

PRESS RELEASE



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HDF and ABB brings Ballard's fuel cell PEM technology a step closer to powering large ships

HDF signs Memorandum of Understanding (MOU) with ABB to jointly manufacture megawatt-scale fuel cell systems capable of powering ocean-going vessels

The MoU between HDF and ABB envisions close collaboration on the assembly and production of the fuel cell power plant for marine applications.

HDF and ABB intend to optimize fuel cell manufacturing capabilities to produce a megawatt-scale power plant for marine vessels. The new system will be based on the megawatt-scale fuel cell, resulting from an existing collaboration announced on June 27, 2018 between ABB and Ballard Power Systems, the leading global provider of proton exchange membrane (PEM) fuel cell solutions. It will be manufactured at HDF Factory's facility in Bordeaux, France.

Fuel cells turn the chemical energy from hydrogen into electricity through an electrochemical reaction. With the use of renewables to produce the hydrogen, the entire energy chain can be clean. This fuel cell is a strategic component of future ship power and electric propulsion systems.

"HDF is very excited to cooperate with ABB to assemble and produce megawatt-scale fuel cell systems for the marine market based on Ballard technology," said Damien Havard, CEO of HDF.

"With the ever-increasing demand for solutions that enable sustainable, responsible shipping, we are confident that fuel cells will play an important role in helping the marine industry meet CO2 reduction targets," said Juha Koskela, Managing Director, ABB Marine & Ports. "Signing the MoU with HDF brings us a step closer to making this technology available for powering ocean-going vessels."

With shipping responsible for about 2.5 percent of the world's total greenhouse gas emissions, there is an increased pressure for the maritime industry to transition to more sustainable power sources. The International Maritime Organization, a United Nations agency responsible for regulating shipping, has set a global target to cut annual emissions by at least 50 percent by 2050 from 2008 levels.

Among alternative emissions-free technologies, ABB is already well advanced in collaborative development of fuel cell systems for ships. Fuel cells are widely considered as one of the most promising solutions for reducing harmful pollutants. Already today, this zero-emission technology is capable of powering ships sailing short distances, as well as supporting auxiliary energy requirements of larger vessels.

About Hydrogène de France: A specialist in hydrogen technologies, HDF has two divisions. HDF Energy, developer of Renewstable® power plants, which capture intermittent renewable energy and store it massively in the form of hydrogen to produce stable, 24-hour electricity that can be controlled like a thermal power plant at a competitive price. In 2019, HDF Industry division has entered into an agreement with Ballard to manufacture 1MW+ Fuel Cells in France using the Ballard FC stacks and technology. www.hdf-industry.com

About ABB (ABBN: SIX Swiss Ex) is a technology leader that is driving the digital transformation of industries. With a history of innovation spanning more than 130 years, ABB has four, customer-focused, globally leading businesses: Electrification, Industrial Automation, Motion, and Robotics & Discrete Automation, supported by the ABB Ability™ digital platform. ABB's Power Grids business will be divested to Hitachi in 2020. ABB operates in more than 100 countries with about 144,000 employees. www.abb.com

- HDF Energy website: www.hdf-energy.com
- HDF Industry website: www.hdf-industry.com
- Contact HDF Energy
+ 33 (0)5 56 77 11 11 / communication@hdf-energy.com