



PRESS RELEASE

A scalable and sustainable proposal with hydrogen as fuel to meet IMO2050 targets

Genoa, 25th November 2021 - Class society RINA, together with technology providers ABB, Helbio (subsidiary of Metacon AB), the Liberian Registry, Wärtsilä and an Energy Major have entered in a common effort to deliver a solution with hydrogen as fuel that would exceed IMO 2050 targets for 70% reduction of carbon intensity without the need for extensive infrastructure investment, offering the shipping industry a low-carbon pathway in shorter timescales.

The difficulties and costs associated with the production, distribution and storage of hydrogen on board have challenged the interest in its direct use as fuel. By producing hydrogen on board and using affordable and readily available LNG the solution meets the very demanding IMO targets for 2050 in a much shorter time frame.

The concept is based on combining the ship's fuel (natural gas) with steam to produce hydrogen and CO₂. Hydrogen will then be used directly in internal combustion engines or fuel cells, without the need to be supplied and stored on board. The CO₂ will be liquefied by the cryogenic stream of LNG that would be used as fuel anyway and stored on board for later disposal ashore for carbon storage and use. In case of tankers, the stored CO₂ can also be used as inert gas.

The equipment necessary to meet the IMO2050 can easily be fitted on the deck of a commercial vessel in a progressive manner, at subsequent drydocks after ship's delivery. The duration of the transition will depend on how far the owner wishes to remain ahead of the competition in terms of efficiency and sustainability and exceed the regulatory requirements.

Only LNG bunkering will be required and, by progressively increasing the production of hydrogen, the consumption of fossil methane and associated methane slip will be reduced at the same rate.

This revolutionary concept will support the shipping industry's gradual transition from LNG to hydrogen, without any major transformation of technology on board a ship.

Wärtsilä and ABB will support the application of hydrogen in powering internal combustion engines and fuel cells respectively, while Helbio will provide the technology and manufacturing of

reformer. RINA and Liberian Registry will provide advice and guidance on the application of rules and regulations for novel concept alternative designs, based on Hazid/Hazop analyses, as well as specific rules for this kind of arrangement.

Figure 1: Installation of the gas reformer on an Aframax tanker

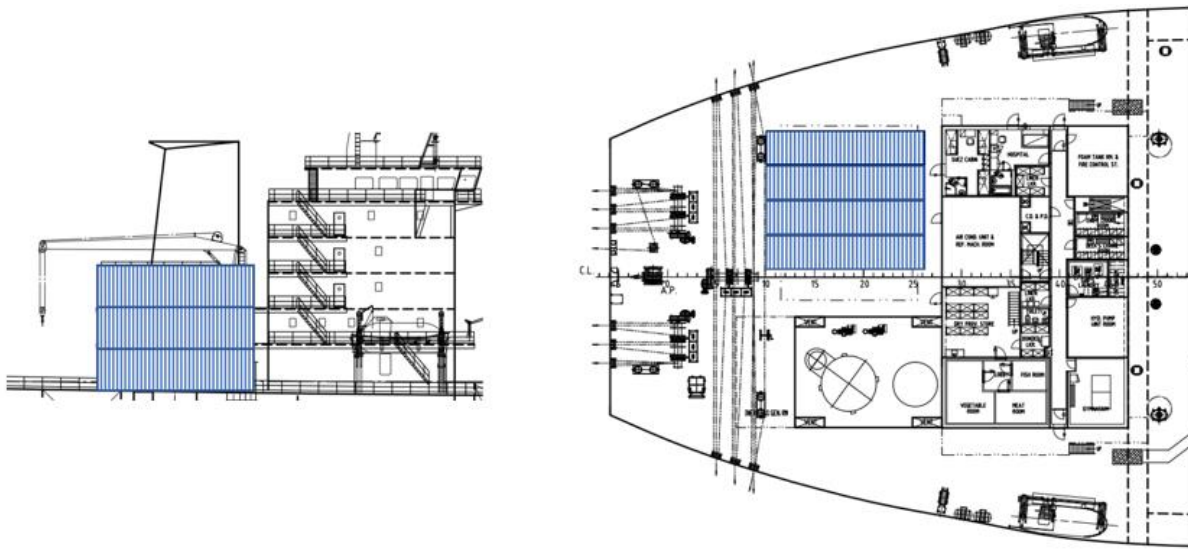


ABB (ABBN: SIX Swiss Ex) is a leading global technology company that energizes the transformation of society and industry to achieve a more productive, sustainable future. By connecting software to its electrification, robotics, automation and motion portfolio, ABB pushes the boundaries of technology to drive performance to new levels. With a history of excellence stretching back more than 130 years, ABB's success is driven by about 105,000 talented employees in over 100 countries. www.abb.com

Helbio S.A. operates in the field of hydrogen and energy production sector developing hydrogen production systems either for industrial use or integrated with fuel cells for Combined Heat and Power (CHP) production. Helbio is a subsidiary of Metacon AB (publ) an international energy technology company whose business idea is to commercialize small and large energy systems for the production of hydrogen, electricity and heat. www.helbio.com, www.metacon.se

The **Liberian Registry** has a long-established track record of combining the highest standards of safety for vessels and crews with the highest levels of responsive and innovative service to owners. Moreover, it has a well-deserved reputation for supporting international legislation designed to maintain and improve the safety and effectiveness of the shipping industry and protection of the marine environment. www.lisr.com

RINA provides a wide range of services across the Energy&Mobility, Marine, Certification, Infrastructure & Real Estate and Industry sectors. With net revenues in 2020 of 495 million Euros, over 4,000 employees and 200 offices in 70 countries worldwide, RINA is a member of key international organizations and an important contributor to the development of new legislative standards. www.rina.org

Wärtsilä is a global leader in smart technologies and complete lifecycle solutions for the marine and energy markets. By emphasizing sustainable innovation, total efficiency and data analytics, Wärtsilä maximises



the environmental and economic performance of the vessels and power plants of its customers. In 2020, Wärtsilä's net sales totalled EUR 4.6 billion with approximately 18,000 employees. The company has operations in over 200 locations in more than 70 countries around the world. Wärtsilä is listed on Nasdaq Helsinki. www.wartsila.com

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