

MOL Group

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# Environmental Vision

## BLUE ACTION 2035 Phase 2

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April 2026



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# Background of the Revision, Key Changes

## ■ Background of the Revision

The MOL Group announced its “Environmental Vision 2.0” in June 2020 and has since continued to review the vision in response to changes in the social environment and other external factors. The most recent revision, “Environmental Vision 2.2,” set out a clear pathway for GHG emissions reduction and established quantitative milestones toward 2050 for key actions related to our own decarbonization and low-carbon initiatives, including the introduction of alternative fuels and improvements in fuel efficiency. We have steadily implemented these measures, resulting in tangible outcomes such as reductions in GHG emissions and emissions intensity. (more details to follow on the next page).

The Environmental Vision is a core component of our Group Management Plan and is aligned with “BLUE ACTION 2035” Phase 2. In recent years, while regional carbon pricing and sustainability disclosure requirements have advanced in regions such as the EU, we have also seen counter-ESG movements gaining traction and the postponement of the IMO Net-Zero Framework (\*) adoption in the international shipping industry. The social environment surrounding decarbonization continues to shift amid uncertainty. In light of these shifts, we have revised our Environmental Vision to ensure that our low-carbon and decarbonization initiatives contribute to strengthening the group’s medium- to long-term competitiveness.

## ■ Changes from Environmental Vision 2.2

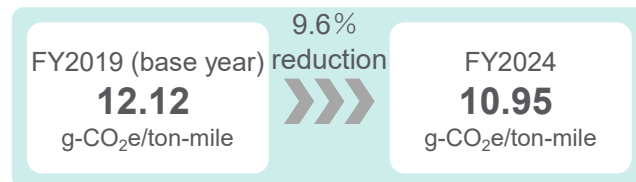
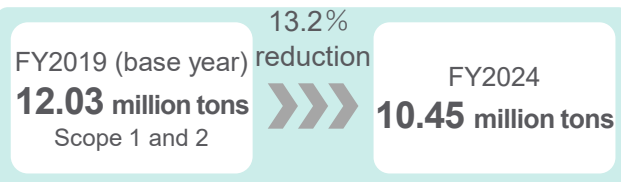
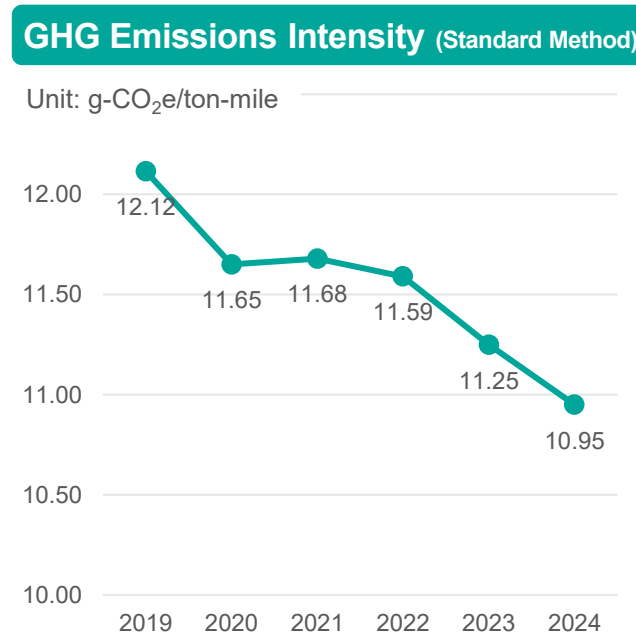
This revision maintains our medium- to long-term target of achieving net-zero emissions by 2050. To ensure steady progress in emissions reductions even under highly uncertain external conditions, we have revised our actions and milestones. Specifically, we have developed a realistic scenario centered on improving fuel efficiency and introducing low-carbon fuels. This scenario combines feasible emissions reduction measures that do not rely excessively on regulatory or technological developments.

(\*) Proposal for GHG emissions regulations in international shipping. While a broad agreement was reached in April 2025, its adoption was postponed for one year in October 2025.

# Initiatives to Date: Progress on Environmental Vision 2.2

We are steadily implementing actions under Environmental Vision 2.2 to reduce GHG emissions, improve emissions intensity, and promote low-carbon and decarbonization efforts.

## Trends in GHG Emissions and Emissions Intensity



## Progress on Key Milestones (Excerpt)

Milestones Measuring Action Progress (*Top row: Metric/ Bottom row: Timeframe and level)	Progress as of End of FY2024
No. of LNG/methanol-fueled ocean-going vessels 90 vessels (2030)	<b>20 vessels</b> (included in the 49 vessels committed)
Ratio of Fuel Efficiency Improvement (compared with 2019) (%) 5% (2025)	<b>8.9%</b> (Achieved the milestone ahead of the target year)
No. of vessels equipped with Wind Challenger 25 vessels (2030), 80 vessels (2035)	<b>2 vessels</b> (included in the 11 vessels committed)

Detailed Progress on Milestones: [Environmental Vision](#)

\*For details on the scope, calculation methodologies, and definitions of each metric, please refer to the Appendix (p. 34-36).

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# 1. Overall View

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## For Bluer Oceans

MOL Group is committed to achieving “Net-Zero Emissions by 2050” and contributing to the realization of a sustainable ocean and global environment.

Stable oceans and climate are not only the foundation for value creation in social infrastructure businesses and traditional shipping businesses but are also essential for industrial development and for enriching people’s lives.

By meeting society’s needs through the provision of environmental solutions such as low- and zero-carbon transportation services, and by turning these initiatives into growth opportunities for our Group, we aim to be a strong and resilient corporate group that grows globally.

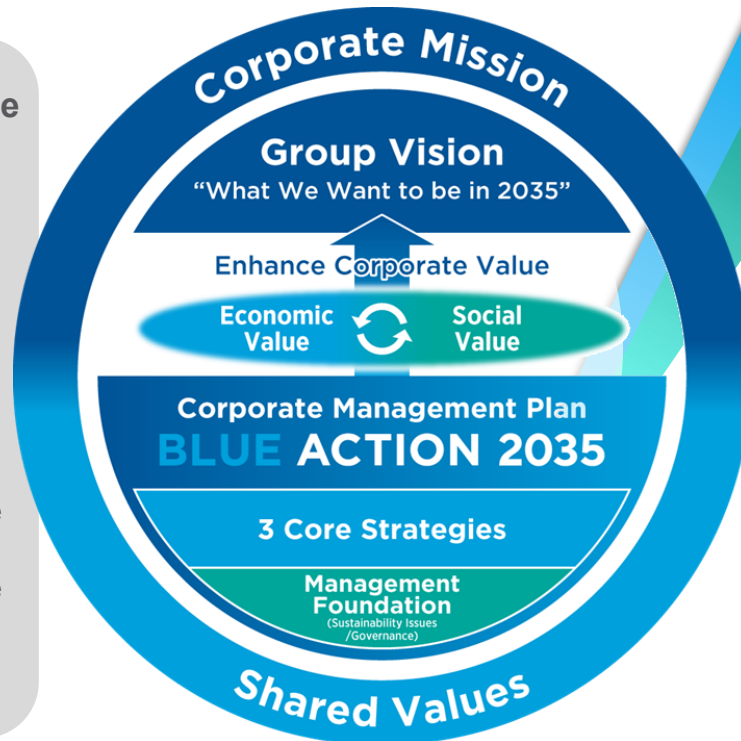
### **MOL Group Environmental Vision**

# Role of the Environmental Vision in the Management Plan

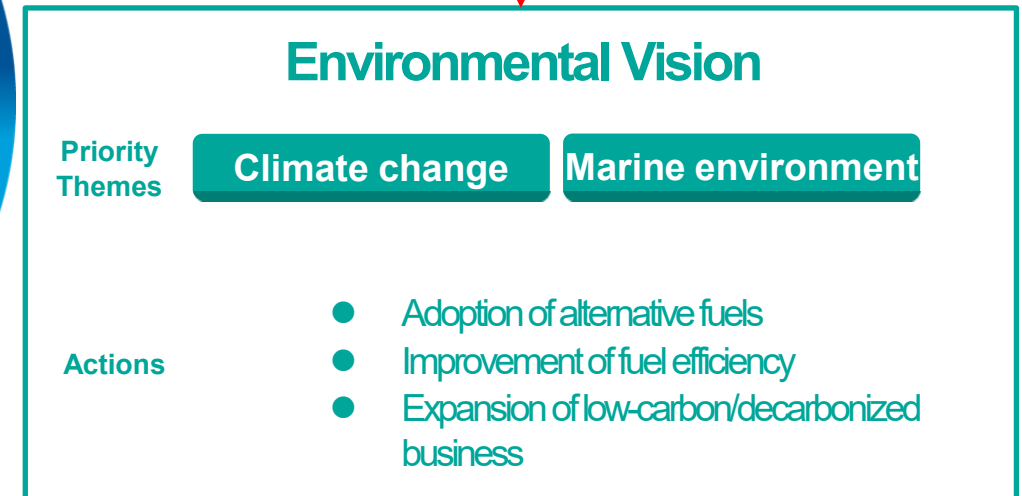
- Under Phase 2 of the management plan “BLUE ACTION 2035,” we have identified the Sustainability Issues (materiality) as “Environment,” “Safety,” “Human Capital,” and “Digital Transformation,” and positions them as key initiatives to strengthen its management foundation.
- The Environmental Vision corresponds to both the “Environmental Strategy,” one of the three key strategies, and the basic policy linked to the Sustainability Issues of “Environment.” The KPIs and actions to address each issue are established and promoted under the Environmental Vision and Action.

## Economic Value and Social Value

The MOL Group enhances corporate value by creating both economic and social value. By strengthening our core strategies and management foundations, we will sharpen our ability to generate profits while contributing—through our business activities—to “providing infrastructure that supports daily life and industry,” “realizing a sustainable marine and global environment,” and “enhancing well-being.” We aim to be the company of choice for all stakeholders.



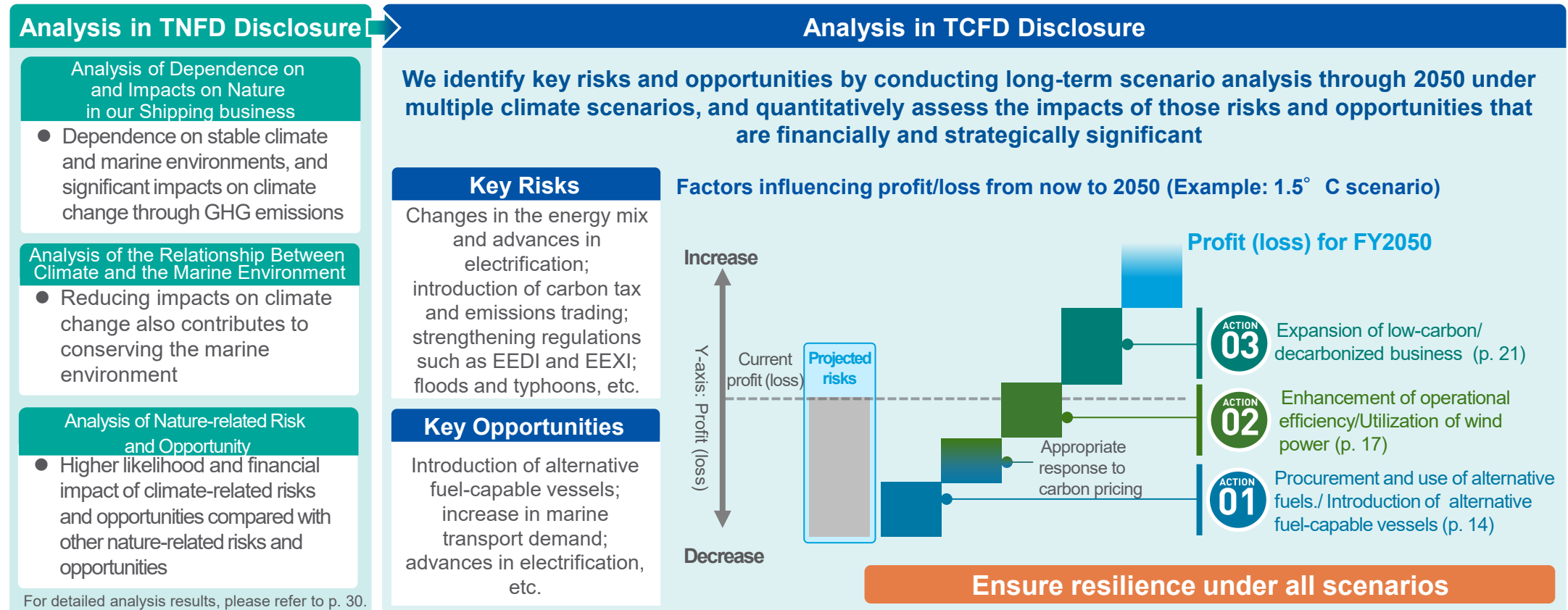
## Management plan BLUE ACTION 2035



# Risks and Opportunities Related to Climate Change and Nature

We conduct analyses based on the TNFD <sup>(\*1)</sup> to assess the relationship between our shipping business and nature—its dependencies, impacts, risks, and opportunities—and analyses based on the TCFD <sup>(\*2)</sup> to evaluate climate-related risks and opportunities. Considering the climate-related risks and opportunities that are important for our shipping business, we incorporate the findings into updates to our Environmental Vision and into our broader management strategy.

For details : MOL Group [TNFD](#) and [TCFD](#) Disclosures



(\*1) *Task Force on Nature-related Financial Disclosures*: An international framework for companies and other entities to assess and disclose risks and opportunities related to natural capital and biodiversity.

(\*2) *Task Force on Climate-related Financial Disclosures*: An international framework for companies and other entities to assess and disclose climate-related risks and opportunities.

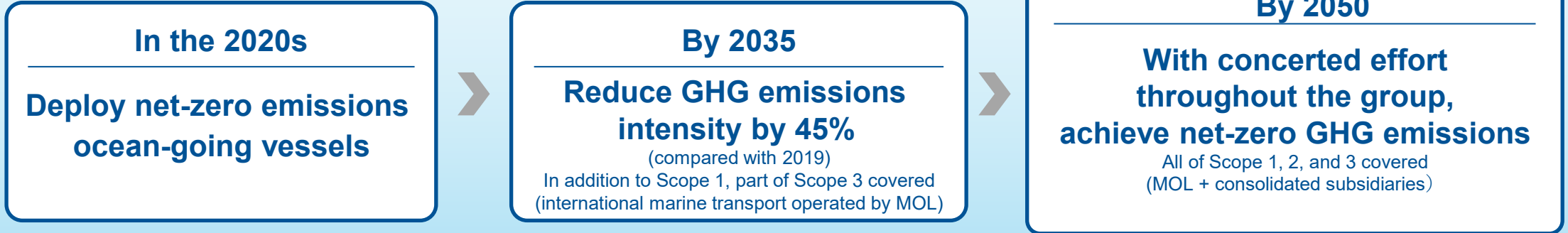
# Environmental Vision – BLUE ACTION 2035 Phase 2

## For Bluer Oceans

MOL Group is committed to achieving “Net-Zero Emissions by 2050” and contributing to the realization of a sustainable ocean and global environment. Stable oceans and climate are not only the foundation for value creation in social infrastructure businesses and traditional shipping businesses but are also essential for industrial development and for enriching people’s lives.

By meeting society’s needs through the provision of environmental solutions such as low- and zero-carbon transportation services, and by turning these initiatives into growth opportunities for our Group, we aim to be a strong and resilient corporate group that grows globally.

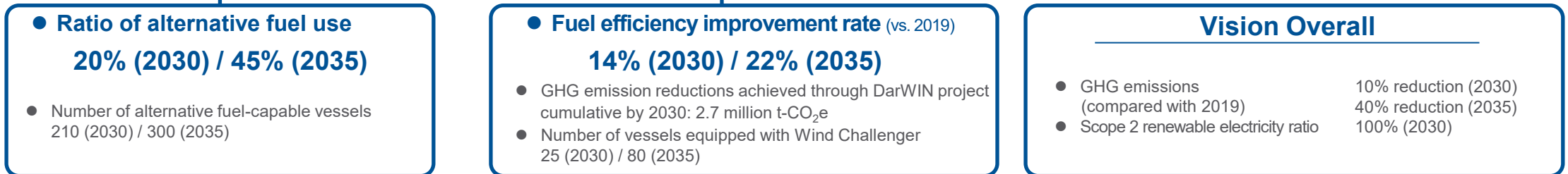
### Medium- to long-term targets



### Actions to achieve medium- to long-term targets

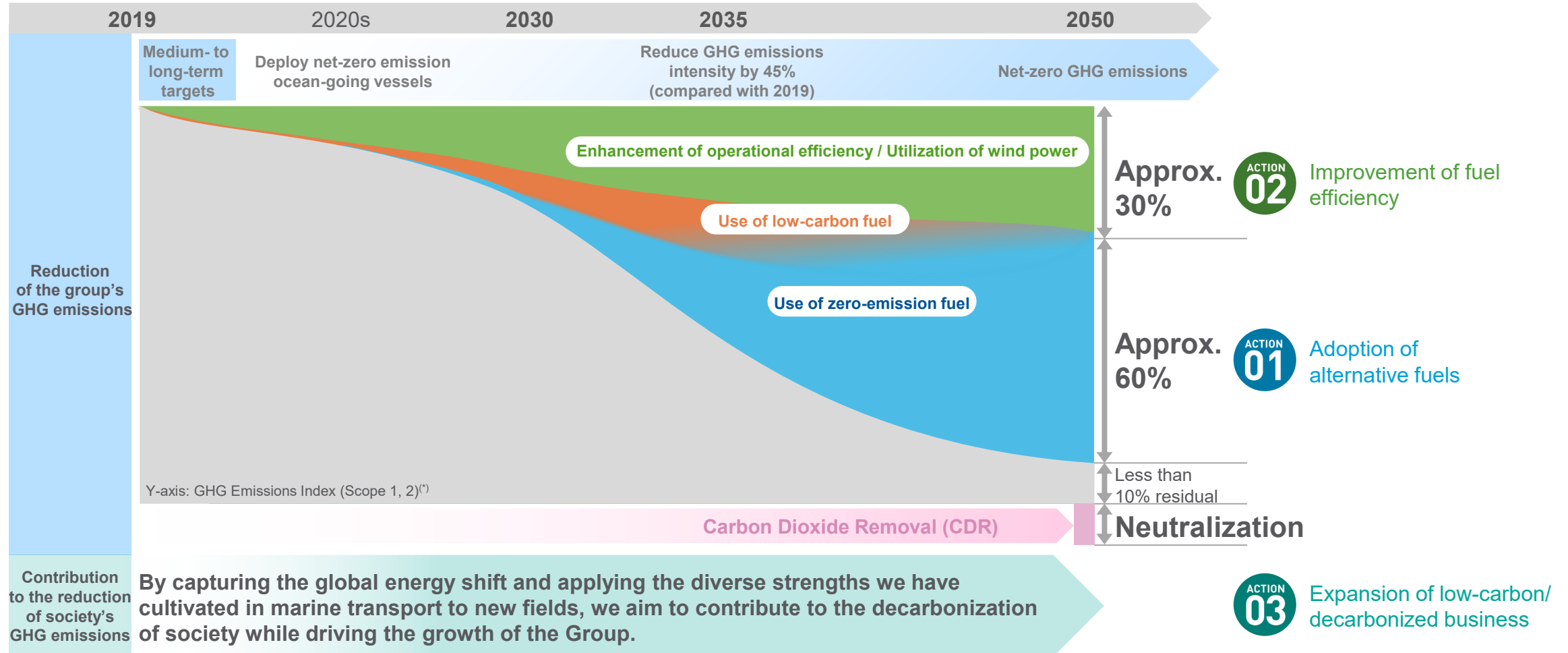


### Milestones measuring action progress



# Roadmap (Pathway to Net-Zero Emissions)

This roadmap presents the Group’s specific GHG emission reduction pathway and demonstrates its commitment to contributing to society’s decarbonization and low-carbon transition by taking on challenges in new business fields.



(\*) Scope: MOL and all consolidated subsidiaries. Scope 3 emissions are also included in the 2050 net-zero target boundary.

Definitions of each term are provided in the Appendix (p. 34)

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## 2. Environmental Action

Actions to Achieve Medium- to Long-term Targets

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## Reduction of the Group's GHG Emissions

We pursue two key actions to achieve net-zero emissions by 2050:

- Selecting optimal fuels for each vessel type and trade route, and reducing emissions immediately through low-carbon fuels.
- Steadily improving fuel efficiency by enhancing operational efficiency and utilizing wind power.



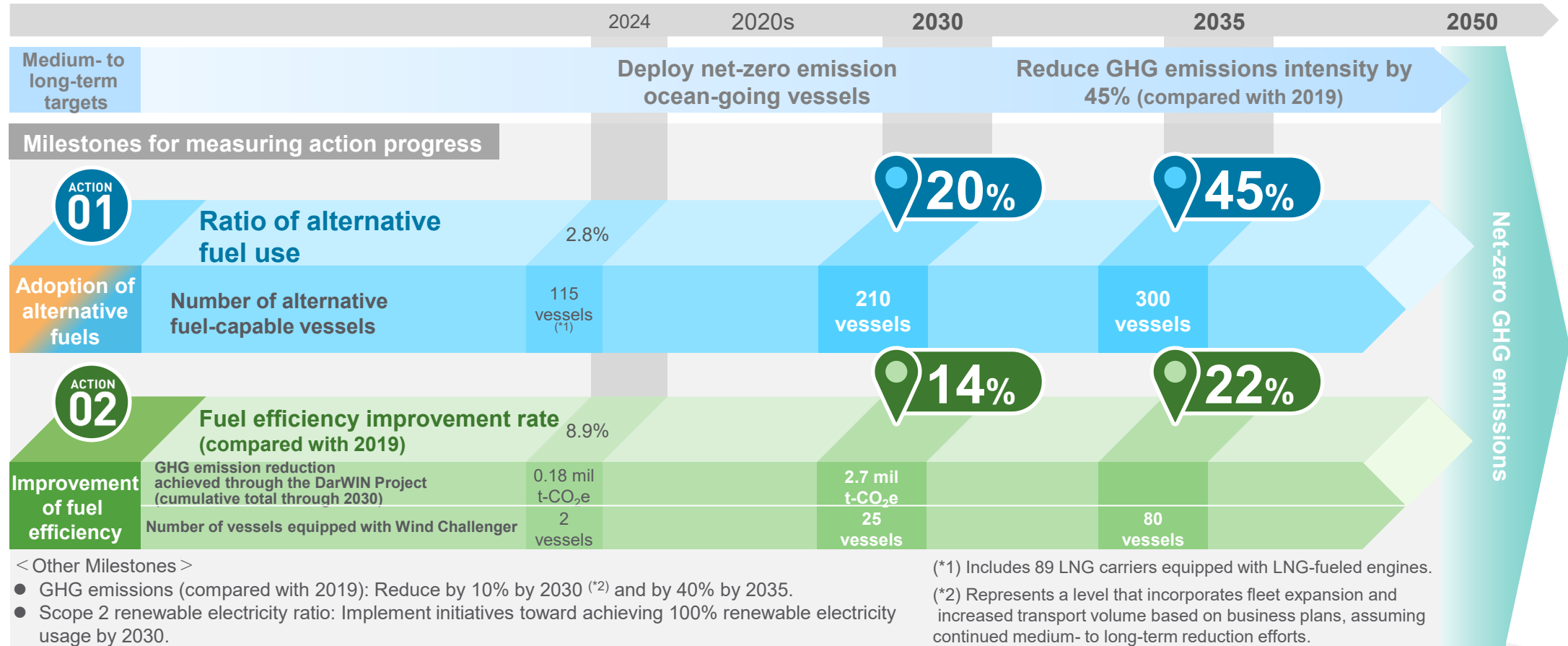
## Contribution to the Reduction of Society's GHG Emissions

Leveraging the diverse strengths we have cultivated in marine transport, we will advance into new business domains that support the reduction of society's GHG emissions.

**Initiatives Complementing Net-Zero**  
 Collaboration with value-chain partners, the maritime sector, and other industries; engagement with policymakers; and early participation in Carbon Dioxide Removal (CDR) projects to neutralize residual emissions

# Milestones Measuring Action Progress

To monitor and manage progress toward net-zero, we have established milestones through 2050. We review milestones levels as needed to reflect changes in the external environment. For this revision, we reviewed the indicators used to measure the adoption of alternative fuels, and expanded the scope of metrics related to fuel efficiency improvements.



< Other Milestones >

- GHG emissions (compared with 2019): Reduce by 10% by 2030 <sup>(\*)</sup> and by 40% by 2035.
- Scope 2 renewable electricity ratio: Implement initiatives toward achieving 100% renewable electricity usage by 2030.

<sup>(\*)</sup> Includes 89 LNG carriers equipped with LNG-fueled engines.

<sup>(\*)</sup> Represents a level that incorporates fleet expansion and increased transport volume based on business plans, assuming continued medium- to long-term reduction efforts.

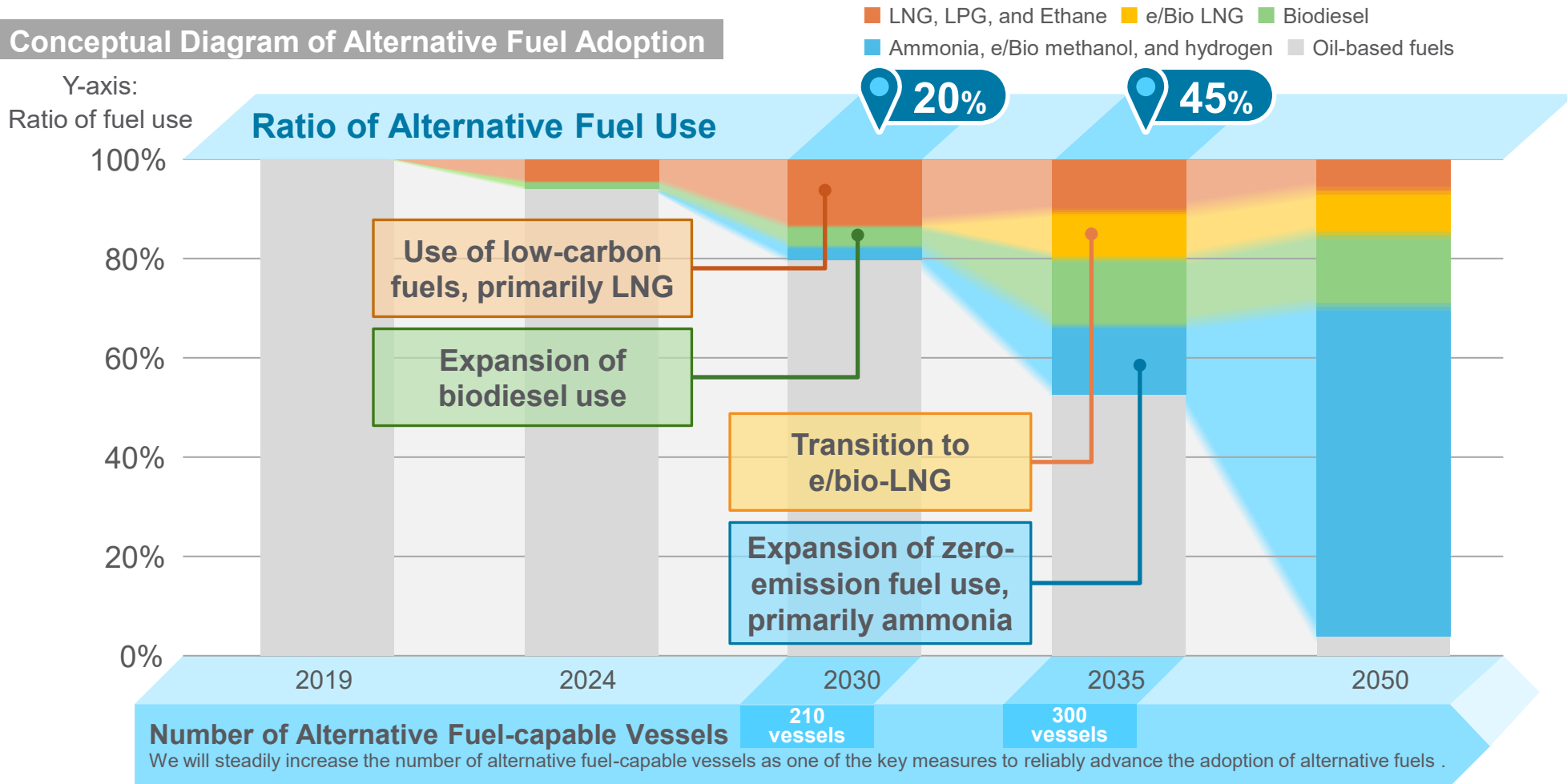
Regarding CDR, we will continue to proactively engage in a broad range of initiatives, spanning from credit generation to social implementation and market development.

Definitions and details of the targets and milestones are provided in the Appendix (p. 35).

# Action 1 Adoption of Alternative Fuels

We will advance the adoption of the most suitable alternative fuels for each vessel, reflecting the diverse vessel types and routes that characterize our business. By introducing alternative fuel-capable vessels—an essential foundation for the transition to new energy sources—we will strengthen our future resilience while accelerating the shift away from carbon-intensive oil-based fuels.

**Conceptual Diagram of Alternative Fuel Adoption**



## Near-Term Low-Carbon Measures and the Transition to Zero-Emission Fuels

As the mainstay of our short- to medium-term low-carbon initiatives, we will proactively utilize LNG, which is already practical and economically viable, and continue the steady use of biodiesel, which has already been adopted. In the medium to long term, we will advance decarbonization by transitioning from LNG to e/bio-LNG and expanding the use of biodiesel.

### LNG – Transition from Fossil-Derived LNG to e/bio-LNG

- We are advancing the introduction of LNG dual-fuel vessels with a view towards near-term low-carbon initiatives through LNG use and long-term decarbonization through the transition to e/bio-LNG. (Number of vessels delivered as of March 2026 (including LNG carriers): 112).
- Since entering the LNG transport business in 1983, we have built a world-leading track record in owning, managing, and operating LNG carriers. Leveraging the expertise accumulated through decades of LNG transport operations, we are expanding the use of LNG fuel across a diverse range of vessel types.

We operate 112 LNG dual-fuel vessels, including 87 LNG carriers and 25 vessels across other types, such as car carriers. With a view towards scaling up its use, we began using bio-LNG—which offers greater emissions-reduction benefits—in FY2025.

First ocean-going vessel operated by a Japanese shipping company to use bio-LNG



#### Measures to Address Methane Slip

We are implementing a range of measures to reduce the trace amounts of unburned methane (“methane slip”) emitted from LNG-fueled engines.

For details: [Press Release](#)

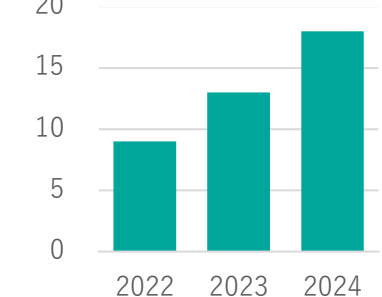
### Biodiesel

- We commenced its use in FY2022 as a drop-in fuel compatible with conventional heavy fuel oil-fired vessels. By utilizing various blend ratios such as B30 and B100 (\*), we are steadily increasing its use.
- We are advancing the establishment of a stable fuel supply system through collaboration with supply chain partners.



Vessel being supplied with biodiesel

Unit: Thousand tons  
(Heavy fuel oil equivalent)



Biodiesel consumption (B100 Equivalent)

(\*) The number following B indicates the biodiesel blend ratio (by volume). A higher blend ratio results in a greater GHG emissions-reduction effect

## Mainstay Zero-Emission Fuels for the Medium to Long Term

We position ammonia as our primary medium- to long-term zero-emission fuel and are building a robust foundation to respond swiftly to future demand growth. We are also flexibly utilizing e/bio-methanol according to vessel type and supply conditions, while advancing technical verification toward the societal implementation of hydrogen.

### Ammonia

- We are advancing the introduction of ammonia dual-fuel vessels in anticipation of future demand growth. As of March 2026, we have decided to introduce a total of five ammonia dual-fuel vessels.
- We are establishing fuel procurement systems while addressing safety challenges and building operational frameworks, including crew training.

#### Development of a Fleet of Ammonia Dual-Fuel Vessels

We are advancing fleet expansion across a diverse range of vessel types.



Ammonia dual-fuel  
Capesize bulk carrier  
(Scheduled for delivery in FY2026)



Ammonia dual-fuel  
Chemical tanker  
(Scheduled for delivery in FY2029)

### Methanol

- We took delivery of our first methanol dual-fuel vessel in 2016. We now operate a total of six such vessels (as of March 2026) and have decided to introduce an additional vessel.
- Leveraging our accumulated expertise in methanol maritime transport, we will flexibly utilize e/bio-methanol as a zero-emission fuel.

Methanol dual-fuel carrier  
"Kohzan Maru VII"  
(Delivered in FY2025)



### Hydrogen

- We are participating in a demonstration project for the operation of hydrogen-fueled vessels and advancing technical verification toward the practical application of hydrogen.

Hydrogen dual-fuel multi-purpose vessel  
(Scheduled for delivery in FY2027)



## Action 2 Improvement of Fuel Efficiency

We will continue to steadily implement feasible measures. With DarWIN enhancing operational efficiency and Wind Challenger harnessing wind power, these two initiatives will serve as the two pillars to improve fuel efficiency on each voyage and advance emissions reduction.

Maximizing GHG Reduction Effects

Full-Scale Introduction

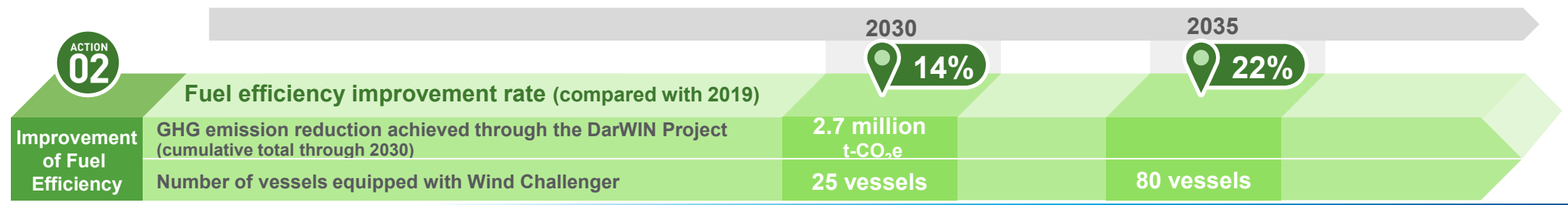
Steady improvement in fuel efficiency

**Evolving our vessels through continuous cumulative improvements**

Using extensive operational data, we apply our know-how and technologies to current vessels, thoroughly reducing environmental impact.

**Turning wind power into a viable source of propulsion**

Our in-house-developed hard-wing sail converts wind into propulsion. It reduces engine load while maintaining sailing speed, thereby lowering fuel consumption.



# Operational Efficiency Improvement Project: DarWIN (Digital Approach to Reduce GHG With Integrated Network)

Leveraging digital technology for vessel fuel-efficiency analysis, we promote a diverse range of energy-saving measures across three key areas: “specification improvements, condition maintenance, and optimal operation.” This approach delivers steady gains in fuel efficiency. By integrating onboard expertise with shore-based insights and building on our accumulated experience, we will further strengthen our decarbonization initiatives, achieving both immediate and sustainable reductions in GHG emissions.

We aim to reduce GHG emissions (cumulative total through 2030) by **2.7 million t-CO<sub>2</sub>e**

### Specification Improvements

Energy-Saving Devices installed

PBCF  
(Propeller Boss Cap Fin)

Stern fin

### Condition Maintenance

Cleaning and Anti-Fouling Measures

Ultrasonic anti-fouling device

Robotic hull cleaning

### Optimal Operation

Operational Support, Autopilot, ETA Adjustment, etc.

Wayfinder  
Optimal operational support tool

Energy-saving  
autopilot

**TSUNEISHI AKISHIMA LABORATORY**  
Verification of fuel savings

**Commercial** **Marine Engineering** **Technical**

**MOL Techno-Trade, Ltd.**  
MOL Techno-Trade, Ltd.  
Negotiations with manufacturers and support for the implementation of measures

**Advancing initiatives through a robust partnership framework—  
from pre-implementation verification, through execution, to post-implementation effectiveness verification**

**Data**

**EcoMOL**  
EcoMOL  
Support for environmental data management

## Utilization of Wind Power, Primarily via Wind Challenger

We focus primarily on the Wind Challenger to harness the clean, inexhaustible energy of wind. Building on the knowledge gained from our first and second vessels already in operation, we will accelerate initiatives to expand introduction going forward.



## Roadmap for Wind Challenger Fleet Expansion



- Wind Challenger is a hard-sail, wind-assisted propulsion system developed by MOL. It harnesses wind power to support vessel propulsion, enabling significant reductions in GHG emissions. For details and specifications of the Wind Challenger, check here: [Wind Challenger-The Wind Assisted Ship Propulsion System](#)
- Installable on both newbuilds and existing vessels of various sizes and types. Fuel efficiency can be maximized by installing multiple sails tailored to each vessel type.
- Introducing optimal technologies based on vessel characteristics, including not only the Wind Challenger but also other wind-assisted devices, such as rotor sails.

# Associated Businesses: Advancing Industry-Leading Initiatives

We will advance GHG emission reductions in businesses beyond international shipping while striving to become the preferred choice of diverse stakeholders through the provision of low-carbon and decarbonized services and environmental solutions.

## Ferries and Coastal Vessels

We are advancing GHG reductions at a level that exceeds Japan's domestic shipping GHG reduction targets (\*), including through the introduction of ferries equipped with alternative-fuel engines, thereby supporting the expansion of industry-wide low-carbon and decarbonized efforts.

We are also conducting studies on producing biomethane from livestock manure and other organic matter for use in ships. [\(Press Release\)](#)



LNG dual-fuel bulk carrier  
"Ise Mirai"



LNG dual-fuel ferries "Sunflower Kamuy/Kurenai"



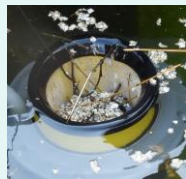
Pure battery tanker  
"Akari/Asahi"

## Tugboats

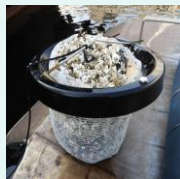
Leveraging our experience in conducting business rooted in local communities and ports, we will continue our initiatives toward low-carbon and decarbonization, including measures such as the introduction of energy-saving devices like PBCF and the fuel conversion of tugboats, while also advancing ongoing marine environmental conservation activities.



LNG dual fuel tugboat "Ishin"



Collecting marine plastic using Seabin  
(Hiroshima Port)



## Terminal and Logistics

We are advancing solar power generation at Tokyo Port's self-operated container terminal and introducing new transfer cranes capable of conversion to hydrogen power at Kobe and Yokohama Ports. In our logistics infrastructure business, we are investing in warehouse properties with high environmental performance.



Demonstration of  
converting cargo-handling equipment  
to hydrogen fuel cells (Yokohama Port)



Energy-efficient refrigerated warehouse  
(Singapore)

## Real Property

We also contribute to enhancing urban sustainability through initiatives such as constructing highly energy-efficient buildings, introducing CO<sub>2</sub>-free electricity to all buildings both domestically and internationally, and creating spaces where cities and nature harmonize.



Dojima no Mori (Osaka)  
Certified as a Nationally Certified  
Sustainably Managed Natural Sites



Yaesu Daibiru Building (Tokyo)  
Certified LEED GOLD · ZEB  
Ready · CASBEE-WO S-Rank



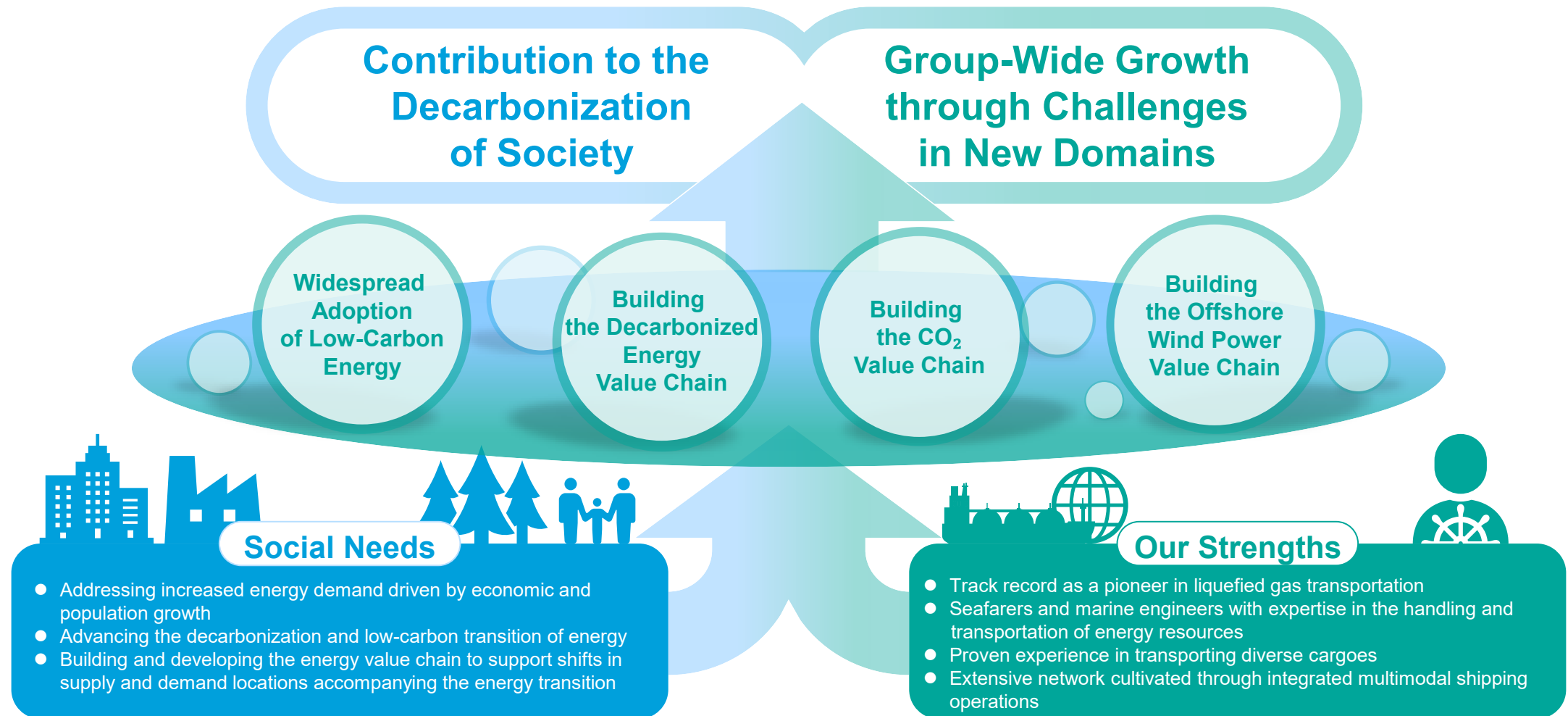
CornerStone Building  
(Vietnam)  
First CO<sub>2</sub>-free  
electricity introduced at the  
Vietnam office

(\*) [Greenhouse Gas Reduction Targets for Domestic Shipping by Fiscal Year 2040](#)

(Announced March 3, 2025, Ministry of Land, Infrastructure, Transport and Tourism): Reduce emissions by approximately 36% compared to FY2013 levels by FY2040 (taking modal shift into account).

## Action 3 Expansion of Low-Carbon/Decarbonized Business

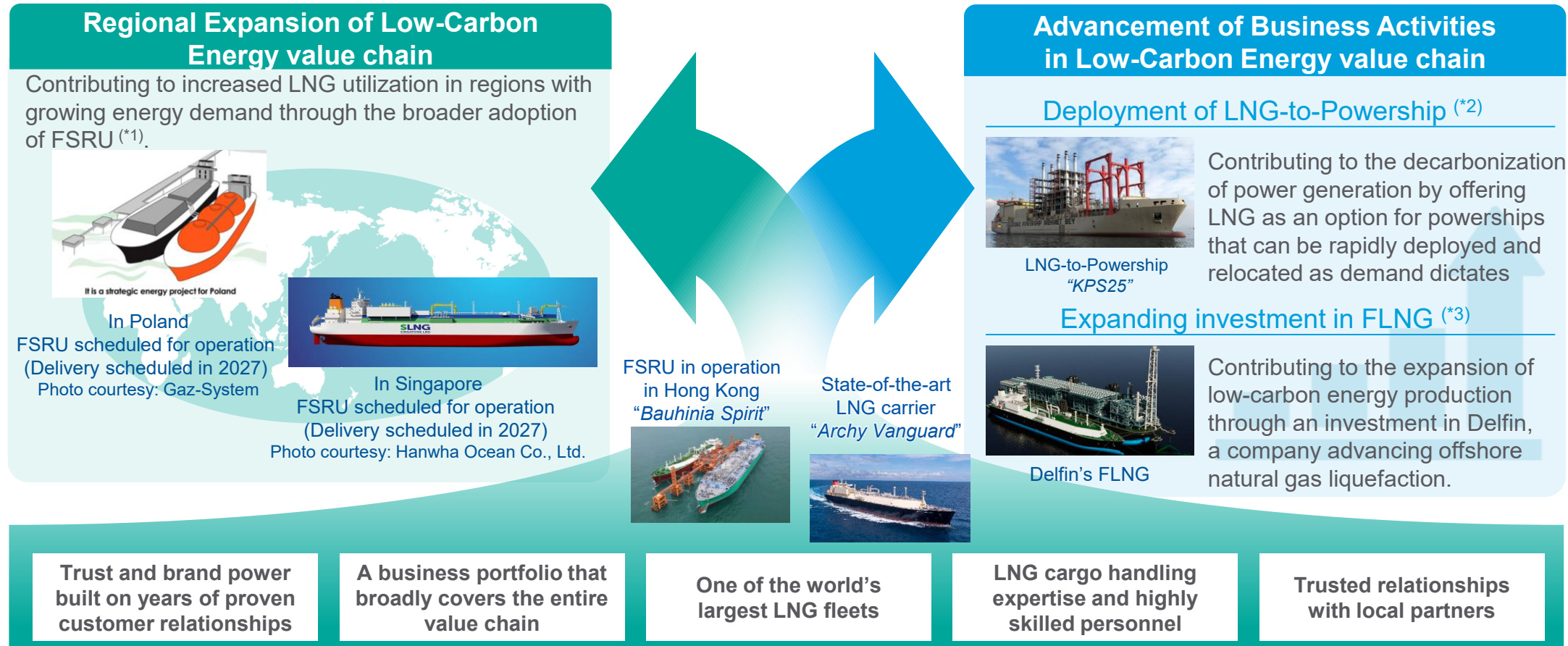
By capturing the social needs emerging from the global energy shift and leveraging the diverse strengths we have cultivated through marine transport to take on new challenges in emerging fields, we aim to drive growth of the MOL Group and contribute to the realization of a decarbonized society.



# Action 3 Expansion of Low-Carbon and Decarbonized Business

## Widespread Adoption of Low-Carbon Energy

During the transition period before decarbonized energy becomes widespread, we will contribute to global low-carbon efforts, including in emerging nations, by leveraging the strengths and track record we have built to expand low-carbon energy value chains regionally and advance existing value chains.



(\*1) FSRU stands for Floating Storage and Regasification Unit. It is a floating facility capable of regasifying LNG at sea and delivering high-pressure gas to onshore pipelines and facilities.  
 (\*2) Powership is a ship equipped with onboard power-generation facilities that moors in ports or coastal areas to supply electricity. It offers rapid deployment and the flexibility to move and operate according to demand.  
 (\*3) FLNG stands for Floating Liquefied Natural Gas. Natural gas is liquefied into LNG—reducing its volume to approximately 1/600th—for efficient transport. After liquefaction at onshore or floating LNG production facilities, it is transported by LNG carriers.

# Action 3 Expansion of Low-Carbon and Decarbonized Business

## Building the Decarbonized Energy Value Chain

Leveraging insights gained from conventional energy maritime transport. Together with group-wide business foundations such as chemical logistics and FSRUs, we contribute to building a decarbonized energy value chain that excels in stability and efficiency.

### Overview of the Decarbonized Energy Value Chain

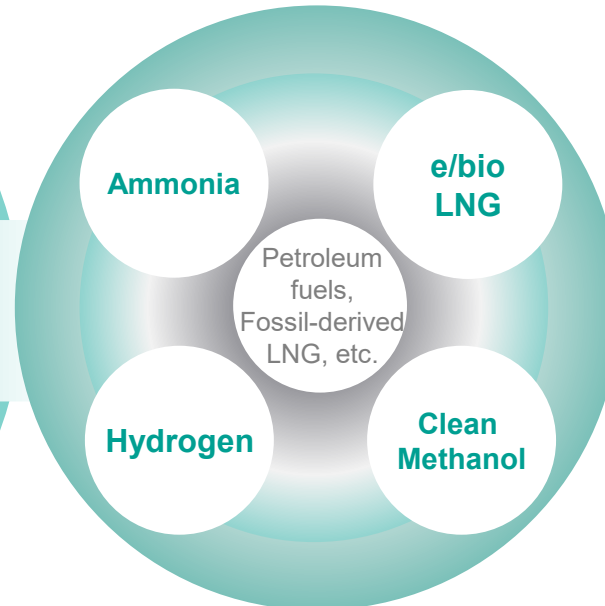
#### Generating decarbonized energy



#### Engagement in production activities



#### Marine Transport



#### Delivering decarbonized energy



#### Contributing to value chain development



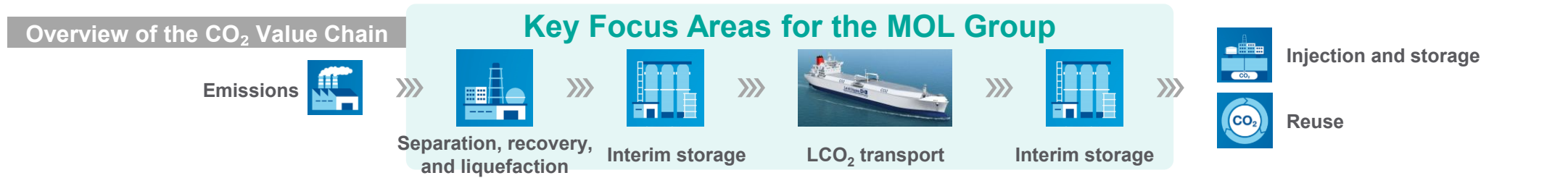
(\*)1 The utilization of secured marine fuels within the MOL Group is described in Action 1 (p.14).

(\*)2 Corporate Venture Capital: A structure in which a company establishes a fund using its own capital to invest in and support startups.

# Action 3 Expansion of Low-Carbon and Decarbonized Business

## Building the CO<sub>2</sub> Value Chain

Leveraging expertise cultivated in the shipping business, we actively pursue the marine transport and interim storage of liquefied CO<sub>2</sub>(LCO<sub>2</sub>), seamlessly connecting the entire value chain.



### LCO<sub>2</sub> transport LCO<sub>2</sub> Marine Transport

Contributing to building the CO<sub>2</sub> value chain as a trusted partner, meeting the growing demand for LCO<sub>2</sub> transport



CG image of the receiving terminal in Norway (Photo courtesy: Northern Lights)

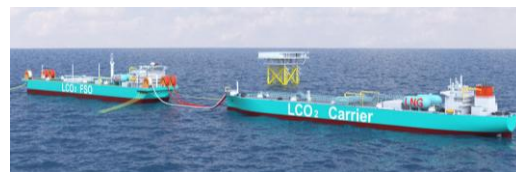
We are participating as the owner of two LCO<sub>2</sub> carriers in the world's first cross-border LCO<sub>2</sub> marine transport and storage project led by Northern Lights JV DA (\*1).

Establishment of a joint venture with the Petronas Group to own LCO<sub>2</sub> carriers



CG image of the 62,000m<sup>3</sup> LCO<sub>2</sub> carrier

Acquisition of AiP for LCO<sub>2</sub> carriers and FSO from major classification societies



CG image of FSO (\*2) with offloading to LCO<sub>2</sub> carriers

### Interim storage Expansion into Onshore Storage Operations

In June 2025, we completed the acquisition of LBC Tank Terminals, a major tank terminal operator. Anticipating growing demand for CO<sub>2</sub> transport, we are accelerating the development of CO<sub>2</sub> receiving terminal operations.



Illustrative image of LCO<sub>2</sub> terminal development in Europe

### Separation and recovery Support for CO<sub>2</sub> capture technology through our CVC

Through our CVC activities, we actively invest in and support startups developing CO<sub>2</sub> capture technologies such as Direct Air Capture and Direct Ocean Capture (\*3).



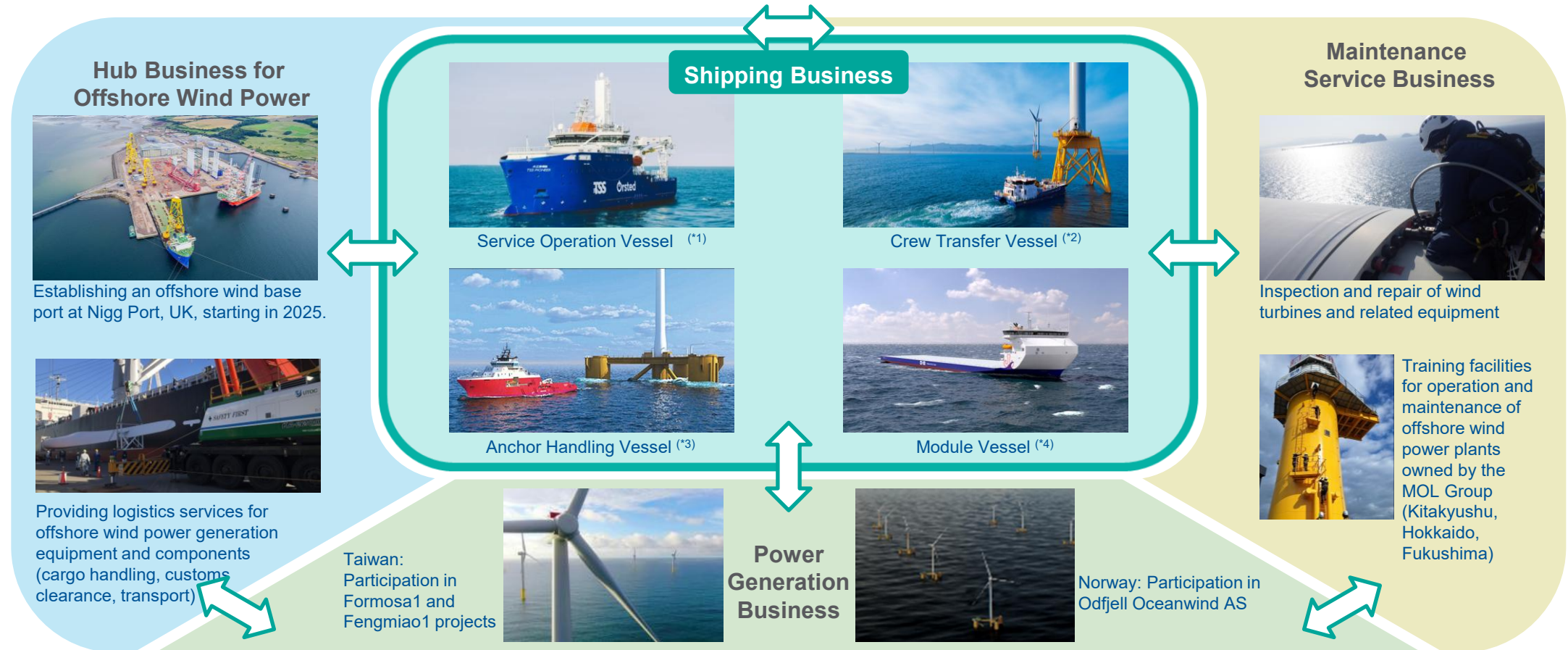
DOC facility (Photo courtesy: Captura Corp.)

(\*1) A joint venture that provides LCO<sub>2</sub> transport and storage services, with Equinor (Norway), TotalEnergies (France), and Shell (U.K.) each holding a one-third stake.  
 (\*2) Floating Storage and Offloading (FSO) system: A floating facility dedicated solely to storing and offloading CO<sub>2</sub>. It receives CO<sub>2</sub>, stores it in onboard tanks, and transfers it for offshore injection.  
 (\*3) Technologies that directly capture carbon dioxide from the atmosphere or ocean using absorbents or chemical reactions. The captured CO<sub>2</sub> is either stored underground or used to produce synthetic fuels and chemicals.

# Action 3 Expansion of Low-Carbon and Decarbonized Business

## Building the Offshore Wind Power Value Chain

With vessel-based shipping business at its core, we will contribute to the global expansion of offshore wind power by leveraging synergies across our power generation, offshore wind hub, and maintenance service businesses.



(\*1) Service operation vessels equipped with accommodation facilities allow maintenance technicians to stay offshore for extended periods while servicing wind turbines. They are fitted with dynamic positioning systems to ensure safe personnel transfer.

(\*2) Crew transfer vessels carry maintenance technicians from ports to nearby offshore wind turbines. They berth alongside turbines using bow fenders, allowing technicians to transfer safely.

(\*3) Specialized vessels for installing and retrieving anchors and mooring ropes used to secure large offshore structures such as platforms and drilling ships in designated positions.

(\*4) Self-propelled heavy-lift carriers with flat, wide decks, suitable for transporting large cargo such as cranes, heavy construction equipment, oil-field platforms, plant modules, and wind-power components.

## Initiatives Complementing Net-Zero

We will not only vigorously advance the three actions toward achieving net-zero but also implement complementary initiatives to ensure its reliable attainment.

### Collaboration with Diverse Stakeholders

International shipping is an industry supported by global value chain partners, as achieving net-zero emissions through individual corporate efforts alone is difficult.

We are advancing initiatives in collaboration with diverse partners, including developing mechanisms that enhance the effectiveness of reduction efforts.

#### Enhancement of Low-Emission Marine Transport Services through Carbon Insetting Initiatives (p. 27)

#### Participation in International Conferences and Initiatives

We proactively participate in international conferences and initiatives, seeking collaboration not only within the maritime and shipbuilding industries but also with other sectors such as energy.



Spoke at a Global Maritime Forum event

#### Engagement with Policy Makers (p. 27)

#### Collaboration with Value Chain Partners for Scope 3 Emissions Reduction

We will advance Scope 3 emissions reduction by improving calculation methodologies and by collaborating with value chain partners.

#### Case

Collaboration with ITOCHU to Promote Environmental Attribute Certificates (EACs)

We signed an MOU for a strategic partnership with ITOCHU and conducted mutual trading of certificates to promote the adoption of EACs that contribute to decarbonization in the transportation sector (sea and air). We plan to use the SAF <sup>(\*)2</sup> EACs purchased from ITOCHU for Category 6 reductions. [\(Press Release\)](#)

### Introduction of New Reduction Measures

We will explore the introduction of new reduction measures, including the use of Onboard Carbon Capture and Storage (OCCS), to further reduce our own GHG emissions, alongside the adoption of alternative fuels and improvement of fuel efficiency.

#### Use of Onboard Carbon Capture and Storage (OCCS) (p. 28)

### Addressing Hard-to-abate Emissions

We will advance CDR initiatives to address emissions that are difficult to reduce, while prioritizing efforts to cut emissions from our business activities.

#### Early Participation in CDR Projects (p. 28)

(\*1) An international nonprofit organization working to reduce greenhouse gas (GHG) emissions from freight transport.

(\*2) Sustainable aviation fuel.

## Developing Mechanisms to Enhance Reduction Effectiveness

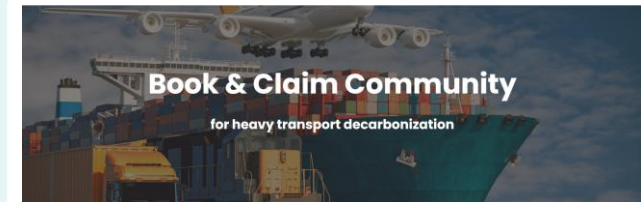
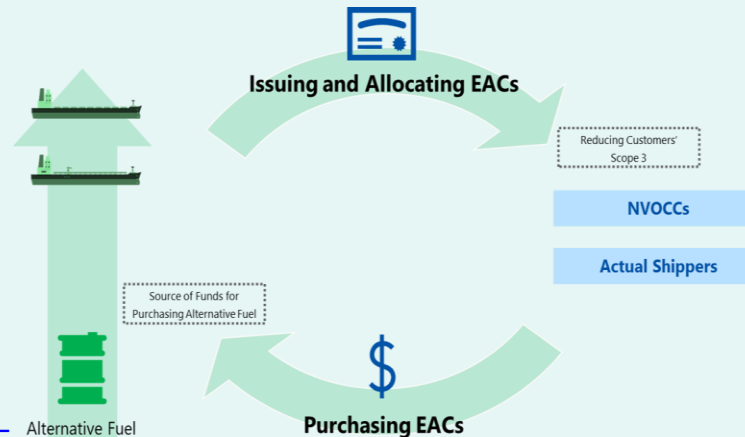
To enhance the effectiveness of the three actions for achieving net-zero, it is critical to establish mechanisms through collaboration with a diverse range of stakeholders.

### Enhancement of Low-Emission Marine Transport Services through Carbon Insetting

We allocate certificates to our customers that transparently verify the low-carbon attributes of voyages using alternative fuels through third-party verification. This contributes to our customers' Scope 3 reductions, while the proceeds from certificate sales are used to fund our next alternative fuel procurement.

This cycle accelerates the adoption of alternative fuels and ensures economic sustainability, thereby supporting supply chain development.

For details: [BLUE ACTION NET-ZERO ALLIANCE](#)



#### Participation in the Book and Claim Community

An organization established in 2023 to develop a unified Book and Claim<sup>(\*)</sup> framework for decarbonizing the transport sector. MOL joined the organization's governing board in September 2024 as the only Asian company at that time.

### Engagement with Policy Makers

For the global shipping industry to advance toward net-zero, it is essential to establish a competitive environment in which decarbonization efforts are properly recognized. We believe this requires setting ambitious industry-wide reduction targets and introducing fair and effective international GHG regulations.

We contribute to discussions in the International Maritime Organization (IMO), the regulatory authority for international shipping, through industry associations. This reflects our belief that institutional frameworks premised on the use of diverse fuels and energy sources—including wind power—are vital for enabling the entire industry to pursue more sustainable decarbonization efforts.

### Appropriate Responses to Carbon Pricing

- Compliance with regional regulations (EU-ETS, FuelEU Maritime, etc.)**  
 We have established a collaborative framework among relevant divisions within the group. This framework covers the entire process—from monitoring regulated emissions to purchasing and retiring the necessary emission allowances—ensuring consistent compliance with applicable regulations.
- Preparation for the Introduction of Carbon Pricing in International Shipping**  
 We introduced an Internal Carbon Pricing (ICP) in fiscal year 2021 and have incorporated it into management decisions, including investment evaluations. We are also continuously strengthening our framework to promote low-carbon and decarbonization measures, such as the adoption of alternative fuels.

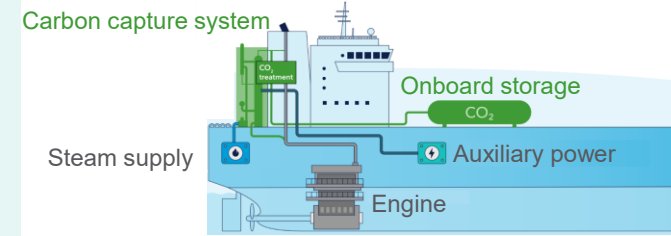
(\*) A method whereby the GHG reduction value achieved through shipping services utilizing low-carbon fuels is recorded ("Book"), and customers who receive an allocation can claim that reduction value.

## Use of Onboard Carbon Capture and Storage (OCCS)

OCCS, which captures and stores CO<sub>2</sub> emitted during ship operations, is one of the decarbonization technologies contributing to reducing our own GHG emissions. MOL achieved the first commercial installation of OCCS system among Japanese Operators in 2025. We will continue to verify implementation feasibility for further introduction and strengthen our initiatives toward net-zero.



First Japanese Operator to commercially install OCCS



OCCS system concept diagram (Photo courtesy: DNV)

## Initiatives for Carbon Dioxide Removal (CDR)

We position CDR as a critical element for addressing hard-to-abate emissions from our business activities and for neutralizing residual emissions. Since 2022, we have proactively engaged in a wide range of activities—from the creation of CDR projects to their societal deployment and market formation—and will continue to do so going forward, contributing to the broader adoption and expansion of CDR. For details: [CDR individual initiatives](#)

### Technology-Based Solution

- We have committed to purchasing and retiring at least 50,000 tons of credits by 2030 through our participation in the NextGen CDR Facility (May 2022), which aims to promote and accelerate the adoption of CDR technologies.
- We participate as a promoter member in the Japan CDR Coalition, contributing to rule-making and demand expansion for the domestic CDR market.



### Nature-Based Solution

- We are also advancing participation in nature-based projects that contribute to reducing global emissions immediately. By supporting initiatives such as forest and mangrove restoration, we contribute to biodiversity conservation, marine environmental protection, and local community development.



Mangrove restoration and conservation project

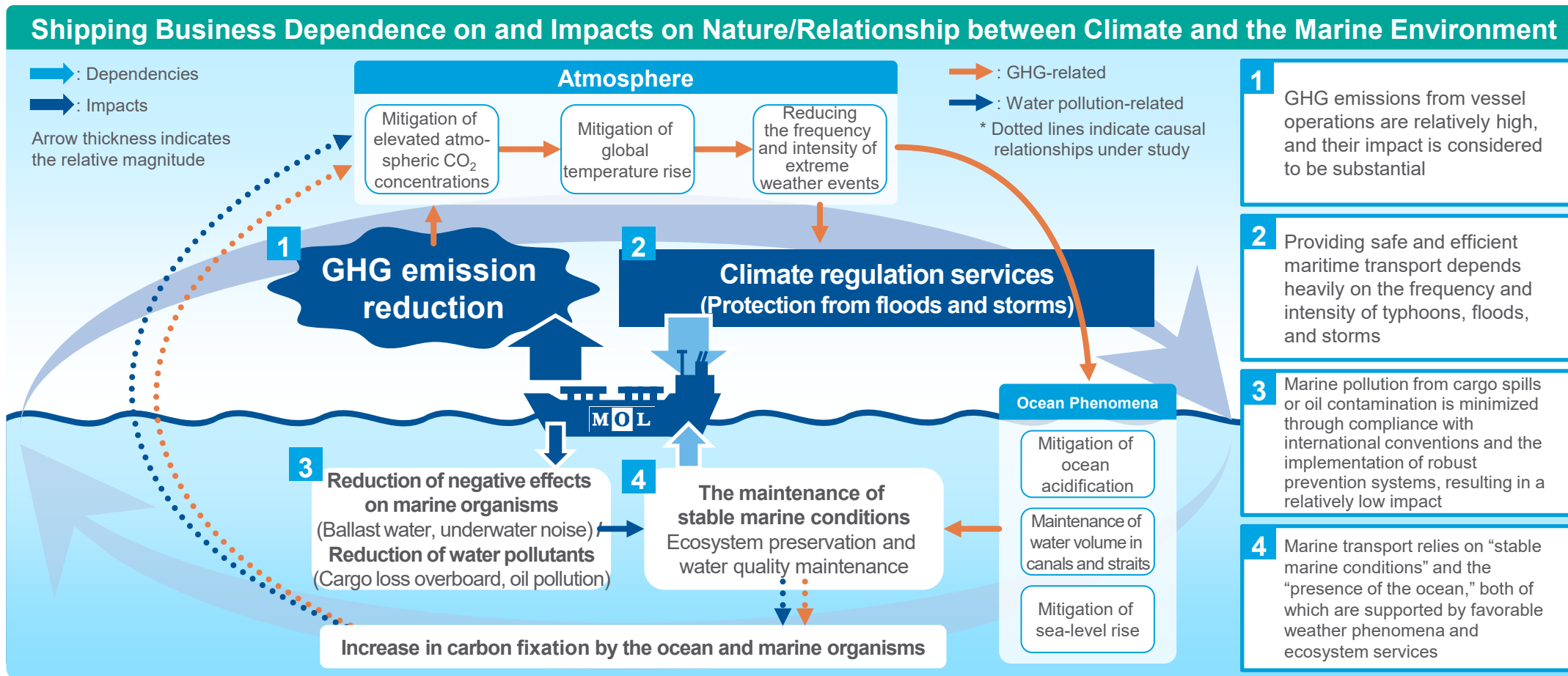
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## 3. Marine Environmental Conservation and Related Initiatives

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# Relationship Between Dependence on/Impacts on the Marine Environment

The marine environment—like the climate—serves as a foundation for value creation. By broadly addressing environmental challenges and striving to properly understand our dependence on and impacts on the environment, we aim to implement more effective and informed countermeasures.

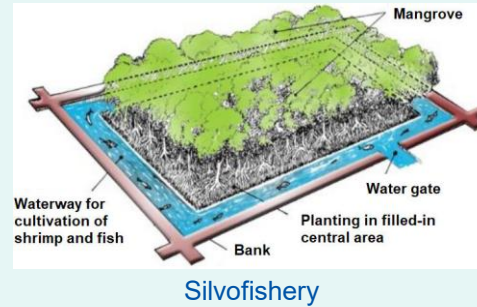


Source: Provided by MOL based on an analysis using the online tool ENCORE and the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC)

## Conservation of the Marine Environment through Climate Change Mitigation

Recognizing that efforts to reduce GHG emissions also contribute to the conservation of the marine environment and biodiversity through climate change mitigation, we are vigorously advancing climate change countermeasures based on analysis results from the TNFD and other sources, while also promoting initiatives expected to deliver co-benefits(\*) for the marine environment.

### Mangrove Restoration and Conservation Project in Indonesia



Co-benefits for nature and local communities are expected through the protection of biodiversity, the mitigation of storm surge damage, and the introduction of nature-based aquaculture (Silvofishery), as well as through mangrove-based CO<sub>2</sub> removal and absorption.

### Reduction of Marine Environmental Impact through Fuel Efficiency Improvement Measures



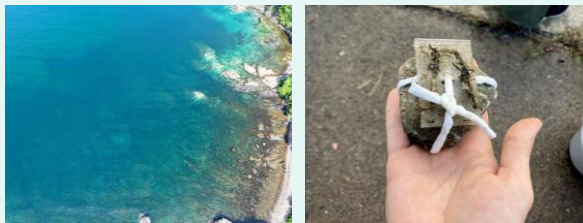
PBCF



Hull cleaning

Fuel-efficiency improvement measures—such as reducing hull and propeller resistance—can also reduce underwater noise.

### Expansion of Blue Carbon Utilization through Seagrass Bed Restoration



We contribute to the large-scale expansion of blue carbon projects, as well as to revitalizing local economies and addressing coastal “sea desertification” through seagrass bed restoration and community-based activities in coastal areas. ([Information](#))

### Reduction of Air Pollutants

Low-carbon and decarbonization measures, such as reducing fuel consumption and switching to lower-sulfur fuels like LNG and ammonia, are also expected to reduce air pollutants. We will advance initiatives for operational efficiency and adopting alternative fuels, in addition to complying with international regulations, to **reduce SOx emissions intensity (g-SOx/ton-mile) by 14% by 2030 compared to 2020 levels.**

(\*) These refer to the positive effects that measures taken for climate change mitigation also have on nature.

## To Protect the Blue Ocean

The MOL Group's mission is to protect the blue oceans shared by all humanity and to create sustainable growth. We not only comply with relevant regulations as a matter of course, but also proactively pursue initiatives that enhance ocean sustainability beyond climate countermeasures.

Moving forward, we will deepen collaboration with diverse stakeholders across society to establish more sustainable practices. Through these efforts, we aim to become a company of choice for our stakeholders, including future generations.

### Contribution to the Advancement of Marine Science and Technology through Cooperation in Research and Surveys



<CG rendering of the Arctic Research Vessel>  
(Photo courtesy: JAMSTEC)

#### JAMSTEC Arctic Research Vessel "Mirai II"

As an operator scheduled to provide services including pre-commissioning crew dispatch, we will contribute to the sustainable development, use, and conservation of the Arctic region. ([Press Release](#))



#### Vessels Recognized for Excellence in Weather Observation and Reporting

MOL Group-managed vessels were officially recognized and honored by Japanese government authorities for 10 consecutive years for their contributions to the development of meteorological services through the observation and reporting of weather and sea conditions. ([Press Release](#))

### Conservation of the Marine Environment through Social Contribution Activities



We believe that conserving the marine environment, including biodiversity, is a mission for our group and for future society. Accordingly, we have designated the "marine environment" as a priority area for our social contribution activities.

For details: [Social Contribution Activities](#)

### Ship Recycling

We have established and operate our own Superior Ship Recycling Standards, in addition to complying with the Ship Recycling Convention, to address internationally recognized challenges such as the management and treatment of hazardous substances during ship recycling, environmental impacts, and worker health and safety.

For details: [Initiatives for ship recycling \(Responsible Procurement\)](#)

### Regulatory Compliance

We have installed ballast water treatment systems in accordance with the Ballast Water Management Convention (with 100% installation completed as of September 2024), and we appropriately implement onboard sewage and waste management as stipulated in the MARPOL Convention Annexes.

For details: [Regulations](#)

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# Appendix

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# Notes on Methodology and Data

## ■ General

All numerical calculation periods align with the Mitsui O.S.K. Lines, Ltd. (hereinafter referred to as “MOL”) fiscal year (April to March).

For the latest data on each indicator’s coverage rate etc., refer to the Sustainability Data ([Link](#)).

## ■ Medium-to-long-term Targets (p. 9, etc.)

### • Deploy net-zero emission ocean-going vessels

- Target Timeframe: In the 2020s
- Scope: Ocean-going vessels operated by MOL and all domestic and overseas consolidated subsidiaries.
- Definition: Net-zero-emission ocean-going vessels are ships equipped with engines capable of using fuels that can be recognized as zero-emission.

### • GHG Emissions Intensity ▲45% (vs. 2019)

- Scope: Scope 1 (Tank-to-wake emissions) plus Scope 3 Category 3 emissions from the production stage of marine fuel used on ocean-going vessels (Well-to-tank emissions).
- Target Year: Fiscal Year 2035
- Coverage: Ocean-going vessels operated by MOL and all domestic and overseas consolidated subsidiaries.
- Definition: GHG emissions intensity is the company-wide total well-to-wake GHG emissions per ton-mile (g-CO<sub>2</sub>e/ton-mile) for target vessels, calculated using the *Standard Methodology* (\*).
- GHG Emission Factors: Prioritize factors from international maritime GHG regulations such as IMO and FuelEU Maritime, updating them as required. If regulatory factors are unavailable, supplement with frameworks such as GLEC. Includes CO<sub>2</sub>, methane, and N<sub>2</sub>O.

(\*) Standard Methodology: A methodology designed to correct the impact of differences in absolute emission intensity values across business segments—arising from their inherent characteristics—on the calculation of the company-wide total. This ensures that efficiency improvements in each segment are appropriately reflected in the company-wide total. Calculated as follows (see also p. 36 for our company’s perspective).

- Base Year(FY2019): Total well-to-wake emissions across all segments ÷ total ton-miles across all segments (ton-mile weighted average).
- Years after the Base Year: Calculate each segment’s reduction rate relative to the base year (method: ton-mile weighted average). Determine each segment’s contribution ratio based on business scale calculated from energy consumption. Calculate the weighted average of reduction rates using these contribution ratios.

## • Achieving Net-zero Emissions

- Scope: Scope 1, 2, 3
- Target Year: Fiscal Year 2050 or earlier
- Coverage: MOL and all domestic and overseas consolidated subsidiaries, calculated based on the control criterion. Scope 2 is location-based.
- GHG Emission Factors: International shipping follows GHG emissions intensity factors. Others include factors from the Ministry of the Environment’s Calculation, Reporting, and Disclosure System; the Emission Intensity Database for Calculating an Organization’s GHG Emissions through the Supply Chain; IDEA v.2; IEA Emissions Factors (2024); and other relevant sources.

## ■ Pathway to Net-zero Emissions (p. 10)

### • GHG Emissions Index

- Scope: Scope 1, 2
- Coverage: Consistent with the company’s net-zero emissions pathway
- Definition: GHG emissions calculated under the assumption of constant ton-mile activity

### • Low-carbon Fuels

Primarily fossil-derived fuels (excluding zero-emission fuels) that have lower well-to-wake GHG emissions intensity than petroleum fuels. Positioned as transitional reduction measures. Examples include fossil-derived LNG, ethane, and LPG.

### • Zero-emission Fuels

Fuels that do not generate CO<sub>2</sub> emissions during use, or fuels that—even if CO<sub>2</sub> is emitted during combustion—are expected to significantly reduce well-to-wake GHG emissions intensity compared with petroleum fuels due to renewable or non-fossil carbon cycles. As fuels consistent with achieving net-zero in the future, examples include ammonia, hydrogen, biodiesel, e/bio-LNG, e/bio-methanol.

### • Neutralization via CDR

Carbon Dioxide Removal (CDR) refers to activities that remove CO<sub>2</sub> from the atmosphere and store or sequester it through technological approaches and/or natural processes. While prioritizing the reduction of our own emissions, we assume that, in the target year for achieving net-zero, residual emissions that are difficult to abate may be neutralized using CDR, up to a limit of less than 10% of total Scope 1–3 emissions, based on the amount of CO<sub>2</sub> removed. For years prior to the net-zero target year, emissions across Scope 1–3 will be calculated and reported on a gross basis, and no offsetting through the use of CDR (e.g., removal-based carbon credits) will be applied.

# Notes on Methodology and Data

## ■ Milestones (p. 13, etc.)

Target levels at the midpoint on the path to 2050.

### • Ratio of alternative fuel use

- Coverage: Ocean-going vessels for which MOL Group manages fuel use.
- Definition: The proportion of non-heavy fuel oil in the total fuel consumption of all applicable vessels (energy equivalent). Alternative fuels include fossil-derived LNG, ethane, LPG, ammonia, hydrogen, biodiesel, e/bio-LNG and e/bio-methanol.

### • Number of alternative fuel-capable vessels

- Coverage: Vessels engaged in international cargo transport and operated by MOL Group ([Link](#)).
- Definition: Number of completed vessels in the target fleet that are not heavy-fuel-oil-only vessels (vessels equipped with engines capable of using fuels other than heavy fuel oil, such as LNG or ammonia). Also includes LNG carriers.

### • Fuel efficiency improvement rate (compared with 2019)

- Coverage: Ocean-going vessels for which MOL Group manages fuel use.
- Definition: Improvement rate compared with the base year for energy consumption per ton-mile (MJ/ton-mile), calculated using the Standard Methodology (p. 34).

### • GHG emission reduction achieved through the DarWIN Project

- Coverage: Existing vessels engaged in international cargo transport and operated MOL Group that are subject to fuel-saving measures.
- Definition: Fuel savings achieved through various fuel-saving measures implemented under the DarWIN Project, which reduces GHG emissions by promoting efficient operations, multiplied by the tank-to-wake GHG emission factor (including methane and N<sub>2</sub>O; source: IMO LCA Guidelines), converted to heavy-fuel-oil equivalent. Cumulative value from FY2023 to FY2030.

### • Number of vessels equipped with Wind Challenger

- Coverage: Vessels engaged in international cargo transport and operated by MOL Group.
- Definition: The Wind Challenger is a device that senses wind direction and speed in real time, automatically controls sail extension/retraction and rotation, and assists vessel propulsion using wind power. Count includes completed vessels in the target fleet equipped with Wind Challenger and already in service. Cumulative value up to each milestone year.

### • GHG emissions (compared with 2019)

- Scope: All Scope 1 and 2 emissions, plus part of Scope 3 Category 3.
- Coverage: MOL and all domestic and overseas consolidated subsidiaries, calculated based on the control criterion. Scope 2 is location-based. Includes manufacturing-stage emissions from fuel used on owned ocean-going vessels (part of Scope 3 Category 3).

### • Scope 2 renewable electricity ratio

- Coverage: All MOL Group business segments, consolidated Scope 2 electricity.
- Definition: The proportion of electricity consumption derived from renewable energy sources. Includes electricity supplied from renewable energy facilities, CO<sub>2</sub>-free electricity, and equivalent environmental certificate arrangements.

### • CDR

- To date, anticipating the early expansion of the CDR market, we have proactively pursued growth in demand and supply volume by setting ambitious quantitative milestones. We are now transitioning to the implementation phase, with a focus not only on securing sufficient volume, but also on establishing robust systems that enable the full CDR value chain—from credit creation to utilization.—and ensure high quality CDR portfolio and reliable societal implementation.
- Regarding quantitative targets, we will continue to evaluate ongoing international discussions on rules/guidance/frameworks, market maturity, and technological progress, and will reassess them at an appropriate time.

## Validity of the Methodology for Calculating Company-wide GHG Emissions Intensity

When calculating company-wide GHG emissions intensity (definition p. 34), we adopt the *Standard Methodology* (definition p. 34) as the MOL Group standard, rather than a ton-mile weighted average. The rationale behind this approach is outlined below.

Comparisons of standard GHG emissions intensity values by vessel type show significant differences arising from the characteristics of the cargo transported. For example, vessels carrying cargo with high weight per volume (e.g., dry bulk carriers) naturally generate far higher ton-miles than vessels carrying cargo with low weight per volume (e.g., vehicle carriers). As a result, the GHG emissions intensity of vehicle carriers can be several to ten times or more than that of dry bulk carriers of comparable size and fuel consumption. In practice, even two vessels with equivalent environmental performance can show extreme differences in numerical assessment solely due to cargo characteristics.

These cargo-specific differences create challenges when calculating a company-wide GHG emissions intensity. Simply dividing total emissions across all divisions by total ton-miles (i.e., a ton-mile weighted average) means that fluctuations in ton-miles for vessels carrying low-density cargo (which inherently have higher GHG emissions intensity) disproportionately affect the company-wide intensity figure.

This presents a major issue for an intermodal ocean shipping group like ours, which operates a diverse fleet including multiple vessel types. While ton-mile weighted averages are widely used in the shipping industry, their inherent characteristics introduce distortions when calculate a company-wide GHG emissions intensity spanning different vessel types.

Under a ton-mile weighted approach, companies operating multiple vessel types with vastly different absolute GHG emissions intensity values can improve their overall intensity simply by altering their business portfolio. Following the example above, reducing the ratio of vehicle carrier business and increasing the ratio of dry bulk business would significantly improve the company-wide GHG emissions intensity. However, we do not believe this accurately reflects a company's decarbonization performance.

We consider it our mission to contribute to global economic development and support people's daily lives through the shipping industry as essential infrastructure. Rather than reducing the ratio of vehicle transport merely to lower emission intensity, we believe it is in the public interest to meet the demand for this socially important business while simultaneously improving efficiency within vehicle carrier transport itself to achieve emissions reductions.

In line with this philosophy, we have adopted the *Standard Methodology* as our standard calculation method to appropriately reflect the GHG emissions intensity fluctuation rates of each business division in the company-wide emission-intensity value.

## Related Information Links

In addition to this document, we disclose various related materials on our website. Please refer to them as well.

### ■ Disclosure in accordance with International Environmental Frameworks

We gather, organize, and publish environmental information, referencing disclosure frameworks related to climate change, and natural capital.

#### [Task Force on Climate-related Financial Disclosures \(TCFD\)](#)

For more information on our environmental management system, executive compensation linked to climate change, overall picture of climate change risks and opportunities, the financial impact, examples of countermeasures, scenario analysis, climate risk management, and the operation of internal carbon pricing, please refer to the URL above.

#### [Taskforce on Nature-related Financial Disclosures \(TNFD\)](#)

For more information on nature-related dependencies, impacts, risks, and opportunities, as well as examples of response measures to risks and opportunities and numerical target, please refer to the URL above.

### ■ Quantitative Environmental Information and Third-Party Verification

Each year, the MOL Group aggregates and discloses information on mid-to-long-term targets, milestones, and actual environmental impact data.

#### [Sustainability Data](#)

For the latest status of our group's environmental impact data and details on third-party verification obtained, please refer to the URL above

#### [MOL Group Environmental Vision](#)

For the latest progress on medium- to long-term targets and milestones, please refer to the URL above.

### ■ MOL Group Management Plan "BLUE ACTION 2035"

The management plan "BLUE ACTION 2035" identifies four sustainability issues (materiality), including "Environment," positioning them as initiatives to strengthen our management foundation.

#### [Management Plan BLUE ACTION 2035](#)

For details on the management plan, please refer to the URL above.

#### [Sustainability Management \(Materiality\)](#)

To learn more about Basic policy to sustainability management, Sustainability management system, Sustainability issues (Materiality), and the identification process, please refer to the URL above.

For integrated reports combining financial and non-financial information, and reports comprehensively summarizing sustainability information, please refer to the following.

- [「MOL REPORT」](#)
- [「Sustainability Fact Book」](#)

