

ICEF 2022 NYK's Green Business

6, October 2022

NYK Line

Green Business Group

General Manager

Tsutomu Yokoyama

About NYK – Overview

Company Name

Nippon Yusen Kabushiki Kaisha
(NYK Line)

Established

September 29, 1885

Paid-in Capital

JPY144,319,833,730

Number of Employees as of March 2022

35,165

Main activities

- Liner & Logistics Business (Liner Trade, Air Cargo, Transportation, and Logistics)
- Bulk Shipping Business
- Others Business (Real Estate and Other)



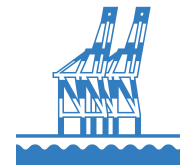
Air Freighter

8 aircrafts
6,007 flights
in 2021



Terminal

Operating at
20 ports
in 2022



Logistics Center

639 locations
2.7 million m²
in 2022



Decarbonization Trend in Shipping

- International shipping accounts for **2.0%** of the world's CO2 emission

IMO



- by 2030: 40% or more CO2 reduction (vs 2008)
- by 2050: 50% GHG reduction (vs 2008) * Goals set in 2018
- **IMO plans to adopt a resolution in 2023 at MEPC80 to set net-zero at 2050.**
* MEPC: Marine Environment Protection Committee

Japan



- Oct 2021: **Declared Carbon Neutrality in International Shipping 2050,**
Agenda proposed to IMO

NYK



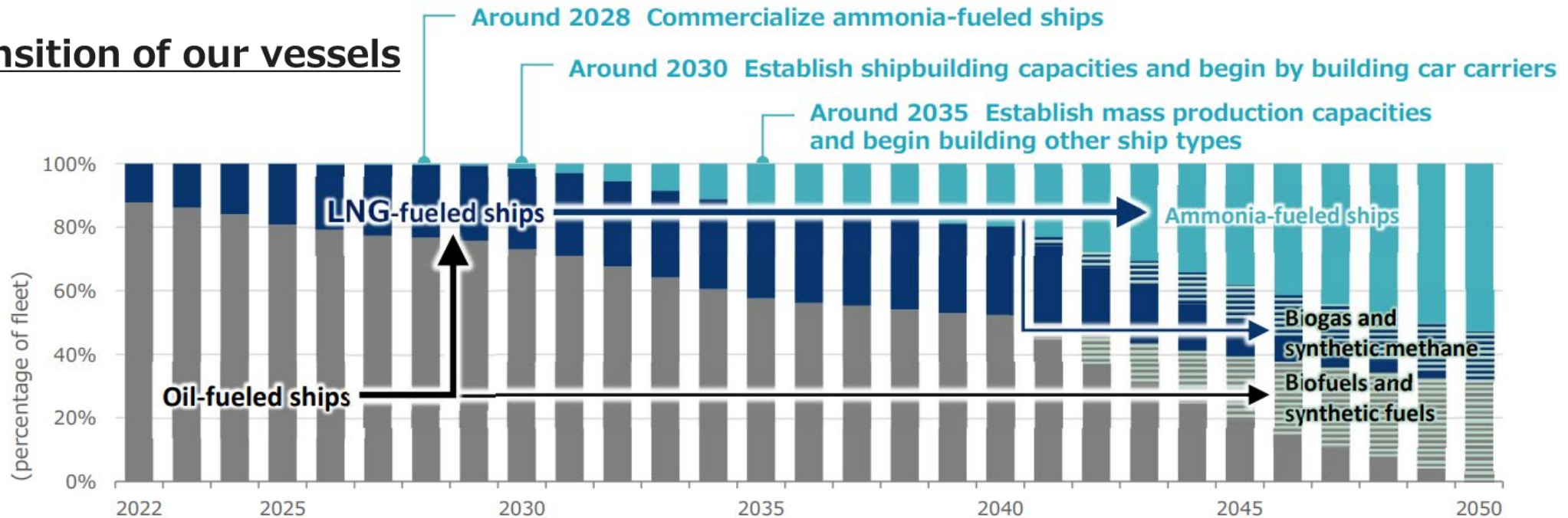
- Sep 2021: **Declared a long-term target of net-zero emissions of GHG by 2050**
for the NYK Group's oceangoing businesses.

Our Plan to Achieve Net-Zero by 2050

NYK Fuel Transition Plan

- Target **ammonia** as one of the most realistic alternative clean marine fuels
- Continue to explore other options as well (e-methanol, H2, biofuel etc.)
- Focus on **LNG** as **immediate low-emission measure** and as a **bridge solution**










Transition of our vessels



*1 LNG-fueled ships include LNG carriers.

*2 The amount of investment in ships powered by zero-emission fuels is premised on the introduction of ammonia-fueled ships.

Japan's maritime industry leads global maritime decarbonization in R&D and the realization of ammonia-fueled ships

Project 1 (Coastal vessel)	Project 2 (Oceangoing vessel)		
<p>Ammonia Fueled Tugboat (A-Tug)</p> 	<p>Ammonia Fueled Ammonia Gas Carrier (AFAGC)</p> 	<p>Shipping</p> 	<p>Shipbuilding</p> 
<ul style="list-style-type: none"> • Delivery scheduled in FY2024 • Concluded contract for the conversion from LNG-fueled tugboat in Jun 2022 • AiP awarded in July 2022 	<ul style="list-style-type: none"> • Delivery scheduled in FY2026 • Completed HAZID in July 2022 • AiP awarded in September 2022 	<p>Class</p> 	<p>Engine</p>  <p>Japan Engine Corporation</p> <p>株式会社IHI原動機 IHI Power Systems Co., Ltd.</p>
		<p>Japanese Government</p>   	

HAZID: Hazard Identification
AiP: Approval in Principle

This project was granted a subsidy of **8.4 billion Japanese Yen** through **the Green Innovation Fund**.

- **The world's 1st HAZID** study for AFAGC as a condition for approval of Alternative Design completed in July 2022
- **Approval in Principle** for AFAGC design awarded in September 2022 at Gastech Milan.

Project has passed the critical milestone, and continues to make further progress toward realising AFAGC **by FY2026**

Challenges of Ammonia Fueled Ship Design		
Flame retardance	VS	Stable combustion
N2O emissions	VS	ZERO emissions
Toxicity to humans	VS	Safety

Alternative Design
<ul style="list-style-type: none"> ■ No international regulations exist for the use of ammonia as a marine fuel. ■ An alternative design is necessary to deliver AFAGC before international regulations are enacted. ■ An alternative design will be required to secure a safety level equivalent to existing liquefied gas fueled ships.



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Contributions in Industry Associations

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

MMMCZCS

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

Maersk
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**

Founding Partners



GCMD

(Global Centre for Maritime Decarbonization)



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

Founding Partners





免責事項

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