Communiqué - Energy Observer Developments (EODev) introduces its REXH2 onboard HYNOVA Yachts's first prototype

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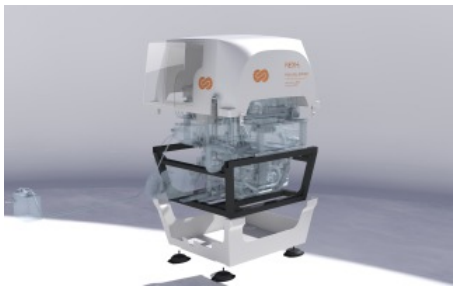

Energy Observer Developments (EODev) will present at the next Cannes Yachting Festival from September 8 to 13, 2020 its REXH2 (Range Extender Hydrogen) solution, integrated for the first time in a vessel other than Energy Observer: a 40-foot open boat developed with HYNOVA Yachts, the first production electro-hydrogen tender to be launched on the market.

The REXH2 is a modular solution developed around Toyota's latest generation fuel cell, making silent maritime and river mobility without emissions of CO2 and fine particles possible. EODev's tailor-made application ensures the propulsion and/or operation of on-board systems using hydrogen. It has been tested in real conditions aboard Energy Observer over more than 7,000 nautical miles.

The HYNOVA 40 is a 12m boat designed by Chloé Zaied, founder and managing director of HYNOVA Yachts, which can be used as a day-boat or superyacht tender. With a capacity of 12 passengers, it is the first pleasure boat equipped with the REXH2, a zero emissions, silent and hydrogen-electric hybrid technology intended to be manufactured in series.

A solution that adapts to all uses

The solution developed by EODev to meet the specifications of the HYNOVA 40 consists of the latest generation Toyota fuel cell, the T-Module, which can supply up to 80 kW, supplemented by three 44kW LiFePO (Lithium-Iron-Phospate) batteries designed by EVE Systems and approved for maritime use, and two BorgWarner electric motors developing a power of 184 kW each (approximately 2 x 250 HP in diesel equivalent).

The set has been designed to allow the boat, which weighs around 9 tonnes, to reach 22 knots at maximum speed and have a working speed of 12 knots. The operating speed limit with the fuel cell alone is 8 knots, the boat being able to cover up to 69 miles at 6 knots in full autonomy, combining the performance of the cell and batteries.

For Jérémie Lagarrigue, Managing Director, EODev: "*The whole team did a wonderful job, not only to design this boat but also to bring all the partners onboard for this challenge. This prototype and its REXH2 are the precursors of tomorrow's pleasure boating, paving the way for the yachting world to become one of the main players in the energy transition, for maritime mobility to be in harmony with the marine environment.*"

Hydrogen, the clean solution for maritime and river mobility

In addition to its very high energy density, hydrogen has two key benefits: it is the most common molecule in the universe, and its combustion only releases water, oxygen and heat, which are easily reusable.

The electricity produced onboard the HYNOVA 40 by the REXH2 fuel cell is used directly to supply energy for the boat's propulsion chain via an electric motor, and is also stored in batteries which can make it available for propulsion and on-board systems, as needed. The hydrogen gas that feeds the system is stored in compressed form, at 350 bar, in specially designed tanks placed in the body of the boat, on a part located outside the structure of the vessel so as to benefit from a direct air intake. The HYNOVA 40 will thus have, in this first configuration, three tanks with a total capacity of 22.5kg of hydrogen.

The advantage of the hydrogen-electric combination in comparison with a 100% electric system, in addition to a significant saving in weight, and therefore in energy consumption, is to make it possible to manage the needs according to the needs. using the continuous power of the fuel cell in “cruise” mode, while being able to instantly use battery power during sporadic peak power needs.

The entire system is managed by an automated Power Management System specifically developed by EODev, which calculates the remaining range according to the usage profile and the expected average speed, like in a car.

Make clean technologies accessible to the largest number of users

The hydrogen solutions developed by EODev have many advantages over traditional systems, such as diesel, but also in comparison with "all electric" solutions. In addition to environmental objectives, without emissions or noise pollution, the sizing of a REXH2 set allows total modularity to optimize the response to energy needs, with reduced size and weight, and rapid refueling — the time it takes to refill of a full tank of gasoline. The lack of moving parts in the fuel cell makes maintenance simplified and predictive, and allowed for at least 10,000 hours of continuous use. The REXH2 being a "plug and play" solution, it is not necessary to be an engineer specializing in hydrogen to operate the boat. As in modern cars, the system is "connected" and the data of all components is traced, saved and archived remotely.

The development of zero emissions and zero noise technologies for private maritime mobility is a great opportunity to contribute to the growth of the hydrogen society. The consumption of several hundred kilograms of hydrogen per day will boost the multiplication of points of distribution and consumption of hydrogen, which in turn will help drive wider use of such solutions by a growing number of people.

Note: During the Cannes Yachting Festival, only the boat and its on-board technologies will be visible. The demonstrations on the water will take place at a later date, the media being able to take advantage of the Cannes Yachting Festival to visit us and indicate their interest in participating in such a session.

About the REXH2

With a footprint of barely one cubic meter and a lightweight of 300 kilos (excluding chassis), the REXH2 equipped with the latest generation of Toyota fuel cell is, today, the most compact and efficient Range Extender on the market. The R&D carried out by the EODev and Toyota teams has made it possible to adapt perfectly to the extreme conditions of the marine environment, to achieve powers of 100 kW per unit, and up to 1 MW when fitted in series. It is this flexibility in the implementation that makes the REXH2 the ideal option for tailor-made hydrogen solutions for propulsion and the supply of carbon-free energy at sea.

About Energy Observer Developments

Energy Observer Developments (EODev) aims to speed up the energy transition by providing solutions at affordable costs. Based on the feedback gotten from the 30,000 nautical miles traveled by Energy Observer, EODev has thus positioned itself as a real incubator, for a smart and optimized use of energy "mixes" combining different renewable energies, and to promote the emergence of eco-responsible industrial products. Totally clean, these systems also optimize the use of biosourced materials with minimal carbon impact.