Presentation CIFE – Club de Nice

MANUFA

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FZERO-CARBON HYDROGEN

DESIGNER AND

FOR THE PRODU

2 Décembre 2020

^{BY} McPhy

McPhy at a Glance | Driving clean energy forward



McPhy

McPhy's Ambition is to Be a Worldwide Leader in Zero-Carbon Hydrogen

Accelerate transition & scale-up to increase the competitiveness of zero- carbon hydrogen

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Partner with our customers Strengthen our leadership position Cover the whole value-chain

McPhy 13

Born from Innovation, Driven by Ambition

| Major Step Changes



McPhy Covers all H₂ Market Segments

A fit-for purpose offer, ideally positioned to capture the market opportunities

Technologies & Markets



Pressurized Alkaline 30 bar

- Capacity to integrate PEM
- 1MW high-density stack
- 44 MW installed base⁽¹⁾
- Already in multi-MW industrial market



Refueling Stations

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

INDUSTRY THE "SCALE-UP DRIVER"

- "Grey" $\rm H_2$ production for industry generates 2% of world emissions
- Key applications are Refineries, Ammonia, Methanol and DRI
- Large capacity electrolyzers (> 100MW) are required, allowing costout through economies of scale

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 the way to grow public awareness and acceptance on $\rm H_2$

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)

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

A Scalable European Team, with Global Reach | Industrial Footprint



Strategic Investors & Partners

- €180m capital raised in October 2020
- Historical strategic investors re-investing and remaining main shareholders
 - EDF
 - BPI
- 2 new strategic investors to accelerate industrial scale-up
 - Chart Industries
 - Technip Energies



A game changer for McPhy

Scale-Up Strategy

Industrial scale-up strategy relying on 4 pillars | Meet customer needs & lower costs



- Ensure state-of-the-art safety of the systems
- Maintain leadership in electrolyzers and HRS
- Increase bankability of value proposition through emblematic references
- Grow capacities to achieve economies of scale
- Achieve cost out roadmap

- Professionalize organization structure and processes
- Hire key talents and capitalize on them

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Electrolyzers Answers to Large-Scale Industrial Needs Through Modular Approach





Augmented McLyzer

High current density Flexibility and fast response time High efficiency: < 4,9 kWh / Nm³ High-pressure: **30 bar Best TCO in its segment Compact footprint Highest quality & safety standards** Selected by leading industrial players

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Refueling Stations are Ready for High Volumes for Heavy Mobility



• "Plug and Play" technology

- Wide range to best suit our customer needs
- Modularity: f.e., 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

McPhy is Building Key Market References in Europe Installed Base 44 MW 35 stations

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Build up strong REFERENCES

ZERO-CARBON HYDROGEN

- Audit E-GAS | Capacity: 6.0 MW
- B Prenzlau | Capacity: 0.5 MW

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- G H₂Ber | Capacity: 0.5 MW
 Sinopec⁽¹⁾ | Capacity: 4.0 MW
- D EnergieDienst | Capacity: 1.0 MW
- **E** Jupiter 1000 | Capacity: 1.0 MW
- 🕞 RAG | Capacity: 0.5 MW
- G Engie & SMT-AG | Capacity: 0.5 MW
- H Apex | Capacity: 2.0 MW
- **Confidential |** Capacity: 1.0 MW
- **1** Nouryon & Gasunie | Capacity: 20.0 MW
- K ZEV⁽³⁾ Overall capacity: 4.0 MW
- **Confidential** | 1.0 MW
- **Rougeot Energie |** Capacity: 1.0 MW
- **Confidential** | 1.0 MW

ZERO-EMISSION MOBILITY

- A Symbio Grenoble | Kg/Day: 5
- B City of Paris | Kg/Day: 20



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- S ZEV (Hympulsion) x5⁽³⁾ | Kg/Day: 400-800
- **Confidential |** Kg/Day: 200
- Rougeot Energie x2 | Kg/Day : 400
- Confidential x2 | Kg/Day: confid.

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| First Power-to-Gas project at a MW-scale in France











| The largest zero-carbon H₂ production unit in Europe







Nouryon gasume (BioMCN DENORA

1 ----



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Zero Emission Valley (Hympulsion)

AcPhy

The largest H₂ mobility deployment project in France



One of the most ambitious zero-emission mobility project in Europe

Consortium led by McPhy delivering 14 stations and 4 MW electrolyzer in AURA region

McPhy technologies (framework agreement): 5 HRS 200 kg / day + 4 MW electrolysis

In addition, McPhy has equipped the 1st station of the ZEV project (Chambéry) with a 40kg/day electrolyzer.







Auvergne-Rhône-Alpes Region, France | Contract: June 2020



McPhy













SMT AG – Lens Béthune

| First H₂ station + ELY for public transport in France









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Growing capacities to generate economies of scale | Electrolyzer GigaFactory





Up to 100 MW per annum

San Miniato, Italy

A premier industrial infrastructure

1 shift activity



Up to 300 MW per annum

San Miniato, Italy

Increased automation, lean manufacturing and move to 3 shifts

Factory expendable up to 600 MW (new building to be built)



>2023

2021-2023

2020



ENGLE SMT AG



Driving clean energy forward

Follow-us !





mcphy.com

Alkaline and PEM will Jointly Support Market Growth





Alkaline



PEM

 200-year old technology that has proven long term resilience and stability

- Avoidance of precious materials enables lower Capex than PEM
- Alkaline is more adapted to large scale projects
- Limited track record of long term reliability
- Shorter lifetime than Alkaline
- Ability to produce highly compressed hydrogen
- More flexible than Alkaline and can be quickly switched on and off without any need for preheating

1	ALKALINE	2 PEM
Maturity of technology	+++	+
Performance	++	+
Capex requirement (USD/kW _e)	500 - 1,400	1,100 - 1,800
Power consumption ⁽¹⁾ (Kwh/kg)	55	58
Stack lifetime (hours)	> 80,000	> 40,000
Operating pressure (bar)	1-30	30-80
Load range (%, relative to nominal load)	10-110	0-160
Footprint ⁽¹⁾ (m ² /MW _e)	95 (atmospheric) 45 (pressurized)	44 (atmospheric) 40 (pressurized)
Electrical efficiency (%, LHV)	63 – 70	56 - 60

Today, it is not possible to say whether one of these two technologies will take the lead over the other The scientific and industrial consensus rather pleads for cohabitation over the next decade

Shareholders Structure

| Capital increase of €180 m in October 2020



Complementary & strong shareholder structure, supporting McPhy for long-term growth