Greening Efforts of Ports in Indonesia

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What are the tools that can green ports?

Pricing Policy

Monitoring and Measuring

Market Access Control & Environmental Standard Regulation

Source: Lam, J.S.L. and Notteboom, T. 2014
Case Study of ‘Pricing Policy’

Port of Rotterdam (NL): a 10% surcharge to docking fees for barge operators using fuel with sulfur levels near the upper limit.

Port of Antwerp (BE): sea-going ships with a score of ESI 31 or more get a discount of 10% on tonnage dues.

Port of Singapore: burning clean fuels with low sulfur content beyond Singapore’s requirement → a 15% reduction on port dues.
Case Study of ‘Monitoring and Measuring’

Antwerp@C, Software to track emission in Port of Antwerp

Translating the port vision into actions,
Define KPI (Key Performance Indicator)
Case Study of ‘Market Access Control & Environmental Standard Regulation’

The international standard affects the regional, national, and local regulation.

IMO regulates Energy Efficiency Design Index → Calculated vessel design → Ship Energy Efficiency Management Plan

Maritime Singapore Green Initiative

- Green Ship Programme
- Green Port Programme
- Green Energy and Technology Programme
- Green Awareness Programme
How does the government of Indonesia respond to climate change?

Commitment Flow of Climate Change Control by the Government of Indonesia

- 2004: Ratify Kyoto Protocol through Law No. 17/04
- 2007: Indonesia to be host of UN Climate Change Conference 2007
- 2014: National Action Plan Climate Change Adaptation
- 2015: Paris Agreement
- 2016: Ratification of Paris Agreement through Law No. 16/2016
- 2018: Second Biennial Update Report to UNFCCC
- 2019: Roadmap of NDC in GHG Emission Mitigation
- 2020: Climate Change to be National Priority in Mid-Term National Plan 2020-2024
- 2021: Perpres 98/2021 Presidential Regulation on Carbon Emission Economic Value

Source: Ministry of Transport, 2023
What measures relating to green ports have been enacted in Indonesia?

Coordinating Ministry of Maritime Affairs of Indonesia

Ministry of Environmental and Forestry

**GREEN PORT CRITERIA KEMENKOMARVES (TH. 2022)**

**MANAGEMENT ASPECT**
1. Commitment & Green Port Implementation Policy
2. Green Port Promotion
3. Community Development

**TECHNICAL ASPECT**
3. Port Management
4. Management of Supporting Transportation
5. Sustainable Dredging & Reclamation
6. OHS Implementation
7. Cargo & Material Handling
8. Minimization of Noise Impact
9. Air Quality Management
10. Water Quality Management
11. Waste Management
12. Energy Management
13. Climate Change Mitigation
14. Management of Biodiversity at Port

**PROPER Criteria**
- AMDAL
- Control of air pollution
- Control of water pollution
- Control of dangerous and toxic waste
- Control of ocean water pollution
- Control of land use
What actions have industry players already implemented in Indonesia?

**Terminal Teluk Lamong Green Port**
- The first semi-automation port in Indonesia
- All port operation uses low energy: CNG trucks, ACS, electric STS, combined CTT, and docking system
- Electric GSU

**Pertamina International Shipping (PIS) procured two Tanker Gas – Ammonia**
- Very Large Gas Carriers produce lower emissions compared to HFO (Heavy Fuel Oil)
- 2 VLGCs: Pertamina Gas Tulip and Pertamina Gas Bergenia
- VLGC has dual fuel tanks to optimize low-sulfur fuel and gas
- The fuel utilization is 16% more efficient compared to the similar vessel
A case of cost saving in RTGC evolution in JICT, the biggest container terminal in Indonesia

<table>
<thead>
<tr>
<th>Type of energy</th>
<th>Conventional Diesel</th>
<th>Optimized Diesel</th>
<th>Hybrid-Dual Power</th>
<th>Hybrid-Full Battery</th>
<th>Pure Electric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumption rate of energy</td>
<td>23 L/hour</td>
<td>19 L/hour</td>
<td>12 L/hour</td>
<td>8 L/hour</td>
<td>70 kWh/hour</td>
</tr>
</tbody>
</table>

- 46% cost saving
- 68% cost saving
- 42% cost saving
Main issues in the greening port efforts in Indonesia

- Non-existence of road map and policies
- No clear incentive for industry players to shift to green port
- Unreadiness of industry especially in shipbuilding
- The dependence on the imported components X local content requirement
The World Bank in Indonesia initiated a study to help the Ministry of Transportation to establish a road map of decarbonization in the maritime transport.

**Greening the shipping**
- Domestic and International Flagged vessels
- Different type of vessel

**Greening the infrastructure**
- Focusing on 25 main ports in Indonesia
- Different type of ports

**Roadmap**
- Short-term
- Mid-term
- Long-term