Recent developments in addressing shipping air emissions and the role of ports

Busan International Port Conference 2018

Working Session II
“Strategies to be Environmentally Sustainable Ports”

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IMO Secretariat
Recent developments in addressing shipping air emissions and the role of ports
Context: air emissions high on the agenda

- Over 80% of global trade by volume and more than 70% of its value carried on board ships

- World seaborne trade volumes expanded by 4% in 2017 to reach 10.6 billion tons of cargo

- Key regulatory trends focus on air emissions:
  - “Efforts to curb the carbon footprint and improve the environmental performance of international shipping remain high on the international agenda”
  - “With regard to air pollution, the global limit of 0.50% on sulphur in fuel oil used on board ships will come into effect on 1 January 2020”

(Review of Maritime Transport 2018, UNCTAD)
Outline

• Context
• Initial IMO Strategy on reduction of GHG emissions from ships and its follow-up actions
• IMO 2020 sulphur regulations including outcome of MEPC 73
• Overview of global initiatives addressing port-related emissions
IMO work to address GHG emissions from ships
IMO work to address GHG emissions from ships

- In 2012, international shipping CO₂ emissions were estimated to be 796 million tonnes accounting for 2.2% of global CO₂ emissions
  - By 2050, CO₂ emissions from international shipping could grow by between 50% and 250%, depending on future economic growth and energy developments
  - Demand is the key driver for growth
- MARPOL Annex VI (Chapter 4)
  - Technical tools (new ships)
    - EEDI (Energy Efficiency Design Index)
  - Operational tools (existing ships)
    - EEOI (Energy Efficiency Operational Indicator)
    - SEEMP (Ship Energy Efficiency Management Plan)
Adoption of the Initial IMO Strategy on Reduction of GHG emissions from ships

RESOLUTION MEPC.304(72)

Adopted on 13 April 2018

INITIAL IMO STRATEGY ON REDUCTION OF GHG EMISSIONS FROM SHIPS

THE MARINE ENVIRONMENT PROTECTION COMMITTEE

RECALLING Article 38(e) of the Convention on the International Maritime Organization (the Organization) concerning the functions of the Marine Environment Protection Committee (the Committee) conferred upon it by international conventions for the prevention and control of marine pollution from ships,

ACKNOWLEDGING that work to address greenhouse gas (GHG) emissions from ships has been undertaken by the Organization continuously since 1997, in particular, through developing global mandatory technical and operational energy efficiency measures for new and existing ships,
Future steps?
Last week the Marine Environment Protection Committee (MEPC 73) gathered in London and approved the Programme of follow-up actions of the Initial IMO Strategy on reduction of GHG emissions from ships up to 2023.

This programme of actions identifies several parallel streams of activity:

- Consideration of concrete proposals for new measures by MEPC 74 (May 2019)
- Impact assessment mechanism
- Fourth IMO GHG Study to update estimates and projections
- Capacity-building, technical cooperation, R&D

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IMO 2020 sulphur regulation
IMO 2020 sulphur regulation

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Fuel oil
% sulphur

4.50
3.50
1.50
1.00
0.50
0.10

1.1.2012
1.7.2010
1.1.2015
1.1.2020

Review completed 2016

Time

Non-ECA
ECA
IMO 2020 sulphur regulation

- MEPC 70 (October 2016) approved report on “Assessment of Fuel Oil Availability”:
  - “In all scenarios, the supply of marine fuels with a sulphur content of 0.50% m/m or less and with a sulphur content of 0.10% m/m or less is projected to meet demand for these products.”

- MEPC 71 (July 2017) approved a new output for the PPR Sub-Committee on “Consistent implementation of the 0.50% m/m sulphur limit” - Intersessional meeting held July 2018

- MEPC 73 adopted amendments to MARPOL Annex VI to “prohibit the carriage of non-compliant fuel oil for combustion purposes for propulsion or operation on board a ship” for entry into force on 1 March 2020 (carriage ban)
IMO 2020 Sulphur regulation

• MEPC 73 approved Guidance on best practice for fuel oil suppliers and Guidance on ship implementation planning that includes an indicative plan that identifies the following key elements:
  • risk assessment and mitigation plan (impact of new fuels);
  • fuel oil system modifications and tank cleaning (if needed);
  • fuel oil capacity and segregation capability;
  • procurement of compliant fuel;
  • fuel oil changeover plan (conventional residual fuel oils to 0.50% sulphur compliant fuel oil); and
  • documentation and reporting.

• Additional guidance that could be taken into account is also provided on impact on machinery systems and on tank cleaning.

• MEPC 73 invite further concrete proposals on how to enhance the implementation of regulation 18 of MARPOL Annex VI, in particular on fuel oil quality and reporting of non-availability of compliant fuel oils, to MEPC 74.
Port-related air emissions
Harmful air pollutants in the port area

- Approximately **230 million people are directly exposed** to harmful emissions (NOx, SOx and PM) from ships in the top 100 ports globally

- 2 main categories of measures:
  - International regulation of ship emissions (MARPOL Annex VI)
  - Local initiatives of individual ports

### Top 10 environmental priorities of the European port sector over time

<table>
<thead>
<tr>
<th></th>
<th>1996</th>
<th>2004</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Port development (water)</td>
<td>Garbage / Port waste</td>
<td>Noise</td>
</tr>
<tr>
<td>2</td>
<td>Water quality</td>
<td>Dredging: operations</td>
<td>Air quality</td>
</tr>
<tr>
<td>3</td>
<td>Dredging disposal</td>
<td>Dredging disposal</td>
<td>Garbage / Port waste</td>
</tr>
<tr>
<td>4</td>
<td>Dredging: operations</td>
<td>Dust</td>
<td>Dredging: operations</td>
</tr>
<tr>
<td>5</td>
<td>Dust</td>
<td>Noise</td>
<td>Dredging: disposal</td>
</tr>
<tr>
<td>6</td>
<td>Port development (land)</td>
<td>Air quality</td>
<td>Relationship with local community</td>
</tr>
<tr>
<td>7</td>
<td>Contaminated land</td>
<td>Hazardous cargo</td>
<td>Energy consumption</td>
</tr>
<tr>
<td>8</td>
<td>Habitat loss/degradation</td>
<td>Bankering</td>
<td>Dust</td>
</tr>
<tr>
<td>9</td>
<td>Traffic volume</td>
<td>Port development (land)</td>
<td>Port development (water)</td>
</tr>
<tr>
<td>10</td>
<td>Industrial effluent</td>
<td>Ship discharge (bilge)</td>
<td>Port development (land)</td>
</tr>
</tbody>
</table>

(source: ESPO, 2012)
Port-related GHG emissions

- Port-related GHG emissions account for only 2% of total shipping CO\textsubscript{2} emissions but they are projected to rise four-fold by 2050 on a business-as-usual basis (Merk, *Shipping Emissions in Ports*, OECD-ITF, 2014)

- The majority of port-related emissions of CO\textsubscript{2} come from ships rather than landward activities (58% in European and Asian ports) therefore decarbonization of ships will make a major contribution to port decarbonization

- Relative emissions from ship, ports and inland transport: example of carbon intensity values from container movement from China (Wuhan) to UK (Glasgow)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Emission Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road in China</td>
<td>120g/tonne-km</td>
</tr>
<tr>
<td>Port</td>
<td>16-18kg/container</td>
</tr>
<tr>
<td>Deep sea</td>
<td>12g/tonne-km</td>
</tr>
<tr>
<td>Road in UK (Rail)</td>
<td>31g/tonne-km</td>
</tr>
<tr>
<td>Road in UK (Air)</td>
<td>75g/tonne-km</td>
</tr>
</tbody>
</table>

(McKinnon, *Decarbonizing logistics*, 2018)
Port-related GHG emissions

• the Initial Strategy identifies as a candidate short-term measure:

“consider and analyse measures to encourage port developments and activities globally to facilitate reduction of GHG emissions from shipping, including provision of ship and shoreside/onshore power supply from renewable sources, infrastructure to support supply of alternative low-carbon and zero-carbon fuels, and to further optimize the logistic chain and its planning, including ports;”
Policy work at IMO

- Initiative from Canada and IAPH to work on an MEPC resolution to encourage port developments and activities to facilitate the reduction of GHG emissions from ships:
  - Port incentive schemes
  - Infrastructures (OPS from renewable sources, etc.)
  - Optimization of port operations
  - Provision of low- and zero-carbon fuels,
  - Etc.
- MEPC 73 invited all interested Member States and organizations to work with Canada and IAPH to develop this resolution for adoption by MEPC 74
Overview of global initiatives to address port-related emissions
Overview of global initiatives to address port-related emissions

• GEF-UNDP-IMO Global Maritime Energy Efficiency Partnerships project

  • Overall objective: Build capacity in developing countries for implementing the technical and operational measures for energy efficient shipping and catalyze overall reductions in GHG emissions from international shipping.

  • 10 Lead Pilot Countries: Argentina, China, Georgia, India, Jamaica, Malaysia, Morocco, Panama, Philippines and South Africa

• Following a strategic partnership between IMO/GloMEEP and IAPH, two port emissions guides have been published to support developing countries in:

  • Gaining a better understanding of emissions in their ports

  • Developing strategies to address emissions
Overview of global initiatives to address port-related emissions

- **Guide No.1: Assessment of port emissions**
  - Updates previous works
  - Covers critical inventory planning elements
    - Drivers
    - Source categories
    - Geographical & operational domains
    - Air quality pollutants & GHGs
    - Level of detail
    - Data streams
  - Port-related sources
  - Regulatory frameworks
  - Types of assessments
  - Methods & approaches
    - Assessing tools & use
    - Putting results in perspective
    - Comparing year over year

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Available here: [http://glomeep.imo.org](http://glomeep.imo.org)
Overview of global initiatives to address port-related emissions

- **Guide No.2 : Development of port emission reduction strategies**
  - Updates previous works
  - Covers critical strategy planning elements
    - Drivers
    - Challenges & opportunities for viable strategies
    - Pollutant/GHG hierarchy
    - Strategy analysis & evaluation considerations
    - Implementation options & considerations
    - Administration considerations
    - Tracking progress & reporting considerations
  - Methods & approaches
    - One-off strategy vs. programmatic approaches
    - Determining cost effectiveness
  - Strategy ranking & selection considerations
  - Examples

Available here: [http://glomeep.imo.org](http://glomeep.imo.org)
Overview of global initiatives to address port-related emissions

- **Global Industry Alliance (GIA)**
  - Support tackling existing barriers towards decarbonizing the shipping sector
  - Through implementation of selected projects (within scope of 5 priority areas including ports)
  - Initiate pilot projects, promote R & D
  - Initiate industry fora and information exchange activities
  - Showcase positive initiatives by maritime sector
  - Develop capacity-building tools

Recent developments in addressing shipping air emissions and the role of ports
Overview of global initiatives to address port-related emissions

- GIA = a public-private partnership
- Current membership of 16 companies
Overview of global initiatives to address port-related emissions

- GIA = five ongoing projects

<table>
<thead>
<tr>
<th>No</th>
<th>Activity Title</th>
<th>Progress/Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Development of E-learning course on the energy-efficient operation of ships</td>
<td>• Videotel KVH contracted</td>
</tr>
<tr>
<td></td>
<td>(for seafarers and onshore personnel)</td>
<td>• E-learning course under development</td>
</tr>
<tr>
<td>2</td>
<td>Development of a Protocol for validation of performance of energy efficiency</td>
<td>• Industry Roundtable held (12 July 2018)</td>
</tr>
<tr>
<td></td>
<td>technologies</td>
<td>• White Paper on fuel performance monitoring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Tendering procedure initiated by GIA Secretariat</td>
</tr>
<tr>
<td>3</td>
<td>Development of guide on alternative fuels their potential for shipping and</td>
<td>• Discussions initiated within the GIA TF</td>
</tr>
<tr>
<td></td>
<td>barriers to uptake with a timeline to 2050</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Idea generation workshops - Workshops to facilitate brainstorming and idea</td>
<td>• First workshop held (30 May 2018)</td>
</tr>
<tr>
<td></td>
<td>generation for effective collaboration</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Development of study on Just-In-Time Operation of ships - solutions for</td>
<td>• Industry Roundtable held (29 June 2018)</td>
</tr>
<tr>
<td></td>
<td>different shipping sectors</td>
<td>• Tendering procedure initiated by GIA Secretariat</td>
</tr>
</tbody>
</table>
Overview of global initiatives to address port-related emissions

- GIA work related to Just-In-Time (JIT) operation of ships:
  - Gather experience from ports that (not) successfully implemented JIT
  - Analyze/categorize barriers (both general and trade specific)
  - Study concrete measures (including incentives) for removal of contractual/operational barriers to large-scale uptake of JIT:
    - short-term measures (2018-2023)
    - mid-term measures (2023-2030)
- Call for tender for the study: [http://www.imo.org/en/About/Procurement/Pages/default.aspx](http://www.imo.org/en/About/Procurement/Pages/default.aspx)

Recent developments in addressing shipping air emissions and the role of ports (Preliminary assessment Port of Rotterdam)
To watch the video, please visit:

https://youtu.be/ioUpqZUNSlg
Thank you for your attention
Recent developments in addressing shipping air emissions and the role of ports