CHARTING THE FUTURE

ClassNK

Transition Support Services

[English]

July 2025

Our initiatives

As reducing GHG emissions becomes an urgent issue for the international society, the maritime industry is facing increasingly stringent pressure to reduce GHG emissions from ships, and the IMO and the EU are strengthening environmental regulations.

In 2023, the IMO revised its GHG Strategy. Under this strategy, new regulations which may incur additional costs to reduce GHG emissions are expected to be introduced, with the goal of achieving net-zero GHG emissions from international shipping by or around 2050. In addition, the strategy considers the life cycle GHG emissions of fuels used onboard ships, expanding the focus beyond just energy efficiency improvement to include the "origin" of the fuels.

Meanwhile, the EU has extended the "EU Emissions Trading System (EU-ETS)" to the shipping sector ahead of international regulations by the IMO. Furthermore, the "FuelEU Maritime", which assesses the life cycle GHG emissions of fuels, has started from 2025. Both regulations impose financial burdens to reduce GHG emissions from ships, making strategic GHG emissions reduction a key element for the future of the maritime business.

ClassNK Transition Support Services

In this regulatory landscape, long-term measures such as the introduction of zero-emission fuels ships are essential for the planned reduction of GHG emissions. However, the infrastructure for supplying zero-emission fuels is still under development, requiring the introduction of various GHG reduction measures during the transitional phase.

GHG reduction measures for ships include the introduction of alternative fuels ships, energy efficiency improvement technologies such as wind-assisted propulsion systems and energy-saving devices, etc. and the use of onboard CCS for capturing and storing CO_2 emitted from ships. Regardless of these measures, monitoring of GHG emissions is essential through a suitable management tool.

ClassNK aims to comprehensively facilitate a smooth transition to zero-emission through its "ClassNK Transition Support Services," utilizing the knowledge gained from participating in various demonstration projects for energy efficiency improvement technologies, onboard CCS and GHG emissions verification as well as issuing an Approval in Principle (AiP) for alternative fuels ships. This service offers a comprehensive menu of solutions to support clients in reducing GHG emissions and proposes optimal strategies tailored to clients' needs.

ClassNK encourages stakeholders to utilize its "ClassNK Transition Support Services" to successfully reduce GHG emissions.

ClassNK Transition Support Services menu

Alternative fuels support (Ammonia/Methanol/LNG/LPG/Biofuels)

Introduction support	ClassNK Alternative Fuels Insight	5
	Cost Simulation	
	Safety requirements	
Technical support	Newbuilding ships / retrofit support	5
Operational support	Operation / crew training support	6
	Usage of biofuels	
Certification support	Fuel certification	6
	Certification of GHG reduction effects	
	Certification of methane slip actual values	

Energy efficiency improvement support

Energy efficiency improvement support	Estimation of energy efficiency improvement effects	7
	Support for introducing energy efficiency improvement technologies	

Onboard CCS support

Introduction support	Trends	8
	Safety requirements	
Certification support	Certification of captured CO_2 volume	8

GHG emissions management support

- Appendix -

Understanding regulations

Alternative fuels support
(Ammonia / Methanol / LNG / LPG / Biofuels)

A key step in reducing GHG emissions from ships in the future is the transition from conventional fuels to zero- or low-emission alternative fuels. With the construction of ships using LNG and methanol as fuel and the upcoming introduction of ships fueled by ammonia, the introduction of alternative fuels ships is expected to increase.
ClassNK provides comprehensive support services for clients who are considering the introduction, design, construction and operation or conversion of alternative fuels ships.

Introduction support

ClassNK Alternative Fuels Insight

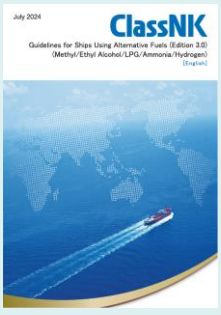
When introducing alternative fuels, it is necessary to consider not only technical evaluations but also to understand trends including cost and supply availability. ClassNK provides the latest information on various alternative fuels intended for onboard ship use, covering cost estimations including regulatory compliance, fuel supply forecasts and ordering status for alternative fuels ships through the "ClassNK Alternative Fuels Insight".

Cost Simulation

In order to properly respond to GHG emission reduction regulations like IMO's mid-term measures, EU-ETS, and FuelEU Maritime, it's essential not only to understand the costs associated with these regulations but also to conduct a comprehensive cost simulation, accounting for changes in shipbuilding and fuel costs due to fuel transitions. Through its "ClassNK Fleet Cost Simulation" service, ClassNK conducts these increasingly complex cost evaluations on behalf of clients, including the estimation of regulatory compliance costs.

Safety requirements

For alternative fuels ships, the development of safety requirements that consider the risks to ships, crews and the environment has become a pressing issue at the IMO. ClassNK supports the introduction of alternative fuels ships through the publication of its "Guidelines for Ships Using Alternative Fuels," which provides guidelines on the safety requirements and the design of alternative fuels ships, ahead of the IMO's formalized safety requirements for such ships.



Technical support

Newbuilding ships / retrofit support

For newbuild ships using alternative fuels or retrofitting existing ships with alternative fuels systems, ClassNK provides technical support for obtaining Approval in Principle (AiP) and facilitating retrofits, utilizing our knowledge as a classification society.

Operational support

Operation / crew training support

As the number of alternative fuels ships rises, international standards and unified guidelines for handling certain fuels like ammonia and methanol onboard, as well as crew training, remain absent. ClassNK supports the operation of alternative fuels ships by issuing guidelines for alternative fuels operations and relevant crew training requirements. As a first step, ClassNK provides guidelines for the operation of ammonia-fueled vessels through the publication of "Guidelines for Safety Operation for Ammonia-Fueled Vessels". Additionally, leveraging our expertise in alternative fuels, we offer comprehensive support for crew training, including e-learning modules covering alternative fuels operations and training necessities that might be challenging to develop internally.

Usage of biofuels

Biofuels are increasingly recognized as carbon-neutral options due to the CO_2 absorption by the plants used in their production. They are also considered drop-in fuels, compatible with existing engines without major conversions. ClassNK facilitates the usage of biofuels by offering guidance through the "Technical Guide for Using Biofuels," outlining their features and usage considerations. Moreover, we provide certification aligned with international biofuels certification schemes, ensuring their safe and effective use.

Certification support

Fuel certification

The demand for certification of biofuels and green fuels produced sustainably is increasing. ClassNK offers third-party certification for alternative fuels used onboard ships, adhering to the certification scheme. We offer a comprehensive service covering fuel certification and certification of emissions reduction achieved through fuel used, providing clients with a convenient one-stop solution.

ClassNK Green Certification

Certification of GHG reduction effects

The use of biofuels and green fuels leads to a decrease in GHG emissions in comparison to conventional fuels. As a third-party organization, ClassNK certifies the reduced GHG emissions stemming from the use of biofuels, etc., in line with ISO standards, GHG protocol, and other relevant criteria. Acquiring certification for reduced GHG emissions enables clients to demonstrate the effectiveness of GHG reduction to stakeholders.

Certification of methane slip actual values

In recent years, with the increasing use of LNG fuel, there has been mounting concern about the impact of methane slip on global warming, as it releases unburned methane into the atmosphere. ClassNK certifies the actual methane slip values for engines using LNG fuel. Obtaining certification for these actual values enables shipowners and other stakeholders to demonstrate the reduction of GHG emissions.

Energy efficiency improvement support

Enhancing the energy efficiency of ships is crucial for reducing GHG emissions. Key technologies for improving energy efficiency include wind-assisted propulsion systems, air lubrication systems, energy-saving devices, propeller retrofits, and optimal operation support systems. By enhancing operational efficiency and decreasing fuel consumption, these technologies effectively reduce GHG emissions. Moreover, they offer avenues for GHG emissions reduction without necessitating major conversions like fuel changes.
ClassNK supports clients in evaluating the potential impact of energy efficiency improvement and facilitates the introduction of these technologies, from assessment to introduction.

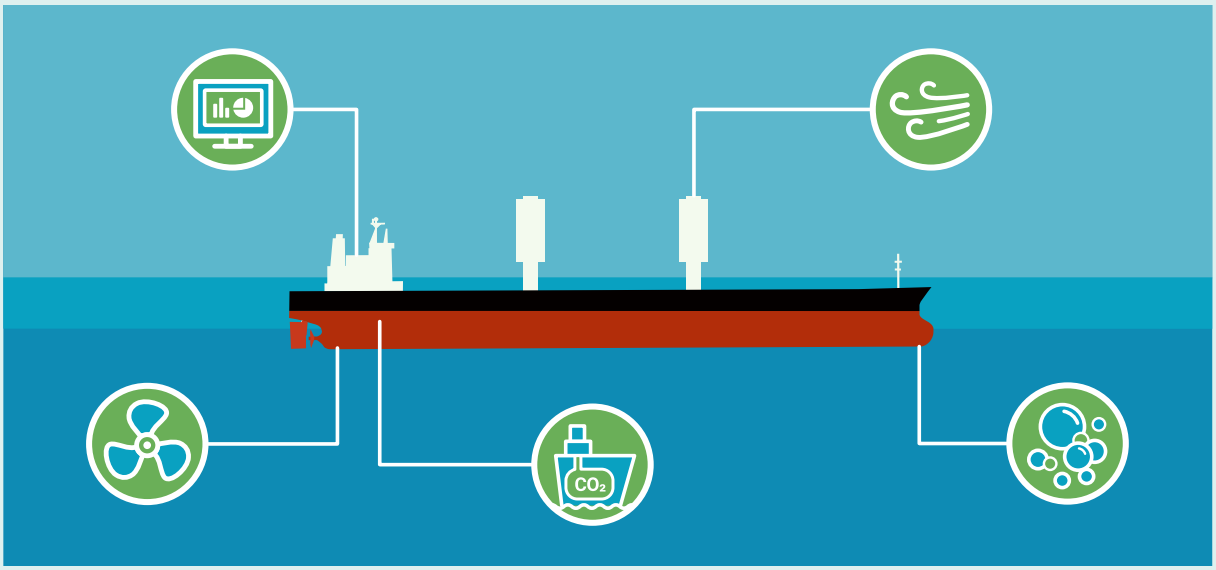
Energy efficiency improvement support

Estimation of energy efficiency improvement effects

When introducing energy efficiency improvement technologies, it's crucial to anticipate the expected improvement effects beforehand. ClassNK assists in estimating the CO_2 reduction effects and the improvement in the CII rating resulting from the introduction of these technologies.

Support for introducing energy efficiency improvement technologies

Energy efficiency improvement technologies like wind-assisted propulsion systems, air lubrication systems, energy-saving devices, propeller retrofits, and optimal operation support systems yield varying energy efficiency effects. Additionally, the availability of these technologies depends on the hull form and ship type, which may impose limitations. ClassNK supports clients in evaluating energy efficiency improvement by offering support for the introduction of these technologies on each ship. This includes considering the energy efficiency impacts of each technology in conjunction with the ships' hull form/type.



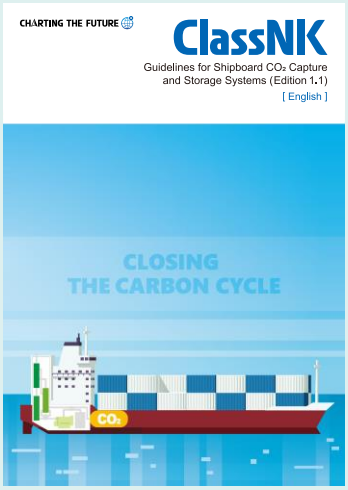
Onboard CCS support

There is a rising interest in capturing CO_2 from ship exhausts to reduce GHG emissions. Onboard Carbon Capture and Storage (CCS) technology is advancing, although still emerging, and lacks comprehensive international regulations. Nevertheless, ClassNK has engaged in onboard CCS demonstration projects, leveraging gained insights to provide services for its future introduction. ClassNK assists clients considering onboard CCS introduction by providing trends, conducting safety assessments, and certifying the amount of CO_2 captured.

Introduction support

Trends

ClassNK provides information to facilitate the introduction of onboard CCS, encompassing insights into implementation trends as well as details on regions, facilities, and storage capacities for captured CO_2.



Safety requirements

Internationally recognized safety standards for onboard CCS systems and installations are currently lacking. ClassNK supports the introduction of onboard CCS by publishing resources like the "Guidelines for Shipboard CO_2 Capture and Storage Systems" which delineate essential safety requirements for both equipment and installation pertaining to onboard CCS.

Certification support

Certification of captured CO_2 volume

As a third-party, ClassNK certifies the actual amount of CO_2 captured by onboard CCS. The certification of this captured CO_2 volume enables stakeholders to appreciate the reduction in CO_2 emissions. Moreover, ClassNK assists in ensuring that the CO_2 reduction achieved through onboard CCS is duly recognized within both IMO and EU regulatory frameworks.

GHG emissions management support

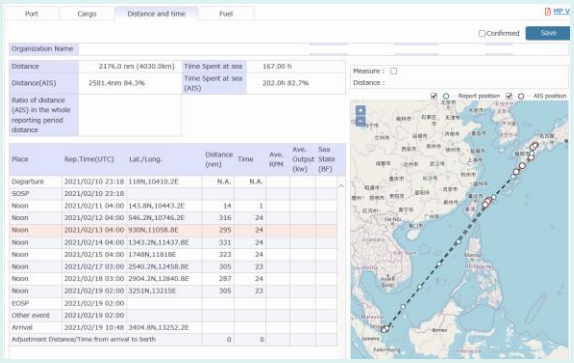
GHG emissions management is mandatory regardless of the measures taken to reduce GHG emissions, such as the use of alternative fuels or the introduction of energy efficiency improvement technologies. To facilitate compliance with regulations such as IMO-DCS and EU-MRV, ClassNK offers the "ClassNK MRV Portal," a comprehensive tool for certification and regulatory compliance. This platform verifies GHG emissions for specific periods or individual voyages/cargo units upon request. Additionally, we provide "ClassNK ZETA," a visualization tool designed to manage fleet emissions by offering insights into GHG emissions. As a GHG certification service, we also evaluate the extent to which a client's shipping operations align with their GHG emissions reduction targets.

GHG emissions management tool

ClassNK MRV Portal

ClassNK provides "ClassNK MRV Portal" for compliance with fuel oil consumption data collection systems like IMO-DCS/EU-MRV and CII rating. This platform serves as a data repository for storing and managing voyage data and vouchers sent from ships.

ClassNK offers extensive support, including templates for data collection, reporting, and shore-based data management, as well as assistance with certification application, DOC issuance, and invoice management. ClassNK can also verify GHG emissions and issue certificates for specific periods or individual voyage/cargo units upon client request, facilitating their sharing among stakeholders.



ClassNK ZETA

ClassNK ZETA is a tool to visualize and manage emissions from ships. This platform enables clients to monitor GHG emissions and CII ratings of individual ships or entire fleets, as well as simulate potential changes in emissions and CII ratings resulting from practices like slow steaming. In addition to these GHG management capabilities, it provides a feature that facilitates the confirmation of GHG emissions subject to the EU-ETS and the management of emission allowances. Furthermore, a feature for the FuelEU Maritime that allows users to check/manage GHG intensity and compliance balance is also incorporated.
ClassNK's verification services for IMO-DCS/EU/UK regulations etc are completely independent from ClassNK ZETA. The use of ClassNK ZETA does not impact the outcome of our verification services.

-Appendix-
Understanding regulations

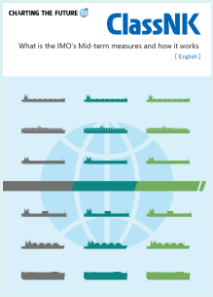
In 2023, the IMO revised its GHG Strategy, with new regulations for reducing GHG emissions slated for introduction in 2027. Concurrently, the EU has initiated the extension of the EU Emissions Trading System (EU-ETS) to the shipping sector from 2024 and FuelEU Maritime from 2025. Understanding these regulations is crucial for devising measures to reduce GHG emissions from ships.
To facilitate comprehension and compliance, ClassNK has published informative documents elucidating these regulations and offering guidance for preparation. These documents will be regularly updated to reflect any revisions to the regulations.

International Maritime Organization (IMO)

What is the IMO's Mid-term measures and how it works

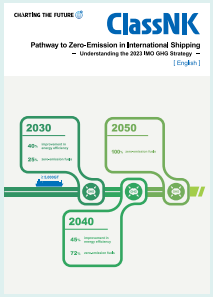
At the 83rd session of the International Maritime Organization (IMO) Marine Environment Protection Committee (MEPC 83) held in April 2025, draft amendments to MARPOL Annex VI including the IMO's mid-term measures for GHG reduction were approved. In response, the draft amendments will be considered for adoption at the extraordinary MEPC session in October 2025.

To help maritime stakeholders understand the mid-term measures, ClassNK released "What is the IMO's Mid-term measures and how it works", which explains the details of the mid-term measures and provides information on how to comply with the regulations.



Whitepaper "Pathway to Zero-Emission in International Shipping"

In an effort to enhance comprehension of the 2023 IMO GHG Strategy, ClassNK has released a white paper titled "Pathway to Zero-Emission in International Shipping - Understanding the 2023 IMO GHG Strategy."
While the 2023 GHG Strategy establishes numerical targets and benchmarks for GHG emissions reduction, there remains a lack of consensus regarding the interpretation of these targets within the realm of international shipping. The white paper analyzes the "life cycle GHG emissions" that international shipping is allowed to achieve these numerical targets, as well as the scale of "zero-emission fuels and zero-emission ships" required to meet these targets, including comparisons with the current situation.



European Union (EU)

FAQs on the EU-ETS for Shipping

ClassNK published the "FAQs on the EU-ETS for Shipping", which provides an overview of the EU-ETS for the shipping sector and the necessary preparations in a Q&A format to assist maritime stakeholders through the essential preparations required for compliance with the EU-ETS, facilitating their initial steps toward regulatory compliance.

FAQs on the FuelEU Maritime

ClassNK published the "FAQs on the FuelEU Maritime", which provides an overview of the FuelEU Maritime and the necessary preparations in a Q&A format to assist maritime stakeholders through the essential preparations required for compliance with the FuelEU Maritime, facilitating their initial steps toward regulatory compliance.

ClassNK Transition Support Services

CHARTING THE FUTURE

ClassNK

Transition Support Services

[English]

NIPPON KAIJI KYOKAI
Planning Division
Green Transformation Center
4-7 Kioi-cho, Chiyoda-ku, Tokyo 102-8567, JAPAN
Tel: +81-3-5226-2031
E-mail: gxc@classnk.or.jp

www.classnk.com

July 2025