Suiso Frontier
World’s First Bulk Liquefied Hydrogen Carrier

Shell is a member of the CO₂-free Hydrogen Energy Supply-chain Technology Research Association (HySTRA). Sponsored by NEDO*, the pilot project undertakes the loading and unloading operations with ship-to-shore interface, long-distance shipping and onshore storage of liquefied hydrogen with an ambition to demonstrate a hydrogen supply chain between Australia and Japan.

The Suiso Frontier has been built by Kawasaki Heavy Industries (KHI) to transport liquefied hydrogen by shipping.

Shell operates the Suiso Frontier with a focus on operational efficiency and safety.

1,250m³
The ship’s centrepiece is its 1,250m³ tank

1/800th
The tank can safely carry liquefied hydrogen at 1/800th of its original gas-state volume

-253 °C
The tank keeps the hydrogen liquid at the cryogenic temperature of -253 °C

Kobe, Japan
Voyage Distance: 9,000 km
Voyage Duration: 16 days

Hastings, Australia

Liquefied hydrogen tanks for marine transportation
A vacuum insulated double-walled structure provides ultimate insulation properties. Using glass fiber reinforced plastic (GFRP) for the support structure minimizes heat transfer.

Images courtesy of HySTRA: https://www.hystra.or.jp/en/project/

* New Energy and Industrial Technology Development Organization, a subsidiary of the Ministry of Economy, Trade and Industry of Japan