Port of Antwerp
A Port Facilitating Compliance with New Environmental Regulations

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A Port Facilitating Compliance with New Environmental Regulations

1. Port of Antwerp, an inland located seaport
2. Environment policy as part of sustainability policy
3. PoA’s approach to environmental services to the shipping industry
4. Air quality in Antwerp and the regulatory framework
5. Dealing with regulations concerning air emissions
   - Sulphur compliance
   - LNG
   - Scrubbers
   - OPS
   - Supporting Pioneers
6. Other services
Port of Antwerp, an inland located seaport

13,057 ha total area
1,073 ha available area for development
900 companies
8,7 million TEU container turnover
199 million tonnes cargo turnover
45 seaships a day
168 barges a day
220 freight trains a day
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Environmental policy view Port of Antwerp

How?
• Pro-active response
• Taking up responsibility
• Critical testing

Instruments / tools:
• Flexible, dynamic, geographical and integrated environment information system
• Strengthened embedding of management for Port of Antwerp
• Service to port users with clear and unambiguous guidelines, central support and stimulation, reward and punishment
Environmental policy view Port of Antwerp

Sustainable environmental policy view

1. Strive for the use of new and best available methods
2. The already limited environmental space assigned to the port should not be jeopardised any further by new initiatives taking place in and around the port area
3. Applying a ‘polluter should pay’ principal aimed at the accountability of port users
4. Environmental efforts should be fairly proportioned with environmental benefits
5. No competition disruption with surrounding EU ports when environmental efforts go beyond European standards
Environmental management from the perspective of a port authority

**Strengthening license to operate:**

- Spatial development plan: accompanying measures
- Compliance of port of activities with legal standards – basis BATNEEC
- Correct implementation of legally assigned roles (water manager in the docks, permitting in certain parts of the port, compliance of own operations,…)
- Operational manager of the port area
- Overall improvement of environmental performance
- Development of activities in accordance with (from environmental point of view) expectations from society (‘green economy’)

Environmental management from the perspective of a port authority

**Strengthening unique selling proposition:**

- Environmental services to shipping
- Space for economic activities in or around the port by nature development
- Respect of environmental quality standards
- Environmental policy and legislation at different levels (also) tailor made to port activities
- Level playing field
- Smooth and reliable permitting procedures
- Port as a sustainable element in the supply chain with added value, also from an environmental point of view
- Reliable information on environmental aspects in support of port users and in support of policy debates
Acting together with…

Stakeholders:
• Private sector
• Public authorities
• Academic world
• NGOs
• Other ports
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Environmental Regulations Facing the Maritime Shipping Industry

Focus of today
Approach to Environmental Services to the Shipping Industry

Sharing the load

Together we move forward
Environmental Services in our Business Plan

GHA works with and for companies to generated value
- Optimalisation Supply chain
- Creating synergies on the port platform
- Realise Efficient use of space/infrastructure
- Top-of-mind in the world

GHA stimulates societal value
- Building a sustainable platform
- Realising accompanying measures to the spatial development of the POA
- Tackling important public themes
- Improved public acceptance
- Cooperation with society and other ports

- Creating equal level playing field
- Guarantee performant services
- Creating space for investments and infrastructural developments by improving overall environmental quality
- Creating commercial added value as a reliable port
- Increased public acceptance for maritime/logistic activities

Environmental services to the shipping industry
Environmental Services in our Business Plan

Needs of the Maritime Shipping Industry

1) Facilitate
2) Support
3) Develop

- Securing level playing field
- Facilitate project development
- Active project development
  - Knowledge sharing
  - ...

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Air emissions in Port of Antwerp

**EMPort(Ant)**

- Modeling of the emissions of ships in the Port of Antwerp
- Securing the license to operate

<table>
<thead>
<tr>
<th>pollutant</th>
<th>EMPort(Ant) 2012 (ton)</th>
<th>EMMOSS 2012 (ton)</th>
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<tbody>
<tr>
<td>CO</td>
<td>1,311</td>
<td>1,559</td>
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<tr>
<td>CO2</td>
<td>388,923</td>
<td>369,238</td>
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<tr>
<td>NOx</td>
<td>6,792</td>
<td>6,902</td>
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<tr>
<td>SO2</td>
<td>740</td>
<td>796</td>
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<tr>
<td>PM</td>
<td>209</td>
<td>225</td>
</tr>
<tr>
<td>VOC</td>
<td>242</td>
<td>285</td>
</tr>
<tr>
<td>PM10</td>
<td>198</td>
<td>213</td>
</tr>
<tr>
<td>PM2.5</td>
<td>188</td>
<td>202</td>
</tr>
<tr>
<td>BC</td>
<td>188</td>
<td></td>
</tr>
<tr>
<td>methaan</td>
<td>9.7</td>
<td>11.4</td>
</tr>
</tbody>
</table>
Air emissions in POA

- Special attention to:
  Particulate matter (PM)

[Map of Europe showing air quality zones in Belgium]

- NOx
1. Sulphur:
   o IMO – MARPOL Annex VI
     • SECA:
       → today 0,1%S
       → Globally today 3,5%S, per 2020 0,5%S
   o EU
     • 0,1%S, at berth since 2012
     • 0.5%S, in EU waters from 2020

2. Nitrogen
   o IMO
     • Tier III limitations for all ships built after January 2016 (MEPC 66) in NECA
     • In event of new NECA date of Tier III limitation to be assessed

3. CO2
   o EU
     • Directive MRV
Regulatory Framework: ECA – SECA - NECA
1. SECA
   - Level playing field
     - in Europe and on global scale
     - in terms of enforcement
   - Dealing with sulphur
     - Port of Antwerp endeavors to play a proactive and trustworthy role

2. NECA
   - Supported by Port of Antwerp
     - Proven to be an extremely cost effective measure to reduce Nox
     - Licence to operate
   - Level playing field remains important
Regulatory Framework

Hurdles to be taken by the maritime industry

Different options to choose from

What can be done by the Port of Antwerp to facilitate?
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Sulphur Compliance

Importance of level playing field

- Compliance cannot be a competitive disadvantage
  - 0.1% S MGO 440,00 USD
  - IFO380 223,00 USD
  - IFO180 253,00 USD
  - Cost of scrubbers or LNG

⇒ What can be done by a port authority?

Accreditation of bunker companies

- Safety, conformity and environment
- Ad random S-checks
  - 240 samples for period 2012-2013

The Port of Antwerp endeavors to help ensure a level playing field and create a trustworthy bunkering market
Implementing Act regarding sulphur regulations

1. 10% of individual ships: documentary check
2. Of the ships under 1. at least the following % must be samples
   1. Fully bordering a SECA: 40%
   2. Party bordering a SECA: 30%
   3. Not bordering a SECA: 20%

Penalties in Belgium
Delivery of fuel that is not compliant with the BDN can be penalised by a fine up to 6 million Euro

Compliance in Antwerp
- 737 documentary checks
  - 29 non-compliant

The Port of Antwerp endeavors to help ensure a level playing field and create a trustworthy bunkering market
Develop clear regulations on LNG bunkering

- LNG bunkering procedures published on 9/3/14

- LNG truck-to-ship bunkering has been possible in Antwerp since November 2012
  - First bunkering of an inland barge 6/12/12
  - First bunkering of a seagoing vessel 15/9/15

- Ongoing work regarding harmonization on LNG bunkering procedures
  - WPCI LNG Working Group of IAPH (led by the Port of Antwerp)
    → [www.lngbunkering.org](http://www.lngbunkering.org)
  - MOU with Port of Singapore and Zeebrugge on harmonization of LNG bunkering procedures
  - Member of Society for Gas as a Marine Fuel (SGMF)
  - Member of European Sustainable Shipping Forum (ESSF) LNG subgroup

The Port of Antwerp endeavors to play a proactive role in the development of LNG as a fuel for shipping.
Development of required supply chain and needed infrastructure

1. LNG bunker terminal
2. LNG hub
3. Liquefaction

LNG Feeder vessel

LNG powered trucks
Inland Shipping
Seafaring Shipping

LNG transport trucks
Scrubbers

Provide clarity on regulations regarding scrubbers – open vs closed loop

- Closed loop system
  - Discharge of a limited amount of wash water (bleed off)
  - Production of sludge: based on an indicative market survey handling of scrubber waste is not a problem in Antwerp

- Open loop system
  - Discharge of wash water into the surface water

→ Sulphur regulations combined with EU Water Framework Directive
→ Flemish (Belgian) Legislation: discharge of waste water (this includes scrubber wash water) is prohibited: level playing field?

➔ Scrubber Impact Assessment study for Port of Antwerp and Scheldt Estuary (in cooperation with regulatory bodies)
Scrubbers

Provide clarity on regulations regarding scrubbers – open vs closed loop

- First results
  - Results depend on location and parameter
  - The use of scrubbers will most likely have a negative impact on the concentrations of some ‘EU priority contaminants’ in the Port of Antwerp.
  - The use of closed loop scrubbers seems feasible in the Port of Antwerp if in zero discharge mode.
  - Study will be completed with more data.

→ Discussion ongoing with regulatory bodies
→ Sampling protocol is finalized in cooperation with Exhaust Gas Cleaning Association
→ Study to be finalized in April 2016

EU WFD priority substances which can be expected in the washwater

<table>
<thead>
<tr>
<th>Metals</th>
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<tbody>
<tr>
<td>Lead</td>
</tr>
<tr>
<td>Cadmium</td>
</tr>
<tr>
<td>Nickel</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>PAHs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzo(a)pyrene</td>
</tr>
<tr>
<td>Benzo(b)fluorantheen</td>
</tr>
<tr>
<td>Benzo(k)fluorantheen</td>
</tr>
<tr>
<td>Benzo(ghi)peryleen</td>
</tr>
<tr>
<td>Indeno(1,2,3-cd)pyrene</td>
</tr>
<tr>
<td>Fluorantheen</td>
</tr>
<tr>
<td>Naftaleen</td>
</tr>
</tbody>
</table>
Facilitate the adoption of OPS by private operators

- **Project IMT – terminal**
  - 10% subsidy for the installment of infrastructure by PoA,
    40% subsidy by Flemish authority
  - Variable success
    → *too few vessels are equipped to take OPS*
    → *in 2009 cost electricity > cost fuel*

- **Project Deurganckdok**
  - No regret measures

- **Future projects – Role of PoA**
  - PoA lobbies for lower taxes on OPS electricity
  - Facilitation of investments by PoA
    → *case by case approach*
    → *cooperation and long term commitments between parties involved.*
Supporting Pioneers – ESI

Environmental Ship Index – reduction of port dues by 10%
  o Focus on NOX, SOX and CO2
    • Standardized formula

ESI NOx (200) + ESI SOx (100) + ESI CO2 (10) + OPS (35)
  3.1

  o For vessels environmentally performing better than required by regulations
    • 3808 vessels

  o System utilized by a multitude of ports
    • Over 29 participating ports

  o Benchmark 31 points or top 25
    • Over 600 vessels are eligible today

The Port of Antwerp endeavors to support pioneers
Reduced port dues based on PM emission reduction

- Starting on 1/6/2015
  - First discount given on 24/8/2015 to an LNG fuelled vessel

- To support pioneers investing in innovative technologies that go further than current environmental emission regulations

- Supported technologies (based on PM reduction potential):
  - LNG
  - Scrubbers

- Degressive

<table>
<thead>
<tr>
<th>Year</th>
<th>LNG</th>
<th>Scrubbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>20%</td>
<td>15%</td>
</tr>
<tr>
<td>2016</td>
<td>15%</td>
<td>10%</td>
</tr>
<tr>
<td>2017</td>
<td>10%</td>
<td>5%</td>
</tr>
</tbody>
</table>
Conclusion

The Port of Antwerp endeavors to:
- Provide clarity on regulations
- Play a facilitating role environmental project development in the port
- Help ensure a level playing field
- Help create a trustworthy bunkering market
- Support pioneers
- ...

Play a proactive and trustworthy role in dealing with air emission regulations
Conclusion

**Everything is Possible**

- Sufficient 0,1% MGO available
- LNG bunkering procedures implemented
- Market is developing LNG bunker supply chain
  - Facilitated by the port
- LNG is already bunkered today via truck-to-ship
- Scrubbers are already in use in our port
- Pioneers are rewarded
Future Developments?
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Other environmental services to the shipping

Port reception facilities

De-gassing

Ballast water

Oil spill response

Antifouling