



SUSTAINABLE PORT DEVELOPMENT IN PORT OF ROTTERDAM: NOISE MANAGEMENT AND NEPTUNES

Frank Wolkenfelt, program manager Noise, Port of Rotterdam
V04 20180404

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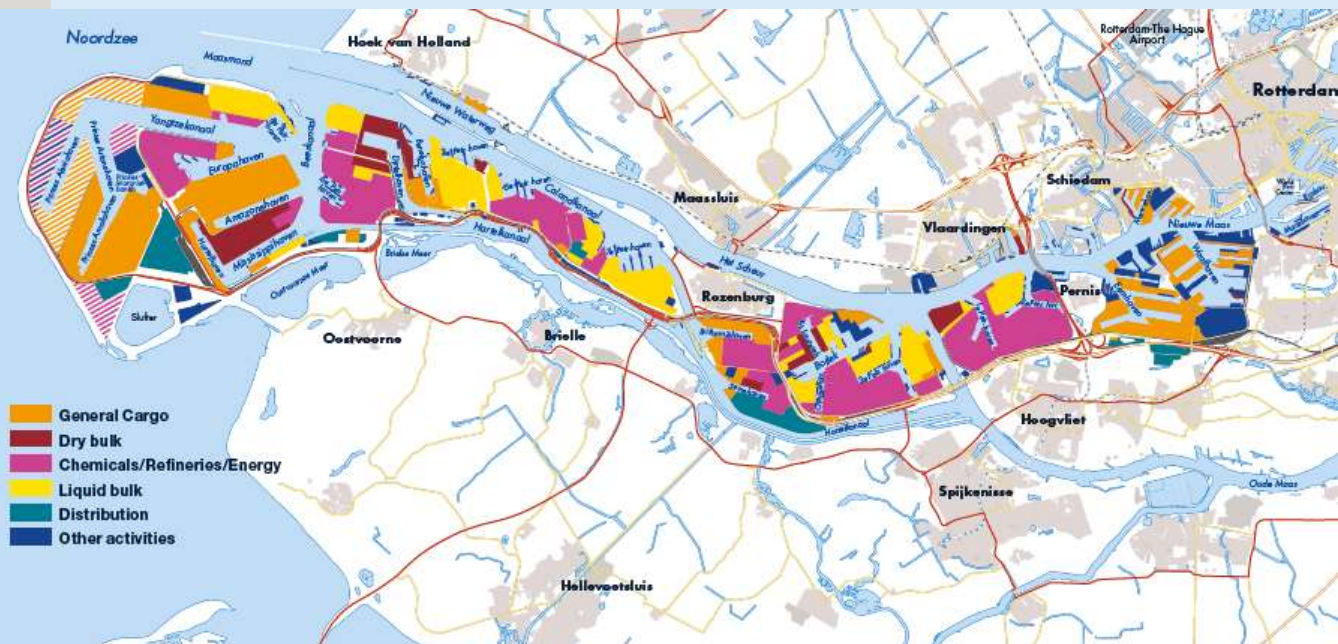
Introduction

Port of Rotterdam

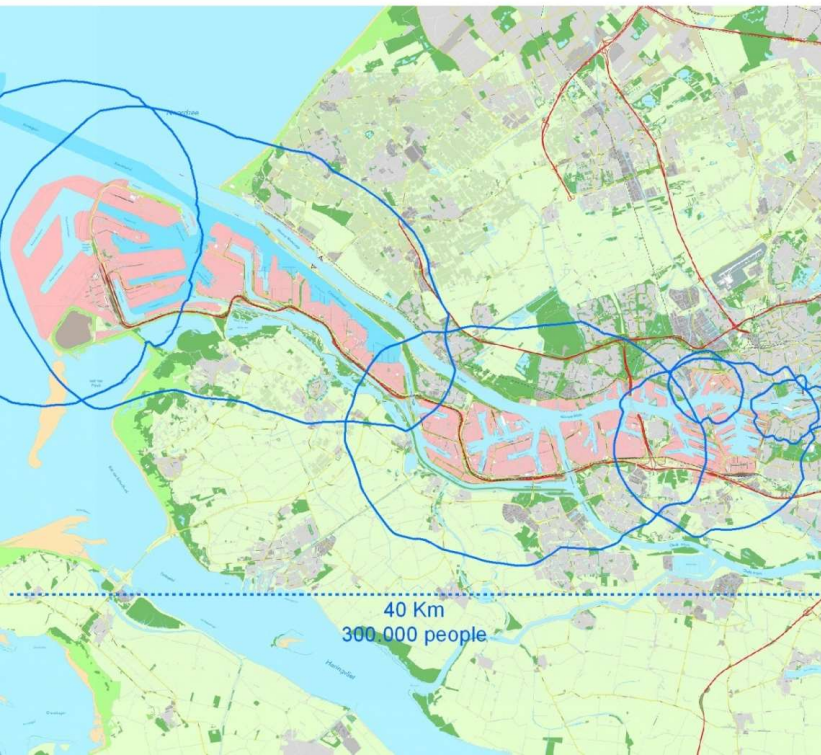
Unrestricted accessibility 24 hours a day,
7 days a week

2016

Total port area, including Maasvlakte 2	12,643 ha
Land area	7,833 ha
of which rentable sites	5,978 ha
Water area	4,810 ha
Total length Rotterdam's port area	42 km
Water depth N.A.P. (max.)	24 m
Depth Eurogeul in the North Sea NAP (max.)	26 m
Length Eurogeul in the North Sea	57 km
Pipelines	1,500 km
Quay length	76.3 km
Banks (slopes)	202.1 km
Sea jetties	19
Inland jetties	100
Dolphins	15
Buoys	12
Pontoons	106



Introduction

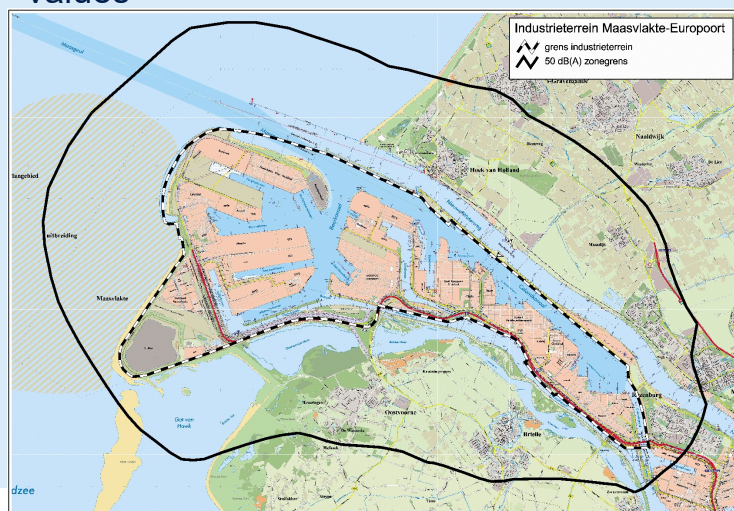


Stakeholders for sustainable port development

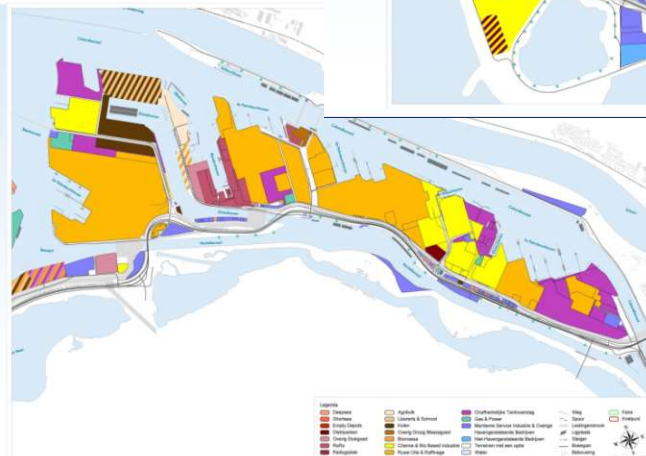
- The Port of Rotterdam commercial landlord facilitating economic growth
- (Organized) Industry (international) competition and growth
- Municipalities building houses
- Inhabitants concerned about nuisance and health
- The Environmental Protection/Permitting Agency Enforcement
- Ministries legislation
- NGO's nature and common health
- Organized health care common health care

Noise Management in Port Area

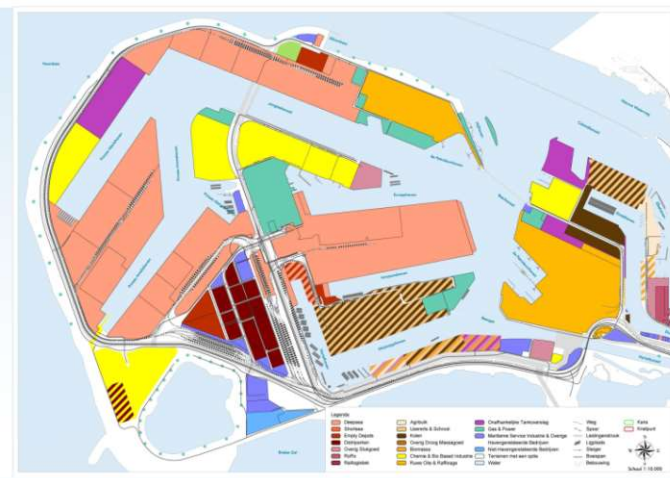
- Total of industrial noise has to stay within legal limit values
- Limit: 50 dB(A) noise zone for port areas (ca mid '90s)
- Task: Port development (2030 and later) should match with limit values



Masterplankaart 2030
Europoort



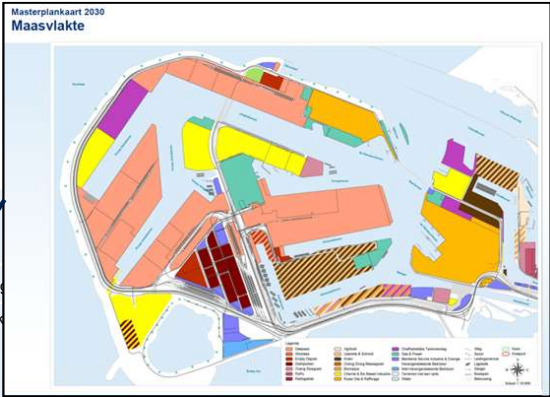
Masterplankaart 2030
Maasvlakte



Noise Management in Port Area

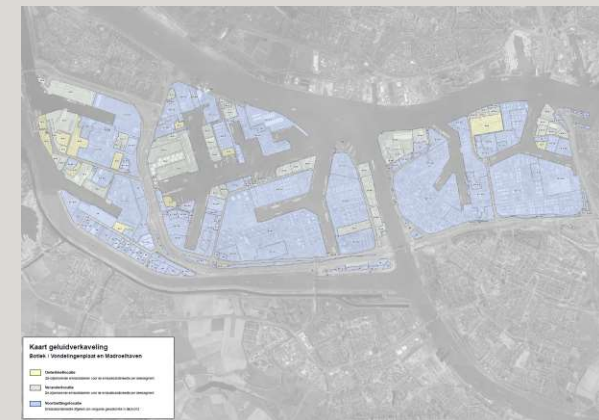
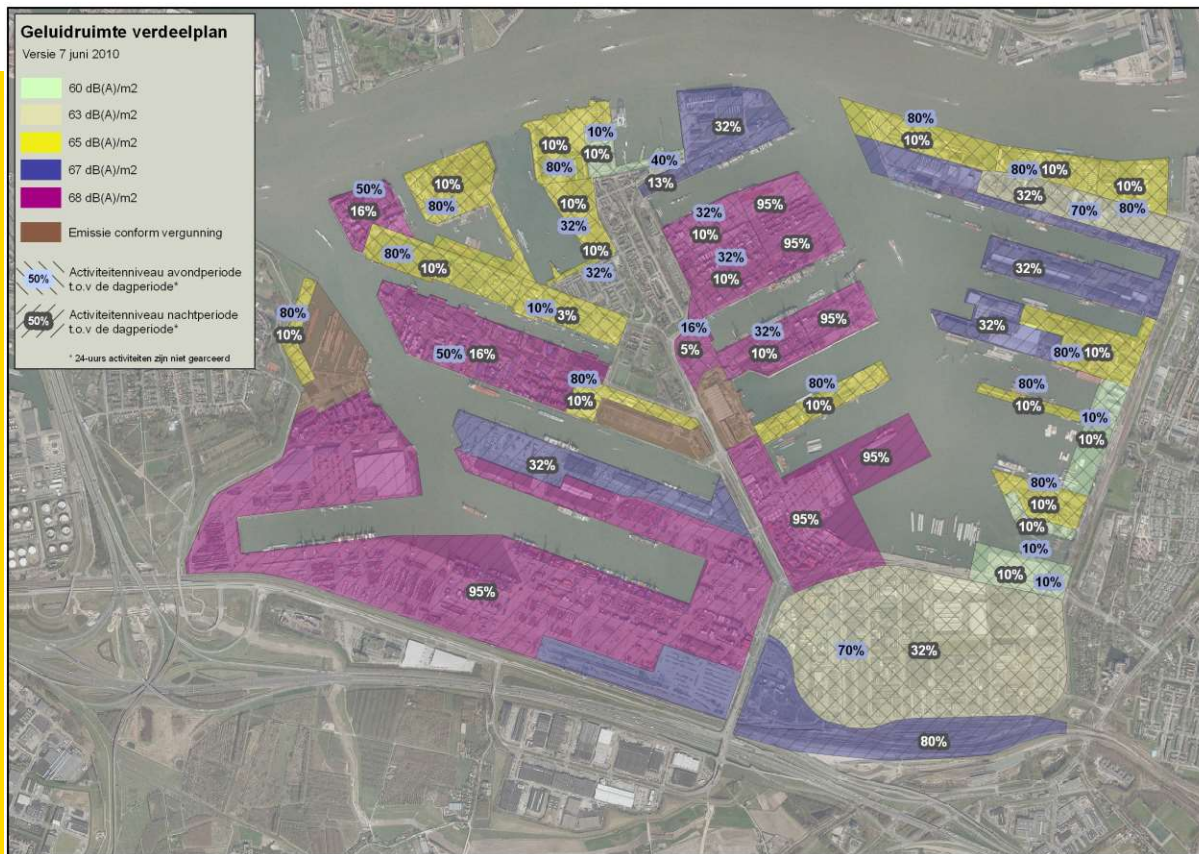
How: noise distribution plan for the port area

Tooling: dedicated software system



Kental nieuw in dB(A)/m2			
2023			
Hoofdse Non-bulk	Breakbulk	Empty depots (emd)	60 - 67
		Distributie (dis)	54 - 61
		Overige stukgoed (ovs)	62 - 67
		RoRo (roro)	62 - 67
Droog massagoed	Droog massagoed	Agribulk (agi)	65 - 70
		Schroot (srt)	70 - 74
		IJzererts & Kolen (y&k)	65 - 70
		Overige droog massagoed (odm)	65 - 70
Nat massagoed	Chemie & Bio-based industry	Chemische industrie (chi)	65 - 70
		Bio-based industry (bbi)	65 - 70
	Ruwe olie en raffinage	Raffinaderijterminals (rat)	51 - 61
		Raffinaderijen (raf)	65 - 70
	Onafhankelijke tankopslag	Minerale olieproducten (otm)	51 - 61

Noise Management in Port Area



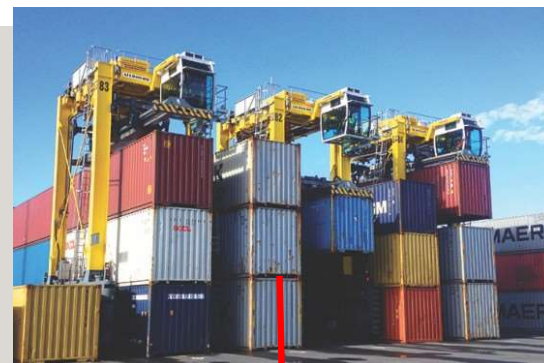
Noise Management in Port Area

Beginning at the source.

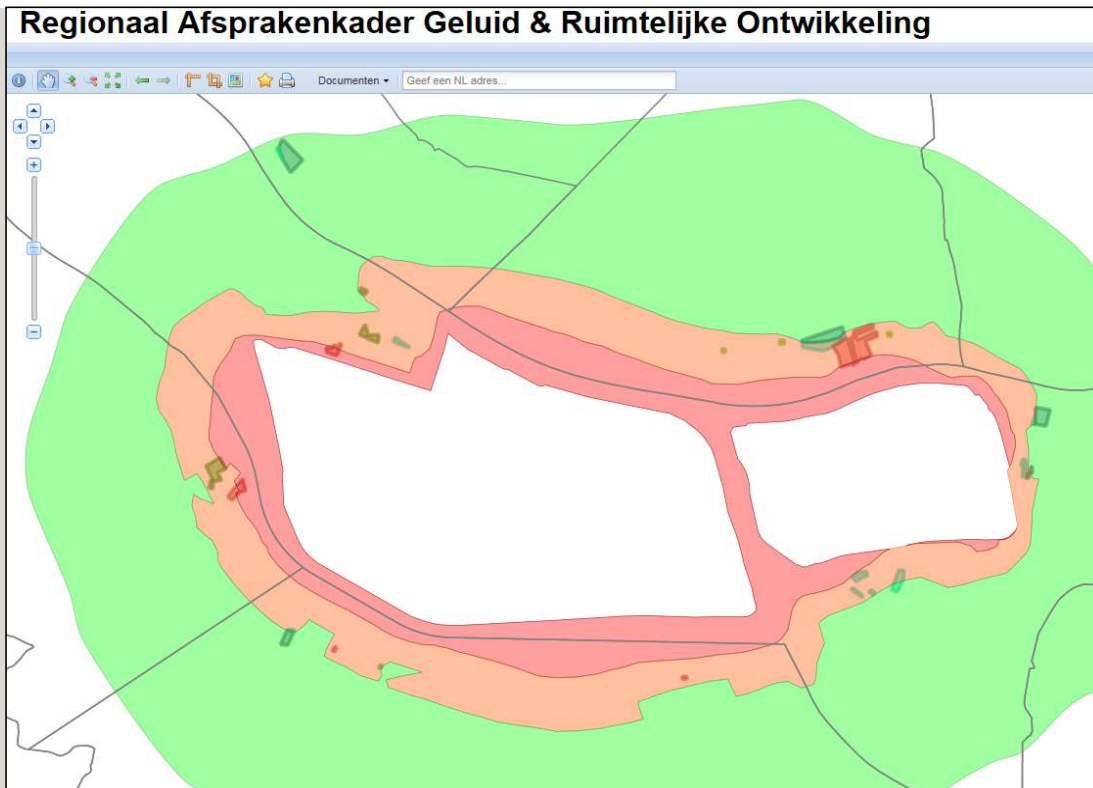
Stimulate use of quieter techniques:

- Early in proces of leasing land to new customers (PoR)
- By critically examining applications for permits (PoR, Environmental Agency)

List of favourable techniques as guidance.



Noise Management around Port Area



Covenant (2015) with municipalities on developing new urban areas around Port Area.

Red: no, exception for existing older plans.

Orange: only under strict conditions and with elaborate stakeholder engagement.

Green: yes.

Objectives of Covenant:

- Grip on urban developments
- Less court cases
- Less hindrance

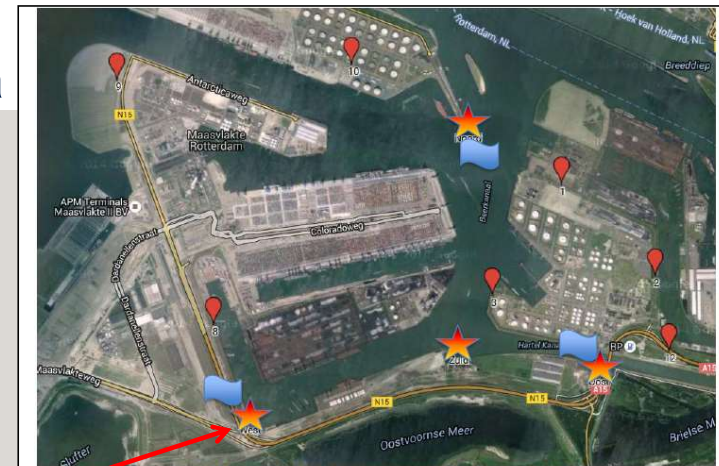
Important: communication and expectation management with new residents.

Noise Hindrance

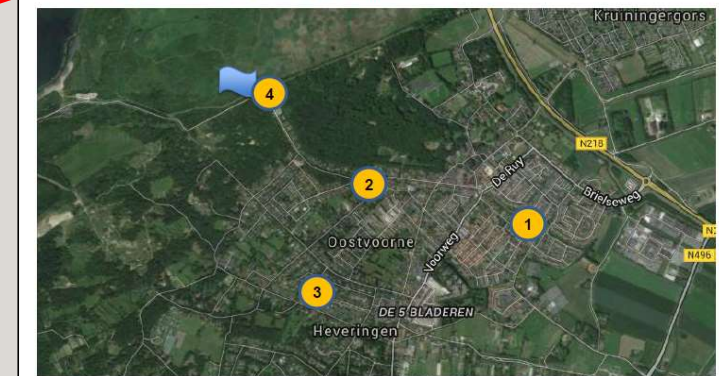
Example: industrial noise of large port area

Project (2013-2018):

- Make realtime 2D noise maps
- Find relation with reported hindrance
- Find relevant noise sources



Figuur 3: Ligging van de meetstation op het industrieterrein (ster = positie array, blauwe vlag = positie meteo-station, pin = geluidmeter)



Noise Hindrance

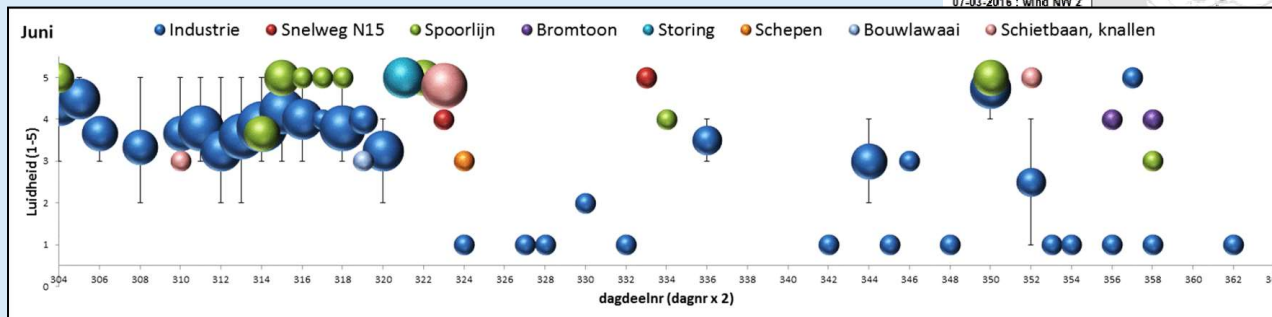
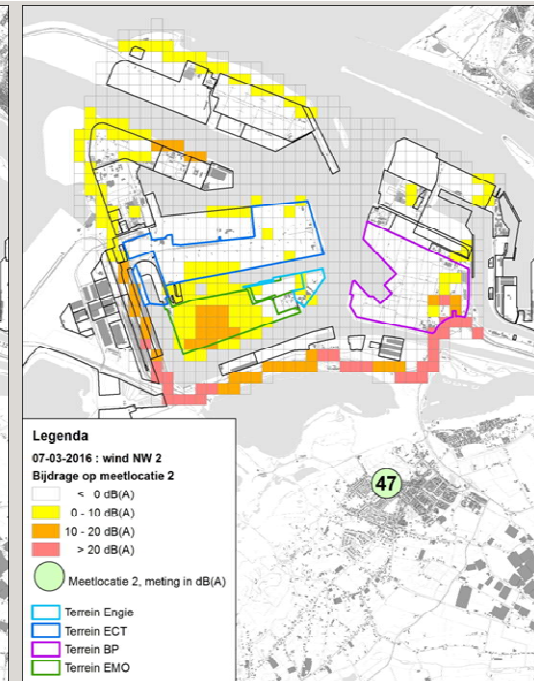
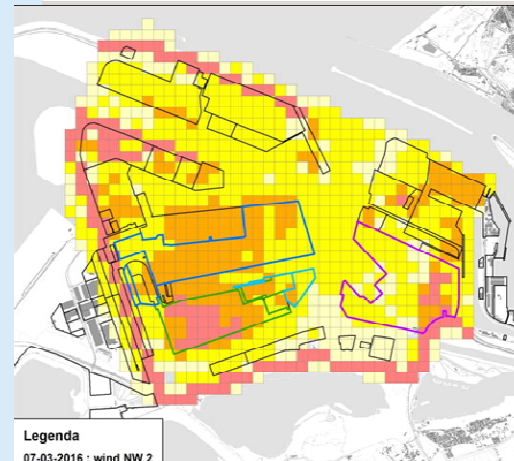
Example: industrial noise of large port area

Results:

Top 5 noise sources identified

Next step (2018-):

Feasibility studies to mitigate noise from top 5 noise sources

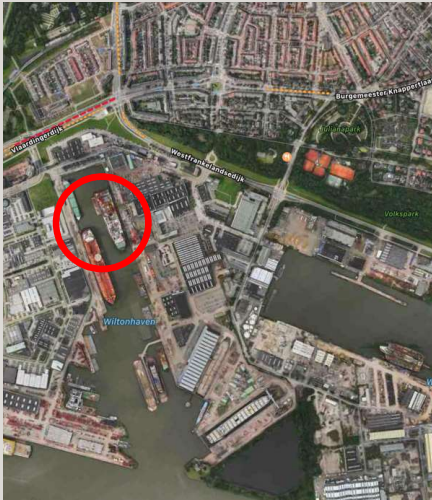


Noise Hindrance: sea going vessels



Noise hindrance

Example: Offshore vessels



Distance < 300 m



Noise hindrance

Example: Offshore vessels

Agreement

- Measurements before visit
- Prediction: >50 dB(A) (day) or >45 dB(A) (night)?
- Measures (dampers) within 24 hours after berth if necessary and if possible



Noise hindrance

Example: Container vessels



Distance < 350 m



Noise Hindrance

Example

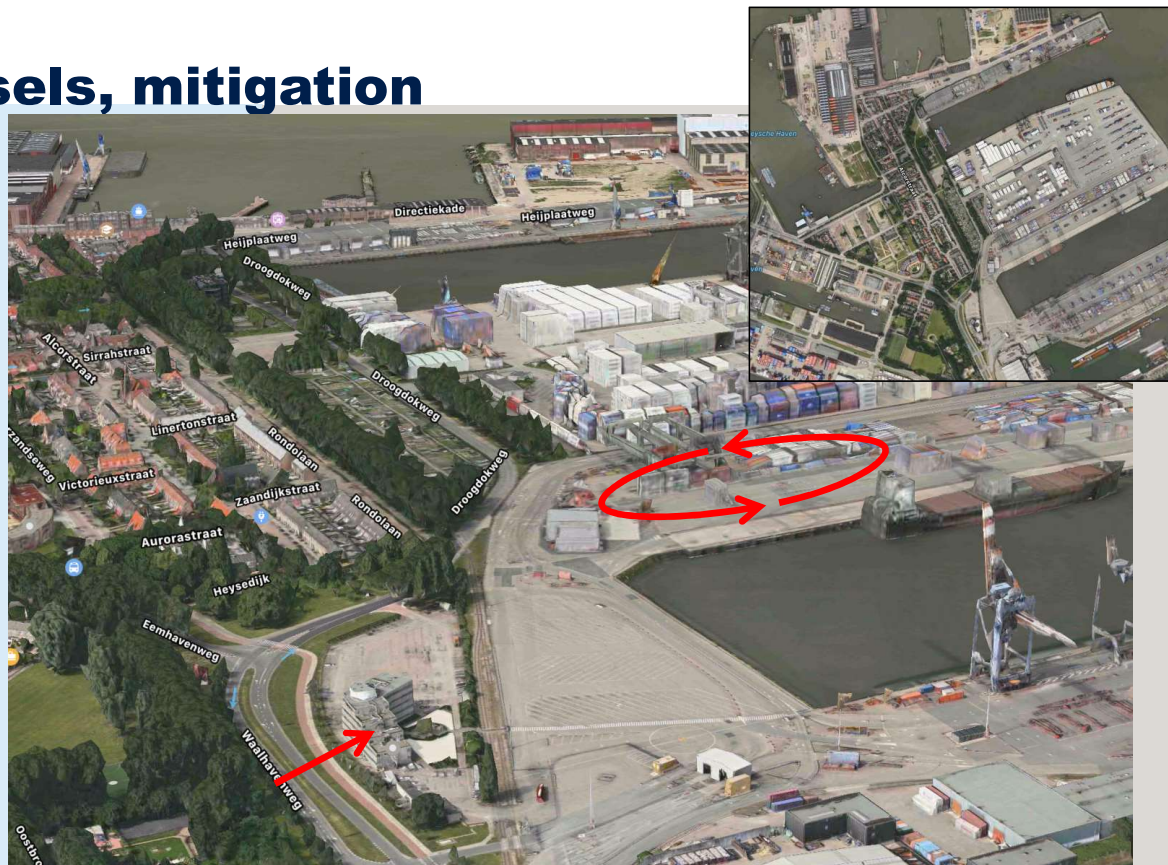


Noise Hindrance

Example: Container vessels, mitigation

Agreement

- Keep track of noisy ships
- Move and/or turn noisy ships around at next visit if possible
- Inform residents
- Monitoring nuisance



Neptunes



NOISE **E**XPLORATION **P**ROGRAM **T**O **U**NDERSTAND NOISE **E**MITTED BY **S**EAGOING SHIPS

Frank Wolkenfelt
Port of Rotterdam

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- Why Neptunes
- Goal
- Project partners and organisation
- Scope and objectives
- Deliverables and planning
- To conclude

INTRODUCTION

Noise complaints from (seagoing) ships at berth are a growing issue

- more residential areas near ports
- more and bigger ships



Providing tools to support a sustainable port development by reducing noise nuisance related to seagoing ships

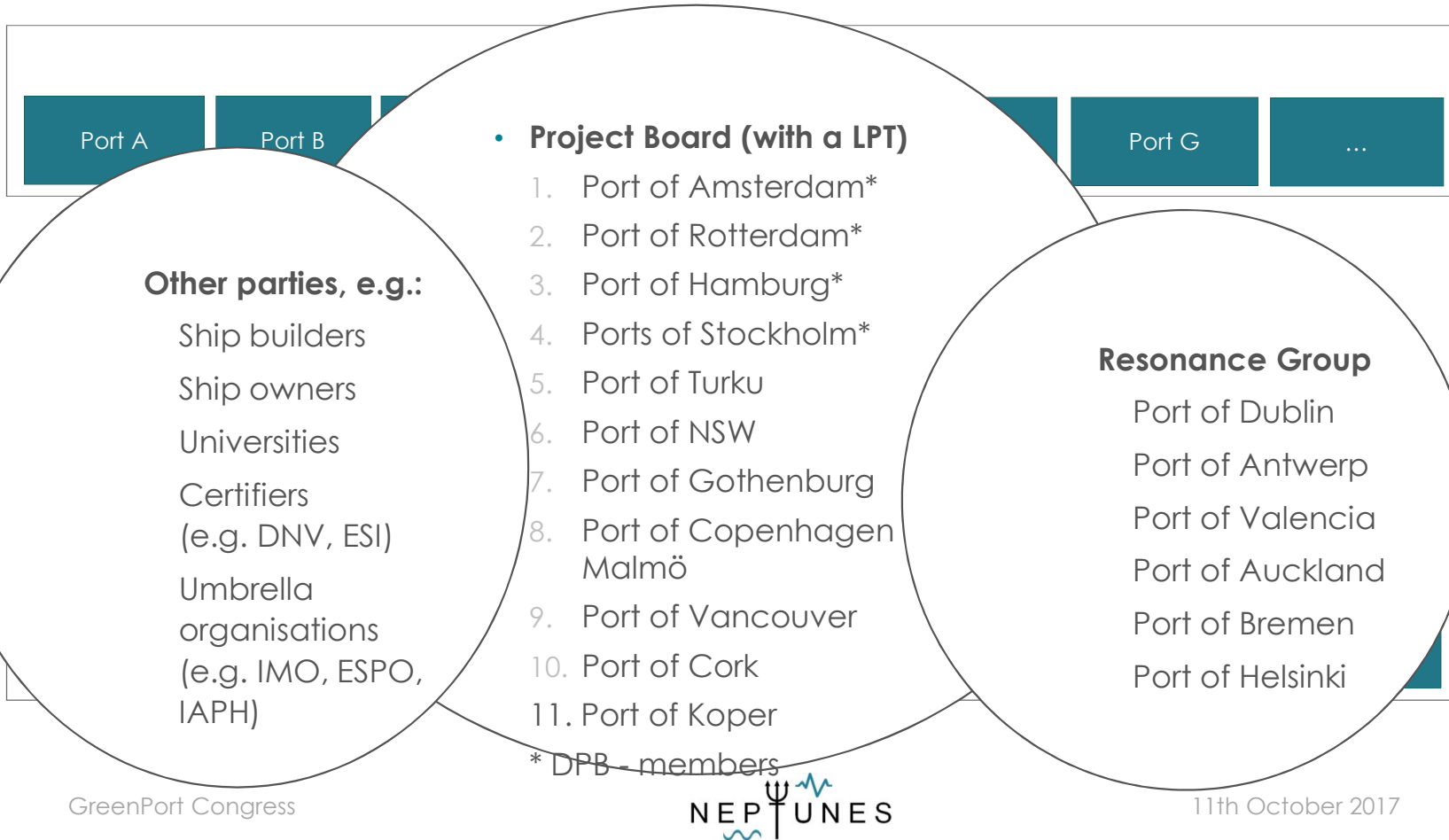
PROJECT PARTNERS



A world map with a teal background and grey landmasses. Yellow pushpin markers indicate project partner locations. There is one pin in the Pacific Northwest of North America, a cluster of about eight pins in Western and Central Europe, one pin in Southern Europe, one pin in Southeast Australia, and one pin in New Zealand.

NEPTUNES

ORGANISATION



SCOPE AND OBJECTIVES

Scope: Sea-going ships

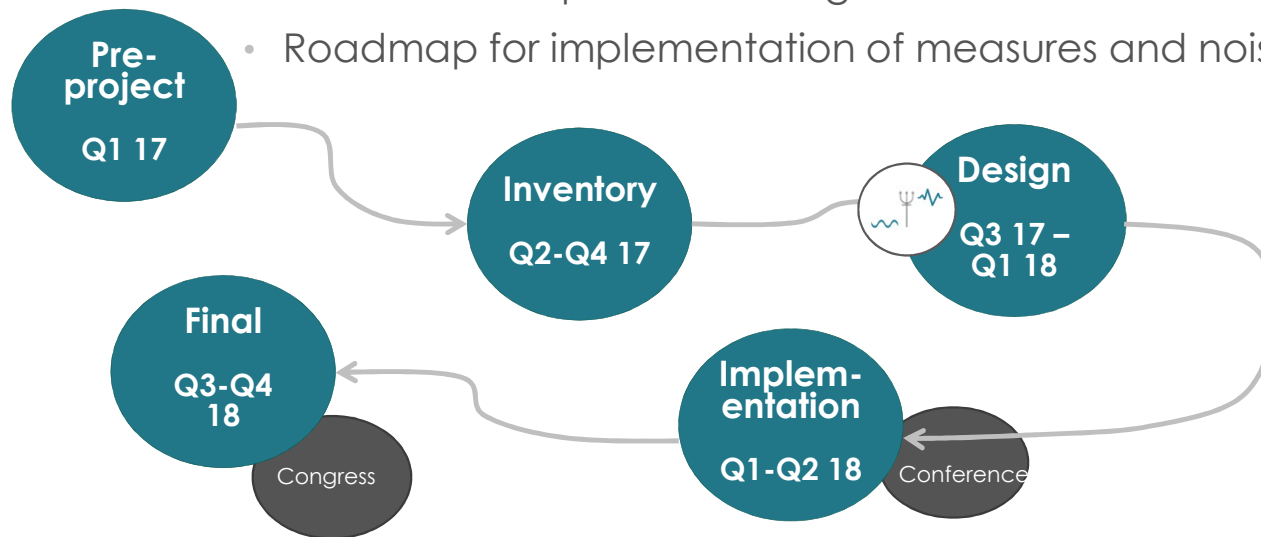
- noise from the auxiliaries and activities or any other component or equipment (e.g. generators,..) belonging, placed or installed on ships at berth.
- the noise produced by equipment attached to the cargo (e.g. reefers) is also included.

Project objectives:

- get more insight into noise problems related to ships
- what type of vessel and source(s) of these ships are the causes of the noise and nuisance perceived by residents
- enhance knowledge of measuring and quantifying ship noise
- identify problems met with legislation, regulations or policies.
- ways to mitigate nuisance

DELIVERABLES

- Report with overview of laws, regulations, policies or governance
- Best practice guide with effective measures, including 'noise awareness' methods
- Measurement protocol and guidelines for noise labelling of a ship
- Roadmap for implementation of measures and noise labelling



MEASUREMENT PROTOCOL

CLASSIFICATION OF SHIPS AND SOUND SOURCES

Ship types

- Container ships
- Cruise ships
- Tankers
- RoRo/RoPax
- Bulk carriers
- General cargo / service vessel

Most relevant sound sources

- Funnel outlet(s) of the auxiliary engine(s)
- Opening of ventilation in- and outlets
- Cooled containers / reefers
- Pumps on deck

MEASUREMENT PROTOCOL

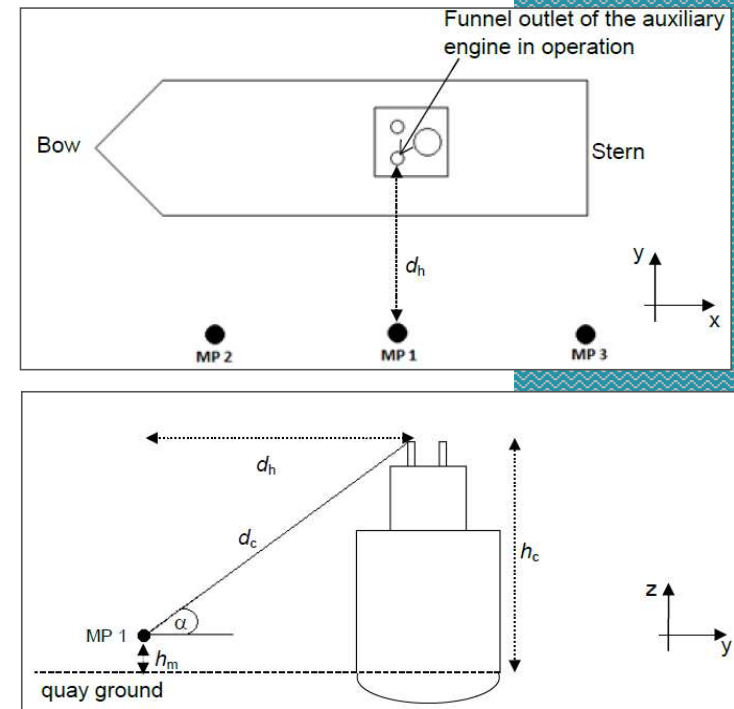
Status: concept

- Practical manual for acoustical consultants
- Measuring on the ship and from a short distance
- Document the operating conditions, like power levels of generators etc

Test phase has started:

- Try out by measuring different type of ships, by projectpartners

Other deliverables: developing noise label and best practise guide in startup phase



ROAD MAP 1

ACTOR / PARTY	CONTACT DETAILS	CONTACTED BY..	IMPORTANCE OF ACTOR
Ports	PB- and RG-members	CPT	implemented measures, available ideas (noise screens, oblige times, increase awareness, etc)
Cities / city planners	PB- and RG-members	PB- / RG-members	already implemented measures by the cities (measures on buildings, increase awareness)
Communication officers ports	Amsterdam, Rotterdam, Copenhagen, Dublin, Barcelona, Hamburg, Stockholm	Henk & PB/RG members	more details about methods of communication, compared with scientific/psychological principles, to best practices
Experts behavioral sc.	Erasmus university /Univ. Groningen, DCMR EPA	Henk	insight in the scientific/psychological principles of communication regarding behaviour change
Experts expec.man.	Expert DCMR, other via DCMR	Henk	details on expectation management
Ship/ Fleetowners	Thun Tankers (H Källsson)		support for the MP and BPG, to increase awareness and learn from their nautical knowledge and experiences with noise and measures (Best Practices). What are the considerations why they move on to develop a more silent ship.
	Tankers: Norient /COSCO Shipping co/ NITC		
	DFDS (P. Woodall)		
	Stena Line / C.Ro	Rob	
	MAERSK (A.M. vdWurff)	Rob	
	Container: CMA/CGM/ COSCO/Hapag Loyd		
	Cruise: Aida/Royal Caribbean/Carnival cruise		
	Bulk: Gearbulk Holding Lt /The Fednav Group/MSC		

ROAD MAP 2

ACTOR / PARTY	CONTACT DETAILS	CONTACTED BY..	IMPORTANTCE OF ACTOR
Cargadors			Increase awareness and lobby to take action
Terminals	Uniport		Increase awareness, lobby to take action. Learn about their world, choices made regarding noise
Ship builders	Hyundai		Knowledge design a quieter ship, experiences with measures. Increase awareness.
	Damen shipyards	Rob	
	Blohm+Voss (Noel Bandholtz)		
Agents	Via the shipowners		How they choose their ship/company
Captains/Crew			Support, knowledge on noise label, best pract.
Certifying bodies	DNV / Loyds		To increase awareness, promote Measurement Protocol, discuss Noise Label
Incentive Schemes	ESI (F. vd Laar)	PoR / CPT	increase awareness, possibilities to include noise to lobby for noise as a label
	GreenAward (Jan Fransen)	PoR / CPT	
	Clean Shipping Index/Right Sh.		
Knowl. inst.	MARIN	PoR	gain knowledge on noise measures
Umbrella organisations	ESPO		Increase awareness, make them aware of NEPTUNES, try to change the research from NEPTUNES into actions.
	IAPH (Peter Mollema)	PoR / CPT	
	IMO		
Out-of the box	Drone-concept (?)	PoCM	
Other Parties	..		Increase awareness
Ac. Consult.		Ports	MP: can they execute it, at acceptable price?

TO CONCLUDE

Long term goals Neptunes:

- supporting a sustainable port development with less noise nuisance
- stimulating the development and use of quieter ships
- supported by a noise labelling system for ships and incentive program in ports