



Northern Power
Nordic Hydrogen Week
Oulu, February 11 - 13, 2025

The Hydrogen technology race An industry perspective by Air Liquide

Dr. Sebastian König, Sales Director Europe

The Air Liquide Group in figures



~66,300
EMPLOYEES⁽¹⁾



PRESENT IN
60 COUNTRIES⁽¹⁾



MORE THAN
4 MILLION
CUSTOMERS &
PATIENTS



REVENUE
€27.6bn



NET PROFIT
(GROUP SHARE)
€3.1bn



INVESTMENT
DECISIONS
~€4.3bn

⁽¹⁾ Figures as of July 23, 2024

Hydrogen: a unique expertise and experience

60

YEARS OF EXPERTISE

>1,000

EMPLOYEES IN HYDROGEN

€2.2bn

ANNUAL SALES

1.2 Mt

ANNUAL PRODUCTION

220+

STATIONS DELIVERED

~2,000

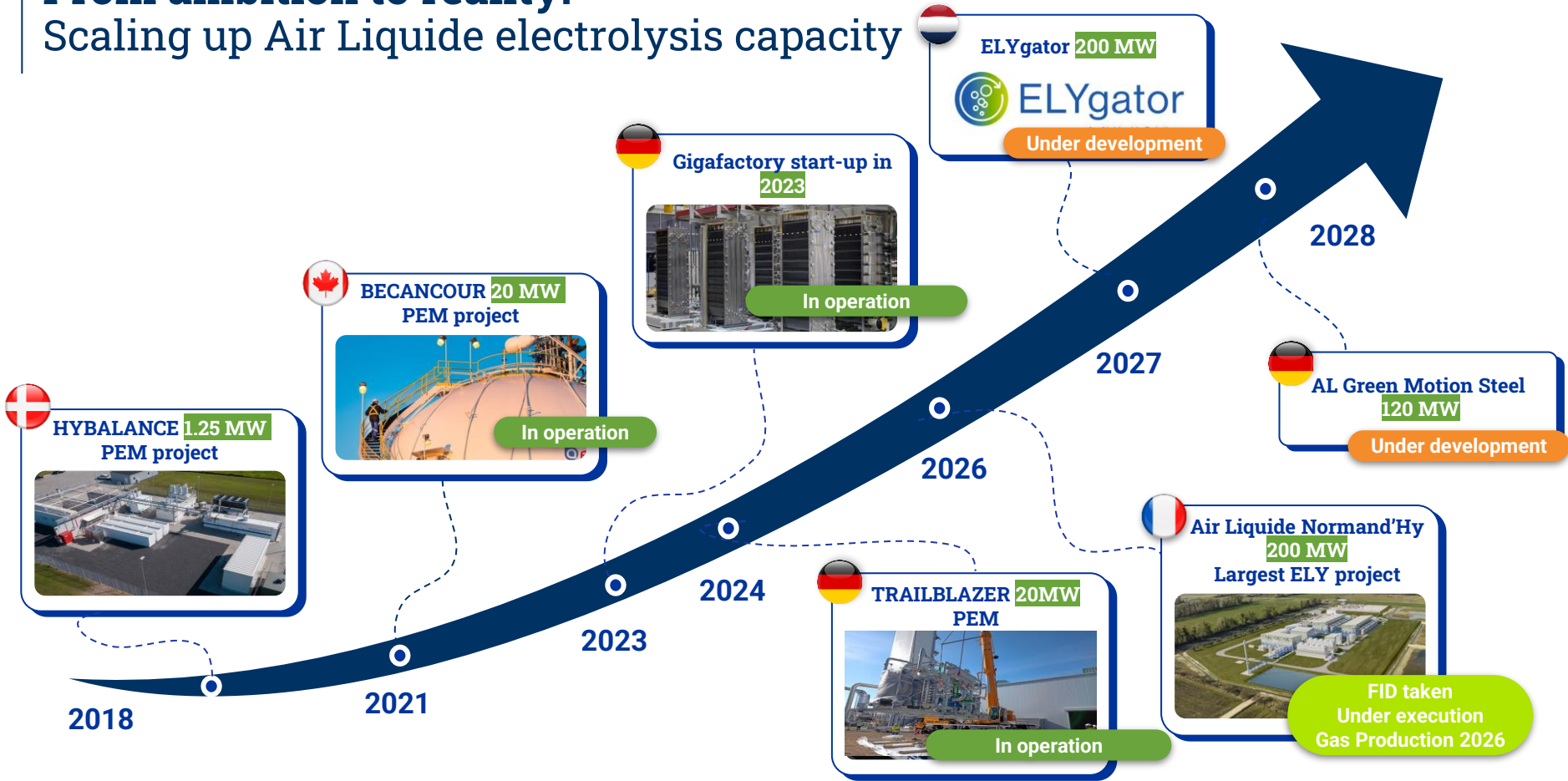
KM OF PIPELINES



Spotlight #1

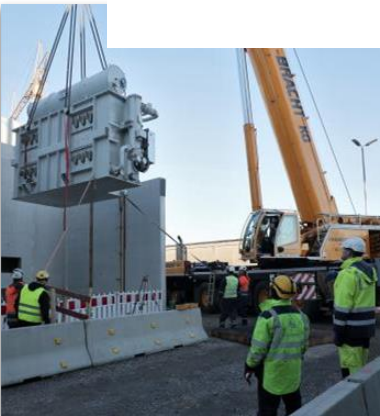
What is Air Liquide's position in the Hydrogen technology race?

From ambition to reality: Scaling up Air Liquide electrolysis capacity



Air Liquide Trailblazer

20 MW PEM Electrolyzer in operation, connected to existing infrastructure in Oberhausen, Germany



Impressions from site



Air Liquide / Siemens Energy partnership

Large scale electrolyzer partnership for sustainable hydrogen production - Siemens Energy & Air Liquide combine their expertise in hydrogen technology

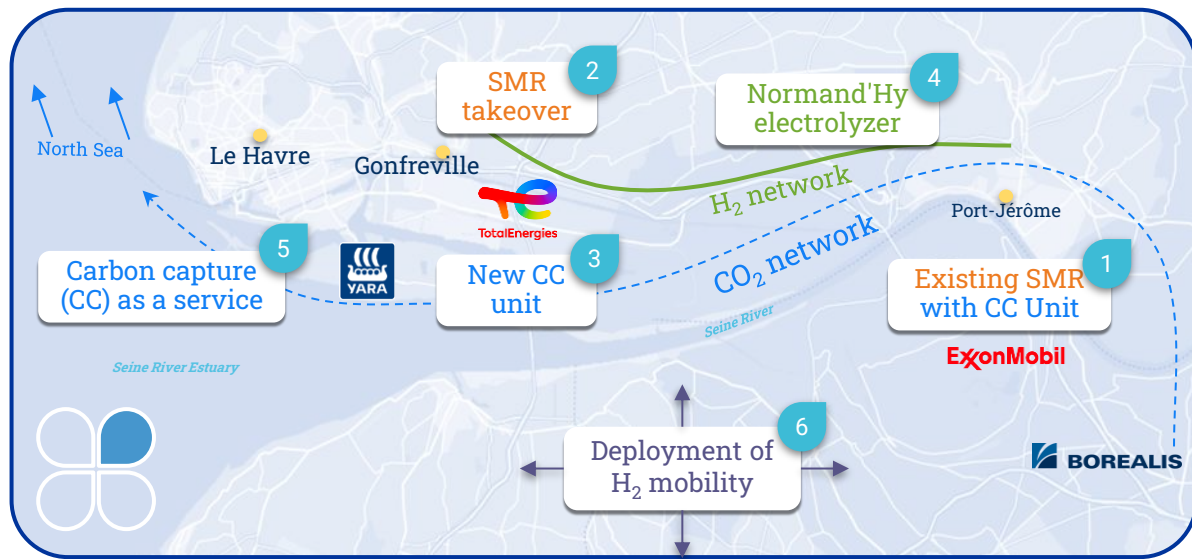
Cooperation Goals

- Creation of a joint venture (74.9% owned by Siemens Energy and 25.1% owned by Air Liquide) dedicated to the series production of industrial scale renewable hydrogen electrolyzers
- Multi-gigawatt factory that produces electrolysis stacks based on proton exchange membrane (PEM) located in the German capital, Berlin
- The factory supplies stacks to both Groups for their respective broad range of customers worldwide to serve the rapidly growing market
- The strategic partnership benefits from a portfolio of hydrogen projects combining both Air Liquide and Siemens-Energy's pipelines
- Dedicate R&D capacities to the co-development of the next generation of electrolyzer technologies



Air Liquide Normand'Hy

200 MW PEM electrolyzer in Port-Jérôme, France, to supply renewable and low-carbon hydrogen for industrial and mobility applications, avoiding the emission of up to 250,000 tonnes of CO₂ per year



- Innovative technologies
- Renewable energy sourcing
- Refineries' needs for renewable and low-carbon products

- CO₂ capture on customers assets
- Large scale carbon management with shipping and storage in Europe

Air Liquide Normand'Hy

200 MW PEM electrolyzer in Port-Jérôme, France, to supply renewable and low-carbon hydrogen for industrial and mobility applications, avoiding the emission of up to 250,000 tonnes of CO₂ per year

From 3D Model...

Financé par



GOUVERNEMENT
Liberté
Égalité
Fraternité



FRANCE
2025



Financé par
l'Union européenne
NextGenerationEU

bpi
france

From 3D Model... ...to reality!



Financé par



Financé par
l'Union européenne
NextGenerationEU



Spotlight #2

CCU value chain - example e-Methanol

Our key references and projects - Carbon Capture

Port-Jerôme

The world's first carbon capture plant in operation in France, setting the standard for reducing industrial CO2 emissions.

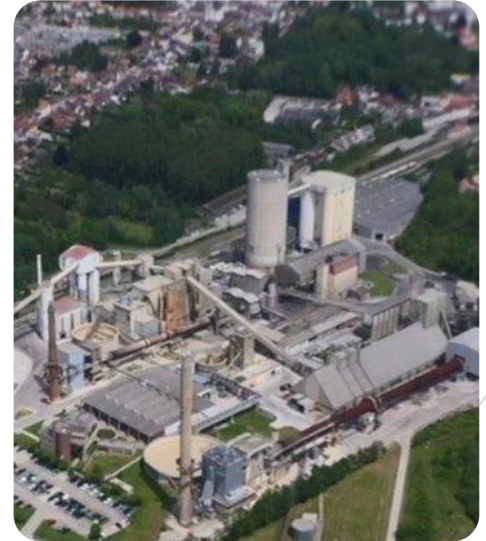


Kairos@C

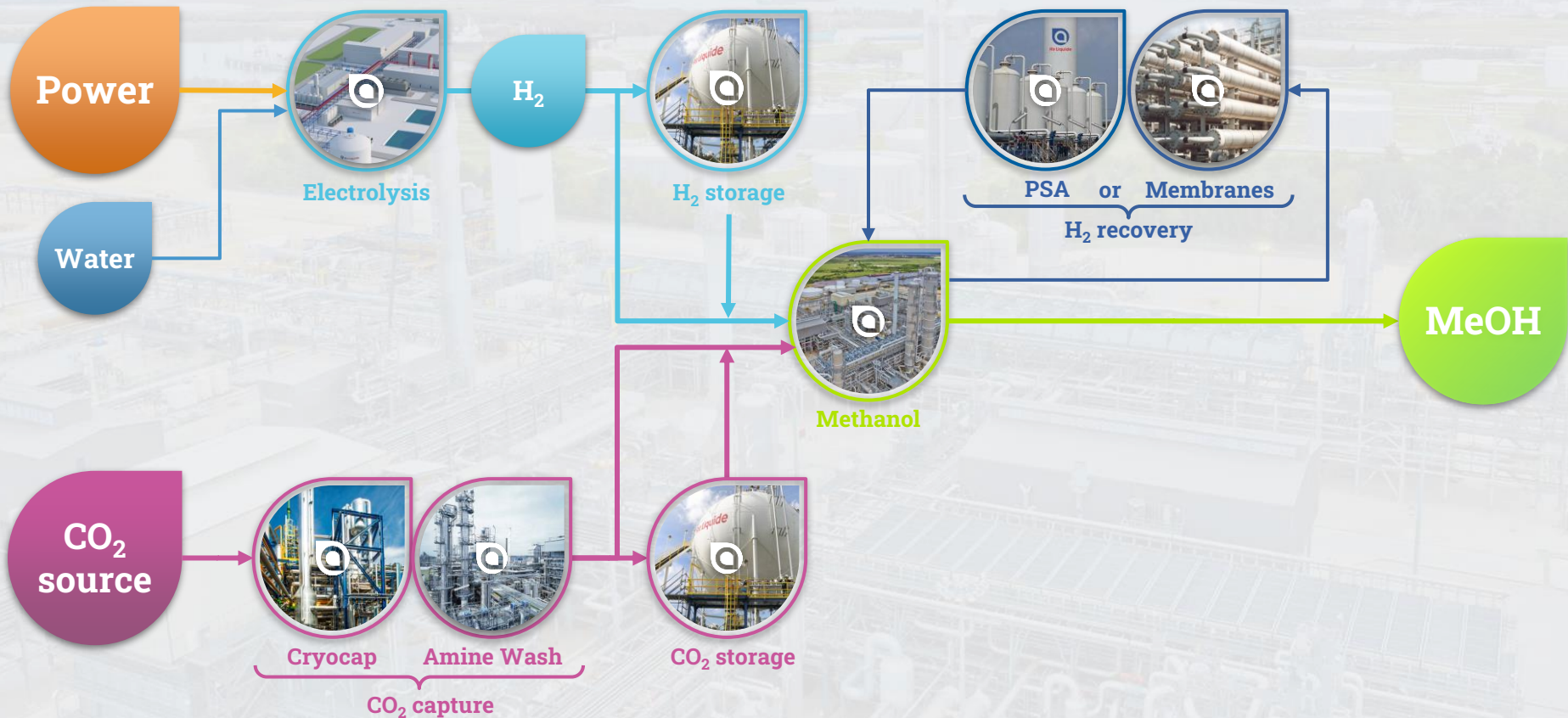
The world's largest cross-border carbon capture and storage (CCS) value chain, transforming the industrial landscape in Antwerp.

EQIOM

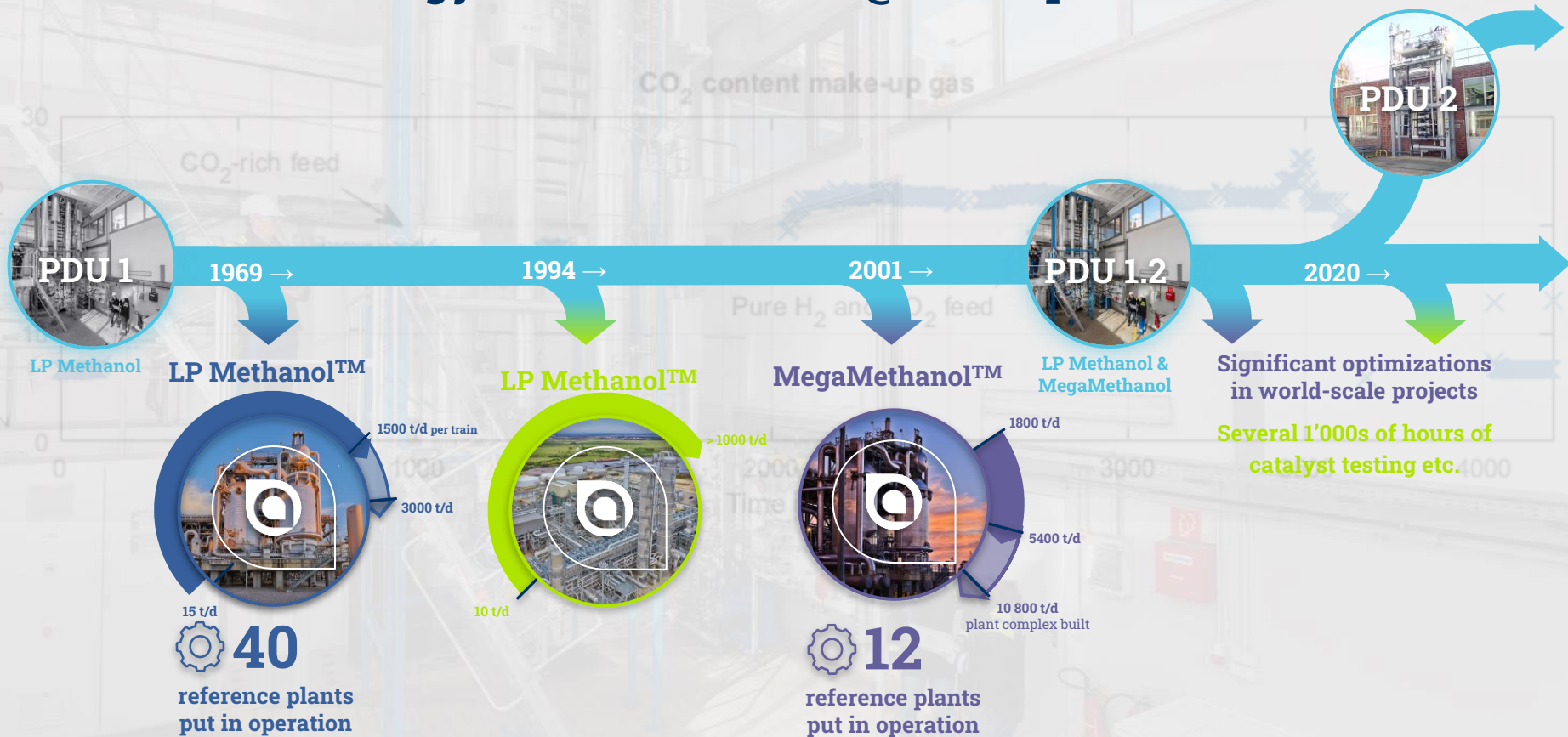
Pioneering one of Europe's first carbon-neutral cement plants, leading the way to sustainable construction.



Smart integration and handling of Balance-of-Plant elements



Methanol technology industrialization @ Air Liquide





M²ARE



This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement n. 101136080.

Coordinator



Partners



M²ARE Project



M²ARE Project

m2are.eu

info@m2are.eu



Summary

The Hydrogen technology race
An industry perspective by Air Liquide

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An industry perspective by Air Liquide

- 1 Many technologies are already there and proven at scale
- 2 For new technologies, partnerships and mid-sized projects such as Trailblazer are key
- 3 Beyond safe, bankable and cost-effective technologies, consistent and reliable regulatory frameworks are required as well
- 4 End-to-end value chain integration is a key success factor for such projects



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Thank you