



Realtà e prospettive per la generazione e l'utilizzo dell'idrogeno

27 novembre 2020

**Soluzioni per la produzione di idrogeno da
elettrolisi alcalina dedicate ad industria e mobilità**

In collaborazione con:



Regione Toscana



McPhy

Driving
clean energy
forward



Marco LUCCIOLI

McPhy Energy Italia srl

McPhy - A Scalable European Team, with Global Reach

| Industrial Footprint

20 to 30
stations p.a.

< *Production capacity per annum* >

100 to 300
MW p.a.

FRANCE - Grenoble

Engineering & Manufacturing

Refueling stations manufacturing
and assembly, unique innovation
platform and test bench



GERMANY - Wildau

Engineering

Engineering development and EPC
for multi-MW electrolysis units

ITALY - San Miniato

Engineering & Manufacturing

Stack manufacturing,
electrolyzers assembly,
small electrolyzers engineering



WORLDWIDE

Sales & Services

Global reach
Backed by our technological & industrial
partnership: EDF / Hynamics, De Nora...



100+ PEOPLE

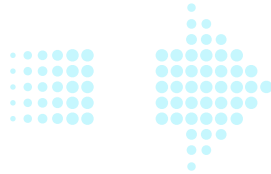
McPhy Covers all H₂ Market Segments

| Technologies & Markets



Electrolyzers

- Pressurized Alkaline (30 bar)
- Capacity to integrate PEM
- 1MW high current density stack
- 44 MW installed base⁽¹⁾
- **Already in multi-MW industrial market**



Refueling Stations

- Full range covered, from 20 to 800 kg / day, 350bar, 700bar, Dual Pressure
- 35 HRS installed base⁽¹⁾
- Patented Augmented McFilling (> 2 tons / day)
- **Ready for very large scale**

Note: (1) [03 August 2020] References are already operational, being installed or under development | Among them: 4 MW ELY and 2 HRS are conditional part of the ZEV framework contract signed in June 2020

INDUSTRY THE “SCALE-UP DRIVER”



- “Grey” H₂ production for industry generates **2% of world emissions**
- Key applications are **Refineries, Ammonia, Methanol and DRI**
- **Large capacity** electrolyzers (> 100MW) are required, allowing cost-out through scale economies

MOBILITY THE “MARKET ENABLER”



- H₂ is best solution for **heavy mobility** decarbonization (buses, trucks, trains, boats)
- Large stations (> 200 kg/day) require **ELY/HRS integration**
- Mobility is also a way to grow public awareness and H₂ acceptance

ENERGY THE “MEDIUM-LONG TERM GROWTH RELAY”



- Growing **intermittent renewables** require energy storage for surpluses
- H₂ produced can be reused to generate electricity or to be injected in gas networks (H₂ or synthetic CH₄)

McPhy Offers a Cutting-Edge, Modularized, Scalable Equipment for the Whole Value-Chain

Invest in
TECHNOLOGY



ELECTROLYZERS



SMALL

PIEL

0.4 to 10 Nm³/h (1 to 8 bar)

McLyzer

10 to 20 Nm³/h (30 bar)

LARGE

McLyzer

100 to 800 Nm³/h (30 bar)

AUGMENTED

**Augmented
McLyzer**

Multi MW, GW



STATIONS



Starter Kit

McFilling 20 kg (350 bar)

McFilling

350 bar: 200 to 1000 + kg per day

700 bar: 200 to 800 kg per day

Dual Pressure (350 & 700 bar):

200 to 800 kg per day

**Augmented
McFilling**

Multi-ton designs

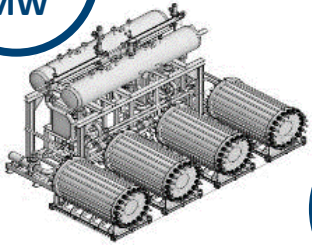
SERVICES



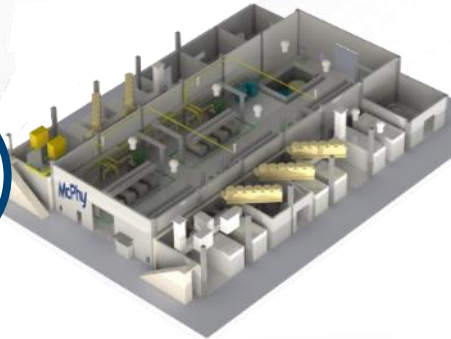
Supervision and remote control, preventive maintenance, training of your teams, etc.

Electrolyzers Answer to Large-Scale Industrial Needs Through Modular Approach

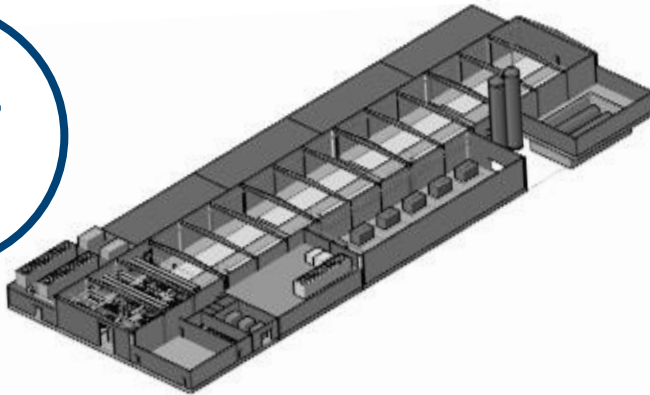
4
MW



20
MW



100+
MW



| Augmented McLyzer

High current density

Flexibility and fast response time

High efficiency: $< 4,9 \text{ kWh} / \text{Nm}^3$

High-pressure: 30 bar

Best TCO in its segment

Compact footprint

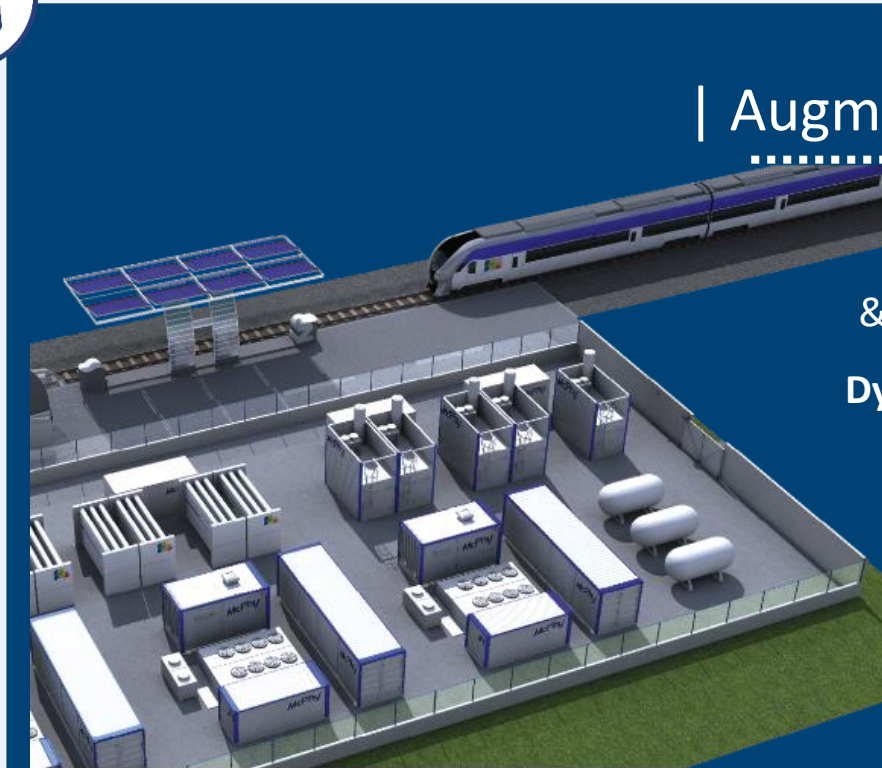
Highest quality & safety standards

Selected by leading industrial players

Refueling Stations are Ready for High Volumes for Heavy Mobility



- “Plug and Play” technology
- Wide range to best suit our customer needs
- **Modularity:** the “500-350/700” model is modularized
=> as of 200 and up to 800 kg
- 96% **Availability**
- IR connector: **350 – 700 bar compliance**
- On-site **electrolysis**



| Augmented McFilling

Proprietary
& patented architecture

Dynamic reconfiguration

Increased **availability**
and **flexibility**

Optimized
energy efficiency

Optimized **investment**
and **operating costs**



SMT AG – Lens Béthune

| First H₂ station + ELY for public transport in France

200 kg/day

0.5 MW

Build up strong
REFERENCES



Fleet of 6 buses powered by a 200 kg/day station
connected to a 0.5 MW electrolysis unit

Design: Compression redundancy,
two distribution units



Houdain, France | Commissioning: 2019

Scale-Up is a Must-Have to Unlock Competitiveness

1

Zero-carbon hydrogen competitiveness depends on three critical drivers

1 ECONOMIES OF SCALE



2 INCREASING NUMBER OF BIGGER PROJECTS

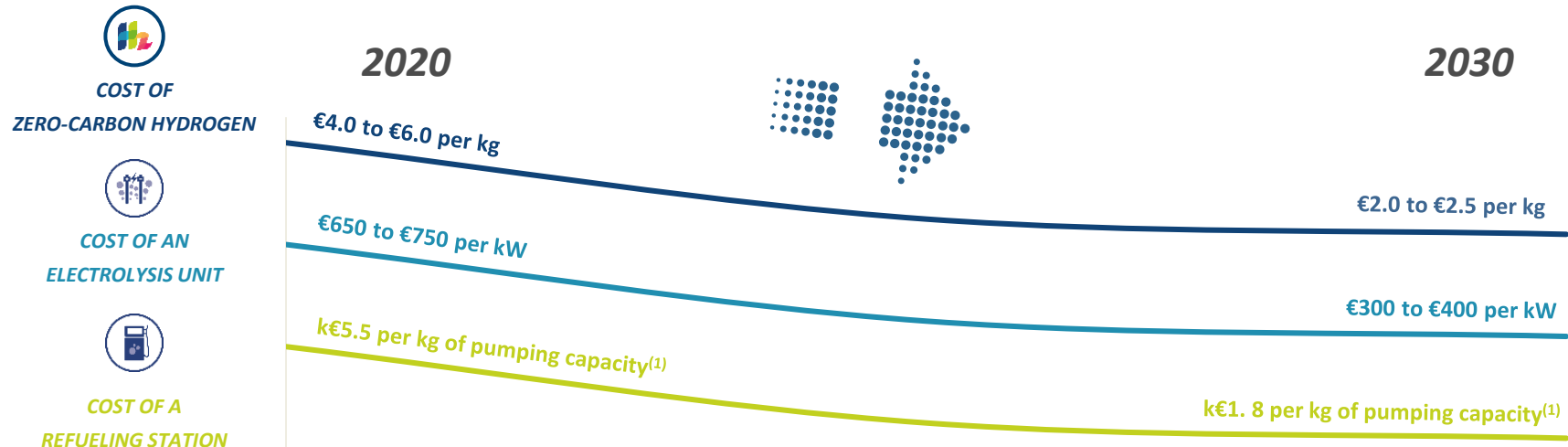


3 TECHNOLOGY UPGRADE



2

The cost of zero-carbon hydrogen is falling off



Note: (1) "large station," c.1 ton / day
Source: Hydrogen Council Study

Thanks for your time !

