

Introduction to Cummins Inc.

New Power Business Unit - Electrolyzers

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CUMMINS



Engines



Power generators

Components

Distribution



Electrolysis



Fuel cells



Batteries



Electrical traction

New Power

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



NEW POWER'S CORE TECHNOLOGIES

FOUNDATION FOR THE FUTURE



Electrolyzers

Creating solutions for industrial and commercial hydrogen generation and MW-scale energy storage

Industrial processes and fueling stations: PEM generator, alkaline hydrogen generator

Critical and uninterruptible power supply, power-to-gas technology



Fuel Cell Systems

Creating and integrating fuel cells for mobility and stationary power applications

Electric mobility: heavy duty truck, transit bus, rail

Utility: microgrids, MW-scale grid firming and renewable integration

Commercial/Industrial: manufacturing, data centers, water treatment facilities, hotels/resorts



Electrified Components

Creating technologies and products for commercial battery electric vehicles and battery energy storage systems

On-highway: transit bus, school bus, medium-duty truck, walk-in van

Off-highway: construction equipment, terminal tractor, material handling, energy storage systems

Components: battery modules, battery packs, PCAS



ePowertrain Systems

Creating technologies and delivering eAxles for electrified vehicles

On-highway: medium-duty truck, heavy-duty truck, walk-in van, transit bus, school bus

Off-highway: construction equipment, terminal tractor

Components: integrated eAxles



Traction Systems

Creating technologies and delivering electric traction systems for electrified vehicles

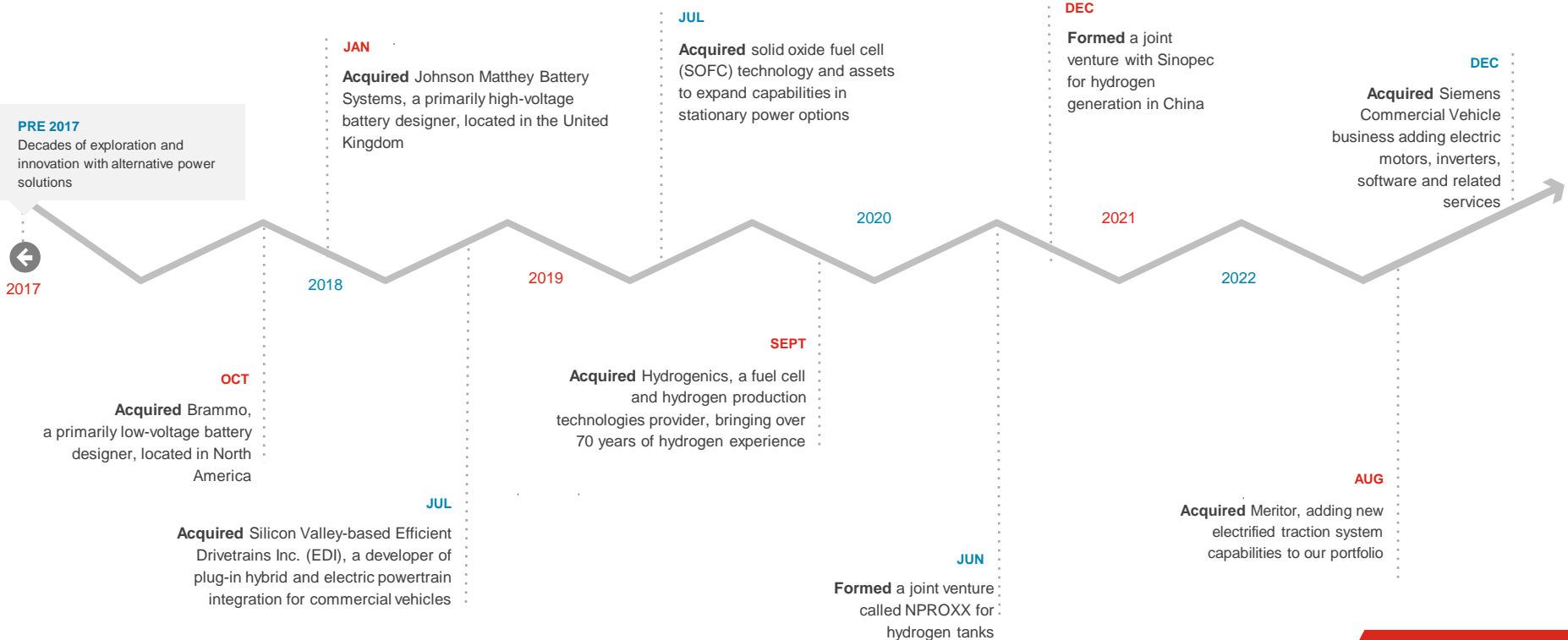
On-highway: medium-duty truck, heavy-duty truck, walk-in van, transit bus, school bus

Off-highway: construction equipment, terminal tractor

Components: motors and inverters for remote mount and eAxle

OUR JOURNEY

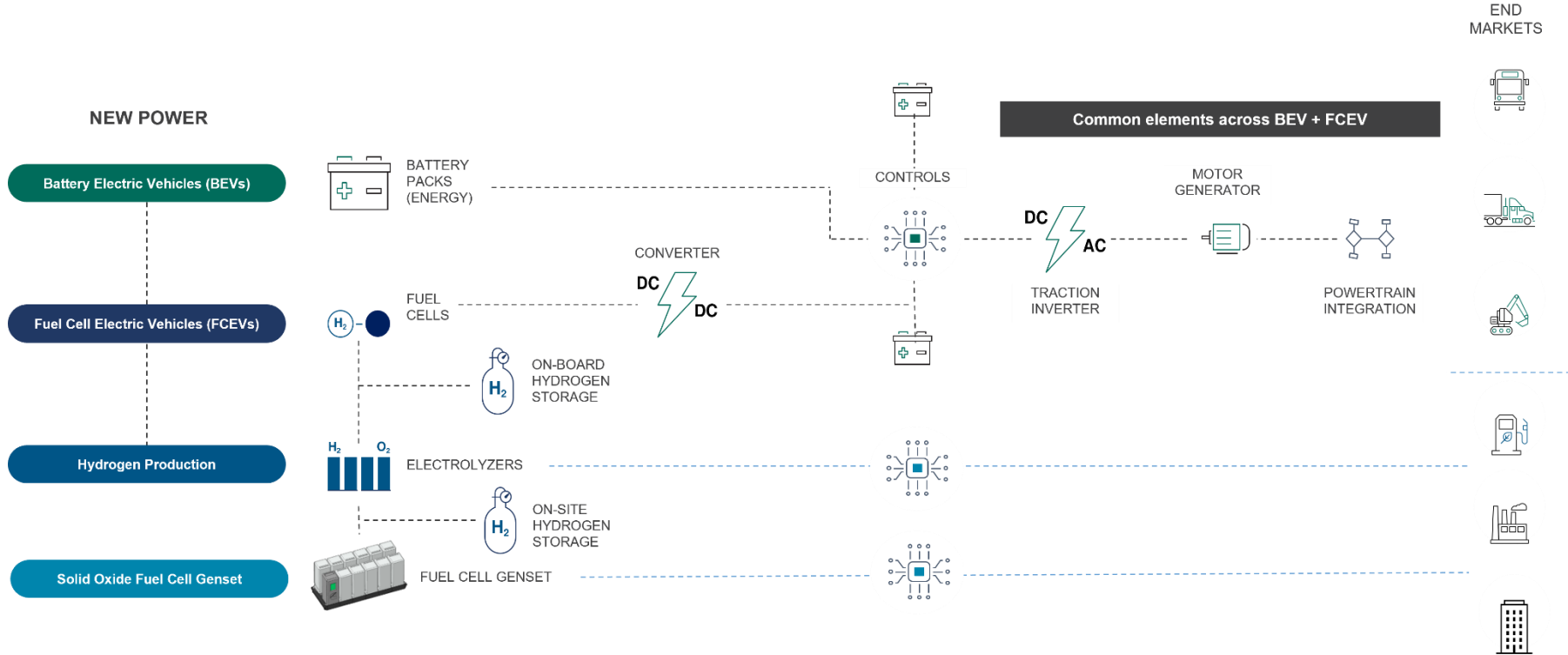
GROWING CAPABILITIES & STACKING EXPERIENCE



COMPLEMENTARY TECHNOLOGIES

TO DELIVER AND SCALE VALUE

Shared key components and capability requirements

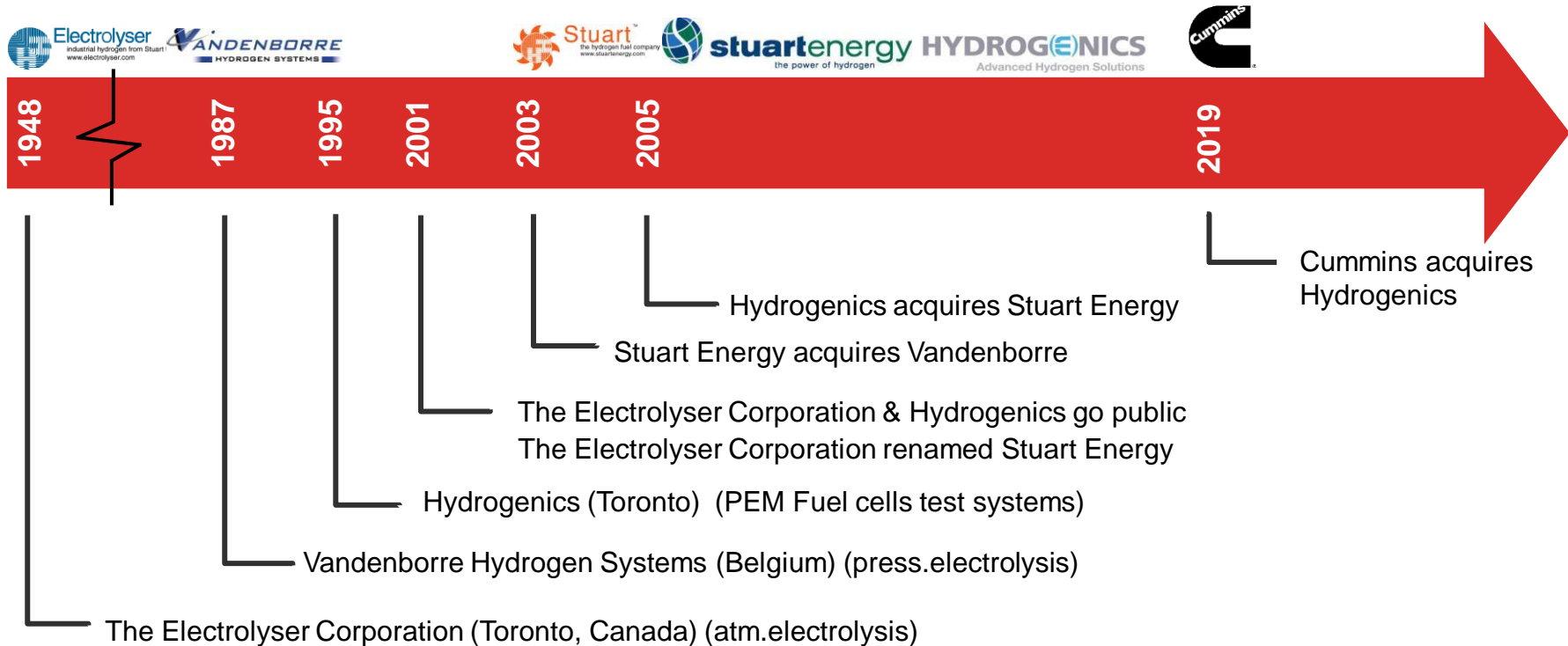


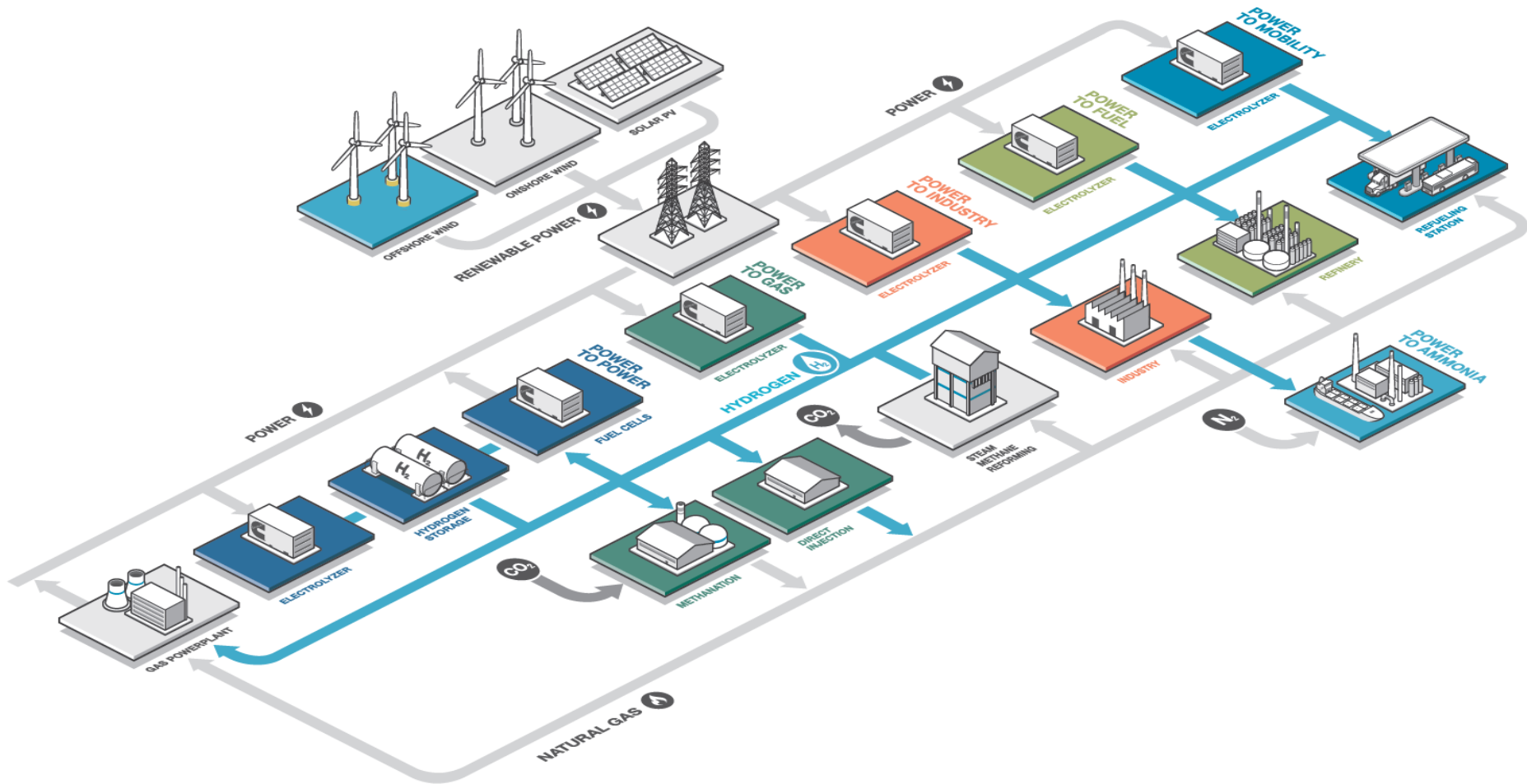
NEW POWER FOOTPRINT

SCALING CAPACITY



WATER ELECTROLYSIS HYDROGENICS HISTORY





WE ARE EXPANDING OUR PEM ELECTROLYZER MANUFACTURING CAPACITY ON 3 CONTINENTS



Country	Belgium	Spain	Canada	USA	China	China (in JV with Sinopec)
City	Oevel	Guadalajara	Mississauga	Fridley	Shanghai	Foshan
Status	Extension	New	Extension	New	New	New
HyLYZER® PEM cell stacks	•		•		•	
HyLYZER® PEM systems	•	•	•	•		•

GLOBAL ANNUAL CAPACITY: 2-3 GIGAWATTS IN 2023-2024

EUROPE DISTRIBUTION SERVICE COVERAGE

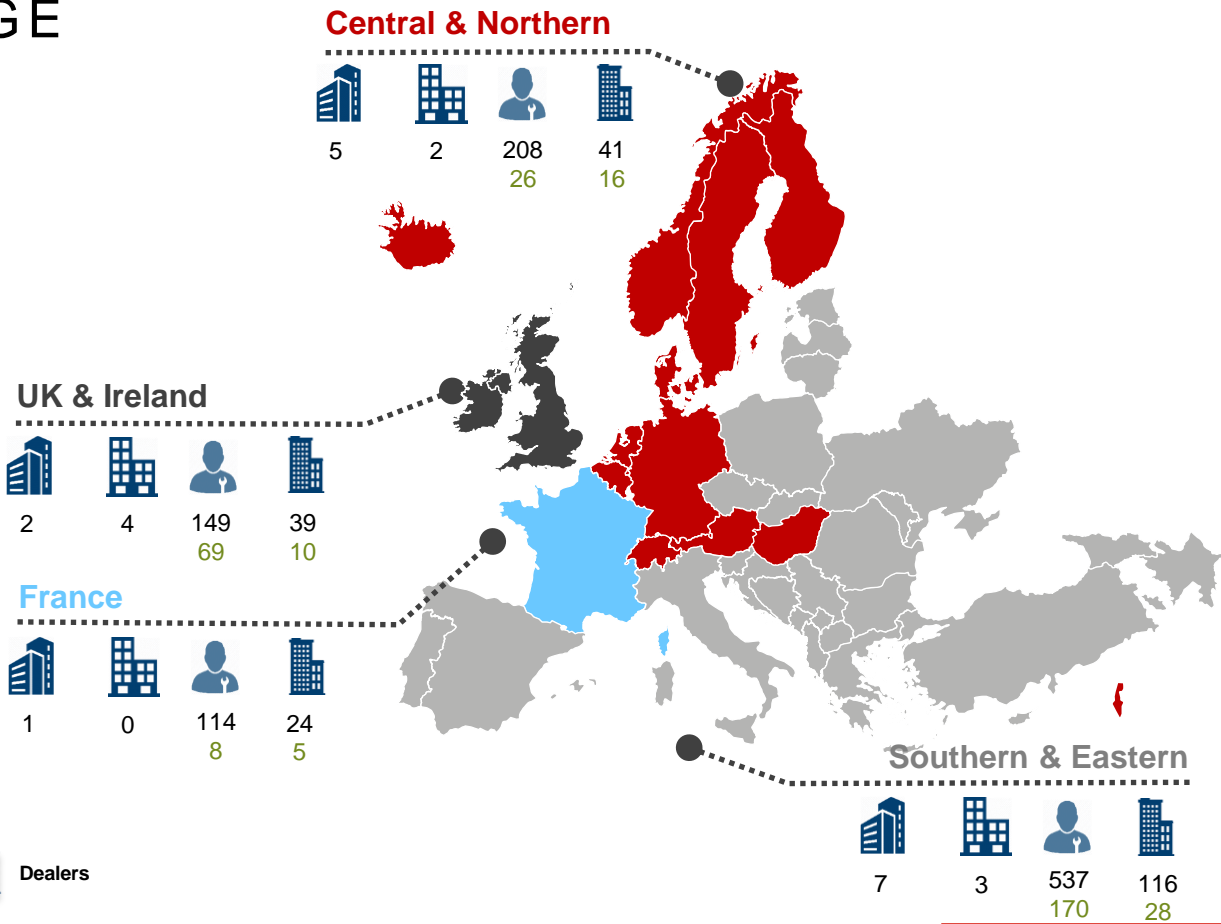
Cummins Service Locations

- Distributors **15**
- Dealers **220**
- Technicians **1008***

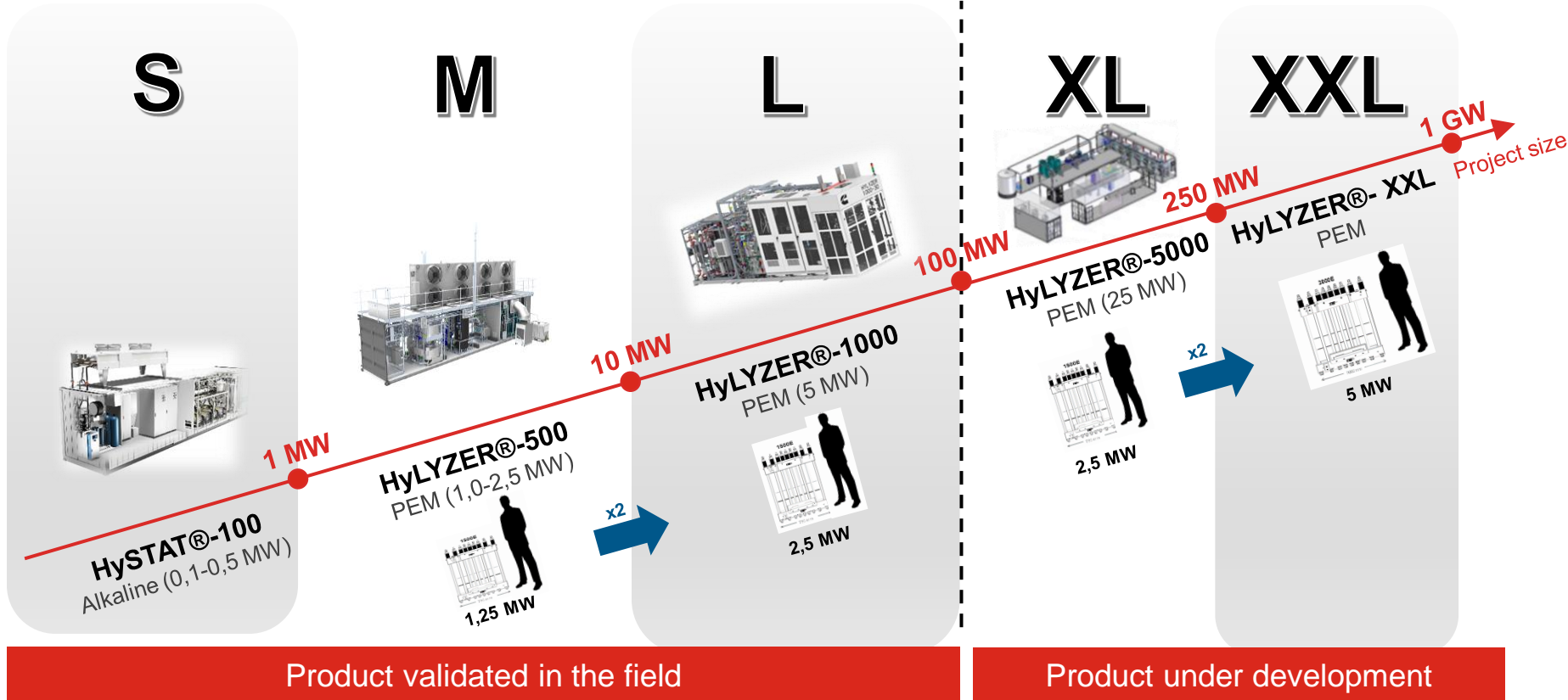
OEM Affiliated Locations

- OEM Dealers **59**
- OEM Techs **273**

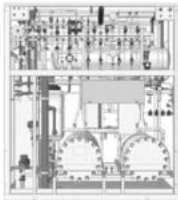
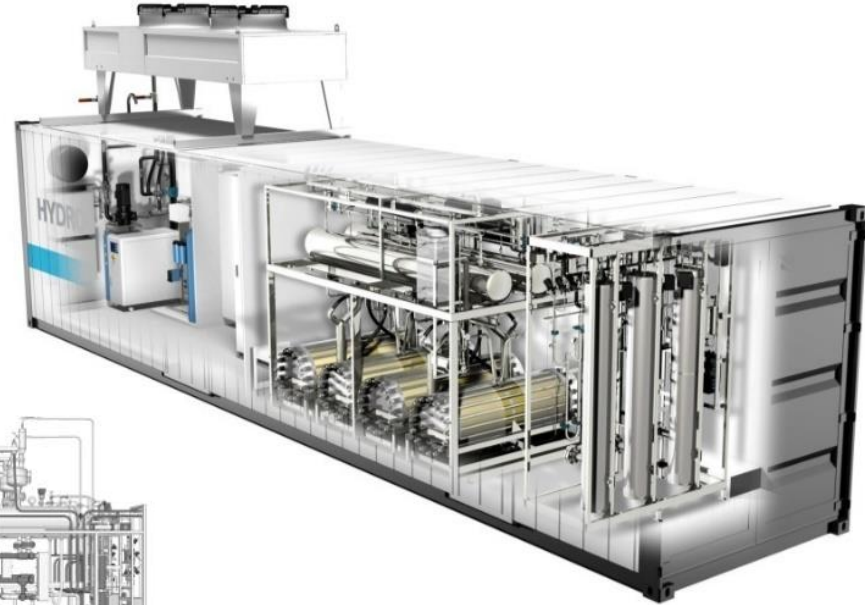

 Distributor-Headquarters
 
 Technicians
 
 Distributor-Branch
 
 Dealers



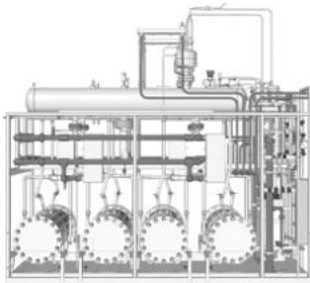
ELECTROLYZER PRODUCT OFFERING



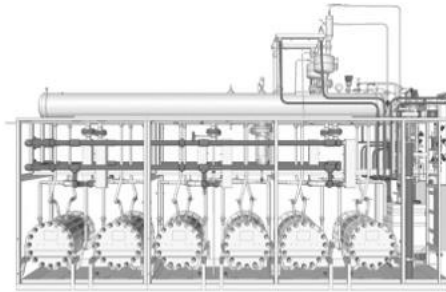
HySTAT[®] SERIES: ALKALINE ELECTROLYZERS



Up to 2 cell stacks
30 Nm³/h



Up to 4 cell stacks
70 Nm³/h

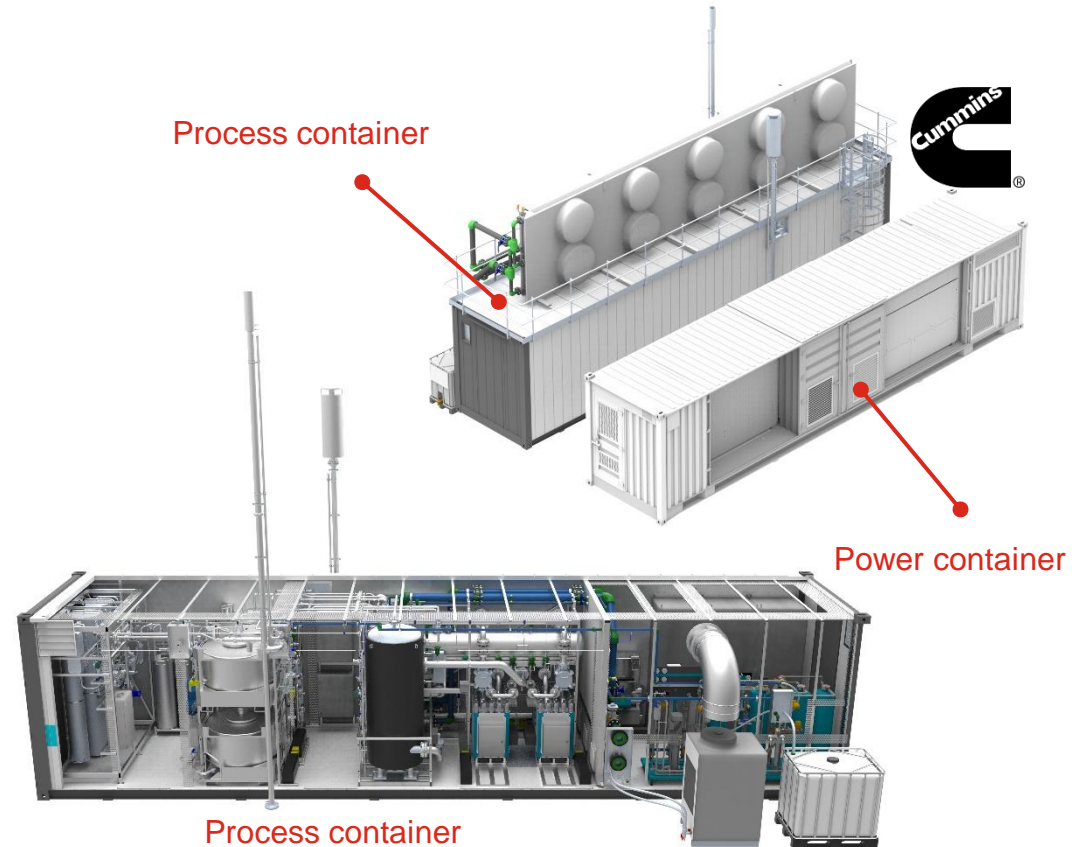


Up to 6 cell stacks
100 Nm³/h

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



CUMMINS TECHNOLOGY LEADERSHIP

2,5 MW PEM CELL STACK

1

MW Scale Electrolyzer Stack

3.0 MW industry benchmark

2

Reduction of Plant Capital Costs

Achieved target system cost

3

Stack Efficiency Improvements

Leading industry performance



4

Fast Response and Dynamic Operation

Key requirement established

5

Very compact

Lowest footprint on the market

6

Reduced Maintenance

Limited and optimized

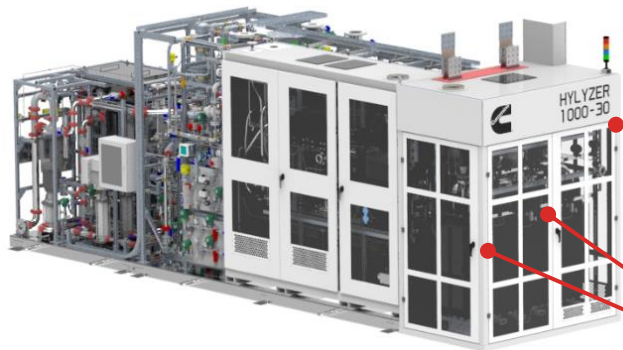
	1500E cell stack (high)	1500E cell stack (small)
Nominal input power (Max)	2,5 MW (3 MW)	1,25 MW (1,5 MW)
Nominal H2 flow (Max)	500 Nm³/h (620 Nm ³ /h)	250 Nm³/h (310 Nm ³ /h)
Operating pressure	30 barg	30 barg

MODULAR PRODUCT PLATFORM

20MW / 4x **HYLYZER®-1000**

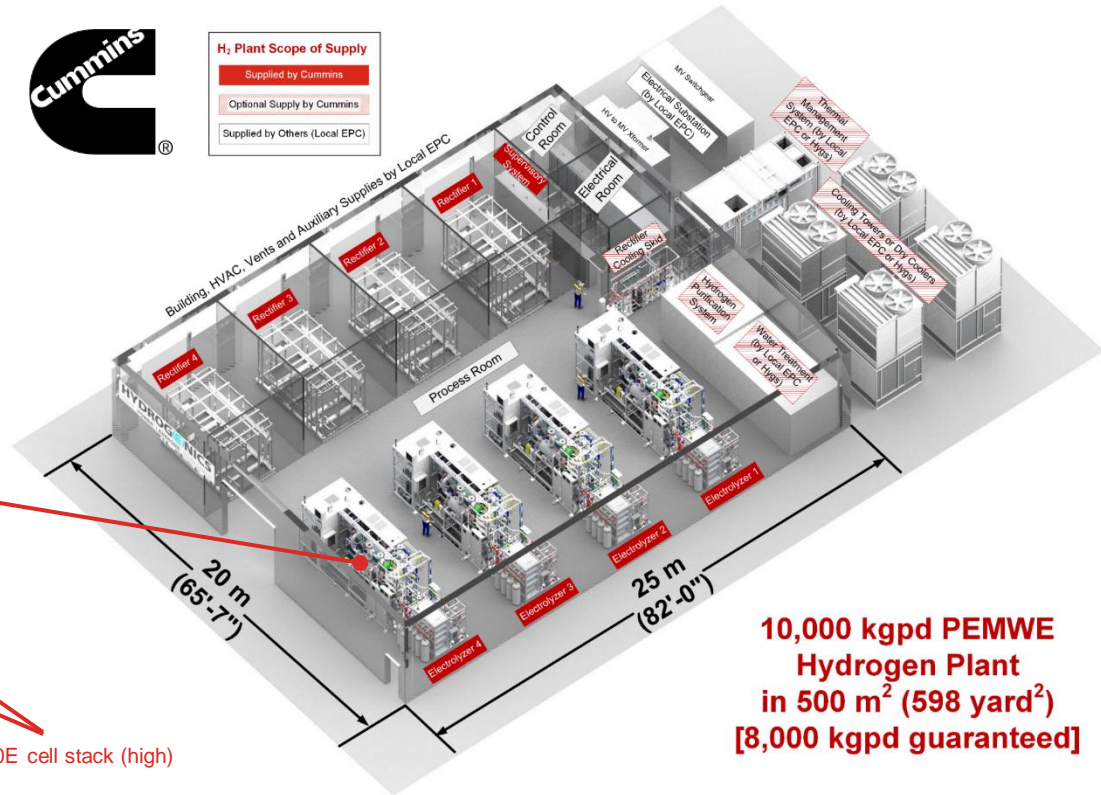


H ₂ Plant Scope of Supply	
	Supplied by Cummins
	Optional Supply by Cummins
	Supplied by Others (Local EPC)



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

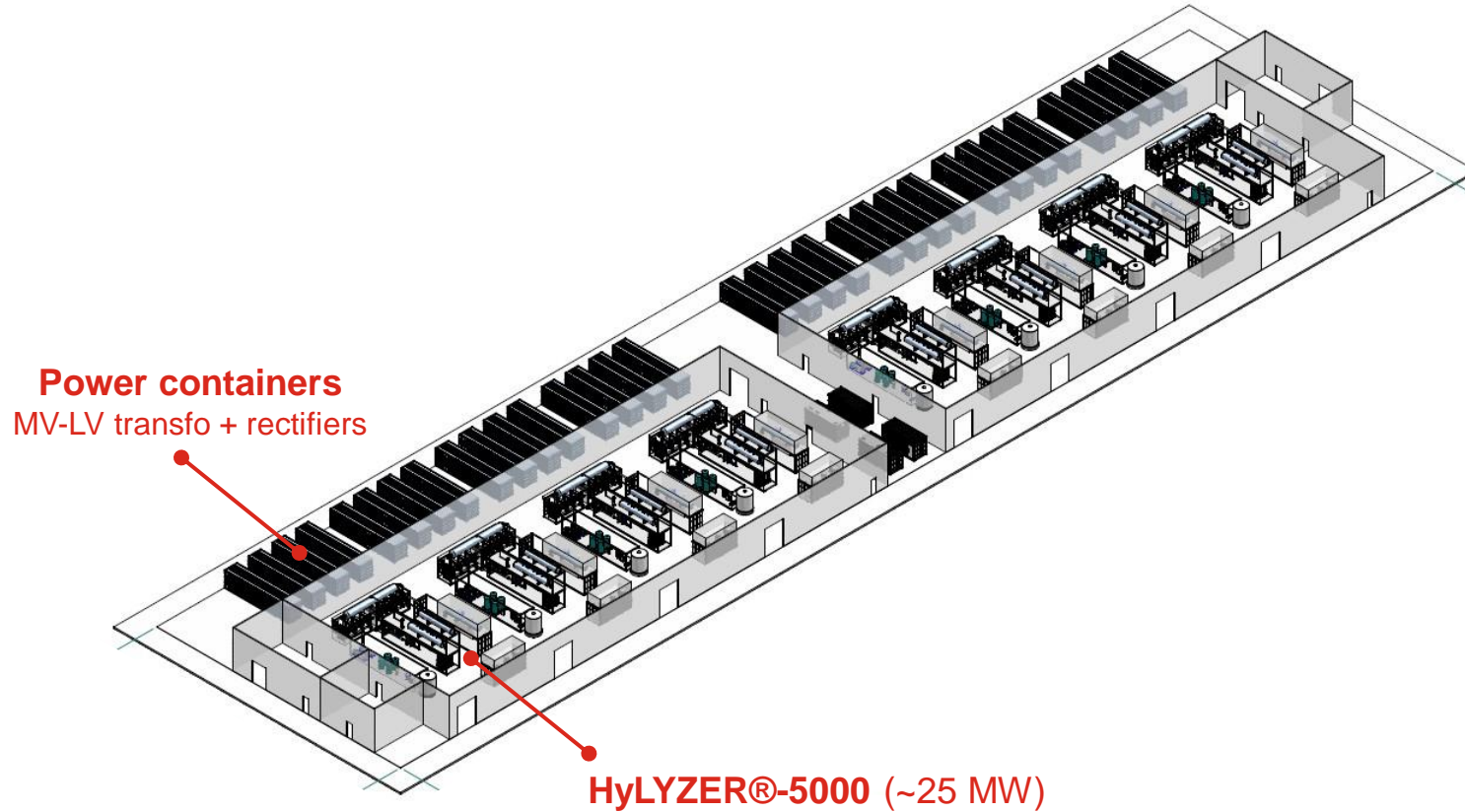
4x HyLYZER® 1000-30 – indoor – 20 MW – 4.000 Nm³/h – 8,6 TPD

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>



HyLYZER®-5000 PEM ELECTROLYZER PLANT LAYOUT 40.000 Nm³/h (~200 MW)



HyLYZER®-XXL PEM ELECTROLYZER PLANT LAYOUT 100.000 Nm³/h (~500 MW)



THANK YOU !

electrolyzers@cummins.com

cummins.com/hydrogen

cummins.jobs - **WE ARE HIRING !**



**FOR
A WORLD
THAT'S
ALWAYS ON™**

A large, white, stylized 'C' logo with the word 'Cummins' written inside it in a bold, sans-serif font. The logo is set against a red background that is a grid of various engine components, including pistons, valves, and other mechanical parts. The word 'EXcellence' is visible in the top right corner of the grid.