International Association of Ports and Harbors

- Promoting development of international port and maritime industry

- Representing port industry’s interests

- Collecting, analyzing, exchanging and distributing information on developing trends
International Association of Ports and Harbors

- 200 Regular Members (Ports) in 90 countries
  - Handling 7 billion tons of cargo
    - 60% of world sea-borne trade
    - 90% of world container traffic
- 150 Associate Members
International Association of Ports and Harbors

- Three Regions
  - Africa / Europe
  - Americas
  - Asia / Oceania

- Equal Regional Representation

- Offices in Tokyo / Japan and Rotterdam / Europe
Technical Committees

- Communication & Training
- Port Safety, Security & Environment, Legal
- Port Development, Operations & Facilitation
Some Facts

- **Houston May 2007**  
  IAPH Resolution: Clean Air Program

- **Dunkirk April 2008**  
  IAPH Resolution: Support for Climate Challenges

- **Rotterdam July 2008**  
  World Port Climate Conference: World Ports Climate Declaration

- **Los Angeles November 2008**  
  IAPH Port Environment Committee Symposium: World Port Climate Initiative (WPCI)
WPCI Mission Statement

The mission of the World Ports Climate Initiative is to

• raise awareness in the port 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
Roles And Responsibilities (1)

Chair of WPCI (Geraldine Knatz, CEO Port of Los Angeles)

- Figure-head / key promoter of WPCI
- Liaise with IAPH Port Environmental Committee
- Report progress to IAPH Board of Directors

Director WPCI bureau (Fer van de Laar, Managing Director IAPH)

- Overall coordination
- Communication & information sharing
- Point of contact
Roles And Responsibilities (2)

• **Project ports / parties**
  - Lead actions on respective theme
  - Organize team (ports and experts) and meetings
  - Organize project funding (if any)
  - Report to WPCI Director

• **Regional port branch organizations**
  - Organize support for WPCI projects from member ports
  - Engage in stakeholder dialogue (ship / port industry / hinterland transport related branch organizations)
  - Liaise with regional governments
WPCI Organization And Cooperation

- 55 supporting ports
- supporting organizations

WPCI
Chair Geraldine Knatz

WPCI bureau
Director Fer van de Laar

Regional port branch organizations
AAPA  ESPO  PAPC

Thematic approach!

IAPH
C-40
WPCC

LNG
SLA
OPS
ESI
LEE
CFP
IMT

?  ?
New York / New Jersey
Gothenburg
Rotterdam
PEMA
Los Angeles
Amsterdam
Current Projects

• Carbon Foot Print
• On-shore Power Supply
• Environmental Ship Index
• Intermodal Transport
• Low Emission Yard Equipment
• Sustainability in Lease Agreements
• LNG as a fuel
WPCI current projects

- Carbon Foot Print
- On-shore Power Supply
- Environmental Ship Index
- Intermodal Transport
- Low Emission Yard Equipment
- Sustainability in Lease Agreements
- LNG as a fuel
Ship emissions, why ports care

• Responsibility for local quality of life

• Air quality as a limiting factor for port development

• Implications of climate change

• Incorporate sustainability in the port, licence to operate and grow
Ship emissions, current options for ports

Regulations of international / regional bodies

IMO  \text{NO}_x / \text{SO}_x  \text{mandatory limits}
\text{CO}_2  \text{SEEMP}

(European Union & California Air Resources Board)
ESI: what it is [1]

- The ESI is a measure for the environmental performance of seagoing ships (air emissions) relative to IMO rules
- Provides a tool that will assist ports and other parties to promote clean shipping
- Use is on a voluntary base using self declaration
- Maximum responsibility with the ship owner
- Suitable for all sizes and types of ships
ESI: what it is \[2\]

- ESI is composed of credits (0 – 100) for above-baseline environmental performance regarding $\text{NO}_x$, $\text{SO}_x$ (indirectly PM) and $\text{CO}_2$

- $\text{NO}_x$: depending on performance of main and auxiliary engines

- $\text{SO}_x$: depending on the sulphur content of the fuels used

- $\text{CO}_2$: bonus for monitoring and reporting of $\text{CO}_2$ emissions (SEEMP)
ESI: how it works [1]

• Ships may obtain an ESI Score by reporting on verified engine certificates, bunker fuel information and CO₂ reporting, via a secured web-based application.

• The ESI administration will manage the ESI Score in its central database.

• Ports develop their own incentive scheme based on ESI points and inform the ESI administration.

• The ESI administration will enter this into its database.
OVERALL CALCULATION ESI SCORE

$$\frac{2 \times ESI \text{ NO}_x + ESI \text{ SO}_x + ESI \text{ CO}_2 + OPS}{3.1}$$

(maximum 100)
ESI: score calculation [2]

The overall ESI formula is built up of different parts for NO$_x$, SO$_x$, CO$_2$ and sub-points for OPS

**NO$_x$:** baseline Tier I; input rpm, rated power of all engines. Engines built before 2000: instead of EIAPP approved statement is accepted.

100 sub-points maximum score.

**SO$_x$:** baselines for MDO/Gasoil and HFO; input thru BDN: date, amount and sulphur content.

100 sub-points maximum score.
ESI: score calculation [3]

**CO₂** : SEEMP present with date of development and originator of the plan recorded and developed according MEPC.1/Circ.683.*
10 sub-points fixed bonus

**OPS** : Where a class approved OPS system is fitted regardless of its use.
35 sub-points fixed bonus

* SEEMP will become mandatory on 1 January 2013 and will be replaced by ...................................?
ESI: score calculation [4]

\[
\text{ESI NO}_x = \frac{100}{\sum \text{Rated Power of all Engines}} \\
\times \left( \frac{\text{NO}_x \text{ limit value} - \text{NO}_x \text{ rating}}{\text{NO}_x \text{ limit value}} \right) \times \sum \text{Rated Power of all Engines}
\]
# ESI: score calculation [5]

<table>
<thead>
<tr>
<th>FUEL</th>
<th>HFO</th>
<th>MDO</th>
<th>MDO LS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulphur Content % (m/m)</td>
<td>≤ 4.5 *</td>
<td>&gt; 0.5</td>
<td>&lt; 0.5</td>
</tr>
<tr>
<td>Baseline</td>
<td>4.5 *</td>
<td>1.0</td>
<td>0.5</td>
</tr>
<tr>
<td>Multiplying Factor</td>
<td>30</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>Relative Sulphur Content</td>
<td>x</td>
<td>y</td>
<td>z</td>
</tr>
</tbody>
</table>

**HFO**  Heavy Fuel Oil  
**MDO**  Marine Diesel Oil / Gasoil  
**MDO LS**  Marine Diesel Oil / Gasoil Low Sulphur  

* 1 January 2012 : 3.5
ESI: score calculation [6]

Average sulphur content of fuel for quarters 2 & 3 2011 :

\[ \text{Mass}_1 \times \text{sulphur content}_1 + \text{Mass}_2 \times \text{sulphur content}_2 + \ldots + \text{Mass}_x \times \text{sulphur content}_x \]

\[ \sum (\text{Mass}_1 \ldots \text{Mass}_x) \]

- HFO \text{ a}
- MDO \text{ b}
- MDO LS \text{ c}
**ESI: score calculation [7]**

\[
x = \text{the relative reduction of the average sulphur content of HFO} \ \frac{(4.5 - a)}{4.5}
\]

\[
y = \text{the relative reduction of the average sulphur content of MDO} \ \frac{(1.0 - b)}{1.0}
\]

\[
z = \text{the relative reduction of the average sulphur content of MDO LS} \ \frac{(0.5 - c)}{0.5}
\]

If the average sulphur content \((a,b,c)\) is above the baseline level, the ESI SOx sub-points of that period for that particular fuel is set on zero (no negative scores).
ESI: score calculation [8]

Scenario 1  Three fuels

HFO, MDO and MDO LS
ESI SOx = 30 * x + 35 * y + 35 * z  max. 100

Scenario 2  Two fuels

HFO and MDO (no MDO LS)
ESI SOx = 30 * x + 35 * y + 0  max. 65

HFO and MDO LS (no MDO)
ESI SOx = 30 * x + 35 + 35 * z  max. 100

MDO and MDO LS (no HFO)
ESI SOx = 30 + 35 * y + 35 * z  max. 100
ESI: score calculation [9]

Scenario 3  One fuel

HFO
ESI SOx = 30 * x + 0 + 0 max. 30

MDO
ESI SOx = 30 + 35 * y + 0 max. 65

MDO LS
ESI SOx = 30 + 35 + 35 * z max. 100
## ESI: score calculation [10]

<table>
<thead>
<tr>
<th>FUELS BUNKERED</th>
<th>HFO sub-points</th>
<th>MDO sub-points</th>
<th>MDO LS sub-points</th>
<th>MAX TOTAL sub-points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - HFO</td>
<td>30</td>
<td>-</td>
<td>-</td>
<td>30</td>
</tr>
<tr>
<td>1 - MDO</td>
<td>bonus 30</td>
<td>35</td>
<td>-</td>
<td>65</td>
</tr>
<tr>
<td>1 - MDO LS</td>
<td>bonus 30</td>
<td>bonus 35</td>
<td>35</td>
<td>100</td>
</tr>
<tr>
<td>2 - HFO &amp; MDO</td>
<td>30</td>
<td>35</td>
<td>-</td>
<td>65</td>
</tr>
<tr>
<td>2 - HFO &amp; MDO LS</td>
<td>30</td>
<td>bonus 35</td>
<td>35</td>
<td>100</td>
</tr>
<tr>
<td>2 - MDO &amp; MDO LS</td>
<td>bonus 30</td>
<td>35</td>
<td>35</td>
<td>100</td>
</tr>
<tr>
<td>3 - HFO &amp; MDO &amp; MDO LS</td>
<td>30</td>
<td>35</td>
<td>35</td>
<td>100</td>
</tr>
</tbody>
</table>
### ESI: score calculation [11]

<table>
<thead>
<tr>
<th>LNG Carrier</th>
<th>ESI NOx</th>
<th>ESI SOx</th>
<th>ESI CO2</th>
<th>OPS</th>
<th>ESI SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turbine</td>
<td>80</td>
<td>100</td>
<td>*</td>
<td>**</td>
<td>&gt; 58</td>
</tr>
<tr>
<td>Diesel</td>
<td>*** (60)</td>
<td>**** (65)</td>
<td>*</td>
<td>**</td>
<td>&gt; 40</td>
</tr>
</tbody>
</table>

* 10 where SEEMP is present

** 35 where OPS system is fitted (only very few if any LNG Carriers fitted with OPS)

*** Dependent on EIAPP Certificate data but typical 60

**** Dependent on fuel mix but typical 65
ESI: how it works [2]

- On entering an ESI-Port, the ship may inform that port of its participation in ESI

- The port may then apply incentives for clean shipping

Whenever a port so wishes

- it can verify the ESI and may check the data on board the ship and report the results to the ESI administration
ESI: how it works [3]

**ACTIVE PORTS (1)**

<table>
<thead>
<tr>
<th>ESI SCORE</th>
<th>INCENTIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amsterdam &gt; 20</td>
<td>~ 6 % reduction on port dues</td>
</tr>
<tr>
<td>Rotterdam &gt; 30 or best 25</td>
<td>~ 10 % reduction on port dues</td>
</tr>
<tr>
<td>Oslo &gt; 20</td>
<td>30 % reduction on port dues (tankers only)</td>
</tr>
<tr>
<td>Antwerp &gt; 30 or best 25</td>
<td>~ 10 % reduction on port dues</td>
</tr>
<tr>
<td>Hamburg &gt; 20</td>
<td>~ 10 % reduction on port</td>
</tr>
<tr>
<td>Green Award(GA)</td>
<td>ESI ships obtain extra GA points</td>
</tr>
</tbody>
</table>
ESI: how it works [4]

### ACTIVE PORTS (2)

<table>
<thead>
<tr>
<th>ESI SCORE</th>
<th>INCENTIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bremen / Bremerhaven</td>
<td>≥ 20</td>
</tr>
<tr>
<td>Kiel</td>
<td>≥ 30</td>
</tr>
<tr>
<td>Zeebrugge</td>
<td>≥ 20</td>
</tr>
<tr>
<td>Groningen</td>
<td>≥ 20</td>
</tr>
<tr>
<td>Le Havre</td>
<td>≥ 20</td>
</tr>
<tr>
<td>PORT</td>
<td>INCENTIVE</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>in preparation</td>
</tr>
<tr>
<td>Wilhelmshaven</td>
<td>in preparation</td>
</tr>
<tr>
<td>Port of Civitavecchia</td>
<td>in preparation</td>
</tr>
<tr>
<td>Gent</td>
<td>in preparation</td>
</tr>
<tr>
<td>Zealand Seaports</td>
<td>in preparation</td>
</tr>
<tr>
<td>Port X</td>
<td></td>
</tr>
<tr>
<td>Port Y</td>
<td></td>
</tr>
<tr>
<td>Port Z</td>
<td></td>
</tr>
</tbody>
</table>
ESI website

www.environmentalshipindex.org

www.wpci-esi.org

www esi wpci nl