Green ports policies, coastal shipping and inland waterways

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Incheon
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1. Background

Why do we need sustainable development?

- Treat against the existence of human race due to weather disasters and ecological destruction
- Economic loss predicated if energy mass consumption system continues: 5-20% of annual world GDP
- Shortage of energy resources and increase in price
  - Caused by economic development of new developing countries and continuous growth in world population
- Enforce international regulation & cooperation for GHG emission
- World CO$_2$ emission: 31.2Gt (2011)
  - Power generation and heating: 41.6%
  - Transportation: 22.1%
1. Background

Why do we reduce GHG emission from logistics sector?

- Increasing demands reducing carbon emissions
  - Reducing carbon emissions: Global consensus & target
    - EU: All ships entering EU should be use Less than 0.1% sulfur content fuel since 2010
    - International Maritime Organization (IMO) under the UN adopted the technical regulation guidelines to reduce greenhouse gas emission from ships (MARPOL annex IV)

- SCM need reducing GHG emissions
  - Increasing pressure reducing GHG to logistics companies and manufactures
  - Need information for GHG emission on whole SCM process
  - Necessity to cooperate between policies on Modal shift, multimodal transportation
  - Ports, coastal shipping & inland waterways are key factors reducing GHG emissions

- International convention: UNFCCC
  - International discussion & protocol for reducing GHG
2. Green ports policies

Joint cooperation between C40 cities & C40 world ports

- **C40 cities climate leadership group : From 2005**
  - Network of the world’s megacities committed to addressing climate change
  - C40 world ports climate conference (WPCC)

- **An active international discussion is under way to cut carbon emissions in port areas**
  - Port areas didn’t take priority so far when it comes to reducing carbon emissions. However, as Europe strengthens regulations on greenhouse gases, particularly in the shipping and aviation field, port areas are pursuing similar policies.
  - For example, the C40 World Ports Climate Change Conference was held in Rotterdam, the Netherlands in 2008 with IAPH (The International Association of Ports and Harbors) playing the key role. At the conference, 55 ports from around the world agreed on the C40 WPCC Action Plan

- **The world ports climate declaration**
  - Reduction of GHG emissions from ocean-going shipping
  - Reduction of GHG emissions from port operations and development
  - Reduction of GHG emissions from hinterland transport
  - Enhancement of the use of renewable energy
  - Development and auditing of CO2 inventories
2. Green ports policies

World port climate initiative (IAPH)
- Fifty-five of the world’s key ports, acknowledging their unique capacity as key hubs in global supply chains, have come together in a commitment to reduce their greenhouse gas emissions while continuing their role as transportation and economic centers.

Chief goal
- Deepen the support for WPCI among the world’s ports
- Promote information sharing
- Establish a framework for CO2 footprint inventory and management
- Establish Environmental Ship Indexing and increase support for this measurement
- Organize global support for WPCI goals among regional and global organizations

Mission statement
- Raise awareness in the port and maritime community of need for action
- Initiate studies, strategies and actions to reduce GHG emissions and improve air quality
- Provide a platform for the maritime port sector for the exchange of information thereon
- Make available information on the effects of climate change on the maritime port environment and measures for its mitigation
2. Green ports policies

Action plan (project in progress)

- **Intermodal transport**
  - Intermodal transport reduces cargo handling as well as improves security and reduces damages and loss.
  - Intermodal transport allows cargo to be transported more efficiently and thus reduces transportation cost, congestion on the roads, and air emissions.

- **Lease Agreement Template**
  - A Lease Agreement Template includes a sustainability approach in lease contracts for the ports’ tenants and includes the requirements related to control measures to combat climate change.
  - The use of Lease Agreement Template at the ports would result in the reduction of GHG emissions and improve air quality. It will also raise awareness in the port and maritime community.

- **Cargo-handling Equipment**
  - To reduce the amount of pollutants emitted from ports, ports are beginning to retrofit these equipment types with emissions control systems, replace older equipment with newer cleaner equipment, or use cleaner fuel technologies, such as electrification.

- **LNG-Fueled Vessels**
  - LNG is of interest to both ship operators and ports because it reduces or eliminates many of the emissions targeted by current and future IMO measures to make shipping cleaner. (For example, LNG eliminates sulphur & particulate matter emissions are close to zero and also reduce NOx by 80-90% and CO2 emissions by 26%.)
2. Green ports policies

Other Green Ports Policies

- **Onshore power supply (OPS)**
  - Onshore power supply (OPS) is one of the strategies recommended by the World Port Climate Initiative for reducing the environmental impact of seagoing vessels in ports.
  - AMP (Alternative Maritime Power)

- **Environmental Ship Index (ESI)**
  - The Environmental Ship Index (ESI) identifies seagoing ships that perform better in reducing air emissions than required by the current emission standards of the International Maritime Organization, the Environmental Ship Index.
  - The ESI evaluates the amount of GHG from ship and own report scheme.
  - Administered by ESI bureau of IAPH

- **Carbon Footprinting**
  - The Carbon footprinting is used to determine emissions sources, track emission trends, and provide information needed to determine where ports can focus efforts to reduce their greenhouse gas (GHG) emissions.
  - A carbon footprint is the amount of GHG emissions an individual, organization or event directly or indirectly releases over a measured period.
2. Green ports policies

Green Ports Policies (Case)

- **LED lighting**
- **Onshore power supply**
- **Hybrid (electricity) Cargo Handling Equipment**
- **LNG Yard Tractor (Hostler)**
- **LNG Ship (Port)**
- **Renewable Energy (Solar plant)**
3. Coastal Shipping

**Costal Shipping is the most environmental friendly transport mode for mitigating greenhouse gases**

- Coastal Shipping is in charge of 20.7% of total cargo movement with only 1% of total transport cost (in Korea)
  - Unit Transport Cost (ton/Km): Shipping cost is 1/23 over road transport
  - Greenhouse Gases (CO₂): CO₂ emissions of shipping is 1/6 compared to that of road transport

- Costal shipping deals with transporting resources required for the national industry development
  - Strategic resources in national development are mainly carried by ship (Mass transportation)

- Coastal shipping is the transport mode connecting between the mainland and the island
  - Sole Freight Transport Mode

- Coastal shipping can be an emergency transport mode
  - When national transportation system has failed after natural or manmade disaster, coastal shipping establishes emergency logistics network
3. Coastal Shipping

**Challenges of Coastal Shipping**

- **Costal shipping has limitations in providing door-to-door cargo service**
  - It requires cooperating with road transport, has difficulty in transporting time-limited cargo, and has difficulty in increasing shipping demands

- **Costal shipping is costly and time-consuming by complex shipping**
  - Coastal shipping Cargo Handling Process: Shipper-Port-Port-Shipper
  - It has disadvantage over short-distance
  * Shipping has advantage long distance (ex, over 400 km) and mass transportation

- **Modal share of costal shipping has been gradually decreased and will be dropped**
  - Caused by its complexity, service quality

- **Surge in oil prices in the past several years has led increases in operating cost**
  - Oil Price increases 4.7 times compared to 10 years ago and consists of over 40% of ship operating cost

- **However, Coastal shipping is very appropriate for future traffic demand of low-cost, high-efficiency, low-carbon transport system**
3. Coastal Shipping

**Coastal shipping: another option to reduce GHG emission**

- **Developing Green Ship**
  - Developing environmental friendly ships to mitigate GHGs
  - Financially supporting the development of eco-ships with the highest priority
  - Evaluating LNG fueled ships into domestic shipping, which mitigate CO2, SOx, NOx
  - Operating pilot LNG ships for business level cooperated with public sector
  - Studying LNG bunkering and safety issues

- **Developing green operating and routing system**
  - Developing ship operation systems for minimizing emissions
  - Optimizing ship operating speed, frequency, scheduling, and so on

- **Improving the quality of transport service**
  - Developing faster cargo service system and its business model
  - Providing Standardized facilities and systems
  - Utilizing IT technologies for management
  - Developing more efficient cargo handling equipment

- **Investing in coastal shipping infrastructures**
  - Improving facilities and system for cargo handling
  - Investing in terminals and docking facilities
3. Coastal Shipping

Coastal shipping (Best practice)

- **Modal shift (Korea)**
  - Subsidy Modal shift (from road to coastal shipping and rail)
  - According to 「Provisions on Modal Shift Agreement」, subsidies are paid to shifted quantities
  - Strongly support and encourage sustainable transport by national plan and regal system

- **Implementation of Coastal Shipping Greenhouse Gas•Energy Target Management System (Korea)**
  - Target Management System is enforced for coastal shipping lines: More than 20,000 tons
  - Voluntary participation from 2011 until 2013 and is changed to the mandatory system from 2014

- **Promotion of modal shift policy (Japan)**
  - Improving Small Shipowners’ Business Conditions
  - Promotion coastal shipping: Green Logistics Partnership Conference, R&D
  - Development Super Eco-Ship: increase fuel efficiency & reduce GHG emission
  - JRTT’s Joint Ownership Scheme: Joint investment JRTT(70~90%) and ship owner(10~30%).
    Operated by ship owner
    * Japan Railway Construction, Transport and Technology Agency
3. Coastal Shipping

Coastal shipping (Best practice)

- Coastal shipping transported 40% of regional trade volume
- Modal shift policy: Marco polo program

### Overview of Marco Polo program I

<table>
<thead>
<tr>
<th>Classification</th>
<th>Contents</th>
<th>Financial support</th>
</tr>
</thead>
<tbody>
<tr>
<td>modal shift</td>
<td>- Measures of shifting road transport to other transportation modes including railway, coastal shipping and inland waterway</td>
<td>Up to 30%</td>
</tr>
</tbody>
</table>
| Catalytic role | - Measures of taking innovative measures to overcome the structural barriers of the logistics market  
- The method of non-road transport should be changed or Trans-European Network or Pan-European transport route should be used | Up to 35% |
| Co-learning    | - Activities sharing know-how between suppliers or cooperating to improve the environmental efficiency of the field in the logistics market | Up to 50% |

### Overview of Marco Polo program II

<table>
<thead>
<tr>
<th>Classification</th>
<th>Contents</th>
<th>Financial support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marine Highway</td>
<td>- Measures aiming to directly shift road transport to coastal transport or other means of transport of coastal transport and road transport as short as possible</td>
<td>Up to 35%</td>
</tr>
<tr>
<td>Congestion avoidance</td>
<td>- Innovative measures combining transport with Production Logistics of Business without a drop in output or labor productivity to reduce the ratio of road transport</td>
<td>Up to 35%</td>
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</table>
4. Inland waterways

Inland water transport: one of the leading means of eco-friendly transportation

Most eco-friendly transport in cargo and passenger transport
- Inland water transport is getting the spotlight as a means of eco-friendly transportation because of the possibility of mass transport using ships and relatively less greenhouse gas emissions compared to land transportation
  * Inland water transport using lakes, rivers and canals

Inland water transport: one of the safest and sustainable means of transport
- In case of Europe, ships used for Inland water transport usually transport cargo equivalent to 14 to 500 trucks and the transport costs of inland waterway are just 10 euros per 1000t km
- UNECE (United Nations Economic Commission for Europe) is preparing measures to expand more and operate it more efficiently
4. Inland waterways

Characteristics of Inland water transport

- Inland water transport is eco-friendly and sustainable means of transport
  - It has price competitiveness compared to road and rail in terms of transportation costs
  - Eco-friendly and sustainable means: in terms of energy consumption, noise and greenhouse gas emissions generation
    * because of the possibility of mass transport using ships (barge)

- Major advantages of Inland water transport
  - The advantages of inland water transport are considered as safety, resiliency, reliability, low cost, high energy efficiency, low-carbon, low-noise, low infrastructure costs, easy integration with supply chain
  - (In Europe) inland water transport accounted for 5.8% of total cargo volume transported in the EU Union and roads accounted for 76% and rail 18%, respectively

- Inland water transport are facing many difficulties
  - Infrastructure development, fleet modernization, expansion of sailing information services, market demand, labor issues, climate change and law-institutional regulations
  - Inland water transport is still underutilized yet and experiencing difficulties in terms of laws and institutional obstacles, technologies and facilities
  - Inland water transport is greatly affected by transport policy in the country and between countries as well as economic and geographical conditions
5. Conclusion

Basic principles of sustainable transportation

- Low-carbon transportation logistics system by a reduction in greenhouse gas emissions
- Eco-friendly transportation logistics system
- Transportation logistics system to save energy and resources
- An improvement in mobility, accessibility and safety of transportation logistics system
- Security of balance between means of transportation, classes, and regions
- Efficient connection between transport modes and nodes

Policy Recommendation

- Make national master plan and strategies
  - Establish long-term plan, target (objectives) and strategies to implement sustainable development
- Restructuring logistics industry based on low carbon
  - Modal shift to less environmental burden: Shipping, inland water, railway
  - Strength Green port policies
  - Expansion ITS (intelligent transport system) and convergence between transport modes
Voluntary participate GHG reduction
- Encourage participation from private sector

Support to set up Green growth strategy
- Provide consulting service to secure sustainable development

Develop and disseminate Guideline for GHG measurement by enterprise base
- Develop guideline & make action plans

Subsidy private proposed project for green logistics
- Eco-friendly facility and device

Introduce “Green logistics certification”
- Certificate best logistics company and shipper

Prepare and arrange legal and institutional system
- Make green growth(sustainable development) legal system
- Designate responsible agents by sector
- Strength International cooperation : GCF, GGGI, GTC and etc
5. Conclusion

### Challenges Ahead

<table>
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<tr>
<th>Continued Support form the public</th>
<th>Support Form Business community</th>
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<tbody>
<tr>
<td>➢ the key to success of sustainable development</td>
<td>➢ meeting its needs to adapt &amp; change</td>
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<tr>
<td></td>
<td>➢ setting a business model</td>
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<td>: emission trading &amp; carbon tax</td>
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### Sustainable development is not an option but, the only option

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<tr>
<th>Sustainable development in not plan B, it's the Plan A</th>
<th>It is the strategy of change that jumps over the chasm and it is a concept of creativity that opens all possibilities</th>
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</table>
The future is not to be given, but to be created.

Thank you!