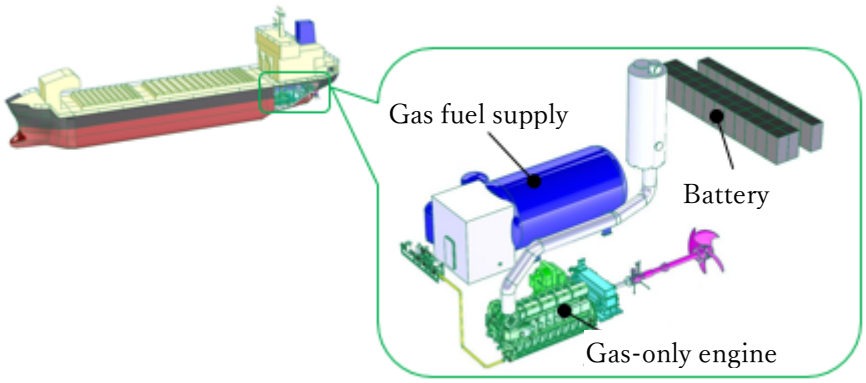
Construction of a Coastal Limestone Carrier with a Hybrid Propulsion System using a Gas-Only Engine and a Battery

September 30, 2021
Nippon Steel Corporation
Nippon Steel Cement Co., Ltd.
NS United Naiko Kaiun Kaisha, Ltd.
Japan Petroleum Exploration Co., Ltd.
Tsuneishi Shipbuilding Co., Ltd.
Kawasaki Heavy Industries, Ltd.

NS United Naiko Kaiun Kaisha, Ltd. (President and Representative Director: Kazushi Fukuda, Head Office: Chiyoda-ku, Tokyo hereinafter called "NSU Naiko"), Nippon Steel Corporation (President: Eiji Hashimoto, Head Office: Chiyoda-ku, Tokyo), Nippon Steel Cement Co., Ltd. (President: Yasuhiro Hashimoto, Head Office: Muroran City, Hokkaido), Japan Petroleum Exploration Co., Ltd. (Representative Director and President: Masahiro Fujita, Head Office: Chiyoda-ku, Tokyo), Tsuneishi Shipbuilding Co., Ltd. (President: Sachio Okumura, Head Office: Fukuyama City, Hiroshima Prefecture), and Kawasaki Heavy Industries, Ltd. (Representative Director, President & Chief Executive Officer: Yasuhiko Hashimoto, Tokyo Head Office: Minato-ku, Tokyo) have agreed to construct a vessel with a hybrid propulsion system combining a gas-only engine and a battery (hereinafter called "this Vessel") as the replacement of the limestone carrier "Shimokita Maru" owned by NSU Naiko, and have today signed" Memorandum of Transportation contract," "Shipbuilding contract," "Gas-only engine and battery propulsion system sales contract," and "Liquefied natural gas for marine fuel sales contract."

<Conceptual image of this Vessel>



This Vessel is scheduled to start the operation in February 2024, and will be equipped with Japan's first gas-only engine and total 2,847 kWh lithium-ion battery. The LNG fuel tank is planned to use 7% nickel steel plate developed by Nippon Steel Corporation for the first time as a marine tank. The propulsion power and the onboard electric power during the sailing are generated by the gas-only engine developed by Kawasaki Heavy Industries, Ltd. Only natural gas will be used for high power, long distance, and long duration navigation. The propulsion power and the onboard power during entering, leaving and berthing ports will be provided from the battery to achieve zero-emission operation.

The CO2 emission reduction effect of introducing the propulsion system of this vessel is 23.56% (about 30% at normal load operation) compared to the conventional vessels of the same type, and the exhaust gas of the gas-only engine contains almost no SOx, and NOx emissions is far below the TierIII standards.

In addition, on its main routes, the loading port, Shiriyamisaki(Aomori Prefecture) and the unloading port, Muroran (Hokkaido), the zero-emission operations that are friendly to the environment will be carried out.

The construction of this Vessel was adopted by the Global Environment Bureau of the Japanese Ministry of the Environment and the Maritime Bureau of the Japanese Ministry of Land, Infrastructure, Transport and Tourism for the "Projects to promote the introduction of advanced technologies that will simultaneously achieve social innovation and the decarbonization of logistics (Projects to promote the introduction of LNG fuel systems, etc.)" FY2021 Subsidy for the expenses in projects for measures to suppress carbon dioxide emissions.

Overview of the successor ship to the Shimokita Maru
Deadweight tonnage (DWT): approximately 5,560 tons
Total length: approximately 93.8 m
Molded breadth: approximately 18.2 m
Molded depth: approximately 9.9 m
Scheduled Delivery: Early February 2024
Propulsion system: Hybrid system of gas-only engine (8L30KG) and battery
Shipyard: Tsuneishi Shipbuilding
Liquefied natural gas supplier: Japan Petroleum Exploration
Main route/Cargo: Shiriyamisaki - Muroran /Limestone

<Roles of each company>
Shipcharterer：Nippon Steel Corporation and Nippon Steel Cement
Shipowner/Operator: NS United Naiko Kaiun Kaisha, Ltd.
Propulsion system: Kawasaki Heavy Industries

Shipyard: Tsuneishi Shipbuilding
Liquefied natural gas supplier: Japan Petroleum Exploration