

Kawasaki's Challenge to Net Zero

Aiming to build an international liquefied hydrogen supply chain

September 2025

Kawasaki Heavy Industries, Ltd.

Kawasaki's Business Segment & Revenue Ratio

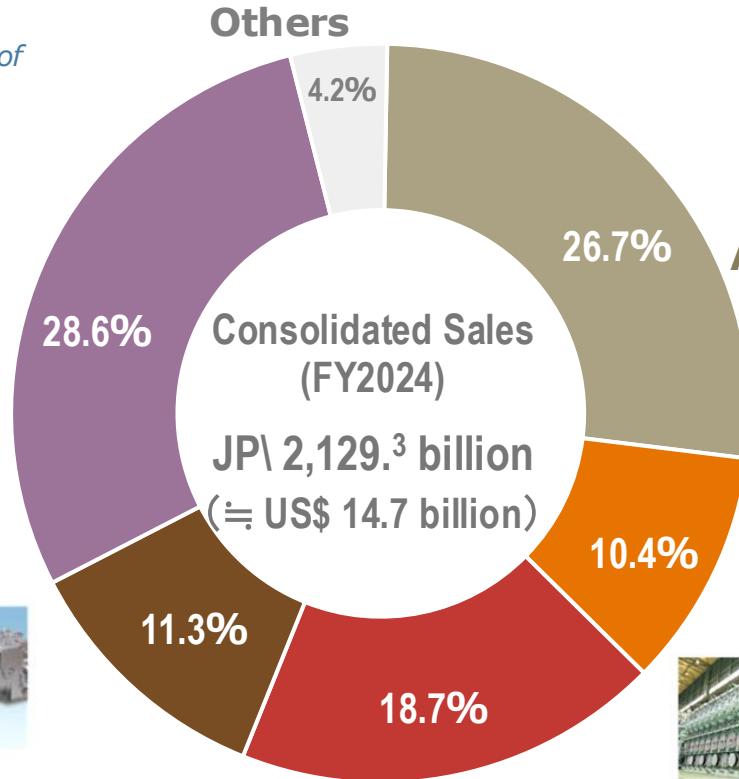
Kawasaki Heavy Industries is a Japanese multinational manufacturer with a history of nearly 150 years that produces not only motorcycles, but also a wide range of industrial products, including ships, rolling stocks, engines, robots, compressors, boilers, aerospace etc.



Power Sports & Engine



Precision Machinery & Robots



Aero Space System



Rolling Stocks



Energy Solution & Marine

KHI Group Hydrogen Products



Hydrogen Gas Engine



Hydrogen Gas Turbine



Membrane/Electrode for Water Electrolyser



Hydrogen Liquefaction Plant



Liquefied Hydrogen Loading Arm System



Centrifugal Hydrogen Compressor



Hydrogen Boiler



Fuel Cell Train



Hydrogen Airplane



High-pressure Hydrogen Regulator



Hydraulic Booster Hydrogen Compressor



Hydrogen-powered Engine Motorcycle



Liquefied Hydrogen Storage Tank

Production

Transportation

Utilisation

Storage

Kawasaki
Synergy of Kawasaki group technologies



Hydrogen Carrier



Liquefied Hydrogen Container



Compressed Hydrogen Container Trailer

History of Kawasaki's Liquefied Gas Carrier Construction

1969

The world's first semi-membrane LPG carrier "No.5 Bridgestone Maru" was completed



1981

Asia's first LNG carrier "Golar Spirit" was completed



1995- '96

38,000m³ and 84,000m³ LPG/NH₃ carriers were delivered to a European shipping company



2003

Japan's first coastal LNG carrier with pressurised cryogenic tanks type "Daiichi Shinju maru" was delivered

2021

World's first liquefied hydrogen carrier "Suiso Frontier" was delivered

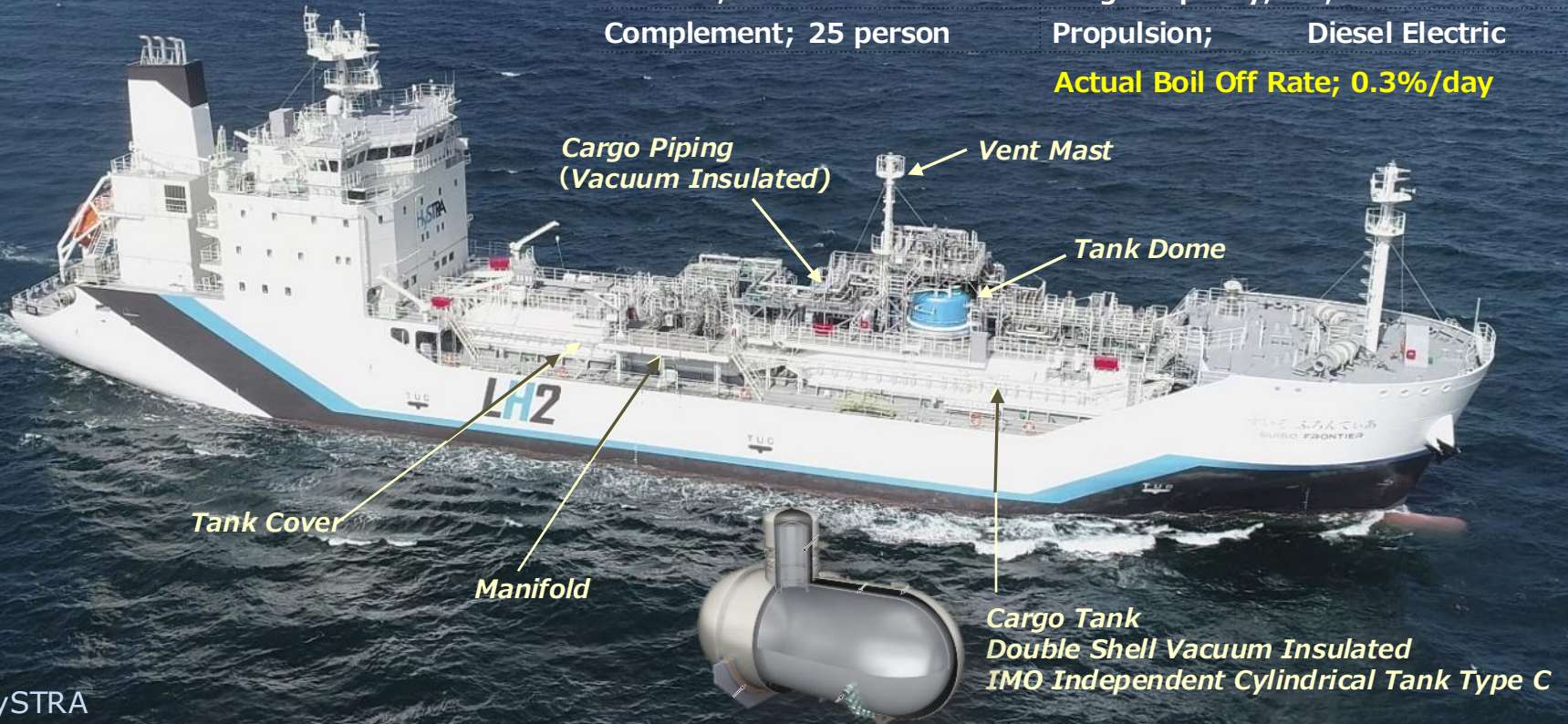


Liquefied Hydrogen Carrier "SUISEO FRONTIER"

(for pilot scale demonstration)

Length;	116 m	Speed;	13-knot
Breadth;	19 m	Cargo Capacity;	1,250m ³
Complement;	25 person	Propulsion;	Diesel Electric

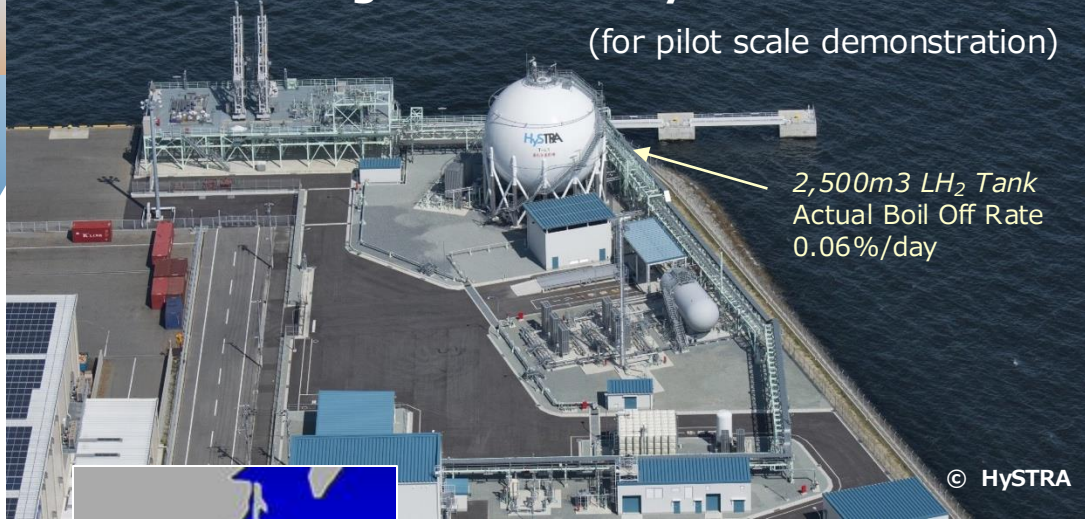
Actual Boil Off Rate; 0.3%/day



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LH2 Receiving Terminal "Hy-touch Kobe"

(for pilot scale demonstration)



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Principal Particulars of "Hy-touch Kobe"

Liquefied Hydrogen Storage Tank	2,500 m3 19 m in diameter spherical vacuum double shell
Loading System	Diameter 6" in vacuum double insulation emergency release mechanism
Boil Off Gas (BOG) Management	<ul style="list-style-type: none"> •BOG Compressor •BOG Holder •Vent Stack
Other Equipment	Receiving equipment from tank to truck etc.



Liquefaction Plant at Hastings, Australia

(for pilot scale demonstration)



Development of Scaling-Up on LH2 Facilities

Pilot scale Demonstration



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1,250m³



2,500m³

Commercial scale Demonstration



40,000m³ class



50,000m³ class

Large Commercial Phase



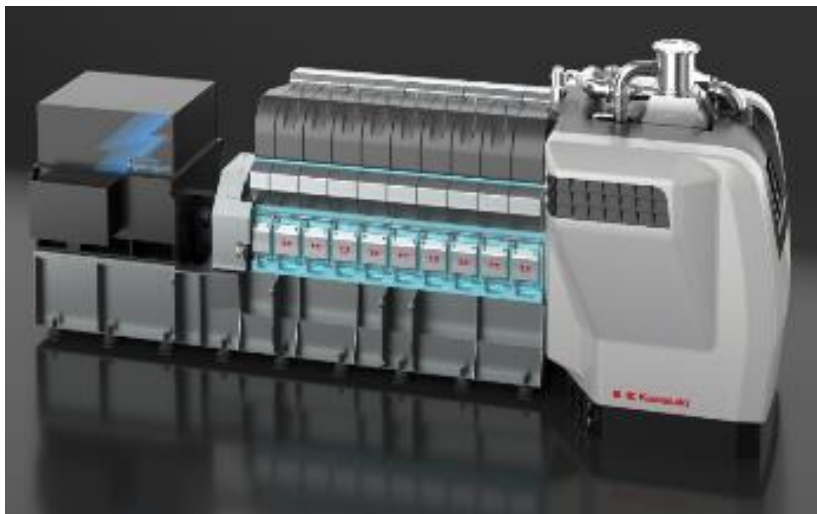
160,000m³ class



200,000m³ class

Hydrogen Gas Engine & Marine Hydrogen Fuel System (MHFS)

Hydrogen Dual Fuel Engine (2.4 MWe) Diesel and Hydrogen



- Op. Mode : H₂ Mode and Diesel Mode
- Approval in Principle from classNK in 2022
- Actual demonstration test by 2030

MHFS Marine Hydrogen Fuel System

In the midst of a worldwide transition to carbon neutrality, there are expectations that marine shipping industry to achieve carbon neutrality in order to lower its environmental impact. Thus, there is an increasing demand for hydrogen-fueled engines to achieve future carbon neutrality. Under these circumstances, Kawasaki has been developing a hydrogen fuel supply system for marine hydrogen fueled engines.



MHFS can supply hydrogen fuel from the liquefied hydrogen fuel tank to marine hydrogen fuel engines.
At present, Kawasaki is developing two types of MHFS that are applicable to medium and high-speed four-stroke low-pressure hydrogen fueled generator engines on board short-sea ships and low-speed two-stroke high-pressure hydrogen fueled propulsion engines on board deep-sea ships.

Roadmap - Liquefied Hydrogen Supply Chain in Japan

2015

2020

2025

2030

2040~

Pilot Demonstration (Completed in 2023)

Demonstration of hydrogen production from brown coal and long-haul marine transportation (approximately 1/100th the commercial scale)



Demonstration test for Commercialisation

- Manufacture commercial-scale (large-scale) equipment/facilities
- Assess the feasibility of commercialisation, including economics (one step away from commercialisation)



Commercial Chain Operation

The Kawasaki logo consists of a red square on the left, followed by a stylized red 'K' shape that resembles a three-bladed propeller.

Kawasaki

Powering your potential

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