Regional Cooperation Mechanism on Low Carbon Transport: Creation of Green Transport Corridors in Asia and the Pacific
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Decarbonization and net zero in the maritime transport sector, focusing on Green Shipping Corridor(GSC)

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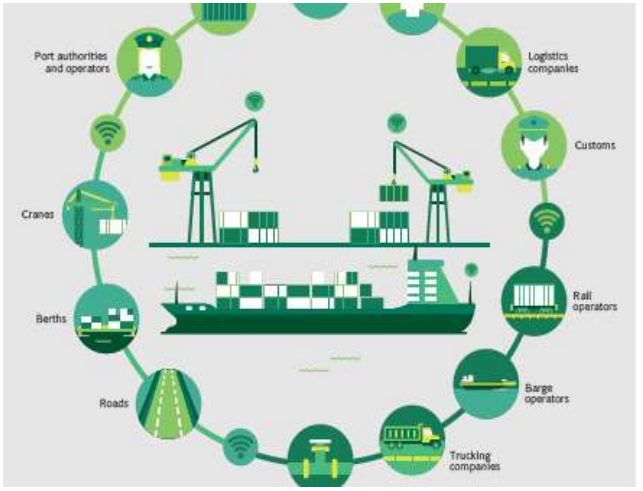



Brief overview of the decarbonization

- Global carbon emissions from international shipping sector: 2.89% of global GHG emissions (by the Fourth IMO GHG Study 2020

- **Trends in Carbon Emissions**

➢ Increasing Emissions
➢ Regulatory Pressures
➢ Shift Toward Alternative Fuels
➢ Technological Innovation

- **Concept of Decarbonization:** the process of reducing and ultimately eliminating carbon emissions associated with maritime transport. This can be achieved through;

➢ Adopting Cleaner Fuels
➢ Enhancing Energy Efficiency
➢ Implementing Carbon Capture Technologies
➢ Operational Measures

- IMO, EU, ASEAN, as well as numerous organizations, associations, and private companies are carrying out various initiatives**.**

IMO Green House Gas Strategy

2023 GHG Strategy (Jul 2023)

- **GHG Emission :** Reach Net-Zero GHG emission **by or around, i.e., close to, 2050**
- **Indicative Check points :** at least 20%(striving for 30%) by 2030
  at least 70%(striving for 80%) by 2040
- ***Uptake zero or near zero technologies :*** at least 5% striving for 10% of the energy used by 2030

Short-term measure

- **EEDI (Energy Efficiency Design Index)** : For New ships
- **EEXI (existing ships)** : For Existing ships
- **CII (Carbon Intensity Indicator)** : For Operating ships

Basket of candidate Mid-term measure

- **Technical element**: Goal-based marine Fuel Standard
- **Economic element**: On the basis of a maritime GHG emissions pricing mechanism(Levy, Feebate...etc.)
- **Technical Cooperation for Developing Countries**: Addressing supporting measures through comprehensive impact assessment

Green Shipping Corridor (GSC)

- **Green Shipping Corridor(definition)**: Initiative aimed at promoting decarbonization in the maritime industry through the establishment of designated routes where sustainable practices and technologies can be developed and tested

- **Concept of the Green Shipping Corridor:** Specific maritime routes that prioritize and facilitate the use of low-carbon emissions technologies and fuels. These corridors are intended to:

➢ **Reduce Emissions**: Focus on minimizing greenhouse gas emissions from ships operating within these designated routes.

➢ **Promote Sustainable Technologies**: Serve as testing grounds for innovative solutions, such as alternative fuels (e.g., hydrogen, ammonia) and energy-efficient vessels.

➢ **Encourage Collaboration**: Foster partnerships between governments, shipping lines, port authorities, and other stakeholders to share knowledge and resources for decarbonization efforts.

- GHG aligns with international commitments to reduce greenhouse gases and aims to explore and implement global advocacy and various initiatives for sustainability
- Resolution adopted by the Economic and Social Commission for Asia and the Pacific (ESCAP)

- Regional cooperation to accelerate climate action on oceans in Asia and the Pacific for sustainable development. (E/ESCAP/RES/79/2)

Updated GSC at COP26 since Nov in 2021

- The UN describes the **Conference of the Parties** (**COP**) as "the supreme decision-making body" of the United Nations Framework Convention on Climate Change (**UNFCCC**).
  - **COP26 ~ COP 28 (2021-2023)**:
    - ✓ **Green shipping corridors (GSC)** by the **Clydebank Declaration** at COP 26 in 2021.
    - ✓ First movers in Asia and the Pacific
      - Out of the 24 signatories, **Singapore** and **Japan** in Asia **and Fiji, The Marshall Islands, & Palau in the Pacific** have signed the Declaration.
    - ✓ **Green Shipping Challenge** initiated by US-Norway at COP27.
    - ✓ **New Green Shipping Challenge** Announcements made by US-UK at COP28
    - ✓ **Pacific Blue Shipping Partnership (PBSP) at COP 28 in Nov. 2023:**.
      - Seven (7) Pacific Islands joined.
      - Fiji, Kiribati, Republic of the Marshall Islands, Solomon Islands, Kingdom of Tonga, Tuvalu and Vanuatu.
  - **Upcoming COP29 in 2024 and COP30 in 2025**
    - ✓ COP29 in Baku, Azerbaijan, 11 to 22 Nov. 2024
      - **Transport at the nexus:** Reflecting on COP28 and looking ahead to COP29
      - **GSC of multimodal transportation**
    - ✓ COP30 in Belém Brazil in 2025

Good Practices for Implementing Green Shipping Corridors

Adoption of Alternative Fuels: ✓ **Dual-Fuel.** ✓ **Investment in Infrastructure**	**Collaboration Among Stakeholders** ✓ **Engage Industry Partners:** ✓ **Stakeholder Forums.**
Operational Efficiency Improvements ✓ **Route Optimization:** ✓ **Speed Managements**	**Technological Innovations** ✓ **Monitoring and Reporting Systems:** ✓ **Retrofitting Existing Vessels**
Regulatory Support and Incentives ✓ **Policy Frameworks:** ✓ **Financial Incentives:.**	**Training and Capacity Building:** ✓ **Crew Training:** ✓ **Knowledge Sharing:**
Public Awareness and Communication ✓ **Engaging Communities:.** ✓ **Transparent Reporting**	

❖ Laura Maersk: Dual fuel (methanol and diesel) container ship (July 2023)

Key stakeholders in implementing GSC

Infrastructure & operation group	Governance & support group
Port Authority: ✓ Infrastructure Development ✓ Regulatory Compliance ✓ Collaboration with Shipping Companies:	**International & regional Organizations** ✓ Policy Advocacy: ✓ Research and Guidance: ✓ Monitoring and Accountability:
Shipping Company ✓ Adoption of Sustainable Practices: ✓ Operational Efficiency: ✓ Collaboration:	**Governments**: ✓ Regulatory Frameworks ✓ Financial Incentives:. ✓ Facilitate Stakeholder Collaboration
Cargo Owner ✓ Sustainable Sourcing: ✓ Reporting and Transparency: ✓ Collaborating with Shipping Lines:	**City Government**: ✓ Local Infrastructure Development: ✓ Environmental Planning: ✓ Community Engagement
Energy Producer/Provider: ✓ Alternative Fuel Development: ✓ Infrastructure Support: ✓ Research and Development	**Ship Classification Societies**: ✓ Standards Development: ✓ Certification and Compliance: ✓ Innovation Support:
Shipbuilding Company: ✓ Design and Construction. ✓ Innovation in Technologies:. ✓ Retrofitting Services:	**Knowledge/Research Institutes**: ✓ Research and Development: ✓ Educating Stakeholders: ✓ Policy Recommendations

Transition toward alternative fuels

- Alternative fuel-powered vessels has been steadily increasing
- Industry is looking at alternative fuels such as LNG (Liquefied Natural Gas), methanol, hydrogen, ammonia and etc..
- Orders for methanol dual-fuel vessels are increasing, with LNG fueled vessels taking up a large portion. Ammonia and hydrogen fueled vessels are in the early stage.
- Each alternative fuel has its distinct advantages and challenges, and the choice of fuel often depends on specific operational needs, regulatory frameworks, and regional infrastructure. The shipping industry is increasingly exploring combinations of these fuels to leverage their benefits while addressing environmental impacts and operational feasibility.

	MDO	LNG	Methanol	Biofuel	Ammonia	Hydrogen	Battery
SOx, NOx, PM emissions	✗	✓	✓	✗	✓	✓	✓
Carbon (CO_2) emissions	✗	✗	✓	✓	✓	✓	✓
Flammability	✓	✓	✓	✓	✓	✗	-
Toxicity	✓	✓	✓	✓	✗	✓	-
Technological maturity	✓	✓	✓	✓	✗	✗	✓
Energy cost	✓	✓	✓	✗	✗	✗	✗
Bunkering availability	✓	✓	✗	✗	✗	✗	✓

Source: Zero carbon shipping: The complex choice of alternative… | Ulstein

Relationship between Decarbonization and Green port

Decarbonized Shipping Strategies	Green Port Strategies
✓ Alternative Fuels: ✓ Energy Efficiency Improvements: ✓ Technological Innovation	✓ Infrastructure for Alternative Fuels: ✓ Energy Efficiency and Renewable Energy: ✓ Waste Management and Pollution Control: Collaboration with Stakeholders

Relationship Between Decarbonization of Shipping and Green Port Strategies

- ✓ Synergistic Goals:
- ✓ Infrastructure Development:
- ✓ Operational Coordination:
- ✓ Sustainability Standards:
- ✓ Collaboration and Partnerships:
- ✓ Policy Alignment:

Challenges in decarbonization and GSC implementation

- **Infrastructure Development : Bunkering Facilities and Port Upgrades**
- **Regulatory and Policy Frameworks: Inconsistent Regulations, Lack of Incentives**
- **Technological Barriers: Readiness of Alternative Fuels, Engine Compatibility**
- **Economic Constraints: High Initial Costs, Market Uncertainty**
- **Supply Chain and Logistics Complexity: Fuel Availability, Operational Coordination**
- **Performance Measurement and Monitoring: Emissions Tracking, Benchmarking**
- **Stakeholder Engagement: Collaboration Challenges, Community Buy-In**
- **Knowledge and Capacity Building: Education and Training, Research and Development**

Policy recommendations

- **Strengthening Regulatory Frameworks: Harmonize Regulations, Establish Emission Targets**
- **Incentives for Alternative Fuels and Technologies: Financial Incentives, Support for Infrastructure Development**
- **Investment in Research and Development: Increase R&D Funding, Public-Private Partnerships**
- **Capacity Building and Education: Training Programs, Knowledge Sharing Platforms**
- **Regional Cooperation and Collaboration: Facilitate Regional Dialogues, Cross-Border Initiatives**
- **Sustainable Port Planning: Integrate Sustainability into Port Development, Green Port Certifications**
- **Adopting Digital Solutions: Promote Digitalization, Maritime Data Sharing**
- **Monitoring and Reporting Mechanisms: Implement Robust Monitoring Systems, Develop Key Performance Indicators**:

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