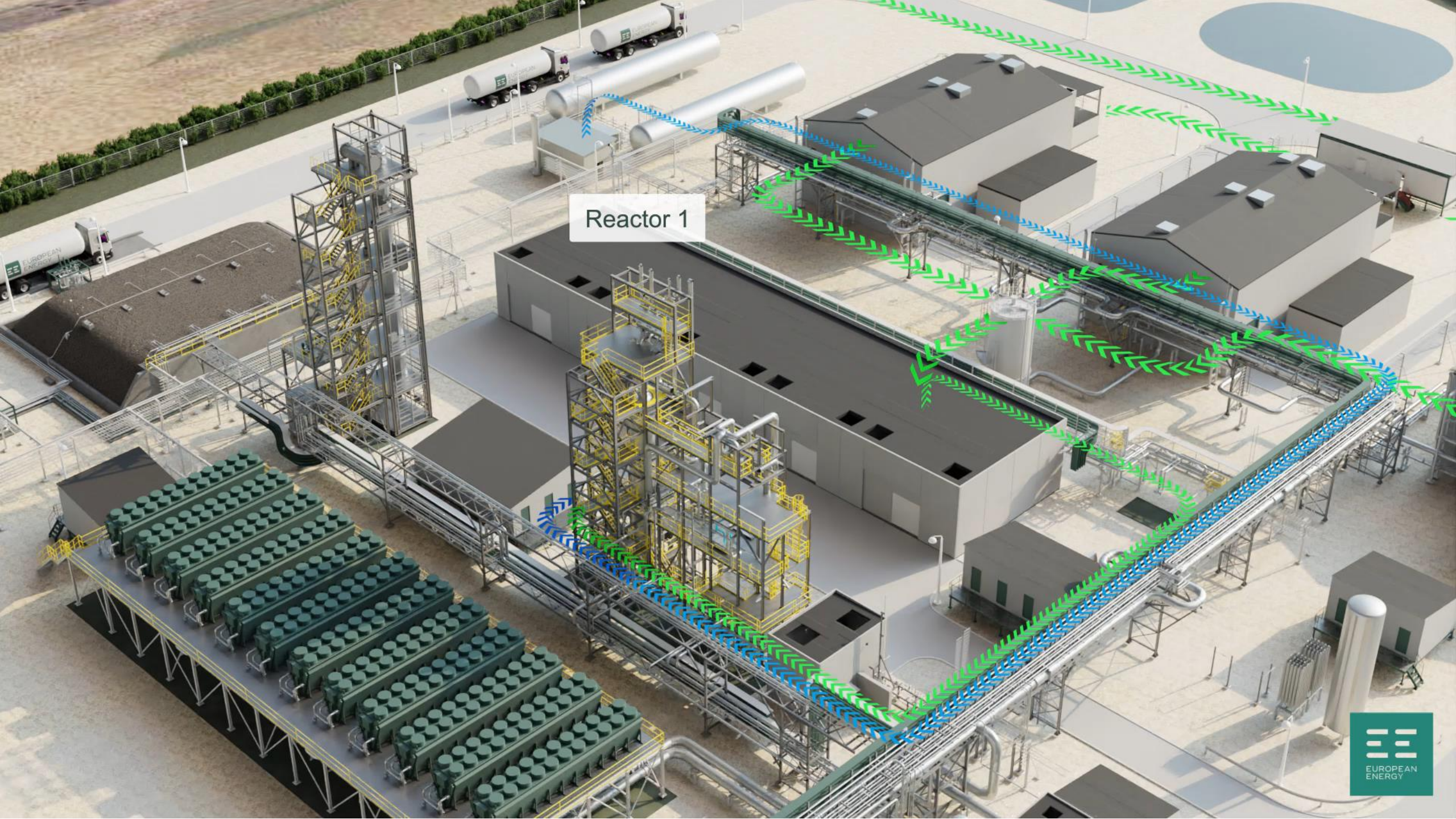
Switch



CO₂ storage

Compressor

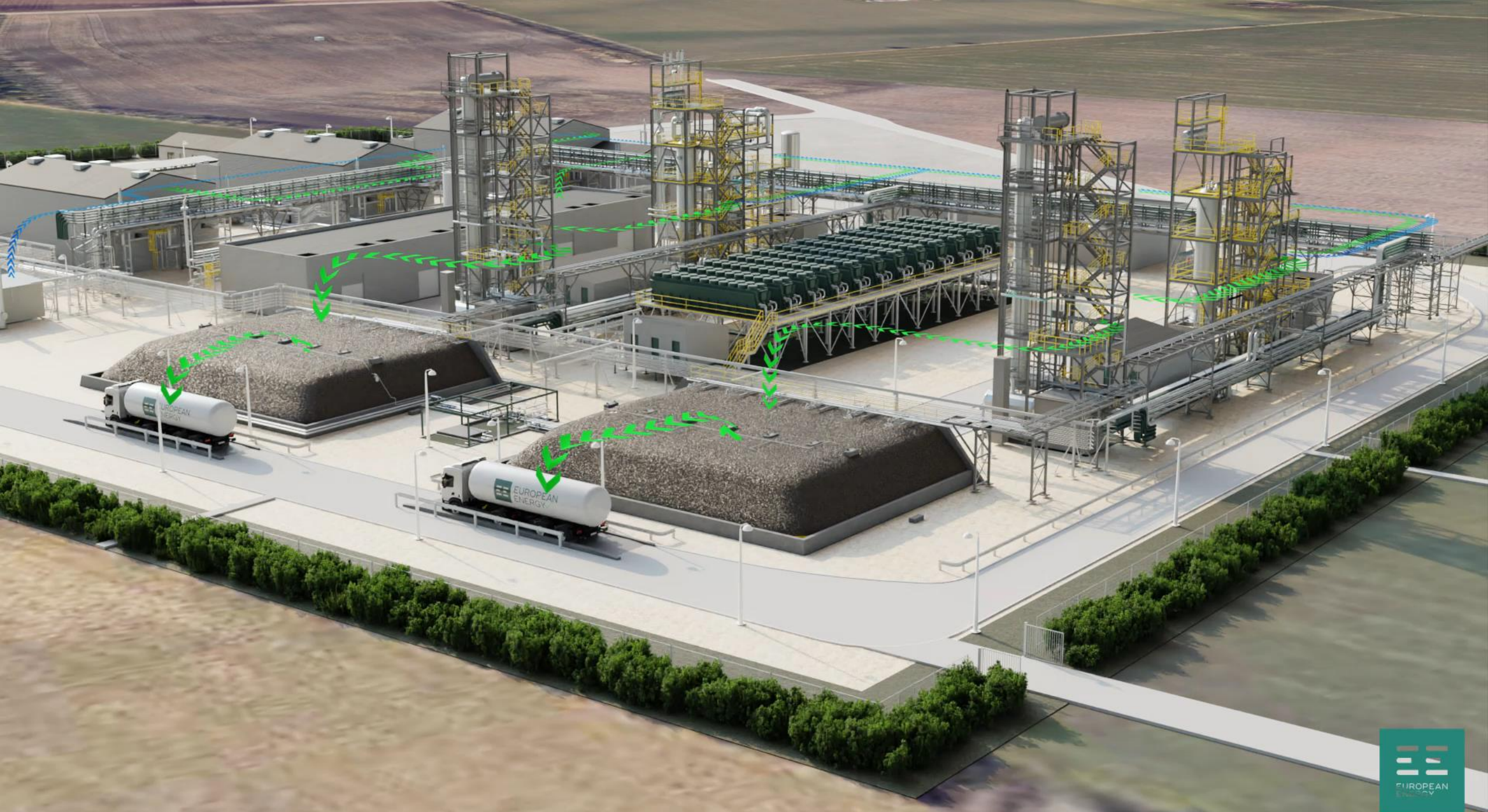




Reactor 1

Destillation tower 2





Green District heating to more than 3000 local homes

Great Collaboration with Åbenrå Fjernvarme...

Method

- Utilizing heat from the exothermal process in the reactor loop
- Capturing 60°C water and boosting temperature up to 70-80°C with heat pump that is cooling other parts of the E-methanol plant
- Re-design of reactor & cooling water system to “capture” excess heat

Sector Coupling

- **Collaboration with Aabenraa District Heating a “Win-Win” situation**
 - Will deliver 50 GWh/yr from 2024
 - Accelerating Åbenrå’s Fjernvarme transition from woodchips and fossil sources to more sustainable district heating
 - Improving energy efficiency of the Kassø PtX-plant
 - Investigating to increase with 100 GWh/yr from electrolyzers



Questions from GESEK

Focus on district heating..

Any Challenges?

- How much time do you have 😊

What solutions did you work with

- Segregation of “high value” vs “low value” cooling water
- Special design of reactor
- Heat/cooling pump with own piping system
- Commercial win win mindset from both parties

Specific solutions for the green transition

- 3.300 households with green sustainable district heating
- Fuel, Laura Maersk, the World First container vessel on E-methanol
- Via Lego & Novo Nordisk start pioneering a sustainable plastic industry free of fossil fuels
- Grid balancing Services to Energinet & Co-location (power generation & consumption)

Thank you for listening!



<https://europeanenergy.com>