

Environment

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- Organization
- Risk and Opportunity Assessment Process

Strategy and Risk Management

- Scenario Analysis and Identification of Risks and Opportunities
- Net Zero Achievement Scenario
- NYK SUPER ECO SHIP 2050

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Our Group has established a management system in which we analyze the risks and opportunities associated with the impact of climate change on our corporate activities and businesses over the medium to long term, incorporate those risks and opportunities into our management strategy, and promote our responses to them. Please see “Environmental Management” for the governance structure of environment-related issues, including responses to climate change.

For more information, click on the link below

[P.030 Environmental Management](#)

Risk and Opportunity Assessment Process

In our Group, based on consultation from the Chief Executive of Sustainability & Transformation Headquarters, the Sustainability Strategy Committee discusses risks and opportunities associated with climate change while considering the contents presented by each business unit. The Sustainability & Transformation Headquarters compiles the details on the matters discussed by the Sustainability Strategy Committee, and reports the same to the Directors and management personnel.

The Risk Management Committee, chaired by the President and composed of chief executives of respective departments, manages and evaluates risks that can potentially have a significant impact on the Company as a whole, and risks associated with climate change. The Sustainability & Transformation Headquarters and Risk Management Committee work closely together to integrate such risks into the company-wide risks, and report them to the Directors twice each fiscal year.

Strategy and Risk Management

The Group considers the transition to a decarbonized society as an opportunity, and actively promotes initiatives to achieve low-carbon emissions and decarbonization, aiming for sustainable growth by decoupling environmental impact and business activities. We will continue to contribute to the realization of a sustainable society by strengthening our own competitiveness through decarbonization initiatives, making proactive, forward-looking investments that respond to social demands for a decarbonized society, and creating mutual benefits with our stakeholders.

Scenario Analysis and Identification of Risks and Opportunities

Our group recognizes that it is important to assess risks and opportunities using scenario analysis for climate change and understand the impact of these risks and opportunities on our business strategy and performance. From the long-term business operations perspective, we continue to work towards managing risks and identifying opportunities based on rational scenarios by factoring in climate change elements into our own transportation demand forecast.

In the “Disclosure Report Based on Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD)”, the business environment and strategies in 2050 are organized and disclosed using climate change scenarios for the “1.5°C scenario” and the “~4°C scenario”. See “Disclosure Report Based on Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD)” for details on the scenario analysis by each business segment.



For more information, click on the link below

<https://www.nyk.com/english/sustainability/pdf/environment005en.pdf>

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• Main Anticipated Risks and Opportunities Associated with Climate Change

Our Group continues to assess and manage the various potential risks and opportunities due to climate change, and strives to strengthen our competitiveness while evaluating the long-term impact on our business operations.

Risks and opportunities Associated with Climate Change	Impact on the Group	Manifestation timing	Business sectors				Impact on Business				Strategy			
			Liner & Logistics	Bulk Shipping			2030		2050					
				Dry Bulk	Energy	Auto-motive	1.5-2°C	≤ 4°C	1.5-2°C	≤ 4°C				
Transition risks/opportunities	Regulations	Risk	Tighter GHG emission regulations by the IMO and each country's authorities may increase the burden of investment in lowcarbon technologies. In addition, there is a possibility that operating costs will increase due to the pricing for GHG emissions from vessels operated by the NYK Group.	Short-medium term	○	○	○	○	Small	Small	Small	Small	<ul style="list-style-type: none"> • NYK Group aims to reduce GHG emissions and gain environmental advantage ahead of future regulations. • Key actions: <ul style="list-style-type: none"> – Improve ship efficiency through DX and adopt LNG-fueled vessels. – Invest in ammonia-fueled vessels to cut emissions by over 80%. – Gradually switch to biogas, synthetic fuels, and biofuels. – By 2050, plans to invest approx. ¥2.1 trillion in low-carbon vessels. Carbon-related costs will be appropriately reflected in freight rates. • NYK Group secures skilled seafarers through in-house training in the Philippines and crew management in Singapore. • Also exploring ship management services as a new business opportunity. • NYK Group transports diverse cargo with a balanced portfolio. • To boost resilience, it will: <ul style="list-style-type: none"> – Strengthen core businesses. – Explore new growth areas. • By 2050, plans to invest: <ul style="list-style-type: none"> – ¥3.6 trillion in core businesses. – ¥1.2 trillion in new growth areas. • NYK Group leads in investing in low-/decarbonized vessels, with 127*1 vessels announced as of March 2025. • Plans to invest ¥2.1 trillion by 2050, but will adjust based on tech progress and social trends. • NYK Group sees LNG-fueled vessels as a practical way to cut GHG emissions by the early 2030s. • Plans to introduce zero-emission vessels using ammonia and hydrogen by the mid-2030s. • Is assessing drop-in fuels like biofuels and bio-LNG to enable gradual decarbonization using existing ships. • NYK Group promotes sustainable financing*2 to support environmental efforts, including climate change. • Shares policies through its website and integrated reports (NYK Report). • Has raised tens of billions of yen in funds. • Will continue using sustainable financing to balance environmental investment and earnings. • Simulations show only a slight increase in severe weather risk for NYK's fleet. • To ensure safe and efficient navigation, NYK implements: <ul style="list-style-type: none"> – Route optimization support using its own system. – Storm avoidance simulations by land-based operators who guide vessels. • Final decisions remain with the captain, but shared data (e.g. costs, arrival times, customer needs) helps minimize risks and fuel use. • These efforts are part of NYK's Sustainability Management. • Most terminals used by NYK vessels are operated by public or third-party entities, so sea level rise poses limited asset risk. • NYK has conducted quantitative assessments for climate-related flood and wind damage risks. • For low-lying properties and warehouses, NYK is converting leases to allow flexible responses to rising sea level risks. • Climate change is expected to negatively impact NYK's business the Panama Canal transit. • Simulations show Gatun Lake water levels will decline as global warming progresses. • The Panama Canal Authority is taking water-saving measures, but NYK will continue to monitor and request improvements if needed. 	
	Technology	Risk	The number of highlyskilled seafarers who can operate LNG-fueled and next-generation fuel vessels is currently limited, and there is a possibility that there will be a shortage of seafarers in the future.	Short-medium term	○	○	○	○	Medium	Small	Medium	Small		
		Opportunity	The demand for highlyskilled seafarers will increase, which could create new business opportunities for ship management companies with these personnel.	Short-medium term	○	○	○	○	Medium	Medium	Large	Medium		
	Market	Changes in shipment and transportation demand	Risk	Demand for existing energy resources with high GHG emissions is expected to decrease, and there is a risk of a decrease in revenue opportunities in the dry bulk energy transportation business.	Long term	○	○	○	Small	Small	Large	Medium		
			Opportunity	In light of the increase in demand for renewable energy, the offshore wind power value chain, and the transportation business of hydrogen, ammonia, biofuel, etc. is expected to expand.	Long term	○	○	○	Small	Small	Large	Medium		
		Rapid changes in customer Trends	Risk	There is a risk of customer attrition due to delays in efforts to reduce GHG emissions.	Long term	○	○	○	○	Small	Small	Large		Medium
			Opportunity	Growing demand for marine transportation services that have low GHG emissions could favor companies that are ahead of the curve in related investments.	Long term	○	○	○	○	Small	Small	Large		Medium
	Decline in asset value due to delays in the decarbon ization of the NYK Group fleet	Risk	Delays in the decarbonization of the fleet (including the earlier-than expected popularization of zeroemission vessels) may lead to increased carbon pricing for existing fuel vessels, resulting in a potential decline in asset value.	Long term	○	○	○	○	Small	Small	Medium	Small		
		Cost of funding activities	Risk	We may not be able to utilize sustainable financing*2, etc., and may have to conduct funding activities under conditions that are less competitive compared to our competitors.	Short-medium term	○	○	○	○	Small	Small	Medium		Small
	Opportunity		By securing our environmental advantage, there is an opportunity to utilize sustainable financing and reduce funding costs.	Short-medium term	○	○	○	○	Medium	Medium	Large	Medium		
Physical Risks	Acute	Risk	The vessels the NYK Group operates are constantly exposed to the risk of encountering stormy weather in various marine regions of the world. In particular, the impact of typhoons, monsoons, and giant cyclones in highlatitude regions is significant, and in recent years, cases of vessels being affected just by typhoons have been on an increasing trend. If a vessel encounters stormy weather, there may be additional fuel costs associated with route changes to avoid the storm zone, or additional fuel costs associated with increased speeds to maintain the transportation schedule.	Long term	○	○	○	○	Small	Small	Small	Small		
	Chronic	Risk	Among the assets held by the NYK Group, real estate, warehouses, terminals, and port facilities located in lowlying areas may become unusable due to rising sea levels as a result of climate change. In addition, as an operational risk, due to the limited number of operating ports, there is a possibility that ships may incur demurrage, etc.	Long term	○	○	○	○	Small	Small	Small	Medium		
	Acute	Risk	The Intergovernmental Panel on Climate Change's 6th Assessment Report (IPCCAR6) predicts that the area around Panama will become hotter and drier. There is concern that the risk of drought will increase in the future, as the water level in Gatun Lake, the source of the Panama Canal, has been dropping in recent years, causing drought problems. As global warming is expected to continue to increase the range of annual rainfall fluctuations, there is concern that the risk of both flooding and drought will increase further.	Short-medium term	○	○	○	○	Medium	Medium	Medium	Large		

*1 127: vessels of our related companies

*2 Financial methods specialized in addressing climate change, environmental destruction, and human rights issues

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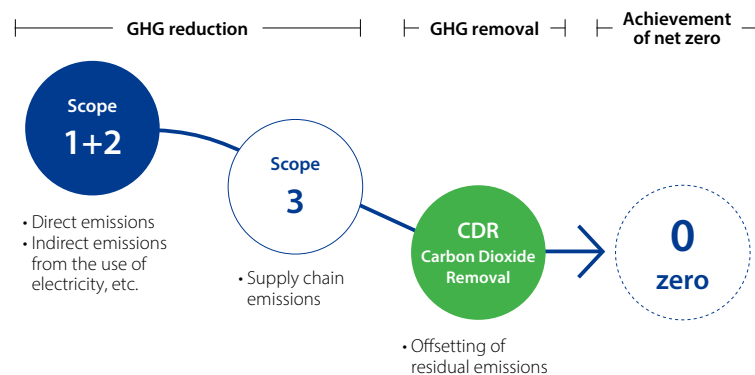
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Net Zero Achievement Scenario

To achieve net zero GHG emissions by 2050, our Group has formulated a scenario that takes a two-pronged approach of “reducing” and “removing” the GHG emissions. With steady implementation of this scenario, we aim to support the decarbonization of society from the perspective of marine transport, and ultimately to realize a sustainable society.

■ Aiming for Net-Zero GHG Emissions through a Reduction and Removal Approach



■ Scenario for Achieving Net Zero



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● Path to Net Zero / Reducing GHG Emissions

Our plan is to gradually deepen our efforts to reduce Scope 1 and 2 GHG emissions using two strategies. We will pursue Strategy ①, in which we will maximize energy efficiency (operation/specifications) till 2030, and then we will aim for Strategy ②, in which we will accelerate the use of alternative fuels after 2030.

With regards to Scope 3, we will share data with stakeholders and work with them in parallel with Strategies 1 and 2, with an aim to build an ecosystem through the creation of a low-carbon value chain.

> Scope 1, 2 Strategy ① Maximize Energy Efficiency (Operation/ Specification)

We will promote the reduction of GHG emissions from our existing fleet by improving daily operations and energy efficiency.

> Scope 1, 2 Strategy ② Acceleration through Alternative Fuels

Starting in 2030, we will introduce alternative fuel vessels that take into account other environmental impact in addition to GHG emissions, and build a resilient fleet portfolio.

■ Scope 1,2 Strategy ①

Improvement of ship operation efficiency

Collaborating with customers to enhance frameworks and management aimed at maximizing the efficiency of vessel operations

Executive Officers and Heads of Groups representing respective group

Sustainability Strategy Committee

Management / Vessel Operator

GHG Reduction Task Force / IBIS* Challenge

Sharing and Integration of GHG Reduction Plans, Actions, and Achievements Across Investment, Sales, Vessel Operations, and Group Company Management

All employees

IBIS Frontier

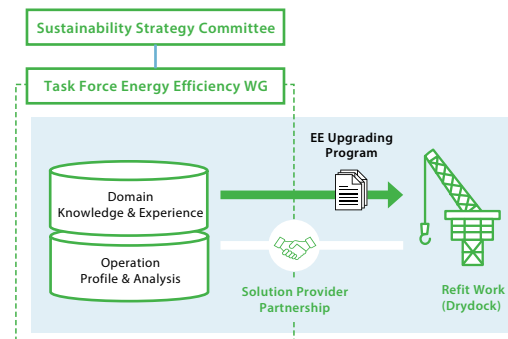
Study Session on Decarbonization and Sustainability for All Group Employees

*IBIS: Innovative Bunker and Idle-time Saving

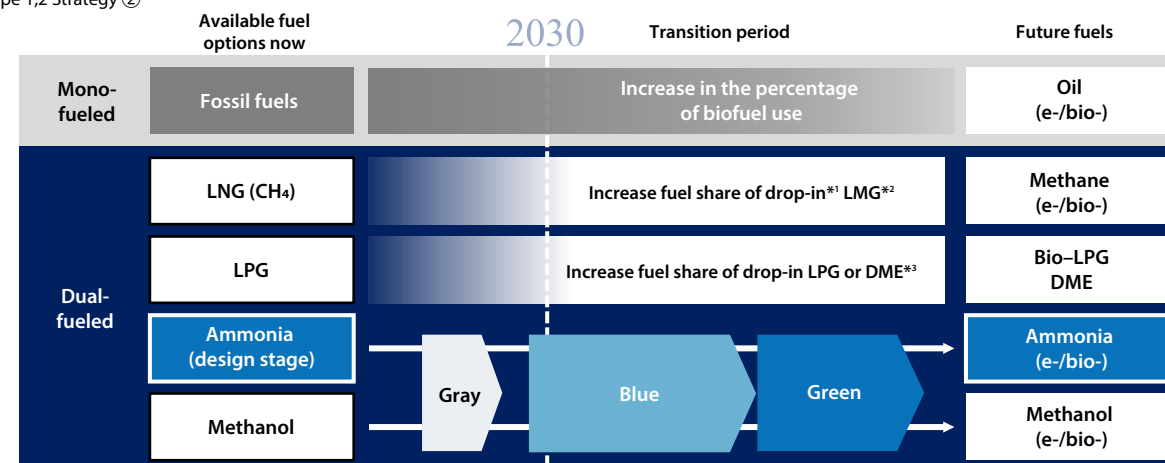


Enhancement of technical capabilities

Working with external partners to improve energy efficiency



■ Scope 1,2 Strategy ②



*1 Drop-in: Fuel that can be used without requiring remodeling the ship or its engines. *2 LMG: Liqueed Methane Gas *3 DME: Dimethyl Ether

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● Path to Net Zero / GHG Removal

In order to cover the remaining GHG emissions that are difficult to shift to zero emissions, we will invest in and participate in projects to build a value chain for carbon capture, utilization, and storage (CCUS) that utilizes negative emissions technology (NETs)*. We will also work to create new green businesses through carbon credits.

*Negative Emission Technology (NETs): A general term for technologies that capture and remove CO₂ from the atmosphere or the ocean

> Internal Carbon Pricing (ICP)

Our Group introduced an internal carbon pricing system (ICP) in fiscal 2020, and we are using it as reference information to aid investment decisions at the Investment and Credit Council and the Management Meeting in which investment decisions are deliberated. By linking financial information and GHG emissions using ICP, we visualize the value of GHG emissions reductions and promote sound decision-making by unifying the evaluation criteria for various departments and projects. The applicable prices are set at US\$120/t-CO₂ until fiscal 2026, US\$200/t-CO₂ from fiscal 2027 to fiscal 2030, and US\$250/t-CO₂ from fiscal 2031 onwards.

NYK SUPER ECO SHIP 2050

In November 2018, NYK in collaboration with our group company MTI Co., Ltd., and Elomatic, a Finnish marine technology consulting firm, devised "NYK Super Eco Ship 2050" to achieve GHG reduction targets and realize the decarbonization of ships.

Equipped with the revised individual elemental technologies of the "NYK Super Eco Ship 2030" concept ship announced in 2009, this ship is a new zero-emission concept ship that reduces GHG emissions by 100% through the use of hull modifications, weight reduction, increased efficiency, and digitalization.

In the future, we will continue to promote collaboration with a wide range of global partners in the maritime industry with the aim of researching, developing, verifying, and introducing the elemental technologies set out in the NYK Super Eco Ship 2050.



For more information, click on the link below

<https://www.nyk.com/english/sustainability/pdf/environment006en.pdf>
<https://www.youtube.com/watch?v=wXJTbcUjxmk>

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In November 2023, our Group announced the "NYK Group Decarbonization Story" in which we established decarbonization strategies and GHG reduction targets towards 2050. In October 2024, our Group released "Progress Report 2024 as an annex to the NYK Group Decarbonization Story", detailing the progress and specific initiatives undertaken over the past year.

In January 2025, the Group also published an official position paper on carbon dioxide removal (CDR). By leveraging CDR technologies, we aim to achieve net-zero greenhouse gas emissions by 2050.

[Link](https://www.nyk.com/sustainability/pdf/environment003.pdf) For more information, click on the link below.
NYK Group Decarbonization Story
<https://www.nyk.com/sustainability/pdf/environment003.pdf>

New Decarbonization Goals

Since the medium-term management plan announced in 2018, our Group has disclosed greenhouse gas emission reduction targets and has been steadily working to achieve these targets. In recent years, the movement towards decarbonization in the international shipping industry has been gaining momentum. In the light of this global trend, for our Group to continue to be a presence that is needed by society and industry, we have revised our medium to long term environmental targets (announced in 2018; 30% reduction in CO₂ emissions from ships and marine transport by 2030 compared to 2015, and a 50% reduction by 2050), and we have revised our targets to achieve a 45% reduction by 2030 (Scope 1+2) and net zero by 2050 (Scope 1+2+3) with 2021 as the base year. Details of the latest GHG reduction targets are as follows.

To reduce emissions, we have changed from an efficiency target to a total emissions target (in accordance with the 1.5°C scenario of the Paris Agreement).

Target year	FY2030	FY2050
Scope 1+2 for the entire group	45% reduction (compared to fiscal 2021)	Net Zero
Scope 3 for the entire group	–	

Past GHG emission reduction targets are as follows.

Established	2018	2021
Publication Medium	Medium-term Management Plan "Staying Ahead 2022 with Digitalization and Green"	Green Pledge*
Type of Target	Efficiency	Total amount
Scope 1+2 for the entire group	Oceangoing ships + aircraft 30% reduction	Oceangoing ships Net Zero
Scope 3 for the entire group		
Target year	2030	2050
Base year	2015	–

* Green Pledge: On September 30, 2021, the NYK Group decided to set a long-term target for reducing GHG emissions related to its international shipping business of achieving "Net Zero Emissions by 2050".

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In addition to initiatives and activities aimed at decarbonization from three aspects; "GHG Reduction", "Zero GHG Emissions," and "GHG Removal", our Group is promoting research and development associated with the decarbonization technology.

Initiatives in Shipping

GHG Reduction

● Overview on Active Use of LNG (Liquefied Natural Gas)

Heavy fuel oil is currently the primary marine fuel used. However, its usage results in environmental destruction, including climate change. LNG, however, is a next-generation fuel that can significantly reduce CO₂, NOx (nitrogen oxides), and SOx (sulfur oxides) emissions.

Our Group positions marine LNG fuel as a bridge solution until zero-emission fuels become commercially viable, and has proactively invested in its development and deployment.

● Establishment of LNG fuel supply system

As an industry frontrunner, the Group has been actively developing its LNG fuel supply business. In 2017, our Group completed the world's first LNG fuel supply vessel and began supplying LNG to vessels operating in the North Sea and Baltic Sea in Europe. We have since established a reliable LNG fuel supply network and a system that enables stable operations from the outset, successfully transitioning into full-scale commercial use.

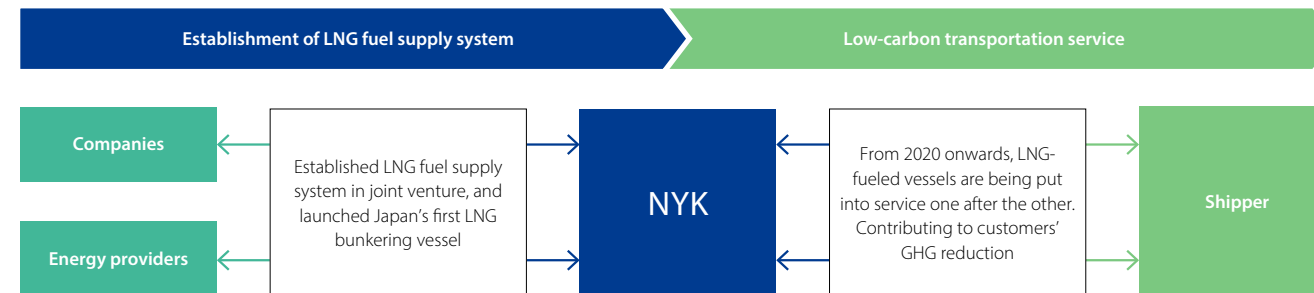
As a shipping company, we can contribute to the LNG-fueledemand side and the supply side. We are expanding our business globally in key locations and building an LNG-fuel value chain.

■ Progress in LNG fuel supply business

Month/Year	Event
Feb-17	NYK begins operation of the world's first LNG bunkering vessel, "Green Zeebrugge"
May-18	The four companies including Kawasaki Kisen Kaisha, Ltd., JERA Co., Inc.*1, Toyota Tsusho Corporation, and NYK establish two joint venture companies, Central LNG Shipping Co., Ltd. (CLS), and Central LNG Marine Fuel Co., Ltd. (CLMF) for the sale of LNG fuel in the Chubu region.
Jul-18	CLS orders an LNG fuel supply ship from Kawasaki Heavy Industries, Ltd. As the first LNG fuel supply ship in Japan, it is put into service in the Chubu region in 2020 and used for the LNG fuel supply business by CLMF
Feb-19	MLZ signs an LNG fuel supply agreement with Equinor ASA, a Norwegian multinational energy company. Starts supplying four shuttle tankers at the Port of Rotterdam and other locations from 2020.
May-19	The four companies, including Kyushu Electric Power Company Inc., Seibu Gas Co., Ltd., The Chugoku Electric Power Co., Inc. and NYK implement the first LNG fuel supply in the Setouchi and Kyushu regions.
Sep-20	The first LNG fuel supply ship ordered by CLS is named "Kaguya"
Oct-20	The LNG fuel supply vessel "Kaguya" carries out Japan's first "ship-to-ship" ^{**2} LNG fuel supply to the LNG-fueled pure car carrier "SAKURA LEADER."
Sep-21	The four companies, including Itochu Enex Corporation, Kyushu Electric Power Company Inc., Seibu Gas, Co., Ltd. and NYK sign MOU to jointly study the commercialization of LNG fuel supply for ships in the Kyushu and Setouchi regions. Full-scale study of building and owning LNG fuel supply ships
Feb-22	The four companies, including Kyushu Electric Power Company Inc., Itochu Enex Corporation, and Saibu Gas Co., Ltd., and NYK jointly establish KEYS Bunkering West Japan. Discussions on ship-to-ship LNG bunkering in western Japan
Mar-24	The LNG bunkering vessel "KEYS Azalea," which was built a joint venture between four companies; Itochu Enex Co., Kyushu Electric Power Company Inc., Seibu Gas Co., Ltd., and NYK is complete.
Nov-24	The LNG supply vessel "Kaguya" completed its 100th LNG fuel supply operation.

*1 At the time of the establishment of CLS and CLMF in May 2018, Chubu Electric Power Co., Ltd.

**2 Ship to Ship: A method of bunkering where an LNG bunkering vessel comes alongside an LNG-fueled vessel to supply LNG. This can be done at various locations, such as along the quay or pier or at anchor



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● Active Investment in LNG-Fueled Ships

In October 2020, Japan's first LNG-fueled pure car carrier, "Sakura Leader", was delivered. Designed to transport approximately 7,000 standard vehicles, it was one of the largest vessels of its kind in the world at the time. The vessel is expected to significantly reduce CO₂ emissions and achieves approximately 99% reduction in SO_x emissions and 86% reduction in NO_x emissions compared to conventional heavy fuel oil engines.

Furthermore, in 2019, the Group decided to build the world's first large LNG-fueled coal carrier, which was completed in 2024. In 2021, an order was placed for a Cape-size LNG-fueled dry bulker, further promoting sustainable maritime transport.

*Capsize: A bulk carrier having a deadweight tonnage of 120,000 tons or more. Ships between 60,000 tons and 120,000 tons are called Panamax carriers



LNG-fueled capsized dry bulk carrier "SG OCEAN"
(LNG dual-fuel engine-equipped ship)

● Utilization of Methanol Fuel

Methanol is a fuel with lower environmental impact compared to heavy fuel oil. Moreover, the use of bio-methanol and e-methanol—produced using hydrogen derived from renewable energy and CO₂ captured from the atmosphere—can significantly reduce greenhouse gas (GHG) emissions.

In May 2025, "Green Future", a methanol dual-fuel dry bulker time-chartered by NYK Bulk & Projects Carriers Ltd., was delivered.

This vessel is the NYK Group's first dry bulker equipped with a dual-fuel engine capable of operating on both methanol and heavy fuel oil.

● IBIS Project: Aiming for both Optimal Ship Operation and GHG-Emissions Reduction

The NYK Group is committed to pursuing safe operations with both high in quality and low in environmental impact, through various initiatives.

Since fiscal 2012, we promoted the IBIS (Innovative Bunker & Idle-time Saving) Project which focuses on optimal and economical vessel operations. Currently, our activities aim to simultaneously create both corporate value and social value by improving operational efficiency while reducing GHG emissions.

As part of the IBIS Project, we have established the "GHG Reduction Task Force / IBIS Challenge," which shares GHG reduction plans, actions, and results related to vessel operations, in addition to conducting educational sessions on decarbonization and sustainability for all group employees. Improving operational efficiency through this initiative is an essential element in achieving the NYK Group's decarbonization targets. We are systematically promoting sharing of best practices, such as communication between on-site employees and land-based operators, as well as remote support from land, to challenge more advanced operational practices.

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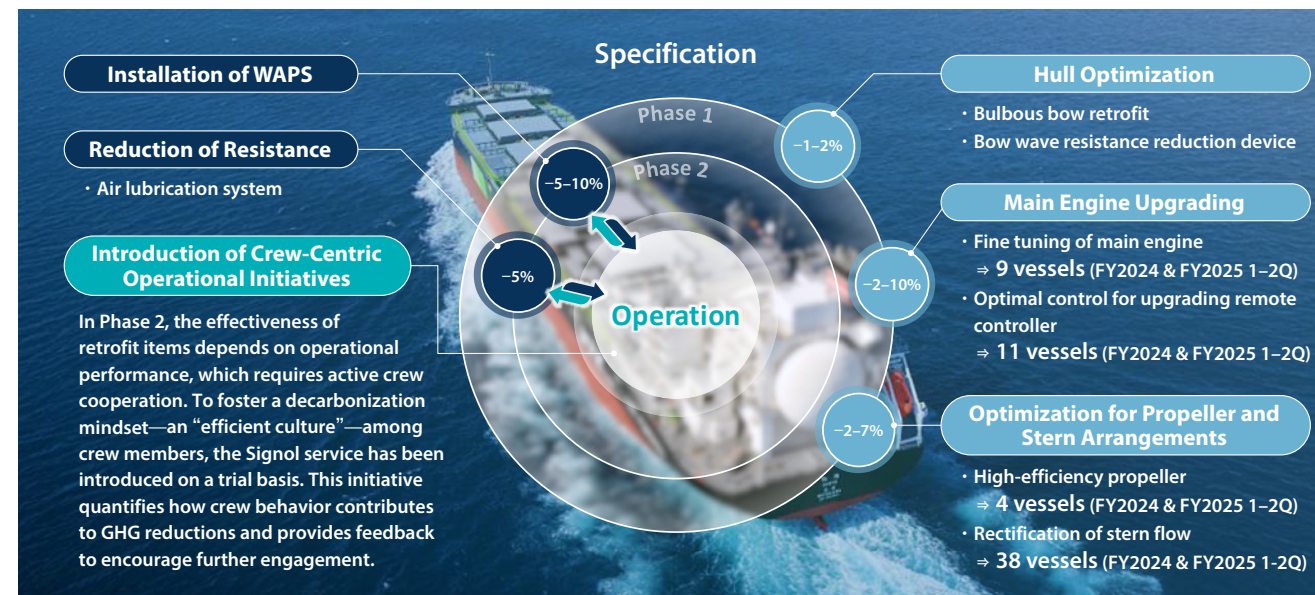
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● GHG Emission Reduction Initiatives by The Energy Efficiency Working Group

In response to the revision of our GHG reduction targets, NYK has established the Energy Efficiency Working Group as part of our initiatives to achieve these goals, focusing on enhancing vessel performance. This working group aims to maximize the energy efficiency of vessels by evaluating and implementing various performance improvement technologies.

In Phase 1, the working group focused on optimizing hull shapes, improving main engine performance, and installing propellers and stern appendages. These measures have not only contributed to reducing GHG emissions but also improved fuel efficiency, leading to lower fuel costs and steady recovery of implementation costs.

In the subsequent Phase 2, we are working to further reduce GHG emissions by introducing technologies such as reducing hull resistance and wind-assisted propulsion systems (WAPS). However, these technologies and equipment involve significant additional investment, and simply reducing fuel costs through improved fuel efficiency will not be sufficient to recover these expenses. The Group is focused on valuing GHG emission reductions by quantifying their financial benefits. Internally, we use the ICP (Internal Carbon Pricing) to convert GHG reductions into monetary value for evaluation. We are also working to ensure that our customers and other stakeholders evaluate the economic value of environmentally friendly transportation services.



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Zero GHG Emissions

• Ammonia

Amid the accelerating energy shift towards a decarbonized society, in the shipping industry in which GHG-emission reduction is an urgent issue, research and development is underway to switch from the conventional heavy oil to LNG and then to next-generation zero-emission fuels for marine vessels.

Ammonia, which does not emit CO₂ when burned, is considered as a zero-emission fuel that will contribute to the prevention of global warming; however, there are several hurdles to overcome before it can be used as a marine fuel. One of the issues is ensuring safety. Ammonia is toxic in nature. Therefore, it is essential to take measures to ensure that seafarers handle it safely. Moreover, to use Ammonia as fuel, production is required on a scale that is completely different from that required for conventional fertilizer use, which means that it is essential to create a fuel ammonia market and build a supply chain.

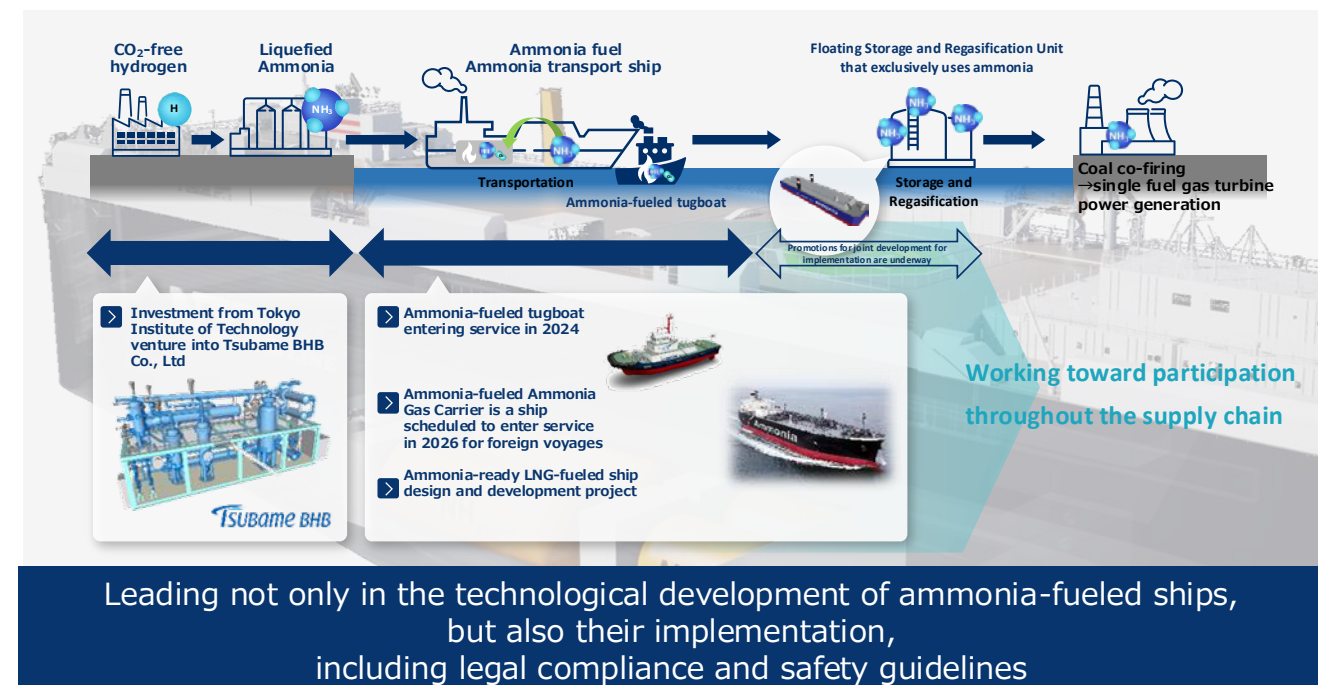
Through the support of the Green Innovation Fund* and collaboration with our partners, the NYK Group is involved in the technological development of next-generation fuel ships, including ammonia, as well as leading the way in implementation of the entire supply chain for the commercialization of next-generation fuels, including legal compliance and safety guidelines.

* Green Innovation Fund: A 2 trillion-yen fund created in NEDO to significantly accelerate current efforts such as structural transformation of the energy and industrial sector and innovation through bold investment toward carbon neutrality by 2050. The fund provides continuous support from R&D and demonstration to social implementation for up to 10 years for companies that share ambitious and concrete goals with the public and private sectors and tackle them as management issues. NEDO mainly provides support in 14 priority areas for which action plans are being formulated in the green growth strategy

■ Prospects for Ammonia-fueled Ship Development Project



■ Driving establishment of ammonia supply chain with partners



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● Demonstration project begins for commercialization of vessels equipped with domestically produced ammonia-fueled engine

In October 2021, our Company was selected for a public call for proposals for a subsidy project by the New Energy and Industrial Technology Development Organization (NEDO), which is a part of the Green Innovation Fund Project. We have begun a demonstration project for commercialization of vessels equipped with domestically produced ammonia-fueled engines in collaboration with our joint development partners; Japan Engine Corporation, IHI Power Systems Co., Ltd., Nippon Shipyard Co., Ltd., and the cooperating organization Nippon Kaiji Kyokai. In December 2023, we concluded a series of agreements related to the construction of the first ammonia-fueled medium gas carrier (AFMGC) equipped with a domestically produced engine.

● Ammonia-fueled tugboat (AFT)

As part of the “Demonstration project begins for commercialization of vessels equipped with domestically produced ammonia-fueled engine”, we are working with IHI Power Systems Co., Ltd., and Nippon Kaiji Kyokai to commercialize the world's first ammonia-fueled tugboat. We obtained Approval in Principle (AiP)* in July 2022.

NYK Group's Shin Nihonkai Ocean Co., Ltd., carried out modification work at Oppama factory of Keihin Dock Co. Ltd. (Kanagawa Prefecture) to convert the LNG-fueled tugboat “Sakigake,” previously operated in Tokyo Bay, into an ammonia-fueled tugboat. In this modification work, the entire engine system including the main engine (hereinafter referred to as “engine”) and the fuel tank were replaced. This involved cutting the engine room to remove the existing LNG fuel equipment and installing new equipment designed for ammonia fuel. The newly installed ammonia fuel engine has completed its operational testing at the IHI Power Systems Co., Ltd. Ota Plant (Gunma Prefecture). It has

been confirmed that emissions of N₂O (nitrous oxide), which has a greenhouse effect approximately 300 times that of CO₂, as well as unburned ammonia, are nearly zero.

The ammonia-fueled tugboat “Sakigake” was completed in August 2024. Subsequently, Shin Nihonkai Ocean Co., Ltd. undertook demonstration operations for the tugboat as the world's first ammonia-fueled vessel to verify decarbonization effects and operational safety.

* Approval in Principle (AiP): This is a certificate issued by a certification body to indicate that the basic design has been reviewed and approved as meeting the technical requirements and safety standards.

> Ammonia-fueled Ammonia Gas Carrier (AFAGC)

As a part of the initiative “Demonstration project for commercialization of vessels equipped with domestically produced ammonia-fueled engine,” we are collaborating with Japan Engine Corporation, IHI Power Systems Co., Ltd., and Nihon Shipyard Co., Ltd. to advance the research and development of ammonia-fueled ammonia gas carrier (AFAGC). In September 2022, we obtained approval in principle (AiP), and we are working on further design optimization with the aim of launching the ship in 2026. Based on the joint study that NYK and Yara Clean Ammonia Switzerland SA have been conducting since 2021 on the practical application of ammonia-fueled ammonia gas carriers, the two companies have now entered into a time-charter contract for the AFMGC.

■ Development and Implementation of Ammonia-fueled Tugboat

Application	In charge	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027
Main machinery	IHI Power Systems	Development, Manufacturing, and Trial Operation of 4-stroke Engines						
Ship development	Nippon Yusen Kabushiki Kaisha (NYK)	Hull Design, Trial Operation, and Construction				Completion		
Operation	Nippon Yusen Kabushiki Kaisha (NYK)	Compliance with Laws and Regulations, Development of Operation Manuals					Demonstrational Operation/Actual Operation	

ClassNK (Nippon Kaiji Kyokai)
 Technical verification of safety
 Basic research for the formulation of international guidelines
 Support for compliance with laws and regulations



Image of AFAGC exterior



Ammonia-fueled tugboat “Sakigake”

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> Ammonia-fuel Ready LNG-Fueled Vessel (ARLFV)

We are working on the design and development of "AmmoniaReady LNG Fuel Vessel," which is an LNG-fueled ship capable of being converted to use ammonia as a marine fuel immediately after the facilities for supplying ammonia as a marine fuel are established. This initiative is undertaken in collaboration with MTI, our group company and Elomatic, a Finnish ship technology consulting firm.

The three companies are positioning the ammonia-ready LNG-fueled ships as the next-bridge solution until marine fuel is completely switched from LNG to ammonia. The concept design is now complete, and we are currently working with shipyards and marine equipment manufacturers on the actual design.

> Ammonia Fuel Supply Initiatives

• Development of a new N₂O Removal System for Ammonia-Fueled Vessels

Kanadevia Co., Ltd. and NYK have jointly proposed the development of an N₂O reactor for ammonia-fueled vessels under the GI Fund Project of NEDO, which was adopted in November 2023. The International Maritime Organization (IMO) has set a target to achieve net-zero greenhouse gas emissions from shipping by 2050, making the transition to alternative fuels such as ammonia an urgent priority. This project aims to develop a catalytic system that removes nitrous oxide (N₂O), a greenhouse gas emitted during the use of ammonia fuel, thereby contributing to greenhouse gas reduction. Kanadevia will leverage its expertise in catalyst technology, and we plan to install an N₂O reactor on an ammonia-fueled vessel scheduled for delivery in 2026 to conduct demonstration voyages.

• Basic Agreement on Maritime Transport of Green Ammonia from India to Japan

NYK has signed a basic agreement with Kyushu Electric Power Co., Inc., Sojitz Corporation, and Sembcorp Green Hydrogen Pte. Ltd., a

wholly owned subsidiary of Sembcorp Industries Ltd., to collaborate on the maritime transport of green ammonia to Japan. This project aims to produce approximately 200,000 tons of competitive green ammonia annually using renewable energy in India and transport it to Kyushu. Leveraging our experience in ammonia maritime transport, we will contribute to building a next-generation energy supply chain for Japan.

* Green ammonia refers to ammonia produced using renewable energy sources. Because it emits no carbon dioxide (CO₂) during either combustion or production, it is considered a promising energy resource for realizing a decarbonized society.

■ Progress in Ammonia Fuel Supply

Date	Initiative
Jan-23	NYK, Japan Marine United Corporation, and IHI Corporation jointly obtained Approval in Principle (AiP) for the world's first A-FSRB (Ammonia-Fueled Floating Storage and Regasification Barge).
Aug-23	NYK and TB Global Technologies Ltd. signed a basic agreement to jointly develop Japan's first land-based ammonia supply system for ships.
Jul-24	Obtained Approval in Principle (AiP) from ClassNK (Nippon Kaiji Kyokai) for the basic design of the bunkering boom.
Jul-24	Conducted the world's first ammonia bunkering for ships using the "Truck to Ship" method.

* Truck to Ship: A method of supplying fuel to vessels by transferring it from tank trucks through flexible hoses.

● Hydrogen

> Capital Participation in JSE Ocean to Establish International Liquefied Hydrogen Supply Chain

In September 2023, NYK agreed to participate in a third-party capital increase alongside Kawasaki Kisen Kaisha, Ltd. and Mitsui O.S.K. Lines, Ltd., to invest in and collaborate with JSE Ocean Co., Ltd., a subsidiary of Japan Hydrogen Energy Co., Ltd.

JSE Ocean was established in January 2023 as a subsidiary of Japan Hydrogen Energy Co., Ltd. with the purpose of exploring marine transportation of liquefied hydrogen using liquefied

hydrogen carriers. Through this third-party capital increase, NYK will jointly work on ensuring safe and efficient operation of the world's first large, liquefied hydrogen carrier and on exploring viable business models for future marine transportation.

● Biofuels*

In pursuit of the practical application of biofuels, we have conducted trial voyages and participated in various demonstration projects, and since fiscal 2024, has conducted long-term trials toward full-scale introduction. As a result, the volume of biofuel (blended fuel base) used on our vessels reached 251,017 tons in fiscal 2024, significantly surpassing the 6,287 tons in fiscal 2023. This achievement marks the start of our company providing low-carbon transportation services utilizing biofuels, thereby accelerating efforts to reduce GHG emissions in maritime transportation.

The environmental value created through the use of biofuels is allocated to customers via our group's Yusen Logistics Group as part of a new green solution called "Alternative Fuel Ocean." The Group also offers "Alternative Fuel Air" and "Alternative Fuel Road."

* Biofuel: A fuel made from renewable, biologically sourced organic materials (biomass), and is expected to serve as an alternative to petroleum-based heavy oil and diesel. CO₂ emissions from burning biofuels are considered to be effectively zero.

> Start of Continuous Use of Bio-LNG Fuel on Car Carriers

We have begun the continuous use of bio-LNG fuel starting with two LNG-fueled car carriers operated by NYK at the port of Zeebrugge in Belgium. The fuel is supplied by Titan Supply B.V., a company specializing in LNG bunkering for ships.

Moving forward, we will continue to actively utilize environmentally friendly fuels, including bio-LNG, as part of our commitment to decarbonizing maritime transport.

* Bio-LNG: Refined and liquefied methane gas (biogas) produced from biomass (organic matter) such as livestock manure and food waste.

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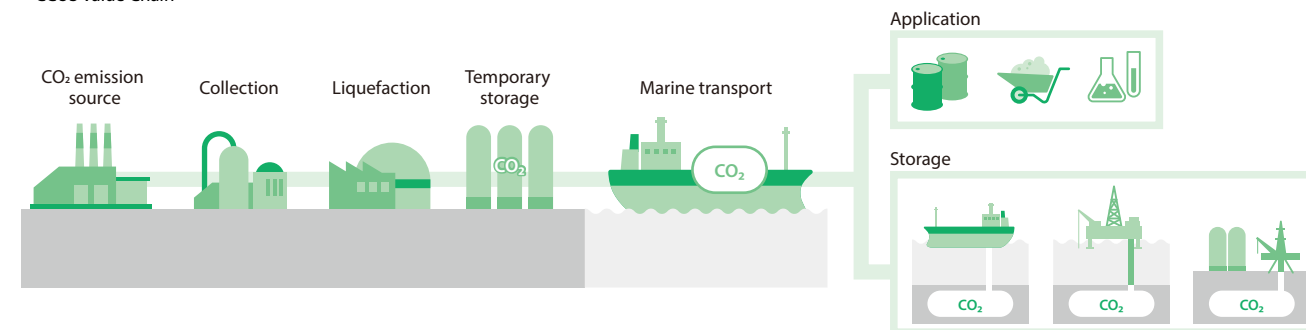
GHG Removal

CO₂ Capture, Utilization, and Storage (CCUS*)

In industries in which GHG emission reductions are technically and economically challenging, efforts in CO₂ capture, utilization, and storage are also essential for achieving net-zero goals. There are currently many CCUS projects being planned around the world including Japan. It is expected that multiple CCUS projects will be launched in parallel in Japan from the second half of the 2020s onwards. With this background, our Group is also participating in the CCUS value chain.

* CCUS (Carbon dioxide Capture, Utilization, and Storage): Involves the capture, conversion, and storage of CO₂; it is garnering attention as an effective means of achieving a carbon-neutral society. In such a value chain, LCO₂ ships are expected to play an indispensable role in transporting liquefied CO₂ to storage and utilization sites, and future demand for them is expected to grow.

CCUS Value Chain



Progress of CO₂ Transportation Technology

Date	Initiative
Nov-21	NYK and Mitsubishi Shipbuilding Co., Ltd. began joint development of CO ₂ transportation technology using large vessels.
May-22	Obtained Approval in Principle (AiP) from ClassNK for the basic design of a large liquefied CO ₂ carrier (LCO ₂ vessel).
Jun-23	Obtained Approval in Principle (AiP) from ClassNK for a dual purpose ammonia and liquefied CO ₂ carrier.

Collaboration in LCO₂ and LNG Transportation and Joint Establishment of a Ship Management Company

In June 2024, we signed a memorandum of understanding with PT Pertamina International Shipping (PIS), a subsidiary of Indonesia's state-owned enterprise PT Pertamina, to collaborate in the transportation of liquefied carbon dioxide (LCO₂) and liquefied natural gas (LNG), and to jointly establish a ship management company.

The two parties agreed to jointly own LCO₂ and LNG carriers in Indonesia, aiming to create new business opportunities and respond to growing transportation demand. In addition, we will work with PIS and other partners to assess the business viability and feasibility of LCO₂ transportation. Through the joint establishment of a ship management company with PIS, we also aim to provide advanced management services to meet the expected increase in ship demand in Indonesia.

Development of LCO₂ Carriers and Floating Liquefied Storage Units

NYK and Knutsen NYK Carbon Carriers AS (KNCC), a joint venture established with the Norwegian Knutsen Group, have developed a new LCO₂ carrier — the LCO₂-EP carrier — which utilizes the ambient temperature and elevated pressure (EP) method to transport liquefied carbon dioxide (LCO₂) at room temperature. Nippon Kaiji Kyokai (Class NK) reviewed the design based on its "Rules for the Survey and Construction of Steel Ships" (Part N) and issued an Approval in Principle (AiP) after confirming that the design meets the required standards.

The LCO₂-EP carrier incorporates KNCC's proprietary LCO₂-EP Cargo Tank technology, enabling stable transport of LCO₂ without the need for sub-zero cooling. This simplifies handling and offers potential reductions in energy consumption and liquefaction costs.

In addition, NYK, KNCC, and ENEOS Xplora Co., Ltd. have jointly

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developed a Floating Liquefied Storage Unit (FLSU) that combines the LCO₂-EP Cargo Tank with the Joule-Thomson cooling method, a liquefaction process that utilizes temperature drops caused by pressure reduction. ClassNK has reviewed the design based on its “Rules for the Survey and Construction of Steel Ships” (Part PS) and the “Guidelines for Floating Offshore Liquefied Natural Gas and Petroleum Gas Production, Storage, Offloading, and Regasification Facilities,” and has issued an AiP.

*1 The Rules for the Survey and Construction of Steel Ships are technical standards established by ClassNK (Nippon Kaiji Kyokai) that define requirements for ship structures and equipment. These rules are divided into sections from Part A to Part X. Part N covers liquefied gas carriers, while Part PS pertains to floating offshore facilities for the production, storage, offloading, and regasification of oil and gas.

*2 The LCO₂-EP Cargo Tank is a specialized tank developed by KNCC for transporting liquefied carbon dioxide at ambient temperatures between 0 and 10 degrees Celsius and under elevated pressure conditions ranging from 34 to 45 barG. This technology enables stable transport without the need for sub-zero cooling.

*3 The Joule-Thomson cooling method, also known as isenthalpic expansion cooling and liquefaction, is a process that utilizes the temperature drop caused by pressure reduction to produce liquefied CO₂ suitable for maritime transport.

Progress in the Marine Transportation and Storage of Liquefied CO₂

Date	Initiative
Dec-21	Established Knutsen NYK Carbon Carriers AS (KNCC), a joint venture between NYK and Norway's Knutsen Group, to engage in the marine transportation and storage of liquefied CO ₂ .
Apr-22	Obtained classification certification from DNV (Norwegian classification society) for technology enabling the transportation and storage of liquefied CO ₂ at ambient temperature (PCO ₂). This was the world's first certification for a cargo tank system of this kind. The system was later renamed the “LCO ₂ -EP System.”
Jun-23	Received General Approval for Ship Application (GASA) from DNV* for the detailed design of the LCO ₂ -EP System, enabling installation on both new and existing vessels.

* DNV is an international classification society that provides third-party certification for ship safety, ISO standards, and technical support in the energy sector.

Carbon Offset

Carbon offset refers to the practice of compensating for greenhouse gas (GHG) emissions—particularly those that are difficult to reduce—by purchasing credits generated through GHG reduction or absorption efforts elsewhere, or by participating in projects that achieve such reductions or absorption in other locations.

Amid growing interest in environmental responsibility across the entire supply chain, the NYK Group is responding to requests from domestic and international customers by offering carbon offset transportation services as one of the environmentally value-added maritime transport options.

Starting in fiscal 2025, we will begin trial procurement of carbon dioxide removal (CDR) credits*, with the goal of offsetting a cumulative total of 100,000 tons of CO₂ by 2030. While maximizing energy efficiency and transitioning to next-generation fuels remain our top priorities for reducing GHG emissions, we will utilize CDR as an equivalent mitigation measure to Scope 1 emissions for unavoidable residual emissions due to technical and operational constraints. Through this approach, we aim to contribute to achieving net zero emissions by 2050.

* CDR credits: An environmental value that can be traded representing the amount of CO₂ reduced by CDR

Initiatives beyond Shipping

Environmental Activities at Terminals and Warehouses

> Domestic Terminals

We have set a target of achieving carbon neutrality by 2040 and aim to realize decarbonization at Japan's domestic ports.

(Example of Activities)

- Installation of hybrid cargo-handling equipment at Ohi Container Terminal (Tokyo) and Rokko Container Terminal (Kobe)

- Cargo-handling operations using hydrogen-powered rubber-tired gantry cranes at Ohi Container Terminal
- Additives that reduce soot and smoke and improve fuel efficiency are used in the fuel
- Installation of hybrid cargo handling equipment
- Older trucks have been replaced with ones that emit less pollution
- Eco-driving training has been provided for truck drivers
- Waste generated in container yards is recycled.

> Overseas Terminals

United States – Port of Los Angeles

- Solar power generation system installed
- Electric vehicles introduced within the terminal
- Power factor correction devices installed to improve electricity usage efficiency
- Shore-side connection boxes installed for supplying electricity from land to vessels

Belgium – Port of Zeebrugge

- Wind power generation introduced within the port

China – Port of Tianjin

- Two wind turbines installed and operating at the finished vehicle terminal

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● Installation of solar-power generation equipment in various facilities

NYK has been operating rooftop solar-power generation facilities at the NYK Tobitakyu general training institute since 2002. Consisting of six generators with 420 solar panels (120 centimeters by 80 centimeters), the system can meet approximately 30% of the electricity needs of the institute. In addition, we have installed and are operating solar power generation systems at facilities in Japan and overseas.

● Offshore wind power

The offshore wind market in Japan is expected to expand rapidly. In addition to the technological capabilities and knowledge of Japanese regulations and legal systems that we have cultivated over many years through our shipping business, the NYK Group is taking full advantage of the knowledge that we have gained through our offshore business and the nationwide group companies that we have established throughout Japan to actively participate in the entire offshore wind value chain.

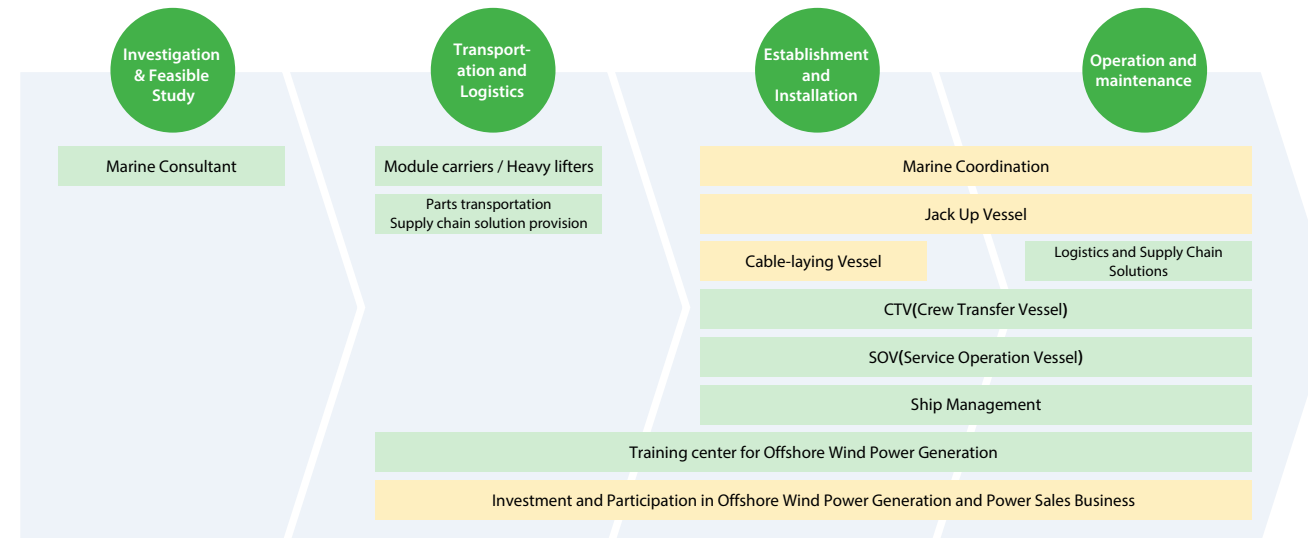
> Crew Transfer Vessel (CTV)

In cooperation with Northern Offshore Group AB (NOG), a pioneering Swedish company in Crew Transfer Vessel (CTVs) for offshore wind power, we signed a basic agreement in 2021 and acquired a majority stake in January 2025, making NOG a consolidated subsidiary. In March 2025, we added a service operation vessel (SOV) to NOG's fleet, enhancing its capability to support personnel and material transportation during the construction and maintenance phases of offshore wind power projects.

In Japan, the Group began operating the CTV "Rera As" in July 2023 at Ishikari Bay New Port in Hokkaido, marking the first domestically owned and managed CTV. In addition to Rera As, we modified NOG's original vessel design to meet domestic construction specifications and placed an order with Kosaba Shipbuilding Co., Ltd. in Kamaishi, Iwate Prefecture. These vessels are primarily managed by Japan Offshore Support Co., Ltd., a company jointly established with Akita Eisen KK to accumulate operational expertise and ensure safe operations, thereby contributing to the nationwide expansion of offshore wind power in Japan.

■ Scope of the Group's Services in Offshore Wind Power Generation Business

Existing business New entry / areas under consideration



CTV "Rera As"

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● Cable-Laying Vessel

We are participating in a four-company consortium with Sumitomo Electric Industries, Ltd., Furukawa Electric Co., Ltd., and Mitsui O.S.K. Lines, Ltd. for a project commissioned by Japan's New Energy and Industrial Technology Development Organization (NEDO) titled "Research and Development of a Multi-purpose and Multi-terminal HIGH Voltage Direct Current Transmission System (RIGHT Project)" and "Development of construction methods for the installation of cable protecting system, etc. and the development of new cable-laying vessels, etc."

Under a cooperative framework with Sumitomo Electric, we are engaged in developing the fundamental technologies for cable-laying vessels that will contribute to the establishment of a domestic DC submarine power transmission network. Also with support from Furukawa Electric, we have obtained Approval in Principle (AiP) for the conceptual design from Nippon Kaiji Kyokai (Class NK).

To contribute to the development of submarine DC transmission networks, which are essential for the widespread adoption of renewable energy, we are actively working toward the realization of cable-laying vessel deployment.

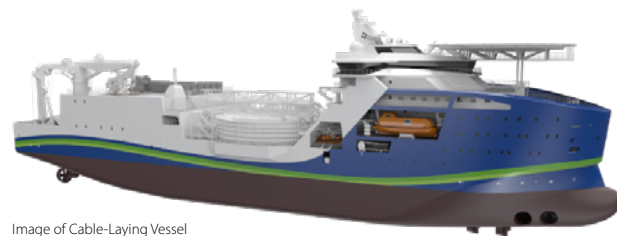


Image of Cable-Laying Vessel

> Maritime consulting services

Japan Marine Science Inc. (JMS), an NYK Group company, provides comprehensive maritime consulting services. For the offshore wind business, JMS offers site environment assessments, feasibility-study support for wind-turbine scale and specifications, use of a maritime simulator to examine vessel safety during and after the installation of wind turbines, diving inspections during wind turbine operation, training via simulator for workboat crews, and marine monitoring systems.



Maritime simulator

> Collaboration with Regions

We opened the Akita branch in April 2022 and the Hokkaido branch in April 2024, strengthening our ties with local governments and communities.

For more information, click on the link below

[P.097 Community](#)

● Offshore Data Center

In March 2025, we signed a memorandum of understanding with NTT Facilities Inc., Eurus Energy Holdings Corporation, MUFG

Bank, Ltd., and the city of Yokohama to conduct a demonstration experiment for a floating offshore green data center utilizing disaster-response mini-floats. In fiscal 2025, solar power generation equipment, storage batteries, and a container-type data center will be installed on a mini-float at Osanbashi Pier to verify salt damage resistance and stable operation. Looking ahead, we aim to realize a carbon-neutral society by maximizing the use of renewable energy through integration with offshore wind power, without relying on the conventional power grid.



Image of an Offshore Floating Green Data Center

Research & Development

● Development of Technology that Enables Energy-efficient Operation

With the promotion of energy-efficient navigation, ships are generally operated at lower speeds than those assumed when they were built. On this background, our Group is working to convert ships to low-speed operation specifications and improve propulsion performance by modifying the bulbous bow* of ships in service and installing the MT-FAST hull appendage.

In June 2014, we carried out retrofit work on a containership,

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including modifications to the bulbous bow and the installation of MT-FAST. Big Data analyses using actual voyage data gathered over a six-month period confirmed a 23% reduction in CO₂ emissions, exceeding initial estimates. We also verified that the retrofit did not affect the safe operation of the vessel or the operating condition of the engine.

The NYK Group has established a method for examining modifications suitable for operational conditions in a short period and efficiently (patent obtained). Based on this method, we will proceed with modifications for our operational vessels in the future to further enhance energy-saving effects.

* Bulbous bow: A protruding bulb at the front of a ship just below the waterline. The bulb modifies the way the water flows around the hull, reducing drag and thus increasing speed, range and fuel efficiency.

Recent Examples of Technology Development for Energy-Efficient Ship Operations

Date	Initiative
May-22	Developed "Unic 800Eco," an enhanced version of "Unic 800VLS"* ¹ with improved sludge** ² dispersion and combustion efficiency
Aug-22	participated in a tidal power generation demonstration project in Singapore conducted by Bluenergy Solutions Pte Ltd, in collaboration with MIT and us
Mar-23	Commenced operation of the tidal power generation demonstration project in an off-grid area in Singapore

*1 Unic 800VLS: An additive that improves the stability and combustion efficiency of low-sulfur marine fuel oil.

**2 Sludge: Sediment contained in fuel. Preventing sludge accumulation and maintaining dispersion improves combustion efficiency.

Co-creation with External Parties

Participation in External Initiatives

NYK group continues to participate in various initiatives and promote co-creation toward the realization of decarbonization.

Major Decarbonization-related Initiatives with NYK Group Participation

Initiative/Organization Name	Theme	Time of Participation
International Shipping GHG Zero Emission Project	Climate Change/Decarbonization	Aug-18
Climate Change Initiative "Japan Climate Initiative"	Climate Change/Decarbonization	Sep-18
Clean Fuel Ammonia Association	Ammonia	Apr-19
Task Force on Climate-related Financial Disclosures (TCFD) Consortium	Climate Change/Decarbonization	May-19
Coalition of Non-Profit Organizations "Getting to Zero Coalition"	Climate Change/Decarbonization	Oct-19
Japan Business Federation "Challenge Zero Declaration"	Climate Change/Decarbonization	Mar-20
Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping	Climate Change/Decarbonization	Jul-20
Hydrogen Council	Hydrogen	Jul-20
Japan Hydrogen Association (JH2A)	Hydrogen	Dec-20
International think tank for CO ₂ capture and storage technology "Global CCS Institute"	Climate Change/Decarbonization	Jul-21
GX League	Climate Change/Decarbonization	May-23
GCMD (Global Centre for Maritime Decarbonization)	Climate Change/Decarbonization	Jul-23
Methane Abatement in Maritime Innovation Initiative (MAMII)	Climate Change/Decarbonization	Sep-23
Smart Freight Centre (SFC)	Climate Change/Decarbonization	Apr-24

Became Member of Smart Freight Centre

In April 2024, we became a member of Smart Freight Centre (SFC), an international non-profit organization that aims to reduce GHG emissions in the logistics sector. We have established Global Ro-Ro Community (GRC), aimed at standardizing GHG emissions calculation for Ro-Ro vessels*, including car carriers, in collaboration with SFC, the overseas shipping company Wallenius Wilhelmsen ASA, and the Nippon Kaiji Kyokai. In recent years, as interest in carbon footprints—GHG emissions throughout the lifecycle of products and services—has grown, we identified the inconsistency in GHG emission calculation standards for Ro-Ro vessels as a key issue. At GRC, we emphasized the importance of establishing unified rules. Open discussions were held at GRC, ensuring fairness and transparency through the involvement of stakeholders such as shipping companies, shipper, and third-party verification bodies. As a result, a standardized model for calculating GHG emissions was formulated in April 2025. This model has been published as a guideline on the SFC website.

* Ro-Ro vessels: cargo ships designed to allow vehicles such as cars, trucks, trailers, construction machinery, and agricultural machinery to drive directly onto and off the ship.

Activities as Member of Japanese Shipowners' Association

The Japanese Shipowners' Association, in cooperation with the Ministry of Land, Infrastructure, Transport and Tourism, is demonstrating leadership in discussions at the International Maritime Organization (IMO) regarding the introduction of regulations and the reduction of GHG emissions.

We are active as a member of the Environmental Committee of the Japanese Shipowners' Association, as well as the various steering committees and task forces that form part of the committee. In the GHG Task Force, which serves as a forum for discussions on GHG emissions, NYK acts as the chair and represents member companies. As a shipowner and ship operator, we actively

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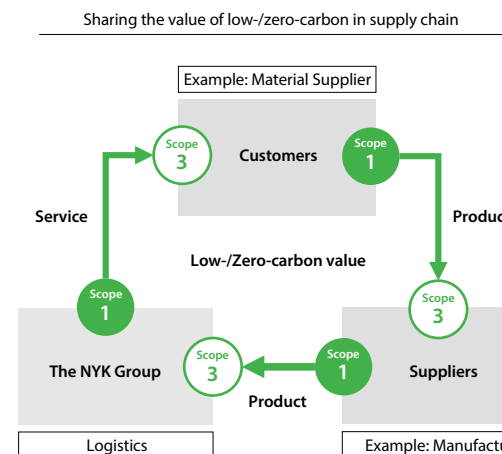
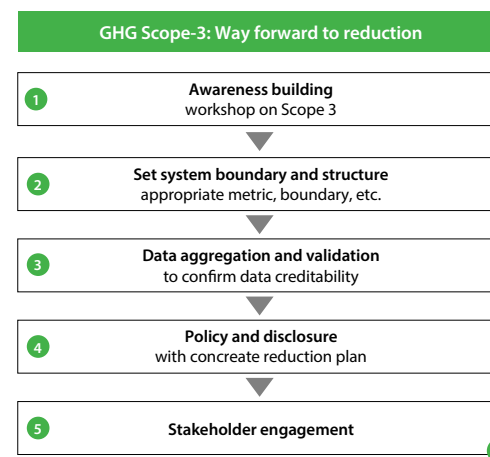
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participate in discussions on a feasible climate change framework within the shipping industry.

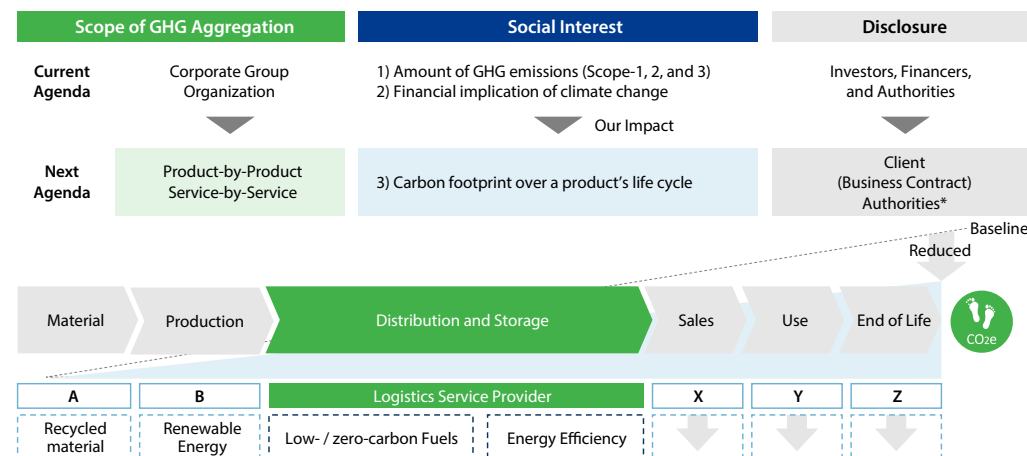
Co-creation with Stakeholders

In pursuit of reducing GHG emissions in Scope 3, we are promoting initiatives aimed at achieving a low-carbon and decarbonized society, working together with our business partners to reduce emissions (carbon footprints) for each product.

Towards Reduction of Scope 3 Emissions



Carbon Footprint Garnering More and More Attention



*EU: Battery Regulation, Carbon Boarder Adjustment Mechanism etc.

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Investment in Startups

We aim to discover startups having groundbreaking ideas and technologies, fostering their growth and co-creation with an eye toward future collaboration. This initiative seeks to promote the decarbonization of our businesses and create new ventures that bring added value to society.

● Tsubame BHB

In June 2021, NYK decided to invest in Tsubame BHB Co. Ltd., a venture company originating at the Tokyo Institute of Technology. Tsubame BHB has established the practical application of an on-site ammonia synthesis system invented by Professor Emeritus Hideo Hosono that uses a manufacturing method to produce a required amount of ammonia at a required location. This method operates at lower temperatures and pressures than conventional technologies, and is expected to contribute to the decentralization of production. We have high expectations for Tsubame BHB as a partner that plays a role in the ammonia value chain.

● Marunouchi Climate Tech Growth Fund

In May 2023, we signed an investment agreement to participate in the Marunouchi Climate Tech Growth Fund L.P., which primarily targets growth investments in climate tech-related businesses that contribute to decarbonization. The fund was established by Mitsubishi Corporation, MUFG Bank, Ltd., and Pavilion Private Equity Co., Ltd., and with a total size of USD 744 million, it is one of the largest climate tech investment funds in Asia. Through our investment in this fund, we aim to co-create with startups that possess groundbreaking ideas and technologies, accelerate the decarbonization of our business, and generate new businesses that deliver added value to society.

Advocacy at International Conferences

● NYK Participates in COP29 in Azerbaijan

NYK Group management discussed international shipping and the Group's specific initiatives to address climate change in discussions at various events during the 29th Conference of the Parties to the United Nations Framework Convention on Climate Change ("COP29") held in Baku, Azerbaijan, from November 11 to 22, 2024.

At COP29, many side events were hosted by national governments and related industry organizations to disseminate information on efforts to address climate change, and various panel discussions were held to encourage active discussion among participants.

An NYK representative director and executive vice president appeared as a panelist at the Japan Pavilion, where he actively communicated the Group's decarbonization initiatives and issues facing the international shipping industry.



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GHG Emissions by Scope

		(ton-CO ₂ e)			
Scope	Subcategory	FY2021 (base year)	FY2022	FY2023	FY2024
Scope 1	Ships	10,708,996	10,123,951	10,239,136	9,939,832
	Aircraft	1,721,397	964,063	1,048,651	1,091,449
	Others	248,301	167,029	136,779	108,955
	Total	12,678,695	11,255,044	11,424,566	11,140,236
Scope 2 - Market basis		45,391	76,255	63,342	82,420
Scope 2 - Location basis		49,010	77,710	67,375	89,402
Scope 3	Category 1	1,887,367	1,486,233	1,347,827	5,265,086
	Category 2	255,143	197,887	482,457	386,218
	Category 3	1,730,934	1,552,422	1,587,687	2,258,724
	Category 4	—	—	—	1,321,450
	Category 5	16,379	19,827	29,792	30,235
	Category 6	678	7,404	9,877	86,282
	Category 7	157	247	183	2,271
	Category 8	—	—	—	0
	Category 9	—	—	—	49
	Category 10	—	—	—	0
	Category 11	—	—	—	792,906
	Category 12	—	—	—	0
	Category 13	—	—	—	4,798,628
	Category 14	—	—	—	0
	Category 15	—	—	—	5,404,127
Total		3,890,661	3,264,023	3,457,823	20,345,980
Emissions from biofuels (B100 basis)	Ships	—	—	1,027	37,758
	Land	—	—	—	444

Note 1: The data is gathered from the head office and consolidated subsidiaries. Until fiscal 2023, the Scope 3 data collection targeted only the head office and selected group companies. Beginning fiscal 2024, the scope has been expanded to include all major consolidated subsidiaries and equity method affiliates, and emissions have been collected from all categories of Scope 3. The investigation found that there were no relevant GHG emissions for Scope 3 Categories 8, 10, 12, and 14.

Note 2: t-CO₂e: tons of CO₂ equivalent. All GHG emissions are converted into carbon dioxide equivalents.

Note 3: GHG emissions data for Scope 1, Scope 2, Scope 3, biofuel and energy consumption has been verified by a third-party organization. Verification Report (<https://www.nyk.com/english/sustainability/pdf/environment009en.pdf>)

Note 4: In fiscal 2022, a renewable energy certificate was used to offset the electricity used at the Yokohama Branch and the NYK Maritime Museum (234,641 kWh).

Note 5: We mainly use bio-blended fuel, which is a mixture of biofuel (B100) and fossil fuel emissions from the biofuel portion are counted as out of scope, while emissions from the fossil fuel portion fall under Scope 1 (tank-to-wake) and Category 3 of Scope 3 (well-to-tank). GHG emissions related to biofuels for fiscal 2023 have been recalculated using the same methodology as fiscal 2024, and the figures have been accordingly updated.

Note 6: For each fiscal year, CO₂ emissions from electricity usage in Japan are calculated using emission coefficients provided by the electricity provider and published by Japan's Ministry of the Environment, based on the actual data from the previous year.

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■ Group's Energy Consumption (GHG-related)

Category	Subcategory	Unit	FY2021	FY2022	FY2023	FY2024
Fossil fuels	Heavy oil A (MDO) - ships	Tons	30,415	27,219	144,025	214,908
	Heavy oil C - ships	Tons	3,184,649	2,979,644	2,976,617	2,850,119
	Gas oil - ships	Tons	159,484	173,779	69,341	6,873
	Jet fuel	KL	699,024	391,486	423,584	440,872
	Gasoline	KL	71,860	9,058	3,602	2,894
	Kerosene	KL	52	49	32	39
	Diesel	KL	23,285	49,408	41,418	32,857
	LPG	Tons	511	375	2,547	1,281
	Natural gas	m ³	8,624,448	7,460,194	7,834,651	5,187,515
	Alternative fuels	LNG - ships	Tons	5,620	14,387	41,530
Ammonia - ships		kg	—	—	—	45,709
Hydrogen		kg	—	—	—	6,913
Biofuel	Bio diesel (blended fuel basis) - ships	Tons	—	—	6,287	251,017
	Bio diesel (blended fuel basis) - land	KL	—	—	—	12,466
	HVO (blended fuel basis) - land	KL	—	—	—	393
	Bio gas - land	MWh	—	—	—	2,220
Energy prepared from other companies	Electricity	MWh	119,880	162,030	146,029	163,276
	Electricity derived from renewable energy	MWh	—	—	15,722	23,353
	Heat	MWh	2,148	1,422	290	587
	Steam	MWh	1,250	1,150	1,097	1,096
Power generation at land	Private power generation derived from renewable energies	MWh	—	5,970	8,874	16,206
Others	Waste (office)	Tons	5,679	6,831	10,142	11,069

Note 1: The biofuel represents the activity level based on blended fuel, but the activity level of fossil fuels contained in the biofuel blend is included in the fossil fuel figures as well.

Note 2: Starting from fiscal 2024, the aggregation method has been revised. The data for fiscal 2023 has also been recalculated using the same method as fiscal 2024, and the figures have been updated accordingly.

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