



International Association of Ports and Harbors

GREENING THE MARITIME INDUSTRY



World Ports Climate Initiative



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**



International Association of Ports and Harbors

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**

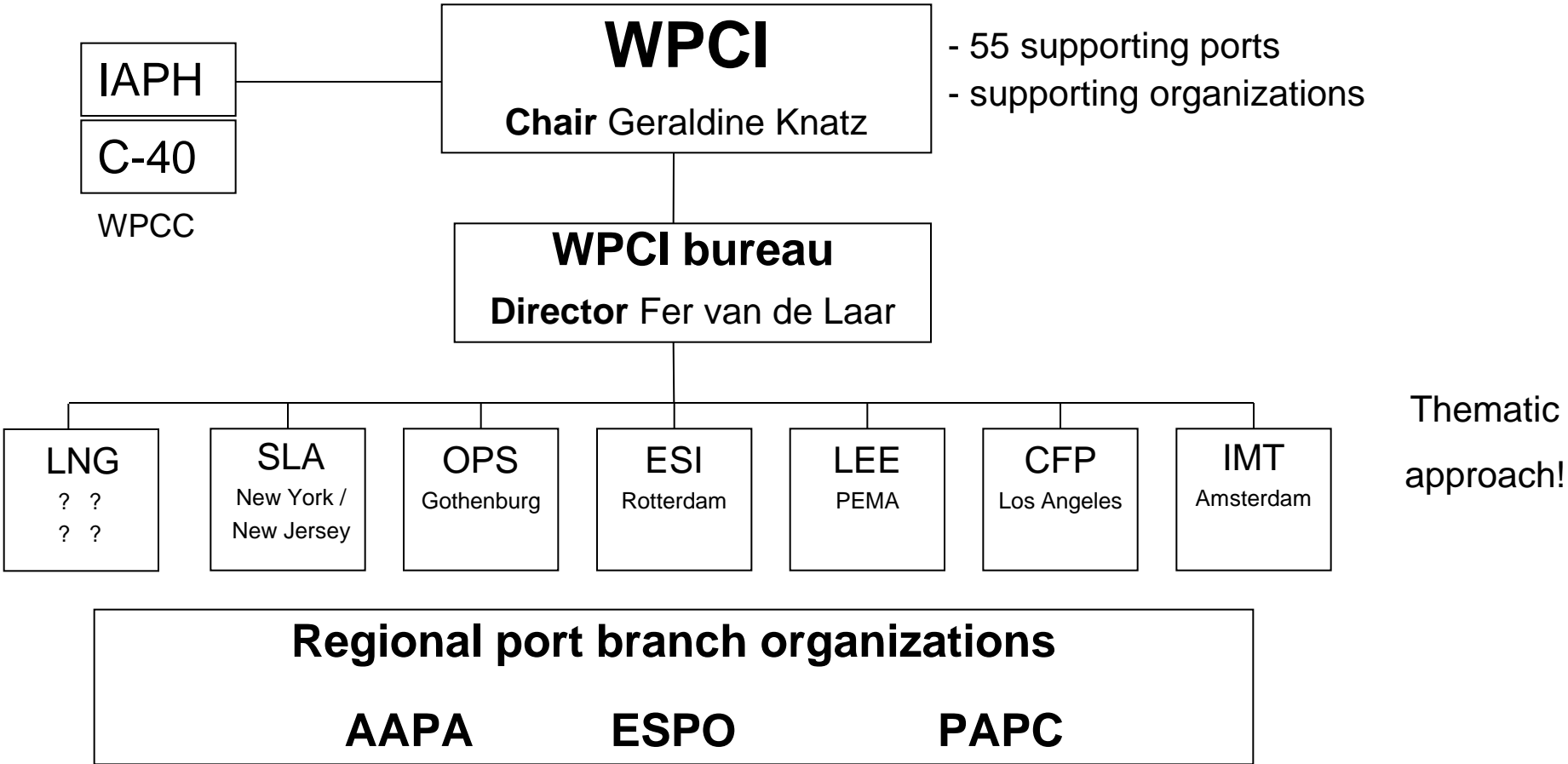


Roles And Responsibilities (2)

- **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



WPCCI Organization And Cooperation





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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



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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**



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Ship emissions, current options for ports

Regulations of international / regional bodies

IMO

**NO_x / SO_x
CO₂**

**mandatory limits
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**



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ESI: what it is [2]

- **ESI is composed of credits (0 – 100) for above-baseline environmental performance regarding NO_x, SO_x (indirectly PM) and CO₂**
- **NO_x: depending on performance of main and auxiliary engines**
- **SO_x: depending on the sulphur content of the fuels used**
- **CO₂: bonus for monitoring and reporting of CO₂ emissions (SEEMP)**



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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**



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ESI: score calculation [1]

OVERALL CALCULATION ESI SCORE

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

(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 2103 and will be replaced by?



ESI: score calculation [4]

ESI NO_x =

$$\frac{100}{\Sigma \text{ Rated Power of all Engines}}$$

X

X

$$\frac{(\text{NO}_x \text{ limit value} - \text{NO}_x \text{ rating}) \times \text{Rated Power}}{\text{NO}_x \text{ limit value}} \Sigma \text{ of all Engines}$$

ESI: score calculation [5]

FUEL	HFO	MDO	MDO LS
Sulphur Content % (m/m)	≤ 4.5 *	> 0.5	< 0.5
Baseline	4.5 *	1.0	0.5
Multiplying Factor	30	35	35
Relative Sulphur Content	x	y	z

HFO **Heavy Fuel Oil**

MDO **Marine Diesel Oil / Gasoil**

MDO LS **Marine Diesel Oil / Gasoil Low Sulphur**

* 1 January 2012 : 3.5

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ESI: score calculation [6]

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

$$\frac{\text{Mass}_1 \times \text{sulphur content}_1 + \text{Mass}_2 \times \text{sulphur content}_2 + \dots + \text{Mass}_x \times \text{sulphur content}_x}{\Sigma(\text{Mass}_1 \dots \text{Mass}_x)}$$

HFO **a**

MDO **b**

MDO LS **c**



ESI: score calculation [7]

- x** = the relative reduction of the average sulphur content of HFO
 $(4.5 - a) / 4.5$
- y** = the relative reduction of the average sulphur content of MDO
 $(1.0 - b) / 1.0$
- z** = the relative reduction of the average sulphur content of MDO LS
 $(0.5 - c) / 0.5$

If the average sulphur content (**a,b,c**) is above the baseline level, the ESI SO_x 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

$$\text{ESI SOx} = 30 * x + 35 * y + 35 * z \quad \text{max. 100}$$

Scenario 2

Two fuels

HFO and MDO (no MDO LS)

$$\text{ESI SOx} = 30 * x + 35 * y + 0 \quad \text{max. 65}$$

HFO and MDO LS (no MDO)

$$\text{ESI SOx} = 30 * x + 35 + 35 * z \quad \text{max. 100}$$

MDO and MDO LS (no HFO)

$$\text{ESI SOx} = 30 + 35 * y + 35 * z \quad \text{max. 100}$$

ESI: score calculation [9]

Scenario 3

One fuel

HFO

$$\text{ESI SOx} = 30 * x + 0 + 0 \quad \text{max. 30}$$

MDO

$$\text{ESI SOx} = 30 + 35 * y + 0 \quad \text{max. 65}$$

MDO LS

$$\text{ESI SOx} = 30 + 35 + 35 * z \quad \text{max. 100}$$

ESI: score calculation [10]

FUELS BUNKERED	HFO sub-points	MDO sub-points	MDO LS sub-points	MAX TOTAL sub-points
1 - HFO	30	-	-	30
1 - MDO	bonus 30	35	-	65
1 - MDO LS	bonus 30	bonus 35	35	100
2 - HFO & MDO	30	35	-	65
2 - HFO & MDO LS	30	bonus 35	35	100
2 - MDO & MDO LS	bonus 30	35	35	100
3 - HFO & MDO & MDO LS	30	35	35	100



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ESI: score calculation [11]

LNG Carrier	ESI NOx	ESI SOx	ESI CO2	OPS	ESI SCORE
Turbine	80	100	*	**	> 58
Diesel	***(60)	**** (65)	*	**	> 40

* 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



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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)

ESI SCORE

INCENTIVE

Amsterdam	≥ 20	~ 6 % reduction on port dues
Rotterdam	≥ 30 or best 25	~ 10 % reduction on port dues
Oslo	≥ 20	30 % reduction on port dues (tankers only)
Antwerp	≥ 30 or best 25	~ 10 % reduction on port dues
Hamburg	≥ 20	~ 10 % reduction on port
Green Award(GA)		ESI ships obtain extra GA points



ESI: how it works [4]

ACTIVE PORTS (2)

ESI SCORE

INCENTIVE

Bremen / Bremerhaven	≥ 20	5 % reduction on port dues
Bremerhaven	≥ 31	10 % reduction on port dues
Kiel	≥ 30	10 % reduction on port dues
Zeebrugge	≥ 20	10 % reduction on port dues
Groningen	≥ 20	5 % reduction on port dues
Le Havre	≥ 20	10 % reduction on port

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ESI: what ports next ?

PORT

Los Angeles

Wilhelmshaven

Port of Civitavecchia

Gent

Zealand Seaports

Port X

Port Y

Port Z

INCENTIVE

in preparation

in preparation

in preparation

in preparation

in preparation

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ESI website

www.environmentalshipindex.org

www.wpci-esi.org

www.esi.wpci.nl