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Solutions for Our Climate

° Report

Global Top 100 Shipping Companies by Environmental Performance (2025)

Is Korea's Shipping Ready for the Net-Zero Era?

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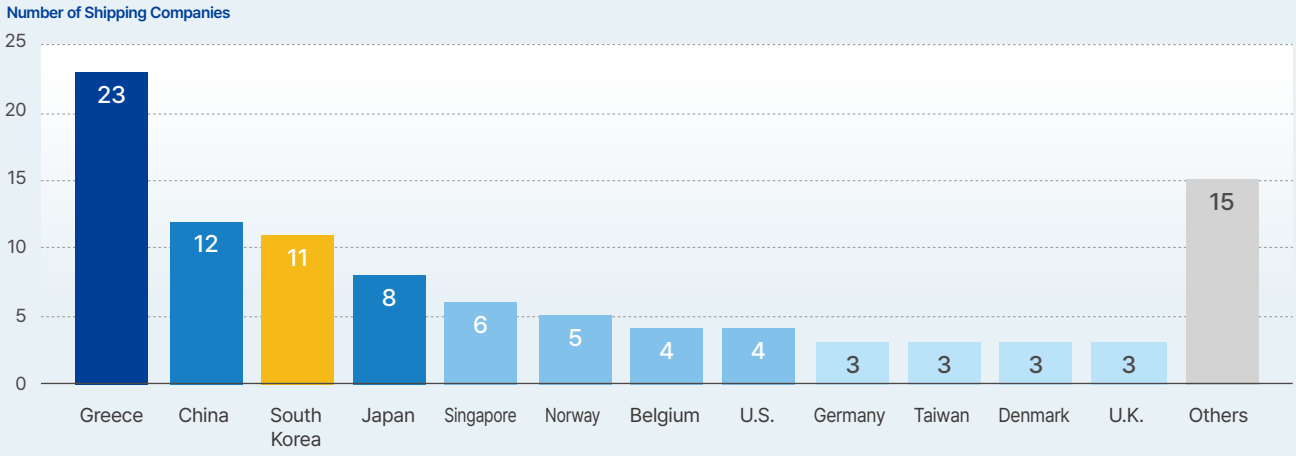
Publication Date	**November 2025**
Author	**Jueun Han** | Solutions for Our Climate | jueun.han@forourclimate.org
Assistance	**Shipping Team, Solutions for Our Climate**
Design	**sometype**

Solutions for Our Climate (SFOC) is an independent nonprofit organization that works to accelerate global greenhouse gas emissions reduction and energy transition. SFOC leverages research, litigation, community organizing, and strategic communications to deliver practical climate solutions and build movements for change.

Top 100 Global Shipping Companies: Country Breakdown



*Others comprise countries with a single shipping company[1]

1 National Distribution of the Global 100 Shipping Companies: Greece (23), China (12), South Korea (11), Japan (8), Singapore (6), Norway (5), Belgium (4), U.S. (4), Germany (3), Taiwan (3), Denmark (3), U.K. (3), Italy (2), Malaysia (2), Oman (1), Qatar (1), France (1), Saudi Arabia (1), Brazil (1), Nigeria (1), India (1), UAE (1), Israel (1), Iran (1), Canada (1)

Top 100 Global Shipping Companies: Environmental Scores

South Korean Companies

Rank	Company	Country	Region	Category	Score
1	MISC	Malaysia	Southeast Asia	Gas Carriers	86.51
2	Danaos Corp	Greece	Southern Europe	Container Ships	84.85
3	Golden Ocean Group	Belgium	Western Europe	Bulk Carriers	83.89
4	Exmar LPG BVBA	Belgium	Western Europe	Gas Carriers	83.84
5	Frontline	Norway	Northern Europe	Tankers	83.76
6	BW LPG	Singapore	Southeast Asia	Gas Carriers	81.94
7	Evergreen Marine	Taiwan	East Asia	Container Ships	81.77
8	Seaspan Corporation	Canada	North America	Container Ships	80.65
9	Bocimar NV	Belgium	Western Europe	Bulk Carriers	80.30
10	DHT Management	U.S.	North America	Tankers	79.19
11	Euronav	Belgium	Western Europe	Tankers	79.01
12	SFL Corporation	Norway	Northern Europe	Special/Other	78.55
13	CoolCo	Singapore	Southeast Asia	Gas Carriers	77.18
14	Asyad Shipping	Oman	West Asia	Tankers	76.88
15	Capital Clean ECC	Greece	Southern Europe	Gas Carriers	76.83
16	AET Tankers	Malaysia	Southeast Asia	Tankers	76.79
17	Hapag-Lloyd	Germany	Western Europe	Container Ships	76.70
18	Navigator Gas	U.S.	North America	Gas Carriers	76.66
19	Solvang ASA	Norway	Northern Europe	Gas Carriers	75.74
20	Costamare Shipping	Greece	Southern Europe	Container Ships	75.67
21	Nakilat	Qatar	West Asia	Gas Carriers	75.14
22	CMA CGM	France	Western Europe	Container Ships	73.95
23	COSCO Shipping Bulk	China	East Asia	Bulk Carriers	73.87
24	NYK Line	Japan	East Asia	Special/Other	73.05
25	COSCO Shpg Energy	China	East Asia	Tankers	72.73
26	OOCL	China	East Asia	Container Ships	72.65
27	Petredec	U.K.	Northern Europe	Gas Carriers	72.14
28	Wisdom Marine Group	Taiwan	East Asia	Bulk Carriers	71.61
29	Scorpio Tankers	Italy	Southern Europe	Tankers	71.29
30	COSCO Shipping Lines	China	East Asia	Container Ships	71.15
31	MSC	Italy	Southern Europe	Container Ships	71.04
32	Intl Seaways	U.S.	North America	Tankers	69.82
33	Berge Bulk	Singapore	Southeast Asia	Bulk Carriers	69.20
34	PIL	Singapore	Southeast Asia	Container Ships	68.98
35	Pan Ocean	South Korea	East Asia	Bulk Carriers	68.40
36	Tsakos Energy Nav	Greece	Southern Europe	Tankers	67.93
37	Star Bulk Carriers	Greece	Southern Europe	Bulk Carriers	67.53
38	Navios MLP	Greece	Southern Europe	Special/Other	67.40
39	HMM	South Korea	East Asia	Container Ships	65.53
40	Maersk	Denmark	Northern Europe	Container Ships	63.11
41	Petrobras	Brazil	Latin America and the Caribbean	Special/Other	61.14
42	Knutsen OAS Shipping	Norway	Northern Europe	Gas Carriers	60.77
43	TORM A/S	Denmark	Northern Europe	Tankers	59.67
44	Schulte Group	Germany	Western Europe	Special/Other	57.72
45	Dorian LPG	Greece	Southern Europe	Gas Carriers	54.17
46	KSS Line	South Korea	East Asia	Gas Carriers	54.13
47	Bahri	Saudi Arabia	West Asia	Tankers	53.69
48	Hyundai Glovis	South Korea	East Asia	Special/Other	53.62
49	H-Line Shipping	South Korea	East Asia	Bulk Carriers	53.21
50	Wallenius Wilhelmsen	Norway	Northern Europe	Special/Other	51.97

Top 100 Global Shipping Companies: Environmental Scores

South Korean Companies

Rank	Company	Country	Region	Category	Score
51	BW LNG	Singapore	Southeast Asia	Gas Carriers	50.23
52	Zodiac Maritime	U.K.	Northern Europe	Special/Other	50.02
53	Eastern Pacific Shpg	Singapore	Southeast Asia	Special/Other	48.48
54	K-Line	Japan	East Asia	Special/Other	48.28
55	COSCO Shipping Dev	China	East Asia	Container Ships	46.96
56	Hyundai LNG Shipping	South Korea	East Asia	Gas Carriers	46.50
57	Thenamaris	Greece	Southern Europe	Tankers	45.85
58	Bonny Gas Transport	Nigeria	Sub-Saharan Africa	Gas Carriers	42.71
59	GasLog	Greece	Southern Europe	Gas Carriers	35.92
60	Celsius Tankers	Denmark	Northern Europe	Gas Carriers	35.69
61	Oldendorff Carriers	Germany	Western Europe	Bulk Carriers	34.98
62	Meiji Shipping	Japan	East Asia	Special/Other	34.83
63	Seapeak	U.S.	North America	Gas Carriers	33.36
64	StealthGas	Greece	Southern Europe	Gas Carriers	30.75
65	Capital Ship Mgmt	Greece	Southern Europe	Tankers	28.94
66	Sinogas Maritime	China	East Asia	Gas Carriers	26.95
67	Shpg Corp of India	India	South Asia	Special/Other	26.30
68	VLOC Holdings	China	East Asia	Bulk Carriers	25.64
68	China Ore Shipping	China	East Asia	Bulk Carriers	25.64
68	TMS Cardiff Gas	Greece	Southern Europe	Gas Carriers	25.64
68	Dynagas Ltd	Greece	Southern Europe	Gas Carriers	25.64
68	Naftomar Shpg & Trdg	Greece	Southern Europe	Gas Carriers	25.64
73	Pantheon Tankers	Greece	Southern Europe	Tankers	25.42
74	Maran Dry Mngt	Greece	Southern Europe	Bulk Carriers	24.98
74	CMES Shipping	China	East Asia	Bulk Carriers	24.98
74	Maran Tankers Mgmt	Greece	Southern Europe	Tankers	24.98
74	China VLCC	China	East Asia	Tankers	24.98
74	Maran Gas Maritime	Greece	Southern Europe	Gas Carriers	24.98
79	Shoei Kisen Kaisha	Japan	East Asia	Container Ships	24.76
80	Shandong Shipping	China	East Asia	Bulk Carriers	23.86
81	Minerva Marine	Greece	Southern Europe	Tankers	21.45
82	SK Shipping	South Korea	East Asia	Special/Other	19.88
83	ADNOC L&S	UAE	West Asia	Special/Other	19.62
84	Doun Kisen	Japan	East Asia	Bulk Carriers	18.73
84	Oceonix Services Ltd	U.K.	Northern Europe	Special/Other	18.73
84	Chartworld Shipping	Greece	Southern Europe	Special/Other	18.73
87	Korea Line LNG	South Korea	East Asia	Gas Carriers	18.01
88	Mitsui OSK Lines	Japan	East Asia	Special/Other	17.88
89	Wan Hai Lines	Taiwan	East Asia	Container Ships	16.53
90	Polaris Shipping co	South Korea	East Asia	Bulk Carriers	16.04
90	Cardiff Marine	Greece	Southern Europe	Bulk Carriers	16.04
90	Winning Intl	China	East Asia	Bulk Carriers	16.04
93	Dynacom Tankers Mgmt	Greece	Southern Europe	Tankers	14.02
94	Sinokor Merchant	South Korea	East Asia	Tankers	13.77
94	Ray Car Carriers	Israel	West Asia	Special/Other	13.77
96	Nat Iranian Tanker	Iran	South Asia	Tankers	11.44
97	Santoku Shipping	Japan	East Asia	Bulk Carriers	8.91
98	Cido Shipping	South Korea	East Asia	Special/Other	8.51
99	Nissen Kaiun	Japan	East Asia	Special/Other	6.03
100	Evalend Shipping	Greece	Southern Europe	Bulk Carriers	2.63

*Note: This ranking does not account for cargo's life-cycle (LCA) greenhouse gas emissions; including it could materially affect the ranking.

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I. Introduction

Shipping is the backbone of global trade and other industries. With global shipping companies competing for limited customers and routes, the shipping industry has long operated under conditions of fierce competition.

Traditionally, cost efficiency was the primary source of competitive advantage for shipping companies. However, the landscape has shifted dramatically since the 2020s. With the International Maritime Organization (IMO) introducing stringent decarbonization regulations, the ability to reduce greenhouse gas (GHG) emissions has emerged as a critical competency for gaining an edge in the market. Sustainability is no longer a strategic option—it has become a prerequisite for survival.

In this context, assessing how Korean shipping companies are preparing for these global changes relative to leading international players has become pivotal to securing future competitiveness of Korea's shipping industry. In particular, evaluating their progress in the Environmental pillar of ESG—the most impactful dimension—and especially their development of systems for GHG emissions reduction is essential to understanding the industry's current standing and shaping its strategic direction.

This report evaluates the environmental performance of 100 major shipping companies worldwide using a newly developed evaluation model. The companies analyzed, including 11 from Korea, were selected based on business scale and primary vessel types. Data was drawn from their most recent sustainability reports, business filings, and official websites for a comparative assessment of environmental performance.

The findings indicate that Korean companies are outperforming the global average in establishing emissions reduction roadmaps and disclosing compliance strategies for IMO regulations. However, they lag behind in investing in green ships and formulating fleet transition plans. Furthermore, the risk of Korean bulk carriers and tankers facing regulatory measures is intensifying despite Korea's national shipping companies being placed in the mid-tier of emission efficiency—calculated through estimate-based analysis of the Carbon Intensity Indicator (CII).

Based on these evaluation results, this report seeks to identify key risks and challenges for Korea's shipping industry and to propose strategic directions for achieving a sustainable competitive advantage.

II. Evaluation Methodology

1 Evaluation Methodology

ESG-related risks and opportunities facing shipping companies vary according to their operating models and vessel types. The importance and the methods of managing fuel efficiency, for example, must differ between vessels that travel long distances or carry large cargo volumes and those that frequently operate on short routes since fuel consumption and emission characteristics are highly vessel-specific. Likewise, crew size, onboard working conditions, and safety incident response systems need to be tailored to vessel size and characteristics. Risk management frameworks must also account for whether a ship operates on regular routes or project-based contract services. Applying uniform evaluation criteria across different vessel types can therefore distort results.

For a more accurate analysis, this report compares shipping companies within similar business groups and models, divided into five categories:

1 Container Ships (15 companies)
Vessels that carry standard ISO containers.

2 Bulk Carriers (20 companies)
Vessels that carry unpackaged bulk cargo such as ore, grain, and coal.

3 Tankers (20 companies)
Vessels that carry liquid cargoes, such as crude oil and chemical products.

4 Gas Carriers (25 companies)
Vessels that carry liquefied gas, such as LNG and LPG.

5 Special/Other (20 companies)
Vessels serving distinct purposes, such as car carriers and offshore support vessels.

The larger the transport volume and fleet, the greater the significance and impact of ESG risks and opportunities. Accordingly, the major ship companies analyzed were selected based on their scale and transport capabilities, as measured by physical capacity metrics.

- **Container Ships**: Twenty-foot Equivalent Unit (TEU)
- **Bulk Carriers, Tankers**: Deadweight Tonnage (DWT)
- **Gas Carriers**: Cubic Meter, (CU M)
- **Special/Other**: Gross Tonnage (GT)

Among the top 100 shipping companies, only 15 container carriers were included despite their dominant market share, while 25 gas carrier companies were selected even though the global fleet is relatively small to reflect the greater impact of gas carriers, driven by high technological and regulatory barriers. To avoid data distortion and enhance the reliability of the analysis, this report adopts a representative sample that accounts for both the market structure and the ESG risk characteristics of each vessel category.

2 Environmental Assessment Metrics

Data was collected from the official websites and sustainability reports of each shipping company as of June 2025 and used to develop an ESG evaluation framework encompassing 10 environmental, 2 social, and 3 governance issues.

Shipping, by its very nature, is heavily affected by environmental issues, and companies' compliance with relevant regulations is closely tied to their financial performance. By contrast, the social and governance performance of large shipping companies shows relatively little variation as mandatory frameworks such as the Maritime Labour Convention (MLC) and International Safety Management (ISM) Code already establish baseline compliance requirements. Moreover, ESG investment frameworks in the global financial sector such as the Poseidon Principles[2] place priority on carbon intensity, fuel transition, the share of green vessels, and other environmental factors. At the same time, growing demand from global cargo owners for Scope 3[3] emissions disclosure is further elevating the importance of shipping companies' carbon emissions management capabilities.

Accordingly, the environmental dimension has been assigned the greatest weight in this report's ESG evaluation framework for global shipping companies. The detailed metrics for the environmental pillar are as follows:

Environmental Issue 1

Disclosure of GHG Emissions

- **Disclosure of Scope 3 Emissions**
- **Disclosure of Detailed Air Pollutant Emissions**
- **Disclosure of GHG Intensity**
- **Disclosure of Separate Ship-Level Emissions**

2 A global framework for assessing and disclosing the climate alignment of financial institutions' ship-finance portfolios. It provides a standardized baseline for quantitatively evaluating and reporting whether portfolio emissions are consistent with the IMO's net-zero by 2050 decarbonization trajectory.

3

Direct Emissions	Scope 1	GHG emissions occurring directly from sources owned or controlled by the reporting company
Indirect Emissions	Scope 2	GHG emissions resulting from the generation of purchased electricity, steam, heating, and cooling consumed by the reporting company
	Scope 3	GHG emissions occurring from sources not owned or controlled by the reporting company but generated as an indirect result of the reporting company's activity throughout its value chain

(*A Guide to Measuring Scope 3 GHG Emissions for Working-Level People*, 2023, p.12)

According to the Fourth IMO GHG Study (2020), global shipping accounts for approximately 3% of total GHG emissions worldwide. If the industry were treated as a country, it would rank as the sixth-largest emitter, following China, the U.S., India, Russia, and Japan. Accordingly, reducing GHG emissions lies at the core of IMO regulations.

Because accurate measurement and transparent disclosure of GHG emissions are critical for cargo owners managing supply chain-wide emissions, the extent of shipping companies' emissions disclosure serves not only as a regulatory response but also as an indicator of competitiveness and risk management.

Environmental Issue 2

Disclosure of GHG Emissions Reduction Strategies

- **Disclosure of Fleet Transition Plans**
- **Disclosure of Emissions Management of Newly Built Vessels**
- **Disclosure of Climate Change Response Scenarios**
- **Disclosure of Decarbonization Roadmaps**
- **Participation in Environmental Initiatives**
- **Disclosure of Green Bond Issuance**
- **Disclosure of Operational Optimization Frameworks**
- **Disclosure of Investments in Carbon Capture Technologies**
- **Disclosure of Participation in the Environmental Ship Index (ESI)**

Items above go beyond emissions disclosure; they represent pivotal factors in assessing shipping companies' ESG risk management capabilities.

Environmental Issue 3

Disclosure of CII Grades

- **Disclosure of CII Grades**

The IMO's Carbon Intensity Indicator (CII) is a vessel-efficiency metric that offers stakeholders a transparent measure of a shipping company's regulatory compliance. If a company's CII grade—one of the IMO's core decarbonization requirements—falls below the prescribed threshold, the company may face sanctions such as suspension of operations until its rating is improved, with significant implications for financial sustainability.

Environmental Issue 4

Improvement of CII Grades

- **CII Grade D Vessel Share and Trend**
- **CII Grade E Vessel Share and Trend**

Using the carbon emissions assessment system of Allseedata (올시데이터), emissions per vessel for the period 2023–2024 were evaluated, along with the resulting changes in CII grades. The CII evaluation model incorporates Automatic Identification System (AIS) data, vessel particulars, and ocean environmental data to assess the carbon emissions of more than 50,000 vessels worldwide in real time.

Environmental Issue 5

Disclosure of Energy Efficiency Index (EEI)

- **Disclosure of EEXI (Energy Efficiency Existing Ship Index)**
- **Disclosure of EEDI (Energy Efficiency Design Index)**

The Energy Efficiency Index (EEI), included in IMO regulations, is a quantitative metric that reflects vessel design and operational efficiency. Vessels with an EEXI above the regulatory limit must reduce service speed or engine power, resulting in operational restrictions such as limits on navigation and berthing, which in turn negative affect financial sustainability.

Environmental Issue 6

Disclosure of Fleet Share and Operational Status (Fossil vs. Non-Fossil Fuels)

- **Fleet Share and Operational Status (Fossil vs. Non-Fossil Fuels)**

The share of vessels powered by fossil fuels versus those powered by non-fossil fuels reveals both a shipping company's pace of fuel transition speed and its capacity to respond to market demands.

Environmental Issue 7

Disclosure Aging Vessel Share and Emissions Data

- **Disclosure of Aging Vessel Replacement Plans**
- **Disclosure of Aging Vessel Disposal and Recycling Plans**

Aging vessels heighten shipping companies' exposure to ESG risks as they generate higher carbon emissions and carry a greater likelihood of safety incidents.

Environmental Issue 8

Disclosure of Plans to Improve Environmental Performance at Port

- **Disclosure of Pollutant Emissions Management System**
- **Installation of AMP/OPS**

In most cases, vessels keep their engines running at port for power supply, releasing NOx, SOx, PM, and CO_2—the primary contributors to air pollution in port areas. This practice not only drives climate change but also harms the health of nearby residents, complicates compliance with regional environmental regulations, and affects access to ports.

Environmental Issue 9

Disclosure of Pollutant Emissions Management Data

- **Disclosure of Air Pollutant Emissions Management Data**
- **Management of Water Resources**
- **Management of Hazardous Substances**
- **Management of Waste and Wastewater**

The volumes of NOx, SOx, PM, wastewater, hazardous substances, and ballast water discharged in the shipping process indicate the extent of a company's environmental load management. Multiple international codes already prescribe thresholds for such emissions, and companies must comply to avoid operational restrictions such as denial of port entry. Moreover, incidents resulting in environmental pollution can trigger substantial recovery costs and jeopardize contractual relationships with cargo owners, exposing companies to reputational risks.

Environmental Issue 10

Biodiversity

- **Disclosure of Biodiversity Policies**
- **Programs and Initiatives for Biodiversity**

Ballast water discharge, hull coating, shipping route development, and other shipping-related activities have a direct impact on marine ecosystems. Compliance with international conventions and national regulations governing Marine Protected Areas (MPAs) is essential to mitigating business risks such as fines and route restrictions.

3 CII Grade Assessment Methodology

Data from companies' sustainability reports alone are insufficient for qualitative assessments. Accordingly, this report conducted qualitative evaluations of each shipping company's CII in collaboration with Allseedata, a company specializing in maritime big data processing.

CII is a metric that measures CO2 emissions relative to operational efficiency (i.e., fuel consumption per ton-mile) and is used to compare and evaluate vessels' carbon emissions performance worldwide. It serves as a key indicator for accurately assessing the shipping industry's energy efficiency management and progress in carbon reduction. CII was adopted at IMO MEPC 76 in 2022, requiring all vessels engaged in international voyages to calculate and report their CII annually beginning January 1, 2023.

Under IMO regulations, vessels rated Grade D for three consecutive years or Grade E even once must submit a Ship Energy Efficiency Management Plan (SEEMP) with a Corrective Action Plan for approval; otherwise, they risk an operational ban. Accordingly, a company's share of Grade D or E vessels indicates its level of risk exposure to CII regulations. Furthermore, the requirements for maintaining a given CII grade become more stringent each year, meaning that without investments in efficiency improvements—such as equipment retrofits or low-emissions operations—the same vessels may eventually fall into lower grades.

For the CII assessment, 106 shipping companies were analyzed. This included six Korean national shipping companies—Dongjin Shipping, Dong-A Tanker, EUKOR Car Carriers, Korea Marine Transport Co., Namsung Shipping, and SM Line—in addition to the top 100 companies previously selected for the sustainability disclosure analysis. Approximately 7,000 cargo vessels operated by these companies in 2024 were assigned CII grades, which were used to analyze the distribution of vessels from Grade A to E and to quantify each company's carbon efficiency management and regulatory risk exposure. For comparative purposes, operational data from 2023 were also incorporated, as specified in the report.

The nationality of each vessel was defined as the corporate headquarters location of the operating company as of 2024. This approach standardizes vessel nationality, as the inherently multinational nature of the shipping industry means that companies often maintain multiple branches across different countries.

III. Sustainability Disclosure Data of the Global Top 100 Shipping Companies

1 Trends of Global Shipping Companies

Global shipping stands at another inflection point. In April 2025 at MEPC 83, the IMO approved the Net-zero Framework—its set of mediate-term measures for reducing GHG emissions in the shipping industry. This decision marked a shift in regulation from a focus on efficiency improvements to one centered on total emissions reductions and penalties. Under the new framework, differential carbon taxes will be levied on excess emissions based on GHG Fuel Intensity (GFI), making emissions reduction a direct cost driver. Although its final adoption—originally scheduled for October 2025—has been delayed by one year due to various conflicting interests, the 2050 net-zero target for international shipping remains unchanged, and short-term measures such as EEXI and CII—both reflected in this report's environmental rating metrics—continue to tighten. Decarbonization by global shipping companies is therefore unavoidable, underscoring the need for proactive preparation..

COVID-19 caused the sharpest decline in seaborne trade volume since the 2008 financial crisis, yet the shipping industry experienced an unexpected boom as port congestion triggered supply shortages and drove up ocean freight rates. Profits generated during this period enabled global shipping companies to place orders for green ships and invest in fleet transitions to meet increasingly stringent environmental regulations and growing demands for sustainability, thereby securing long-term resilience. Since 2023, orders for vessels powered by methanol and other alternative fuels have risen significantly, boosting the share of green ships both in operation and within orderbooks (Kim et al., 2024, p. 24)[4]. Notable examples include Maersk, which has pledged to achieve net zero by 2040, and CMA-CGM, which has been securing vessels powered by methanol, ammonia, and other alternative fuels. Such strategies reflect how global companies are responding to tightening IMO regulations and evolving market demands.

4 MOF & KMC. Guidebook on global trends and national support programs for greenships(2024). p24

Against this backdrop, the level of ESG disclosure among global shipping companies has been advancing. Although a wide gap remains between listed and unlisted companies, large shipping companies worldwide are increasingly aligning with IMO guidelines and expanding their disclosure items. For instance, when the IMO issued guidelines on biofuel and Underwater Radiated Noise (URN), leading companies promptly incorporated them into their sustainability reports. This underscores the direct link between international regulatory compliance and the advancement of ESG disclosure, highlighting the importance of transparency in securing a competitive edge in the global shipping industry.

2 Ranking of Korean Shipping Companies

The environmental disclosure results presented in **[Table 2]** indicate that most Korean shipping companies fall within the mid- to lower tiers.

[Table 2] Top 100 Global Shipping Companies: ESG Assessment Results (Environmental)

South Korean Companies

No.	Container Ships	Bulk Carriers	Tankers	Gas Carriers	Special/Other
1	Danaos Corp	Golden Ocean Group	Frontline	MISC	SFL Corporation
2	Evergreen Marine	Bocimar NV	DHT Management	Exmar LPG BVBA	NYK Line
3	Seaspan Corporation	COSCO Shipping Bulk	Euronav	BW LPG	Navios MLP
4	Hapag-Lloyd	Wisdom Marine Group	Asyad Shipping	CoolCo	Petrobras
5	Costamare Shipping	Berge Bulk	AET Tankers	Capital Clean ECC	Schulte Group
6	CMA CGM	Pan Ocean	COSCO Shpg Energy	Navigator Gas	Hyundai Glovis
7	OOCL	Star Bulk Carriers	Scorpio Tankers	Solvang ASA	Wallenius Wilhelmsen
8	COSCO Shipping Lines	H-Line Shipping	Intl Seaways	Nakilat	Zodiac Maritime
9	MSC	Oldendorff Carriers	Tsakos Energy Nav	Petredec	Eastern Pacific Shpg
10	PIL	VLOC Holdings	TORM A/S	Knutsen OAS Shipping	K-Line
11	HMM	China Ore Shipping	Bahri	Dorian LPG	Meiji Shipping
12	Maersk	Maran Dry Mngt	Thenamaris	KSS Line	Shpg Corp of India
13	COSCO Shipping Dev	CMES Shipping	Capital Ship Mgmt	BW LNG	SK Shipping
14	Shoei Kisen Kaisha	Shandong Shipping	Pantheon Tankers	Hyundai LNG Shipping	ADNOC L&S
15	Wan Hai Lines	Doun Kisen	Maran Tankers Mgmt	Bonny Gas Transport	Oceonix Services Ltd
16	-	Polaris Shipping	China VLCC	GasLog	Chartworld Shipping
17	-	Cardiff Marine	Minerva Marine	Celsius Tankers	Mitsui OSK Lines
18	-	Winning Intl	Dynacom Tankers Mgmt	Seapeak	Ray Car Carriers
19	-	Santoku Shipping	Sinokor Merchant	StealthGas	Cido Shipping
20	-	Evalend Shipping	Nat Iranian Tanker	Sinogas Maritime	Nissen Kaiun
21	-	-	-	TMS Cardiff Gas	-
22	-	-	-	Dynagas Ltd	-
23	-	-	-	Naftomar Shpg & Trdg	-
24	-	-	-	Maran Gas Maritime	-
25	-	-	-	Korea Line LNG	-

[Figure 1] Where South Korean Companies Rank in the Environmental Assessment

Compared with the global average, Korean shipping companies perform strongly in systematically disclosing their GHG reduction strategies. Notably, 6 out of 11 Korean companies have published a decarbonization roadmap—well above the disclosure levels of China (1 out of 12) and Japan (3 out of 8). Korean companies also surpass the global average in reporting their compliance with IMO regulations, including the Energy Efficiency Existing Ship Index (EEXI), which sets minimum efficiency standards for vessels built before January 1, 2023, and the Energy Efficiency Design Index (EEDI), which applies to newly constructed ships.

On the other hand, Korean companies scored below the global average in disclosing their investment activities and fleet transition status. All Korean firms trailed global competitors in reporting on fossil fuel use, plans to replace aging vessels, retrofit ships for dual-fuel capability, and transition to green fuels. For instance, Pan Ocean was the only Korean company to disclose the share of fossil-fuel-powered vessels and fossil fuel consumption relative to total energy use, while none reported the share of non-fossil fuel usage.

[Table 3] GHG Reduction Disclosure Performance: Korean Shipping Companies vs. Global Average

Disclosure Item	Korea Avg.	vs. Global Avg.
Decarbonization Roadmap	0.545	**+0.205**
Climate Scenario Analysis	0.273	**+0.043**
EEXI Compliance Status	0.455	**+0.155**
EEDI Disclosure Level	0.455	**+0.085**
Share and Operational Status of Fossil Fuel-Powered Vessels	0.091	**−0.279**
Aging Vessel Replacement Plans	0.091	**−0.229**
Dual-Fuel Retrofitting and Green Fuel Transition Plans	0.364	**−0.136**

3 Key Takeaways

Korean shipping companies perform above the global average in setting GHG reduction targets and disclosing compliance with IMO regulations but fall short in the overall completeness and transparency of their ESG practices.

- **Strengths**: Disclosure of emission reduction plans and IMO regulation compliance
- **Weaknesses**: Limited disclosure of green ship deployment, fleet transition plans, and fuel consumption

The limited disclosure of alternative-fuel vessel deployment—a critical mid- to long-term task for reducing carbon emissions—along with insufficient reporting on plans for aging vessel replacement, newbuilding deliveries, and fuel consumption raises concerns about the climate risk preparedness of Korean shipping companies.

There are two possible reasons why companies may not disclose their fleet replacement plans, each requiring a different response:

[1] Underdeveloped Investment Plans

If companies are unable to disclose investment plans for alternative fuel vessels because their plans lack sufficient detail for public reporting, they must step up and actively expand their investments. Otherwise, the emissions efficiency of Korean shipping companies that are currently above the global average will decline, increasing their exposure to IMO carbon emissions regulations.

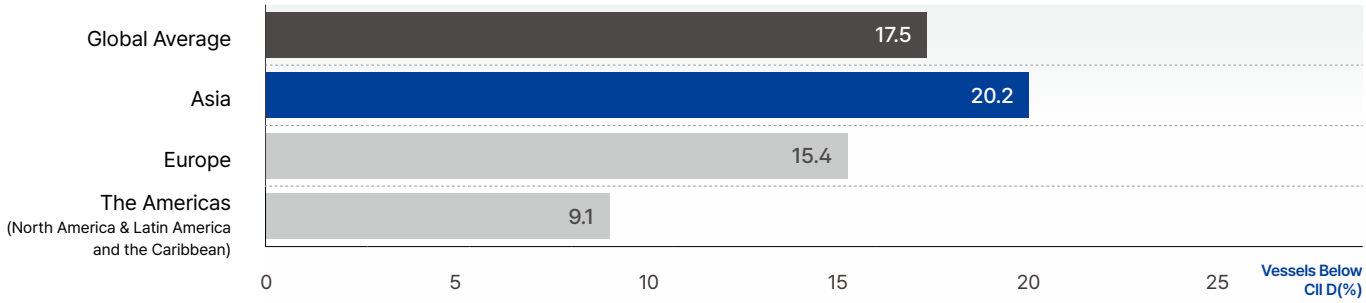
[2] Investment Under Way or Unwillingness to Disclose

If companies already have a vision for and in the process of investing in a fleet transition based on alternative fuel vessels, transparent disclosure is essential. Investment status should be reported to investors and stakeholders not through press releases but through verified sustainability reports validated by third-party sources. Such disclosure demonstrates preparedness for transition risks and helps mitigate external concerns.

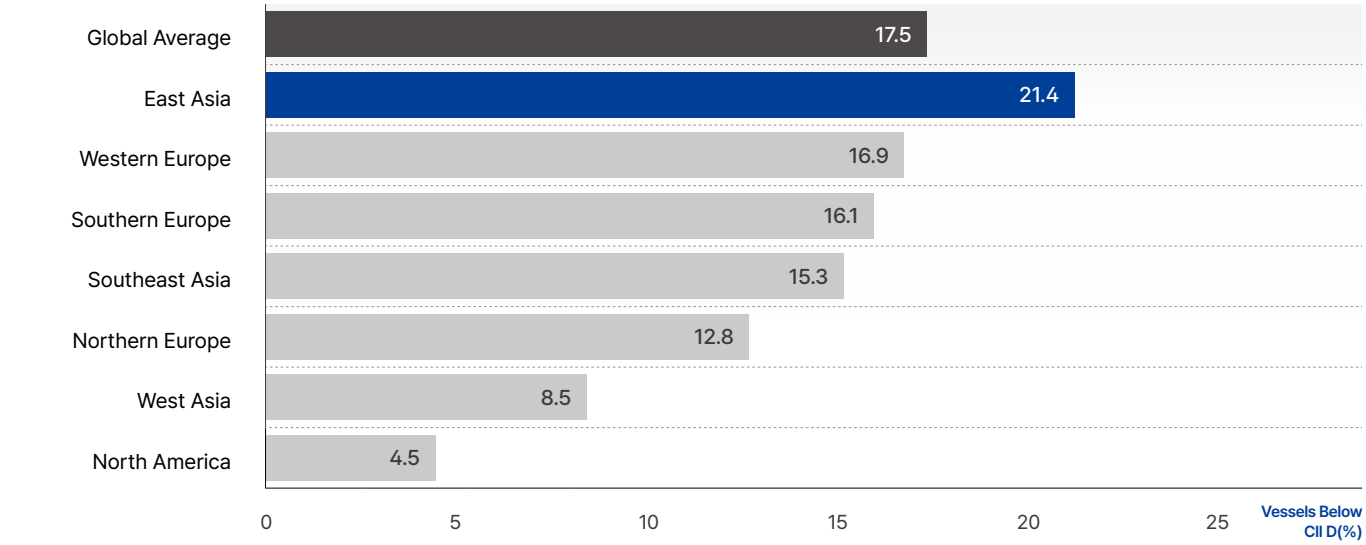
IV. CII Grades of Korean Shipping Companies

In the comparison across all vessel types, Korea ranked 9th out of 15 countries, which is above the East Asia average but in the mid- to lower tier globally.

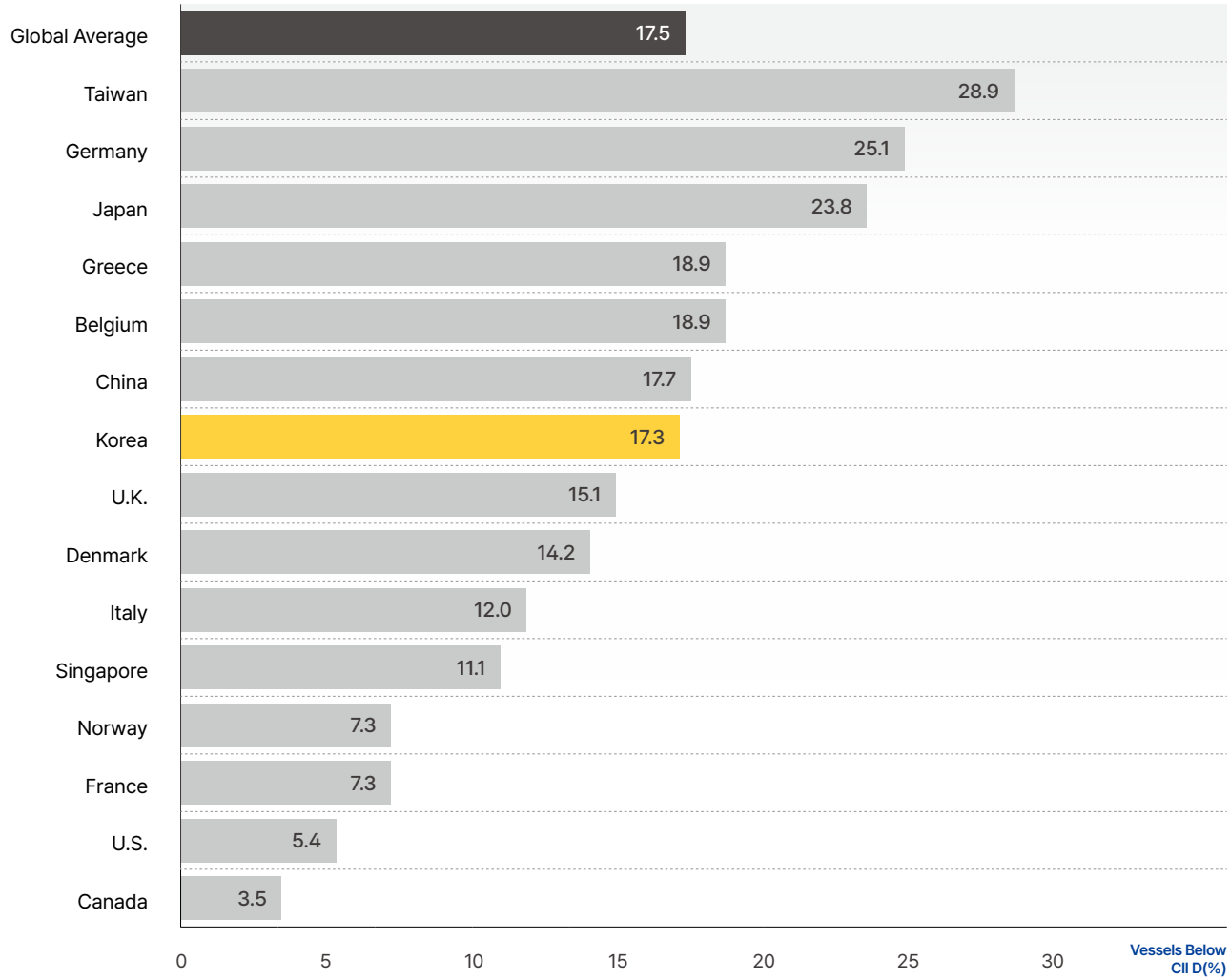
[Graph 1] Vessels Below CII D by Region – **Continent**



[Graph 2] Vessels Below CII D by Region – **Subregion**



[Graph 3] Vessels Below CII D by Region – **Country**



However, the overall ranking alone does not provide an accurate measure of the climate change response capabilities of Korean shipping companies, as vessel types differ in their engineering characteristics. For example, North American companies tend to record higher CII grades because their fleets include a relatively smaller share of bulk carriers—which fall short of IMO requiremets on GHG emissions efficiency—and a larger share of container ships and gas carriers, which are generally more efficient.

To address these limitations, the share of Grade D and E vessels was analyzed by vessel type and compared across national shipping companies. Categorizing performance by vessel type enables a more accurate assessment of the GHG management capabilities of Korean companies relative to global competitors and provides deeper insight into their strengths and weaknesses.

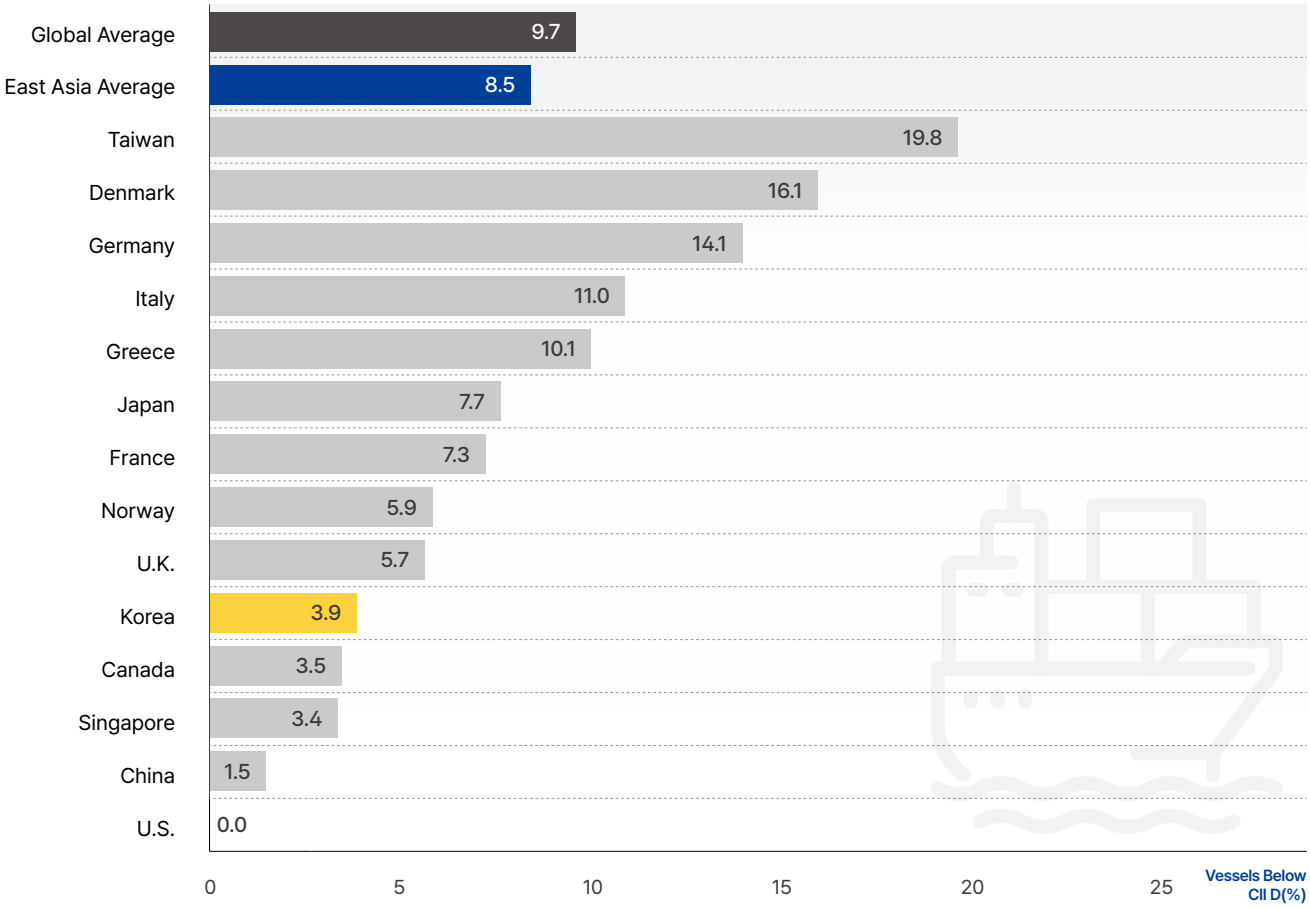
1 Container Ships

Container ships transport cargo in standard ISO containers and are primarily used for manufactured goods. Among all vessel types, container ships accounted for the largest number selected for analysis, and companies operating them are widely distributed across the globe.

The analysis indicates that container ships pose relatively smaller GHG regulatory risks as the share of vessels rated below CII Grade D is low across all nationalities. In fact, all 14 countries included in the study recorded a smaller proportion of container ships in Grades D and E compared with the average grade of their overall fleets.

Korean companies performed relatively well in regulatory risk management—ranking 5th out of 14 countries—with only 3.9% of their container ships rated Grade D or E. However, an examination of detailed CII grade data from 2023 to 2024 for two representative Korean shipping companies, HMM and Korea Marine Transport Co. (KMTC), shows a decline of more than 25%p in the share of Grade A vessels with a corresponding increase in Grades B and C. This drop is significant compared with the 10.58%p decline in Grade A shares recorded by other global container ship operators. While the two Korean firms currently face lower short-term CII risks, they will need systematic plans to improve energy efficiency in order to prevent further downgrades into Grade D over the medium term.

[Graph 4] Vessels Below CII D by Region (%), **Container Ships**



* Countries operating fewer than 10 vessels of this type were excluded from the analysis due to insufficient sample size.

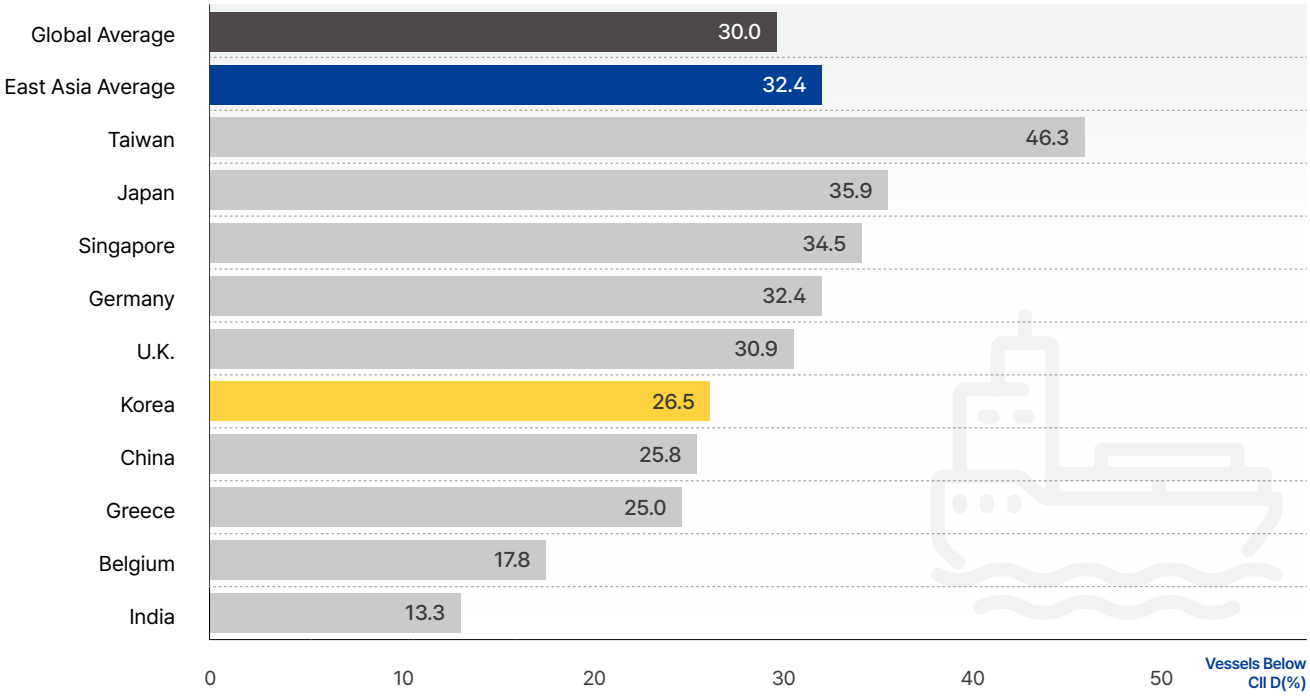
2 Bulk Carriers

Bulk carriers are vessels that transport unpackaged goods; in a narrower sense, they are ships that carry solid raw materials and other dry bulk cargo. This category excludes specialized vessels designed to carry finished products such as liquified cargo or automobiles. Bulk carriers represent the second-largest vessel group in this analysis, concentrated mainly in Asia and the Middle East, with comparatively fewer found in North America and Europe.

Bulk carriers face significant IMO regulatory pressure for a low-carbon transition with more than 25% of such vessels in most companies worldwide rated Grade D or E. The challenge is compounded by the fact that costs for fuel efficiency upgrades and green investments are often not reflected in freight rates since bulk carriers typically operate under long-term contracts with large cargo owners, leaving limited room for price negotiation. This dynamic undermines companies' climate response capabilities because it increases uncertainty over investment recovery.

Although Korea ranked 5th out of 10 countries in the analysis, proactive climate action is essential, as bulk carriers graded D or lower account for 26.5% of its total fleet. Pan Ocean, the largest bulk carrier operator in Korea, reduced its share of Grade E vessels by 1.72 percentage points between 2023 and 2024, yet its share of Grade D vessels rose by 18.23 percentage points. This increase is significant even compared with the 11.21 percentage-point rise recorded by global bulk carrier operators, underscoring the need for immediate action by Korean companies.

[Graph 5] Vessels Below CII D by Region (%), **Bulk Carriers**



* Countries operating fewer than 10 vessels of this type were excluded from the analysis due to insufficient sample size.

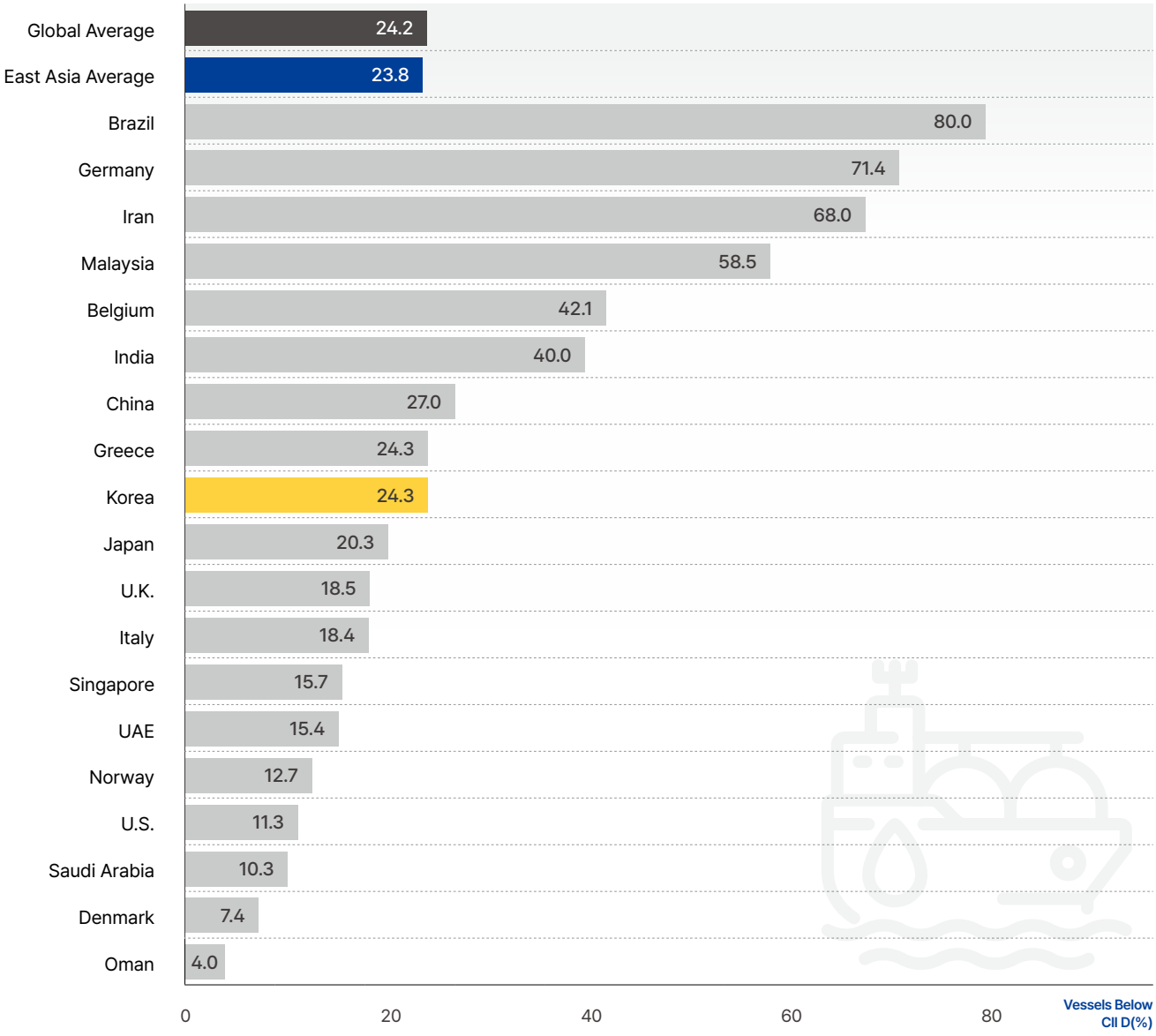
3 Tankers

Tankers, including oil tankers and chemical carriers, transport oil, liquid chemicals, and other liquified cargo. While the two types can be distinguished in a strict sense, they are treated as a single category in this report due to the limited sample size.

The share of tankers rated below Grade D was comparable to the average across all vessel types; however, country-level variation was significant, with European fleets showing substantial differences in grade distribution, unlike those of Korea, Japan, and China, where the patterns were relatively consistent.

Among tankers operated by Korean shipping companies, Grade E vessels account for 16.4% of the total fleet—twice the share of Grade D—highlighting below-average performance levels. Within this category, Cido Shipping operates 20 tankers, Sinokor Merchant 2, and SK Shipping 1, with most deployed for transporting crude oil and petroleum products to Korea. The means that roughly 16% of Korean tankers are directly exposed to climate-related regulatory risks, posing potential immediate impacts on their operations. Such vulnerabilities extend beyond individual companies, raising broader concerns for the sustainability of downstream industries reliant on imported oil.

[Graph 6] Vessels Below CII D by Region (%), **Tankers**



* Countries operating fewer than 10 vessels of this type were excluded from the analysis due to insufficient sample size.

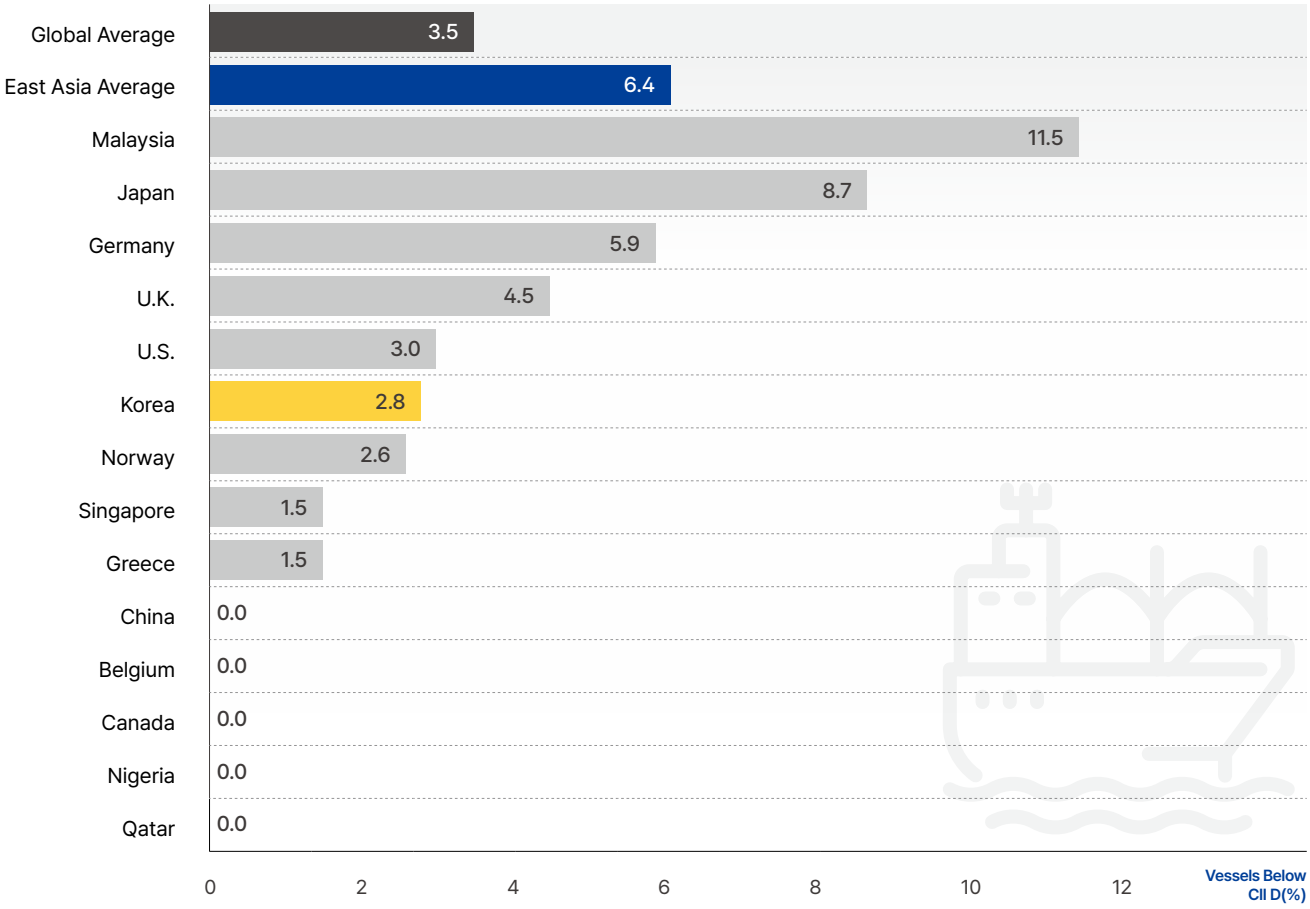
4 Gas Carriers

Gas carriers, including LPG and LNG carriers, are specialized vessels fitted with liquefiers and storage systems for the transport of gas cargo.

Analysis indicates that gas carriers face comparatively lower emissions regulation risks, being even less likely than container ships to receive a Grade D or E. A possible explanation is that the development and commercialization of natural gas-fueled engines, rather than mazut-powered ones, have been concentrated in gas carriers. Notably, Qatar and several countries had no any Grade D or E gas carriers, while Japan—the country with the largest share—recorded only 8.7% of such vessels in its fleet.

The share of Grade D gas carriers among Korean companies operating gas carriers, including KSS Line, Hyundai LNG Shipping, and Korea Line LNG, stands at 2.8%, positioning Korea in the mid- to lower tier compared with other countries operating large gas carrier fleets. Nevertheless, the CII grades of Korean fleets show clear signs of improvement: from 2023 to 2024, Hyundai LNG Shipping and KSS Line have reduced their shares of Grade D vessels by 20.9% and 5.0% respectively, while Korea Line LNG has lowered its share of Grade E vessels by 8.3%.

[Graph 7] Vessels Below CII D by Region (%), **Gas Carriers**



* Countries operating fewer than 10 vessels of this type were excluded from the analysis due to insufficient sample size.

5 Special/Other

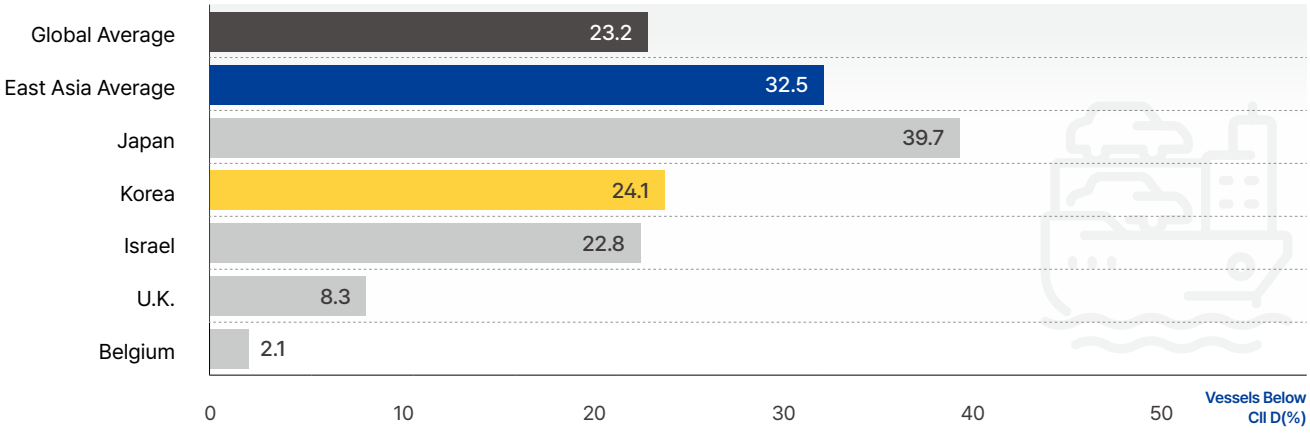
Car carriers differ from other cargo ships in that they are specialized for transporting vehicles such as passenger cars, trailers, and trains. Because this market requires both specialized vessels and secured demand sources, entry barriers remain high, resulting in a limited number of ships of this type and relatively few companies operating them.

Globally, the share of Grade D or E is relatively high for car carriers compared with other vessel types. However, cross-country variations are significant: in Japan, roughly 40% of car carriers are rated Grade D or E, whereas the proportion is much lower in the United Kingdom and Norway.

Hyundai Glovis, EUKOR Car Carriers, and Cido Shipping are Korea's major car carrier companies. The vessels operated by these firms and included in the analysis—all built before 2018—were found to be older than those of other global companies, of which only 23.2% of fleets were built prior to 2018. This is attributed to the reluctance of Korean companies to order new car carriers in the early 2020s, resulting in an overall aging fleet. However, in the post-COVID period, new orders and charter contracts have been increasing, particularly at HMM and Hyundai Glovis.

Therefore, although Korean car carrier companies currently face regulatory risks due to their large share of aging vessels, the introduction of more efficient new ships and chartered vessels is expected to accelerate the reduction of Grade D and E vessels in their fleets.

[Graph 8] Vessels Below CII D by Region (%), Car Carriers



* Countries operating fewer than 10 vessels of this type were excluded from the analysis due to insufficient sample size.

V. Comprehensive Analysis of Major Korean Shipping Companies

Among Korea's major shipping companies, the following firms hold strong positions in the global market for their representative vessel types: **HMM** in container ships, **Hyundai Glovis** in car carriers, and **Pan Ocean** in bulk carriers.

HMM ranks 9th among the world's top 15 container ship operators. Its disclosure of net zero strategies and goals through sustainability reports as well as its reporting of scope 3 emissions is noteworthy. However, its estimated 2024 CII rating distribution shows a sharp decline in Grade A vessels alongside a corresponding increase in Grade C vessels. In contrast to its commendable ESG disclosures, its fleet efficiency management appears to have deteriorated, underscoring the need for greater transparency on emissions reductions capabilities and fleet transition plans to prevent further declines in CII grades.

Hyundai Glovis discloses its net-zero strategies, goals, and implementation plans through sustainability reports and has also begun reporting its scope 3 emissions in 2024. Notably, the energy efficiency of its fleet has improved from 2023 to 2024, as reflected in CII analysis. However, its net-zero strategy remains narrowly focused on ordering LNG carriers, despite its commitment to achieve carbon neutrality by 2045, and no detailed roadmap has been identified for transitioning its fleet to alternative fuel-powered vessels.

Pan Ocean has been disclosing its GHG management system, climate response strategies, and related initiatives through sustainability reports. However, CII estimation analysis shows that more than one-fourth of its vessels are rated Grade D or below, while none are rated Grade A. This poses limitations in responding to the gradual tightening of IMO environmental regulations, including the phased strengthening of CII standards from 2026. Pan Ocean should expand the application of GHG reduction technologies across its existing fleet and disclose detailed execution plans and progress for regulatory risk management.

While major Korean shipping companies are performing relatively well in ESG disclosure, a significant difference persists between their fleet transition plans and their current fleet energy efficiency. Several firms beyond the three previously mentioned also lack adequate regulatory response capabilities. For example, Sinokor Merchant has not disclosed IMO regulation response strategies or green fleet transition plans, while its fleet efficiency has deteriorated, with the share of Grade D and E vessels increasing in 2024. Similarly, Cido Shipping provides virtually no ESG-related information, operates a large share of aging vessels, and has more than 30% of its fleet rated Grade D and E. The fleet energy efficiencies of such companies fall well below the industry average, leaving them highly exposed to risks such as operational restrictions under tightened IMO regulations. To address these vulnerabilities, companies should first establish a robust ESG management framework to secure external credibility and then disclose concrete plans for replacing aging vessels, transitioning to green ships, and managing GHG emissions.

VI. Conclusion: Challenges Facing Korean Shipping

Korea's Leading Shipping Companies: Environmental Scores

Ranking	Company	Environmental Score
1	Pan Ocean	68.40
2	HMM	65.53
3	KSS Line	54.13
4	Hyundai Glovis	53.62
5	H-Line Shipping	53.21
6	Hyundai LNG Shipping	46.50
7	SK Shipping	19.88
8	Korea Line LNG	18.01
9	Polaris Shipping co	16.04
10	Sinokor Merchant	13.77
11	Cido Shipping	8.51

The environmental scores of large Korean shipping companies included in the global 100 list were above the global average with—68.40 for Pan Ocean and 65.53 for HMM. However, their performance in fleet efficiency management remains weak, and among Korea's small- and medium-sized shipping companies, the necessary systems are largely lacking.

In recent years, Korean shipping companies have been relatively proactive in disclosing their company-wide plans to reduce carbon emissions as well as their progress in responding to IMO regulations. As of 2024, Korean companies have rated in the mid-tier among global 100 companies in terms of GHG emissions efficiency, representing a strong foothold in the global competition in the short term. This indicates the willingness of Korean companies to respond to climate change by building systems and disclosing relevant information.

However, this alone is not sufficient for Korea to grow into a green shipping powerhouse. Korean shipping companies still lack concrete plans and investment disclosures related to transitioning their carbon emissions structure, including the introduction of alternative fuel-powered vessels, the replacement of aging ships, and newbuilding delivery schedules—all essential for achieving carbon neutrality in the mid- to long-term. In particular, the absence of transparency in the fuel mix makes it difficult to assess their current status. Moreover, as many bulk carrier and tanker operators are assumed to have been added to the scope of regulation, companies must invest in enhancing fleet efficiency to ensure sustainable operations.

The following section sets out recommendations for shipping companies and governments, respectively:

Recommendations for Shipping Companies

Improve transparency in environmental disclosures

- Disclose decarbonization roadmaps, fuel usage, and other key metrics on a regular basis to enhance international credibility.

Accelerate investments in green ship transition

- Develop detailed execution roadmaps and investment plans to replace aging vessels and transition to green fuels.

Develop vessel-type-specific strategies

- Take proactive measures to enhance the efficiency of vulnerable vessel types, including bulk carriers and tankers.

Recommendations for the Korean Government

Provide government support for companies transitioning to green fuels

- Develop a tiered green fuel subsidy framework to accelerate compliance with international standards by Korean companies.
- Introduce green vessel funds and other institutional frameworks that attract private finance to support companies' investment in their green transition.

To summarize, Korean shipping companies currently face two major challenges: transparency and investment. Firms that have yet to invest in the green transition must scale up their commitments, while those that already have should disclose their progress with greater transparency. Although an IMO-level carbon levy will not take effect now, the 2050 net-zero target remains unchanged, and regional regulations equivalent to the mid-term measures, such as the EU Emissions Trading System (ETS) and FuelEU Maritime, are already being phased in. This makes the present a decisive window in which Korean companies must get ahead of the curve.

Relying on the delay to slow-walk action will ultimately raise transition costs and market-access risks, weakening global competitiveness. While sticking with fossil fuels may look cheaper in the very short term, accumulating carbon charges and rising procurement and operating costs during any transition lag argue for meeting initial targets early and then tightening progressively[5]. This approach spreads upfront burdens, improves predictability over total expenditures, and enhances transition stability.

To avoid falling behind in the new paradigm, substantive transition investment—backed by enabling policy support—is essential. Priorities at this stage are to set out a clear financing plan for the transition and to close the gap between disclosures and real-world performance. In parallel, shipping companies should prepare proactively for short-term measures such as CII by combining energy-efficiency retrofits, voyage and route optimization, and fuel transition into an executable roadmap with regular performance reporting. How effectively this one-year grace period is used will directly shape the future competitiveness of Korea's shipping industry.

5 SFOC. IMO net-zero framework: Fuel cost and carbon price impacts(2025).

VII. Appendix

Top 100 Global Shipping Companies: Comprehensive Environmental Scores

South Korean Companies

No.	1 Container Ships	2 Bulk Carriers	3 Tankers	4 Gas Carriers	5 Special/Other
1	Danaos Corp	Bocimar NV	Frontline	MISC	SFL Corporation
2	Evergreen Marine	Golden Ocean Group	Euronav	Exmar LPG BVBA	NYK Line
3	Hapag-Lloyd	Wisdom Marine Group	DHT Management	Capital Clean ECC	Navios MLP
4	Seaspan Corporation	Berge Bulk	AET Tankers	BW LPG	Schulte Group
5	CMA CGM	Star Bulk Carriers	Asyad Shipping	Solvang ASA	Petrobras
6	OOCL	Pan Ocean	COSCO Shpg Energy	CoolCo	Hyundai Glovis
7	MSC	COSCO Shipping Bulk	Intl Seaways	Navigator Gas	Wallenius Wilhelmsen
8	PIL	H-Line Shipping	Tsakos Energy Nav	Nakilat	K-Line
9	HMM	Oldendorff Carriers	Scorpio Tankers	Petredec	Eastern Pacific Shpg
10	Costamare Shipping	VLOC Holdings	TORM A/S	Knutsen OAS Shipping	Zodiac Maritime
11	COSCO Shipping Lines	China Ore Shipping	Bahri	Dorian LPG	Shpg Corp of India
12	Maersk	Maran Dry Mngt	Thenamaris	BW LNG	Meiji Shipping
13	COSCO Shipping Dev	CMES Shipping	Capital Ship Mgmt	KSS Line	ADNOC L&S
14	Shoei Kisen Kaisha	Shandong Shipping	Pantheon Tankers	Hyundai LNG Shipping	SK Shipping
15	Wan Hai Lines	Doun Kisen	Maran Tankers Mgmt	GasLog	Mitsui OSK Lines
16	-	Polaris Shipping	China VLCC	Bonny Gas Transport	Oceonix Services Ltd
17	-	Cardiff Marine	Minerva Marine	Celsius Tankers	Chartworld Shipping
18	-	Winning Intl	Dynacom Tankers Mgmt	Seapeak	Ray Car Carriers
19	-	Santoku Shipping	Sinokor Merchant	StealthGas	Cido Shipping
20	-	Evalend Shipping	Nat Iranian Tanker	Korea Line LNG	Nissen Kaiun
21	-	-	-	TMS Cardiff Gas	-
22	-	-	-	Dynagas Ltd	-
23	-	-	-	Sinogas Maritime	-
24	-	-	-	Naftomar Shpg & Trdg	-
25	-	-	-	Maran Gas Maritime	-

Detailed Description of Environmental Evaluation Metrics

Environmental Issue 1 Disclosure of GHG Emissions

- **Disclosure of Scope 3 Emissions**
  Calculate and disclose supply chain-wide carbon emissions for cargo owners and related industries as essential data for ESG risk management.
- **Disclosure of Detailed Air Pollutant Emissions**
  Disclose detailed data on substances that directly impact the climate and atmosphere—such as NOx, Sox, CH_4, N_2O—to provide the foundational information needed for evaluating regulatory risk management.
- **Disclosure of GHG Intensity**
  Identify operational carbon efficiency and emission intensity levels to set emission reduction targets and evaluate management performance.
- **Disclosure of Separate Ship-Level Emissions**
  Baseline data to support the development of tailored reduction strategies reflecting the fuel efficiency and carbon emission characteristics of each vessel type.

Environmental Issue 2 Disclosure of GHG Emissions Reduction Strategies

- **Disclosure of Fleet Transition Plans**
  Retrofit aging vessels for dual-fuel or green-fuel operation to maximize emission reductions.
- **Disclosure of Emissions Management of Newly Built Vessels:**
  Build low-carbon vessels starting from the design phase to secure long-term competitiveness.
- **Disclosure of Climate Change Response Scenarios**
  Formulate scenario-based strategies to build an organization-wide climate response framework.
- **Disclosure of Decarbonization Roadmaps**
  Develop clear annual reduction targets and implementation plans to build trust with stakeholders.
- **Participation in Environmental Initiatives**
  Engage in SBTi, Clean Cargo Working Group (CCWG), Getting to Zero Coalition, and other global initiatives to ensure alignment with international frameworks.
- **Disclosure of Green Bond Issuance**
  Obtain financing for green projects to support financial sustainability.

- **Disclosure of Operational Optimization Frameworks**
  Reduction in fuel consumption and carbon emissions.
- **Disclosure of Investments in Carbon Capture Technologies**
  Secure technologies for future regulatory compliance
- **Disclosure of Participation in the Environmental Ship Index (ESI)**
  Share quantitative data on reduction efforts with global stakeholders, including ports, cargo owners, and financial institutions.

Environmental Issue 3 Disclosure of CII Grades

- **Disclosure of CII Grades**
  Ensure IMO compliance transparency and provide supporting data to cargo owners, investors, and other stakeholders.

Environmental Issue 4 Improvement of CII Grades

- **CII Grade D Vessel Share and Trend**
  If a vessel receives a Grade D rating three years in a row, its operation may be suspended unless an improvement plan is submitted and approved.
- **CII Grade E Vessel Share and Trend**
  Any vessel rated Grade E even once must are required to obtain approval for an improvement plan, and failure to do so may result in suspension of operations or difficulties securing contracts with cargo owners and charterers.

Environmental Issue 5 Disclosure of Energy Efficiency Index (EEI)

- **Disclosure of EEXI (Energy Efficiency Existing Ship Index)**
  Disclose the energy efficiency index for existing vessels.
- **Disclosure of EEDI (Energy Efficiency Design Index)**
  Disclose the energy efficiency design index for new vessels.

Environmental Issue 6 Disclosure of Fleet Share and Operational Status (Fossil vs. Non-Fossil Fuels)

- **Fleet Share and Operational Status (Fossil vs. Non-Fossil Fuels)**
  Data offering an intuitive view of fuel transition status.

Environmental Issue 7 Disclosure Aging Vessel Share and Emissions Data

- **Disclosure of Aging Vessel Replacement Plans**
  Evaluate carbon emission reductions and operational stability.
- **Disclosure of Aging Vessel Disposal and Recycling Plans**
  Minimize the environmental impact of vessel disposal and assess the level circular resource management.

Environmental Issue 8 Disclosure of Plans to Improve Environmental Performance at Port

- **Disclosure of Pollutant Emissions Management System**
  Check whether vessels at berth are equipped with emission-reduction systems, such as scrubbers, low-sulfer fuel, and power-saving equipment.
- **Installation of AMP/OPS**
  Assess whether vessels have alternative maritime power or onshore power supply to assess associated reductions in engine running time and air pollutant emissions.

Environmental Issue 9 Disclosure of Pollutant Emissions Management Data

- **Disclosure of Air Pollutant Emissions Management Data**
  Installation and operation of scrubbers, low-sulfer fuel, and Exhaust Gas Recirculation (EGR)
- **Management of Water Resources**
  Check ballast water treatment system installation and Ballast Water Management Convention (BWMD) compliance.
- **Management of Hazardous Substances**
  Implementation and operational status of hazardous substance safety management process.
- **Management of Waste and Wastewater**
  Management system for processing and recording the disposal of waste and wastewater.

Environmental Issue 10 Biodiversity

- **Disclosure of Biodiversity Policies**
  Company-wide policies on the conservation of marine ecosystems.
- **Programs and Initiatives for Biodiversity**
  Biodiversity conservation activities, such as protecting coral reefs and preventing invasive species.

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