

**IINO LINES****NYK LINE**
NIPPON YUSEN KAISHA

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Idemitsu Tanker Co., Ltd.

IINO Kaiun Kaisha, Ltd. (IINO Lines)

Nippon Yusen Kabushiki Kaisha (NYK)

Nihon Shipyard Co., Ltd.

Japanese Consortium Produces Design Concept for Eco-Friendly VLCC

Idemitsu Tanker Co., Ltd., IINO Kaiun Kaisha, Ltd. (IINO Lines), Nippon Yusen Kabushiki Kaisha (NYK), and Nihon Shipyard Co., Ltd. are pleased to announce that the consortium the companies established on 26 January 2024 (*1) for the joint research and development of an eco-friendly very large crude oil carrier (VLCC) has produced a design concept for Japan's first Malacca Max (*2) type VLCC to use methanol as alternative fuel (hereafter, the "Vessel").

Principal Particulars of Vessel

Length Overall	Max 339.5 m
Breadth	60.0 m
Depth	28.6 m
Scantling Draught	21.0 m
Deadweight at Scantling Draught	Approx. 309,400 t
Fuel	Methanol and heavy oil
Others	Equipped with a shaft generator Able to equip with a Rotor Sail wind propulsion system

To provide power while sailing, the Vessel will be equipped with a shaft generator (*3) and the latest dual-fuel main engine that can use methanol and heavy oil as fuel. A wind propulsion system (*4) will be optional.

As a result, the Vessel can achieve a CO₂ reduction of more than 40% compared to the reference line against the Energy Efficiency Design Index (EEDI) regulation (*5), clearing Phase 3 (reduction of more than 30% compared to the reference line), which will apply from 2025.

Methanol is expected to contribute to the International Maritime Organization's (IMO) greenhouse gas (GHG) emission reduction strategy by reducing CO₂ emissions by

approximately 15% compared to the use of conventional fuel oil. In addition, the use of green methanol, such as bio-methanol produced from biomass and synthetic methanol (e-methanol) produced using hydrogen from renewable energy sources and captured CO₂, makes it possible to reduce CO₂ emissions to net zero (*6).

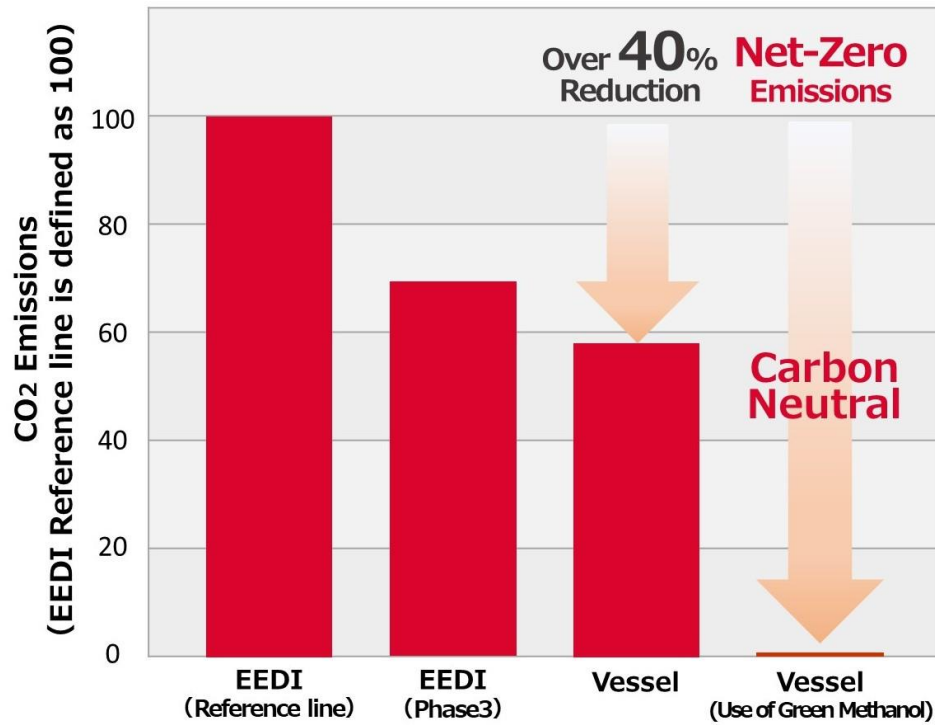


Image of the Vessel's CO₂ emissions reduction



Image of the design concept for eco-friendly VLCC

The four companies, which play a leading role in Japan-based energy transportation, will conduct further studies based on the design concept in order to achieve the international shipping goal of becoming carbon neutrality by 2050. Furthermore, the companies will aim for strategically phased shipbuilding orders for this next-generation eco-friendly VLCC and allocate vessels to crude-oil transport for Japanese refineries as soon as possible.

- *1 : News release “Japanese Consortium to Develop Design Concepts for Eco-Friendly VLCCs” (<https://www.idemitsu.com/en/tanker/topics/2023/240126.pdf>)
- *2: The largest vessel type capable of passing through the Strait of Malacca, a major shipping route of crude oil between Japan and the Middle East
- *3: To generate electricity by using the rotation of the shaft to transfer power from the main engine to the propeller. Reduces fuel consumption and CO₂ emissions used by generators.
- *4: A device that uses the force of the wind to assist the propulsion of the vessel.
- *5: International convention by the IMO on the reduction of CO₂ emissions for new vessels. Emissions are assessed using a unified fuel index and must be below a certain value. The regulation values are progressively tightened for each type of vessel.
- *6: Net-zero CO₂ emissions based on the fuel lifecycle from production to consumption.

Overview of Consortium Members

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