



Company Registration Number: 196300098Z

Towards a Decarbonised Future: Sembcorp Marine, Shell and Penguin International Sign MoU for Hydrogen-powered Vessel

Project to explore viability of hydrogen as a marine fuel, potentially paving the way for emission-free shipping in the future

Highlights Sembcorp Marine's commitment to providing innovative and sustainable solutions

Singapore, 21 April 2021 – Sembcorp Marine, Shell and Penguin International today signed a Memorandum of Understanding (MoU) to jointly develop hydrogen as a marine fuel - a first for Singapore as it champions decarbonisation in the marine industry.

The collaboration will see Sembcorp Marine designing, fabricating and integrating a hydrogen fuel cell system onto a roll-on/roll-off vessel. Shell will supply the hydrogen fuel and is the charterer of the trial vessel. The RoRo vessel is owned and operated by Penguin International.

As the world pivots towards cleaner and greener energy sources, interest in hydrogen as an alternative fuel has increased in recent years. The lightest element in the Periodic Table and most abundant chemical substance in the universe, hydrogen produces zero emission when used as a power source, making it an ideal and sustainable fuel. However, while widely produced, hydrogen is still untested as a marine fuel due to the low technological maturity for hydrogen-based engines.

This project will be a pilot to test hydrogen fuel cell and also the first step in establishing the feasibility of hydrogen as a marine fuel. If successful, the project not only paves the way for zero-emission shipping, but also reinforces Singapore's reputation as a world class marine and offshore engineering centre.

Sembcorp Marine President and CEO, Mr Wong Weng Sun, said: "Sembcorp Marine is delighted to partner Shell on this project. It holds exciting possibilities for decarbonisation in the marine and energy industry. Hydrogen fuel cells have the potential to revolutionise shipping and transportation, enabling the industry to become greener with the ambition to achieve the 2050 target set by the International Maritime Organization to reduce total greenhouse gas emissions from international shipping by at least 50%."

"This trial is an important step in demonstrating the applicability of hydrogen and fuel cells on ships," said Nick Potter, General Manager of Shell Shipping and Maritime, Asia Pacific & Middle East. "We see fuel cells and hydrogen as a promising pathway for decarbonising shipping and working with partners in this way will develop our understanding of this critical technology. This trial is a testament to the thriving sector ecosystem in Singapore that makes

this possible. It is also part of our ambition to help accelerate progress towards net-zero emissions in the shipping sector, an important pillar of the Singapore economy.”

“Hydrogen is generally regarded as a new frontier in alternative fuels for shipping,” said James Tham, Managing Director of Penguin International. “This trial is significant for Singapore and for the maritime community at large. The outcome of this trial, which is based on retrofitting a RoRo which we operate for Shell, could quickly bring many ship owners to the forefront of this alternative fuel. As a Singaporean shipbuilder, owner and operator, we believe in playing an active part in decarbonisation.”

Mr Wong, who is also the Co-Chairman of the International Advisory Panel on Maritime Decarbonisation, said: “This collaboration dovetails perfectly with Sembcorp Marine’s focus on sustainability and innovation which we have embedded into our operations and product developments. Our flagship Tuas Boulevard Yard’s sustainable facilities have harnessed smart and green technologies to decrease our carbon footprint. This is how we want to continue delivering innovative and sustainable engineering solutions to the global offshore, marine and energy industries.”

Sembcorp Marine received the Sustainability Award at the Singapore International Maritime Awards 2021 earlier this week for its steadfast commitment to Sustainability, which is integrated into the Group’s business strategy and embedded into its operations.

“The Maritime and Port Authority of Singapore (MPA) welcomes this initiative on the use of hydrogen fuel cells as a cleaner source of energy. We appreciate the confidence the companies have placed on Singapore in trialling the applicability of this new technology within the Port of Singapore. This project, together with the other joint industry projects, complements efforts in Singapore to come up with commercially viable solutions to decarbonise the industry,” said Ms Quah Ley Hoon, Chief Executive, MPA.

Breaking New Frontiers, Enabling Transformation, Remaining Relevant

In addition to augmenting Sembcorp Marine’s Sustainability credentials, this latest collaboration highlights Sembcorp Marine’s technological bench strength to undertake complex and cutting-edge projects. The Group continuously boosts its capabilities by investing in human capital, making strategic acquisitions and collaborating with best-in-class partners.

Notably, the Group has embraced Industry 4.0 technologies such as additive manufacturing (or 3D printing) and the Industrial Internet of Things (IIoT). In 2019, Sembcorp Marine received certifications qualifying its 3D printing procedures for making and restoring parts used in construction and repair projects, and completed the proof of concept for applying IIoT to improve the precision of steel-plate tracking at its steel fabrication facility.

Mr Wong added: “The global transition towards cleaner, greener and renewable energy is underpinned by multiple complex social, political and economic factors. There is a push for businesses to embrace digitalisation, alternative propulsion technologies and fuels, and Industry 4.0 applications. To remain relevant, the maritime community must continuously invest in innovation and remain flexible and agile to future-proof the industry for current and future generations.”



Company representatives at the signing of the MoU on Industry Development Project on the Use of Hydrogen as a Marine Fuel (from left to right): Mr James Tham, Managing Director, Penguin International; Ms Aw Kah Peng, Chairman, Shell Companies in Singapore; and Mr Simon Kuik, Vice-President and Head of Research & Development, Sembcorp Marine

Editor's Notes

Please click [here](#) to download the high-resolution version of the above image.

About Sembcorp Marine

Sembcorp Marine provides innovative engineering solutions to the global offshore, marine and energy industries. Headquartered in Singapore, the Group has close to 60 years of track record in the design and construction of rigs, floaters, offshore platforms and specialised vessels, as well as in the repair, upgrading and conversion of different ship types. Sembcorp Marine's solutions focus on the following areas: Renewables, Process, Gas, Ocean Living and Advanced Drilling Rigs.

Sembcorp Marine's customers include major energy companies, owners of floating production units, shipping companies and cruise and ferry operators. They are supported by four commercial units: Rigs & Floaters; Repairs & Upgrades; Offshore Platforms and Specialised Shipbuilding.

Sembcorp Marine operates shipyards and other facilities in Singapore, Indonesia, the United Kingdom, Norway and Brazil.

Discover more at www.sembmarine.com.

For more information, please contact:

Ms Chua Mun Yuen
Head, Investor Relations and Corporate Communications

Tel No: +65 6971 7039

Email: munyu.chua@sembmarine.com

Mr Lin Daoyi

Manager, Corporate Communications

Tel No: +65 6971 7040

Email: daoyi.lin@sembmarine.com

This release may contain forward-looking statements that involve risks and uncertainties. Actual future performance, outcomes and results may differ materially from those expressed in forward-looking statements as a result of a number of risks, uncertainties and assumptions. Representative examples of these factors include (without limitation) general industry and economic conditions, interest rate trends, exchange rate movement, cost of capital and capital availability, competition from other companies and venues for sale and distribution of goods and services, shifts in customer demands, customers and partners, changes in operating expenses, including employee wages, benefits and training, governmental and public policy changes. The forward looking statements reflect the current views of Management on future trends and developments