Progress Report 2024

Annex to the NYK Group Decarbonization Story

Decarbonization Group
ESG Strategy Headquarters, NYK Line

October 2024

Chapters

NYK Group Decarbonization Strategy

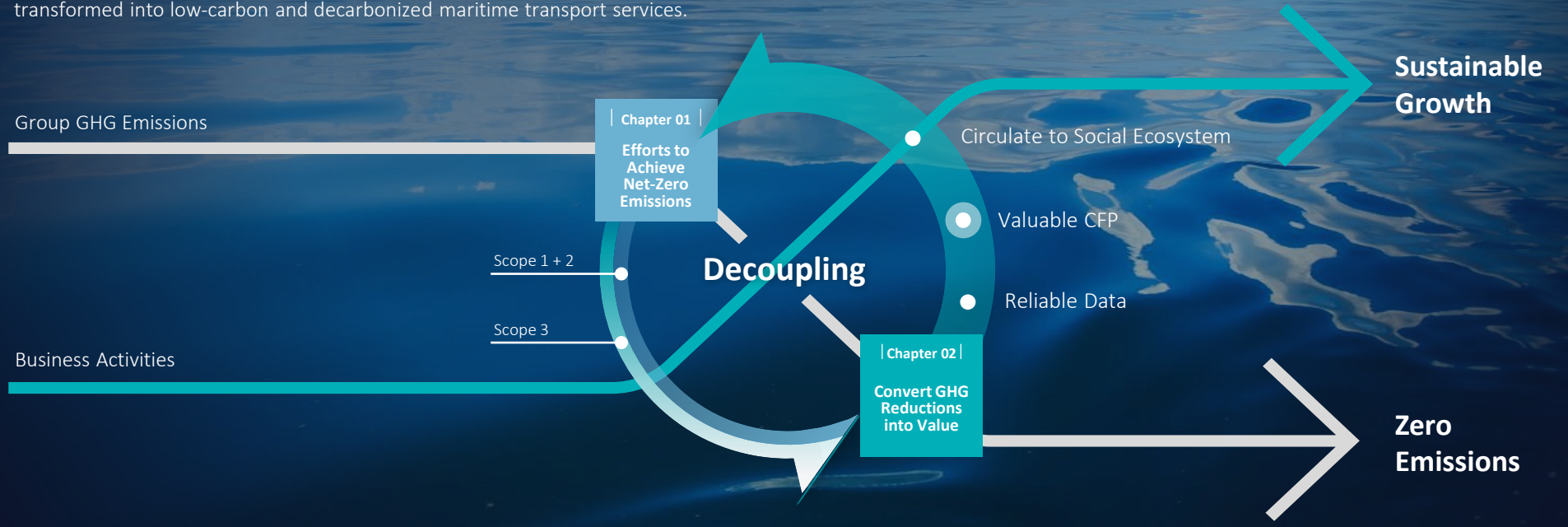
Logistics serves as the backbone of countless industries, playing a vital role in the global economy. However, it is often classified as one of the "Hard to Abate" sectors, where reducing emissions proves to be particularly challenging. The truth is, without the decarbonization of logistics, the ambition of achieving carbon neutrality for society as a whole remains just that—an ambition.

At the NYK Group, we recognize the weight of this responsibility. We are fully committed to addressing our emissions and taking meaningful steps toward reduction. We believe that these efforts are not just an obligation but a pathway to sustainable growth for the NYK Group.

As we navigate the complex world of logistics across the world, we are united in our mission to tackle decarbonization head-on. Our goal is to convert the value derived from our emission reductions into a Carbon Footprint (CFP) that can be transformed into low-carbon and decarbonized maritime transport services.

With a vision set for 2050, we have pledged to reach net-zero emissions across Scope 1, 2, and 3. However, achieving reductions in Scope 3 is particularly crucial and will require the collaboration of various stakeholders within the supply chain, including those engaged in next-generation fuels. By building an ecosystem that facilitates the sharing and circulation of emission reduction values, we aim to not only realize our Scope 3 reductions but also offer transport services that are rich in environmental value.

In doing so, we hope to accelerate the decarbonization cycle within society, creating a ripple effect that contributes to a sustainable future. Our commitment is not just to our own growth, but to the growth of a society that prioritizes sustainability—together, we can turn the vision of a carbon-neutral world into reality.

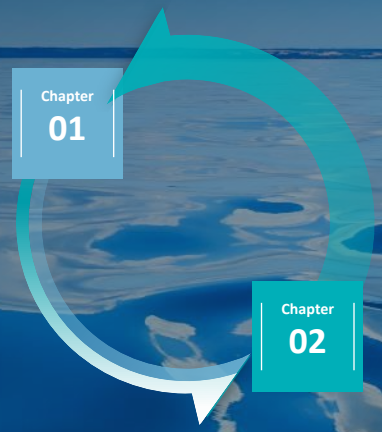


Overview of Our Progress

In November 2023, we presented the NYK Group Decarbonization Story, which outlines strategies that we believe should be implemented based on social significance and current information. No one has a definitive answer on how to achieve decarbonization in society and the shipping industry; we are proceeding cautiously, engaging in a PDCA (Plan-Do-Check-Act) cycle while validating our approaches. We recognize that it is impossible to leap directly to a solution, and discovering barriers is also a step forward for society. Our aim is to create a sustainable framework with a medium- to long-term perspective.

Over the past year, we have focused on confirming our progress toward achieving our medium-term goals set for six years from now, monitoring the implementation of our strategies, and discussing highly hypothetical measures. This has led to the selection of critical points for improving our initiatives, unifying our direction, strengthening our organizational structure, and advancing our system design. Notably, discussions regarding the expansion of biofuels have highlighted that carbon management is a crucial key not only for biofuels but also for next-generation fuels. This realization has deepened our efforts to create reliable data, which is the first step in converting GHG emissions into value.

In this report, we will share the evolved aspects of these initiatives that have undergone significant trial and error, along with the journey that led us to these points. We hope to deepen interest and understanding of the feasibility of the NYK Group's decarbonization initiatives and welcome various opinions to facilitate further discussions toward realization.



Monitoring GHG Emissions

Measures for Achieving the 2030 Target
— Maximize Energy Efficiency
— Use of Alternative Fuels

Implementation and Identification of New Challenges

Convert GHG Reductions into Value through CFP

Strengthening Carbon Management to Ensure CFP

Chapter

01 | Efforts to Achieve Net-Zero Emissions

Status of GHG Emissions

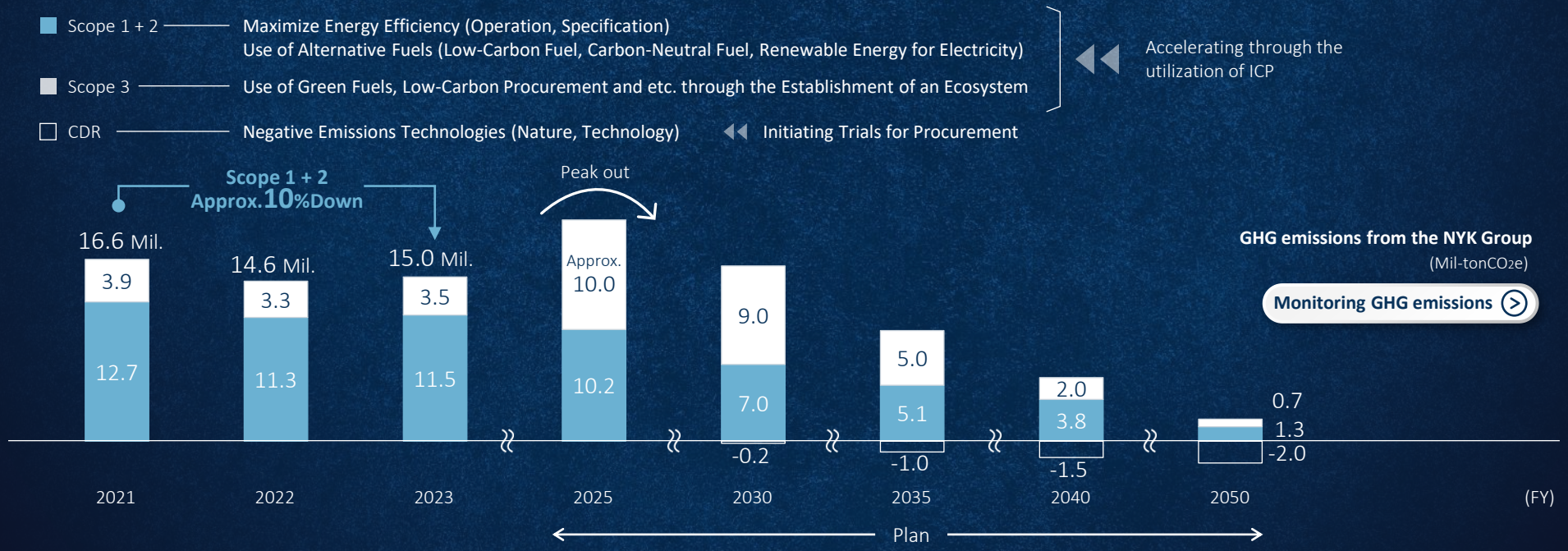
Progress and New Challenges of
— Tactic 1: Maximize Energy Efficiency
— Tactic 2: Use of Alternative Fuels

Progress of Internal Carbon Pricing

Current Status of GHG Emissions —Scope 1 + 2 + 3—

- In the FY2023, Scope 1 + 2 emissions amount to 11.5 million tons of CO_2e, while Scope 1 alone stands at 11.4 million tons of CO_2e. Compared to the baseline year of FY2021, this represents a reduction of approximately 10% over two years, which can be considered a positive outcome.
- However, to achieve the ambitious 2030 target of a 45% reduction in Scope 1 + 2 emissions compared to the FY2021 while maintaining business activities, it is necessary to continue implementing effective measures.
- Regarding Scope 3, the aggregation system has been strengthened. Efforts are being made to refine the data with the aim of peaking out by 2025 and reducing toward 2050 to achieve net zero.

GHG emission trajectory toward 2050



Current Status of GHG Emissions —Scope 1 + 2 + 3—

Monitoring GHG Emissions

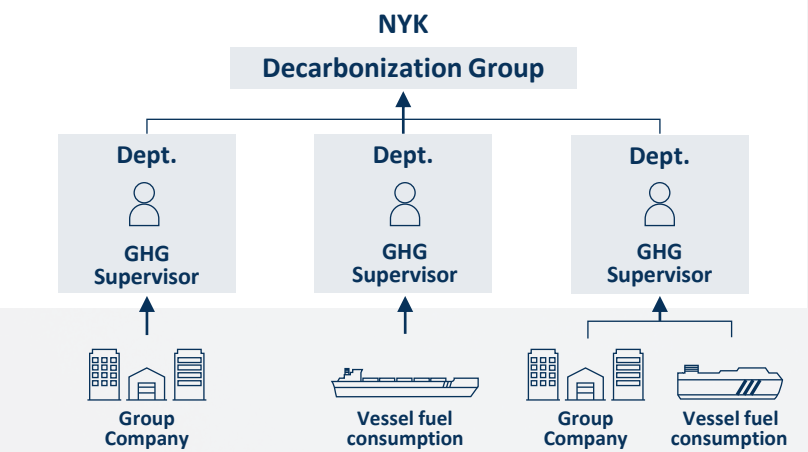
To achieve net-zero emissions, it is essential to aggregate GHG emissions. As of April 2023, the NYK Group has established a GHG accounting system.

In the second half of 2023, NTT DATA Group Corporation supported us to aggregate the NYK Group's GHG Scope 3 emissions, thereby creating a framework to account for not only Scope 1 and 2 but also the entire NYK Group's GHG Scope 3 emissions.

Starting in October 2024, the NYK Group will use Zeroboard's GHG accounting system to aggregate GHG emissions for Scope 1, 2, and 3.

Aggregation Structure

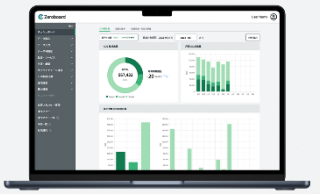
- Scope 3 aggregation has been set up.
- GHG supervisors have been assigned in all departments and each one is able to monitor their GHG emission data.



New GHG Aggregation System

- The NYK Group's GHG will be aggregated and monitored by Zeroboard platform.
- The system enables the aggregation of GHG emissions from the vessel.
- The system launched in October 2024.

Zeroboard



The software allows for the calculation, visualization, and reduction management of a company's supply chain GHG emissions simply by inputting activity data or setting up data integration. It can generate reports that comply with various environmental regulations and allows for data exports tailored to specific purposes. By utilizing tab features, users can sort data effectively. Additionally, it is possible to assign multiple attributes to a single emission data point, enabling GHG emissions calculations from various perspectives.

Current Status of GHG Emissions —Scope 1 + 2 + 3—

Monitoring GHG Emissions

In the first half of 2024, we conducted impact assessments for Scope 1, 2, and 3 and calculated their respective impacts. We have defined Scope 1 and categories 1, 13, and 15 of Scope 3 as the scopes for GHG emissions and will consciously work on reducing these emissions.

In a world where non-financial information, such as GHG emissions, is becoming integrated with financial information, understanding Scope 3 emissions is essential.

Business	Scope 1	Scope 2	Scope 3													
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Liner Trade	++																+++
Air Cargo Transportation	+++				++												
Logistics	++	+	+++														
Automotive	+++		+++		++												++
Dry Bulk	+++		+++		++										+++		++
Energy	++		++		++										+++		
Others		+											++				
The NYK Group FY2023(Trial)	+++		++		++										++		++

Scope 1
(Direct Emissions)

Scope 3 Cat. 1
(Purchased Goods and Services)

Emissions from Shipping Related Services
- Port Operation—Pilot Services/TUG Services
- Cargo handling, Feeder Services

Emissions from Air & Ocean Forwarding Business

Scope 3 Cat. 13
(Downstream Leased Assets)

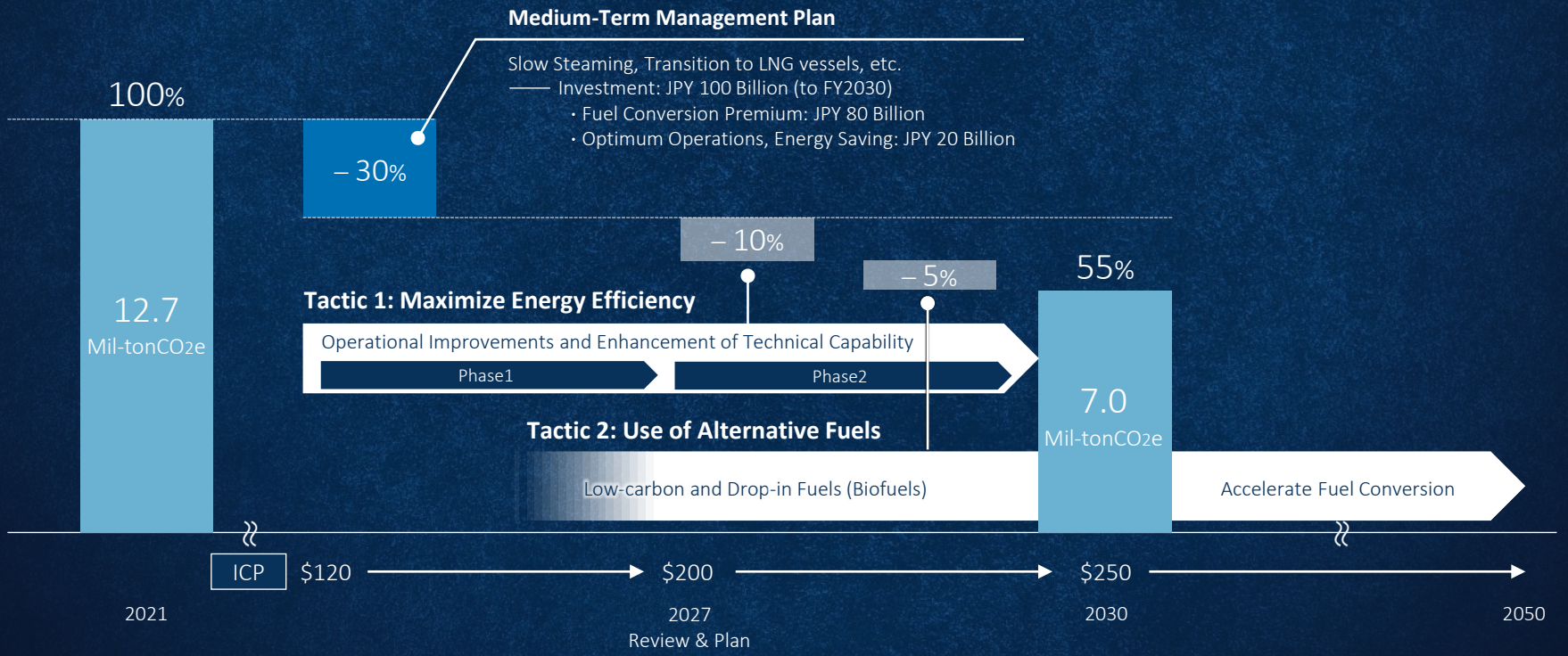
Emissions from Time Charter Business
└ Vessel Owner: Scope 3 Category 13
= Vessel Charterer: Scope 1

Scope 3 Cat. 15
(Investments)

Emissions from Equity-Method Affiliates
- Ocean Network Express
- United European Car Carriers, Others

Towards Achieving the 2030 Target —Scope 1 + 2—

- The reduction of Scope 1 + 2 emissions will be achieved through maximizing energy efficiency and using of alternative fuels.
- The medium-term management plan had set a target to reduce Scope 1 + 2 emissions for the NYK Group by 30% compared to the FY2021 by FY2030. In 2023, the NYK Group Decarbonization Story updated this target, announcing an additional 15% reduction.
- The medium-term management plan includes measures such as slow steaming, which is one of the efficiency improvement strategies, and the transition to LNG vessels, which is one of the fuel conversion strategies. Additional measures will be implemented to accelerate reductions to achieve our updated target.



Tactic 1: Maximize Energy Efficiency

- The Energy Efficiency Working Group is conducting a comprehensive evaluation of equipment with GHG abatement costs below the ICP price.

Internal Carbon Pricing (ICP) >

- Engine tuning optimized for the current operational profile is evaluated as more effective than improvement of hull resistance in the ship speed of slow-steaming operations.
- We are also working on improving operations by sharing best practices through activities established across each layer within the NYK Group. On the other hand, there are many items related to the enhancement of technical capability that have not yet been addressed, and since they have a significant impact, we are prioritizing our efforts in those areas.

Technical capability (Specification)

	Resistance reduction	Engine optimization
Measures implemented	Teaming up with engineering companies to improve energy efficiency of dry bulk carriers and car carriers **Decreased hull resistance due to slow steaming,** resulting in a reduction effect that is less than initially anticipated	Teaming up with engine manufacturers to study optimization for each operational profile **Significantly lower actual operational speed than the planned speed** anticipated during the shipbuilding process

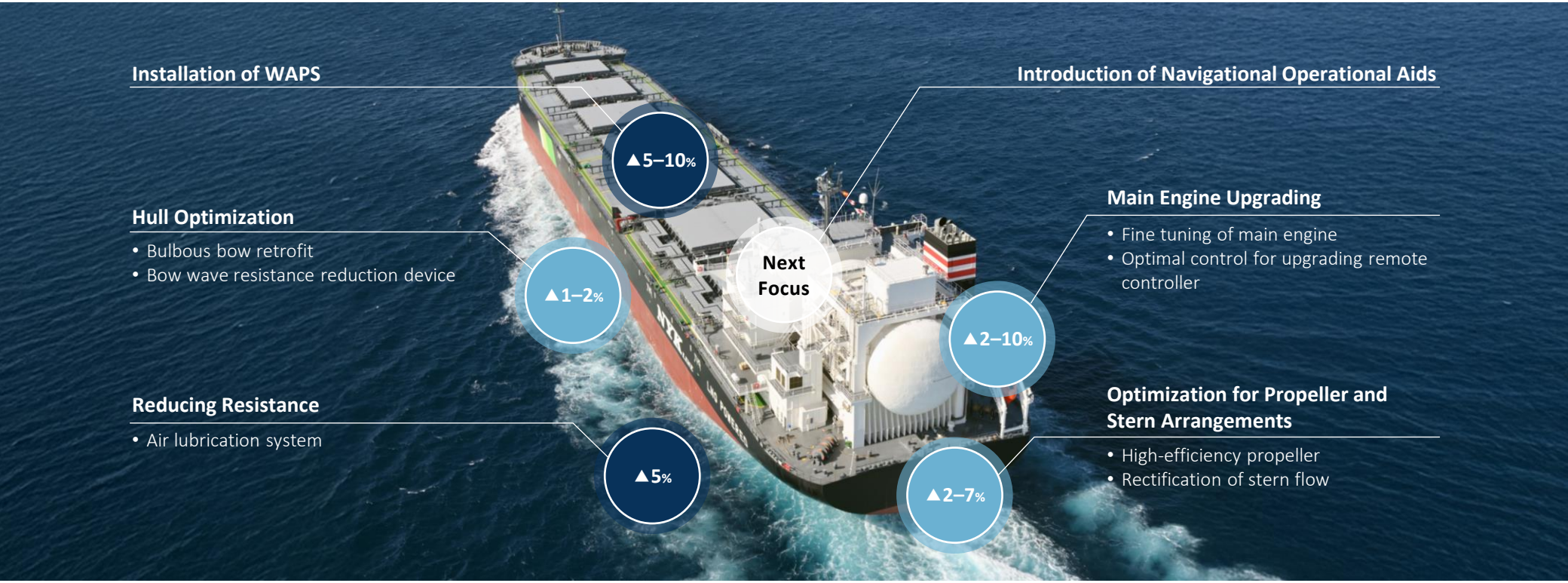
It has become clear **that the menu for improving energy efficiency varies depending on the ship's operational profile. Since the engine's fuel efficiency improves, we can reliably expect GHG reduction effects.**

Further improvement	Consideration of devices that can offer further benefits through slow steaming > Wind-assisted propulsion system (WAPS)	**Consideration of broad application to our fleet**

Tactic 1: Maximize Energy Efficiency

Technical capability (Specification)

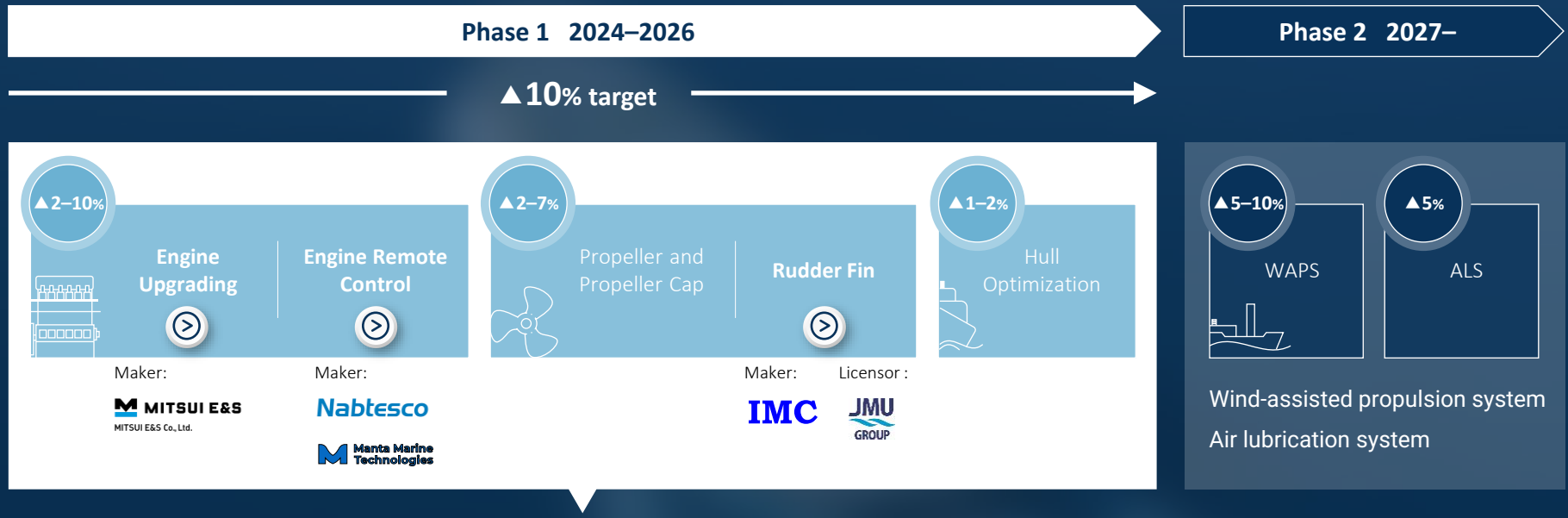
- A study regarding high-efficiency hardware has progressed and the next target will be improving energy efficiency by operation (e.g., routing assist aids specialized for WAPS).
- By 2030, the goal is to achieve a 10% reduction by installing resistance reduction devices and optimizing the engine and propeller.



Tactic 1: Maximize Energy Efficiency

Technical capability (Specification)

- Energy-efficiency improvement devices with GHG abatement costs (the cost to reduce one ton of GHG) below ICP $120 will be prioritized for installation during phase 1 between 2024–2026.
- Energy-efficiency improvement devices with GHG abatement cost is $120–$200 will be installed in phase 2 between 2027–2030.

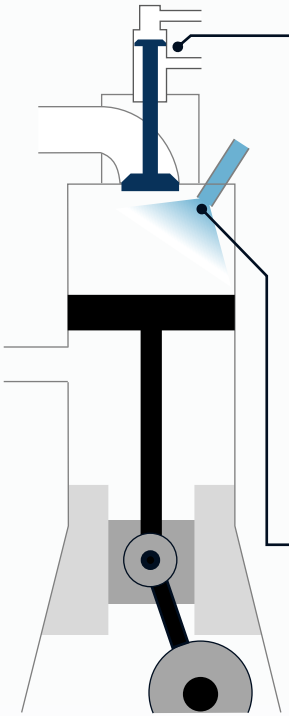


Approx. 650,000 ton-CO_2e/year is expected to be reduced by applying these devices.

Engine Upgrading/Engine Remote Control

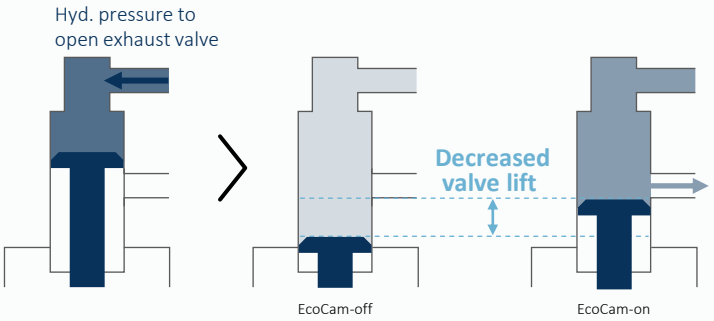
Engine Upgrading

Applying the latest fuel-saving technology for mechanically controlled engines improves performance between the range of low and medium engine loads which is frequently used in slow steaming operations.



EcoCam (Optimizes Slow Steaming)

EcoCam adjusts the exhaust valve closing time optimized for operating range of low and medium engine loads to improve engine efficiency by 1–2% by increasing in-cylinder pressure.



Variable Injection Timing (VIT)

An electronic VIT system, which replaces a mechanically controlled system, enables tuning of fuel injection timing at mechanically controlled engines. Fuel injection timing optimized for low-load operations increases in-cylinder pressure and reduces fuel consumption by 1–2%.

Engine Remote Control

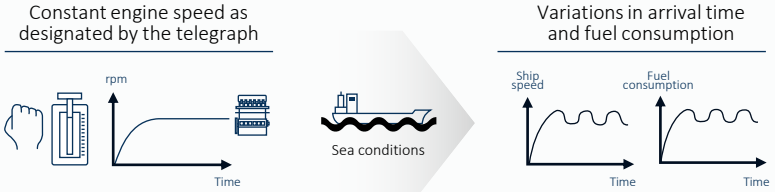
Applying the latest engine remote control system, which automatically controls engine loads, can maximize the engine's performance.

TELEGRAPH AGENT™

Currently, engine speed is manually controlled using the engine telegraph (a part of a remote control system).

With the Telegraph Agent, the system automatically controls the main engine speed to maintain a set value for ship speed, horsepower or fuel consumption. This enables navigation at the optimal ship speed according to the voyage plan, thereby reducing fuel consumption.

As-Is: Manual Telegraph Operation

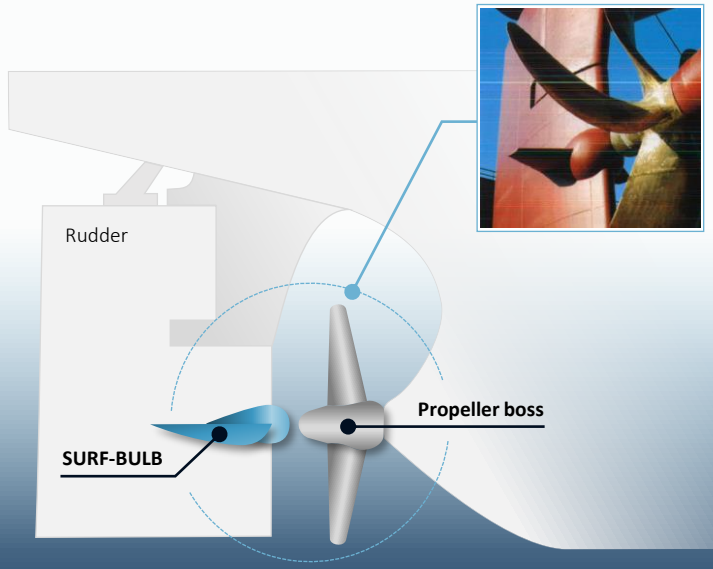


To-Be: Automatic Control

Rudder Fin

SURF-BULB* Retrofits

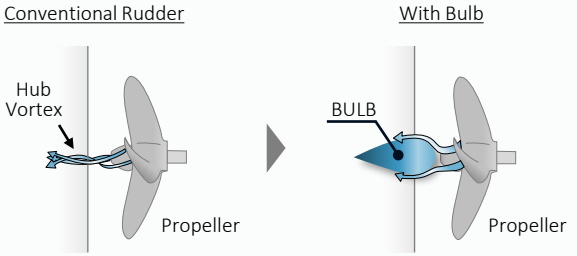
SURF-BULB are energy-saving devices installed on a vessel rudder, which can be installed on existing ships, and improve fuel consumption without impacting a ship's maneuverability.



Principle 1:

Streaming of water flow

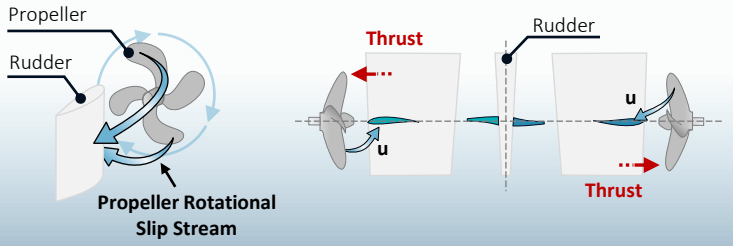
By directing the water flow generated by the propeller onto a curved surface before it forms vortices, it streamlines the flow and prevents the dispersion of water pressure.



Principle 2:

Further generation of lift

By capturing the streamlined water pressure with an asymmetrical surface, the rotational flow behind the propeller is converted into a forward thrust.

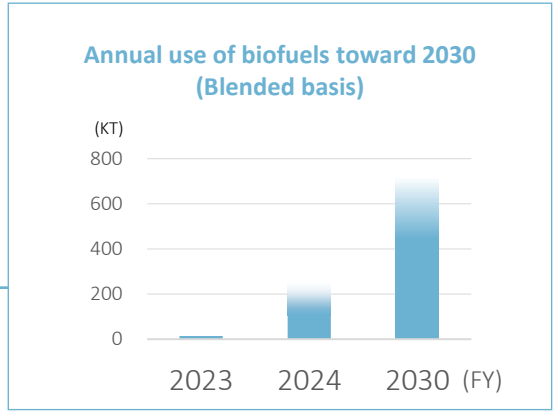


The installation of a SURF-BULB can be expected to improve efficiency by 3–7%.

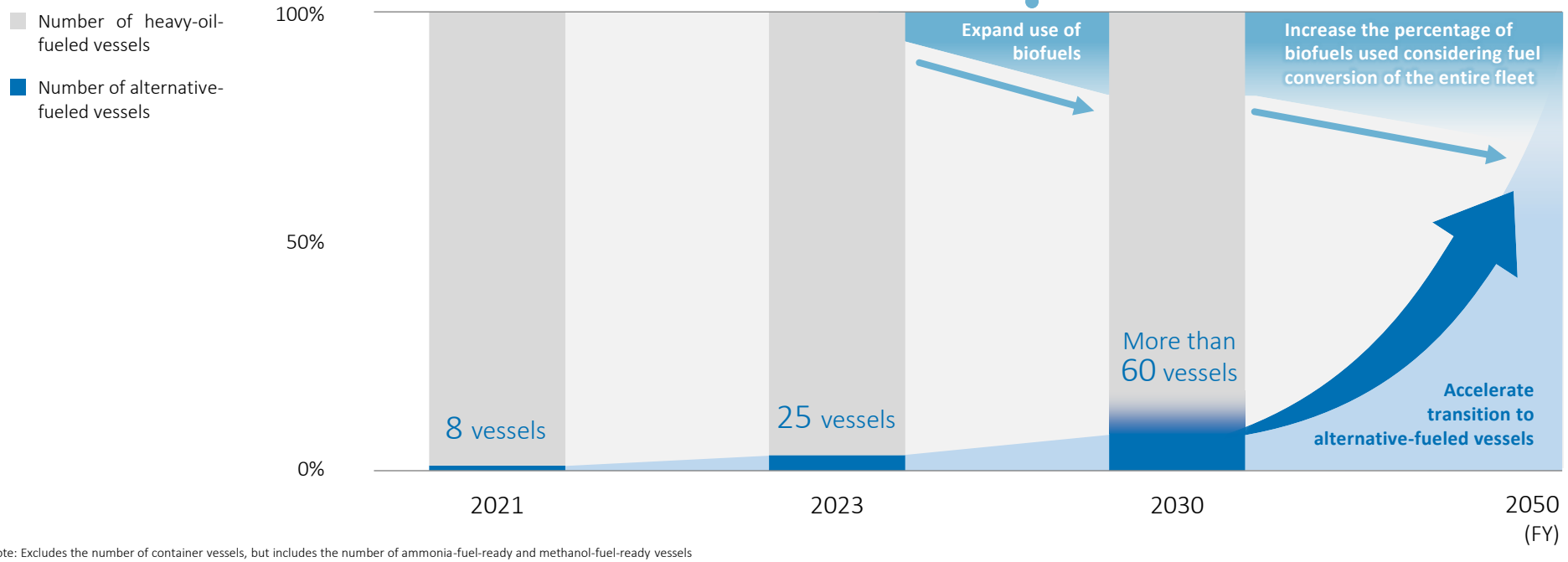
* SURF-BULB is a registered trademark of JMU in Japan.

Tactic 2: Use of Alternative Fuels

- Based on our medium-term management plan, we are steadily progressing with the fuel transition of our entire fleet. Additionally, we are scheduled to complete the world's first ammonia-fueled medium gas carrier (AFMGC) in 2026.
- On the other hand, replacing the fleet with alternative-fueled vessels requires a certain lead time. At this stage, we are expanding the use of biofuels as “drop-in” green fuels for our existing vessels to achieve our target for 2030.



Number of Alternative-Fueled Vessels Completed by the NYK Group (Cumulative)

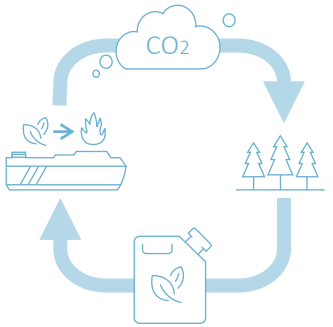


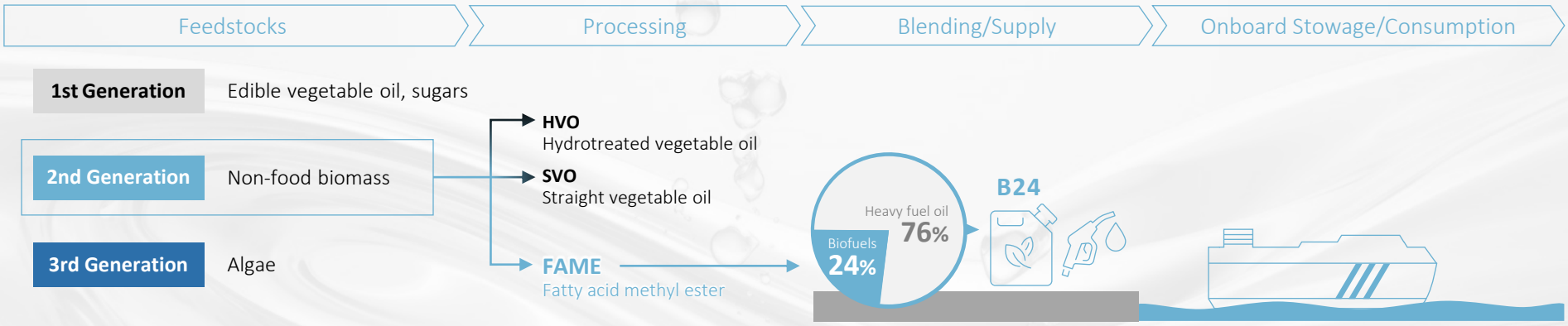
Note: Excludes the number of container vessels, but includes the number of ammonia-fuel-ready and methanol-fuel-ready vessels

Tactic 2: Use of Alternative Fuels

Biofuels

- Biofuels are made from organic resources (biomass) of biological origin, such as used cooking oil and agricultural residues. They are considered to have virtually zero carbon dioxide (CO_2) emissions when combusted because the plants absorb CO_2 and reproduce biomass. The greatest advantage is that they can be used in existing heavy-oil-fueled vessel engines and can be blended with heavy fuel oil.
- Currently, FAME (fatty acid methyl ester) produced from non-edible biomass is the mainstream for marine use. However, since there are limitations on production volume, it is important to consider other feedstocks and refine methods to increase usage. It is also necessary to assess the impact of long-term use of biofuels on vessels and to secure a supply chain that enables stable supply globally.





1 Challenges in Procurement and Quality Control

- ✓ Lack of transparency in quality
- ✓ Increase in the time required for analysis and testing
- ✓ Unclear extent of scalability and cost impact

2 Challenges in Supply Chain and Usage

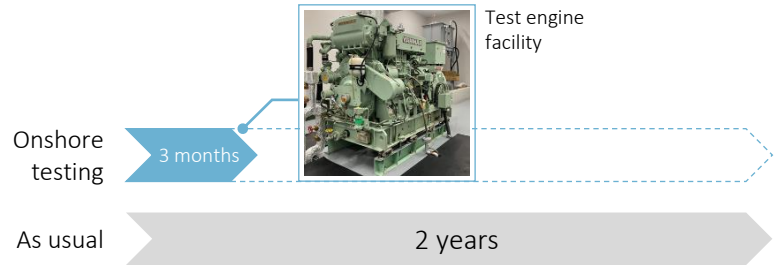
- ✓ Availability at the port of call
- ✓ Uncertainty regarding the impacts of continuous use on engine performance and onboard system operations

Tactic 2: Use of Alternative Fuels

Biofuels

1 Overcoming Challenges in Procurement and Quality Control

- We began operations of a test engine facility for evaluating the safety of biofuels in October 2024. This is expected to shorten the testing and analysis period, as well as the duration of onboard trials, from approximately two years to three months.



2 Overcoming Challenges in Supply Chain and Usage

- Since conducting our first trial of biofuels in 2019, we have gradually expanded the number of ports where we can take biofuels.
- We started a long-term trial project in 2024 to verify the impact of biofuels on a ship's main engine, generator engine, fuel supply system, etc., and the quality of biofuels after a certain period of stowage on board.

Biofuel Bunkering Ports

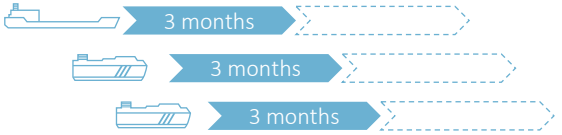
We have completed over 100 biofuel bunkering operations worldwide for various types of vessels.

Moving Forward to Long-Term Trial from 2024

NYK In-House Project

Continuous use for more than three months across multiple vessels

Gradually extending the usage period while confirming safety



Joint Project

Continuous use for six months on a vehicle carrier

A collaborative project named Project LOTUS launched in partnership with the Global Centre for Maritime Decarbonisation, with analytical services provided by Veritas Petroleum Services.

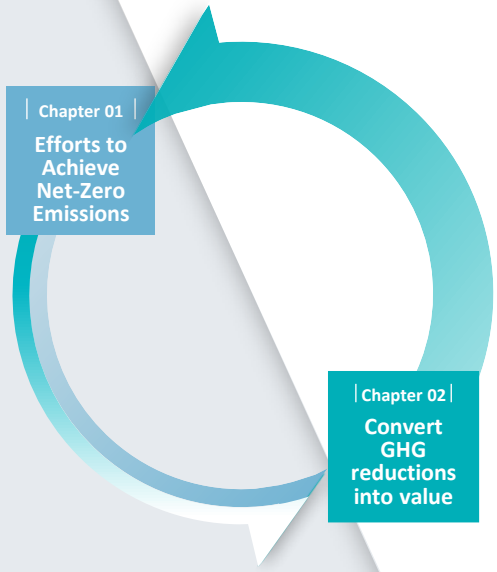
Tactic 2: Use of Alternative Fuels

Biofuels

Current Insights on Our Progress

- So far, there have been no issues regarding safety in the use of biofuels on vessels.
- Various biofuels can be evaluated for usability using a test engine.
- If used within a certain stowage period, sufficient quality will be maintained.

Technical challenges are likely to be overcome.



Potential Challenges

- **Calculation and Data Management:**
  Biofuels have individual emission factors, making calculation and data management complex.
- **Reporting and Disclosure:**
  The methodologies for calculating GHG reductions vary by regulation. The rules for disclosure have not been established.

In the future, the same challenges will arise with other alternative fuels.

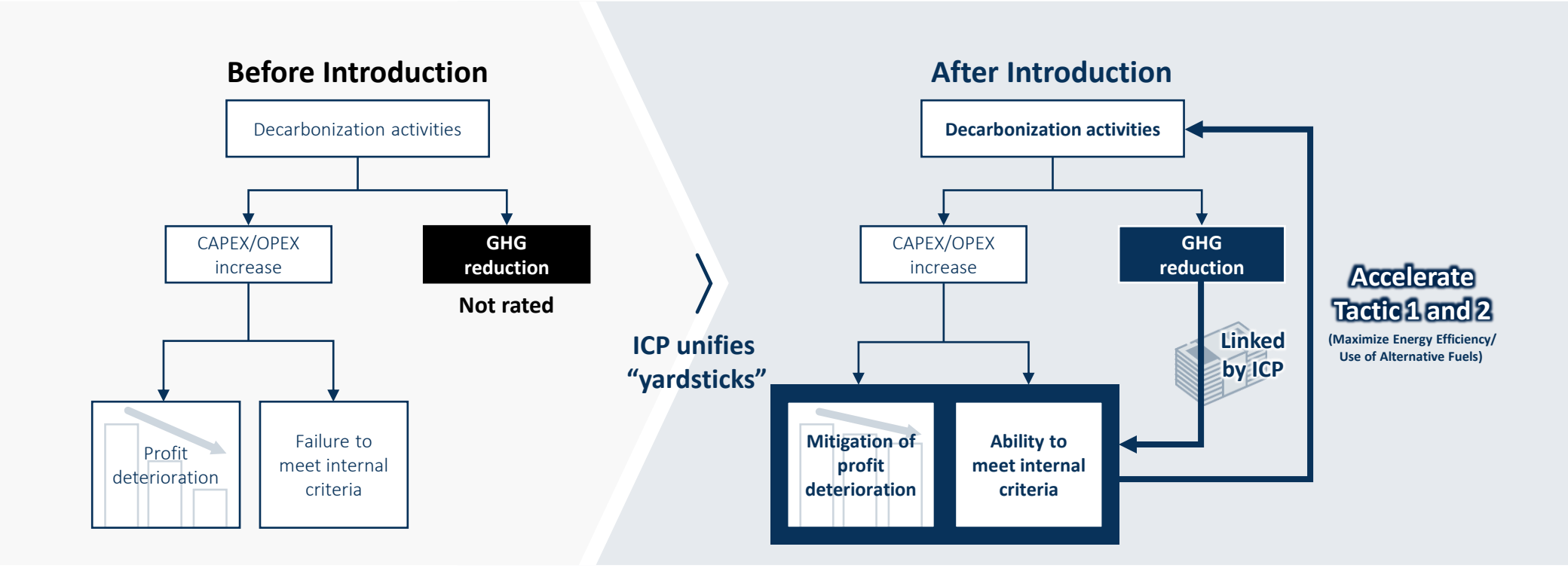
The importance of carbon management

Carbon Management

Internal Carbon Pricing (ICP)

Through ICP, GHG emission reductions are converted into economic value and measured under the same yardsticks.

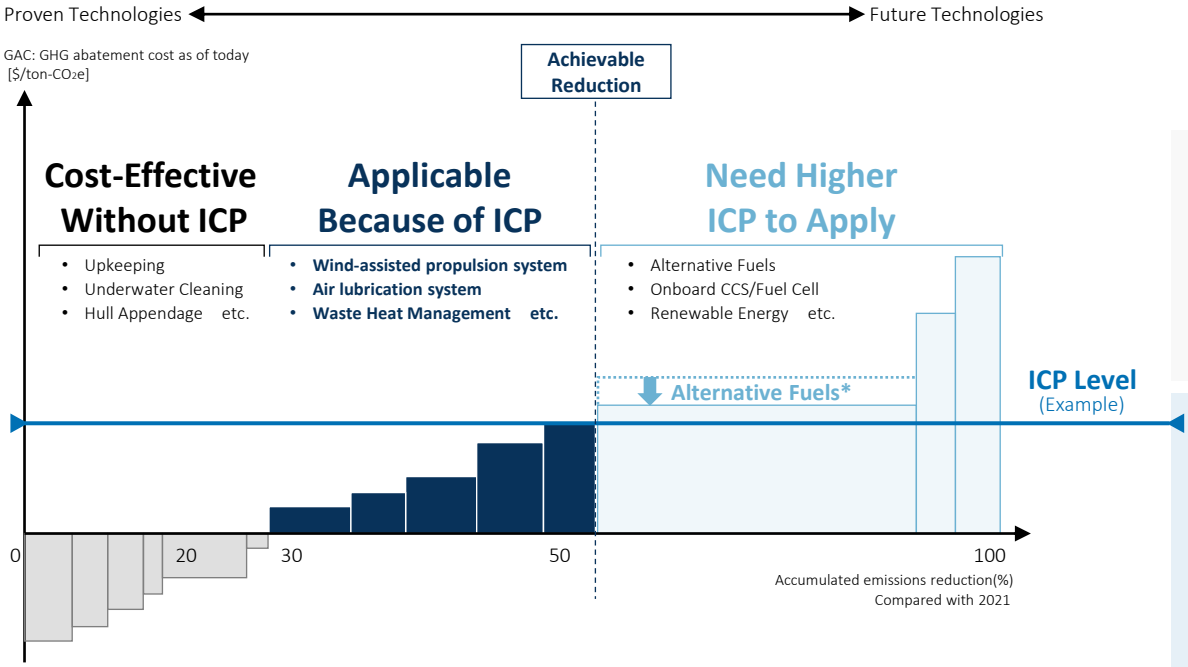
1. Visualizing emission reduction value by linking financial information with non-financial information, e.g., GHG emissions
2. Developing decarbonization governance by unifying in-house evaluation criteria for emission-reduction value
3. Promoting appropriate decision-making on decarbonization investment through comparisons with existing in-house evaluation criteria



Internal Carbon Pricing (ICP)

- The introduction of ICP will enable us to tackle more advanced decarbonization technologies.
  If the GHG abatement cost (the cost to reduce one ton of GHG) is lower than the established ICP price, it can be determined that the technology should be adopted.
- We determine the ICP price using implicit pricing. By adjusting the price at our discretion, we can either accelerate or slow down decarbonization efforts.

Reduction Potential and Its Abatement Cost

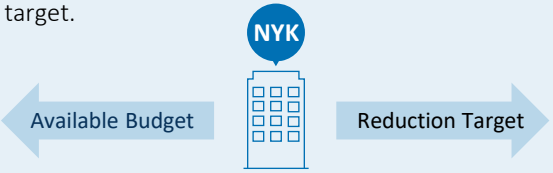


* Subject to regulation, subsidy, and innovation
Especially GAC will be reduced by carbon tax such as EU-ETS (2024 onward);
FuelEU Maritime (2025 onward) or IMO's medium-term measures (2027 onward)
Figure: Abatement cost evaluation for GHG mitigation measures (Illustration only)

Types of Carbon Pricing

Shadow Pricing:
Setting a carbon price based on assumptions concerning external prices

Implicit Pricing:
Setting an appropriate price for the amount a company will spend to achieve its GHG reduction target.

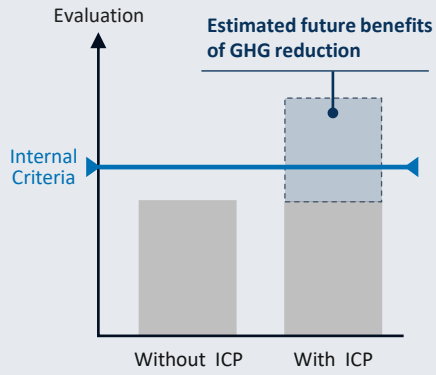


Internal Carbon Pricing (ICP)

Progress

- Moving forward from phase 0 to phase 1, we have established a calculation method and have started refereeing ICP for investment decisions. Since October 2023, we have applied ICP for more than 70 cases.
- Our ICPs set in 2024 remain $120 from 2024 to 2026, $200 from 2027 to 2030, and $250 after 2030.

Application	Capital expenditures Product and R&D
Scope	Scope 1 & 2 (includes Scope 3 categories 13 and 15 for shipping)
Calculation	Add ICP x GHG* saving on income *CO_2, CH_4, N_2O
Governance	Report at Management Meeting every six months



To verify decoupling while reducing GHG emissions and growing profits, we are currently exploring methods for performance evaluation as the next step.

KPIs: Carbon budget, return of carbon, etc.

2021–2023 **Phase 0**
Calculation and visualization

2023– **Phase 1**
Utilization of investment

Going Forward **Phase 2**
Evaluation of business performance

Chapter

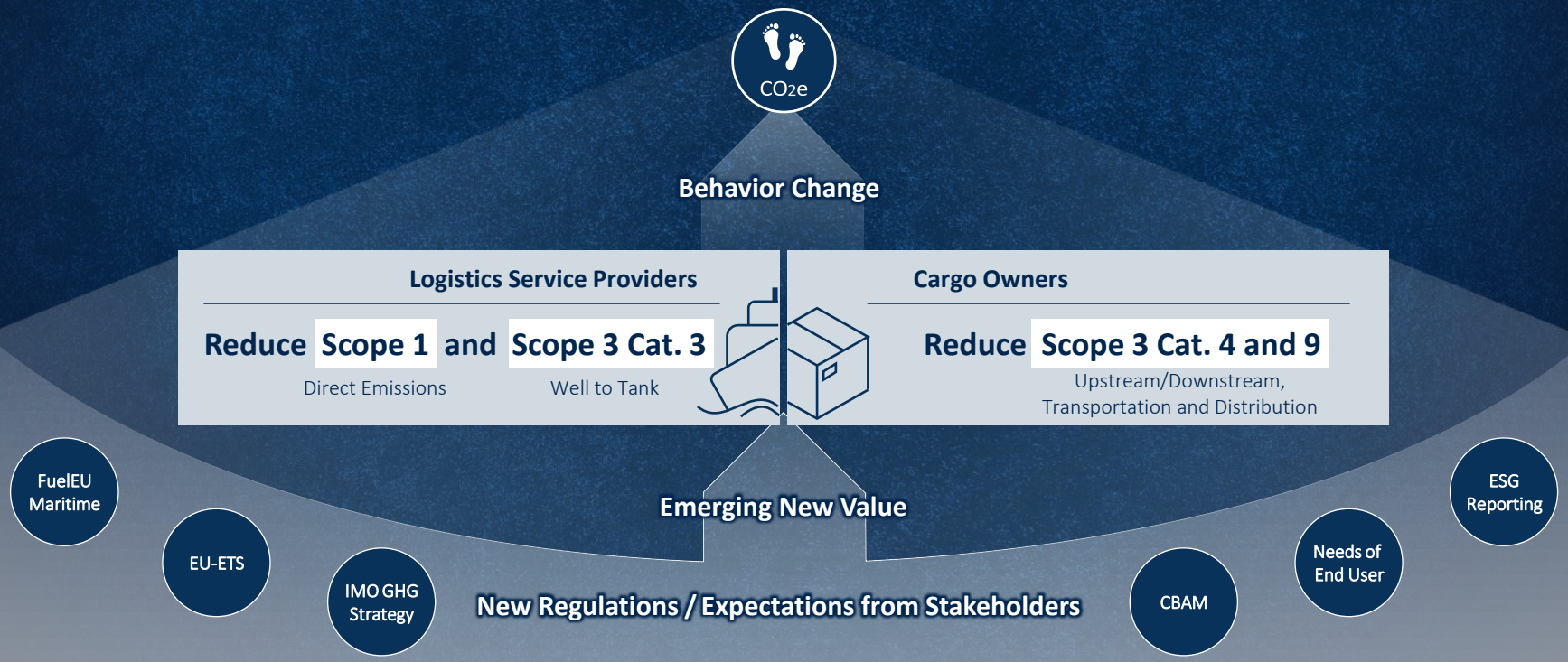
02 | Convert GHG Reductions into Value

Carbon Insetting

Carbon Accounting

From Emerging New Value to Shared Objective: Reduction of CFP

- The regulatory changes surrounding the shipping industry are accelerating, particularly in Europe. Discussions are also underway in the IMO regarding the introduction of new rules for GHG reductions in international shipping.
- These changes are accelerating the trend of GHG emissions reduction in logistics and transportation, leading to an increased adoption of CFP as a management tool. In the future, there will be a stronger emphasis on value calculation based on CFP, and the logistics industry will need to work together with customers to minimize it to the greatest extent possible.



Valuing Carbon Footprint of Service

- As customers interested in CFP increases, the need for a platform to share environmental value data is growing. Additionally, to ensure the reliability of the CFP exchanged on such a platform, carbon management will become increasingly important.
- Carbon Footprint of Service is calculated as activity levels multiplied by emission factors. When there are no unified guidelines, establishing a baseline for comparison is one of the most challenging aspects in terms of calculation. Secondly, the default values for emission factors of alternative fuels are still under discussion. Alternative fuels, like biofuels mentioned earlier, come in various types depending on their feedstocks and refining methods, making it difficult to apply a uniform calculation formula.
- Such a situation may lead to skepticism about the value of CFP calculated by each company and could potentially hinder its distribution. Thus, it is crucial to make CFP value data fair, accurate and credible.

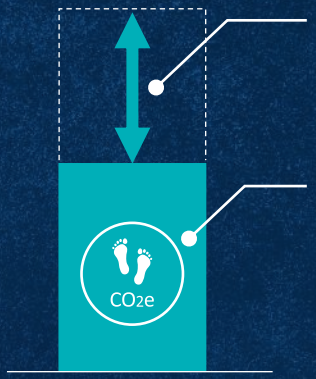
Carbon Management

Bringing Value
Carbon Insetting

1 **Platform for Sharing Environmental Value Data**

Fairness, Accuracy and Credibility
Carbon Accounting

Emission Mitigation



GAP = Value of Low CFP

Activity Level: Fuel Consumption (t-fuel)

×

Emission Factor: Carbon Intensity (t-GHG/t-fuel)

- Diverse Biofuels x Blending Ratio
- Blue/Green Ammonia
- Bio-Methanol/E-Methanol, etc.

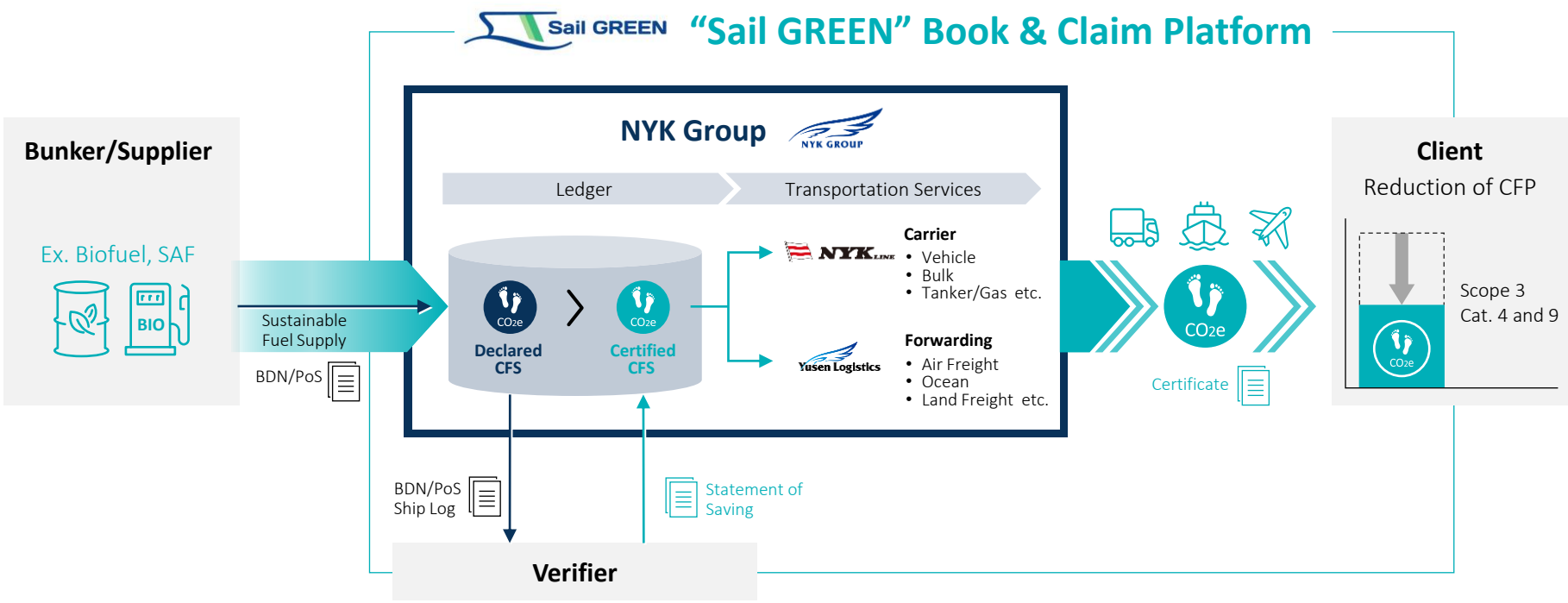
2 **Setting Benchmark to Measure GAP**

3 **Reliable Data through a Primary Data Approach**

Carbon Insetting

1. Platform for Sharing Environmental Value Data

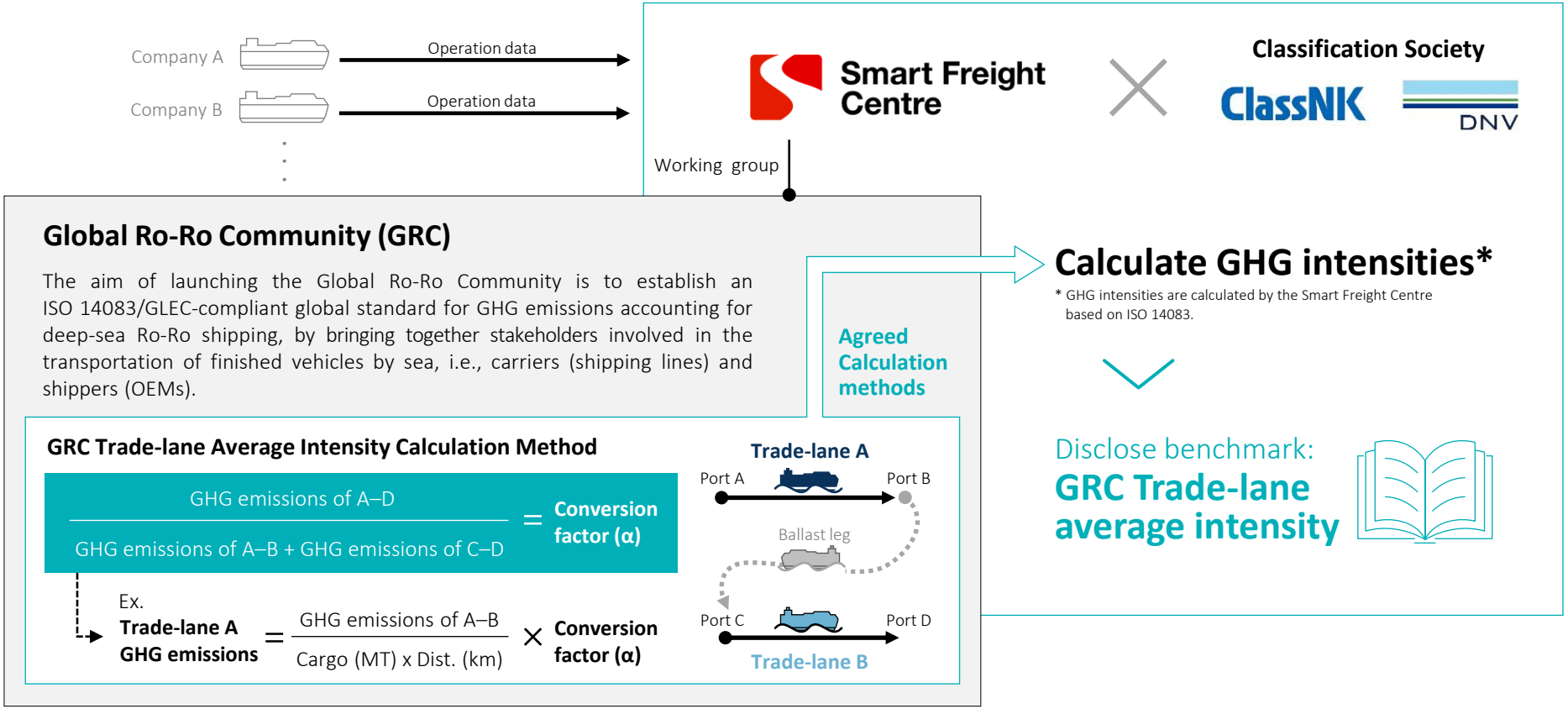
- Due to new regulations and expectations from stakeholders, the number of customers aware of CFP will continue to grow. The NYK Group is establishing a system and framework to share reliable environmental data.
- By incorporating external certification steps, we will distribute it as a Certified CFP. Leveraging our strengths as a comprehensive logistics group, we will collaborate with YUSEN LOGISTICS CO., LTD. to ensure convenience for diverse customers, allowing them to utilize the service in one easy step.



Carbon Accounting

2. Setting Benchmark to Measure GAP for Deep Sea PCC/RO-RO Vessels

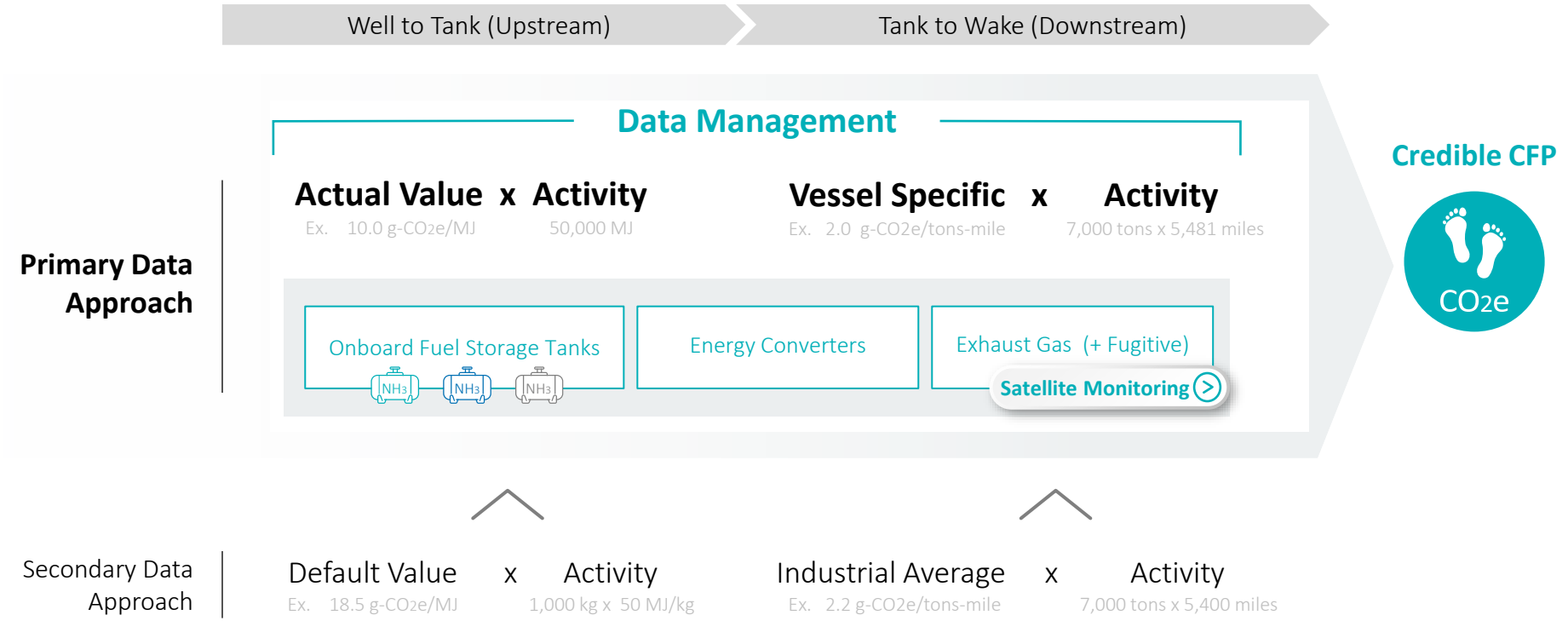
One of the essential aspects of measuring GHG emissions reductions is determining industrial benchmarks. Collaborating with classification societies, the Smart Freight Centre (SFC), and other carriers, we are working to establish a universal calculation method that can be used in global Ro-Ro and car carrier shipping. As part of this initiative (Global Ro-Ro Community), we are also discussing calculation methods for determining members' average GHG emissions to establish trade-lane-specific benchmarks.



Carbon Accounting

3. Reliable Data through a Primary Data Approach

- There are two approaches to calculating GHG emissions. Unless we switch from theoretical values known as secondary data to actual figures referred to as primary data, emissions may become conceptualized, undermining accuracy and credibility.
- To truly understand accurate emission levels, it is necessary to measure actual data from onboard tanks and converters, as well as verify the actual GHG emissions data released into the atmosphere exhaust gas.



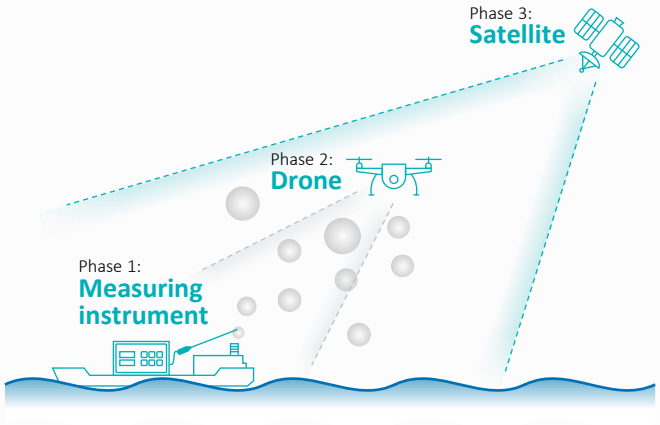
Satellite Monitoring

The demand for emission data assurance may grow to ensure that actual GHG emissions are consistent with the self-declared amount.

Quality Management of Emission Data by the Emitters + Data Quality Assurance from a third-party Perspective

We are collaborating with partners to pilot a system to monitor the correlation between ammonia substitution ratios and CO_2 emissions when ship fuel is replaced with ammonia.

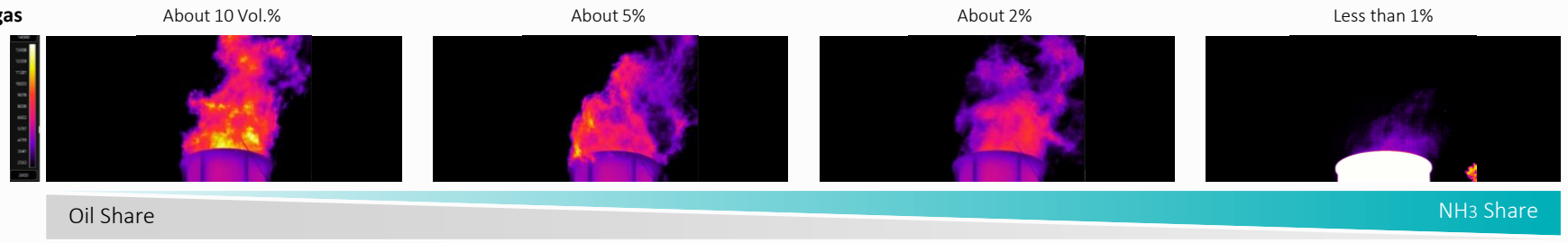
We have carried out a ground-based pilot experiment. Next, we plan to conduct exhaust measurements on board, followed by monitoring using drones and eventually satellites, with the goal of communicating objective data with transparency.



Proof of Concept

On-site direct imaging of CO_2 emissions from a funnel—Ammonia + Gas oil combustion gas

CO_2 contents in exhaust gas



Source: Collaborative demonstration involving NAGOYA Electric Works Co., Ltd. SHIMIZU Corporation, CSP Japan Inc., ArkEdge Space Inc. , SUNFLAME Co., Ltd. MUFG Bank, Ltd. and NYK Line.

SHOWCASE

Challenges for
Green Corridor

Our goal is to connect the supply chains of industries through decarbonization efforts, creating an impact on society as a whole. To validate the feasibility of this ideal, we are exploring the potential of global logistics through the Green Corridor, involving regional and international stakeholders in the process.

North Pacific Green Corridor

NYK Bulk & Projects Carriers(NBP) became one of the founding members of the North Pacific Green Corridor Consortium (NPGCC), whose members and partners will work together to decarbonize the value chain for commodities between Canada, Japan and South Korea.

The NPGCC will apply its collective expertise to develop a corridor for the decarbonized transportation of multiple commodities, including agricultural products, metal concentrates and steelmaking coal.

Core Members
Teck Resources Limited (Canada)
Canadian National Railway (Canada)
Trigon Pacific Terminals (Canada)
Mitsubishi Canada Limited (Japan)
Oldendorff Carriers (Germany)
NYK Bulk & Projects Carriers (Japan)

Advisory Members
Prince Rupert Port Authority (Canada)
Vancouver Fraser Port Authority (Canada)
Mitsubishi Heavy Industries (Japan)

Chilean Green Corridors Network Project

NYK became one of the members of the Chilean Green Corridors Network Project (Copper Concentrate Export), a joint project to establish a green shipping corridor in Chile launched by the Ministry of Energy in Chile and the Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping (MMMCZCS).

A project consortium consisting of the workstream leads Sumitomo Corporation, Interacid Trading S.A., NYK, Corporación Nacional del Cobre de Chile (CODELCO) and the MMMCZCS conducted a green corridor feasibility study regarding the export of copper concentrate from Chile to Japan and South Korea. The feasibility project kickstarted in March 2023 and will be formally closed by December 2024.

SHOWCASE

Challenges for
Zero Emissions by Ammonia

To accelerate GHG emissions reductions using zero-emission fuels, NYK is implementing pilot projects to build and operate vessels using ammonia, one of the most promising alternative fuels. Since there is no precedent for using ammonia as a fuel by directing it to a ship's engine, the establishment of safe operations and technical standards will be a pivotal aim of said pilot projects.

Sakigake, the world's first commercial-use ammonia-fueled vessel was delivered in August 2024.

On August 23, 2024, the tugboat Sakigake, the world's first commercial-use ammonia-fueled vessel, was delivered. It also achieved world firsts in terms of being converted from an LNG-fueled tugboat to an ammonia-fueled vessel and of realizing truck-to-ship ammonia bunkering.

NYK formed a consortium with engine manufacturer IHI Power Systems Co., Ltd. and classification society ClassNK to advance the development of ammonia-fueled engines and tugboats. NYK Group subsidiaries Keihin Dock Co., Ltd. and Shin-Nippon Kaiyosha Corporation are handling construction and modification work and managing operations, respectively, thereby gaining valuable insight and feedback.

This project is one of the Green Innovation Fund Projects of the New Energy and Industrial Technology Development Organization (NEDO).

Our ammonia-fueled tugboat Sakigake is providing tug services around the Port of Yokohama as part of a proving test.

Bringing value to life.

Our journey is to be continued.

Please look forward to the sequel of this story.