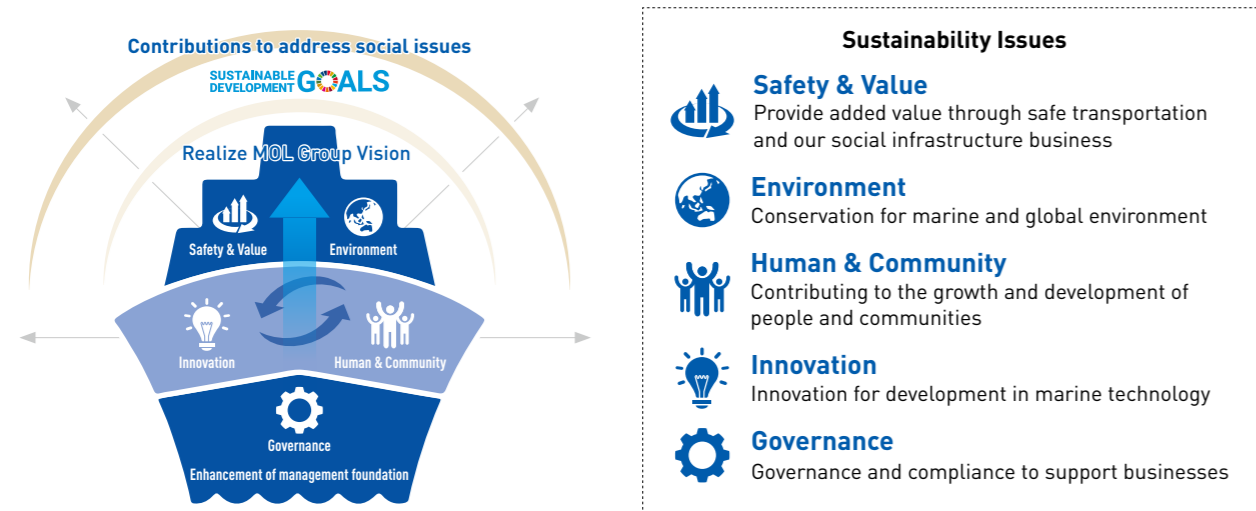


Sustainability Initiatives

Sustainability Issues Overview

We have identified five Sustainability Issues (Materiality), which comprise the social issues our businesses should give priority to addressing. With the ongoing enhancement of Governance as a premise of business management, the Group will tackle the Sustainability Issues of Safety & Value and Environment while enabling reciprocal benefits among initiatives focused on Innovation and Human & Community. By advancing such initiatives, we will realize the MOL Group Vision, thereby enhancing corporate value and helping to build a sustainable society.

Conceptual Diagram of Sustainability Issues



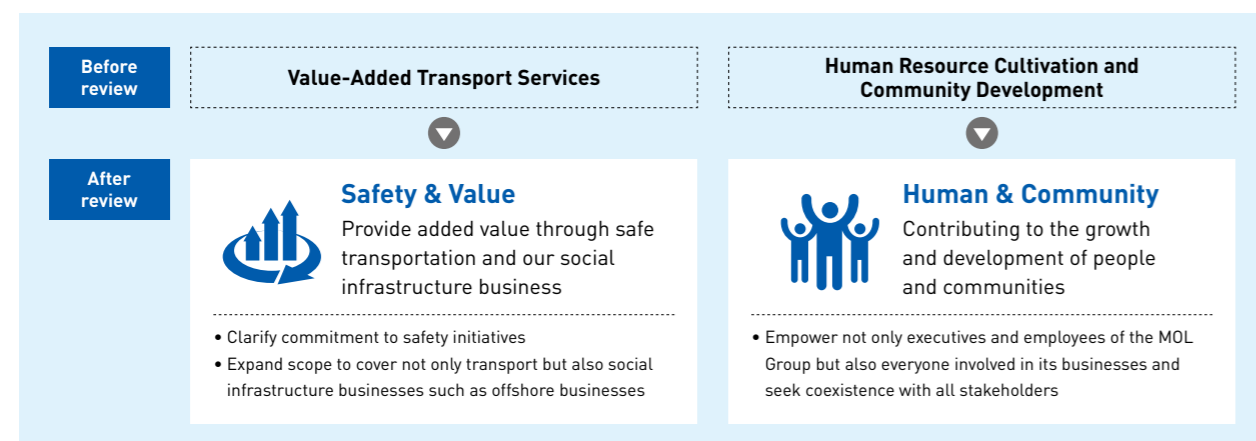
Materiality Identification Process

In fiscal 2019, we initially identified Sustainability Issues (Materiality) by forming an internal team with cross-divisional membership, the Sustainability Promotion Project Team, which analyzed the negative and positive social impacts of our business activities and then categorized the impacts based on their relationships to social issues. In light of this analysis and categorization, we used two axes—impact on society and impact on the MOL Group’s businesses—to condense these social issues into five Sustainability Issues.

Sustainability Issues Revision and MOL Sustainability Plan Formulation

In fiscal 2021, we revised our Sustainability Issues to reflect developments in relation to climate change, human rights issues, and other aspects of the social environment as well as changes in our business environment during the two years since we had first identified Sustainability Issues.

To accelerate initiatives focused on addressing the Sustainability Issues, we established targets, KPIs, and action plans for each issue and formulated the MOL Sustainability Plan in April 2022. We will steadily implement this plan, measure its effectiveness, and make improvements as appropriate.



A Message from the Chief Environment and Sustainability Officer (CESO)

Purpose of the MOL Sustainability Plan

The worldwide trend toward decarbonization has become clearer since the 26th session of the Conference of the Parties to the United Nations Framework Convention on Climate Change, which was held in fall 2021. In addition, society is increasingly focusing on biodiversity, human rights, and other matters as pressing issues. The MOL Group has advanced initiatives to achieve respective goals based on the Sustainability Issues (Materiality) identified in fiscal 2019, and the Group needs to accelerate these initiatives even further.

Meanwhile, as CESO I have taken great pains to instill the Sustainability Issues in all employees. I realized that, as the Sustainability Issues are highly abstract, employees grasped the concepts but additional steps were needed to encourage them to take ownership of the issues, incorporate them into daily work, and change behavior. Accordingly, the recently released MOL Sustainability Plan (MSP) makes the Sustainability Issues more concrete, understandable, and easy to put into practice for employees and a range of other stakeholders. In relation to each Sustainability Issue, the plan establishes clear KPIs and action plans. We have also included such design features as the creation of icons for each issue.

In an organization like ours, where employees of various nationalities work in regions worldwide, setting out a clear road map is essential. For example, in the environmental field, the fiscal 2021 announcement of MOL Group Environmental Vision 2.1 ahead of the MSP has boosted the progress of concrete initiatives. We have begun a project tasked with introducing for contracts with U.S. customers dry bulkers that incorporate two environmental technologies: Wind Challenger hard sail system and Rotor Sail. We have also decided to introduce LNG-fueled car carriers. Moreover, the Group has seen the emergence of self-starting efforts to advance environmental strategies. The personnel of our London base have launched Green Circle, an inter-departmental team that is conducting such activities as gathering information from universities and research institutions and exploring involvement in measures aimed at making U.K. ports carbon neutral. As for non-environmental Sustainability Issues, I hope that the KPIs and action plans established when preparing the MSP will provide reference points for employees and encourage them to make positive changes in business activities.

Integration of the MSP and Business Plans to Enhance Corporate Value

With our sights set on advancing the MSP in an even more effective manner, we are considering its integration with respective divisions’ business plans in the new management plan scheduled for release in fiscal 2023. We believe that these integrated plans will enable employees to better understand the connections between their jobs and the Sustainability Issues while advancing business plans vigorously and achieving results. Unlike sales divisions, divisions involved in corporate services, such as human resources and technology, tend to be less able to see the connection between the work at hand and society due to the nature of their operations. I will do my utmost as the CESO to persuasively demonstrate the value of integrating the Sustainability Issues into operations, thereby instilling an understanding of our initiatives among all employees, regardless of their division.

In fiscal 2021, we revised the MOL Group Corporate Mission and the MOL Group Vision, while in fiscal 2022 we have formulated the MSP. In line with new commitments that have resulted, we will improve services and create new businesses while fulfilling social responsibilities. By pursuing this integrated approach to create a cycle of improvement and innovation and by communicating our efforts to society in a clear, readily understandable way, we will heighten both our brand value and corporate value.



Toshiaki Tanaka
Representative Director, Executive Vice President Executive Officer
Chief Environment and Sustainability Officer (CESO)

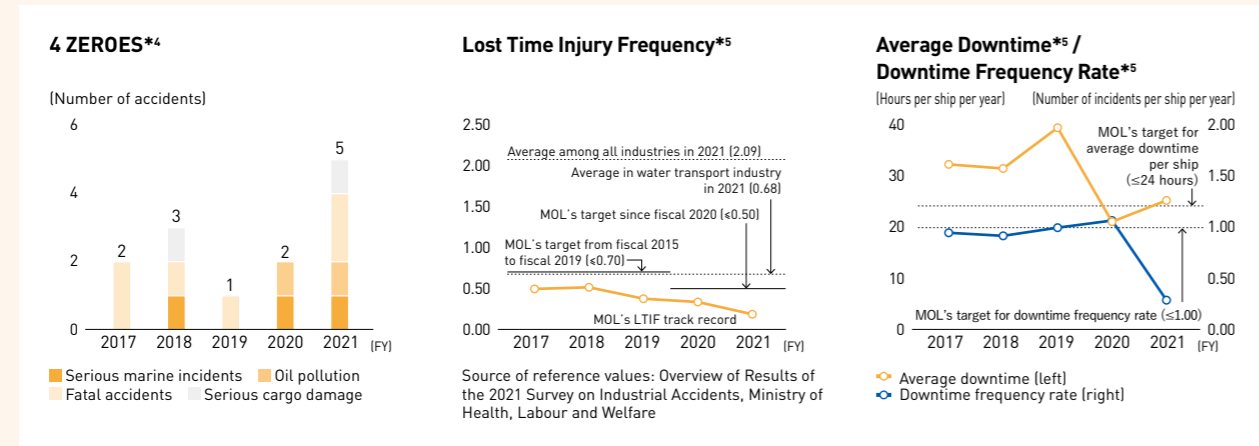
Provide Added Value through Safe Transportation and Our Social Infrastructure Business

MOL aims to promote sustainability and prosperity in people's everyday lives and in industries around the world, by transporting energy, commodities, and finished products safely, reliably, and cost-effectively. The MOL Group continuously aims to expand its social infrastructure business, centered primarily on marine transport.



Initiative Focus	Targets	KPIs	Fiscal 2022 Action Plans
Value through Our Core Business	<p>Provide sustainable value through marine transport and social infrastructure businesses</p> <p>Numerical Targets Achieve fiscal 2027 profit and financial targets set out in Rolling Plan 2022 Ordinary profit: ¥200.0 billion ROE: 9.0%~10.0% Net gearing ratio (times): <1.0</p>	<ul style="list-style-type: none"> Ordinary profit ROE Net gearing ratio Transport volume (ton-mile) 	Implement strategies set forth in Rolling Plan 2022
Safety Levels	<p>Rigorously ensure safe operation and eliminate accidents</p> <p>Numerical Targets • Achieve 4 ZEROES: —Zero serious marine incidents —Zero serious cargo damage —Zero oil pollution —Zero fatal accidents • Lost time injury frequency*: ≤0.50 • Average downtime***: ≤24.00 hours per ship per year • Downtime frequency rate***: ≤1.00 incident per ship per year</p>	<ul style="list-style-type: none"> Number of days with zero serious marine incidents Number of days with zero serious cargo damage Number of days with zero oil pollution Number of days with zero fatal accidents Lost time injury frequency Average downtime Downtime frequency rate 	<p>Implement activities to heighten safety awareness</p> <ul style="list-style-type: none"> —Conduct safety events such as Safety Campaign and Safety Conferences and disclose safety level indicators <p>Strengthen ICT-enabled support of safe operation</p> <ul style="list-style-type: none"> —Utilize vessel movement monitoring system and FOCUS Project initiatives and reinforce monitoring of weather and navigation risks
Creation of New Added Value	Create services that meet social needs	<ul style="list-style-type: none"> Track record of new services that cater to society's sustainability-related needs Number of projects commercialized through the MOL Incubation Bridge, system for employee-inspired proposals for new businesses 	<p>Steadily promote existing projects and explore new service opportunities</p> <ul style="list-style-type: none"> —Advance clean energy transport businesses, employment agency businesses that recruit personnel outside Japan, and blue carbon businesses, etc. <p>Continuously commercializing new businesses proposed by employees</p>

*1 The number of work-related accidents per one million hours worked; the scope of calculation includes any workplace illness or injury that prevents a worker from resuming normal duties or light duties on the day the illness or injury occurs, regardless of whether the illness or injury requires disembarkation.
 *2 The amount of downtime due to mechanical malfunctions or incidents per ship per year
 *3 The number of mechanical malfunctions or incidents that result in downtime per ship per year



*4 Including chartered vessels. If it affects more than one KPI, an accident is counted as one accident under each one of them in this graph.
 *5 Beginning from fiscal 2021, the scope of KPI calculation for safety levels was extended from MOL-owned and managed vessels to cover all operating vessels of the MOL Group, including chartered vessels. Offshore businesses were also newly included.

Value through Our Core Business

For details on initiatives under Rolling Plan 2022, please see pages 12 to 23.
 For details on initiatives in each business headquarters, please see pages 30 to 35.

Safety Levels

Organizational Structure Supporting Safe Operation

The Operational Safety Committee, which is a subordinate organization of the Executive Committee, conducts analysis and deliberations on and ensures the rigorous enforcement of the safe operation of all Group vessels. In addition, the Group has established the position of chief safety officer, who is delegated by the CEO to supervise strategy planning and policy implementation to make sure safety is maintained throughout the MOL Group's businesses and provide necessary advice to the director generals of business headquarters and executive officers. The Headquarters of Safety Operations is responsible for the formulation and implementation of measures related to Groupwide safe operation. In addition, within this headquarters we have established the Global Maritime Resources Division, which is responsible for international policy on crew members and the utilization of non-Japanese marine technical specialists.

Organizational Structure Supporting Safe Operation (Fiscal 2022)

Operational Safety Committee	Headquarters of Safety Operations	
Chair: Chief safety officer, who is the managing executive officer serving as the director general of the Headquarters of Safety Operations Members: Eight executive officers including the CEO Observer: Chairman executive officer	Marine Safety Division Global Maritime Resources Division Marine Technical Management Division Offshore Technical Division Smart Shipping Division	Liquefied Gas Ship Management Strategies Division MOL Ship Management Co., Ltd. MOL LNG Transport Co., Ltd.

Implement Activities to Heighten Safety Awareness

Emergency Response Tabletop Drills

We continuously conduct various drills to ensure that we are ready for and respond appropriately to emergencies and problems. Onboard vessels, we regularly conduct emergency response drills for a range of scenarios, such as fire and flooding. Also, Group companies engaged in ferry and cruise ship businesses give first priority to passenger safety and conduct periodic drills with an emphasis on evacuation guidance.

At the Head Office, executive officers up to and including the rank of CEO, related divisions and departments, and ship management companies annually collaborate in emergency response tabletop drills that simulate a serious marine accident, with the cooperation of authorities and the media. As well as raising safety awareness, the simulation of such accidents verifies the ability of organizations to respond appropriately and communicate information accurately and smoothly.

Safety Campaigns

With the aim of cohesively heightening safety awareness among offshore and onshore employees and thereby further developing our safety culture, we conduct annual safety campaigns in which crew members onboard vessels and onshore officers and employees discuss their opinions on safety. In fiscal 2021, due to the COVID-19 pandemic we conducted a safety campaign that connected vessels and offices through an online format. During the campaign period, approximately 2,300 employees participated, including 693 onshore officers and employees and the crew members of 79 vessels.

With "Overcome rough seas with MOL CHARTS!" as a theme, the fiscal 2021 safety campaign provided opportunities to consider and discuss how best to raise safety awareness in light of the lessons learned from a serious accident that occurred in fiscal 2020. Information and suggestions received from crew members are being widely shared in-house and among vessels and used to further strengthen safe operation capabilities. Also, the campaign increased the safety awareness of onshore officers and employees by enabling them to speak directly with crew members and gain insights into frontline operations.

Launch of SOS CHANNEL Informational Videos for Employees

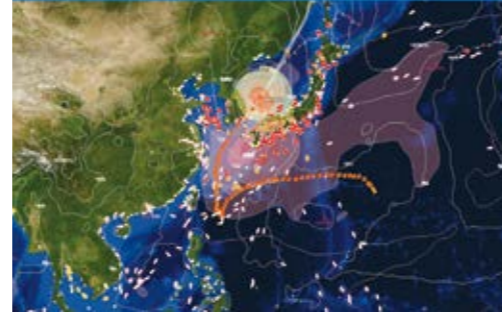
To disseminate a variety of informational videos on safe operation, the Safety Operation Supporting Center (SOSC) (→page 44) used an intranet portal to launch the SOS CHANNEL at the end of March 2021. This in-house channel comprises five-minute videos featuring explanations by officers of fog, typhoons, and other weather and sea conditions as well as waters where care is required with respect to piracy and other risks. The videos also give examples of how risks have been avoided by following the SOSC's advice. As well as providing valuable information on safe operation to many employees, the channel helps make the SOSC more familiar and approachable.

Strengthen ICT-Enabled Support of Safe Operation

Established at the Head Office to monitor and support from shore the safe operation of vessels 24 hours a day, 365 days a year, the Safety Operation Supporting Center (SOSC) realizes its role by combining the expertise and experience of two on-duty personnel—one of whom is a captain—and information obtained from a range of systems and external sources. Based on advances in digital technologies and lessons learned from accidents, the SOSC is upgrading systems and increasing safety even further.

SPiRiT Vessel Movement Monitoring System

Introduced in January 2021, the SPiRiT (Sustainable Platform with Intellectual Resource and Innovative Technology) system enables us to monitor where our approximately 800 vessels are around the world and what kind of weather and sea conditions they are experiencing at any given time. Moreover, while tracking the movements of individual vessels, the system allows us to conduct multifaceted risk assessments by combining information on piracy, military exercises, and a range of other information. In April 2022, the functions of the system were upgraded even further so that it can incorporate the voyage plans of each vessel. The system is used not only by the SOSC but also by vessel operators and other related in-house personnel to provide support to vessels in operation.



Navigation Risk Monitoring System

Developed as a measure to prevent a recurrence of the WAKASHIO grounding accident, which occurred on July 25, 2020, our navigation risk monitoring system began full-scale operation at the end of January 2022. The system constantly monitors many different types of data, including data on vessel positions and water depths as well as information from the Electronic Chart Display and Information System. If vessels are about to enter waters where there is a high risk of grounding, the system alerts the SOSC, which continuously observes this system and, if necessary, initiates measures by telephoning captains directly to alert them.

A Message from the Chief Safety Officer



Mitsuhsa Tanimoto
Managing Executive Officer
Chief Safety Officer
Director General, Headquarters of
Safety Operations

MOL is engaged in a wide range of businesses around the world. The Company operates approximately 800 vessels and offshore plants, and these vessels and plants are of many different types. In addition to established measures for the management of operating vessels' safety and the prevention of accident recurrence, we are further bolstering our ability to manage safety levels by backcasting from target profiles and implementing initiatives accordingly.

In ensuring safety and advancing our businesses going forward, personnel development is essential. To build reliable capabilities for safe operation, we will utilize not only the Japanese personnel who form the core of our marine technical divisions but also marine technical specialists from all over the world. Within the Headquarters of Safety Operations, we have established the Global Maritime Resources Division to lead our international policy on assignment of seafarers in various nations and the utilization of non-Japanese marine technical specialists. Moreover, we have appointed a non-Japanese marine technical specialist to serve as the general manager of the new division. We will continue developing as a corporate group in which diverse personnel play active roles.

Through our safety campaign and other initiatives, we are fostering a safety culture that is common to all Group personnel, regardless of their profession or job. In addition, we will promote safe operation through measures focused on both technologies and human factors. Specifically, we will utilize information and communications technology (ICT) and DX to support vessels from shore and conduct training and drills for crew members.

As chief safety officer, I am committed to raising the safety levels of the MOL Group even higher while helping to improve the safety of marine transport through collaborative initiatives that involve industry peers and related organizations.

Creation of New Added Value

Marine Renewable Energy Business Initiatives

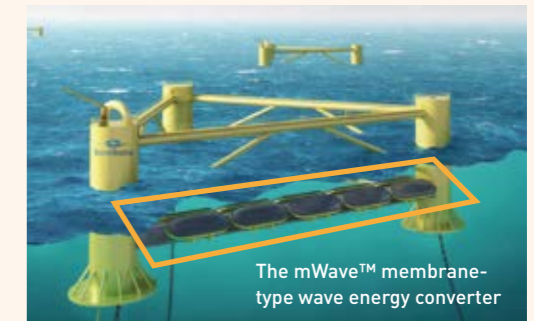
Foraying into all offshore power generation-related business fields, including transport, power generation, and peripheral businesses

Marine renewable energy comprises five types of power generation: offshore wind, wave power, tidal power, ocean current, and ocean thermal energy conversion (OTEC). By utilizing the inexhaustible supply of seawater and waves as an energy source, the realization of power supplies that are stable and particularly resilient to stormy weather is possible. We are involved in offshore wind, wave power, tidal power, and OTEC power generation.

Wave Power Generation

In 2020, we began participating in the management of Bombora Wave Power Pty Ltd, a British developer and manufacturer of wave power generation equipment. Bombora Wave Power is pursuing the early commercialization and widespread use of this type of power generation through the development of generation that uses the company's mWave™*1 membrane-type wave energy converter. Moreover, the company is developing the InSPIRE™ floating platform, which integrates mWave™ with floating wind turbines. Demonstration tests of a full-size 1.5 MW mWave™ converter are scheduled to begin off the coast of Pembroke, Wales, in the second half of 2022. Meanwhile, the company plans to conduct demonstration tests of a large-scale InSPIRE™ platform around 2025.

As a Bombora Wave Power shareholder, the MOL Group will help the company to advance its business. We will also provide the company with such practical support as assistance with the selection of suitable sites and finding local partners in Japan and Mauritius. When the company's wave power generation becomes commercially viable, we will establish synergistic relationships between it and our projects related to the offshore wind power generation business.



A rendering of the InSPIRE™ concept whereby mWave™ wave energy converters are integrated with the bases of floating wind turbines

*1 Pressure fluctuations below the water surface move rubber membranes in a pumping motion, creating flows of air within the energy conversion system that are used to generate power. The system is installed on the seafloors of coastal waters that are between eight and 20 meters deep. The system can operate 24 hours a day and is not easily affected by weather conditions as it is installed below the water surface.

Ocean Thermal Energy Conversion (OTEC)

OTEC uses temperature differences of around 20°C between surface water and water at depths of between 750 meters and 1,000 meters to evaporate ammonia and other media with low boiling points. The resulting steam turns the turbines of generators, producing electricity. The principle was first proposed in France in 1881, and the development of OTEC has been underway since the 1970s. Waters with high surface temperatures, such as those in the vicinity of Okinawa in Japan and equatorial regions, are suitable for OTEC. Due to the growing expectations for renewable energy in recent years, development activities have been gathering momentum in Japan, the United States, France, and other countries. Since April 2022, we have been collaborating with our partners Saga University and Xenosys Inc. to participate in the operation of a 100 kW-class OTEC demonstration facility in Kumejima, Okinawa. Owned by Okinawa Prefecture, the facility was established in 2013. We are advancing efforts with a view to introducing the world's first 1 MW-class OTEC facility to Okinawa around 2025. We also aim to realize a floating OTEC facility in the future.

Initiatives in Mauritius

The government of Mauritius aims to meet 60.0% of the country's energy needs through renewables by 2030 and has officially recognized wave power generation as a future power source. Also, past studies have confirmed that conditions in the country are highly compatible with the introduction of OTEC. With the cooperation of Japan's government, the MOL Group is verifying suitable sites for wave power generation in the coastal areas of Mauritius. We are also analyzing the introduction of OTEC to the country. By introducing to Mauritius the Kumejima model,*2 which utilizes deep ocean water from the seas near Kumejima in Okinawa Prefecture, we will not only establish a power generation business but also contribute to the creation and development of a wide range of industries.

*2 In this model, deep ocean water is actively used for secondary purposes. After being used for power generation, the water is of sufficiently low temperature for use in air-conditioning and industrial applications. In addition, the nutrients in the water can be utilized for aquaculture, agriculture, and the manufacture of beauty products. In Mauritius, the water is expected to be used as coolant for data centers and the air-conditioning of accommodation facilities.

Conservation for Marine and Global Environment

MOL aims to minimize the negative impacts of its business activities (marine environmental pollution, air pollution, reduction of biodiversity, climate change, etc.) and to ensure a sustainable world for everyone.



Initiative Focus	Targets	KPIs	Fiscal 2022 Action Plans
Climate Change Countermeasures	<p>Achieve net zero GHG emissions for the entire Group by 2050</p> <p>Numerical Targets</p> <ul style="list-style-type: none"> Achieve an approximately 45.0% reduction in the GHG emissions intensity of transport by 2035 (compared to that of 2019) Reduce GHG emissions intensity by 1.4% per year (average up to 2030) 	<ul style="list-style-type: none"> GHG emissions and emissions intensity Amount of environmental investment in climate change countermeasures 	<p>Implement strategies set forth in MOL Group Environmental Vision 2.1</p> <p>Set Scope 2 targets</p> <p>Increase and enhance disclosure based on TCFD recommendations (→page 48)</p> <p>Strengthen collaboration with Group companies</p>
Preservation of Marine Environments	<p>Reduce negative impact on the marine environment and biodiversity</p>	<ul style="list-style-type: none"> Number of vessels equipped with ballast water management systems Progress in establishment of methods for collecting related data 	<p>Consider methods of managing data on waste and wastewater</p> <p>Comply with the Taskforce on Nature-related Financial Disclosures and other international guidelines</p>
Protection of Biodiversity			
Prevention of Air Pollution	<p>Reduce air pollutants emitted from vessels</p>	<ul style="list-style-type: none"> NOx and SOx emissions NOx and SOx emissions intensity 	<p>Set quantitative target for SOx emission reduction</p> <p>Promote shift to clean alternative fuels</p>
Environmental Management	<p>Enhance an environmental management system incorporating measures for compliance with environmental regulations</p>	<ul style="list-style-type: none"> Progress in the enhancement and operation of the environmental management system 	<p>Comply with laws and environmental regulations</p> <p>Improve the operation of the environmental management system</p> <p>Conduct initiatives to improve environmental literacy</p>

For the MOL Group's environmental initiatives, please also see MOL Group Environmental Vision 2.1. <https://www.mol.co.jp/en/sustainability/environment/vision/index.html>

Climate Change Countermeasures: Progress of MOL Group Environmental Vision 2.1 Strategies

Strategy 1 Adopt Clean Alternative Fuels

With our sights set on acquiring approximately 90 LNG-fueled vessels by 2030, we have already decided on investments in 16 LNG-fueled oceangoing vessels in the form of eight car carriers, six dry bulkers, and two tankers as of the end of August 2022. Further, the introduction of many different types of LNG-fueled oceangoing vessels is under consideration. In addition, two LNG-fueled coastal ships have commenced service, and we have decided to invest in four LNG-fueled ferries.

Given that using LNG fuel emits less GHG than using conventional bunker oil and that LNG has been used for many years as a vessel fuel, the MOL Group is advancing the introduction of LNG-fueled vessels as an immediately realizable way of reducing GHG emissions.

In parallel with these initiatives, we are studying the introduction of vessels fueled by ammonia and hydrogen, which are strong candidates to become carbon-free fuels of the future. However, the establishment of marine engines and other technologies compatible with these new fuels as well as the building of fuel supply infrastructures globally will take a considerable amount of time. Continuing to use only conventional bunker oil until then would be inappropriate for us from a carbon budget*2 perspective. In our view, proactive introduction of LNG-fueled vessels will immediately contribute to the reduction of GHG emissions, thereby lowering our cumulative GHG emissions until new fuels become widely available and helping us address the global issue of climate change.

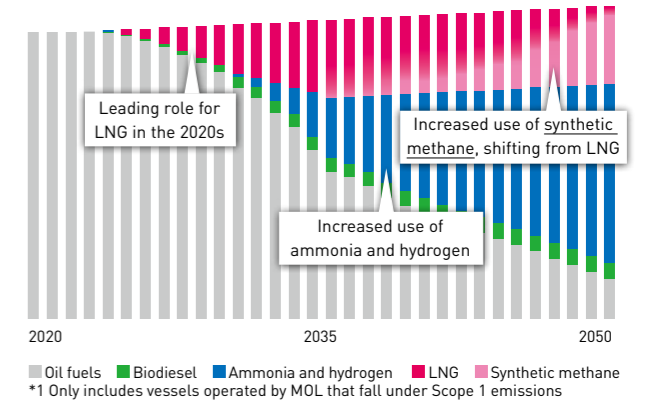
Moreover, compared with the use of conventional bunker oil, the use of LNG fuel is likely to reduce the CO2 emission costs arising from restrictions and taxes on emissions, which are expected to be imposed on international marine transport in the near future. The introduction of LNG-fueled vessels ahead of other companies will give us a competitive advantage.

At present, our LNG-fueled vessels use natural gas, which is a fossil fuel. Going forward, however, we will significantly reduce GHG emissions by replacing this type of LNG with bio-LNG, which is made from organic waste, and with synthetic methane, which is produced through the use of renewable energy sources.

*2 A carbon budget sets the upper limit of permissible cumulative GHG emissions during a specified period that spans the past and future if the rise in global temperatures is to be limited to a certain level. The carbon budget approach views humanity as being in the process of using this budget.

For details on initiatives related to ammonia, methanol, batteries, and liquefied hydrogen, please see page 19.

Projected Composition of the MOL Oceangoing Fleet by Fuel Type*1 (Vessels)



Strategy 2 Enhance Energy-Saving Technologies

October 2022 is scheduled for the completion of the first vessel equipped with the Wind Challenger hard sail wind propulsion system, which is expected to reduce GHG emissions by roughly 8.0% on routes between Japan and the West Coast of North America. Further, plans have been finalized for the building of a second vessel equipped with the system by 2024. Our initiatives also include studies on the introduction of wind propulsion systems enabled by other technologies, such as Rotor Sail and Delta Sails.

Strategy 3 Boost Vessel Operating Efficiency (→page 19)

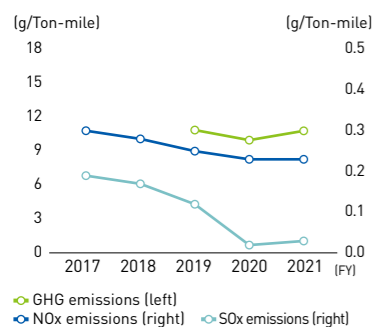
Strategy 4 Build Business Models That Enable Net Zero GHG Emissions

We are moving forward with a range of initiatives to establish business models that enable net zero emissions. For example, in fiscal 2021 we introduced internal carbon pricing (→page 19) as a mechanism to facilitate investment decisions that advance us toward achieving net zero emissions. In addition, we are acquiring carbon credits through afforestation that absorbs and fixes CO2 (→page 38), and we are jointly purchasing verified CO2 removals from a range of technology-enabled projects, such as those engaged in the removal of CO2 from the atmosphere.

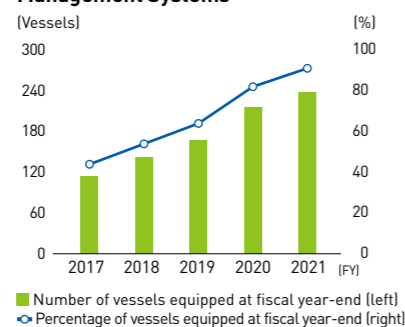
Strategy 5 Expand Low- and Zero-Emission Energy Businesses through the Use of the MOL Group's Concentrated Strengths

Aiming to deepen our involvement in the production, transport, storage, and supply stages of clean energy supply chains, we are tackling a variety of initiatives, such as a liquefied CO2 marine transport business, demonstration tests under the Wind Hunter Project, and a concept study on an FSRU for ammonia fuel. Also, with the aim of reducing GHG emissions by promoting the proliferation of offshore wind and wave power generation, we have acquired an equity interest in an offshore wind power generation business in Taiwan (→page 17) and invested in a wave power generation equipment developer in the United Kingdom.

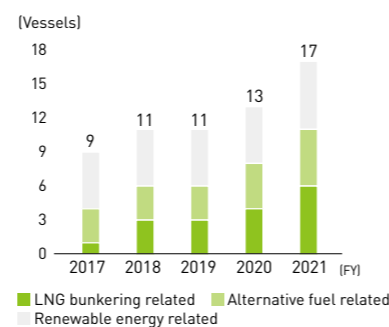
GHG, * NOx, and SOx Emissions



Number and Percentage of MOL-Owned Vessels Equipped with Ballast Water Management Systems



Number of Environment-Friendly Vessels in Operation



* Data presented beginning from fiscal 2019, when aggregation commenced.

Endorsement of TCFD Recommendations and Conduct of Scenario Analysis

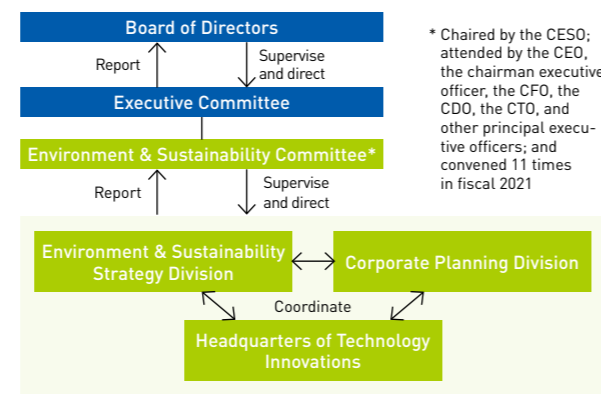
MOL conducts scenario analysis using the TCFD framework to identify risks and opportunities that may arise from climate change. With reference to the new TCFD guidance released in October 2021, we are further enhancing analysis and significantly increasing disclosure. For example, in fiscal 2022 we added 1.5°C scenarios to the range of scenarios that we use for analysis, which includes well-below 2.0°C scenarios, among others.

Please visit our website for details on our disclosure in line with TCFD recommendations.
<https://www.mol.co.jp/en/sustainability/environment/tcfid/>

• Governance

To advance initiatives for the Group's environmental strategies and sustainability issues in a manner that is integrated with management plans, MOL has established the Environment & Sustainability Committee as a subordinate committee of the Executive Committee. The former committee deliberates and determines basic policies on climate change-related matters. Following its deliberations, particularly important matters are reported to the Executive Committee and the Board of Directors for discussion and approval.

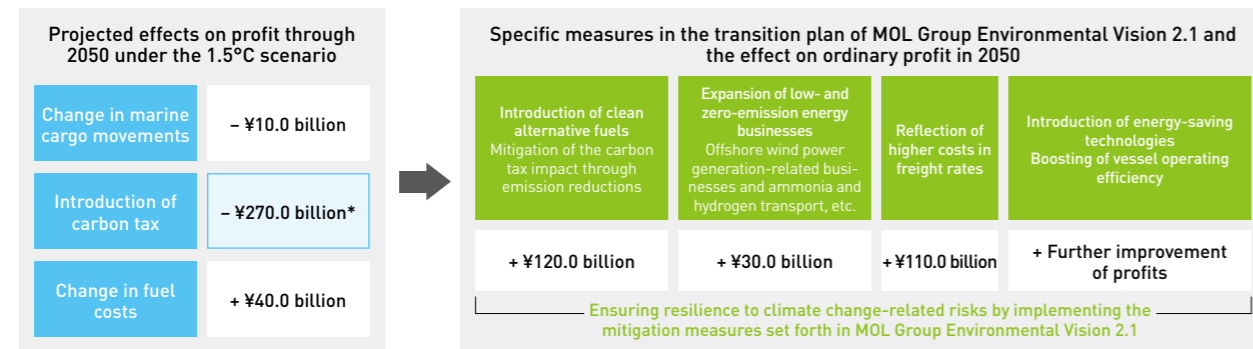
Formulation of Environment and Sustainability Policies and the Supervision of Their Implementation



• Strategy

We conduct scenario analysis-based assessments of climate change impacts to identify the long-term risks and opportunities associated with climate change, understand the impacts on our businesses, and incorporate appropriate measures into our management plans. In addition to the existing well-below 2.0°C scenario and the 2.6°C scenario, we conducted analysis using a 1.5°C scenario in fiscal 2022. Using 2050 as a target year, we assessed the quantitative financial impact of each risk and opportunity. At the same time, we verified that in all scenarios the transition plan set out in MOL Group Environmental Vision 2.1 will function appropriately as a mitigation measure and realize sufficient resilience.

Particularly Significant Risks and Opportunities Identified through Scenario Analysis



* Monetary impact if all vessels continued to use oil fuels until 2050

• Risk Management

By classifying major risks related to our overall businesses and mapping these risks based on their impact level and likelihood of occurrence, we are preparing to identify important issues. Identified as a major risk through this process, climate change is being further classified and assessed by the Environment & Sustainability Committee (→pages 72 to 77).

• Indicators and Targets

MOL conducts management based on a variety of indicators and targets. For example, we disclose emissions intensity and Scope 1, 2, and 3 GHG emissions, and we have incorporated these indicators into the medium- and long-term targets set out in MOL Group Environmental Vision 2.1. Also, we set quantitative targets in management plans for investments in low-carbon and decarbonization fields and conduct related performance management. Further, our decisions on investments reflect carbon prices that are calculated by using internal carbon pricing.

Preservation of Marine Environments and Protection of Biodiversity

Ballast Water Management

Carried out when loading cargo, the discharge of ballast water by vessels can negatively impact marine ecosystems by transferring foreign marine organisms across borders. Before the 2017 enforcement of the Ballast Water Management Convention, in 2014 the MOL Group established and began implementing a Groupwide policy of equipping vessels with ballast water treatment systems. As of June 2022, we have equipped 233 existing vessels and vessels under construction with these systems.

Management of Hull Biofouling

To prevent the adverse effect on biodiversity resulting from the transborder movement of marine organisms attached to hulls (hull biofouling), the International Maritime Organization (IMO) has adopted various regulatory guidelines, which are currently being revised. Our involvement in the revision of international guidelines on hull biofouling entails offering our opinions as a business operator through industry associations.

Prevention of Marine Pollution

An international convention requires that vessel fuel tanks and tankers have double hulls, and the MOL Group complies with all related conventions and laws.

Based on the MARPOL Convention, we prepare onboard waste management plans requiring the separation, collection, storage, and disposal of onboard waste. Further, designated managers ensure all crew members are thoroughly apprised of these plans. We also appropriately dispose of onboard waste oil and water.

▶ CASE 1: Participating in the Ocean180 Marine Biodiversity Big Data Project

MOL participates in Ocean180, an industry-academia-government project led by Professor Yasuhiro Kubota of the University of the Ryukyus and tasked with protecting marine biodiversity. To this end, the long-term project is using big data on marine life, statistical modeling, and artificial intelligence to render ocean ecosystems visible. The project's name reflects a commitment to turning around the ongoing deterioration in marine biodiversity. The MOL Group contributes to the project by providing the operational data from its vessels. At the same time, we are using the information and knowledge gained from this project in other initiatives aimed at protecting marine biodiversity.

▶ CASE 2: Collecting and Investigating Marine Microplastic and Debris

As of 2022, five of our owned vessels have installed a device jointly developed by MOL and Miura Co., Ltd. for collecting microplastic, which refers to plastic grains measuring 5 mm or less. In Southeast Asia, where the problem of marine debris is becoming increasingly severe, we are conducting an investigation with the aim of establishing and introducing a marine debris collection system that suits local conditions and uses a specialized vessel to collect marine debris. Also, in the 2019-2020 Japan-Palau Goodwill Yacht Race, we cooperated with the Japan Agency for Marine-Earth Science and Technology in an ocean plastics observation project.

Prevention of Air Pollution

SOx emissions countermeasures

- Utilizing compliant fuel with sulfur content of ≤ 0.50%
- Equipping vessels with SOx scrubbers
- Switching to alternative fuels

Planning to set quantitative reduction targets for SOx emissions

NOx emissions countermeasures

- Installing onboard SCR (selective catalytic reduction) systems
- Installing onboard EGR (exhaust gas recirculation) systems

Environmental Management

Since 2001, we have been developing and operating our own environmental management system, and the system has obtained certification under the ISO 14001 international standard. We will steadily reinforce and improve the operation of this system in line with our Environmental Strategy, which is one of the three pillars of our management plan.

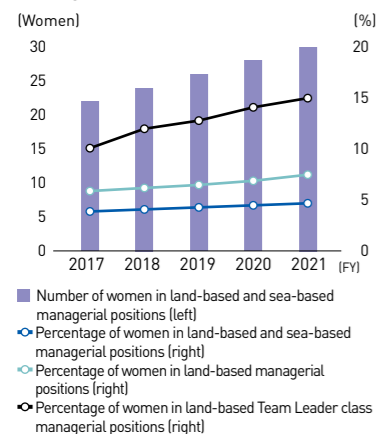
Contributing to the Growth and Development of People and Communities

MOL aims to achieve successful coexistence among everyone involved in the MOL group businesses and the sustainable growth and development of communities through its activities as a corporate group that respects diverse personalities and that can maximize the capabilities of every employee.

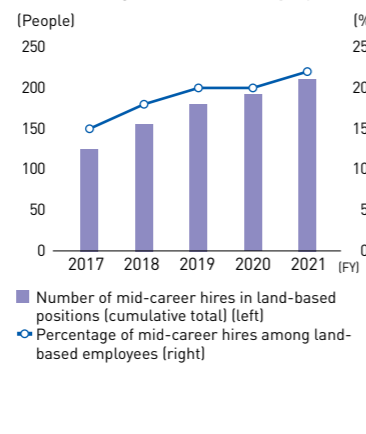


Initiative Focus	Targets	KPIs	Fiscal 2022 Action Plans
Human Resource Development	Foster personnel who embody MOL CHARTS	<ul style="list-style-type: none"> Results of activities to instill MOL CHARTS Groupwide Training investment and number of training days Results of the One MOL Management School and the One MOL Global Management College training programs for the next generation 	<ul style="list-style-type: none"> Conduct activities to instill MOL CHARTS Groupwide Expand and enhance rank-based training and career support programs Strengthen the operation of the talent management system Implement training programs for the next generation
	Secure and develop highly skilled crew members	<ul style="list-style-type: none"> Results of training and e-learning for crew members 	<ul style="list-style-type: none"> Regularly conduct training programs Operate our maritime academy in the Philippines and produce high-quality graduates
Work-Style Reforms	Improve human resource competitiveness and realize innovation through a corporate culture that enables employees to work with vitality and enthusiasm	<ul style="list-style-type: none"> Percentage reduction in overtime hours Percentage of paid leave taken 	<ul style="list-style-type: none"> Introduce a telecommuting system and improve office environments Further reinforce infrastructure for DX Set new KPIs as well as division-specific KPIs
Diversity & Inclusion	Realize a work environment in which diverse personnel can play active roles Numerical Targets <ul style="list-style-type: none"> Percentage of women in managerial positions by fiscal 2025: <ul style="list-style-type: none"> All managerial positions ≥ 7.0% Land-based managerial positions ≥ 10.0% Land-based Team Leader class managerial positions ≥ 20.0% 	<ul style="list-style-type: none"> Percentage of women in respective employee ranks Percentage of non-Japanese officers at overseas subsidiaries Use of the reemployment system Percentage of mid-career hires 	<ul style="list-style-type: none"> Upgrade and expand the childcare leave system Hold dialogues for female employees of domestic Group companies Promote the recruitment of local employees at overseas subsidiaries Upgrade and expand the reemployment system
Health and Productivity Management	Encourage employees to take the initiative in improving their own health Numerical Targets <ul style="list-style-type: none"> Percentage of employees receiving regular health checks: 100.0% Percentage of employees receiving stress checks: ≤ 90.0% Percentage of employees who smoke: ≤ 10.0% by fiscal 2025 	<ul style="list-style-type: none"> Percentage of employees receiving regular health checks Percentage of employees receiving stress checks Percentage of employees who smoke 	<ul style="list-style-type: none"> Rigorously ensure that employees receive regular health checks and strengthen post-check follow-ups Rigorously ensure that employees receive stress checks Conduct interviews with employees assigned overseas Hold seminars on health
Stakeholder Engagement	Enhance dialogue with major stakeholders and reflect their concerns in business management	<ul style="list-style-type: none"> Results of stakeholder engagement 	Increase opportunities for dialogue with major stakeholders
Advancement of Local Communities	Increase activities that contribute to the development of the local communities where we conduct business activities	<ul style="list-style-type: none"> Results of corporate citizenship activities Progress of activities benefiting local communities in Mauritius 	<ul style="list-style-type: none"> Conduct corporate citizenship activities Conduct activities benefiting local communities in Mauritius

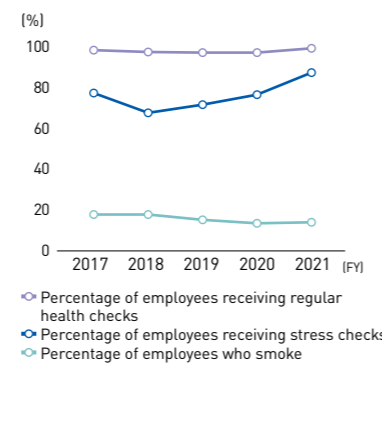
Number and Percentage of Women in Managerial Positions



Number and Percentage of Mid-Career Hires among Land-Based Employees



Health and Productivity Management Indicators



Human Resource Development

Instillment of MOL CHARTS Groupwide

Revised in April 2021, the acronym CHARTS stands for challenge, honesty, accountability, reliability, teamwork, and safety and encapsulates a set of values shared by Group employees worldwide. We established the values in their current form by adding an "S" to the MOL CHART values originally established in 2015. We have promoted the new CHARTS by conducting the activities outlined in the table below.

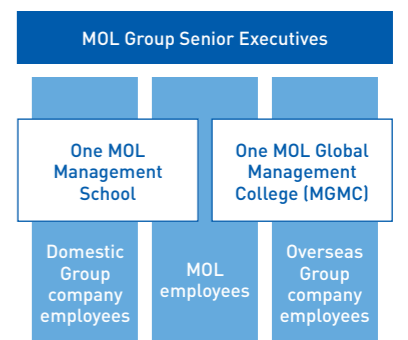
Fiscal 2021 Initiatives for the Instillment of MOL CHARTS Groupwide

Overseas	In Japan and overseas, conferences aimed at furthering understanding of the MOL Group Corporate Mission, the MOL Group Vision, and MOL CHARTS were held.	In 15 countries, subsidiaries held workshops in which 573 participants deepened their understanding of MOL CHARTS by giving presentations on personal interpretations of the values to fellow participants.
Japan		To provide individual participants with opportunities to consider the significance of MOL CHARTS in relation to their particular position, we held approximately 100 CHARTS TALK sessions under a range of formats, including discussions among executive officers and sessions focused on specific topics and divisions.

Training Programs for the Next Generation

In addition to the use of external training programs, we are expanding and enhancing our original training programs for those personnel who are candidates to become the officers responsible for business management in the coming generation. At the core of these in-house programs are the One MOL Management School and the One MOL Global Management College (MGMC). Held since fiscal 2000, One MOL Management School gives trainees the fundamental skills needed for business management. Since fiscal 2021, the school has been focusing on creative leadership that recognizes the nature of innovation and inspires originality in organizations. In fiscal 2006, we launched the MGMC, which improves the management skills that leaders of globalized operations require to unite and mobilize diverse organizations.

In fiscal 2021, due to restrictions resulting from the COVID-19 pandemic, we held the school and college programs entirely online, and the programs were mainly participated in by personnel from overseas subsidiaries worldwide.



Work-Style Reforms Maximizing Job Satisfaction, Employee-Friendliness, and Group Performance

Aiming to increase employee productivity and fulfillment and thereby establish an environment that encourages the emergence of innovative ideas and new concepts, the MOL Group is pursuing work-style reforms focused on four main areas: personnel system reforms, workplace reforms, productivity improvements, and corporate culture reforms.

Our personnel system reforms included the introduction of a telecommuting system in March 2020 in response to the COVID-19 pandemic. Following multifaceted analysis of work styles, we introduced a permanent telecommuting system in July 2022. The new system is aimed at maximizing job satisfaction and employee-friendliness. At the same time, the system is designed to boost the MOL Group's performance as an organization by facilitating collaboration. In introducing the system, we have organized seminars on telecommuting that are conducted by an outside company and offered employees a range of telecommuting advice through an email magazine.

In conjunction with the introduction of telecommuting and as part of workplace reforms, we will remodel our Head Office to further develop safety awareness, improve work efficiency, deepen communication, and strengthen team building. Based on the insights gained from a pilot office established on the 5th floor, which has already been remodeled, the new-look Head Office will be an interconnected space that constantly and seamlessly integrates office work with working from home and that heightens safety awareness by locating sales divisions near the Safety Operations Headquarters. We will phase in the use of the remodeled parts of the Head Office beginning fall 2022. Also in fiscal 2022, we will advance work-style reforms for sea-based employees. As with land-based employees, we will take a range of measures to promote job satisfaction and employee-friendliness. We will create attractive, comfortable workplaces and actively improve offices and living quarters on vessels. Further, through initiatives aimed at empowering female employees, we will develop employee-friendly, rewarding environments not only for female employees but for all sea-based employees. To improve productivity, we will enhance the quality of meetings, streamline and clarify duties, and utilize tools such as robotic process automation. As for corporate culture reforms, we will expand and enhance engagement surveys and 360-degree evaluations and utilize corporate culture assessments.

>> Diversity & Inclusion

In April 2021, we established the Diversity & Inclusion Management Basic Policy, which identifies the advancement of diversity & inclusion as a new driver of growth. With this policy forming the core of its human resource strategy, the MOL Group will build frameworks for combining the diverse talents and attributes of Group employees around the world and thereby enabling the creation of new value.

Empowerment of Women

The empowerment of female employees is essential in promoting diversity & inclusion. As a company that excels at promoting women in the workplace, we earned selection as a "Nadeshiko Brand" company in fiscal 2020 and fiscal 2021. As well as existing support that helps employees meet work and childcare responsibilities, we will raise the percentage of women in managerial positions by empowering women in line with an action plan based on the Act on Promotion of Women's Participation and Advancement in the Workplace. As part of these efforts, on International Women's Day we will partner with other companies to hold joint events focused on career development and self-development.

Mid-Career Hires

Since 2001, we have been conducting mid-career hiring to attract and develop a diverse workforce. As a result, about a quarter of our land-based employees in career-track and managerial positions are mid-career hires. By welcoming into our workforce people with many different types of individuality and attributes—such as experience, personal qualities, skills, and values—we are achieving diversity & inclusion.

Employment of People with Disabilities

With a diverse workforce as a premise, the MOL Group is creating workplace environments that enable all employees to utilize their abilities and fostering an organizational culture that encourages mutual understanding among the various individuals in the Group. In accordance with these efforts, since April 2021 we have been employing people with disabilities through the MOL RAISE in-house farm program, which operates in Koshigaya in Saitama Prefecture. By enabling Head Office employees and officers to visit the farm and participate in cultivation and harvesting and by using the farm's fresh vegetables as ingredients at the Head Office cafeteria, we encourage a wide range of employees and officers to think about those different from themselves, helping create an organization based on respect for diversity.

>> Health and Productivity Management

In April 2021, we formulated the Declaration on Health and Productivity Management. Viewing the enhancement of employee health as an important management task, we are further developing initiatives aimed at the Groupwide dissemination and promotion of the values set out in the declaration. Since becoming the first shipping company selected as a Health & Productivity Stock by the Tokyo Stock Exchange and the Ministry of Economy, Trade and Industry, we have earned this recognition for a second consecutive year.

The Human Resources Division plays a central role in providing tailored support and encouragement to employees in coordination with MOL's health insurance association and with a team of industrial health personnel consisting of industrial doctors, internal medicine doctors, psychiatrists, certified psychologists, health nurses, and massage therapists. Through training and various other measures, we are raising employees' awareness of health management. Also, we are rigorously ensuring that employees receive regular health checks and increasing the percentage of employees that receive stress checks to prevent mental health disorders. Other initiatives include a smoking cessation support program, which is reducing the percentage of employees who smoke.

A Message from the Chief Human Resource Officer



Junko Moro
Managing Executive Officer
Chief Human Resource Officer
Responsible for the Human Resources Division

In addition to conventional marine transport, the MOL Group is developing various social infrastructure businesses and taking on new challenges to meet society's changing needs with respect to such issues as environmental protection. In all of these businesses, personnel are the driving force of initiatives. As the Chief Human Resource Officer, I would like to contribute to the initiatives of each business.

Given that securing and developing diverse human resources is an urgent issue for the Group, which aims to achieve global growth by leveraging its comprehensive capabilities, we will create an environment that enables individuals to demonstrate their talents and play active roles.

>> Stakeholder Engagement

Recognizing that our important stakeholders include shareholders and investors, customers, business partners, employees, government agencies, local communities, and nongovernmental organizations (NGOs), we engage in the various forms of stakeholder dialogue shown in the table below. By utilizing the valuable opinions obtained through these dialogues in management, we will advance business activities in line with the needs of society and help address a range of social issues.

Important Stakeholders	Main Types of Dialogue (Frequency)	
Shareholders and Investors	<ul style="list-style-type: none"> General meetings of shareholders (once a year), financial results briefings (four times a year, two of which are conducted by the CEO) Investor relations meetings in Japan and overseas (approximately 200 times a year), stakeholder relations meetings (approximately 20 times a year) Business briefings for investors and ESG briefings (once or twice a year) Company briefings for individual investors (several times a year) 	<ul style="list-style-type: none"> Small meetings with the CEO (general version: four times a year, ESG version: once a year) Small meetings with outside directors (planned for fiscal 2022) Various reports (securities report, corporate governance report, integrated report, and investor guidebook, each once a year)
Customers	<ul style="list-style-type: none"> Sales activities (year-round) Website and social networking services (year-round) MOL service website and inquiry desk (as needed) 	<ul style="list-style-type: none"> Vessel visits (cargo-handling tours, as needed) Customer satisfaction surveys (irregular) Various seminars and exhibitions (irregular)
Business Partners	<ul style="list-style-type: none"> Shipowner meetings (once a year) Safe operation liaison meetings with shipowners (once a year) Agency and stevedore meetings (once or twice a year) 	<ul style="list-style-type: none"> Safe operation campaigns (once a year) Various seminars and exhibitions (irregular)
Employees and Crews	<ul style="list-style-type: none"> Personnel evaluation meetings (four times a year) Organizational culture assessments (every two years) Labor-management consultations (as needed) Advisory service desks (as needed) In-house magazines (printed and online, as needed) 	<ul style="list-style-type: none"> Business performance and management presentations (four times a year) Dialogues between management and employees (at least 10 times a year) Seafarer Family Days (once a year) Safety Conferences (three times a year)
Government Agencies	<ul style="list-style-type: none"> Dialogue with government agencies and municipal authorities (as needed) 	<ul style="list-style-type: none"> Cooperation in surveys and questionnaires (as needed)
Local Communities and NGOs	<ul style="list-style-type: none"> NGO round-table discussions (once a year) Social contribution activities in Mauritius (throughout the year) Beach cleanup activities (several times a year) 	<ul style="list-style-type: none"> Cargo-handling and terminal tours (irregular) Workplace visits by students and events that explain businesses (as needed) Sending of instructors to lectures and training programs (as needed)

>> Advancement of Local Communities

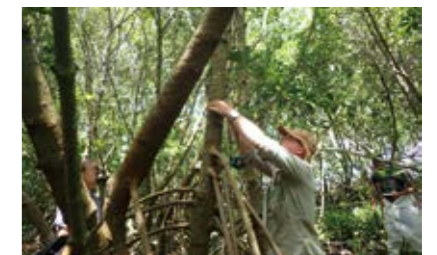
The MOL Group has engaged in restoration and preservation of the natural environment and contribution to local communities in Mauritius since an oil spill resulting from the running aground of chartered vessel the WAKASHIO in 2020.

We established the MOL Charitable Trust in June 2021 and the MOL Mauritius International Fund for Natural Environment Recovery and Sustainability in November 2021. The trust and fund are in the process of steadily disbursing a total of approximately ¥800.0 million. In December 2021, 26 projects were selected to receive grants from the trust, while in May 2022 it was decided to provide grants to 11 projects from the fund.

Through the trust and fund, we will provide long-term support focused on the restoration and conservation of the rich natural environment and ecosystems of Mauritius, including mangrove forests and coral reefs; protection and research activities for wild birds and migratory birds, including indigenous species; the development of fisheries, tourism, and cultural activities, which form the foundations of the Mauritian economy; and the training of local personnel to support all of these activities. Also, we aim to contribute to the sustainable economic development of the country. To this end, we are conducting feasibility studies on the introduction of such marine renewable energy as wave power generation and ocean thermal energy conversion generation.



Offering support to local fishermen in Mauritius



Conducting a mangrove monitoring survey

For details on our other initiatives for local communities, please visit the Social Contribution Activities section of our website.

<https://www.mol.co.jp/en/sustainability/human/society/index.html>

For details on our activities in Mauritius, please visit the MOL for Mauritius website.

<https://www.mol.co.jp/en/formauritius/>

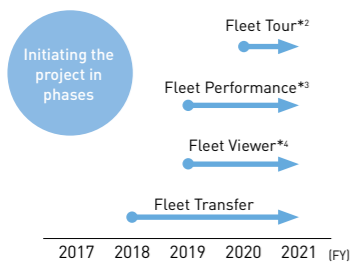
Innovation for Development in Marine Technology

MOL aims to enhance its business through advanced technologies using clean energy and ICT and to help address various social issues. This will also help the Group to provide added value through safe transportation and our social infrastructure business and achieve its goal of conservation for marine and global environment.

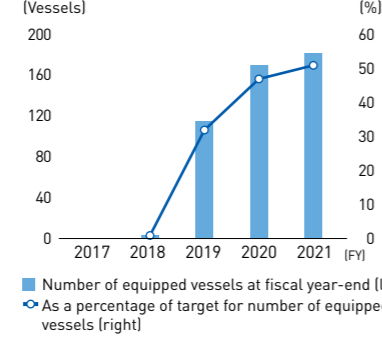


Initiative Focus	Targets	KPIs	Fiscal 2022 Action Plans
Groupwide Adoption of Clean Energy	Introduce and increase the use of clean alternative fuels for vessels Numerical Targets <ul style="list-style-type: none"> Deploy commercial net zero GHG emissions oceangoing vessels in the 2020s Deploy 90 LNG-fueled vessels by 2030 Deploy approximately 110 net zero GHG emissions oceangoing vessels by 2035 	<ul style="list-style-type: none"> Number of alternative clean energy fueled vessels ordered and completed and progress in developing these vessels 	Promote the development of related technologies —Ammonia-fueled vessels, vessels that use hydrogen as fuel, and Wind Hunter Increase the introduction of LNG-fueled vessels Collect basic information on new alternative fuels
	Develop technologies that contribute to the spread of clean energy in society	<ul style="list-style-type: none"> Progress in developing clean energy carriers Number of LNG and ammonia bunkering vessels ordered and completed 	Promote the development of relevant technologies —Liquefied CO ₂ carriers and liquefied hydrogen carriers Conduct a study on the development of LNG and ammonia bunkering vessels
Increasing the Energy Efficiency of Vessels	Use natural energy and establish and promote energy-saving technologies that help improve propulsion performance	<ul style="list-style-type: none"> Number of vessels equipped with wind propulsion systems such as Wind Challenger Progress in introducing and promoting other existing energy-saving technologies 	Introduce lighter sails designed for commercialization Conduct a study with a view to the installation of a cylindrical rotor sail Introduce and adopt energy-saving technologies —Propeller Boss Cap Fins and the Optimal Trim System
ICT Utilization for Safe, Efficient Operation	Upgrade, expand, and establish platforms using vessel-related big data (the FOCUS Project)	<ul style="list-style-type: none"> Progress of the FOCUS Project Number of vessels equipped with Fleet Transfer*1 	Upgrade FOCUS Project initiatives Promote the introduction of Fleet Transfer to chartered vessels Conduct data analysis with a view to economizing on fuel Develop technologies for the diagnosis of equipment defect precursors
	Establish technologies for autonomous vessel navigation	<ul style="list-style-type: none"> Progress in developing technologies for autonomous vessel navigation 	Formulate a development plan in light of sea trials Select partners and conduct verification with a view to installation
Advancement of Technology Development and DX	Establish an organizational structure that sustains technology innovation	<ul style="list-style-type: none"> R&D expenditures 	Enhance organizational structure for technology development Launch new development projects that will lead to benefits in relation to environmental protection, safety, and labor-saving technologies Strengthen collaboration among MOL and Group companies
	Establish an organizational structure that promotes the realization of DX	<ul style="list-style-type: none"> Amount of DX-related investment Number of DX-related personnel 	Establish the MOL DX Vision Promote various DX projects such as quantitative evaluations of the quality of shipowners and ship management Establish a DX training and recruitment policy and implement measures

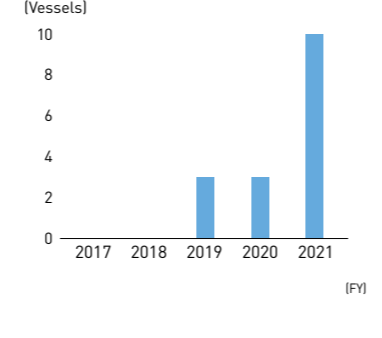
Progress of the FOCUS Project



Number and Percentage of Vessels Equipped with Fleet Transfer



Number of Clean Alternative Energy Fueled Vessels Ordered



*1 A system that collects IoT big data from vessels in real time and sends it to shoreside platforms *2 An application for virtual tours of vessels
 *3 An application for the analysis of vessel propulsion performance *4 An application for the advanced monitoring of ship data

Groupwide Adoption of Clean Energy

Initiatives for Ammonia-Fueled Vessels

We are developing technologies related to ammonia fuel, a promising next-generation clean alternative to LNG fuel. Although ammonia-fueled marine engines have yet to be commercialized, we have launched a pilot project by concluding a memorandum of understanding with MAN Energy Solutions and Mitsui E&S Machinery, Ltd., with a view to ordering vessel main engines that are primarily fueled by ammonia.

Further, aiming to build an ammonia-fueled oceangoing ammonia carrier, we have begun joint development with Tsuneishi Shipbuilding Co., Ltd. and Mitsui E&S Shipbuilding Co., Ltd. The envisioned vessel is a mid-size ammonia carrier that achieves net zero CO₂ emissions while underway by using some of its ammonia cargo as fuel. Moreover, the project is tasked with designing a highly versatile vessel that can call at the major ammonia loading and receiving ports and be deployed on a wide variety of routes. We will proceed with joint development aimed at the completion and service commencement of an inaugural commercial net zero GHG emissions oceangoing vessel around 2026, thereby progressing toward one of the targets set out in MOL Group Environmental Vision 2.1.



Development of Liquefied CO₂ Carriers

In March 2021, MOL began participating in the liquefied CO₂ ocean transport business by investing in Norway's Larvik Shipping AS, which has managed industrial liquefied CO₂ carriers in Europe for more than 30 years. Further, with our sights set on future growth in transport demand, we are developing specialized carriers. Envisioning a range of transport needs, we completed a concept study on multiple vessel types with Mitsubishi Shipbuilding Co., Ltd. in November 2021.



Liquefied CO₂ carriers will play an important role in the carbon capture, utilization, and storage value chain, attracting attention as a means of realizing a low-carbon or carbon-free society. For MOL, demand for the transport of liquefied CO₂ has the potential to replace demand for the transport of fossil energy resources, which is expected to gradually decline. Although issues remain to be resolved before liquefied CO₂ carriers can be commercialized, we will continue utilizing a wide range of internal and external expertise to advance development initiatives.

Wind Hunter Project

Following on from the Wind Challenger Project (→page 56), which is developing a hard sail that enables wind-power propulsion, since November 2020 we have been working on the Wind Hunter Project to achieve zero emissions through the use of wind power, hydrogen, and fuel cells. In November 2021, we successfully completed stage one sea trials using the yacht WINZ MARU equipped with a small power generation plant in Omura Bay, Nagasaki Prefecture. At sea, a cycle was completed in the following order: ocean wind-based power generation, hydrogen production, hydrogen storage, use of the stored hydrogen for fuel cell power generation, and propulsion by an electric propeller. In stage two, we will build a 60-meter-long sailing vessel by 2024. Stage three will entail developing and building a large zero-emissions carrier by 2030.



A sea trial using the yacht WINZ MARU in Omura Bay, Nagasaki



WINZ MARU sailing on electricity generated by wind power



A rendering of the vessel to be built in stage two

》》 Increasing the Energy Efficiency of Vessels

Wind Power Utilization

MOL is engaged in a range of initiatives aimed at exploiting the power of wind, an important energy-saving solution. One such initiative is the Wind Challenger Project, which is tasked with reducing the fossil fuel consumption and environmental impact of large commercial vessels by converting wind power into propulsion through the use of a hard sail. A single hard sail is estimated to reduce GHG emissions by roughly 5.0% on routes between Japan and Australia and 8.0% on routes between Japan and the West Coast of North America. We aim to achieve even greater benefits by installing multiple hard sails and using them in combination with other GHG emission reduction measures. A new coal carrier—which will become the first vessel equipped with the hard sail—is currently in the final stages of construction and is scheduled for completion in October 2022. Further, we have concluded a contract for the construction of a second hard sail equipped vessel, which is for Enviva Partners, LP, a major global company in the wood biomass energy field.

We will become a leading company in the use of wind power by introducing technologies optimally suited to particular vessel sizes, cargoes, and routes. In addition to the Wind Challenger hard sail, we will introduce a cylindrical Rotor Sail, which utilizes the Magnus effect for propulsion, and a delta sail, which is mounted on cargo handling cranes.



Full-sail Wind Challenger Lowered-sail Wind Challenger

Wind Challenger concept video (in Japanese only)
<https://www.youtube.com/watch?v=OuDP-Flmemk>



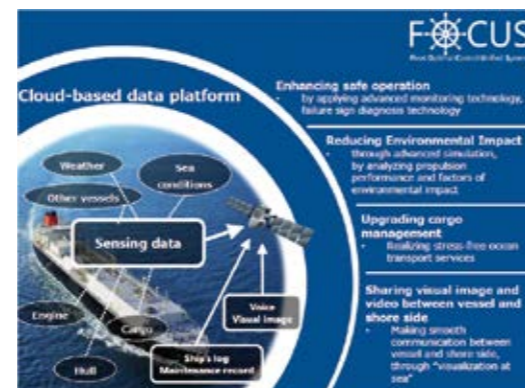
》》 ICT Utilization for Safe, Efficient Operation

Use of Digital Twin Technology

The rapid development of big data, the Internet of Things (IoT), and other ICT is increasing the possibilities for using ICT at sea and between vessels and land. Our core initiative for the exploitation of ICT is the FOCUS Project, which was launched in fiscal 2018. We utilize detailed voyage and engine data on operation in actual seas, which is collected from approximately 10,000 sensors installed in each vessel. Roughly 180 operating vessels were equipped with sensors as of the end of March 2022. After being stored on a cloud-computing data platform, the data is utilized for advanced operational monitoring as well as the analysis of propulsive performance.

As part of the FOCUS Project, we are taking advantage of digital twin technology, which digitally reproduces real-world events in real time. In a virtual space, a copy of reality is constructed on a digital system, and various simulations are then performed. The analysis of simulation results enables us to optimize real-world actions. The MOL Group is advancing development initiatives under the themes shown in the table below.

Hull Structure	Based on the stress that has been placed on a hull since its completion, structural fatigue is precisely estimated, and hull maintenance work is optimized during periodic docking.
Main Engine Operation	With a high level of precision, engines' operating conditions and degree of deterioration over time are estimated and engine characteristics are analyzed through the visualization of main engine scavenging and exhaust gas heat, which are difficult to measure during navigation. The results are used to prevent engine overload (torque rich) and curb torque fluctuations during operation in stormy weather, thereby facilitating optimal, safe operation.
Route Recommendation	Based on the analysis of a vessel's propulsion performance in actual seas and weather and sea forecast information, the optimal route and propulsion output for reducing GHG emissions while ensuring safety and punctuality are selected and recommended.



Autonomous Vessel Navigation

With the aims of enhancing safety levels and lightening the workloads of crew members, the MOL Group is working on the development and introduction of technologies for autonomous vessel navigation. Given that about 80% of navigation accidents are attributable to human error, we will reduce the risk of accidents by using technologies for autonomous vessel navigation to perform tasks currently performed by crews.

In fiscal 2021, MOL participated in the MEGURI 2040, a project led by the Nippon Foundation that is focused on the unmanned operation of vessels. Under the project, a consortium of six companies conducted successful sea trials of the unmanned operation of the coastal car ferry Sunflower Shiretoko on the approximately 400-nautical-mile route between Tomakomai Port in Hokkaido and Oarai Port in Ibaraki Prefecture and of the coastal containership Mikage on the approximately 145-nautical-mile route between Tsuruga Port in Fukui Prefecture and Sakai Port in Tottori Prefecture. The ferry is owned and operated by MOL Ferry Co., Ltd., while the containership is owned by Imoto Ship Company and operated by Imoto Lines, Ltd. In the aforementioned sea trials, an autonomous vessel operation control system, developed by Mitsui E&S Shipbuilding, realized autonomous vessel navigation by referring to accurate analysis of vessel location information; wind, tides, currents, and various other external factors; vessel-specific attributes such as maneuverability, acceleration and deceleration performance, and equipment configuration; and rules applied to vessels. If there were other ships, obstacles, or debris on the set routes, the vessels safely navigated along avoidance routes based on information gathered and provided by a vessel peripheral information integration system developed by Furuno Electric Co., Ltd. Berthing and unberthing, which require especially delicate handling, were realized by enabling the autonomous vessel operation control system to use information from berthing and unberthing support sensors developed by Furuno Electric. When mooring a vessel in port, an onboard crew member normally passes a heaving line to a worker on the pier by throwing the line. In these sea trials, however, an automatic flight drone, which was developed by A.L.I. Technologies Inc., was used to carry the line to piers.

In addition to participating in the initiatives of the aforementioned consortium, the MOL Group is developing elemental technologies with the aim of realizing automated watch-keeping and the automated creation of routes that avoid collisions with other vessels. We will continue devising and introducing technologies to heighten safety levels and reduce the workload of crews.

》》 Advancement of Technology Development and DX

A Message from the Chief Technical Officer



Makoto Yamaguchi
 Executive Officer
 Chief Technical Officer (CTO)
 Director General, Headquarters of
 Technology Innovations

In April 2022, we established a new slogan for technology development: One Mile Ahead. This slogan continues the themes of the Senpaku ISHIN Project and ISHIN NEXT—MOL SMART SHIP PROJECT, which were launched in 2009 and 2016, respectively, as symbols of technological innovation aimed at advancing the safety and environment-friendliness of vessel operations. The new slogan for technology development expresses our determination to steadily move forward "one mile" at a time in the way that a vessel voyaging in stormy weather heads toward its destination no matter how rough the seas. Further, the slogan represents our commitment as an industry-leading corporate group to always pursue technologies that are "one mile" ahead.

Announced in June 2021, MOL Group Environmental Vision 2.1 calls on us to achieve net zero GHG emissions for the entire Group by 2050. The advancement of our strategies, which involve numerous technological innovations, is a mission we must fulfill to help address the environmental issues that the world is facing. Given the major changes that the entire logistics industry is undergoing as DX progresses, technical personnel will play integral roles in technology development and innovation initiatives. At the core of such initiatives is the Headquarters of Technology Innovations, which comprises the Technical Division, the Offshore Technical Division, and the Smart Shipping Division. As well as being assigned roles in these divisions and related sales divisions, our technical personnel are responsible for supervision and vessel management in relation to the shipbuilding projects of Group companies. Currently, we have 80 technical personnel in Japan and 14 technical personnel assigned to overseas bases.

Going forward, the Headquarters of Technology Innovations will concentrate on three goals.

- Resolving various issues in the marine transport industry by using leading-edge ICT
- Reducing environmental impact by lowering GHG emissions through the utilization of wind power as a renewable energy and the introduction of clean alternative fuels
- Benefiting society as a whole not only through vessels but also by promoting marine environmental conservation, FSRUs, offshore wind power generation-related businesses, and liquefied CO₂ marine transport.

In addition to augmenting our technical teams in Japan and overseas, we will strengthen partnerships with external organizations. Under our new slogan for technology development, we will make a concerted drive toward our target profile, focusing efforts on the development of unique technologies that leverage both hardware in the form of elemental technologies and software in the form of IT.



Governance and Compliance to Support Businesses

Through enhancement of corporate governance and thorough compliance, MOL aims to ensure transparency in Groupwide management, build foundations for its initiatives on social issues through business activities, and establish sustainable value chains based on consideration for human rights, safety, and the environment.



Initiative Focus	Targets	KPIs	Fiscal 2022 Action Plans
Management Transparency	Strengthen corporate governance capabilities with a view to enhancing corporate value Enhance the content of corporate governance related disclosure	<ul style="list-style-type: none"> Results of effectiveness external evaluations to measure effectiveness of the Board of Directors Progress of deliberations of the Corporate Governance Council 	Establish and disclose policy and plan for enhancing the skills of directors and Audit & Supervisory Board members Establish and disclose policy for cross-shareholdings and engagement with shareholders Rebuild the skills matrix for directors and Audit & Supervisory Board members
Information Security	Reduce information security risks	<ul style="list-style-type: none"> Number of serious ICT incidents E-learning track record in relation to information security 	Revise internal rules and ensure all employees are informed about them Establish a policy on ransomware countermeasures Conduct drills for responding to serious ICT incidents Conduct e-learning on information security Strengthen collaboration with Group companies
Responsible Procurement	Identify and reduce risks related to the environment, safety, and human rights throughout supply chains	<ul style="list-style-type: none"> Progress of initiatives to establish a monitoring scheme Track record on human rights training 	Announce related policies Conduct monitoring and implement improvement measures Promote initiatives on ESG-driven vessel recycling Conduct human rights-related training
Respect for Human Rights			
Fair Trade	Numerical Targets • Zero compliance violations	<ul style="list-style-type: none"> Number of compliance violations Number of consultations received by compliance advisory service desks Track record on compliance training and e-learning 	Establish policy on corruption prevention Expand compliance training and e-learning Hold a compliance awareness month Conduct various audits and implement improvement measures
Bribery Prevention			

Revision of the Director Remuneration Plan

In regard to its governance system, MOL is a company with an Audit & Supervisory Board, and the Board of Directors has both executive and supervisory functions. With the aim of realizing appropriate management decisions and sound governance, outside directors and Audit & Supervisory Board members focus on supervision and participate in discussions with internal directors, who also serve as executive officers, that reflect internal and external perspectives.

The remuneration plan is one of the most important means of ensuring highly effective governance. Balance and fairness are required to establish and maintain a remuneration plan that exercises a certain degree of control over directors while motivating them to increase corporate value. For this reason, the Remuneration Advisory Committee, a majority of whose members are outside directors, and which is chaired by an outside director, takes the lead in development of the Company's governance system.

In fiscal 2021, the director remuneration plan was significantly revised based on the recommendations of the Remuneration Advisory Committee and following the approval of the General Meeting of Shareholders convened in June 2021. Under the new system, to further promote the establishment of shared interests between executive directors and shareholders, performance-linked remuneration in the form of restricted stock is granted commensurate with contribution to long-term targets. Also, the new system clarifies and discloses the evaluation indicators for single fiscal year performance-based monetary remuneration. Further, safety has been incorporated as a component of ESG indicators to reflect the paramount importance of safety to the Company.

As well as the revision of the remuneration plan in fiscal 2021, in June 2022 the General Meeting of Shareholders approved the introduction of non-performance-linked remuneration in the form of restricted stock for non-executive directors and higher remuneration of Audit & Supervisory Board members to reflect their increased responsibilities and duties in recent years.

While advancing management in accordance with the new remuneration plan, the Remuneration Advisory Committee will constantly verify whether the system is contributing to effective governance, highly transparent management, and the Company's sustained growth.

For details on the remuneration plan, please see page 70.

Revitalization Revision of the Skills Matrix

The basic policy of the Company is to appoint directors based on the recommendations of the Nomination Advisory Committee and to establish a Board of Directors that comprises internal directors who can contribute to the enhancement of the Company's corporate value—based on a wealth of experience, expertise, and skills as well as an ability to make decisions on global management in light of broad perspectives and farsightedness—and outside directors who can realize supervisory functions—based on objective viewpoints, extensive experience, and high levels of expertise.

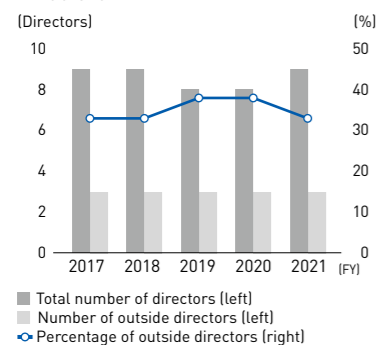
Since fiscal 2019, the Company has stipulated the experience, expertise, and skills that members of the Board of Directors should possess. Following in-depth discussions aimed at identifying and selecting the particular types of experience, expertise, and skill needed to realize the Company's target corporate profile, however, the Nomination Advisory Committee made the following revisions.

Main Features of the Revisions

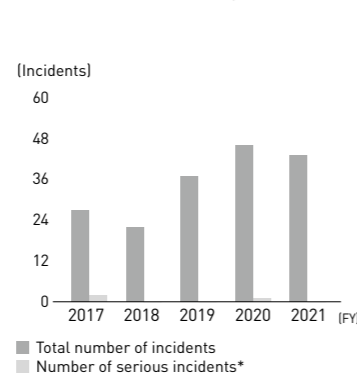
- With respect to experience, expertise, and skills, a general classification of the five types that are universally important in corporate management as well as the four types that are particularly important for a provider of social infrastructure
- Addition of human resource diversity as a fundamental component of sustainability
- Addition of safety as the most important foundation of businesses
- Addition of technology as an essential factor in fields central to the Company's future growth, including decarbonization businesses, safe and efficient operation, and DX

The short-listing and selection of candidates for the position of CEO and other director positions is conducted with reference to whether candidates possess the experience, expertise, and skills identified as necessary in the skills matrix. Meanwhile, given that these attributes may change as the business environment evolves, the Company will continue reviewing the content of the skills matrix. In addition to providing opportunities for directors to broaden their experience, expertise, and skills through training and development, the Company will appoint advisors to enhance the functions of the Board of Directors as required.

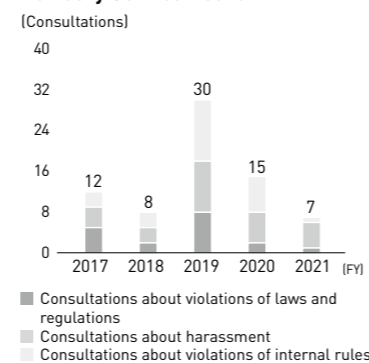
Total Number of Directors and Number and Percentage of Outside Directors



Number of ICT Security Incidents



Number of Consultations Received by Internal and External Compliance Advisory Service Desks



* Incidents are defined as threats, failures, and other events that damage ICT systems or information assets. Incidents are classified into four levels according to severity. Incidents corresponding to the highest level of severity are classified as serious incidents and are reported to management when they occur.