

BIPC 2025

Sept. 23rd

Green Shipping Corridor Challenges and Policy Tasks from Korea

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1. Global Green Shipping Corridors Trends

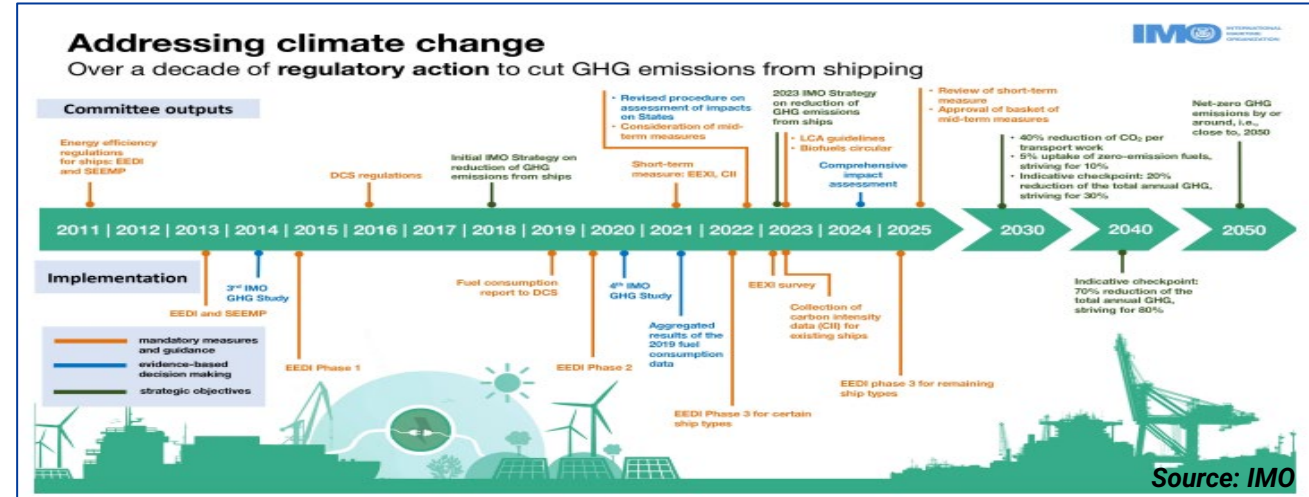
➤ Problem Recognition

- Global shipping GHG emissions have surged 20% over the past decade

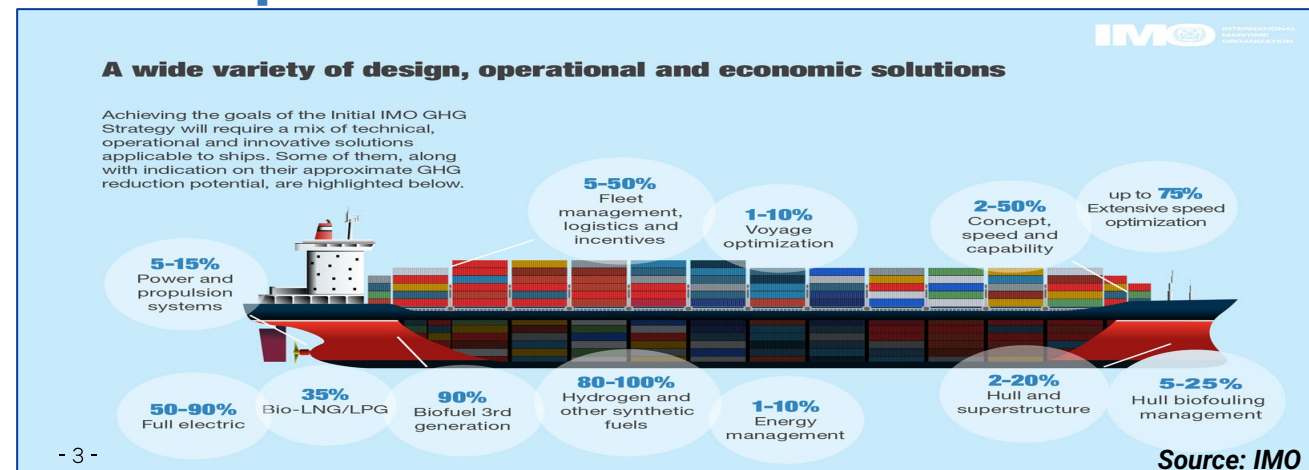
➤ Regulatory Response

- IMO has implemented phased regulations since 2011, setting a net-zero emissions target by 2050

What is the 2023 IMO Strategy on Reduction of GHG Emissions from Ships?



What ships must do?



1. Global Green Shipping Corridors Trends

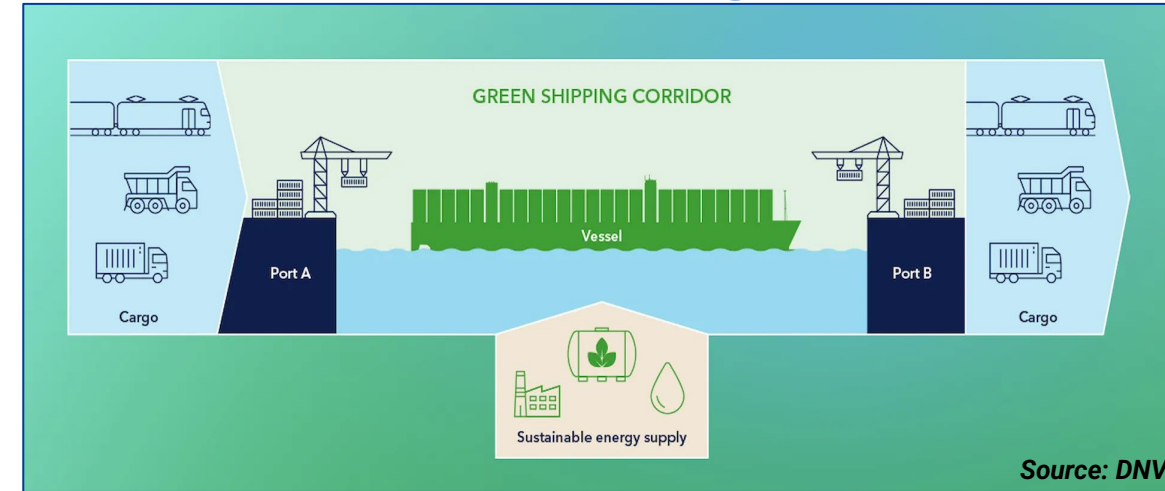
➤ Solution

- Green shipping corridors combining low-carbon fuel usage and port infrastructure development

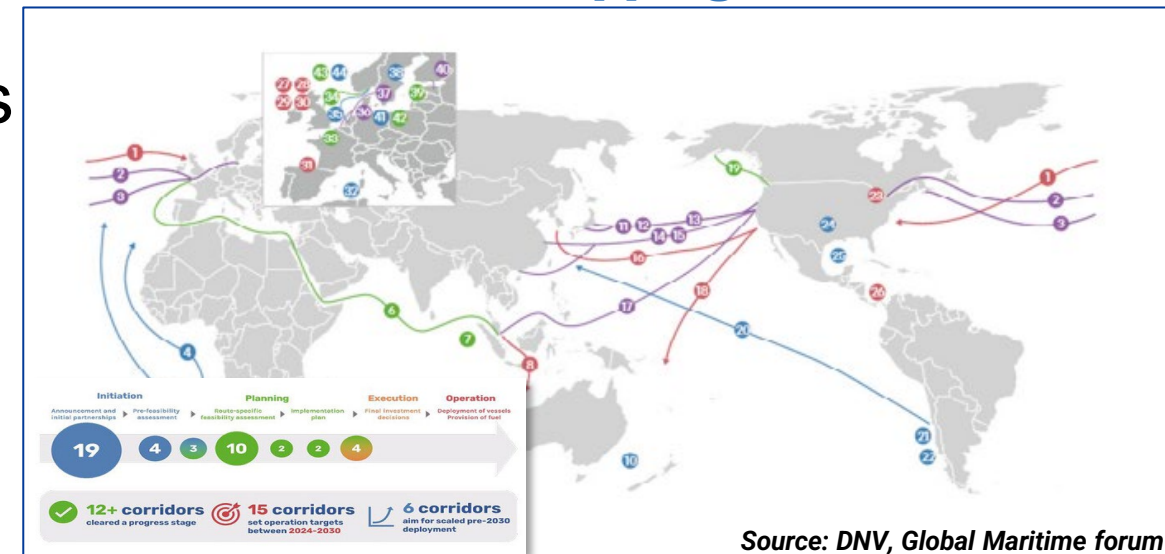
➤ Current Situation

- Intensifying competition among nations to achieve carbon neutrality and secure dominance in the energy industry (22 projects in '22 → 57 projects in '24)

What is the Green shipping corridor?



Worldwide Green Shipping Corridor Status



2. Green Shipping Corridors Implementation Status in Korea

➤ Korea-US

- 2027 commercial launch planned for Busan/Ulsan-Seattle/Tacoma methanol routes

➤ Korea-Australia

- Feb'25 MOU signed, pre-feasibility study underway with 2029 target for hydrogen-based operations





➤ Korea-Singapore

- MOU expected late 2025 for Busan/Ulsan-Singapore route with potential Rotterdam extension

➤ Korea-Denmark

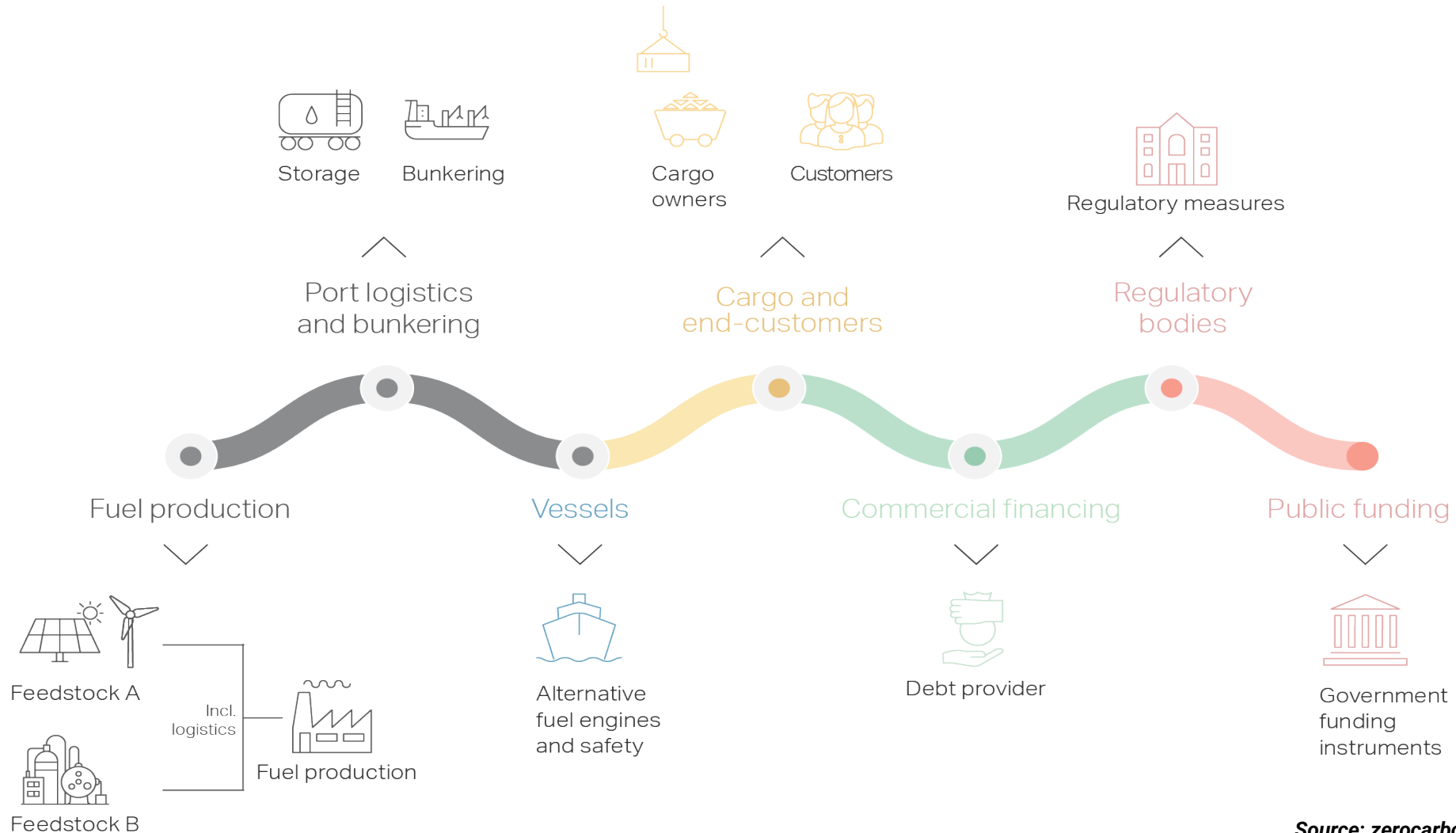
- Technology cooperation focus rather than direct shipping route



Country	Status	Timeline	Key Focus
	Feasibility studies	2027 launch	Methanol fuel, transpacific corridor
	Pre-feasibility study	2029 operations	Hydrogen/ammonia, MOU signed Feb 2025
	MOU preparation	Late 2025 MOU	Port network, potential Rotterdam link
	Technology partnership	Ongoing	Knowledge sharing, no direct route

3. Policy Tasks for Supporting Green Shipping Corridors of Korea

Green shipping corridor projects involve collaboration across the entire value chain.



3. Policy Tasks for Supporting Green Shipping Corridors of Korea

➤ Why Collaboration is Critical ?

- Complex ecosystem requiring synchronized investment
- No single actor can achieve commercial scale alone
- Shared risk reduction accelerates development

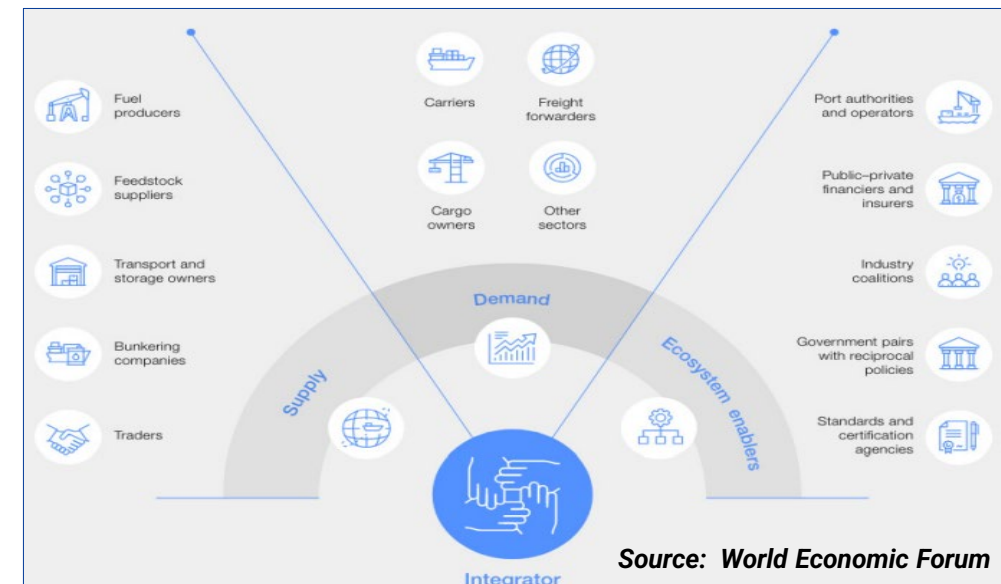
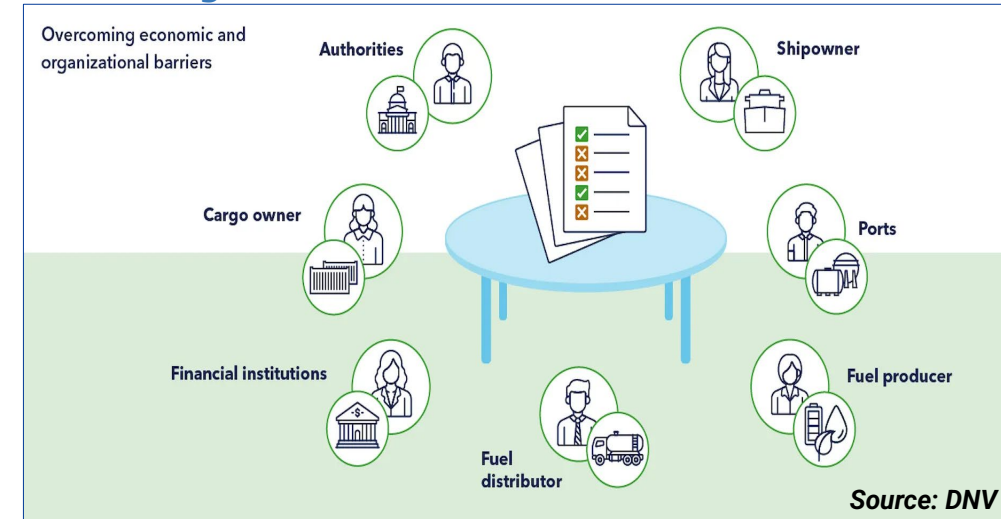
➤ Key Stakeholder Roles

- Supply: Fuel producers, bunkering companies, infrastructure providers
- Demand: Shipowners, cargo owners, freight forwarders
- Enablers: Ports, financiers, governments

➤ Critical Issues

- Cost gap between green and conventional fuels
- Chicken-and-egg problem: fuel supply ↔ vessel demand
- Regulatory inconsistencies across jurisdictions
- Massive infrastructure investment with uncertain ROI
- Technology maturity varies by fuel type

Key Stakeholders & Roles



3. Policy Tasks for Supporting Green Shipping Corridors of Korea

Analysis Focus



Comprehensive feasibility study targeting key stakeholders in Green Shipping Corridors

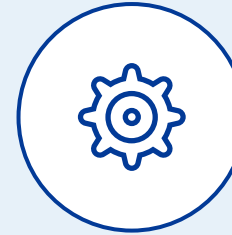
Analysis Target



Domestic and international experts from 5 key sectors in Green Shipping Corridors

Maritime/shipbuilding/eco-friendly fuel/port authorities/other sectors

Analysis Method



Qualitative Research Method

Complex stakeholder analysis through response pattern and priority weighting systematic approach

Expected Outcomes



Comprehensive analysis of complex requirements for Green Shipping Corridor development through current status and future challenges

3. Policy Tasks for Supporting Green Shipping Corridors of Korea

Key Issues by Stakeholder



Fuel

Key Issues

- **High production costs** and economic viability of clean fuels
- **Lack of legal framework**
- Need for integrated approach(policy-shipbuilding-infrastructure)



Port

- Eco-friendly **fuel supply shortage** issues
- **Technology gap in existing facilities**
- Eco-friendly vessel **bunkering infrastructure shortage**
- Alternative fuel bunkering operations hindering port competitiveness

3. Policy Tasks for Supporting Green Shipping Corridors of Korea

Key Issues by Stakeholder



Shipping

Key Issues

- **Alternative fuel adoption high cost burden**
- **additional cost and maintenance burden**
- Short-term profit focus structural reform obstacles
- Ammonia DF (Dual Fuel) engine development and commercialization delays
- Eco-friendly vessel operations



Ship-building

- **Production capacity shortage due to actual shipbuilding order backlog**
- **Green shipbuilding technological gap with existing vessels**
- Eco-friendly fuel supply difficulties
- Global regulations(carbon, IMO, etc.)

3. Policy Tasks for Supporting Green Shipping Corridors of Korea

Issue 01

Economic feasibility challenges

- **High Cost Structure**
 - High production costs of eco-friendly fuels
 - Massive investment costs required for initial infrastructure construction
 - Rising operational costs
- **Inadequate Compensation System**
 - Absence of additional cost compensation methods due to eco-friendly conversion
 - Insufficient participation incentives for private companies
 - Inability to achieve mass production/supply due to undeveloped markets

Issue 02

Infrastructure Construction Limitations

- **Supply Chain Development Issues**
 - Physical distance between production sites-supply sites-refueling sites
 - Absence of stable fuel supply chain
 - Inadequate technical support infrastructure

Issue 03

Institutional/Policy Fragmentation

- **Legal Framework Gaps**
 - Absence of legal basis for eco-friendly vessel/fuel regulations
 - Unestablished regulatory system with binding force
 - Compatibility issues with international standards/regulations
- **Policy Coordination Necessity**
 - Misalignment between government policy objectives and field commercialization timing
 - Fragmentation of sector-specific plans

3. Policy Tasks for Supporting Green Shipping Corridors of Korea

Short-term

Goal

“Establish the foundation and initial collaboration framework for the development of green shipping corridors.”

Implementa-tion Measures

Identify Stakeholders and Form a Collaborative Body

"Resolve conflicts of interest among stakeholders."

- Establish and operate a "Green Shipping Corridor Steering Committee."
- Promote understanding and networking through regular workshops and seminars.

- Government ministries (Ministry of Oceans and Fisheries, Ministry of Trade, Industry, and Energy, Ministry of Environment).
- Port authorities.
- Shipping companies, fuel suppliers, shipbuilders, financial institutions.
- Academia and research institutions.

Develop Legal and Institutional Frameworks

"Address conflicts with existing regulations and resistance to new regulations"

- Conduct preparatory work for amending domestic laws
 - * Review and amend relevant laws, including the Shipping Act, Port Act, and Ship Safety Act.
- Pursue harmonization with IMO regulations.
- Utilize regulatory sandbox systems.
- Strengthen stakeholder feedback mechanisms(e.g., public hearings, opinion collection).
- Introduce incentive systems for regulatory compliance.

- Government ministries (Ministry of Oceans and Fisheries, Ministry of Environment, Ministry of Government Legislation).
- National Assembly Standing Committees.
- Legal experts, decision-makers in shipping companies.
- Representatives from international organizations (e.g., IMO).

Launch Pilot Projects

"Address high initial costs and technical uncertainties."

- Establish proactive government support policies to facilitate the transition.
 - * Provide subsidies and low-interest loans to address financial challenges.
- Support the development of core technologies through government-led R&D initiatives.
- Adopt a phased approach:
 - * Retrofitting ships → Introducing small-scale eco-friendly ships → Expanding alternative fuel usage.
- Develop a structured system for sharing outcomes and lessons learned.
 - * Publish regular reports and host result-sharing seminars to disseminate findings.

- Government ministries (Ministry of Oceans and Fisheries, Ministry of Trade, Industry, and Energy).
- Port authorities.
- Shipping companies, fuel suppliers, shipbuilders, financial institutions.
- Academia and research institutions.

Partici-pants

3. Policy Tasks for Supporting Green Shipping Corridors of Korea

Mid-term

Goal

“Expand infrastructure and accelerate technological development based on foundations established in the short term.”

Implementation Measures

Participants

Eco-Friendly Ships and Port Infrastructure Expansion

“Attract large-scale investments and integrate new infrastructure with existing facilities.”

- Utilize public-private partnership (PPP) models.
- Establish and implement phased infrastructure development plans. * Focus on building eco-friendly infrastructure at major trade ports, then expand to smaller ports.
- Support eco-friendly retrofitting of existing infrastructure. * Determine the optimal retrofitting timeline based on the lifecycle and economic feasibility of existing infrastructure.

- Government ministries (Ministry of Oceans and Fisheries).
- Port authorities.
- Shipping companies, terminal operators, and private investors.

Establish Alternative Fuel Supply Chains

“Stabilize fuel supply systems.”

- Stabilize fuel supply systems through government-facilitated long-term contracts. Develop a fuel diversification strategy.
- Establish an emergency fuel supply system at the government level.

- Government ministries (Ministry of Trade, Industry and Energy, Ministry of Oceans and Fisheries).
- Energy-related corporations and public institutions, port authorities.
- Fuel suppliers and shipping companies.

Promote Technology Development and Commercialization

“Prevent delays in technology development and commercialization, and provide cost support.”

- Strengthen the industry-academia-research collaboration system. * Develop technologies by dividing roles based on each stakeholder's strengths.
- Allocate government budgets to core technology fields and provide platforms for collaboration.
- Develop and periodically update a technology roadmap.
- Accelerate commercialization through the expansion of pilot projects.

- Government ministries (Ministry of Science and ICT, Ministry of Trade, Industry and Energy, Ministry of Oceans and Fisheries).
- Technical standardization bodies (e.g., KR).
- Universities and research institutions.
- Shipyards, shipping companies, and equipment manufacturers.

Enhance Financial Support Systems

“Mitigate financial risks for participants.”

- Promote and activate the issuance of 'green bonds,' led by government and public institutions.
- Establish clear criteria and certification systems for green bonds to gain investor trust.
- Expand government guarantee systems. * Develop technologies through role-sharing based on the strengths of each stakeholder.
- Strengthen guarantee support for early-stage innovation projects and SME-led initiatives.
- Introduce ESG investment-linked incentive programs.

- Government ministries (Ministry of Economy and Finance, Ministry of Oceans and Fisheries).
- Financial institutions.
- Shipping companies.
- ESG rating agencies.

3. Policy Tasks for Supporting Green Shipping Corridors of Korea

Long-term

Goal

“Complete implementation and global expansion of green shipping corridors.”

Implementa-tion Measures

Partici-pants

Greening the Entire Shipping Network

"Achieve international consensus and establish multilateral cooperation frameworks."

- Develop global standards centered around the International Maritime Organization (IMO).
- Establish and operate multilateral cooperation systems for effective implementation (by region, corridor, etc.).
- Develop support programs for developing countries.

- International Maritime Organization (IMO).
- National governments (Ministry of Oceans and Fisheries, Ministry of Foreign Affairs, etc.).
- International shipping associations.
- Global shipping companies.
- Environmental international organizations.

Building a Carbon-Neutral Shipping Ecosystem

"Achieve carbon neutrality across the entire value chain."

- Introduce and build infrastructure for carbon capture and storage (CCS) technology.
- Expand the application of circular economy models.
- Establish a full-cycle carbon emissions monitoring system. * construction → operation → maintenance → scrapping

- Government ministries (Ministry of Environment, Ministry of Trade, Industry and Energy, Ministry of Oceans and Fisheries).
- Shipping companies.
- Shipyards.
- Energy companies.
- Research institutions (environment, technology, policy, etc.).
- International certification bodies.

Creating New Business Models and Services

"Prevent disruptions caused by changes to existing industry structures."

- Develop policies to support industrial transformation. *Provide technical support, workforce retraining, and financial assistance.
- Foster startups and build an innovation ecosystem.
- Operate retraining and workforce redeployment programs.

- Government ministries (Ministry of SMEs and Startups, Ministry of Oceans and Fisheries).
- Shipping companies/startups.
- Universities and research institutions.
- Innovation centers and accelerators.

Preserving a Sustainable Marine Ecosystem

"Balance economic benefits with environmental protection."

- Enhance marine ecosystem monitoring systems.
- Strengthen environmental impact assessment standards and conduct regular reviews.
- Promote marine ecosystem restoration projects.

- Government ministries (Ministry of Environment, Ministry of Oceans and Fisheries).
- Research institutions.
- Environmental NGOs.
- Shipping companies.
- International organizations.

Securing Global Leadership and Knowledge Sharing

"Lead the global industry."

- Institutionalize regular international conferences and forums. * Establish a global knowledge-sharing platform to exchange the latest technologies and policy trends. Operate global talent exchange programs.
- Build and manage an open innovation platform.

- Government ministries (Ministry of Foreign Affairs, Ministry of Oceans and Fisheries).
- International maritime organizations.
- Universities and research institutions.
- Global shipping companies.
- International shipping and port-related associations.



Thank you

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