

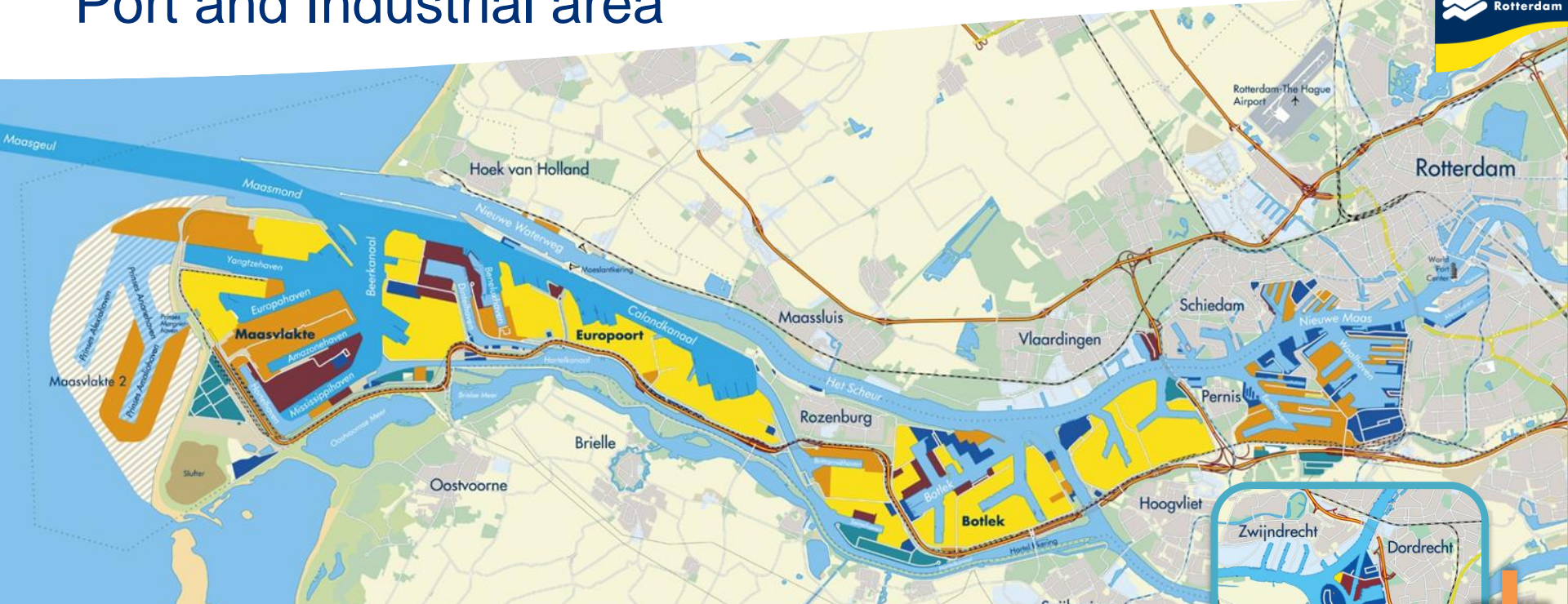
Reducing air emissions in the Port of Rotterdam (PoR)



SHANGHAI 13-12-2012

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Port and Industrial area



Over 40 kilometres!



Port in figures

Port of Rotterdam engine of the economy

- Total port area 26,000 acres (net 12,500 acres)
- Total employment 140,000 people (90,000 direct and 50,000 indirect)
- Total added value € 10.3 billion
- Throughput 435 million tons; 11.1 million TEU (2011)
- Depth up to 75 ft (= 24 m)



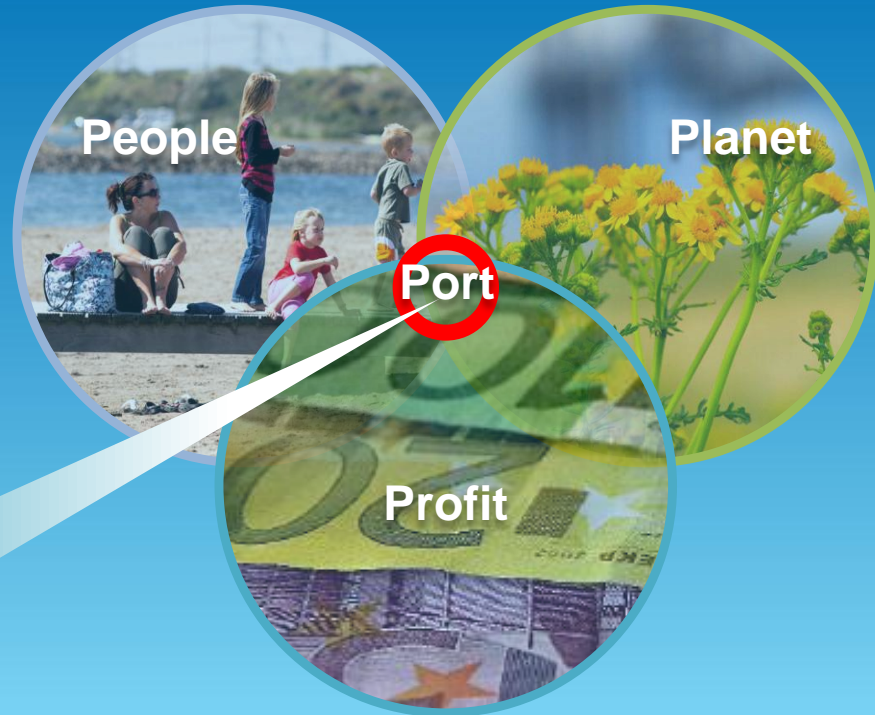
Employment

Sustainability: Licence for future operation

- Investments in sustainability are necessary for consensus & growth
- When Sustainability is an unknown entity; resistance can be expected : be patience and try to understand drivers from all stakeholders
- Sustainability is the balance between:

Priorities:

- Optimum use of space
- Sustainable accessibility
- Air quality & climate



Sustainability: Scope and influence

Port of Rotterdam Authority



Influence: ++
Effect: --

Port and industrial area



Influence : +
Effect: -

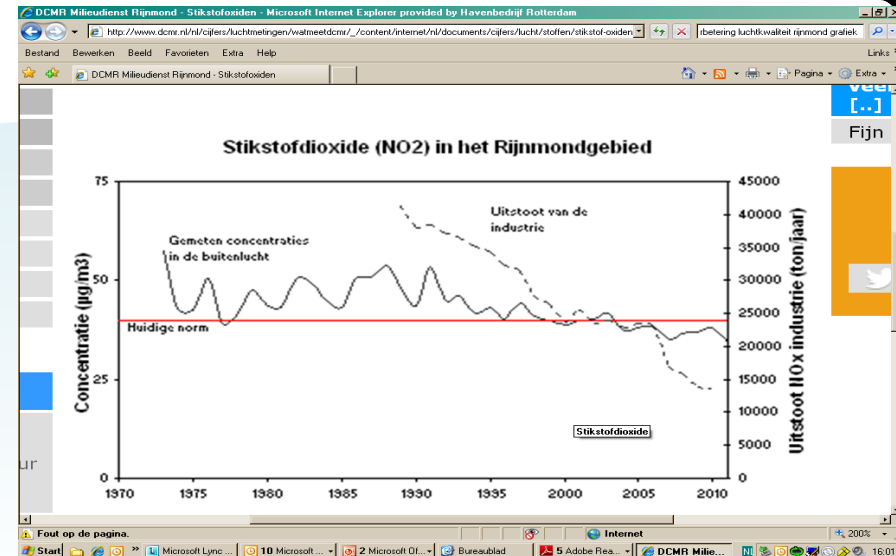
Chain



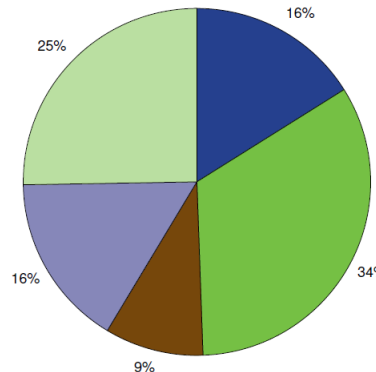
Influence : +/-
Effect: ++

Airquality in the past (< 2006)

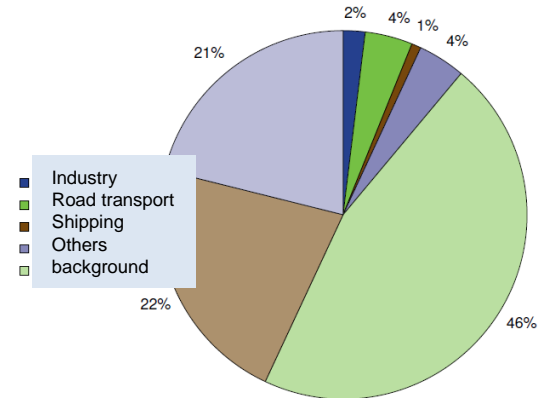
- Decreasing airquality standards
- More industrial activities
- More transport
- Influence 3 major targetgroups:
 - PoR: Shipping (inland and seagoing)
 - Ministry of Transport: Roadtransport
 - DCMR EPA: industry
- Improving airquality (EPA) models and measurements different sources (MoT)
- Partition all sources which contribute to the airquality



NO₂-concentraties
bijdrage van sectoren



Fijnstofconcentraties
bijdrage van sectoren



Clean Air Action Program own fleet

- Started in 2006
- Using sulphurfree (< 0.005% S) diesel
- 3 Newbuilts and 2 retrofitted engines comply with CCR Phase II (emission) standards
- 5 vessels with Selective Catalists Reduction (NO_x ↓) and soot filter (PM ↓)
- 1000 hour pilot with 100% Hydrotreated Vegetable Oil (HVO) (CO_2 ↓) on 1 vessel together with Rotterdam Climate Initiative and Neste Oil
- Saving while sailing (smart planning, report fuel use, monthly best performing vessel)



Seagoing patrol vessel RPA 16



Fathom measure vessel Surveyor 1

Clean Air Action Program for calling inland barges

- Ban of vessels from 2025 if not comply with CCR II emission standards
- surplus 10% port dues if not compliant with CCR II emission standards
 - This surplus is only used for local funding program for cleaner vessels and sustainable logistics*
- 15% discount Green Award for inland vessels
www.greenaward.org/467-english.html
- 30% discount if 60% below the CCR II standards
- Speed limitation on some locations from 2014
- EU-Law: Since 2011 using max 10 ppm S fuel in EU
- Onshore Power Supply on all public quays. Forbidden to use generators where OPS is available (Port Bye Laws)
- **NEW: Bunkering of LNG (fuel)**



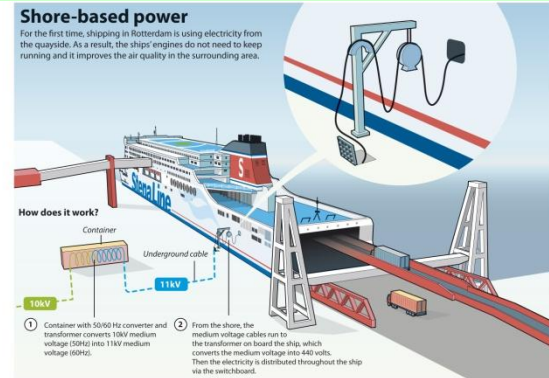
Clean Air Action Program for Seagoing vessels

- Promote clean ships by financial incentives (discount on Port Dues)
Based on Environmental Ship Index (www.environmentalshipindex.org)
- Feasibility studies for Onshore Power Supply
 - Cruiseterminal (not realised)
 - Container terminal (not realised)
 - Ferries companies
- Onshore power supply
 - StenaLine (Hook of Holland) 2 connections
 - Prepare new quays (for containerterminals on new port extension Maasvlakte 2)
- NEW:** Facilitate new bunkerfuels like LNG from 2014
- North sea is Sulphur Emission Control Area (max 1.00 m/m S)
- EU Sulphur Directive: max 0.10 m/m S while at berth in ports



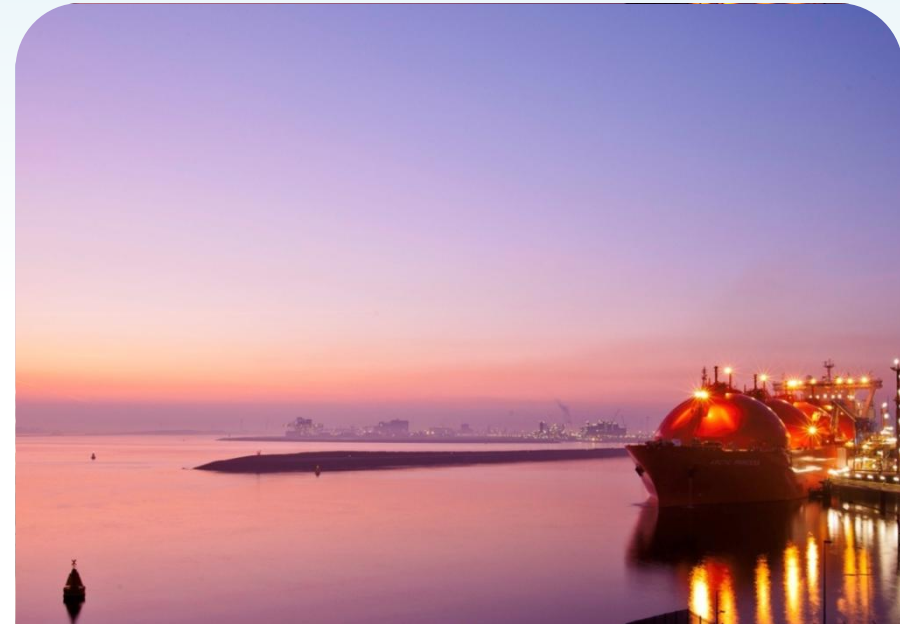
Shore-based power

For the first time, shipping in Rotterdam is using electricity from the quayside. As a result, the ship's engines do not need to keep running and it improves the air quality in the surrounding area.



Q1: How to engage and get support from various stakeholders?

- WHY: your own conviction for promoting clean ship which improve air quality
- HOW: by showing and present your own projects and using ESI
- WHAT: invest in clean technology and discount on Port Dues
- Discuss with your stakeholder
 - at front (before developing plans)
 - during implementation
- Try to get understanding of possible resistance
- Involve the best performing companies in your plan
- Have regular meetings with your stakeholders



Q2: How to evaluate and identify best applicable measures?

- **Start with low hanging fruit (quick wins)**
- Less indirect hurdles
- **Common approach by port authorities**
 - Same vessels call different port!
- **act/lobby together with stakeholders**
- Search for common benefits
 - Support from people living near your port
 - Better for the environment (beyond standards)
 - Develop a financial benefit for stakeholders who have to perform better
 - Local benefits prefer to global effects
 - **Use simple & harmonized approach for vessels and ports -> easy adoption**



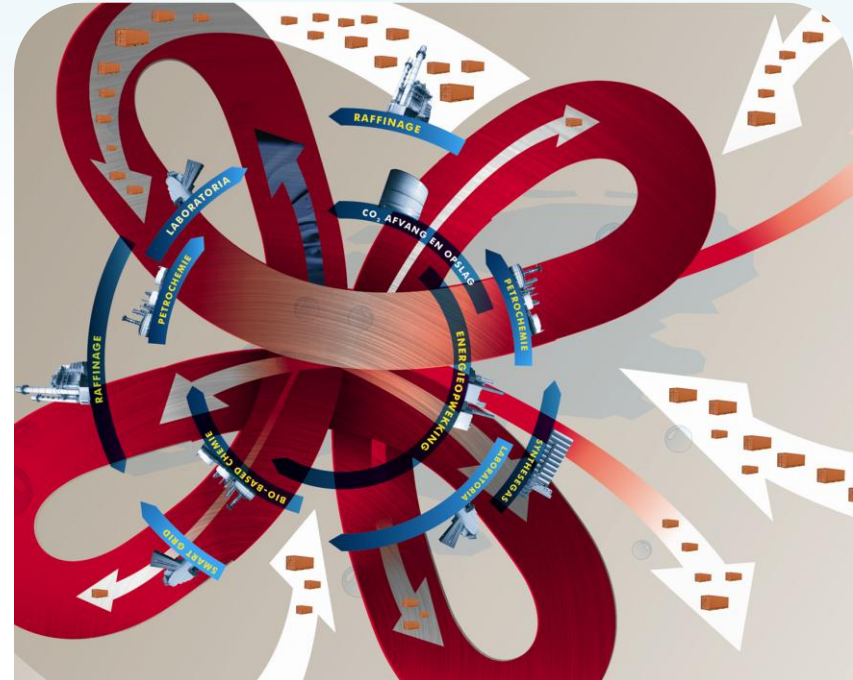
Q3: How to evaluate success of the programs?

- Start your program with target (Specific, Measurable, Acceptable, Realistic and Time)
- Acceptance by own management (internal) [PortVision2030 \(click on Environment, short movie\)](#)
- Acceptance by stakeholders (external) : shipping lines, people living near port, NGO's
- E.g. all LNG chain actors are needed to develop for the LNG bunkerchain: do they work together?
- Is their a spin-off?
- Evaluate during the program and improve



Q4: Results of the air programs to-date?

- Be the first and more will follow...
- Environmental differentiated port dues for inland barges operate since 2012
- Environmental Ship Index discount operate since 2011
 - Increasing number of certified vessels (now more than 1,400)
 - Increasing number of incentive providers (now 20)
- LNG:
 - All stakeholders in LNG chain are needed
 - Increasing requests for supplying and bunkering



Environmental Opportunities & Challenges

- The burning of LNG reduces the emissions of PM10, NOx and SOx for inland and seagoing vessels
- The LNG engines may comply with TIER III criteria (NOx seagoing)
- *During LNG bunkering and burning some methane (CH4) may escape*
- *Don't forget this environmental challenge: public perception of climate change is a risk in a sense*
- [Several calculation methods result in different Methane Numbers]
- Measurements during operation must show the expected emission reduction.

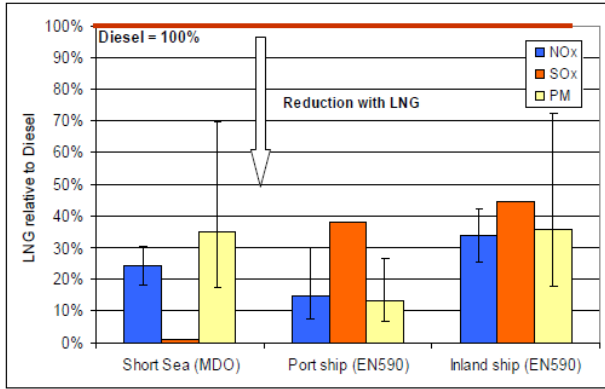


Figure 5. Comparison annual air pollutant emissions between diesel and LNG engines for 2011 – 2015.

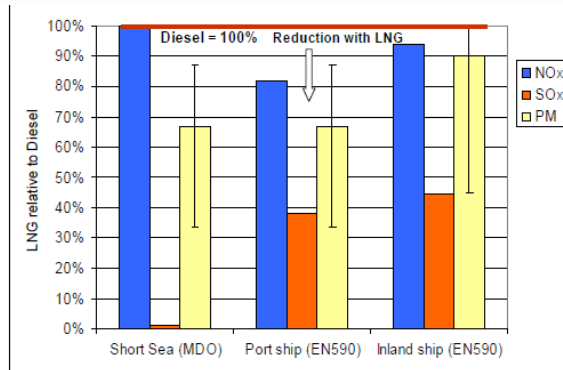


Figure 6. Comparison annual air pollutant emissions between diesel and LNG engines for 2016 and later (diesel engines are assumed to be equipped with deNOx SCR catalyst).

LNG story line: Environment and Safety

- In 2009 LNG raise on the horizon for maritime industry
- Only environmental benefits, so let's go for it
- Some safety issues arise
- To continue this development we needed a better understanding
- We are on track
- Some work still has to be done
- We need your input and assistance in this process
- We will be ready in time
- *In this timeline our discussion were with different stakeholders.*

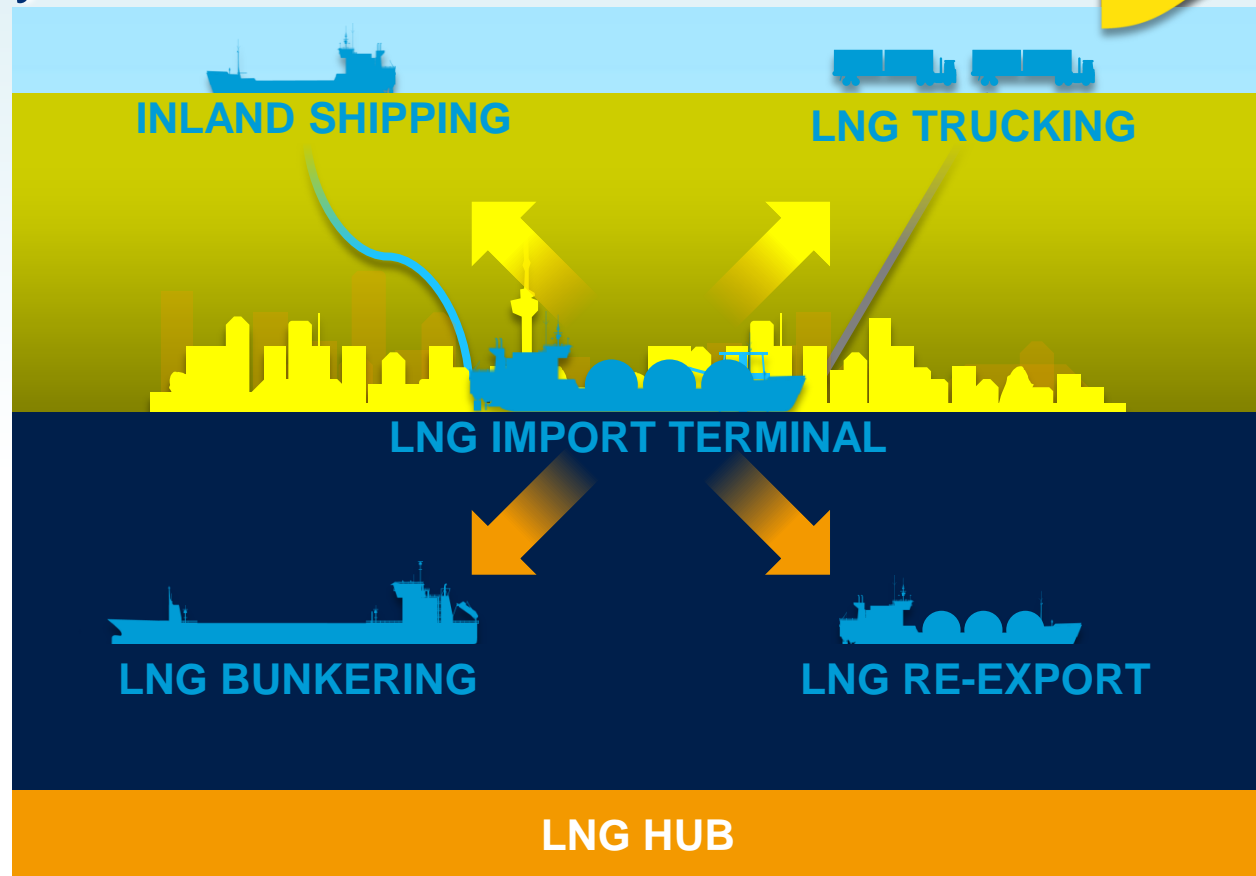


ARTIST IMPRESSION LNG BREAK BULK TERMINAL (MAASVLAKTE 2)

New LNG opportunity's in the Port of Rotterdam

Role for a Port Authority:

- Co – investor in nautical infrastructure
- Understand Safety issues
- Develop (if necessary) Regulations (port Bye Laws)
- Incentives
- Strategic Alliances (for LNG chain)
- (Inter)national lobby

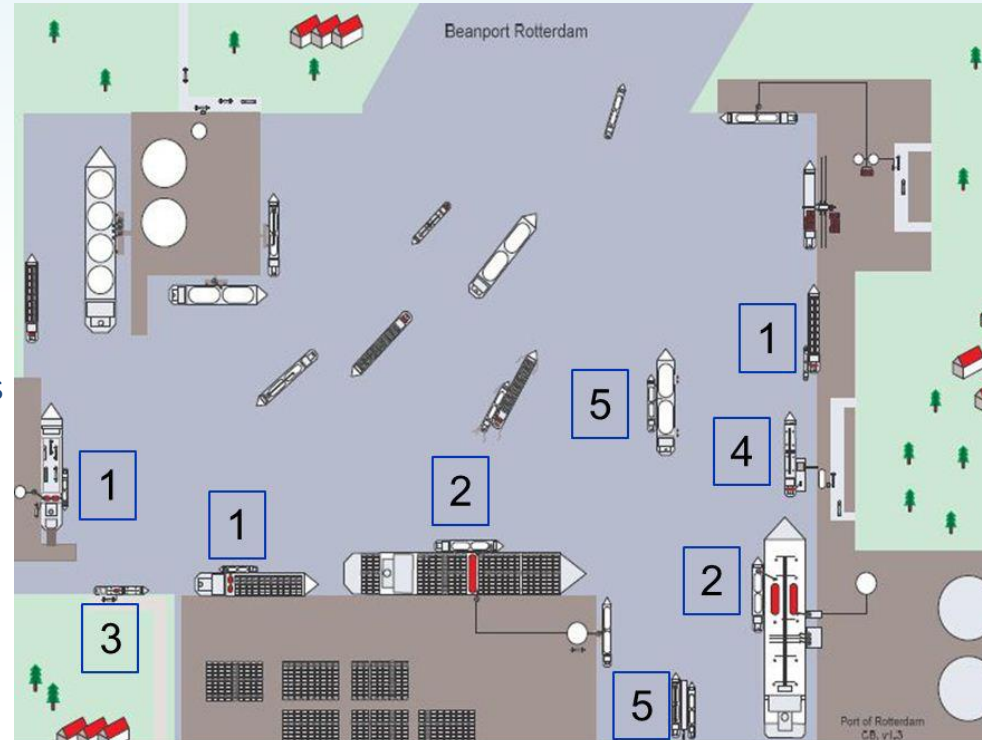


Port toolkit safety distances LNG bunkering

We identified various LNG bunker activities our port area. Those activities can be grouped in five different categories:

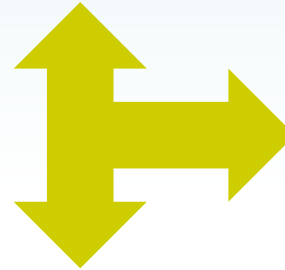
- 1) LNG bunkering from small inland bunker vessel to small vessels
- 2) LNG bunkering from large bunker vessel to seagoing vessels
- 3) LNG bunkering from trucks to small vessels
- 4) LNG bunkering from bunker pontoons to small vessels
- 5) LNG transfer from ship to ship


Bunker activities from land are excluded in the study.




Bunkering in Rotterdam

- Based on IGF code
- ISO standards
- Guidance from WPCI
- Several QRA for bunkering in ports
- Experience in ports
- Discussion with other authorities
- At same time as (un)loading cargo
- No extra time needed for bunkering





INTERNATIONAL MARITIME ORGANIZATION



SUB-COMMITTEE ON BULK LIQUIDS AND GASES
16th session
Agenda item 6
BLG 16/6
15 July 2011
Original: ENGLISH

DEVELOPMENT OF INTERNATIONAL CODE OF SAFETY FOR SHIPS USING GASES OR OTHER LOW FLASHPOINT FUELS

Report of the working group at BLG 15 (part 2)
Submitted by the Chairman of the working group

SUMMARY

Executive summary: This document provides part 2 of the report of the Working Group on the Development of provisions for gas-fuelled ships met during BLG 15

Strategic direction: 5.2

High-level action: 5.2.1

Planned output: 5.2.1.3

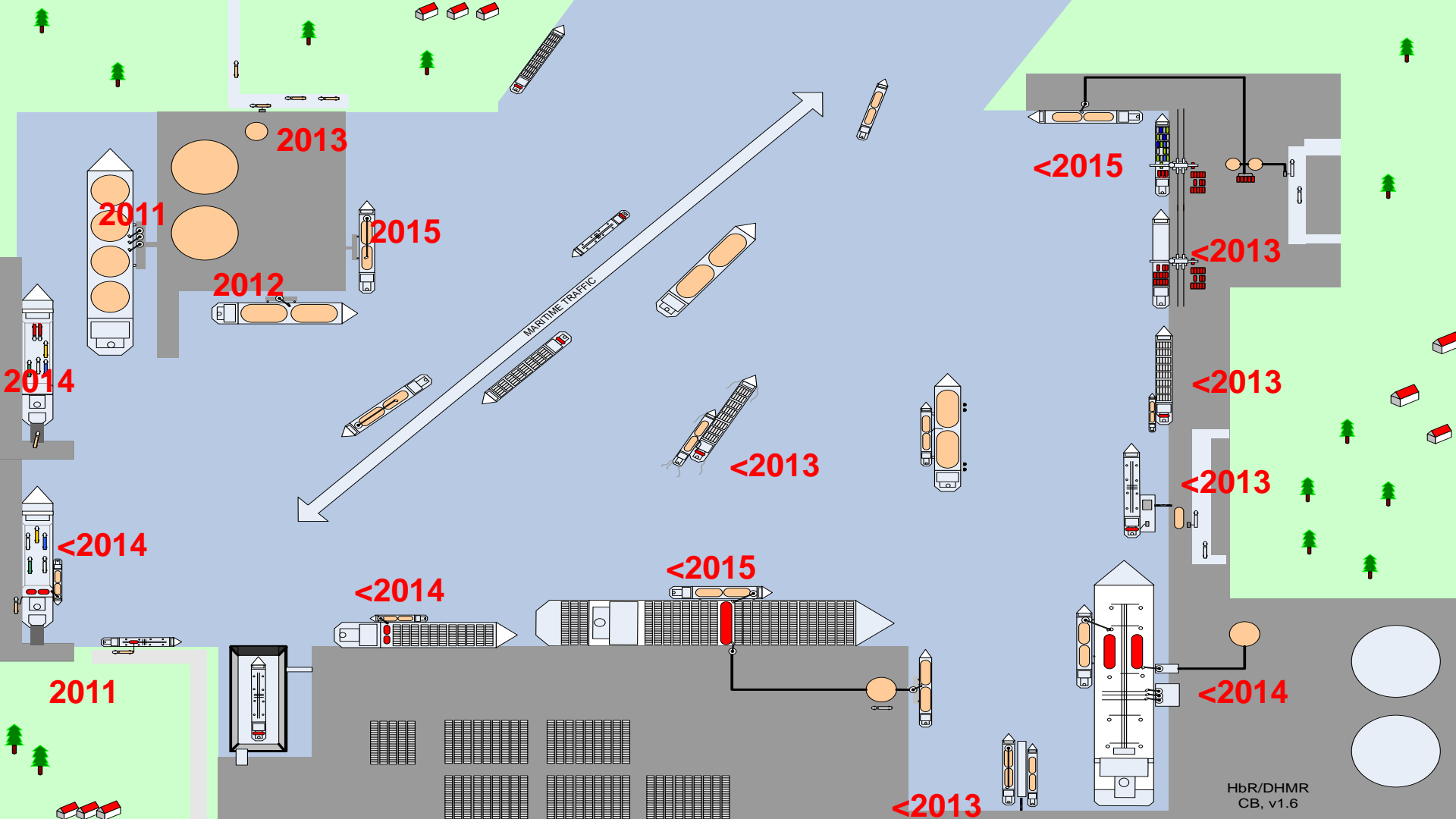
Action to be taken: Paragraph 10

Related documents: BLG 15/19; BLG 15/6; BLG 15/6/1; BLG 15/6/2 and BLG 15/WP.5

General

- The Working Group on the Development of provisions for gas-fuelled ships met from 7 to 9 February 2011 (part 1) and from 10 to 11 February 2011 (part 2), under the chairmanship of Ms. T. Stemre (Norway).
- The group was attended by delegates from the following Member Governments:
 - LIBERIA
 - MARSHALL ISLANDS
 - NETHERLANDS
 - NORWAY
 - REPUBLIC OF KOREA
 - SPAIN
 - SWEDEN
 - UNITED KINGDOM
 - UNITED STATES





World Port Climate Initiative: mission



International Association of Ports and Harbors

GREENING THE MARITIME INDUSTRY



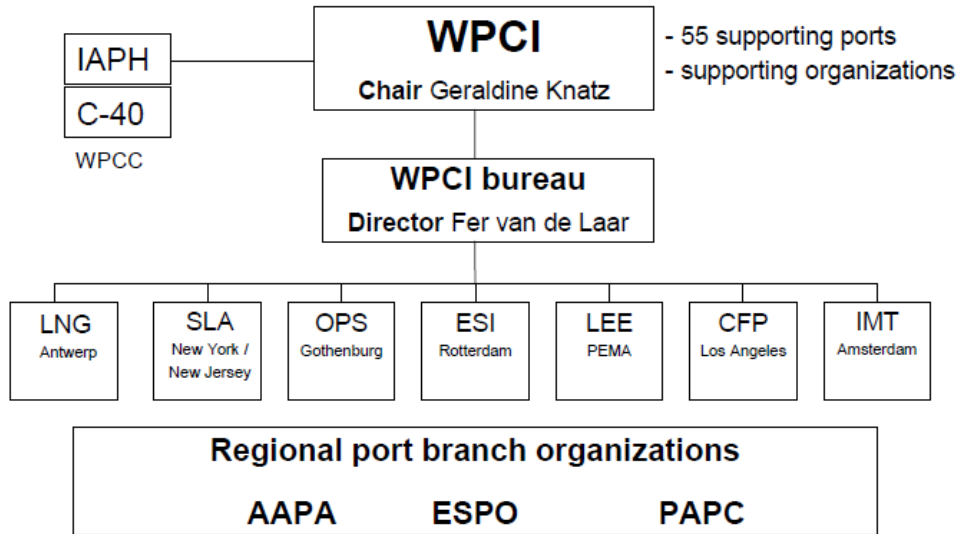
World Ports Climate Initiative

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

WPCI: Organisation and why

WPCI Organization And Cooperation



Why ports care about ship emissions:

- Responsibility for local quality of life
- Air quality as a limiting factor for port development
- Implications of the climate change (CO₂ mainly but also methane as a GreenHouseGas)
- Incorporate sustainability in port, license to operate and grow

WPCI/WG LNG



World
Ports
Climate
Initiative



SWG 1: Bunkerchecklists

- **Create bunker checklists to reflect the extra requirements of ports with regards to LNG bunkering operations in a port environment.**
- ***Create guidance document* with regards to the conditions for safe bunkering in the port**
- **Some ports might choose the method of accreditation for bunker companies based on certain conditions. A guideline for the content of these conditions will be developed in this SWG.**
- **Standardization and harmonization for our common clients**



SWG 2: Risk perimeters

- Create guidance to harmonized approach of risk perimeters of the different possible LNG bunkering scenarios within a port environment.

SWG 3: public awareness / communication

- Make up documents per target group
- Communication approach

SWG 4: information share point

- Create website for participants and reference group





Thank you