# KAWASAKI GAS TURBINE EUROPE GMBH

Gas Turbines Ready For Future Requirements

## Hydrogen Energy Supply Chain for Decarbonization

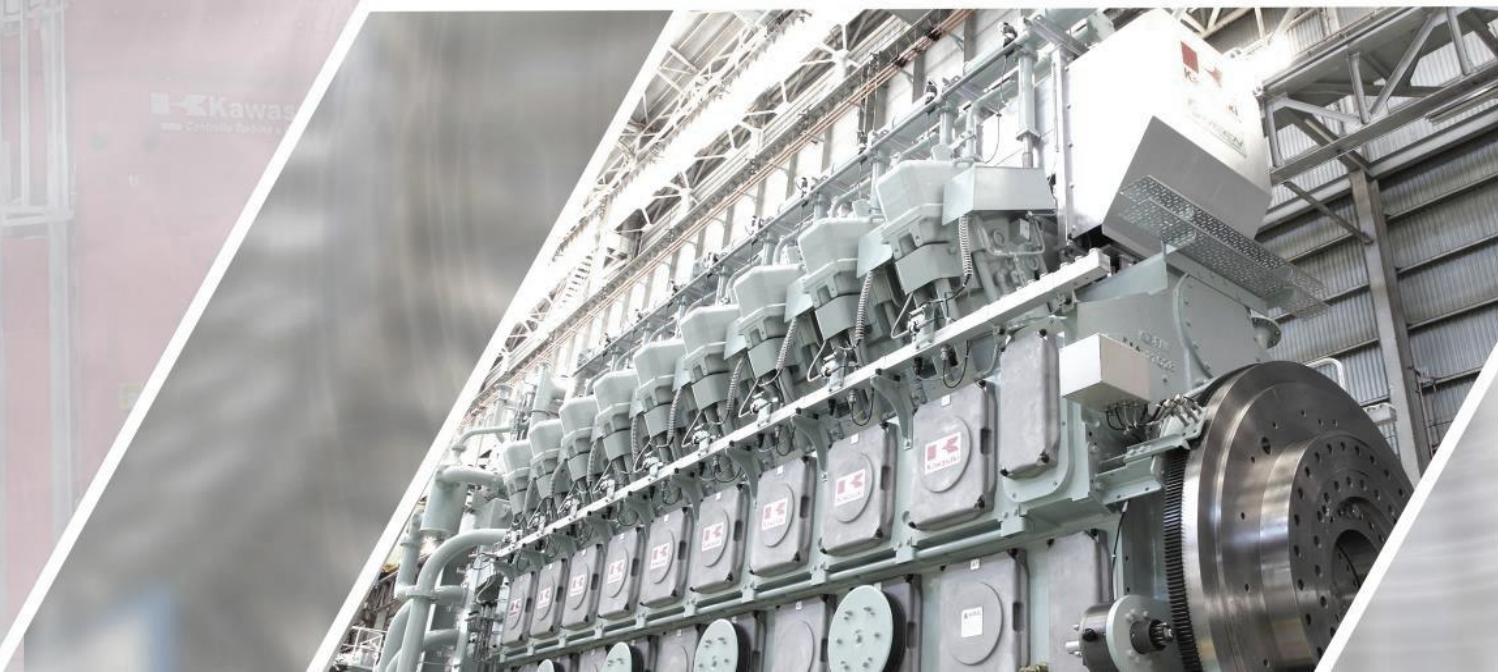
## KAWASAKI HYDROGEN ROAD

Development of Innovative Hydrogen Technologies
for Future Hydrogen Society

**1. Ostdeutscher Wasserstoffkongress**

26th August 2026, Dresden

**Dr. Nurettin Tekin**
Hydrogen Product Manager

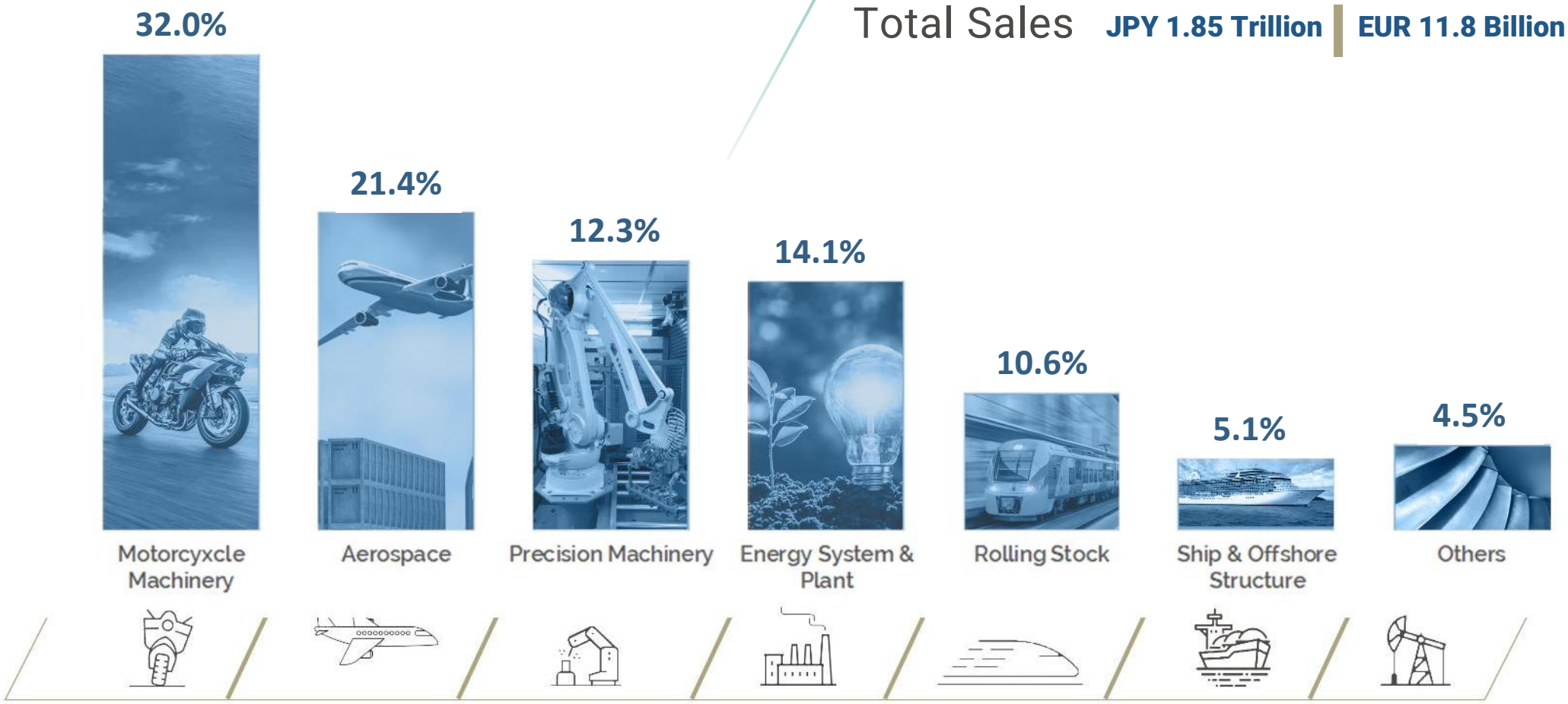


# Kawasaki Heavy Industries (KHI)

FY2023

Business year starts from April 1, 2023 and ends on March 31, 2024

Total Sales **JPY 1.85 Trillion** | **EUR 11.8 Billion**

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# Ships' Line-up of Kawasaki Group

- Kawasaki Group has a good record of developing and building a wide range of kind of ships.
- By combining extensive experience from "a century of shipbuilding" with the newest technology, Kawasaki ensures safe and efficient marine transportation.

LNG Carrier

LPG/Ammonia Carrier

Jetfoil

Submarine

AUV

Bulk Carrier

Containers Ship

Car Carrier
RO/RO Ships

Oil Tanker

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# KAWASAKI GAS TURBINE EUROPE

## PRODUCTS

### Gas Turbine Generator Sets

| GPB17D | GPB50D | GPB80D | GPB180D | GPB300D |
|---|---|---|---|---|
| 1,800 kWel | 4,700 kWel | 7,800 kWel | 18,500 kWel | 34,300 kWel |
| η = 28.1 % | η = 32.6 % | η = 33.6 % | η = 34.3 % | η = 40.3 % |

### Gas Engines

| KG12 | KG18 | KG18-V | KG18-T |
|---|---|---|---|
| 5,200 kWel | 7,800 kWel | 7,800 kWel | 7,800 kWel |
| η = 49.0 % | η = 49.0 % | η = 49.5 % | η = 51.0 % |

@ ISO-conditions

## SERVICES

### ENGINEERING
Preliminary Engineering
Detailed Engineering

### IMPLEMENTATION
Project Planning
Customized Packaging
Erection Commissioning

### MAINTENANCE
Scheduled Maintenance
Trouble Shooting
Spare Parts, Consumables
General Overhaul
Remote Monitoring

### HYDROGEN
Preliminary engineering
Detailed engineering
Retrofit

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# KHI Group Hydrogen Products

Hydrogen Gas Engine

Fertilizer Plant
(mass production of hydrogen)

Water Electrolyzer

Hydrogen Liquefaction Facility

Liquefied Hydrogen Loading Arm System

Centrifugal Hydrogen Compressor

Hydrogen Boiler

Hydrogen Gas Turbine

Production

Transportation

Kawasaki

Synergy of Kawasaki group technologies

Liquefied Hydrogen Carrier

Fuel Cell Train

Hydrogen Airplane

Utilization

Storage

Large-scale Hydrogen Carrier

Liquefied Hydrogen Container

Compressed Hydrogen Bulb

Hydrogen-powered Engine Motorcycle

Liquefied Hydrogen Storage Tank

Compressed Hydrogen Container Trailer

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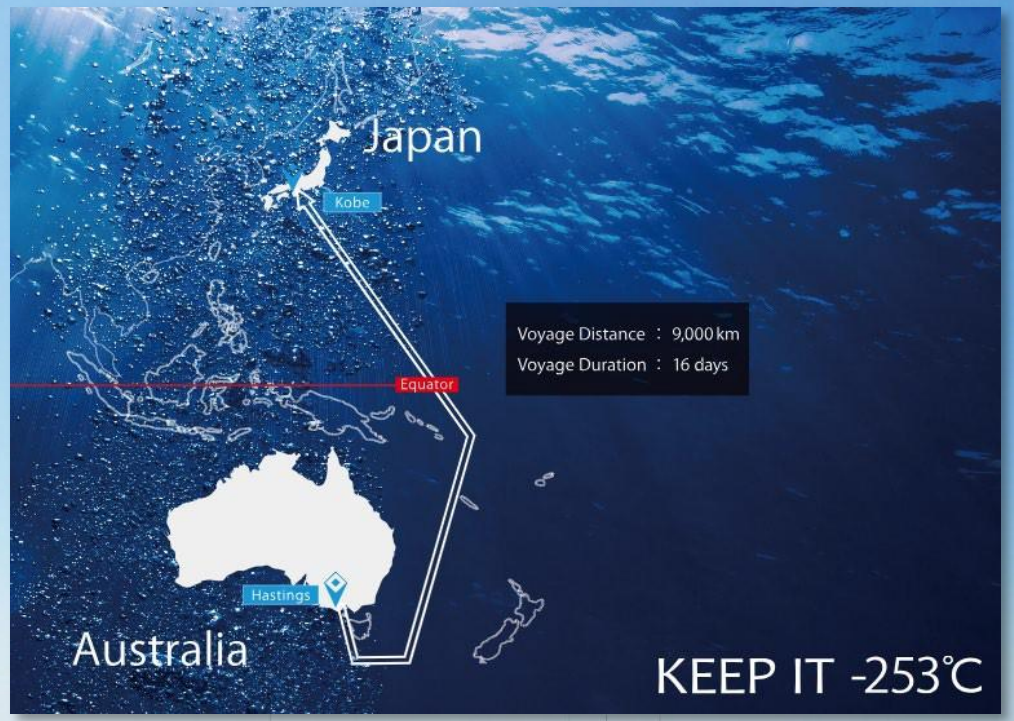


# Successful Completion of Pilot Demonstration in 2022

©HySTRA

# Hydrogen Energy Supply Chain (HESC) Pilot Project

## Ship visit during G7 Sapporo Climate/Energy/Environment Ministers Meeting

Jennifer Granholm, Secretary of U.S. DOE
(14/04/2023, at Otaru)

Kadri Simson, European Commissioner for Energy
(16/04/2023, at Otaru)

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# Result of Pilot Project Demonstration Phases

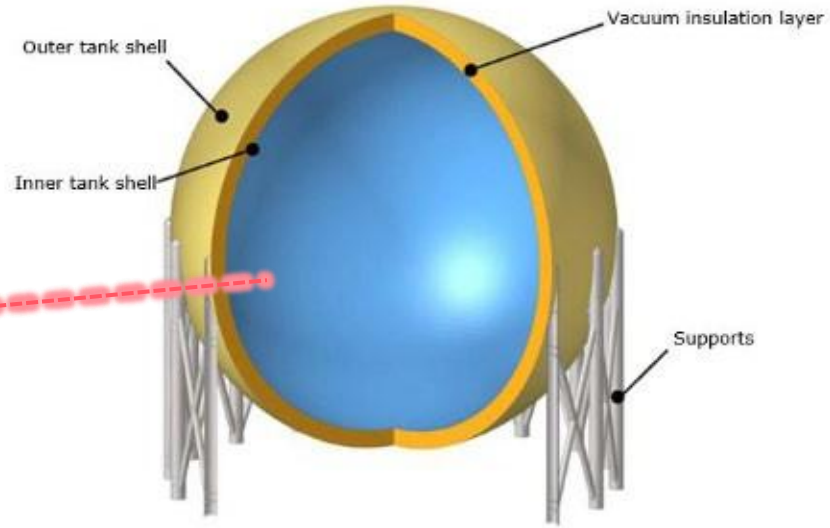
Both BORs have achieved the same level of performance as LNG carriers and storage tanks

*BOR（Boil off Rate）：Ratio of liquid evaporated per day by external heat

Suiso Frontier

Hy touch Kobe

Tank used on the *SUISO FRONTIER*




Tank used at Hy touch Kobe

CG-rendered images of the double-shell vacuum-insulation structure

# Progress of commercial scale equipment development

**2021**

**Pilot Demonstration**

HySTRA

**1 250m3 '** Proven for 40 years

**Spherical tank: 2,500 m ³**

**Demonstrated the feasibility of hydrogen production and long-distance maritime transport**

**(About 1/100 of the commercial level)**

*Equivalent to about 5,000 households' power consumption

**-2030**

**Commercialization Demonstration**

JSE

advantageous for scale-up

**40,000 m ³ Cylindrical tank: 50,000 m ³**

**Scale up equipment size to assess the viability of commercialization.**

**(One step away from commercialization)**

**From 2031**

**Commercialization**

**160,000 m ³ x 2 carriers**

**Cylindrical tank: 50,000 m ³ x 4** (plan)

**Profitable business model, which is economically self-sustaining**

*Equivalent to approx. 400,000 households' power consumption

*cost of shipboard delivery

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# Liquefied Hydrogen Supply Chain – Commercialization Demonstration –

**Our aim : Complete the demonstration and start supplying hydrogen to Japan in FY2030**

<Scope of the commercialization demonstration>

**Commercialization Demonstration**

Production → Storage → Transportation → Utilization

**$GH_2$ Production**

★Produced in

**Liquefaction ($LH_2$) 25t/d × 2**

**$LH_2$ Tank 50,000m³ × 1**

**Foreign voyage test**

Liquefied hydrogen carrier 40,000m3 × 1 carrier

**Utilization**

★Utilized in

:GI Fund(Green Innovation Fund)

**No restrictions that would delay progress.**

**To enable early achievement of results**

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# Fabrication of Large Liquefied $H_2$ Storage Tank Launched
## - Toward the Establishment of Liquefied Hydrogen Supply Chain

[Fabrication of Large Liquefied Hydrogen Storage Tank Launched - Toward the Establishment of Liquefied Hydrogen Supply Chain - | Kawasaki Heavy Industries, Ltd.]

Aug. 07, 2025

| **Specifications of the above-ground flat-bottom cylindrical liquefied hydrogen storage tank** | |
|---|---|
| Tank type | Flat-bottom cylindrical vertical storage tank |
| Heat insulation system | Non-vacuum heat insulation system |
| BOR*4 | 0.26 wt%/day (Development goal) |
| Dimensions of storage tank | Outer tank diameter: Approx. 60 m,<br>Height: Approx. 45 m |
| Storage capacity for liquefied hydrogen | 50,000 $m^3$ (Approx. 3,550 tons) |

Conceptual drawing for a liquefied hydrogen storage tank (computer generated image)

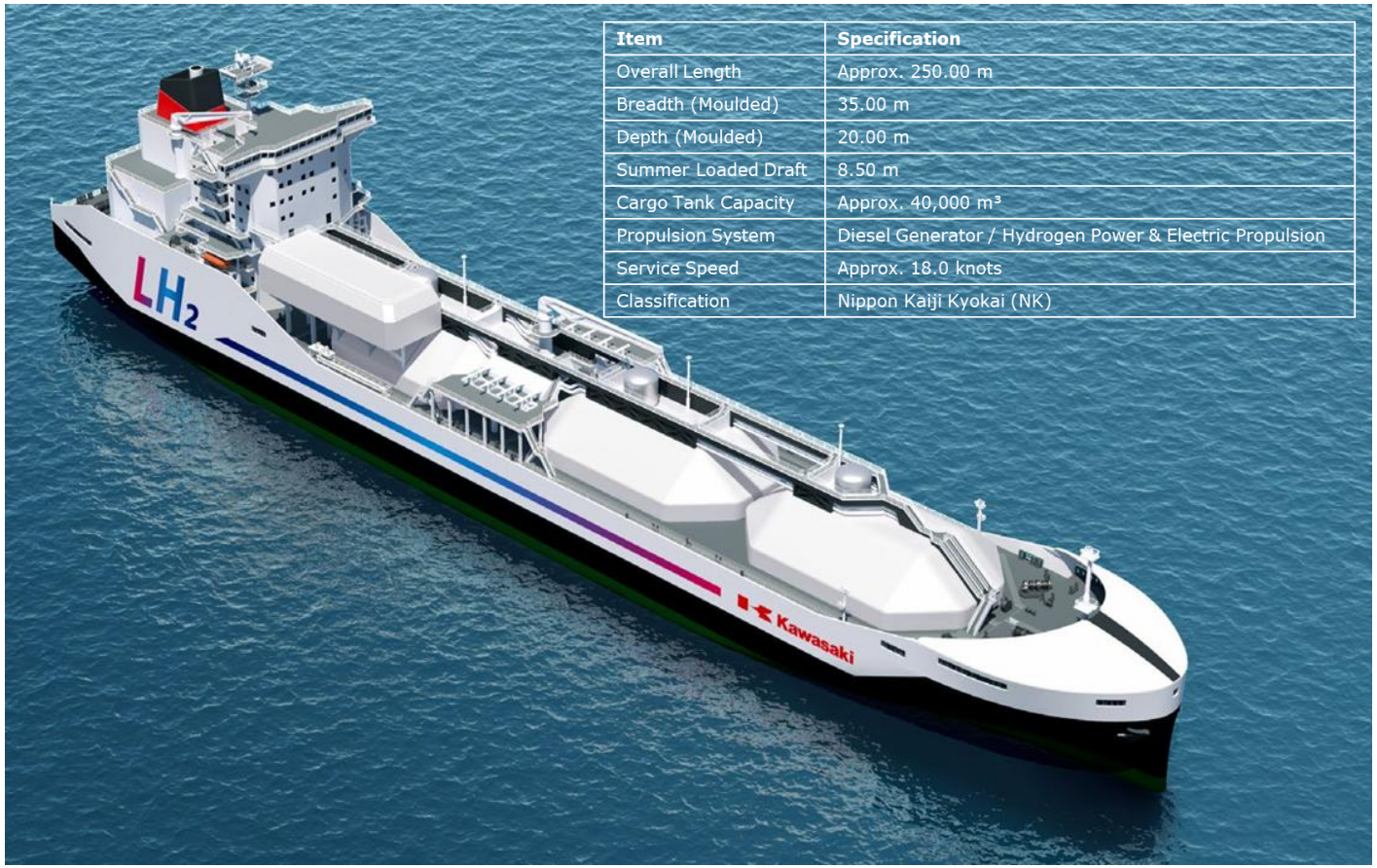
January 6, 2026

Japan Suiso Energy, Ltd.

Kawasaki Heavy Industries, Ltd.

# Contract Signed to Build World's Largest 40,000 m³ Liquefied Hydrogen Carrier

## —Constructing a Commercial-Scale Liquefied Hydrogen Supply Chain—



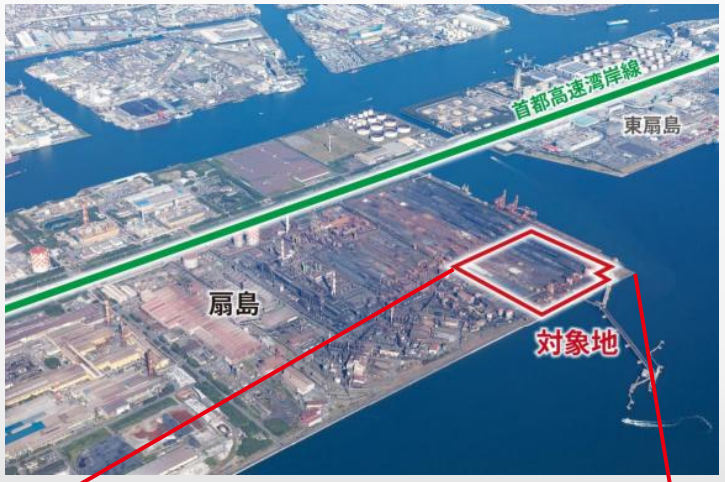

| Item | Specification |
|---|---|
| Overall Length | Approx. 250.00 m |
| Breadth (Moulded) | 35.00 m |
| Depth (Moulded) | 20.00 m |
| Summer Loaded Draft | 8.50 m |
| Cargo Tank Capacity | Approx. 40,000 m³ |
| Propulsion System | Diesel Generator / Hydrogen Power & Electric Propulsion |
| Service Speed | Approx. 18.0 knots |
| Classification | Nippon Kaiji Kyokai (NK) |

Tokyo, January 6, 2026 - Kawasaki Heavy Industries, Ltd. (Representative Director, President, and CEO: Yasuhiko Hashimoto, Head Office: Minato-ku, Tokyo) and Japan Suiso Energy, Ltd. (JSE, Representative Director and President: Eiichi Harada, Head Office: Minato-ku, Tokyo) announced the signing of a contract to build the world's largest liquefied hydrogen carrier with a capacity of 40,000 m³.

The vessel will be built at Kawasaki's Sakaide Works (Sakaide City, Kagawa Prefecture). JSE is the project operator for the New Energy and Industrial Technology Development Organization (NEDO) Green Innovation Fund Project*1: Liquefied Hydrogen Supply Chain Commercialization Demonstration which plans to demonstrate by FY2030 the ship-to-base loading/unloading of liquefied hydrogen and perform trials under ocean-going conditions.

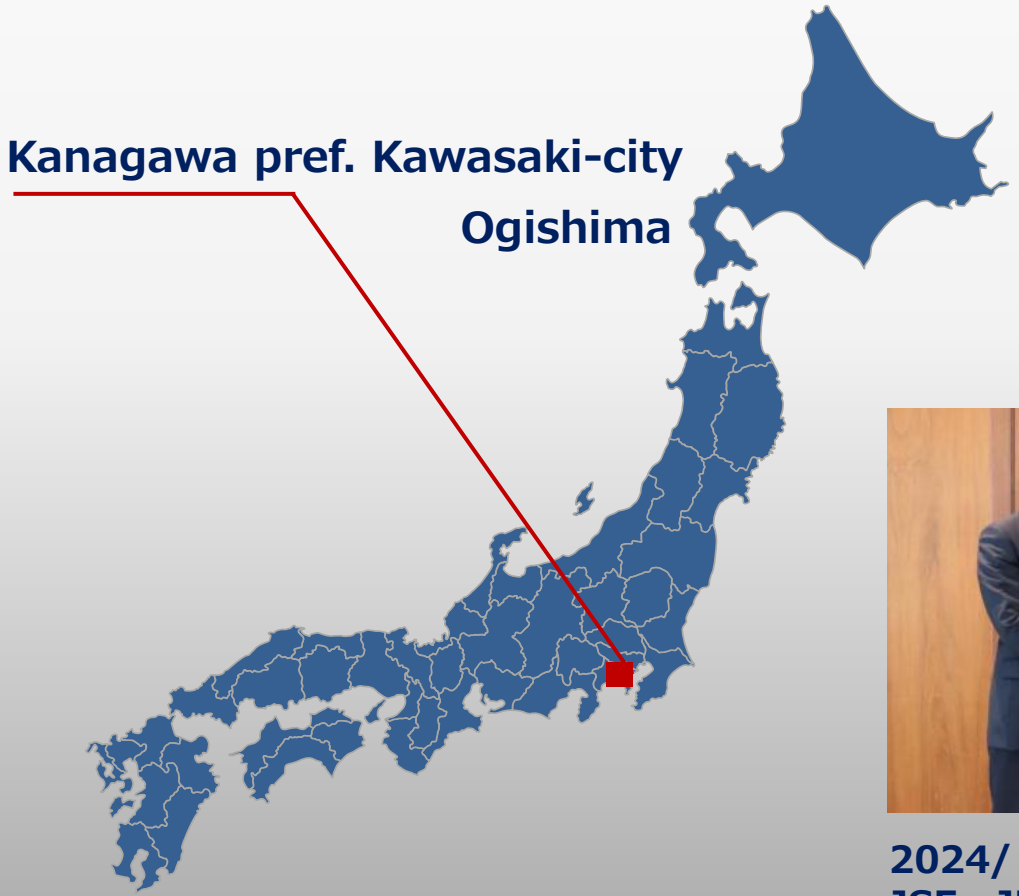
# Liquefied Hydrogen Supply Chain
# – Commercialization Demonstration –

## Our aim : Complete the demonstration and start supplying hydrogen to Japan in FY2030




**2025 Break ground**

Perspective drawing of Kawasaki LH2 Terminal



**2024/7/25**
**JSE・JFE steal**
**Land lease contract conclusion**

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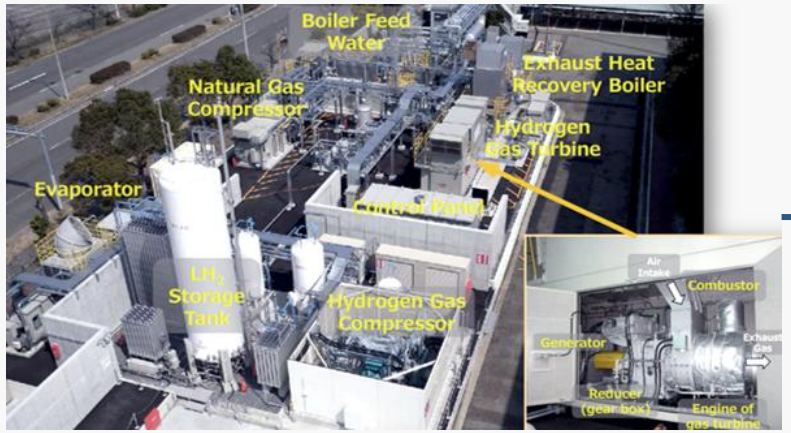
Kawasaki
Powering your potential

# Groundbreaking Ceremony

## Liquefied Hydrogen Supply Chain Commercialization Demonstration Project

# FIRST REFERENCES



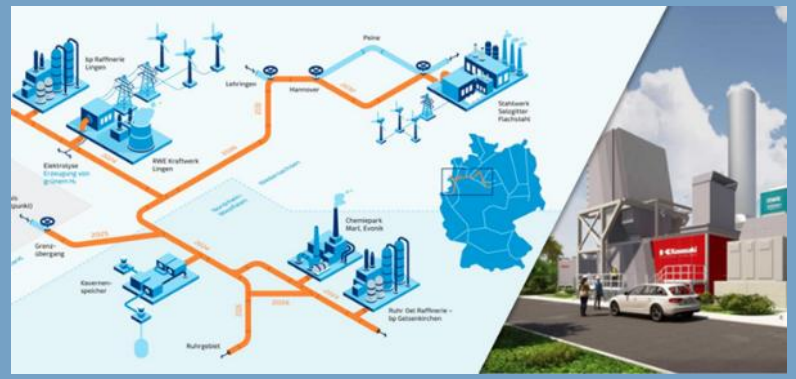

**World's First 100% H2-CHP Plant at Kobe Port in 2018**

Retrofit from diffusion to Micromix 2020

**GPB17D-H2 CPChem (Tessenderlo, Belgium)**

Installation in 2021

Retrofit for hydrogen in October 2023



**Joint undertaking of RWE & Kawasaki**
(planned commissioning end of 2026)

**World's First 100% H2 industrial size GTGS**

From 2026 onwards 34 MW plant could reconvert green hydrogen to power

**Power generation Output:**
**34,000 kW**
Mixed combustion (20%-50% hydrogen)

**Hydrogen power generation plant for Seibu Oil Co., Ltd.**
(started operations in August 2021)

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“Global Kawasaki”

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