



Enginyers industrials de Catalunya - Accelerera by Cummins

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June 6th, 2023

AGENDA

- 18:00 Presentación y apertura del evento
- 18:XX Introducción a Accelera by Cummins
- 18:XX Accelera product offering
- 18:XX Global Hydrogen and Electrolyzers demand
- 18:40 Production strategy
- Q&A



INTRODUCING ACCELERA

The new brand for
New Power,
Cummins' fifth
business segment,
focused on zero-
emission technologies.

#acceleratetheshift

Cummins and Accelera



Engines



Power generators

Components

Distribution



Electrolysis



Fuel cells



Batteries



e-Traction

Accelera by Cummins

190
Countries



59.9K
Global employees



1.3M+
Engines built



10.6K
Distributor & dealer
locations



\$1.1B
Invested in research &
development



103 YEARS
of industry leadership



*2021 figures

Accelera by Cummins

Reduced Emissions vs Zero Emissions



CUMMINS

REDUCED EMISSIONS

Cummins' comprehensive range of low-to-near zero emissions solutions has the right tech at the right time to help you run your business more sustainably.

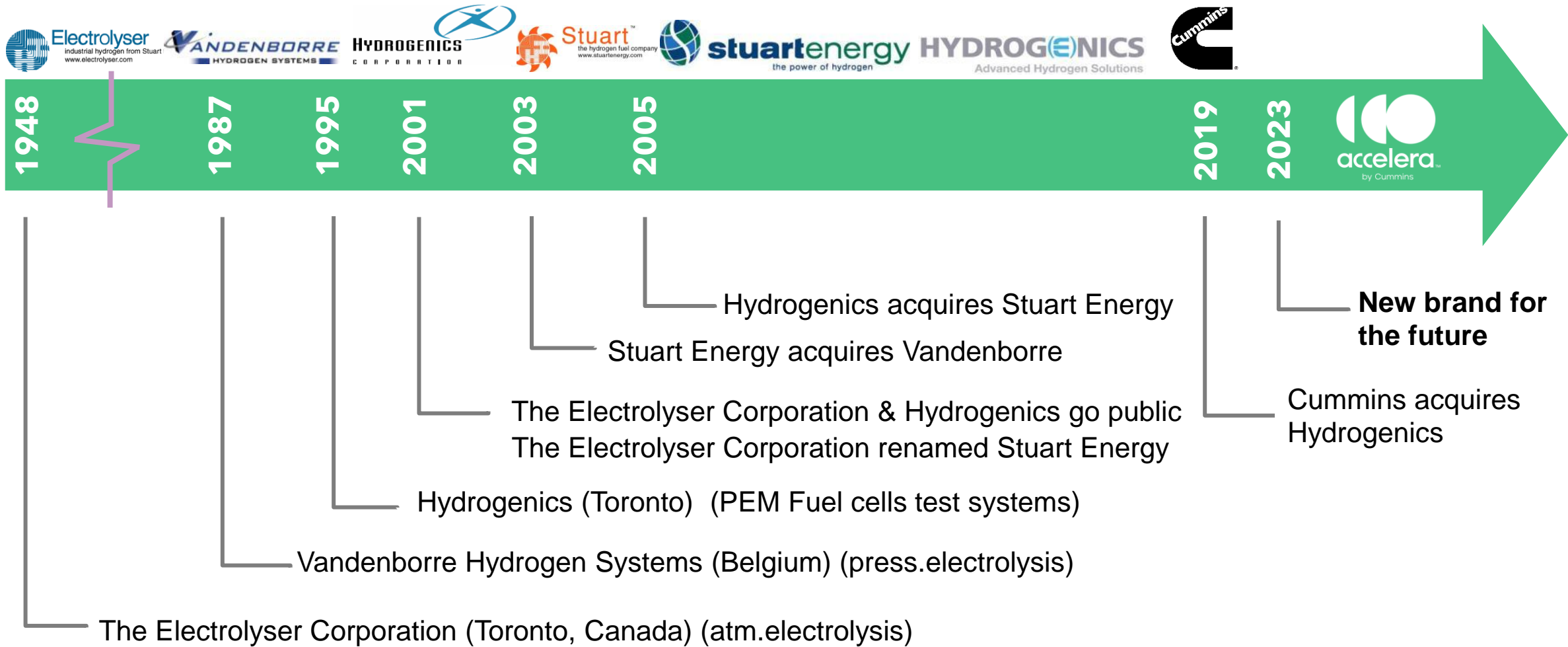


ACCELERA

ZERO EMISSIONS

Accelera hydrogen fuel cell, battery electric, electrolyzer and ePowertrain solutions are ready to transition your fleets, construction sites, ports, factories and grids to zero emissions today.

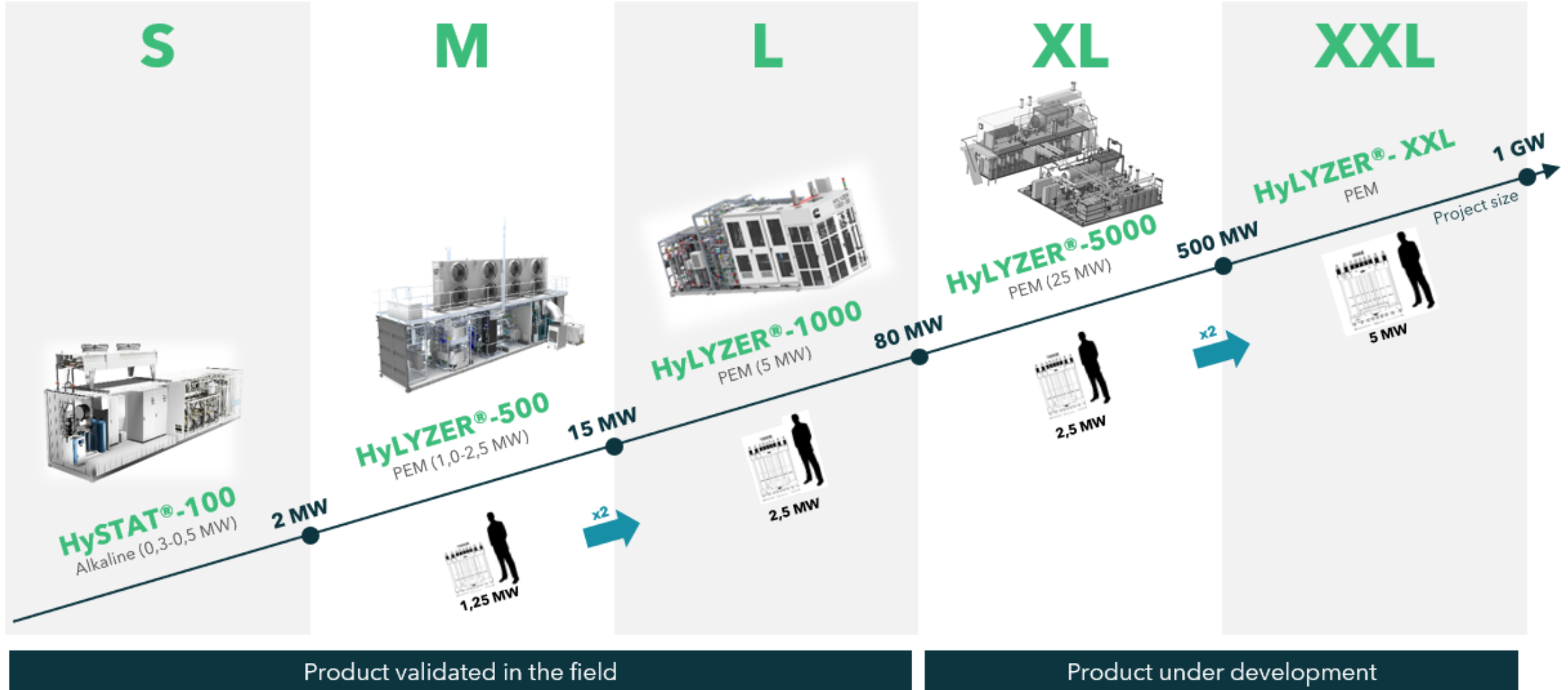
Water Electrolysis From hydrogenics to Accelera by Cummins



Accelera's Electrolyzer product offering

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Accelera's Electrolyzer product offering

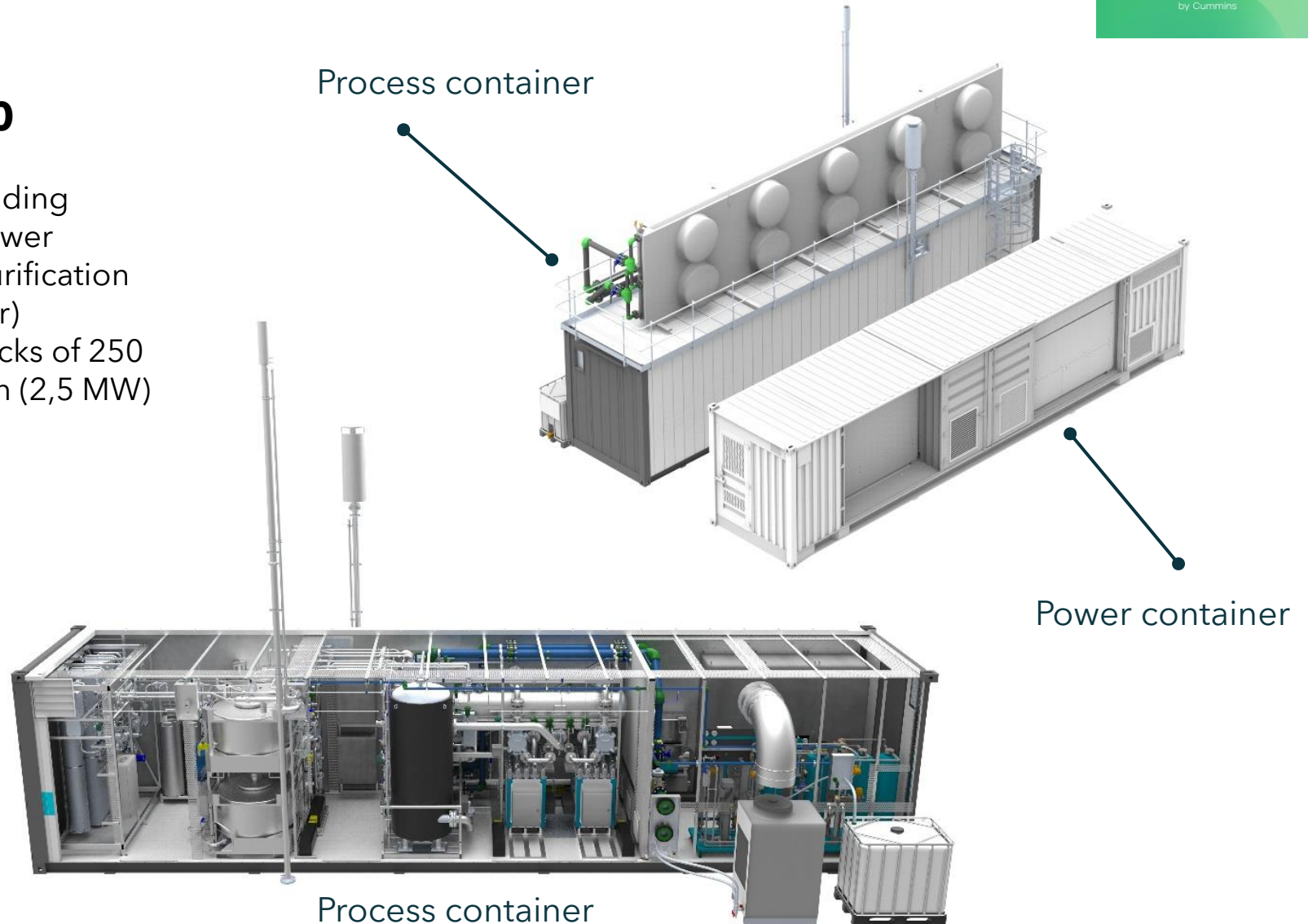


HyLYZER[®]-500 PEM electrolyzer



HyLYZER[®] 200/250/400/500-30

- **Containerized** system
- **Turnkey product (Plug&Play):** including hydrogen gas generation system, power transfo and rectifier AC-DC, water purification (reverse osmosis), cooling (dry cooler)
- **Dual stack platform:** up to 2 cell stacks of 250 Nm³/h (1,25 MW) to reach 500 Nm³/h (2,5 MW)
- **Product versions:**
 - 1,0 MW: 200 Nm³/h (1 stack)
 - 1,25 MW: 250 Nm³/h (1 stack)
 - 2,0 MW: 400 Nm³/h (2 stacks)
 - 2,5 MW: 500 Nm³/h (2 stacks)
- **Output pressure:** 30 barg



HyLYZER[®]-500 PEM electrolyzer



HyLYZER® -500 Spanish references

Power-to-Mobility



5 MW, TMB HRS, Barcelona



Power-to-Industry

Power-to-Mobility

Power-to-Gas



2,5 MW, Lloseta plant, Mallorca



HyLYZER®-1000 PEM electrolyzer

HyLYZER® 1000-30

- **Indoor** system
- **Modular product (to be integrated):** including hydrogen gas generation system, power transfo and rectifier AC-DC
- **Dual stack platform:** 2 cell stacks of 500 Nm³/h (2,5 MW) to reach 1000 Nm³/h (5 MW)
- **Output pressure:** 30 barg

Every hazardous zone of the product is enclosed (ventilated enclosure + hydrogen detection) preventing the building to be classified as ATEX zone → cheaper equipment inside the building + ease of operation & maintenance



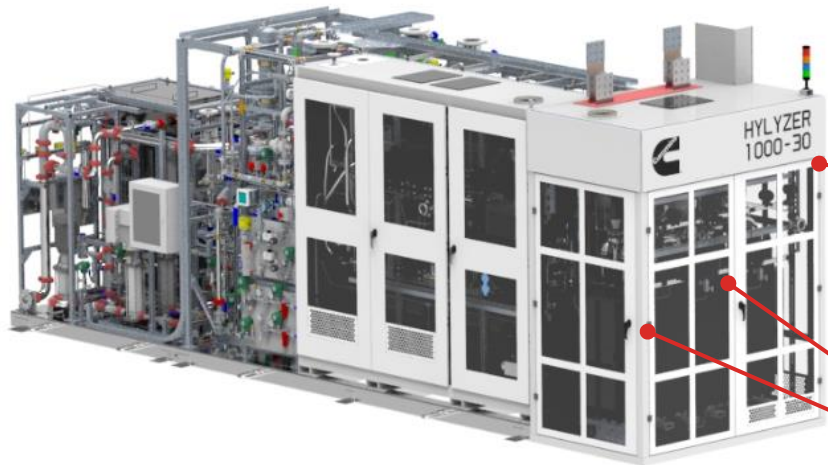
modular PRODUCT PLATFORM

20MW / 4x HYLYZER®-1000



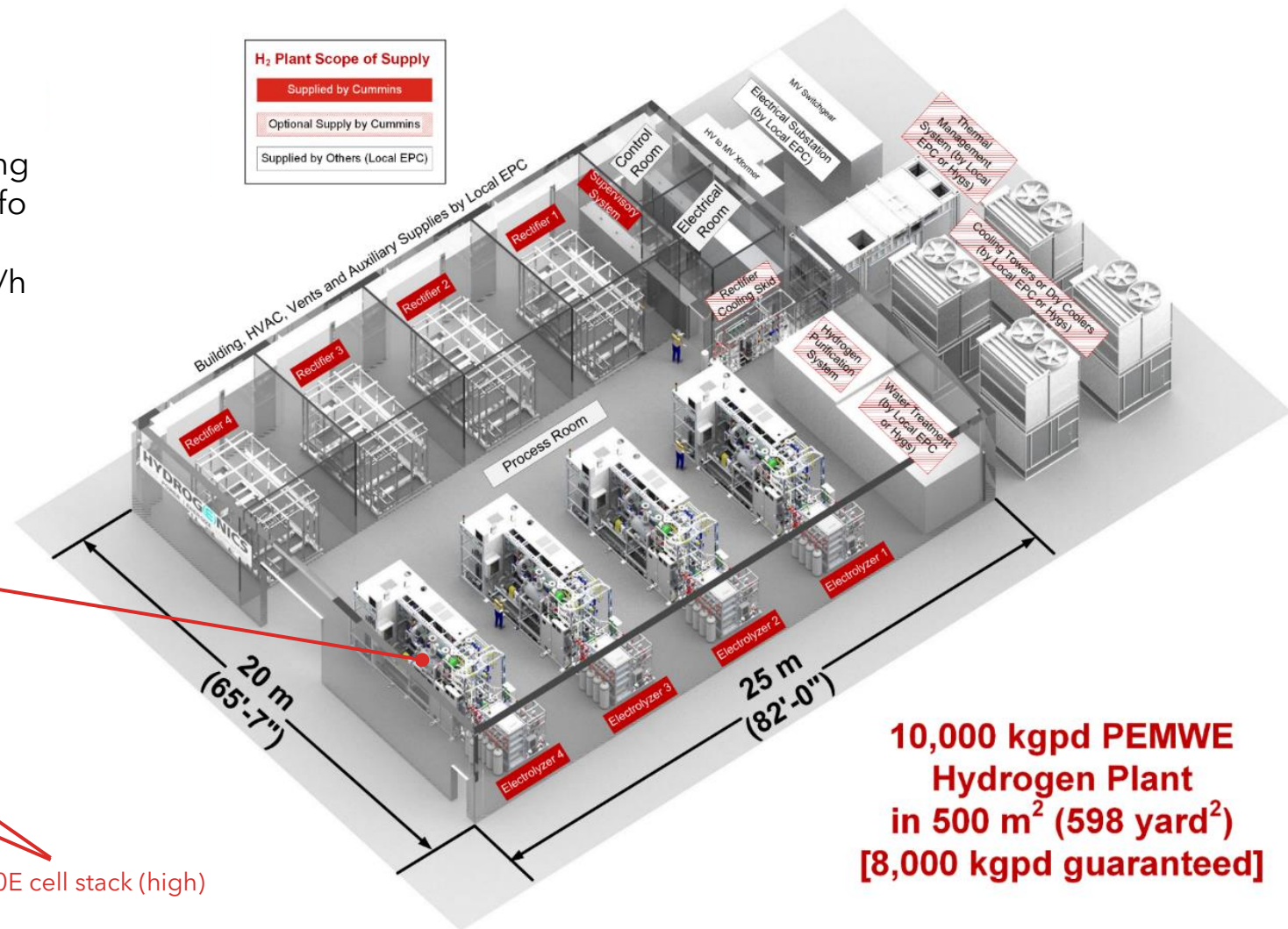
HyLYZER® 1000-30

- **Indoor system**
- **Modular product (to be integrated):** including hydrogen gas generation system, power transfo and rectifier AC-DC
- **Dual stack platform:** 2 cell stacks of 500 Nm³/h (2,5 MW) to reach 1000 Nm³/h (5 MW)
- **Output pressure:** 30 barg



HyLYZER®-1000 - Balance-of-Stack
1000 Nm³/h (~5 MW) in total

2x 1500E cell stack (high)



**10,000 kgpd PEMWE
Hydrogen Plant
in 500 m² (598 yard²)
[8,000 kgpd guaranteed]**

World's Largest PEM Electrolyzer 20 MW

More info & video tour:
<https://www.cummins.com/news/2021/10/04/video-case-study-cummins-hylyzer-pem-electrolyzer-becancour-quebec>



Air Liquide Becancour, Canada
4x HyLYZER® 1000-30 - indoor - 20 MW - 4.000 Nm³/h - 8,6 TPD



Air Liquide Becancour, Canada
HyLYZER® 1000-30 - indoor

Confidential

HyLYZER®-1000 PEM electrolyzer

reference plant (4.000 Nm³/h, ~20 MW)

Air Liquide Bécancour, Québec, Canada

Hydrogen is liquefied and distributed by trucks to industrial customers in Québec region

3 tons of hydrogen per truck, 6-7 hours to refuel one truck

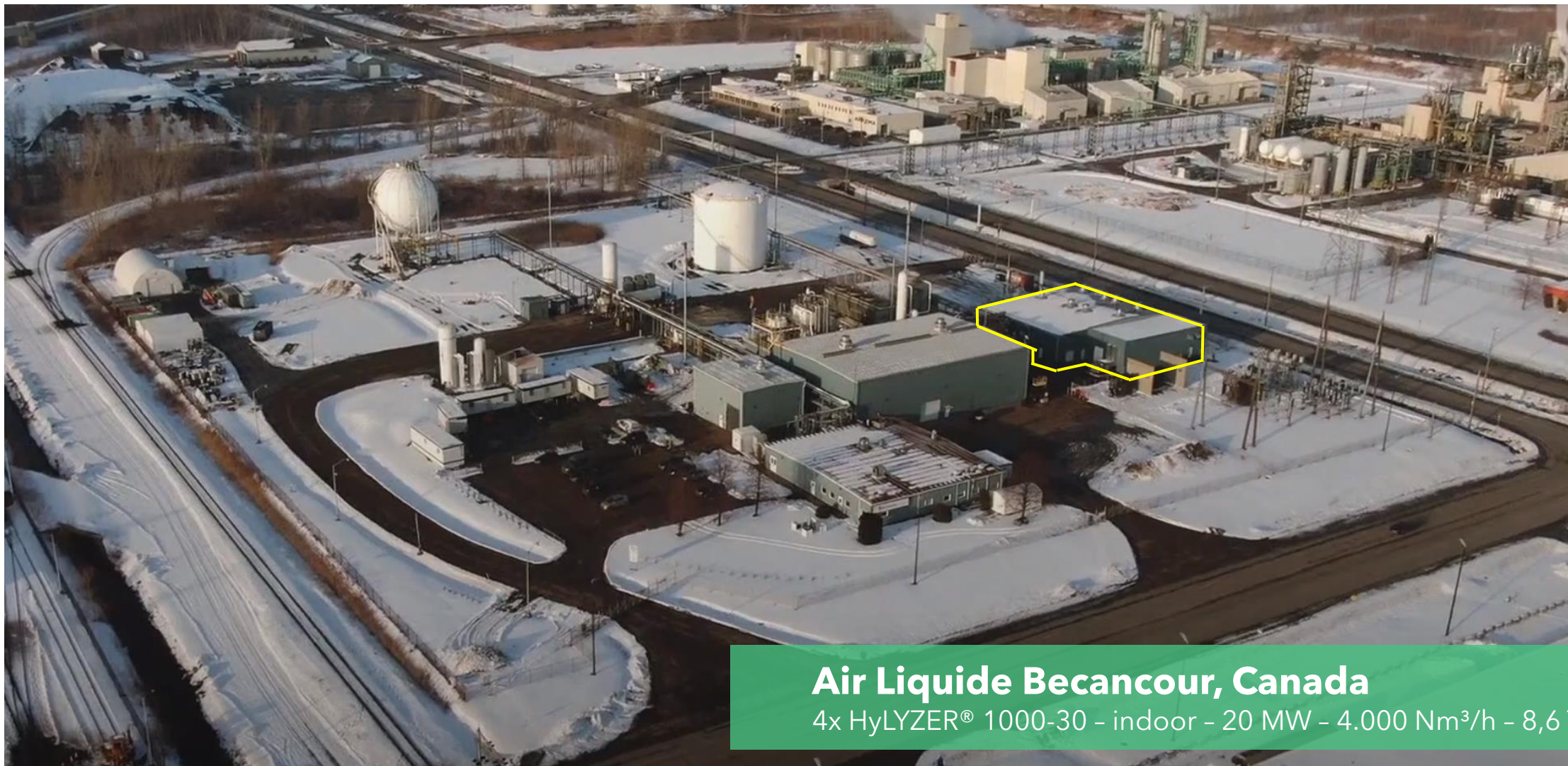
2 great video's about the project:

- <https://ici.radio-canada.ca/nouvelle/1844495/hydrogene-electricite-strategie-jomathan-julien>
- <https://www.youtube.com/watch?v=vS5opnwFCUA>



Replacement of old atmospheric ALKALINE electrolyzer (3TPD, 1985) delivered by Stuart Energy*

*Hydrogenics acquired Stuart Energy in 2005



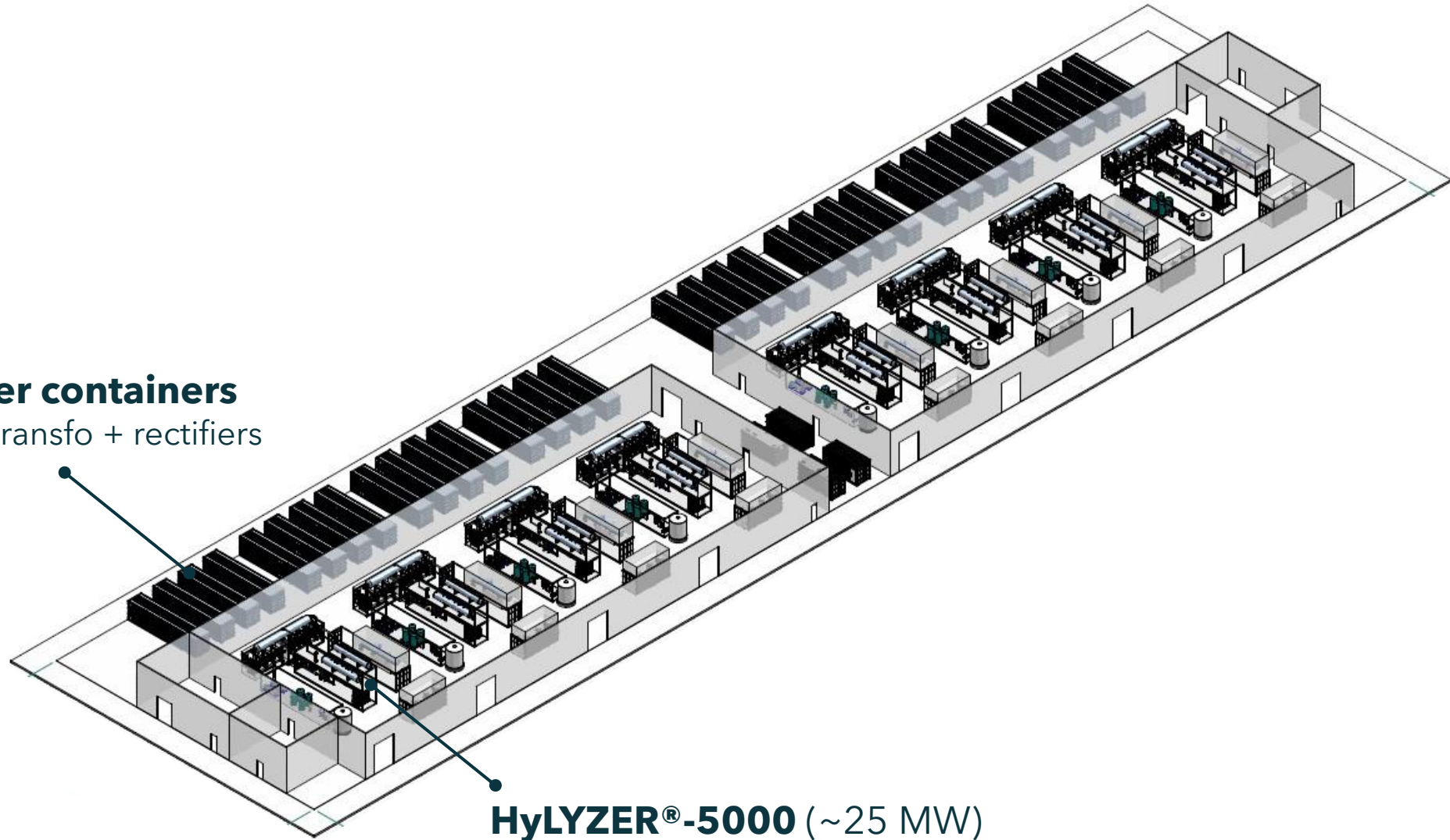
Air Liquide Becancour, Canada

4x HyLYZER® 1000-30 - indoor - 20 MW - 4.000 Nm³/h - 8,6 TPD

HyLYZER[®]-5000 PEM electrolyzer plant layout 40.000 nm³/h (~200 MW)



Power containers
MV-LV transfo + rectifiers



HyLYZER[®]-5000 (~25 MW)

HyLYZER®-XXL PEM electrolyzer plant layout 100.000 Nm³/h (~500 MW)



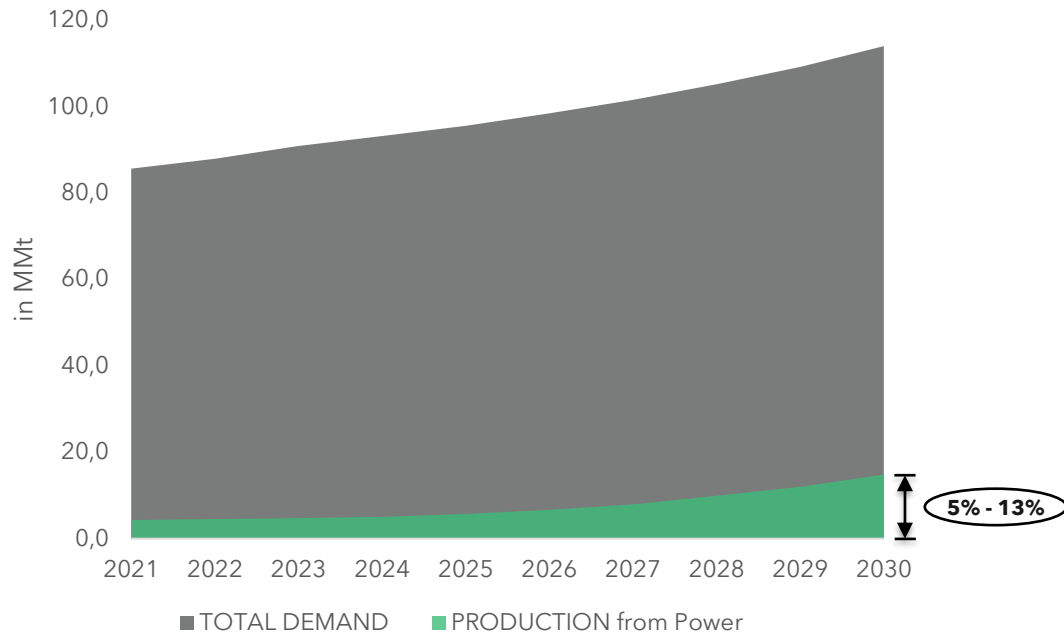
Global Hydrogen and Electrolyzer Demand

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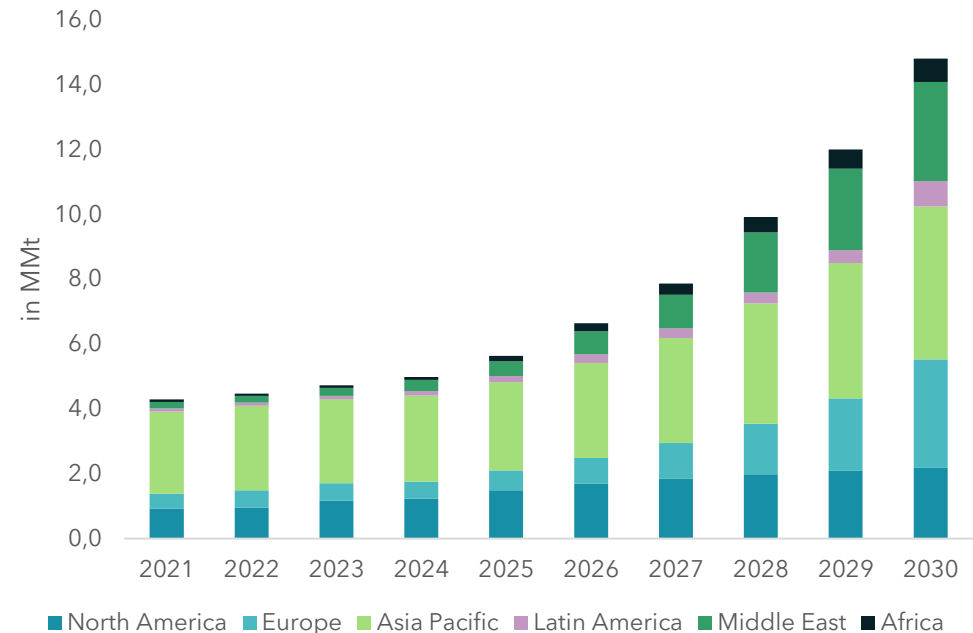
Hydrogen remains predominantly in industrial usage

Gradual replacement of existing capacity with low-carbon production followed by decarbonization of new supplies

Planned Case Scenario



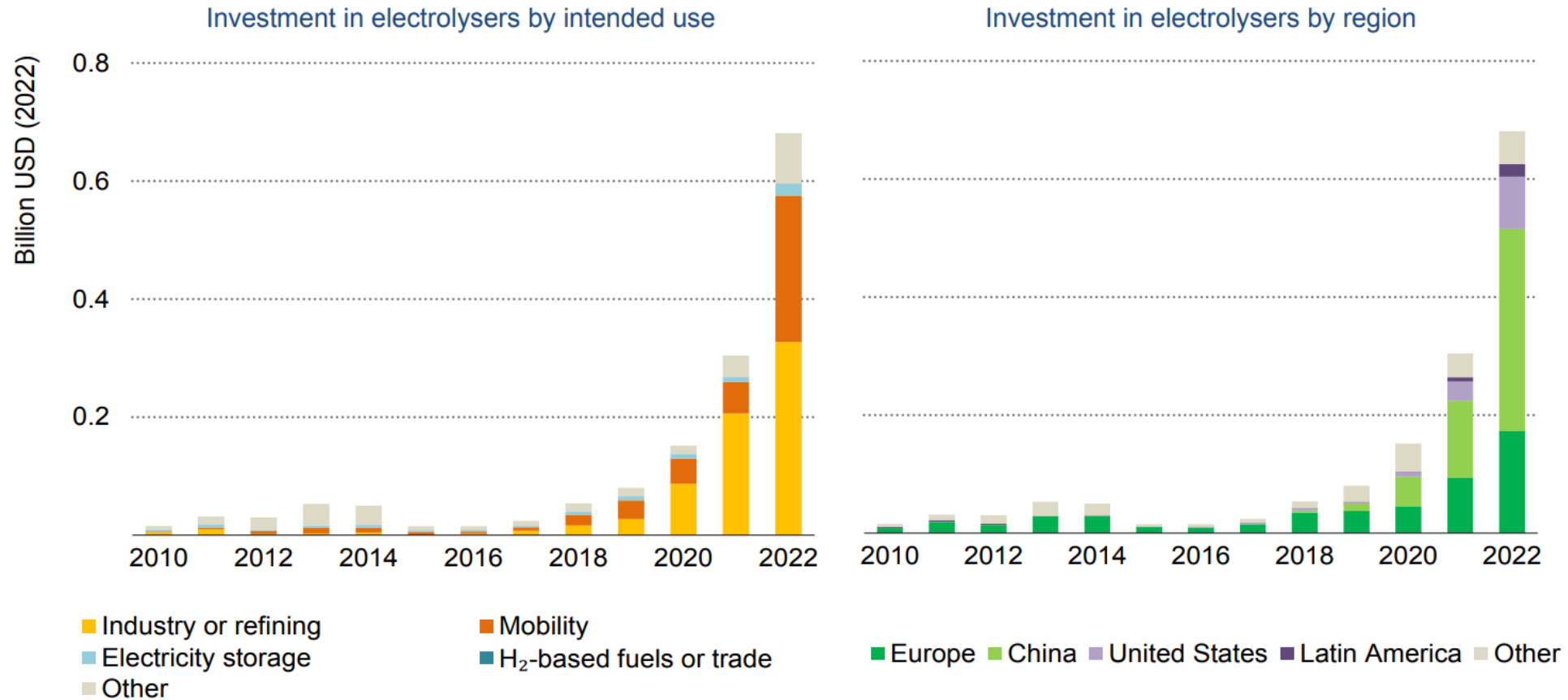
Electrolysis by Region



Source: S&P IHS Markit Global term hydrogen supply & demand outlook (inflections, August 2022)
 Production from power includes RES and legacy electrolysis from grid power

Investment by hydrogen developers remains positive driven by government incentives

Uncertainty about the environmental requirements for hydrogen requirements to qualify for incentives



Source: IEA World Energy Investment (2023)

We plan to expand capacity aligned with demand in NA and Europe from 375MW to 2GW by 2025



| Country | Belgium | Spain | Canada | USA | China (in JV with Sinopec) |
|---|----------------------|------------------|-----------------------|----------------|-------------------------------|
| City | Oevel | Guadalajara | Mississauga | Fridley | Foshan |
| Status Operational date | Extension Q4 2022 | New Q1 2024 | Extension Q4 2022 | New Q2 2023 | New Q2 2023 |
| HyLYZER® PEM cell stacks | ● 125MW to 1000MW | | ● 250 MW to 1000MW | | |
| HyLYZER® PEM systems Production capacity | ● 100 MW | ● 500-1000 MW | ● 150 MW | ● 650 MW | ● 500-1000 MW |
| HyLYZER®-500 | ● | | | ● | ● |
| HyLYZER®-1000 | ● | ● | ● | ● | ● |
| HyLYZER®-5000 | | ● | | ● | |



Thanks!

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