



Cluster Energie Stockage
Nouvelle Aquitaine

Webinaire H2 maritime et fluvial

MARCH 2021



hydrogen
power
company

2 business units



HDF Energy is an Independant Power Producer (IPP) and develops Multi MW power plants called Renewstable®.

The HDF Industry’s fuel cell plays a key role in the energy transition by producing clean electricity and rejecting only water steam.

- DEVELOP**
Market selection / Sizing feasibility study / Permitting
- FINANCE**
SPV Building and financing / Equity investment
- BUILD**
Supervising the construction and the commissioning
- OPERATE**
Infrastructure operation and maintenance (20+ years)

- DESIGN**
Design in partnership with Ballard the Fuel Cell system based on stacks
- PRODUCTION**
Produce with local suppliers and sub-contractors to reduce the costs and increase the reliability
- INSTALLATION**
Install and commission utility-scale Fuel Cells in global projects
- MAINTENANCE**
Maintain the complete operation during 20 years

HDF Energy’s Renewstable® turnkey Multi-MW power plant delivers competitive, firm and stable electricity to grid and micro grids operators.

HDF Industry is a French manufacturer of containerized multi MW hydrogen fuel cells. The fuel cells are assembled in the HDF factory in Bordeaux.

TO ADDRESS AN INDUSTRIAL BOTTLENECK, HDF ENERGY HAS DEVELOPED A SPECIFIC EXPERTISE IN UTILITY-SCALE CAPACITY STATIONARY FUEL CELL SYSTEMS

UNIQUE KNOW-HOW IN THE DEVELOPMENT OF MULTI-MW FUEL CELLS TO ACCESS THE MISSING TECHNOLOGICAL BRICK IN HYDROGEN POWER

HYDROGEN POWER INDUSTRIAL BOTTLENECK



Only demonstrators of utility-scale capacity fuel cells available on the market



Need for industrialized fuel cells



Need for highly reliable fuel cells to meet grid operators' requirements



Need for long-life expectancy fuel cells

DEVELOP AND MANUFACTURE A MULTI-MW BANKABLE FUEL CELL



Proton exchange membrane (PEM) technology



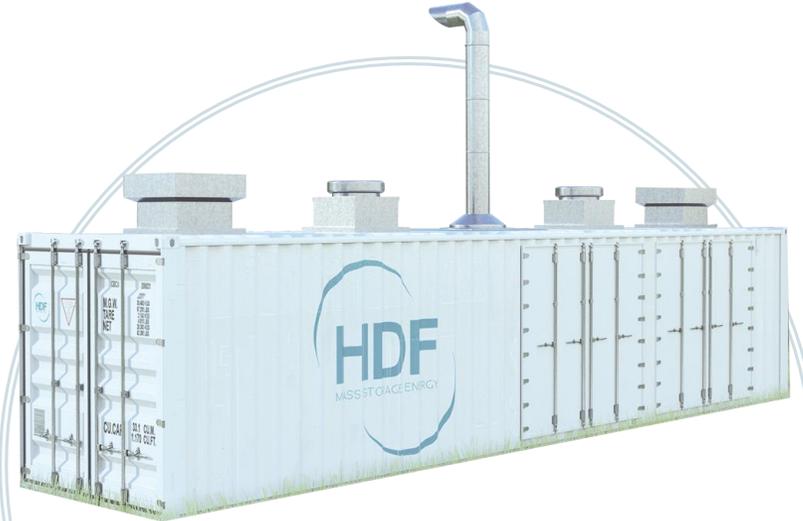
Scalable technology applicable to industrialization



To be assembled in Blanquefort (Bordeaux), France



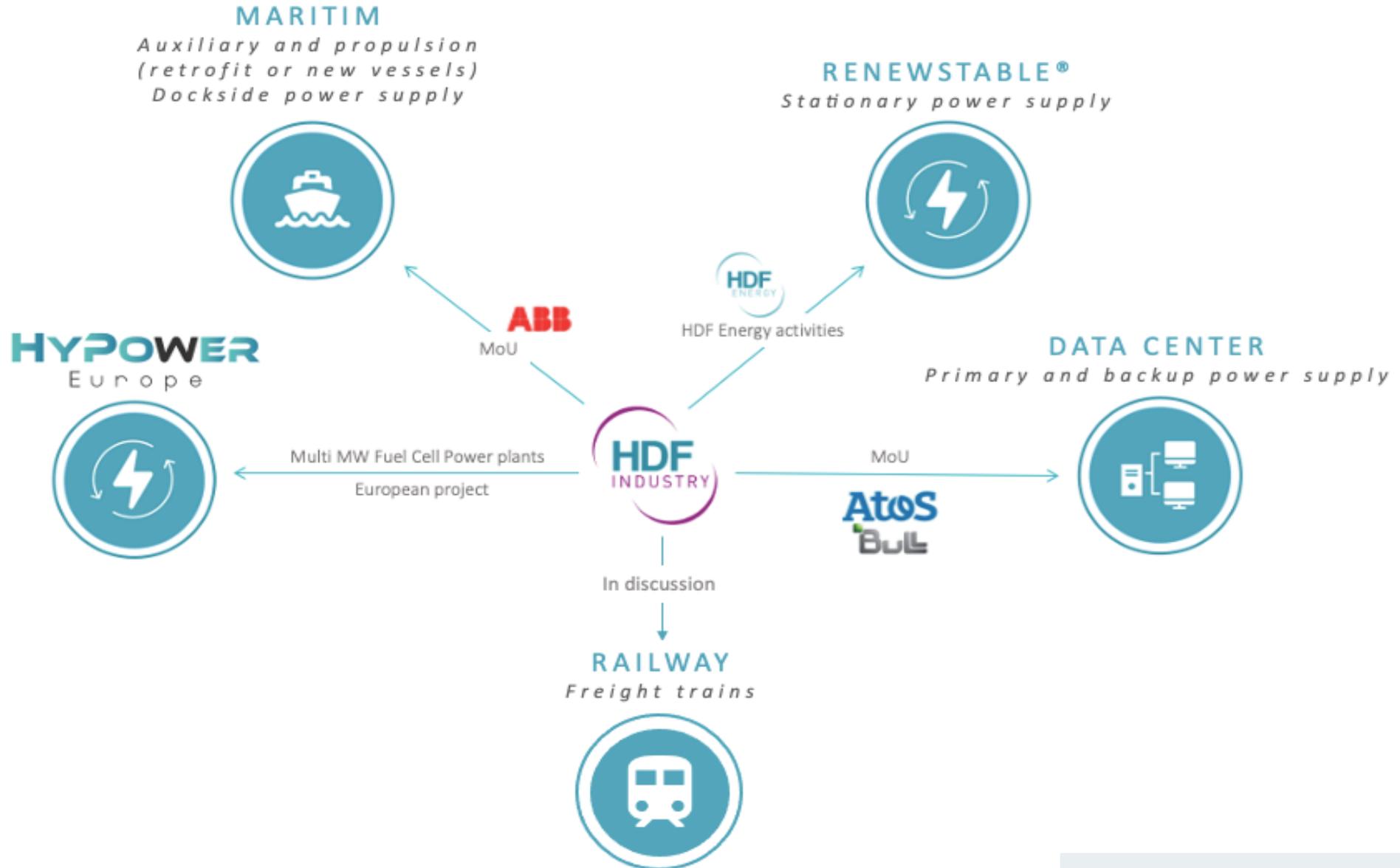
20-25 years life expectancy and highly reliable



Same stacks used as the ones in the mobility industry and will thus benefit from strong economies of scale



1 PRODUCT FOR SEVERAL MARKET, USE MW SCALE SYSTEM FOR DIFFERENT APPLICATION WITH SYNERGY IN DEVELOPMENT



INCREASING PRESSURE TO DECARBONIZE THE MARITIME INDUSTRY



Global maritime sector is highly polluting
Maritime transport emits around 940 million tons of CO2 annually

940m



In 2018, the International Maritime Organization agreed to reduce GHG emissions by at least 50% by 2050⁽¹⁾

50%



Objective to reach zero-emission fuels for shipping using hydrogen fuel cell systems

0%



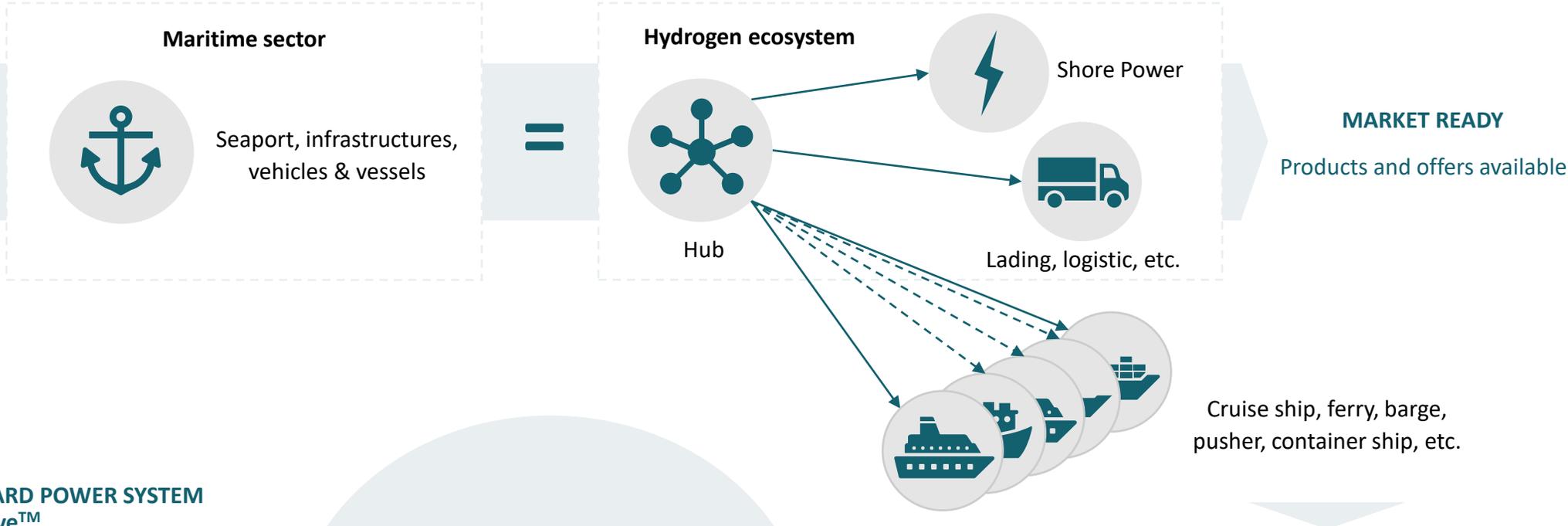
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- a Industrialization of a + 1 MW fuel cell for marine applications
- b Enable the transition towards hydrogen-powered cruise ships
- c Projects under discussion in 

HDF ENERGY AND ABB WILL JOINTLY DEVELOP THE NEXT GENERATION OF CRUISE SHIPS

MARITIME SECTOR IS A KEY MARKET TO DEVELOP HYDROGEN TECHNOLOGY



BALLARD POWER SYSTEM FCwave™
200kW module
Design for Marine
Scalable (up to MWs)
Expertise of H2 mobility key player

HDF help maritime stakeholders to implement **first kind projects** by integrating Ballard Modules

Needs demonstrators in operation conditions



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