

Innovation for Cool Earth Forum(ICEF)
11th Annual Meeting

**NYK's Decarbonization Strategy & initiative for Net-Zero
Emission by 2050 by aspect of Ammonia as a marine fuel**



2024/10/10

Tsutomu Yokoyama
Executive Officer
NYK Line



Company Overview

■ Company Name

Nippon Yusen Kabushiki Kaisha (NYK Line)

■ Founded

September 29, 1885

■ Business Lines

Comprehensive logistics business, mainly international marine transportation, as well as cruise ship business, terminal and harbor transport-related business, marine transportation peripheral business, real estate business, and other businesses.

■ Paid-in Capital

144.3 billion yen

■ Employees *As of March 31, 2024

35,243

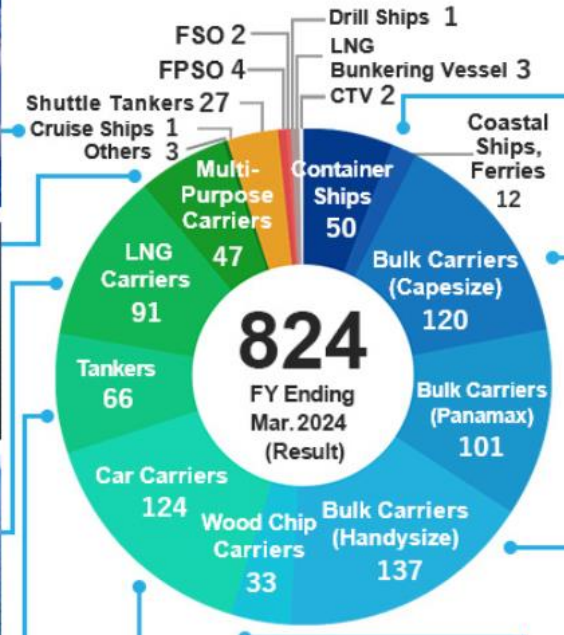
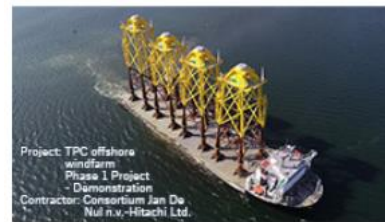
■ Revenues/Recurring Profit *Fiscal 2023 Results

Revenues: 2.39 trillion yen

Recurring Profit: 0.26 trillion yen

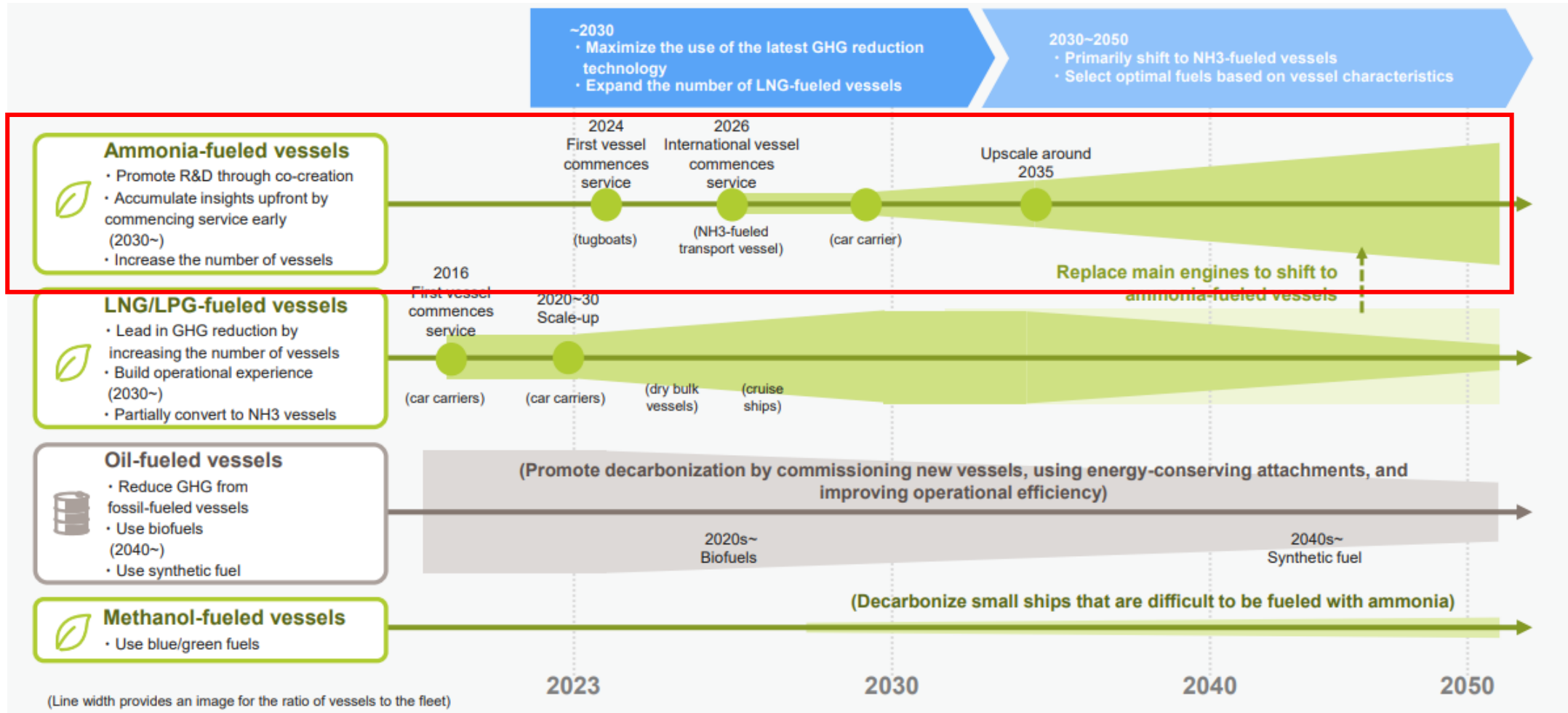
■ NYK Group Fleet *As of March 31, 2024

824 vessels



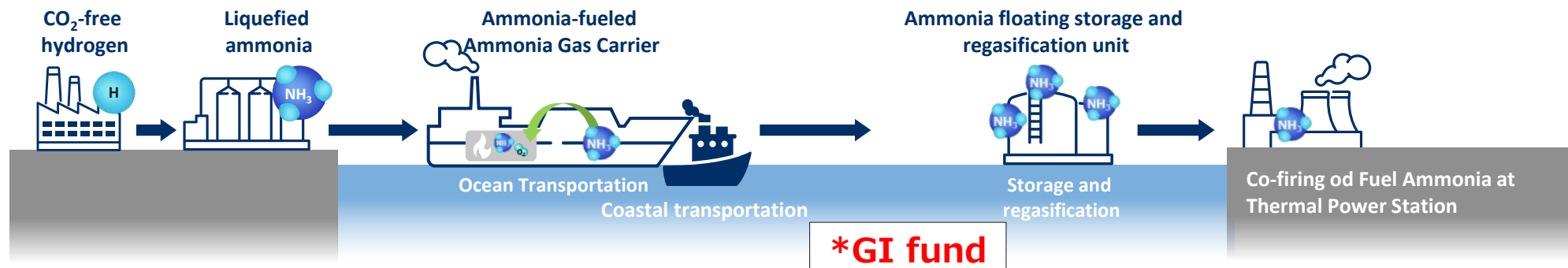
Marine Fuel Transition Scenario towards 2050

- Move forward towards net zero with various decarbonization measures
- Ammonia-fueled ship will play an important role in NYK's fuel transition









Our strategy to establish ammonia value chain

- Proactively establishing a value chain for ammonia
- By introducing ammonia fueled vessels, we contribute to the expansion of ammonia demand.



***GI fund**

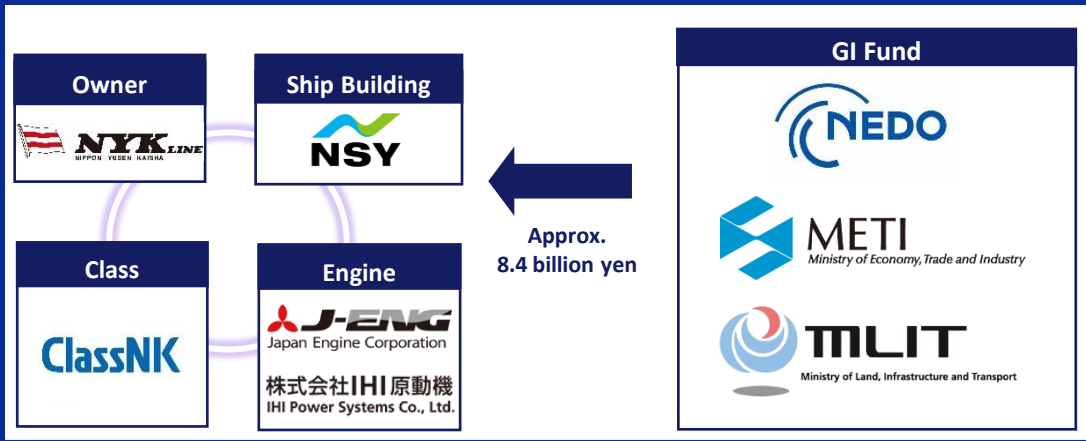
	Upstream	Transportation	A-FSRU	Marine fuel use		Bunkering
Ammonia	Blue/Green Ammonia Production business	Ammonia marine transportation	Ammonia Floating Storage Regasification Barge	Ammonia-fueled Tug-boat	Ammonia-fueled Ammonia Gas Carrier	Ammonia Bunkering
						

***Subsidy / Green Innovation Fund**

Development of ammonia-fueled ships

- In October 2021, our proposal to develop ammonia-fueled vessels was adopted as part of the Green Innovation (GI) Fund project.
- **Subsidy from Japan Government and NEDO is great help for introducing the ammonia-fueled vessel in early days.**

Ammonia-fueled Vessels Project (2021 ~ 2027)



Ammonia-fueled Tugboat (A-Tug)

- A-Tug delivered on 23rd Aug 2023

<Topic>

- Development of 4 stroke ammonia-fueled engine
- The world's first Truck to Ship ammonia bunkering
- The world's first commercially used ammonia-fueled vessel



Ammonia-fueled Medium Gas Carrier (AF-MGC)

- AF-MGC to be delivered on Nov 2026

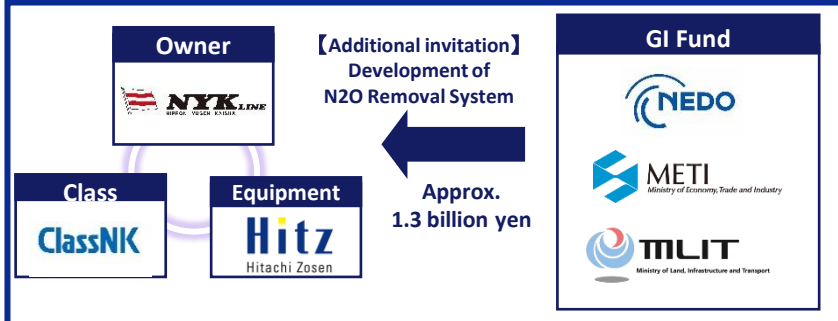
<Topic>

- Development of 2 stroke ammonia-fueled engine
- Highest level of safety design certified by Class NK to be installed (The world's first)



*image

N2O Reactor Project (2024 ~ 2027)

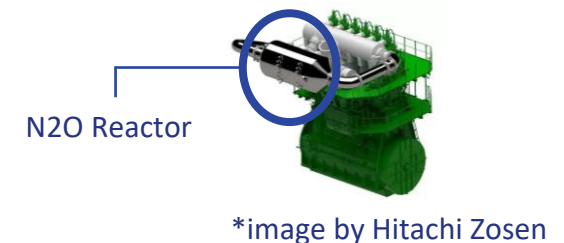


N2O (Nitrogen Dioxide) Reactor

- Adopted on Mar 2024 as one of the GI Fund Project
- To be installed on AF-MGC

<Topic>

• Towards 2050 Net Zero Emission, Trying to realize more environmentally-friendly AF-MGC by removing N2O whose GWP is about 300 times that of CO2.



Efforts on Ammonia-fueled Tugboat

1. World's First Commercial-Use Ammonia Vessel

- On 23rd August, A-Tug "Sakigake" has completed the modification process at Keihin Dock Co. Ltd.
- A-Tug is the world's first commercial-use ammonia vessel, currently on a harbor tugboat business.

2. World's First Truck to Ship Ammonia Bunkering

- On 17th July, A-Tug has completed the world's first Ammonia Bunkering by Truck to Ship method with JERA and Resonac.
- With the cooperation of City of Yokohama, ammonia bunkering has held in port of Yokohama.

Development of Ammonia-fueled Tugboat

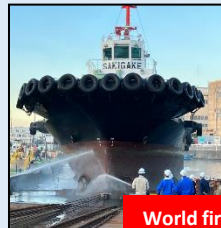
LENGTH (O.A.)	37.20m
BREADTH (mld)	10.20m



July 2022
Obtained world first AIP for Ammonia-fueled Tugboat



May 2023
succeeded 80% combustion test (4-stroke NH3 engine)



October 2023
conversion of LNG fueled started (at Keihin Dock)



February 2024
Main Engine installed to A-Tug



July 2024
Truck to Ship Ammonia Bunkering



Aug 2024
A-Tug Delivered on 23rd Aug
World's First Commercial-use Ammonia-Fueled Vessel

Efforts on Rule-Making & Collaboration with Overseas Partners

World's First Machine Room Safety Accreditation for AF-MGC to be granted by ClassNK



- Our consortium has been thoroughly working on ship's specification to protect crews from toxic risks.
- **World's first** MRS (Machine Room Safety) Notation is to be granted by ClassNK, **which means the world's highest level of safety beyond the minimum design requirements.**
- Our consortium continuously works on development of AF-MGC and contributes to establishment of safety rules for ammonia-fueled vessels.

NYK are working for decarbonization as a member of overseas associations.

GCMD
(Global Centre for Maritime Decarbonization)



NYK contributes to the GCMD as an expert on bunkering rule development.

MMMCZCS
(Maersk Mc-Kinney Moller Center for Zero Carbon Shipping)

**Mærsk
Mc-Kinney
Møller Center**
for Zero Carbon Shipping

The center is committed to seeing commercially viable deep-sea zero-carbon vessels powered by zero-carbon fuels

NYK also works with **overseas leading companies (Jera, BHP etc)** for pursuing decarbonization.



Sustainable Marine Transport



Ammonia to Zero.

アンモニアで地球を救え。



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