



ENEOS

Introduction of ENEOS Group and Our Challenges in Hachinohe Terminal

Fujimoto Hiroaki

Executive Officer
General Manager
Gas Business Department
Resources & Power Company
ENEOS Corporation

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Introduction of ENEOS Group

- ✓ ENEOS Group is the largest integrated energy company in Japan, with approximately 50% domestic market share in fuel oil sales.
- ✓ ENEOS Group is committed to pursue carbon neutral society and has been expanding its business to Power Generation, Renewable Energy, and Hydrogen

ENEOS Holdings, Inc.

Envisioned Goal for 2040.

ENEOS Group pursues carbon neutral status in its CO2 emissions

ENEOS Corporation



Market share of fuel oil sales in Japan

Approx. 50%.

FY2022 actual: No. 1 in Japan



Hydrogen stations market share in Japan

Approx. 30%. [43 Locations]
(as of Sep. 2023)

Refining Capacity

Approx. 2 million BD

(as of Jun, 2023)

Power Generation Capacity

2.39 GW

(as of Jun. 2023)

Renewable Energy
[Approx. **0.88 GW**]



JX Nippon Oil & Gas Exploration

Equity-entitled crude oil and natural gas production

82,000 bbl/day

[Crude oil equivalent
Gas ratio: 70%]

JX Nippon Mining & Metals

Equity-entitled copper mine production

200,000 tonnes/year

Other Listed subsidiaries

ENEOS' LNG Terminals in Japan

- ✓ Mizushima LNG Terminal started its operation in our Mizushima refinery in 2006 and the operating company is a JV with The Chugoku Electric Power Co., Inc
- ✓ **Hachinohe LNG Terminal** is wholly owned and operated by ENEOS from 2015 and has the capacity to reload LNG to coastal LNG tankers for supply of LNG to Hokkaido and Akita area.

Mizushima LNG Terminal

- Tank capacity : 320,000m³
- Start-up : April 2006
- Joint venture between ENEOS (50%) and The Chugoku Electric Power Co., Inc. (50%)



Kushiro LNG Terminal

- Tank capacity : 10,000m³
- Start-up : April 2015
- Joint operation between ENEOS (50%) and Hokkaido Gas Co. Ltd. (50%)



Two coastal LNG tankers are in operation

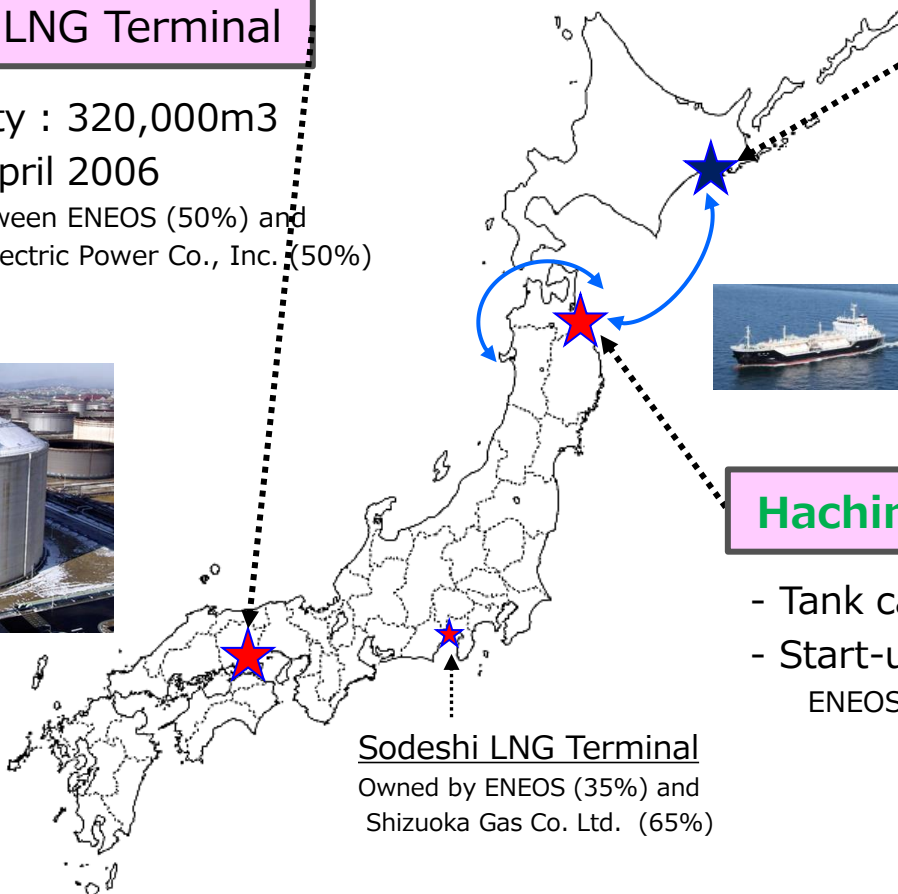
Hachinohe LNG Terminal

- Tank capacity : 280,000m³
- Start-up : April 2015
- ENEOS (100%)



Sodeshi LNG Terminal

Owned by ENEOS (35%) and Shizuoka Gas Co. Ltd. (65%)



Hachinohe – Where is it? What we do?

Hachinohe City

- ✓ **Transport and logistics hub** in Northern-Tohoku area.
- ✓ **Less snowfall** compared to the other locations in Aomori.
- ✓ One of the largest fishing ports and also one of the largest industrial cities in Northern-Tohoku area.

Hachinohe Port

- ✓ Well-maintained shipping channels and anchorage areas.
- ✓ Calm sea condition is maintained due to sufficient breakwater.

LNG terminal

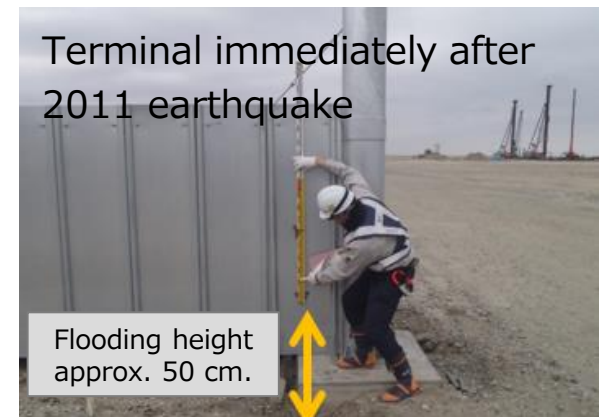
- ✓ Able to receive Q-Flex class, one of the largest LNG tankers acceptable in Japan.
- ✓ **Adequate disaster prevention** measures taken. **Emergency survival kit** stored **at the top of the tank**, which also serves as an evacuation site in the event of a large tsunami.



Emergency survival kit being lifted to the top of the tank →



↑ Emergency survival kit at the top of the tank.
(150 cm (W) x 53 cm (D) x 47 cm (H))

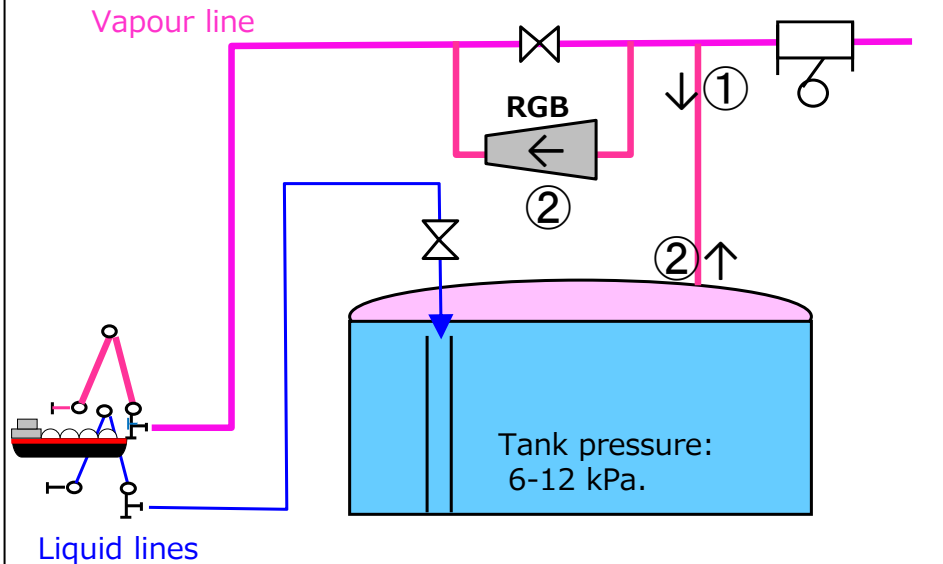


Optimization Measures - 1

1. Treatment of BOG during LNG discharge (without installation of a Return Gas Blower(RGB))

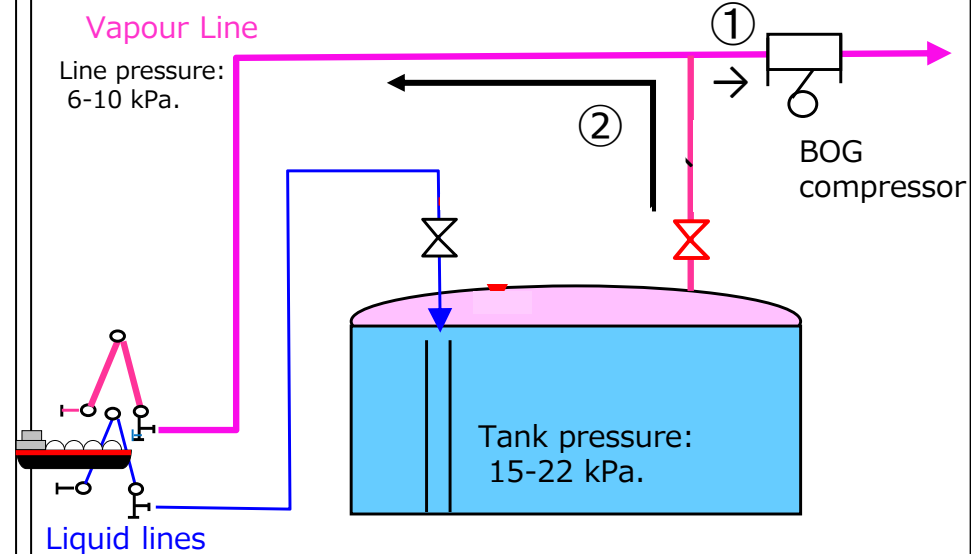
- Investment cost saved : approx. 2 millions USD
- Reduction in electricity use : 5,000 kWh per year.

Standard operation at LNG terminals



Hachinohe terminal

Patented 2016

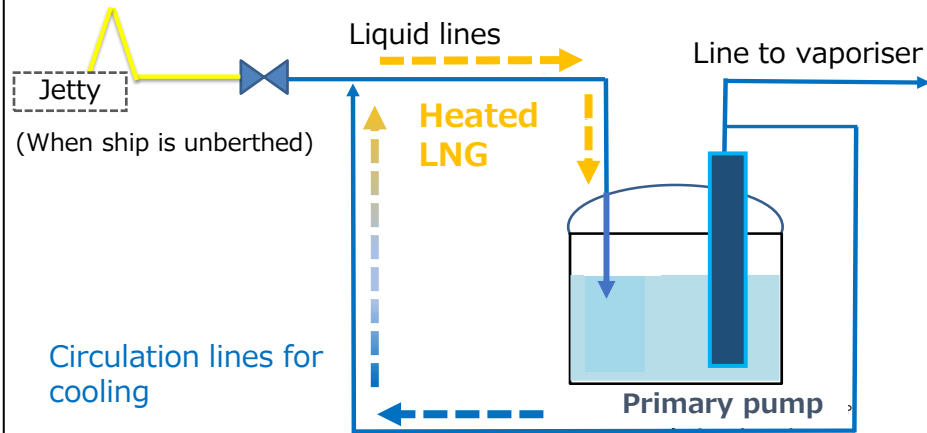


Optimization Measures – 2

2. Cooling-system for shore liquid lines

- Reduction in electricity usage :
125,000 kWh* per year
*equivalent about 62 tons of CO2 emissions

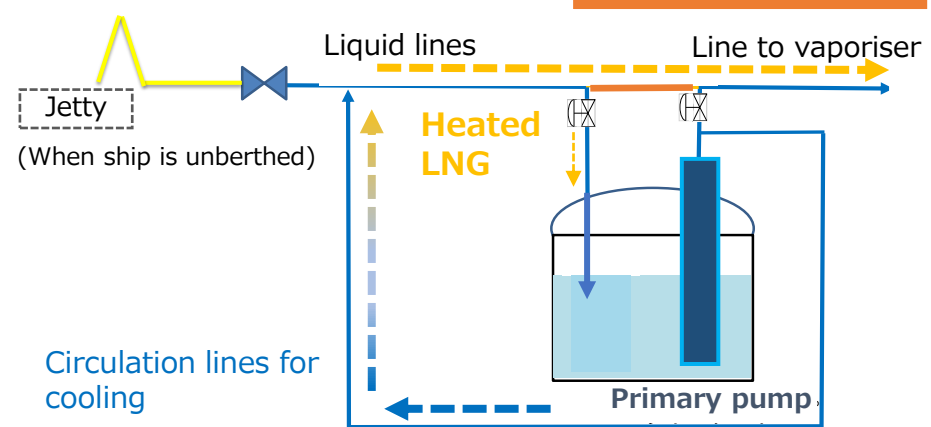
Standard operation at LNG terminals



- Heated LNG during circulation is returned to the shore tanks.

Hachinohe terminal

Patented 2015



- Heated LNG during circulation is sent directly to vaporiser
 - >> Reduce BOG generation
 - >> Enable installation of smaller pump as a result of little LNG circulation (less investment cost)

Other optimization measures

- ✓ Multi-skilled operators.

Staff in charge of LNG receiving operation also handles LNG lorries loading, maintenance work, etc..

- ✓ Plan for future installation of solar panels to reduce CO2 emission

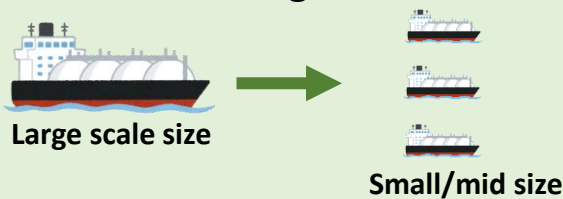


LNG STS at Hachinohe LNG Terminal jetty

- ✓ In Japan, STS operation of LNG is prohibited in principle.
- ✓ However, our safety measures at Hachinohe jetty have been accepted and we are preparing to commence the first commercial STS operation in near future.
- ✓ This new operation will provide access to **new marketing possibilities** for LNG industry players and help to **improve vessel optimization**.

<Model Case>

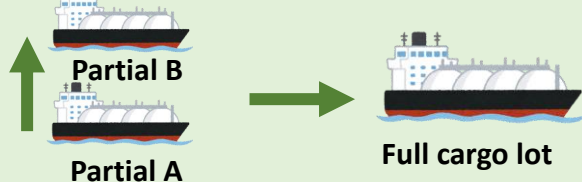
Breaking bulk



Breaking bulk from full size to small or mid size

- Enable supply to LNG terminals where only small or mid size can be received.

Consolidate



Combining partial cargoes

- Transshipping cargo from A to B to create a new full cargo
- Make vessel (A after STS) available to load a full cargo for next voyage.

Optimization



Transshipment from vessel to vessel

- Transshipment from high-cost vessel like ice class to less expensive vessel can reduce costs and result in optimization of fleet operations.

ENEOS' Commitment
Safe operation & Operational efficiency



Thank you for your kind attention