

Positive Effects of Alternative Maritime Power (AMP) on Marine Industries

Hae(海)-Reporter

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Introduction

Environmental issues at ports

	2004	2009	2013	2016
1	Garbage/Port waste	Noise	Air quality	Air quality
2	Dredging operations	Air quality	Garbage/Port waste	Energy Consumption
3	Dredging disposal	Garbage/Port waste	Energy consumption	Noise
4	Dust	Dredging operations	Noise	Relationship with local community
5	Noise	Dredging disposal	Ship waste	Garbage/ Port waste
6	Air quality	Relationship with local community	Relationship with local community	Ship waste
7	Hazardous cargo	Energy consumption	Dredging operations	Port development(land related)
8	Bunkering	Dust	Dust	Water quality
9	Port development(land)	Port Development(water)	Port development(land)	Dust
10	Ship discharge(bilge)	Port Development(land)	Water quality	Dredging operations

Air pollution has been ranked on top as key concerns.

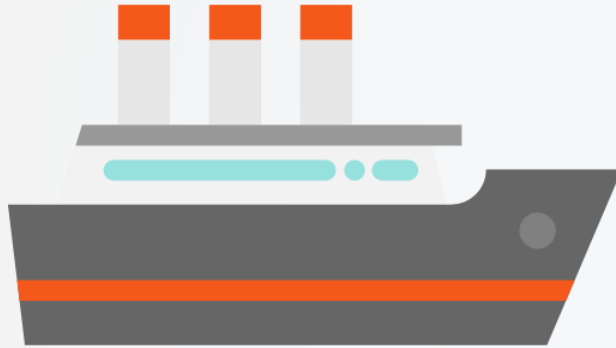
This eventually encouraged stakeholders to show efforts for reducing air emissions.

1

Introduction

Environmental issues at ports

Over a period of about 8 hours, a berthed cruise ship (12 MVA) generates emissions as following:



1.2 t NOX

30 kg PM*

(*Particulate matters)



10,000 cars

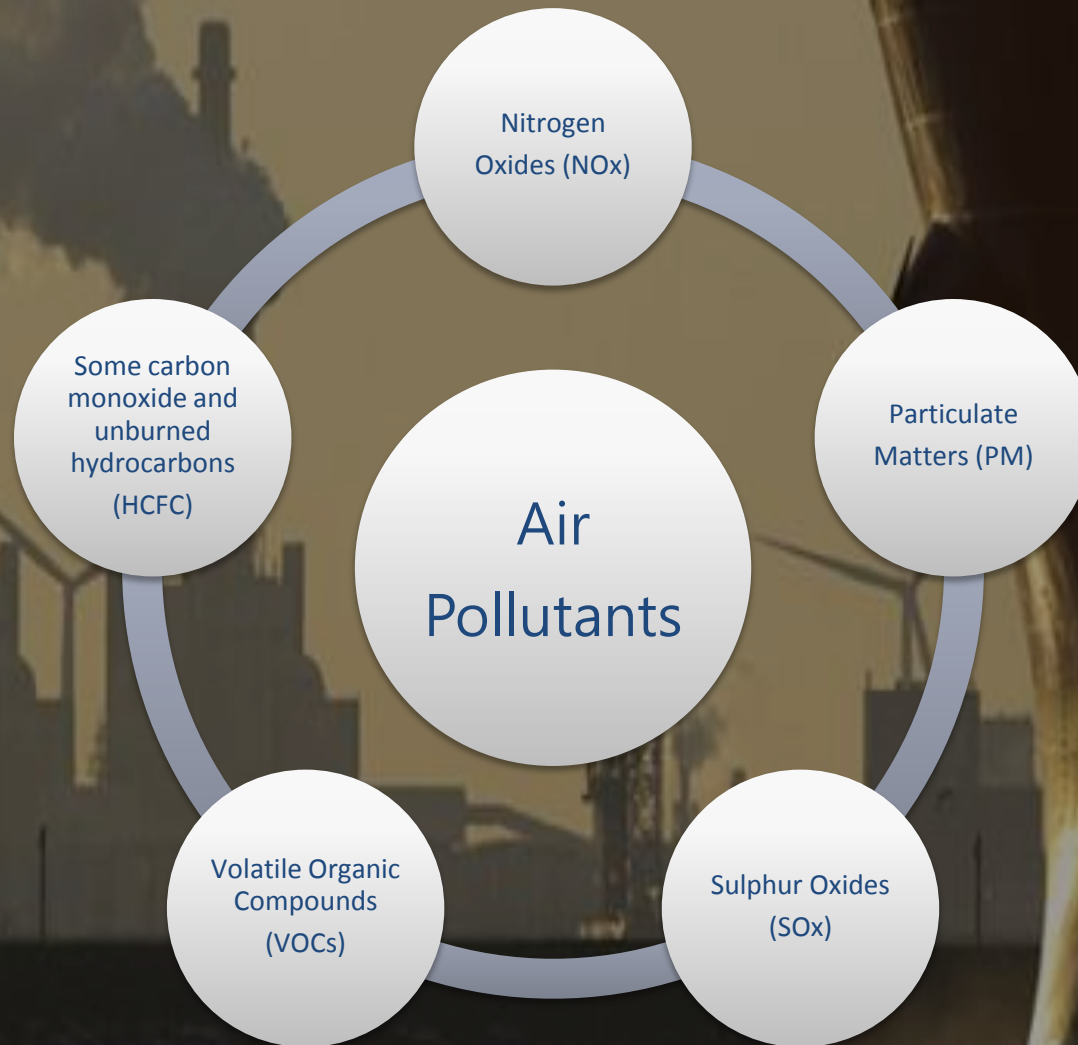
6 000 cars

In transit Paris - Berlin

(Source: *An Environmentally friendly, economical power supply for berthed ships, Siemens*)

1

Introduction Main air pollutants



1

Introduction

The efficacy of AMP

Driving Slow

Automatic
Docking
System

Changing Oil

AMP

Diesel
Particulate
Filter (DPF)

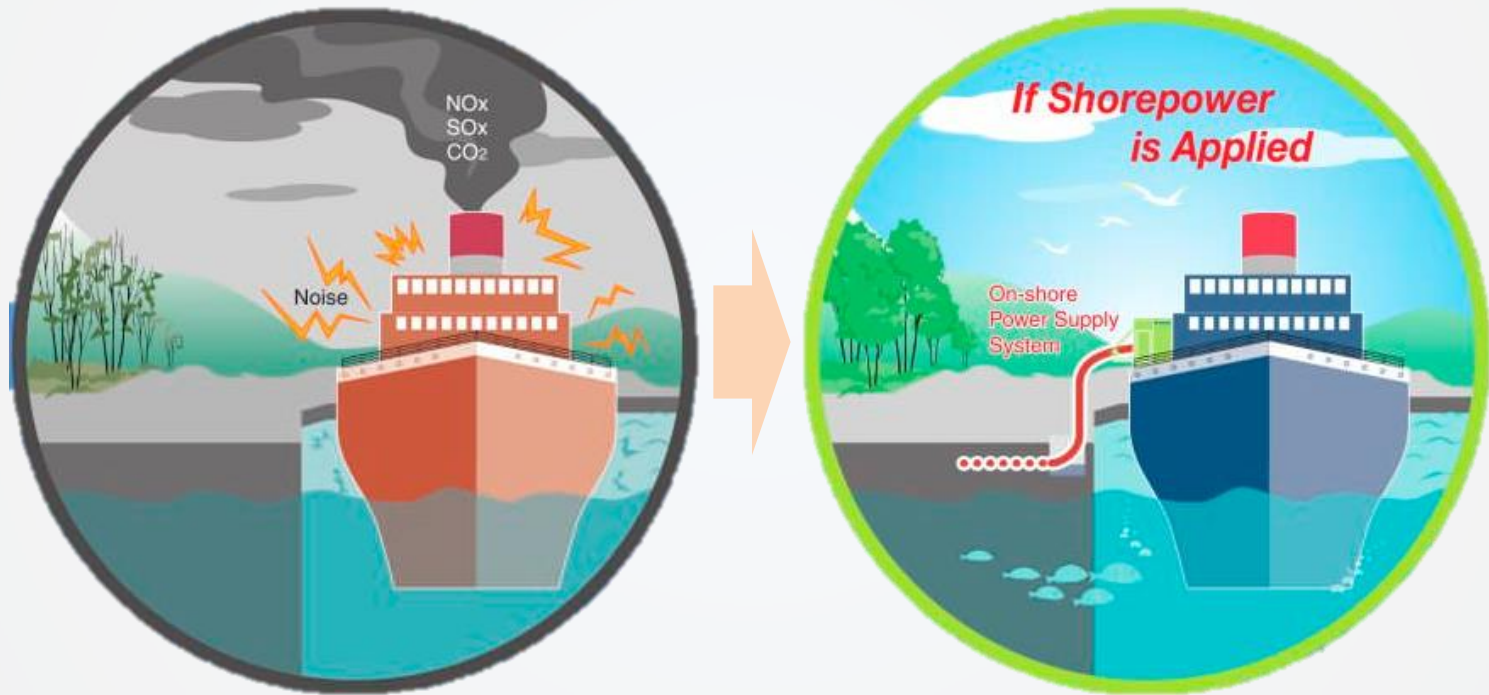
Technologies \ Emissions	Reduction Percentage (%)				
	CO	NOx	SOx	PM	VOCs
Driving slow	-	85.7	-	-	-
Changing Oil	-	14	15~20	63	25
AMP	-	90	99	94	-
DPF	90	6	90	87	90

(Source: Necessity of onshore power supply for the reduction of air pollution in seaports)

AMP would bring the most promising effects for air pollution.

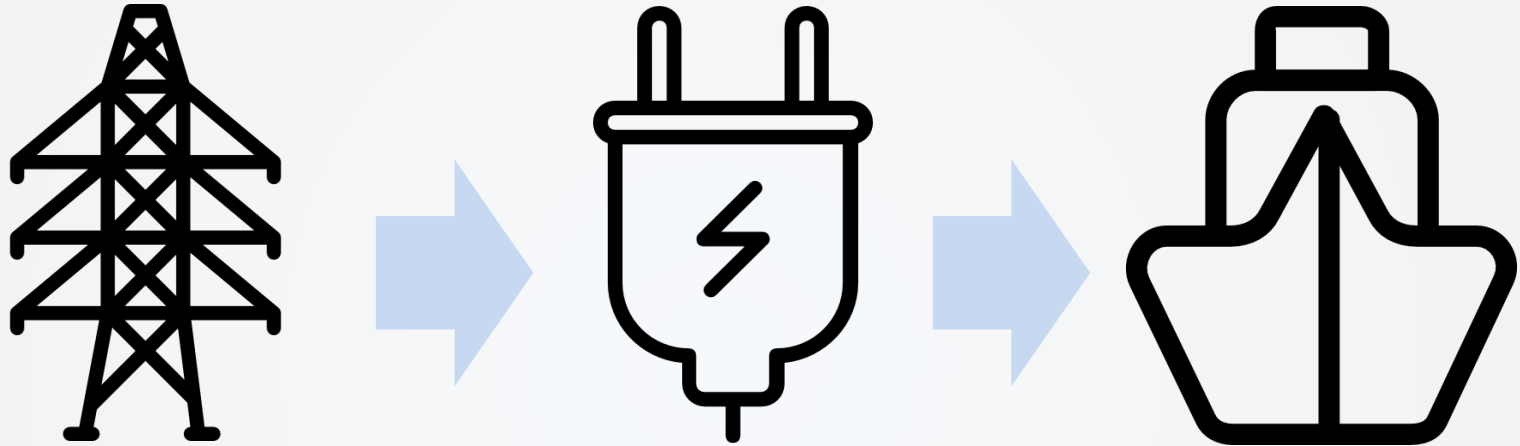
2 Why AMP? AMP system

At present, most vessels use auxiliary engines from inside the ship when berthing.



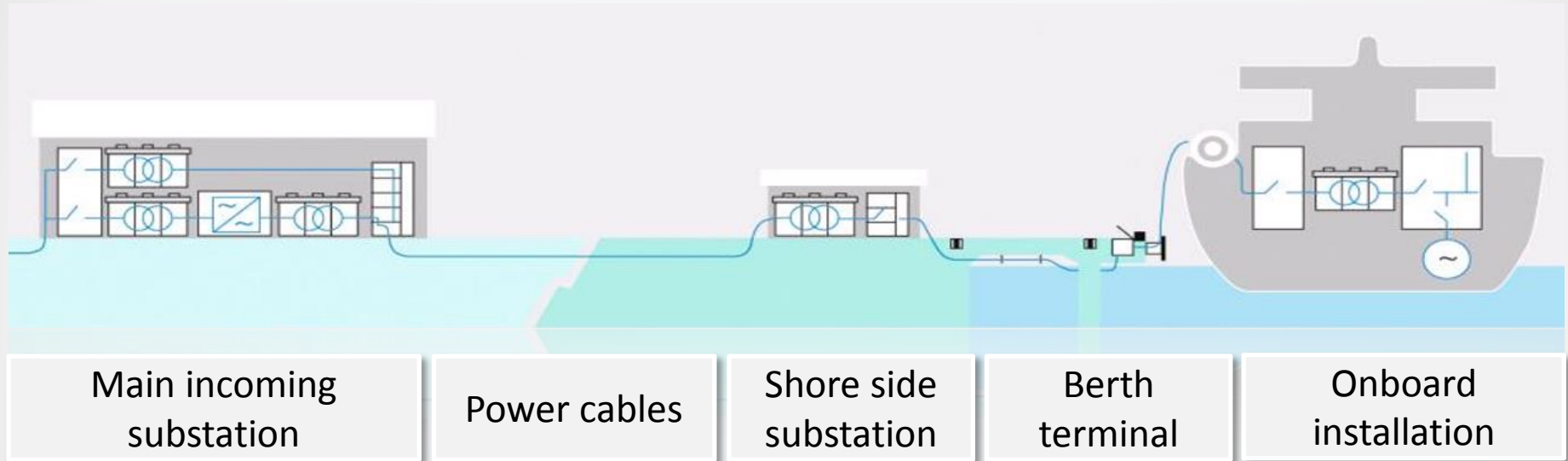
Why not let the ports provide energies to the vessels with electric power?

2 Why AMP? AMP system



The process of providing shore side electric power to a ship at berth while its main and auxiliary engines are turned off

2 Why AMP? How it works



High voltage green power from plants with help of supply cables that are plugged to an electricity supply board in the port is supplied to the vessel.

1) Economic barriers

- High Initial installation costs regarding setting up all the equipment needed
- Power consumption costs
- Difference in tax on the electricity and the fuel

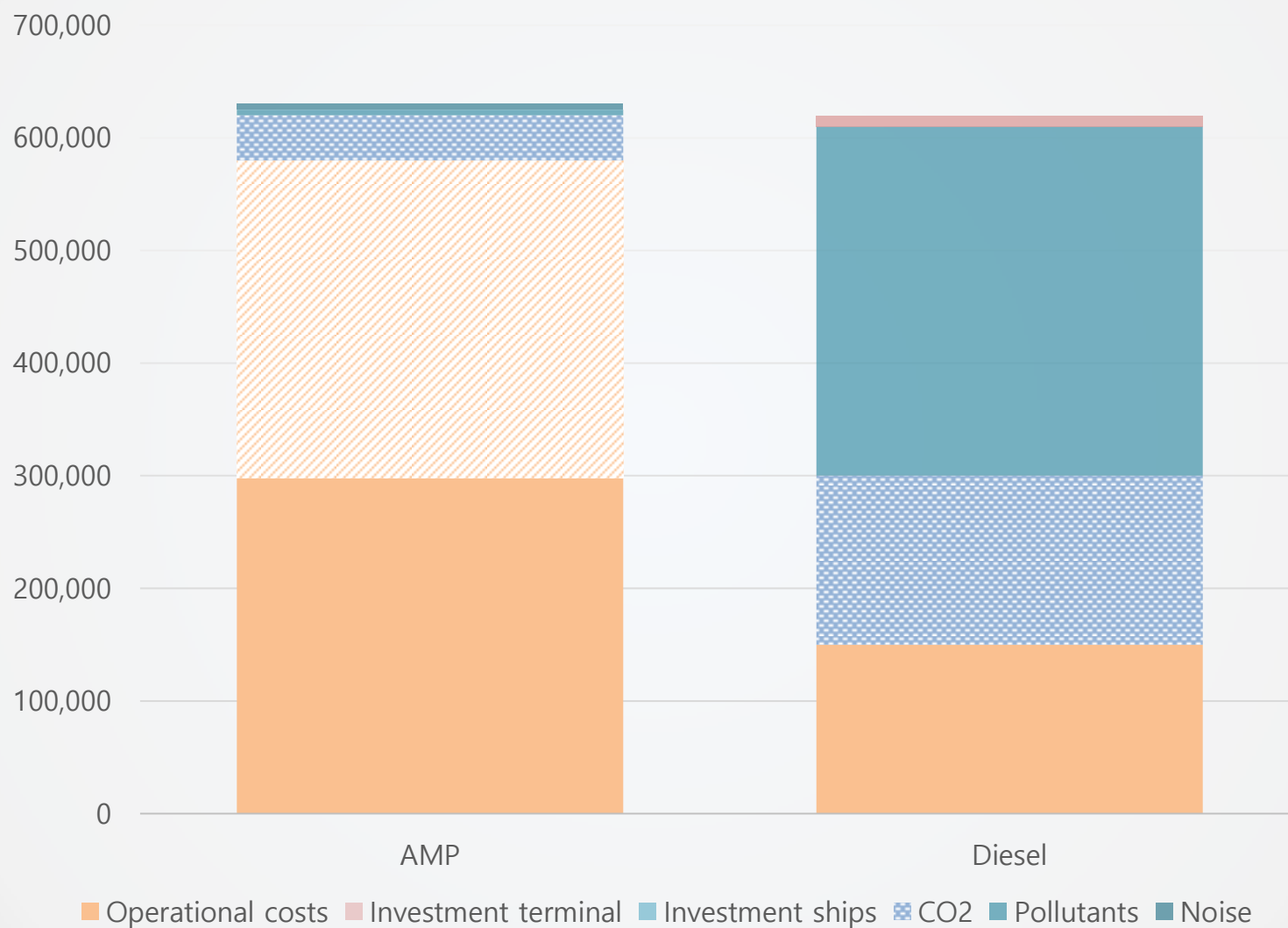
2) Technological barriers

- Different voltage levels and frequency

3) Interests barriers

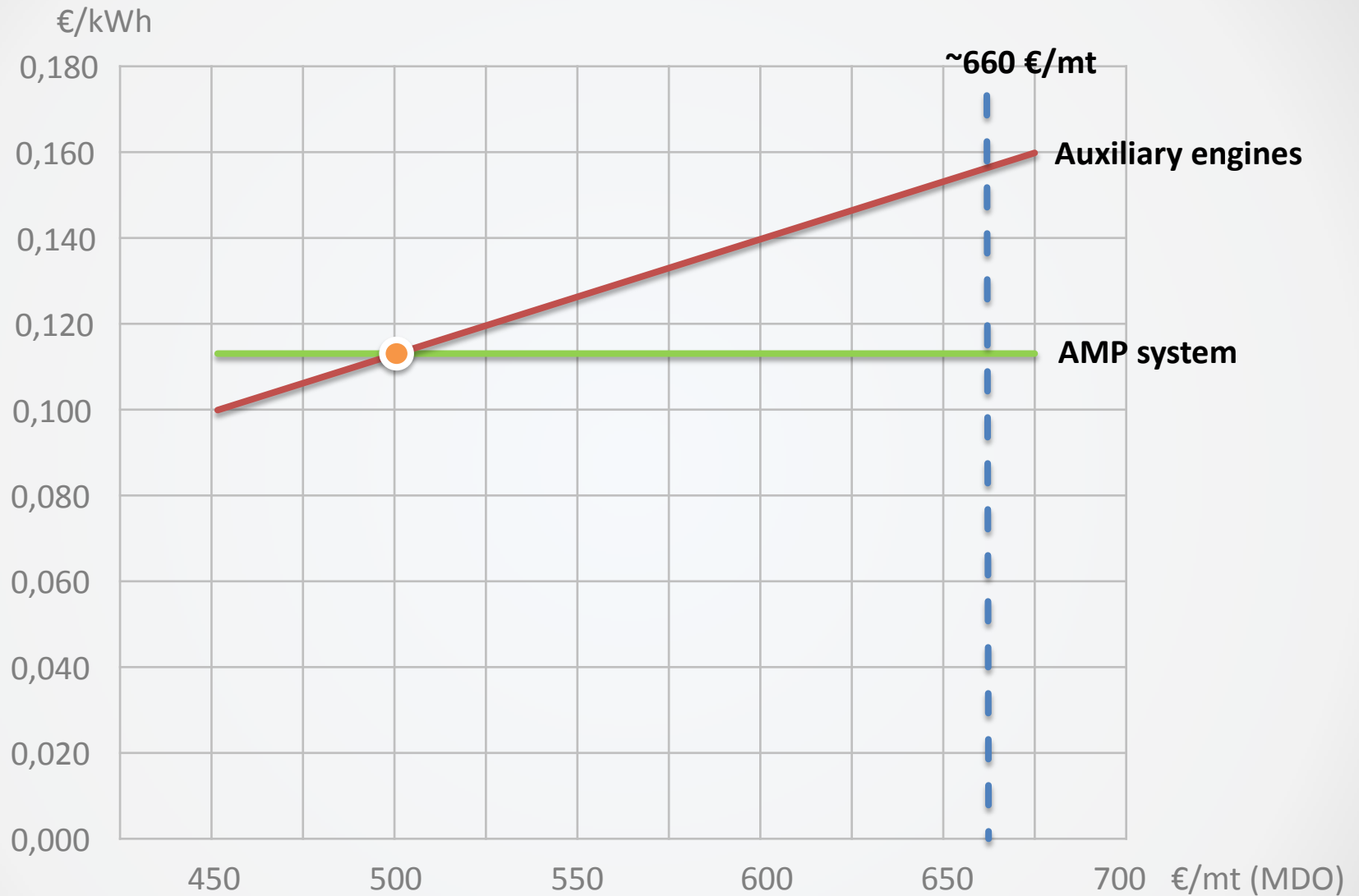
- Stakeholders not feeling the need for AMP from lack of incentives

Annual cost of Onshore Power Supply and Diesel (incl external costs)



(Source: *Cost benefit calculation tool onshore power supply*, CE Delft)

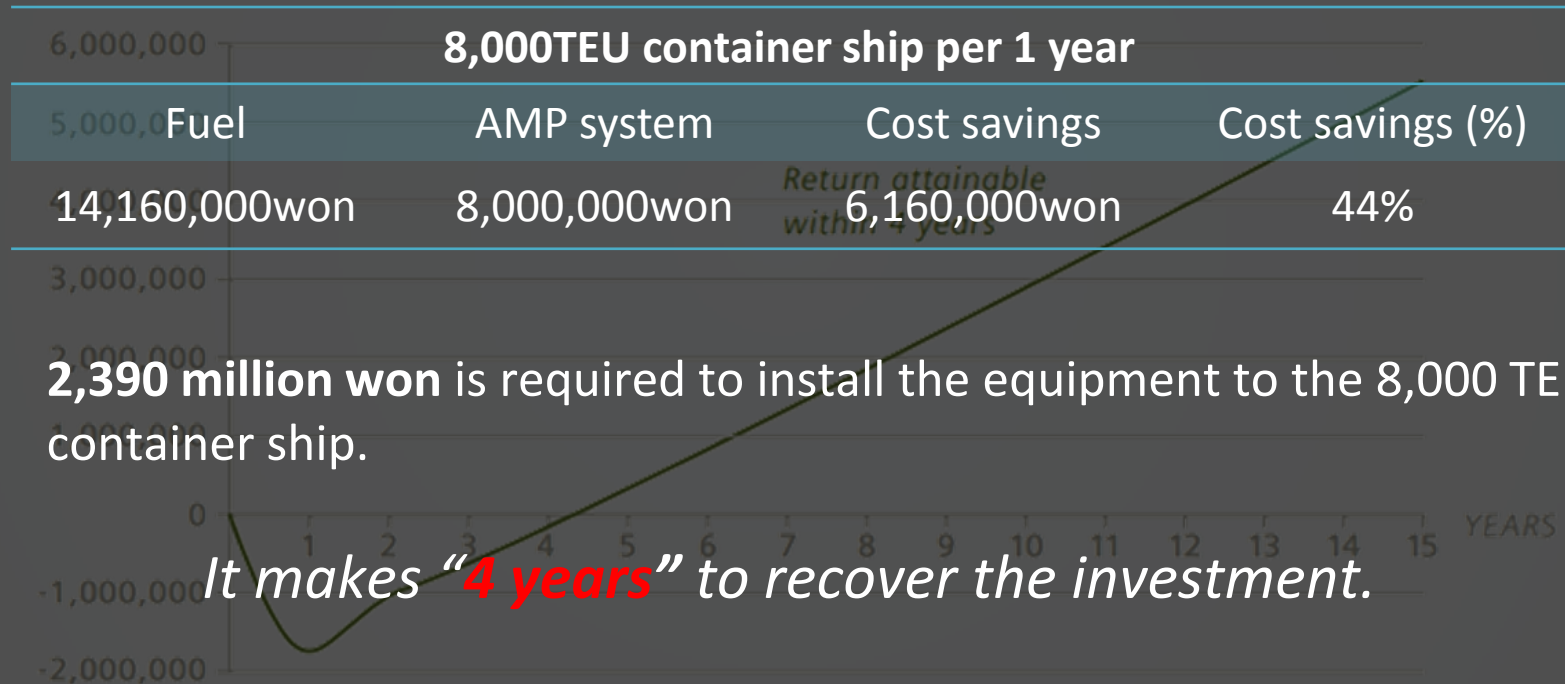
Price comparison



(Source: Onshore power supply case study – Port of Helsinki, 2015)

- Prior to the break-even point, financial assistance by government is needed.
- Investments will be soon collected as electricity costs lower than oil.

INVESTMENT
SUM (IN €)



(Source: An Environmentally friendly, economical power supply for berthed ships, Siemens)

1) Economic barriers

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2) Technological barriers

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3) Interests barriers

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Funding

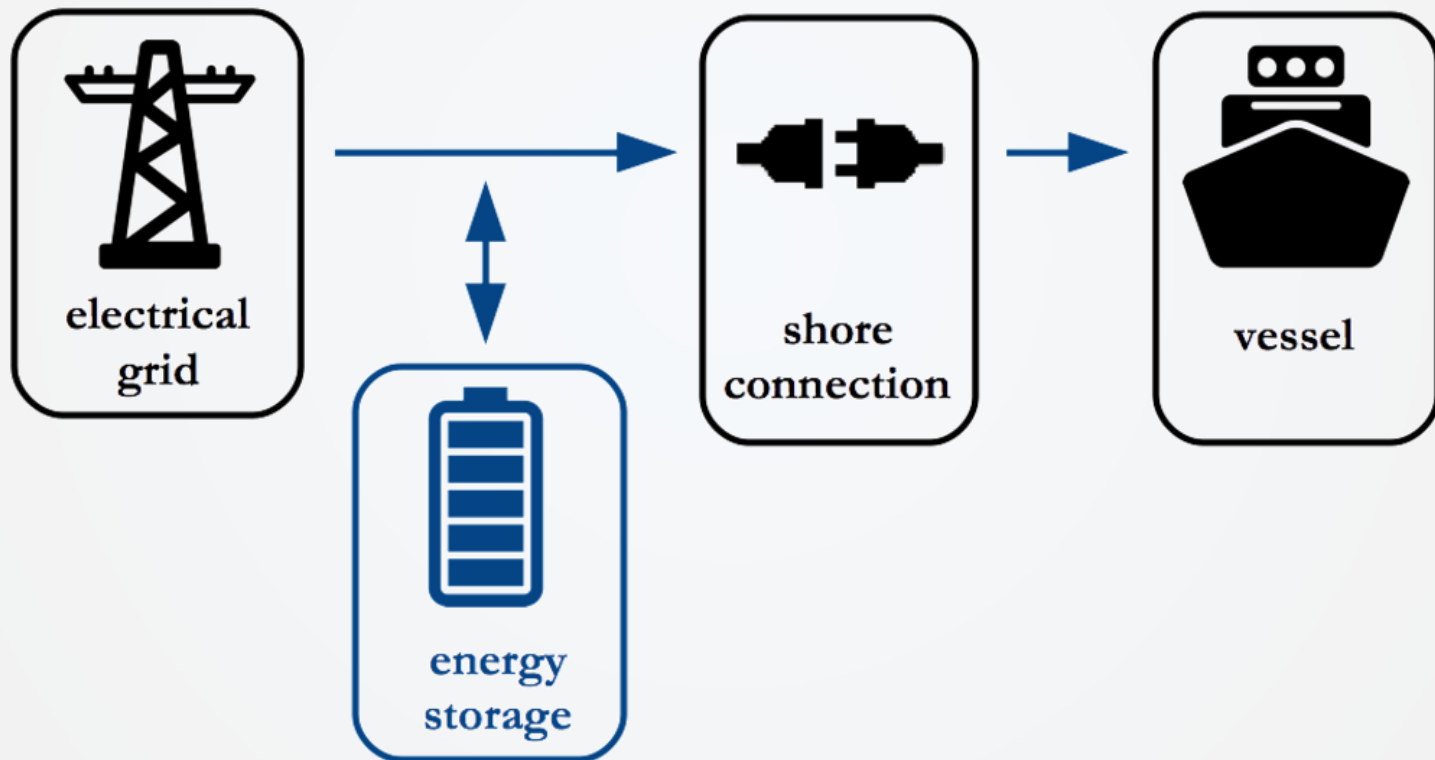
- CEF (Connecting Europe Facility)
 - Focused on infrastructure development
 - Two types of funding: Research, and deployment
 - Also available for private ports/operators
- Juncker Plan
 - Unlock €315 billion for the EU economy using only €21 billion in risk guarantees for investment projects.
 - Financing: European Fund for Strategic Investment (EFSI)

3

How to make it real

Resolutions

Onshore Power Supply with energy storage acting as buffer



1) Economic barriers

- High Initial installation costs regarding setting up all the equipment needed
- Power consumption costs
- Difference in tax on the electricity and the fuel

2) Technological barriers

- Different voltage levels and frequency

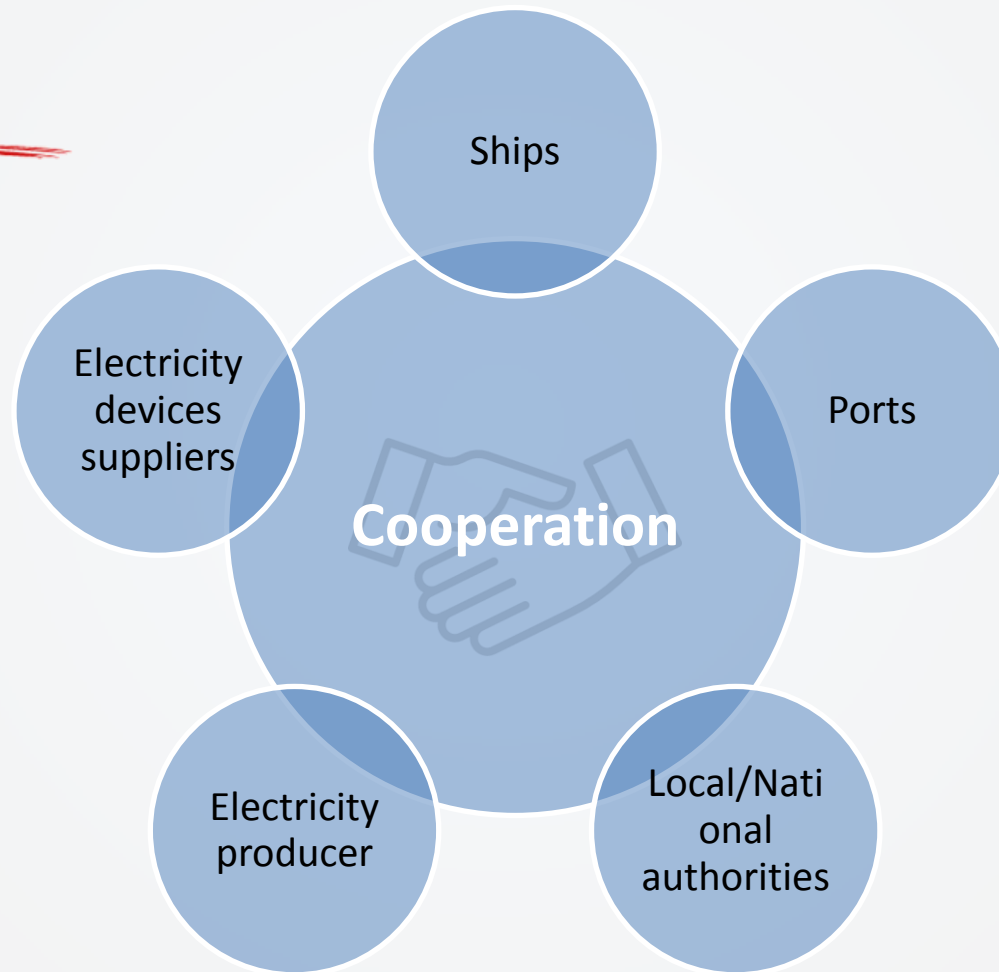
3) Interests barriers

- Stakeholders not feeling the need for AMP from lack of incentives

How to make it real

Resolutions

Tax



1) Economic barriers

- High Initial installation costs regarding setting up all the equipment needed
- Power consumption costs
- Difference in tax on the electricity and the fuel

2) Technological barriers

- Different voltage levels and frequency

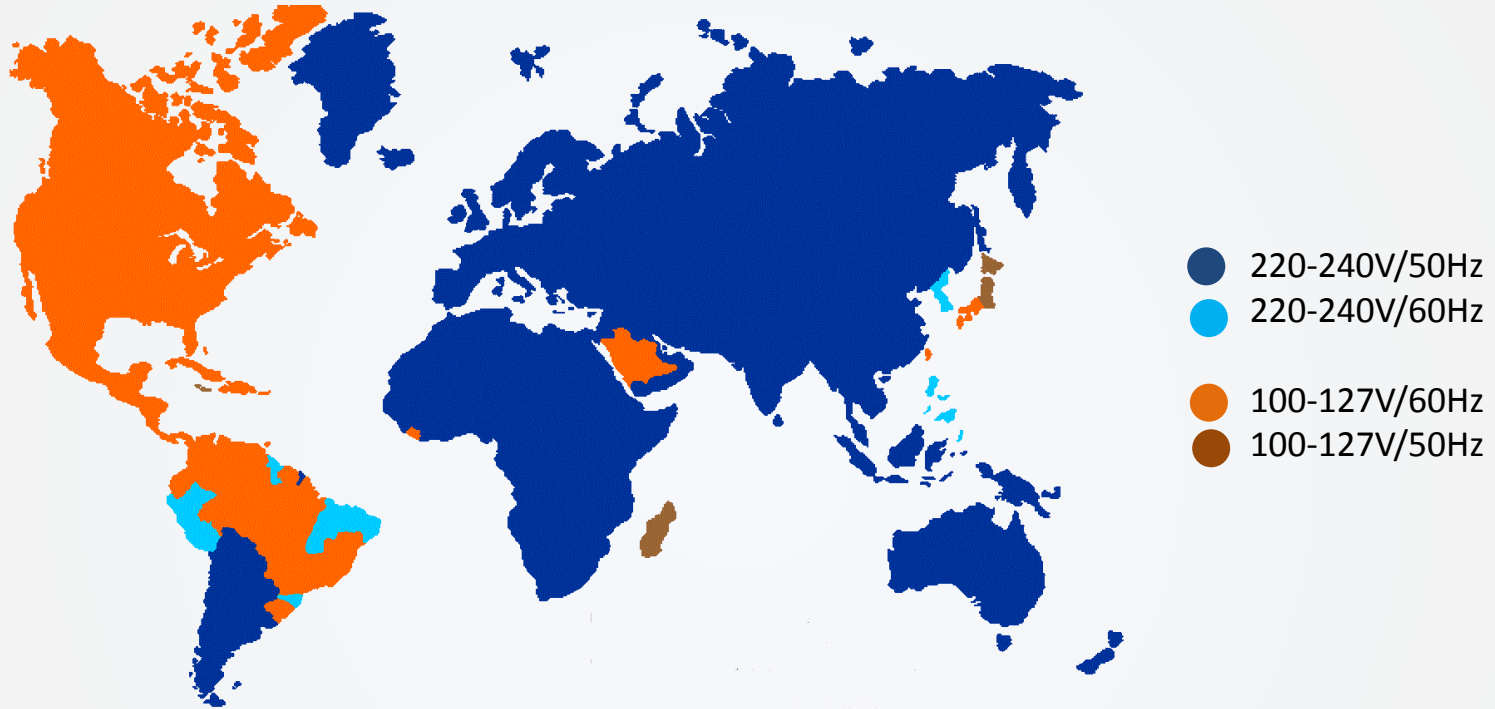
3) Interests barriers

- Stakeholders not feeling the need for AMP from lack of incentives

3

How to make it real

Resolutions



- Either the ship or port side need to provide a power frequency converter in cases where the power frequencies do not match.
- New/devised equipment should be constructed.
- Globally standardized regulations are needed.

1) Economic barriers

- High Initial installation costs regarding setting up all the equipment needed
- Power consumption costs
- Difference in tax on the electricity and the fuel

2) Technological barriers

- Different voltage levels and frequency

3) Interests barriers

- Stakeholders not feeling the need for AMP from lack of incentives

How to make it real

Resolutions

- Introduction of incentives
 - Subsidy provided by government for installing AMP
 - Attract vessel operators to install the equipment through incentive - for early installment – and punishment – for latter installment – policy
- Installation obligation for ports by IMO
 - The need for standardized regulations

4

Conclusion

Background

IMO is strengthening regulations on air pollutants emitted at berth.



As a result, major trading partners around the world are taking actions to improve the air quality around the port. And the most appropriate measure to this is installing AMP system.



Lack of integrated regulations for building AMP system is making it difficult to introduce AMP related facilities.



Suggestion

Proposing amendment of International Regulations MARPOL 73/78 annex vi (air pollution) to establish standards and rules for the installation and operation of AMP systems.

4

Conclusion

Proposing integrated International Regulations connected to AMP system

MARPOL 73/78 annex vi (air pollution)

1. Compulsory installation of AMP on incoming container ships
2. Port make its own standard regarding Installation and system with LADWP

1. Compulsory installation of AMP from the year 2025

USA – LA port

Europe ports

Difficulty in compatibility



- Using 440V
- Standardization of AMP facilities
- Issuing Textbook that deals with the operation of AMP system

Suggestions of cost procurement method for quick rule implementation

- Induce National support for initial cost procurement
- Collecting fines from a ship with no equipment installed
- Pay electricity bill directly to the ports
- Port users would share the facilities management cost with the port authorities
- Governments provide tax benefits to the shipping companies which are using ports

Q & A