



Press release

GTT, TotalEnergies, LMG Marin and Bureau Veritas join forces to develop a large-scale LH₂ carrier

Paris – April 27th, 2023. GTT, TotalEnergies, LMG Marin and Bureau Veritas have signed an agreement for a Joint Development Project (JDP) to develop a 150,000 m³ capacity liquid hydrogen (LH₂) carrier concept design fitted with GTT's membrane-type containment system.

Low-carbon hydrogen offers a promising solution to decarbonise hard-to-electrify industries as well as heavy-duty terrestrial mobility, long-distance aviation and maritime shipping. Hydrogen is also a solution for large-scale energy storage and could be used to generate distributable power to complement intermittent solar and wind power sources. In the future, continents such as Europe or some Asian countries may need to import hydrogen on a large scale to complement domestic production.

The ability to transport by sea very large volumes of hydrogen in liquefied form at -253°C is one of the major technological challenges to be overcome to set up a reliable, efficient and competitive global carbon-free hydrogen value chain.

The JDP partners will leverage their combined expertise and know-how to develop a large-scale LH₂ carrier concept that can be implemented on an industrial scale for the maritime transport of liquefied hydrogen.

- TotalEnergies will work on defining the vessel's specifications including operational profile;
- GTT will design the membrane containment system, considering the constraints related to liquefied hydrogen;
- LMG Marin will define the concept design of the LH₂ carrier adapted to TotalEnergies' specifications and taking into account the constraints related to the membrane containment system;
- Bureau Veritas will conduct a risk assessment and review the design in accordance with the latest regulatory requirements and will ensure it meets Bureau Veritas' rules with the goal to deliver an Approval in Principle.

Philippe Berterottière, Chairman and CEO of GTT, declared: *"We are very proud and excited to join forces with TotalEnergies, LMG Marin and Bureau Veritas to take up this ambitious technological and environmental challenge for the maritime transport of liquefied hydrogen. GTT's ability to design a disruptive technology adapted to large-scale vessels is a major step forward for the development of the hydrogen sector. This partnership and the associated R&D efforts are part of the GTT Group's ambition to develop technologies to help build a sustainable world."*



Press release

Mansur Zhakupov, VP of Hydrogen at TotalEnergies, declared: *“Complementary industry players working together is an effective approach to de-risking and accelerating the deployment of the hydrogen value chain. We are confident that this JDP will shed light on the prospects of transporting hydrogen at scale in liquefied form.”*

Vincent Rudelle, Managing Director of LMG Marin France, declared *“LMG Marin looks forward to this exciting partnership with industry-leading companies, which will enable hydrogen to be transported at sea safely and efficiently, paving the way for a global clean hydrogen supply chain. Out-of-the-box thinking is key to allow the transport of such quantity of liquid hydrogen on board this unique vessel. LMG Marin will be able to share its LH₂ experience with the HYDRA project, the world’s first vessel powered by liquid hydrogen currently in operation in Norway. This confirms that emission reductions initiatives and highly innovative projects are part of the company’s DNA.”*

Matthieu de Tugny, President of Bureau Veritas Marine & Offshore, commented: *“We are pleased to join forces with GTT, LMG Marin, and TotalEnergies for this JDP to develop a large-scale membrane LH₂ carrier. Hydrogen is a crucial component of the energy transition and holds great promise for our industry. As a class society, we recognise our responsibility to support the safe development of innovative projects like this, and we are committed to ensuring that this project meets the highest safety and environmental standards.”*

About GTT

GTT is a technological expert in containment systems with cryogenic membranes used to transport and store liquefied gases. For over 50 years, GTT has been designing and providing cutting-edge technologies for a better energy performance, which combine operational efficiency and safety, to equip LNG carriers, floating terminals, land storage, and multi-gas carriers. GTT also develops systems dedicated to the use of LNG as fuel, as well as a full range of services, including digital services in the field of Smart Shipping. The Group is also active in hydrogen through its subsidiary Elogen, which designs and assembles electrolysers notably for the production of green hydrogen.

GTT is listed on Euronext Paris, Compartment A (ISIN FR0011726835 Euronext Paris: GTT) and is notably included in SBF 120, Stoxx Europe 600 and MSCI Small Cap indices.

For more information, visit www.gtt.fr.

Media contact: press@gtt.fr / +33 (0)1 30 23 20 43

Investor Relations contact: information-financiere@gtt.fr / + 33 (0)1 30 23 20 87



Press release

About TotalEnergies

TotalEnergies is a global multi-energy company that produces and markets energies: oil and biofuels, natural gas and green gases, renewables and electricity. Our more than 100,000 employees are committed to energy that is ever more affordable, cleaner, more reliable and accessible to as many people as possible. Active in more than 130 countries, TotalEnergies puts sustainable development in all its dimensions at the heart of its projects and operations to contribute to the well-being of people.

TotalEnergies Contacts

- Media Relations: +33 (0)1 47 44 46 99 | presse@totalenergies.com | [@TotalEnergiesPR](https://www.linkedin.com/company/totalenergies)
- Investor Relations: +33 (0)1 47 44 46 46 | ir@totalenergies.com

About LMG Marin

LMG Marin is an independent ship design, naval architecture and engineering office located in Norway, France, and Poland, with more than 80 years in business. With a workforce of about 90 engineers, the company emerged as a leading partner for innovative, low carbon and carbon-free ship designs. World firsts of LMG Marin references include largest zero-emission battery-powered ship, first deep-sea cargo ship featuring a kite-assistance, liquid-hydrogen powered ship, etc...

LMG Marin France is based in Toulouse where a growing team is daily dealing with innovative and ambitious projects with worldwide applications.

Media contact

Nikias Ioannidis / nilo@lmgmarin.no / +33 (0) 6 72 47 23 80

About Bureau Veritas

Bureau Veritas is a world leader in laboratory testing, inspection and certification services. Created in 1828, the Group has close to 80,000 employees located in nearly 1,600 offices and laboratories around the globe. Bureau Veritas helps its 400,000 clients improve their performance by offering services and innovative solutions in order to ensure that their assets, products, infrastructure and processes meet standards and regulations in terms of quality, health and safety, environmental protection and social responsibility.

Bureau Veritas is listed on Euronext Paris and belongs to the CAC 40 ESG, CAC Next 20 and SBF 120 indices.

Compartment A, ISIN code FR 0006174348, stock symbol: BVI.

For more information, visit www.bureauveritas.com, and follow us on [Twitter](https://twitter.com/bureauveritas) (@bureauveritas) and [LinkedIn](https://www.linkedin.com/company/bureauveritas).

Media contacts

Nicholas Brown / +33 (0) 6 04 91 72 41 / nicholas.brown@bureauveritas.com

Alexandra Beverley / +33 (0) 6 37 67 46 84 / alexandra.beverley@bureauveritas.com