

Japan, January 2025

Position Paper

Role of Carbon Dioxide Removal in the NYK Group's Decarbonization Strategy

This position paper sets out the NYK Group's perspective on the role of carbon dioxide removal in its corporate decarbonization strategy, aiming to unlock the potential of carbon dioxide removal in the maritime decarbonization journey toward net-zero emissions by 2050, as adopted in the 2023 IMO GHG strategy.¹

IPCC AR6 WG III² explains that *“Carbon Dioxide Removal (CDR) refers to technologies, practices, and approaches that remove and durably store carbon dioxide from the atmosphere. CDR is required to achieve global and national targets of net zero CO₂ and GHG emissions. CDR cannot substitute for immediate and deep emissions reductions, but it is an important tool that should be deployed in tandem with other mitigation methods.”*

The NYK Group agrees with the Intergovernmental Panel on Climate Change (IPCC)'s science-based approach to global net-zero emissions, and this approach has been adopted in our decarbonization strategy, as shown in Figures 1 and 2.

Taking into urgent consideration the remaining carbon budget left for humanity for limiting global warming to 1.5 degrees, the NYK Group hereby confirms that we shall make the utmost efforts to mitigate direct and indirect emissions from business activities and employ CDR to address the balance of emissions so that the net-zero emission target is achieved by 2050. Thus, by 2050, CDR competency should be a core part of management responsibilities across our businesses.

Meanwhile, we do not anticipate overnight change capable of providing the necessary capacity for carbon removal equivalent to the scale of residual emissions from all relevant industries, especially hard-to-abate sectors such as aviation and maritime transportation, which operate worldwide and rely heavily on energy-dense fossil fuels.

Some CDR concepts with low technology maturity are still in the early stages. MRV (measurement, reporting, and verification) has not been well established, and commercial markets are under development. Nevertheless, CDRs are slowly but steadily moving from research laboratories to practical applications. A global framework to promote the use of CDR is important to break through the circumstances and accelerate CDR capacity.

A carbon credit is a mechanism for one party to compensate another for the action of reducing, avoiding, or removing carbon. There are three carbon credit types, each with a different net-emissions impact: carbon reduction, carbon removal, and carbon avoidance. The carbon credits that the NYK Group would deploy for filling the gap between the ambitious target and the resulting emissions, in the company’s best efforts for mitigating emissions, are of the carbon-removal type generated from a project providing a durable solution that stores CO2 with relative permanence and carries minimal risk for reversal. Additionality³ is also a key factor for consideration.

From FY 2025, or earlier if practical, the NYK Group will commence the procurement and retirement of qualified CDR credits at a reasonable pace and scale to build up the capacity of neutralization of residual emissions toward 2050. Through this initiative, we will demonstrate how an emission-balancing mechanism can be used to achieve the ambitious target set by a corporation in a hard-to-abate sector not only from the point of registration of corporate GHG inventory but also clarifying the accounting and financial arrangements around these environmental attribute certificates calling for a regulatory global framework for this transaction.

Table: CDR Implementation Plan in the NYK Group’s Decarbonization Journey

Target Year	2025 – 2026	2027 – 2029	2030
	Trial Phase		Implementation
Procurement	Execution		
Retirement	Preparation	Execution: total 100,000 tons	Revised Target: abt. 100,000 tons/year ⁴

Through integration of the essential environmental value to remove GHGs from the atmosphere and the corporate-emission mitigation portfolio, the industry can expect the following:

1. To neutralize residual emissions with scale
2. To rationalize the GHG abatement cost for hard-to-abate sectors (price ceiling effect)
3. To comply with the coming mandatory requirements

A will shall find a way. The NYK Group is showing concrete action as part of its strategy to walk a climate-positive path together with like-minded partners united by a shared ambition.

— Path planning – Setting a target: Definition of net zero



- ✔ Our definition of net zero in the 2050 target is clarified to involve carbon removal.

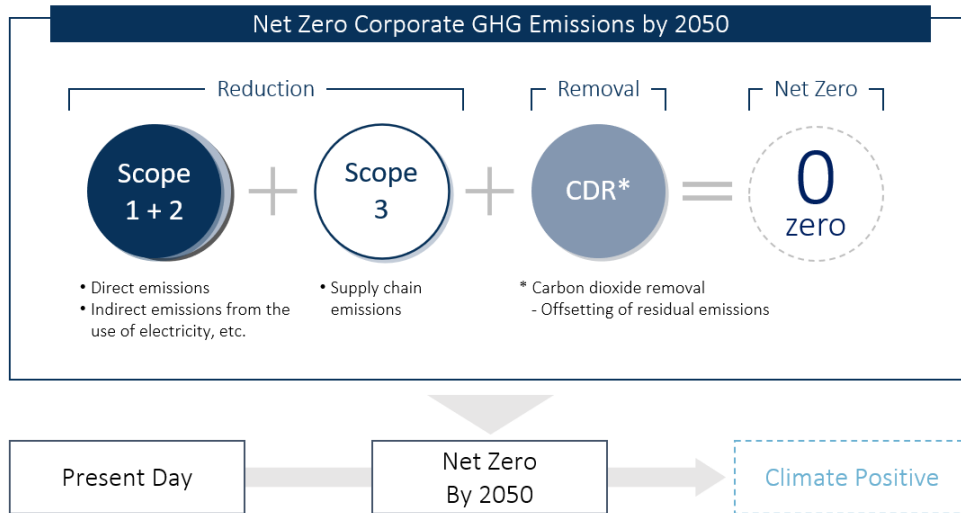


Figure 1: Definition of net zero – (NYK Group Decarbonization Story (2023), Page 15)

- Balancing residual GHG emissions – Role of CDR



- ✔ 1.5 deg. C aligned climate scenarios project **the need of CDR to achieve net zero.**
 - In global shipping, which is a hard-to-abate sector, a GHG emissions reduction close to 100% is expected be challenging to achieve from both technical readiness and maturity and economic standpoints
 - Carbon dioxide removal (CDR) is a necessary element to achieve net-zero CO₂ and GHG emissions both globally and nationally, counterbalancing residual emissions from hard-to-transition sectors. Reference: IPCC WG3 Chapter 12

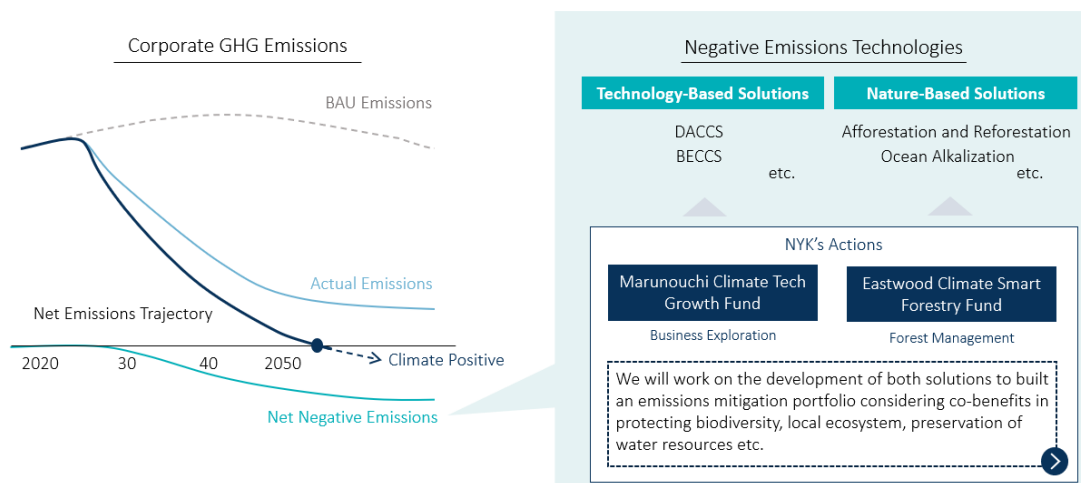


Figure 2: Balancing residual GHG emissions (NYK Group Decarbonization Story (2023), Page 30)



<Decarbonization Strategy>

In November 2023, the NYK Group released the NYK Group Decarbonization Story (hereafter “NDS”) to powerfully communicate its high aspirations and stance to proactively promote its decarbonization efforts. The NDS includes initiatives, technical measures, reduction targets, and transition plans, and addresses the concept of sustainable growth. In October 2024, marking one year since the publication of the NDS, the NYK Group released Progress Report 2024 as an annex to show the progression of the NDS.

In Chapter 1 of the NDS, which plans a pathway and sets targets, the definition of our long-term goal to achieve net-zero corporate GHG emissions by 2050 was clarified to involve carbon removal. We aim to neutralize residual emissions, which is the balance after making all efforts to mitigate the scope 1 emissions, by means of maximizing energy efficiency, emission avoidance by carbon capture and storage technology, and the use of alternative fuels such as low carbon (LNG, LPG, methanol), zero carbon (hydrogen, ammonia), and carbon neutral fuels (biofuels).

Notes

1. Levels of ambition directing the 2023 IMO GHG Strategy

GHG emissions from international shipping to reach net zero: to peak GHG emissions from international shipping as soon as possible and to reach net-zero GHG emissions by or around, i.e. close to, 2050, taking into account different national circumstances, whilst pursuing efforts towards phasing them out as called for in the Vision consistent with the long-term temperature goal set out in Article 2 of the Paris Agreement.

2. IPCC AR6 WG III: CDR Factsheet

https://www.ipcc.ch/report/ar6/wg3/downloads/outreach/IPCC_AR6_WGIII_Factsheet_CDR.pdf

3. Additionality

A CDR solution is considered additional if the emissions removals it provides would not have taken place without carbon credit revenue incentives.

4. Difference from the original plan

The NDS’s original plan was 200,000 tons/year in 2030. Due to the immaturity of CDR technology and market, the initial capacity of CDR was revised to 100,000 tons/year and is subject to further change.