# **Ammonia Energy Association 2025 APAC Ammonia Energy Conference**

# NYK's Decarbonization Strategy and Efforts for Adopting Ammonia as a Marine Fuel

16th June 2025

Jack Jones, General Manager







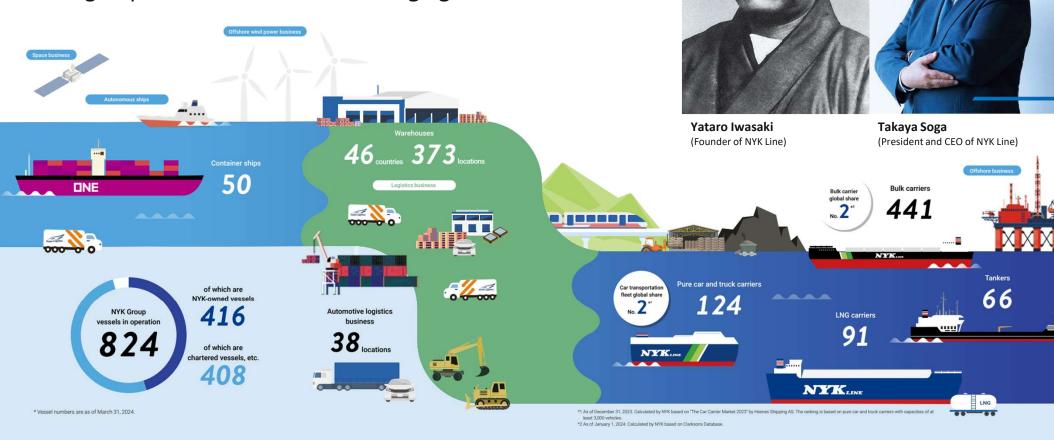
# NYK Line (Nippon Yusen Kabushiki Kaisha)

NYK Group was established in 1885.

The founder of the company is Yataro Iwasaki.

He started the business as an original company of Mitsubishi.

Our group mission statement is "Bringing Value to Life".



# Advancing Initiatives Aimed at Net-Zero Emissions



# Ship Fuel Conversion Scenario toward 2050



#### Ammonia-fueled vessels

- · Promote R&D through co-creation
- · Accumulate insight upfront by commencing service early (2030-)
- Increase the number of vessels



#### LNG/LPG-fueled vessels

- ·Lead in GHG emissions reductions by increasing the number of vessels
- ·Build operational experience (2030-)
- ·Partially convert to NH3 vessels



#### Oil-fueled vessels

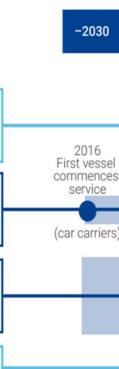
- · Reduce GHG emissions from fossil-fueled vessels
- ·Use biofuels (2040-)
- ·Use synthetic fuel



#### Methanol-fueled vessels

·Use blue/green fuels

(Line width indicates the ratio of vessels to the fleet.)



 Maximize the use of the latest GHG emissions reduction technology

P.36

2026

International vessel

·Expand the number of LNG-fueled vessels

commences service commences service

P.40

2024

First vessel

Scale-up

2030-2050

Scale up around 2035

 Primarily shift to NH3-fueled vessels Select optimal fuels based on vessel

Replace main engines to shift to (tugboats) (NH<sub>3</sub>-fueled (car carrier) transport vessel) ammonia-fueled vessels 2020-30

(car carriers) (dry bulk vessels) (cruise ships) (tankers)

2020s-

(Promote decarbonization by commissioning new vessels. using energy-conserving attachments, and improving operational efficiency)

> Synthetic fuel Biofuels (Decarbonize small ships that are

difficult to be fueled with ammonia)

2030 2040





**Midstream** (Transportation)



**Downstream** (Bunkering / Use)

2040s-

Proactively establish the value chain for fuel ammonia

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(Ammonia Fueled Ammonia Gas Carrier)







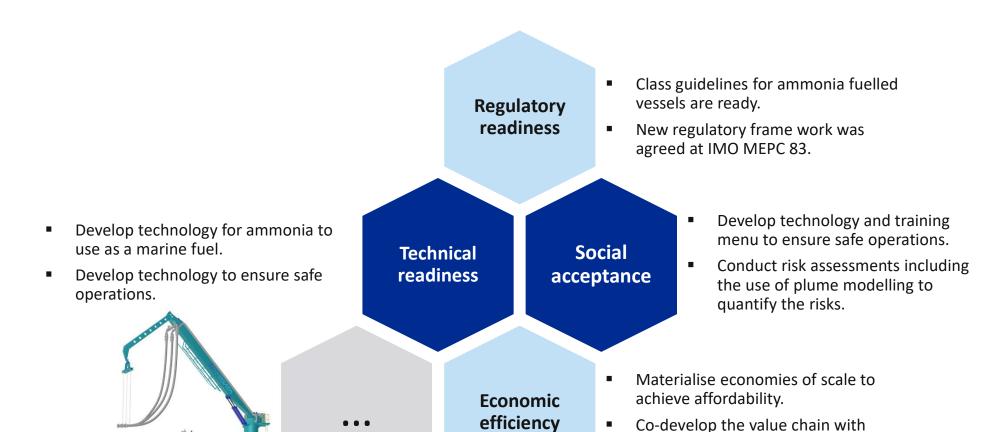


2050

# Game Plan for Ammonia as Marine Fuel Adoption



☐ Four key elements to establish the value chain for fuel ammonia



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various industry to lower to cost.

# NYK's effort to improve Technical readiness



The development of ammonia-fueled vessels has been steadily progressing, A-tug has been completed world's first demonstration voyage, achieving GHG emission reductions of up to about 95%.



A-tug "Sakigake"

'24/7

# World's first Truck to Ship ammonia bunkering at Yokohama.

 Procurement of ammonia derived from waste plastic from JERA and Resonac.



'24/8

### Retrofitted at the Keihin Dock Oppama (NYK subsidiary)

- World's first ammonia-fueled commercial vessel.
- After the delivery, the vessel was chartered to Shin-Nippon Kaiyosha (NYK subsidiary) and engaged in tug & towing operations in Tokyo Bay.

3 months verification of demonstration voyage to review safe operation and emission.

Confirmed GHG reduction was up to about 95%.

'25/3

## Ceremony to mark completion of the A-Tug project.





#### Ammonia co-firing rate/GHG reduction rate

M/E load	100%	75%	50%	25%
NH3 Co-firing rate	95.2%	94.8%	93.4%	91.1%
GHG reduction rate*	94%	94.4%	93.0%	90.3%

\*GHG emission compared to Fuel Oil



#### arget in Nov 2026

## **Ammonia Fueled Ammonia Gas Carrier**

☐ Dec 2023 NYK signed the Ship Building Contract to build an Ammonia-Fueled Ammonia Gas Carrier (AFAGC).



□ Nihon Shipyard (NSY) have developed the design and plans to acquire the classification code MRS\* from NK.

\*Machinery Room Safety for ammonia

### Ammonia-Fueled DF main engine (J-ENG)

- High mixing and firing rates (approx. 95%) achieved in single-cylinder tests. Limited N2O emissions.
- Ammonia operation in actual equipment tests started in April 2025.





to be delivered in Oct 2025

# <u>Ammonia-fuelled DF auxiliaries</u> (IHI Power System)

 High mixing and firing rates (approx. 80%) achieved through field trials.





to be delivered in Aug 2025

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# Ammonid to Zerousexa.





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