



7 AFFORDABLE AND  
CLEAN ENERGY



9 INDUSTRY, INNOVATION  
AND INFRASTRUCTURE



13 CLIMATE  
ACTION



# Enabling and accelerating the transition to green mobility

## MEMORANDUM

Confidential

30/01/2023

Jean-Patrick CORSO



PART 1

# Rethinking the fuelcell



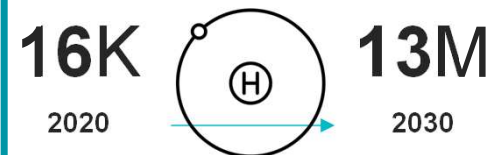
Transport accounts for 30% of the world's GHG emissions. It is the driving sector for the hydrogen industry



Europe : launch of  
**HORIZON** program



**France.** Strategic sector of the "Plan France 2030".  
**9 Bn€** investments.



Evolution of the number  
of FCEVs (fuel cell  
vehicles) in the world.

PART 1

# Rethinking the fuelcell

## The problems and constraints of the hydrogen sector are numerous.

- Costs
- Geo-strategic dependence
- Sustainability and environmental compliance
- Practical and logistical aspects
- Regulations

Failure to provide solutions to industry will prevent the automotive sector from making its green revolution.

### PLATINUM CATALYST



**Platinum is traded at €30,000 per kilo** (more expensive than gold)

It is a scarce resource (13,000t worldwide), which results in a poor ecological footprint and geo-strategic dependence (South Africa 80%, Russia 10%)

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### HYDROGEN



**95% of its origin is carbon-based to date.**

Hydrogen requires expensive high-pressure tanks to manufacture, the deployment of infrastructure and stations, and is subject to strict regulations to enforce high safety standards.

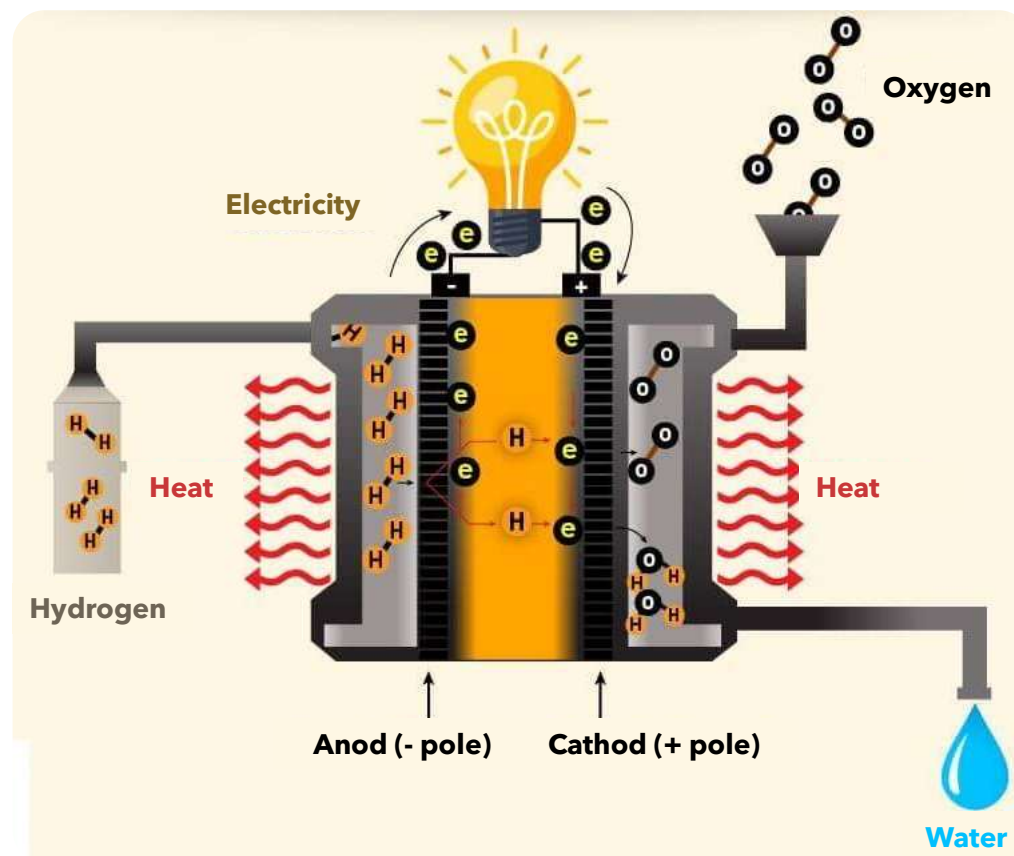


PART 2

# Solution INNOVATIONS

## Reinventing the fuelcell

Presentation of the functioning of a "traditional" fuelcell



PART 2

# Solution INNOVATIONS

15 years of R&D, and a reversal of operation to become a **game changer** in fuel cells, by integrating 3 major innovations.

## Source of HYDROGEN



Porous active substance+water = Hydrogen

TRL  
4/5

## Catalyst: NICKEL



Use of nickel (a more abundant and cheaper resource) in the same way as platinum.

TRL  
4

## Multiple MEMBRANES



Possibility of membranes of more common materials and simpler manufacturing

Solid silicon membrane with OH- instead of H+ ion exchange

Modified conventional membrane (NAFION) with OH- instead of H+ ion exchange

TRL  
4

All **international patents** and know-how belong to CLHYNN since October 2022

PART 2

# Solution / BENEFITS

## Economical

1000 times cheaper catalyst than platinum, without onerous storage to hold the pressure



## Geostrategic

No risk of supply disruption compared to platinum, neither contextual, nor structural.

## Time to market

No need to wait for infrastructure to be created, accelerated adoption

## Practical

30 à 300% more autonomous than a same tank volume, quick replacement of the recharge

PART 3

# Team FOUNDERS



**Jean-Patrick  
CORSO**  
CEO

Business Development  
and partner relations

## Profile

Entrepreneur, large projects up to 500 M€ in the automotive, connectivity and energy sectors, former CEO of SME (large export), turnover 5 M€.

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+



**Bernard  
GAUTHIER-MANUEL**  
CSO

Technical validation and  
skills transfer

## Profile

CNRS researcher, electrochemistry expert, 64 publications and 8 patents filed, inventor of the 3 patents held by CHLYNN

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+



**Régis  
PANOZZO**  
CTO

Technical & manufacturing  
follow-up, design to cost

## Profile

Experienced product and process engineer, fuel cell specialist

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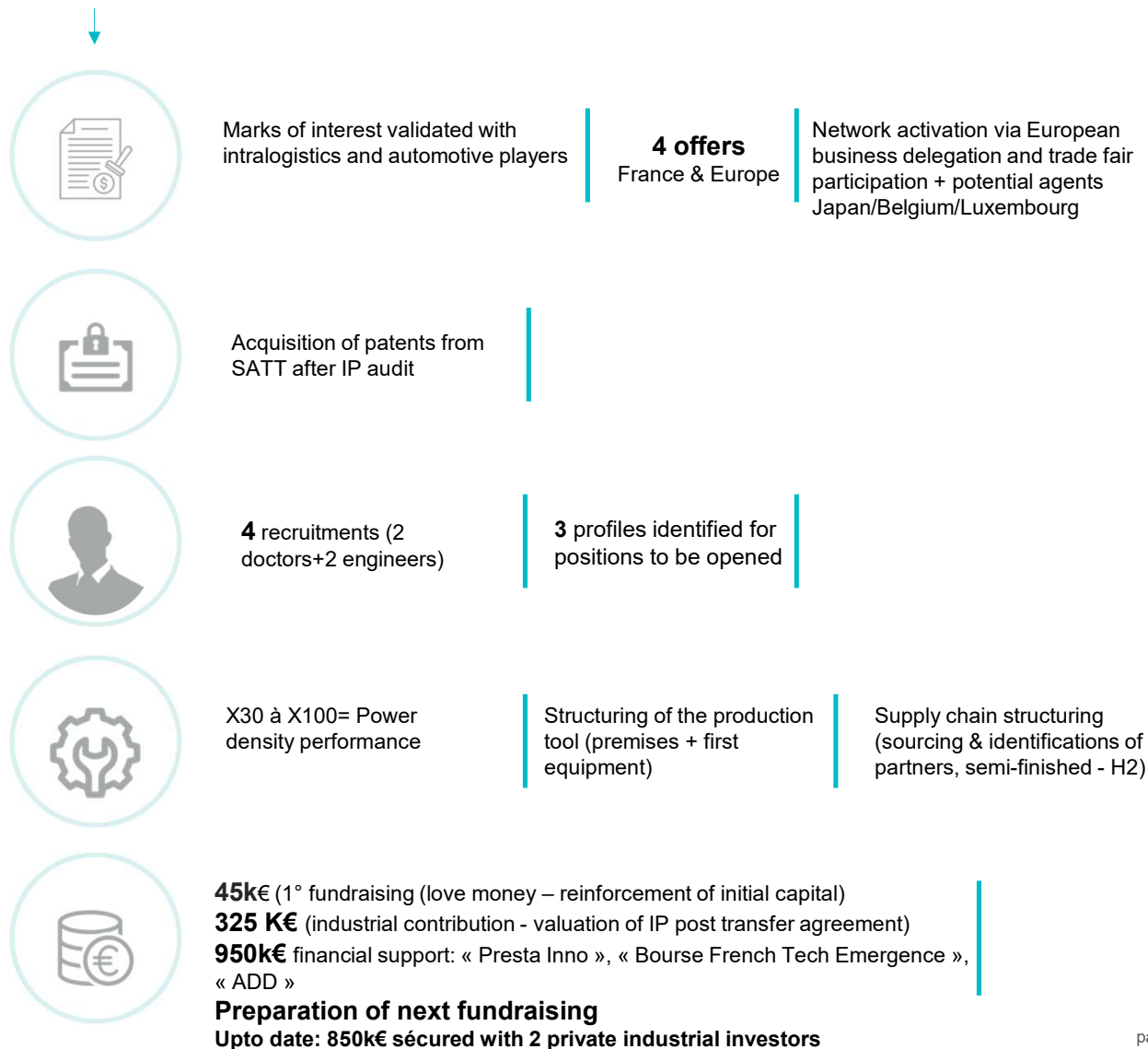


PART 3

# History

A first execution since March 2022 to leave the laboratory state and move towards industrialisation

SINCE MARCH 2022





PART 4

# Strategy : MARKET

## North America

2020 - 2030



## Europe

2020 - 2030



## Asia

2020 - 2030



## HYDROGEN DEPLOYMENTS 2020 vs 2030 OUTLOOK

### North America

	2020	2030
Electrolysis, MW	9	NA
HRS, # (operational)	66	4,300
FCEVs	7,800	~3.7 million
Commercial Vehicles	32	300,000
FC CHP (MW)	240	NA

### Europe

	2020	2030
Electrolysis, MW	84	>10,000
HRS, # (operational)	170	3,700
FCEVs	~1,300	~4.2 million
Commercial Vehicles	91	~45,000
FC CHP (MW)	NA	NA

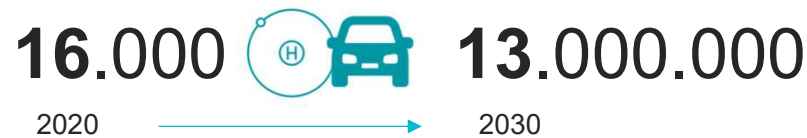
### Global

	2020	2030
Electrolysis, MW	134	NA
HRS, # (operational)	407	>10,000
FCEVs	~16,000	~13 million
Commercial Vehicles	~1,600	1 million
FC CHP (MW)	~500	NA

### Asia

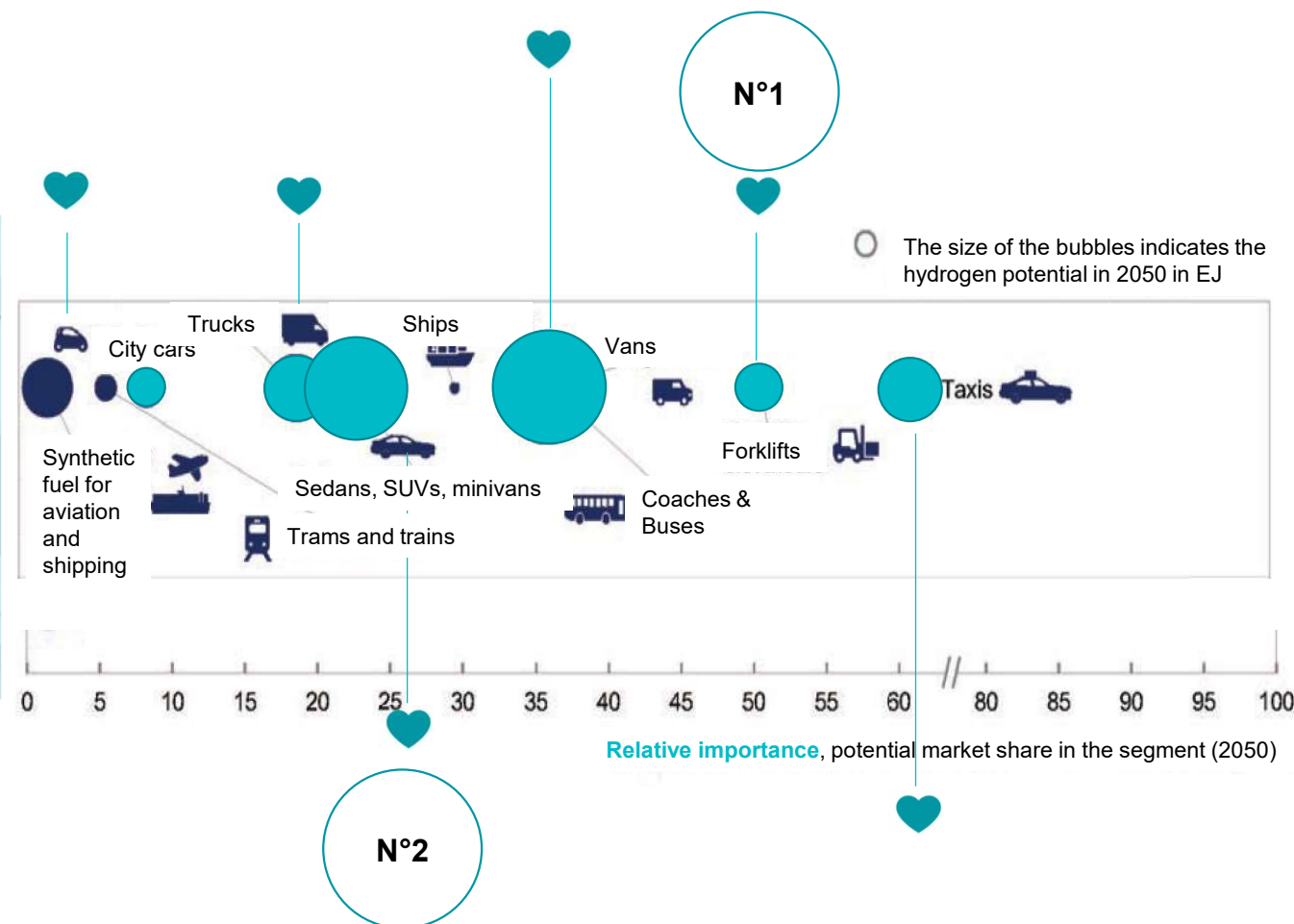
	2020	2030
Electrolysis, MW	30	NA
HRS, # (operational)	163	2,560
FCEVs	~6,300	~5.1 million
Commercial Vehicles	~1,500	~650,000
FC CHP (MW)	~200	NA

Note: HRS = Hydrogen Refueling Station, FC CHP = Fuel Cell Combined Heat and Power  
Source: Hydrogen Council, based on input from IEA, H2Stations.org, Web, and government targets



PART 4
















# Strategy : SEGMENTATION



PART 4

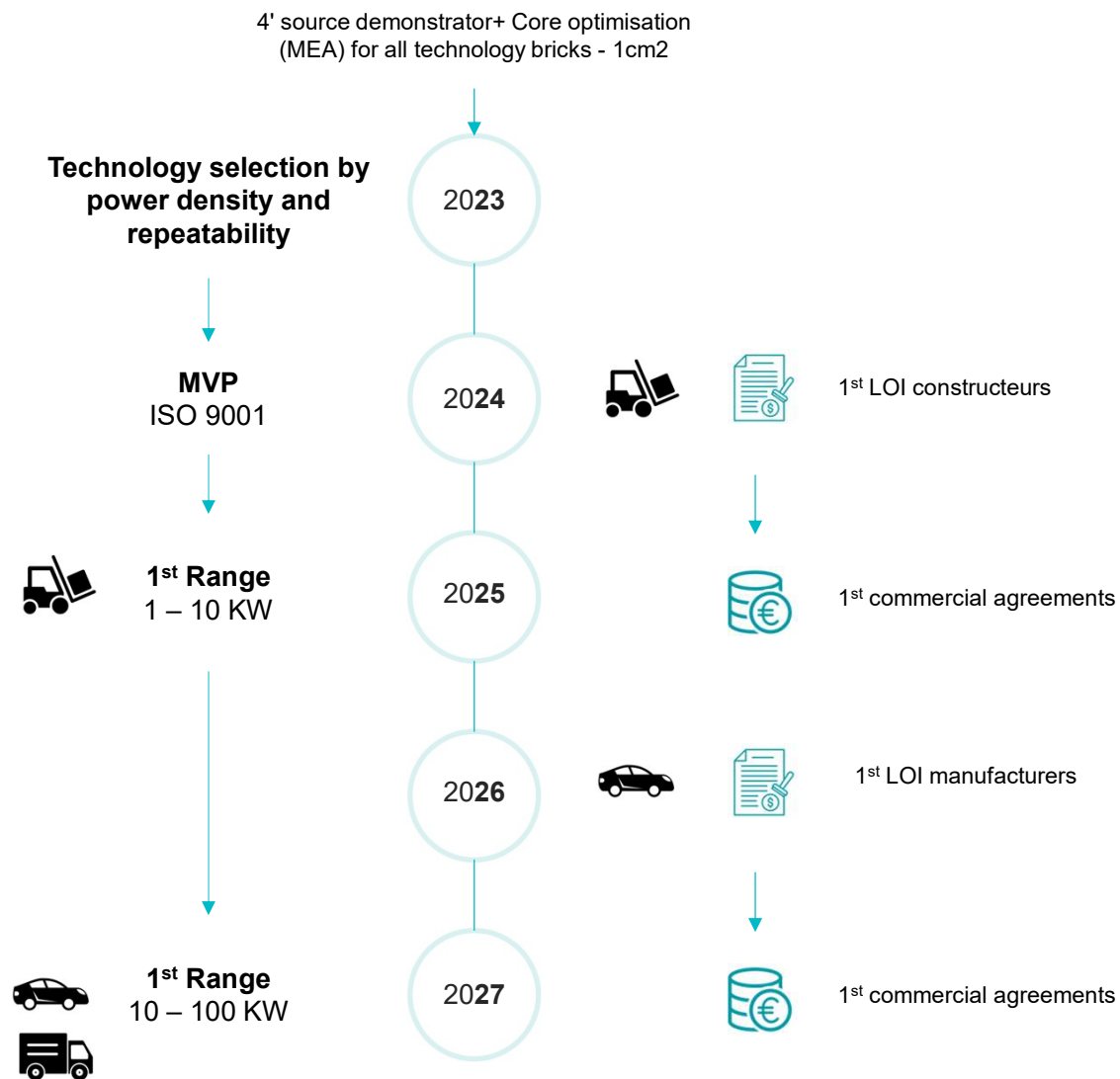
# Solution / ORIGINALITY

CHLYNN's disruptive technology approach creates 3 major competitive advantages to position the company as a game changer and future industry leader.

Competitors			
	 	  	
Technology	SOFC, PCFC, MCFC, PAFC, DMFC, AFC	PEMFC	SOLID ANIONIC
Ease of use	Liquid electrolyte, high temperature, toxicity (methanol) 	Solid Low T°C 	Solid Low T°C 
Availability	Depending on techno. 	Platinum Membrane: Nafion 	Nickel Multi membranes 
Integrated Source	No 	No 	Yes 
VAST MAJORITY OF FUELCELLS			

PART 4

# Strategy ROADMAP







## CONTACT

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