

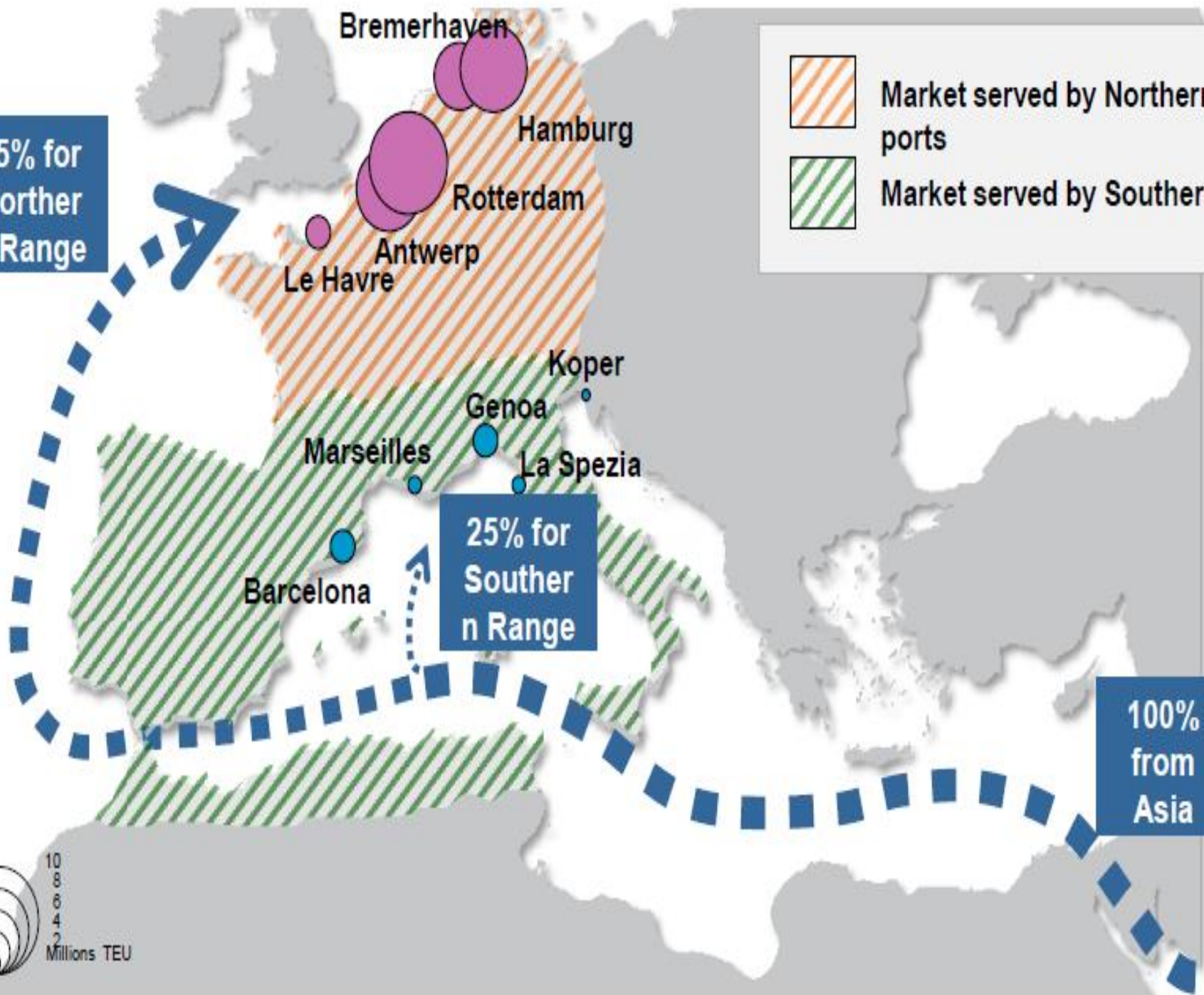
75% for Northern Range

Market served by Northern ports

Market served by Southern ports

25% for Southern Range

100% from Asia





International Conference:
“Climate Change and Transport”

INTERNATIONAL EMISSION REGULATION IN SEA TRANSPORT: ECONOMIC FEASIBILITY AND IMPACTS

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Research



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Rationale/Aim

IMO/EU

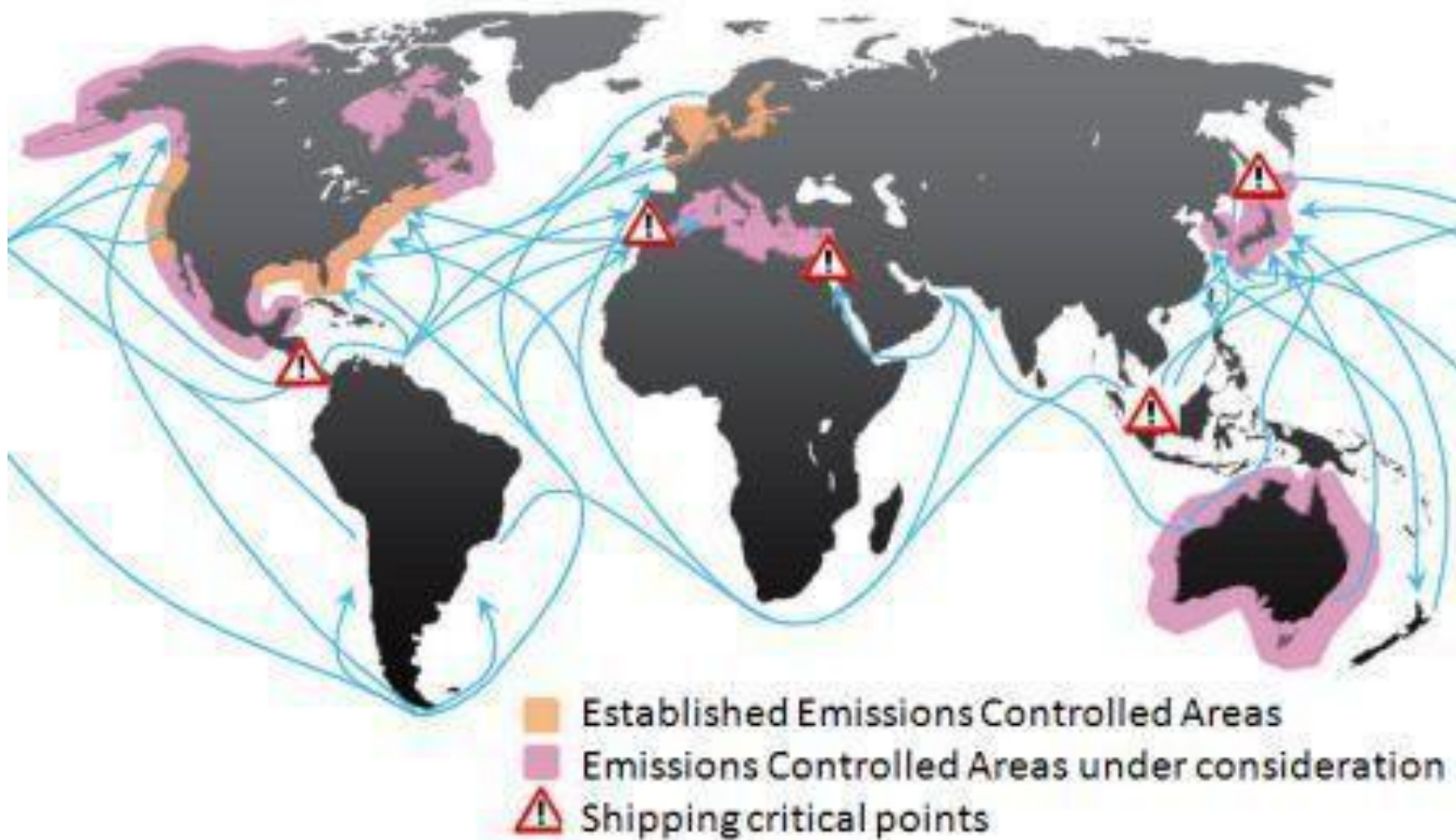
- Developing an extensive legislative playing field
- Focusing stepwise reduction worldwide on Sulphur and NOx

Objective of legislation

- To provide an environmental benefit and health gains by reducing the hazardous emissions that international shipping produces.

Rationale/Aim

Actual and potential ECA zones



Source: Wärtsilä

Rationale/Aim

Potential negative effects for the maritime economy?

Two broad mechanisms for reducing emissions

- Alternative fuel
- Vessel retrofitting (retrofit-project.eu) or cleaner new vessels
 - Also slow steaming (reduces capacity)

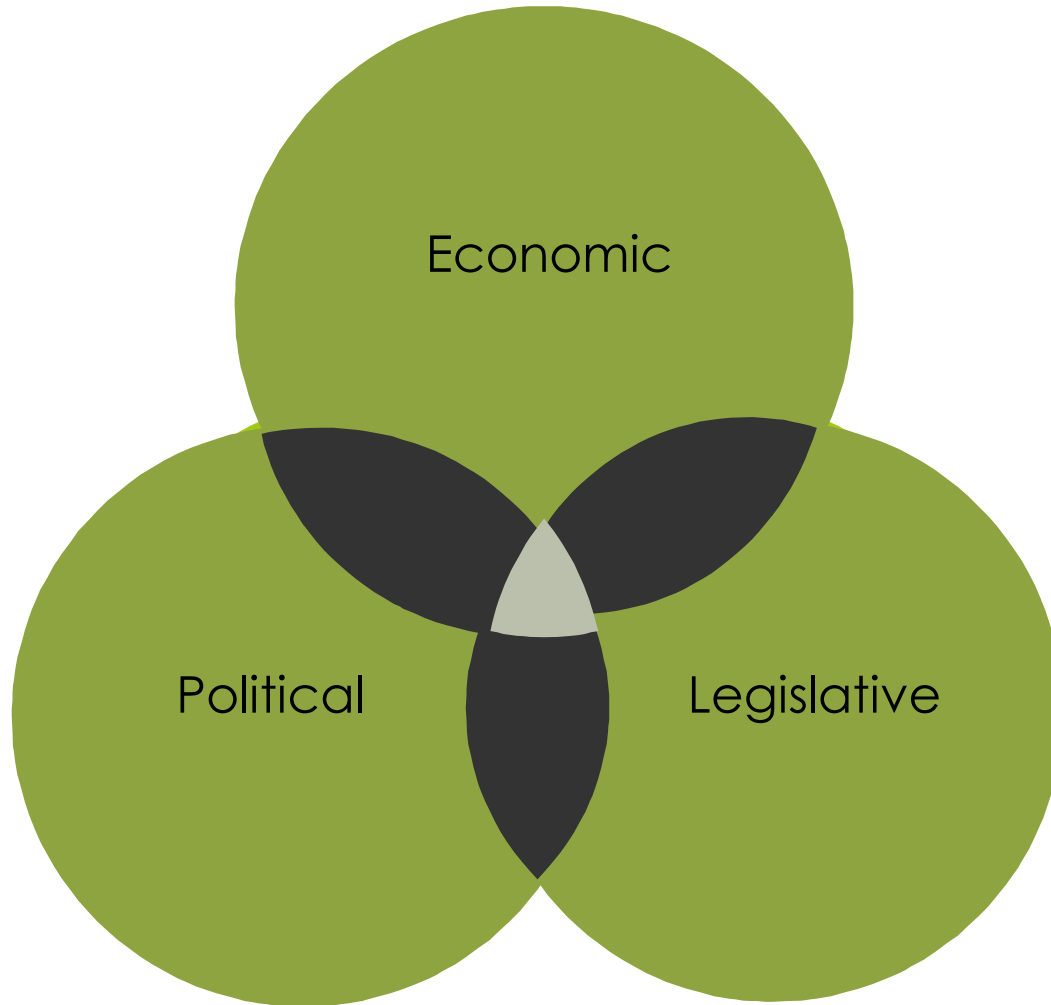
Extra cost

- Ship owners must determine which method is the most cost efficient. (Miola et al., 2010)
- ECA zones have a cost effect (Johansson et al., 2013; Odgaard et al., 2013; Entec Consulting Ltd., 2010)
- Ship routes or landing ports may be affected by ECA zones
- Possibility of reverse modal shift?

Rationale/Aim

- To examine the potential effects upon the competition between European ports of the approaching international maritime emission regulations
- To analyse the potential underlying motivations fostering the discussion

A transversal study



Research Questions



Political playing field of the regulation

- RQ1: Why are some European seas ECA-zones and others not (e.g. the Mediterranean)?
- RQ2: Why is the SECA emission cap fixed at the very strict 0,1%?



Economic viewpoint

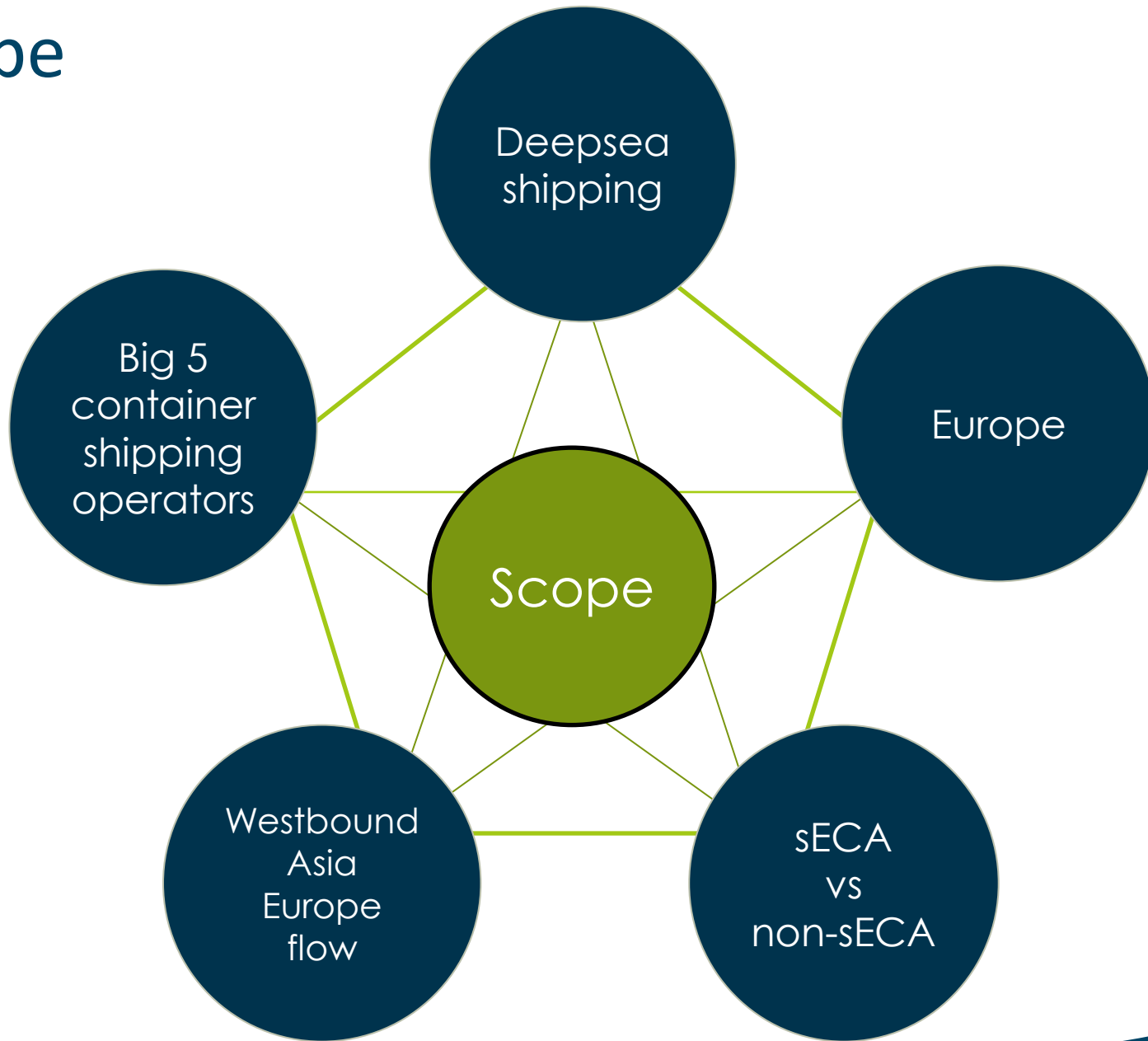
- RQ3: Will the main container carriers re-route their vessels and adapt their strategies with respect to Northern-European port calls in favour of Mediterranean Ports?



Legal viewpoint

- RQ4: Which important legal issues have influence on the answer to RQ3.

Scope



Methodology

Methodology



Qualitative research

Face to Face interviews

Public choice theory of
Buchanan and Tullock

Olson's Logic of
Collective Action



Qualitative research

Face to face interviews

Shift Port Assessment
Method



Qualitative research

Becker's theoretical
framework

Main results



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Policy Discussions

RQ1: Why isn't the Mediterranean Sea a sECA?

- Member states should have the will and conviction to persevere and enforce the sECA (Mortensen, 2010)
- Political instability and unresolved treaties in the Mediterranean.
- Maritime environmental discussions are unpopular in the region

Policy Discussions

RQ2: Why 0.1% standard for sECA's?

- Geopolitical: become less dependent on oil
- Political: greening of public policies and public opinion throughout the Western world.
- **Method: Public Choice theory – ‘rent seeking’**
 - What? an economic and game-theoretic approach to decision-making
 - The winners are environmentalists and alternative fuel/technology manufacturers
 - Clean shipping Coalition obtained observer status at IMO, same level as EU
 - Do environmentalist always benefit?
 - Potential modal backshift may not be beneficial

Policy Discussions

RQ2: Why 0.1% standard for sECA's? (2)

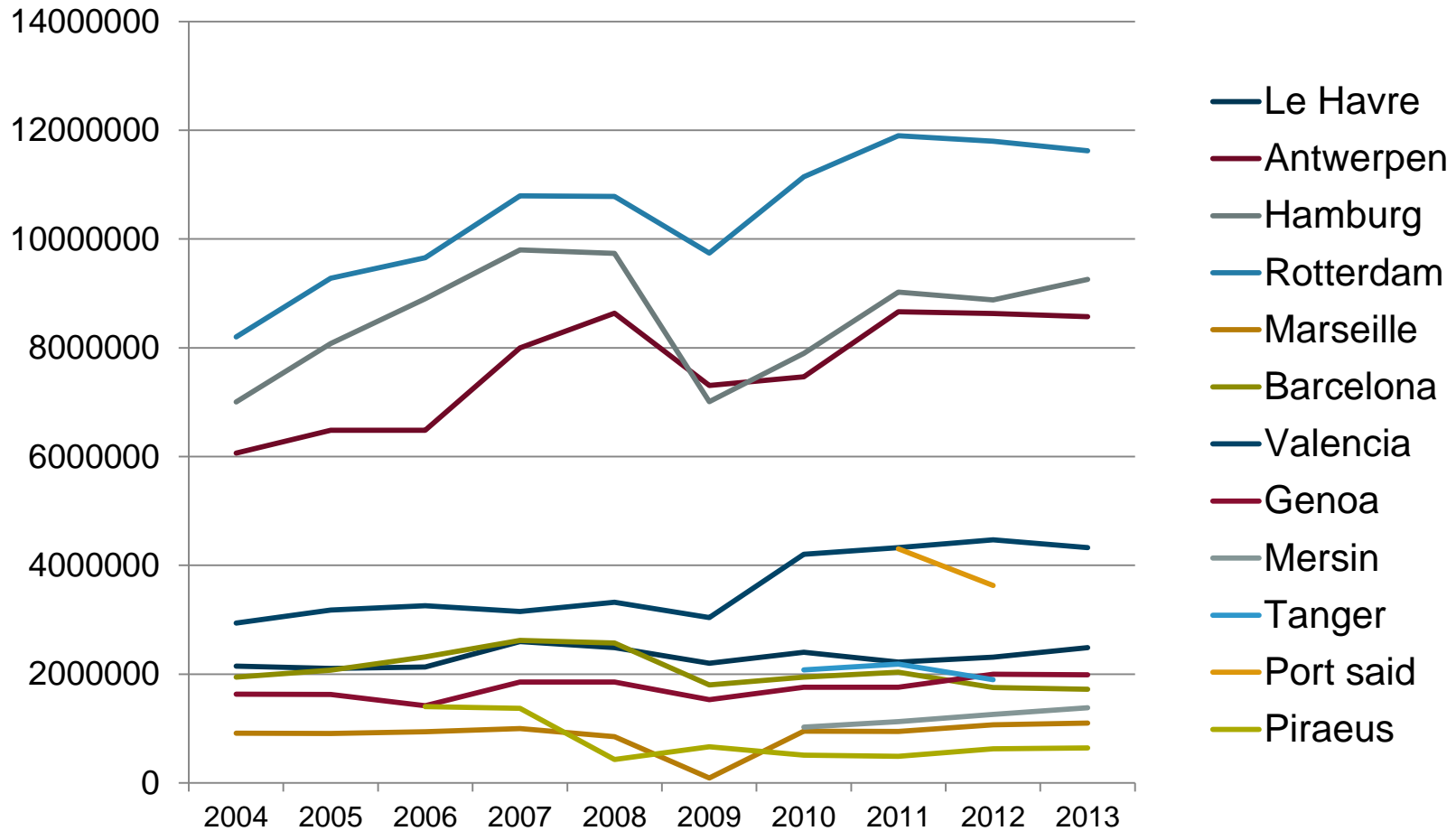
➤ **METHOD: Olson's logic of collective action**

What? To explain the impact of interest groups / to look at member interests

- The members of Clean Ocean Shipping have a rather diverse profile (from fishery to emissions technology) making successful cooperation rather unrealistic.
- Petrochemical lobbies are very united and backed by vast resources of their members.
 - They can thus emerge as winners in such a strict legislation
 - May shift shore based sulphur-free production/supply to maritime

Economic Analysis: Ports and Port Competition

TEU/year for selected ports



Economic Analysis: Ports and Port Competition

Throughput /crane for selected ports

	2008			2012			% throughput/crane
	throughput	cranes	throughput/crane	throughput	cranes	throughput/crane	
Mersin	854,500	19	44,974	1,260,000	12	105,000	↑ 133.47
Piraeus	431,056	16	26,941	625,914	12	52,160	↑ 93.61
Marseille	850,000	26	32,692	1,070,000	26	41,154	↑ 25.88
Barcelona	2,570,000	43	59,767	1,756,429	25	70,257	↑ 17.55
Port Said	3,202,000	31	103,290	3,631,000	31	117,129	↑ 13.40
Genoa	1,766,605	30	58,887	2,000,000	31	64,516	↑ 9.56
Antwerpen	8,633,736	77	112,126	8,629,992	84	102,738	↓ -8.37
Valencia	3,597,215	26	138,354	4,470,000	36	124,167	↓ -10.25
Tanger	920,708	12	76,726	1,900,000	28	67,857	↓ -11.56
Hamburg	9,737,000	81	120,210	8,880,000	91	97,582	↓ -18.82
Rotterdam	10,784,000	90	119,822	11,800,000	128	92,188	↓ -23.06
Le Havre	2,488,654	30	82,955	2,310,000	40	57,750	↓ -30.38

Data source: Ports website



Economic Analysis: Ports and Port Competition

RQ3: Will ports shift and/or reverse modal shift occur?

METHOD: Port Shift Assessment Method

What? to calculate the cost increase associated with sailing through a sECA

Cost? The total logistics cost in port selection decisions

- on the Shanghai-Antwerp trajectory, the cost increase is within a range of 2,15% and 2,66% depending on the sailing speed and fuel price scenario.
- the sailing speed has a higher impact than the fuel price.
- the percentage of the cost increase is lower than in most studies
 - most studies focused on shortsea shipping, where commercial speed is very important and a far greater percentage of the sailing distance needs to be covered with low sulphur fuel
- the higher maritime trajectory cost is compensated for by the lower road transport cost

Economic Analysis: Ports and Port Competition

RQ3: Will ports shift and/or reverse modal shift occur?

Criteria

- Transportation costs
- Transit times
- Quality
- Frequency



Economic Analysis: Ports and Port Competition

RQ3: Will ports shift and/or reverse modal shift occur?

METHOD: interviews

Opportunities and Chances	Weaknesses and Pitfalls
Closer to Asia	Geography (mountains, locations...)
Liberalisation creates dynamism	Social tensions and strong unions
Not as congested as the North	Few barge connections
North-African hinterland and market	North-African competition
Rising capacity	Old infrastructure and less capacity
New initiatives	Lack of cooperation and perseverance
Wants to develop logistical chains	Few green strategies
Potential grower	Stays number two in Europe
Does not border a sECA-zone	

Legal viewpoint

RQ4: Is the current enforcement regime is efficient or not?

METHOD: Becker's theoretical framework

What? to explain why people decide to violate or not to violate a certain regulation

A shipping company will violate the regulations when the associated benefits exceed the costs and when utility is maximized.

No guidelines for implementation → a number of different enforcement regimes

Ship operators with a great amount of uncertainty.

Ships inspections are limited to a verification of the documents

- bunker delivery notes
- analysis of fuel samples

Concluding remarks

Transversal study

- The petrochemical lobby much more than the green lobby is the driver behind emission caps at sea.
- The shift from Southern-European to Northern-European ports as a consequence of emission zones at sea will be rather limited.
- The main liner companies seem well prepared to deal with the upcoming emission zones in their current strategies.
- MARPOL enforcement is to be improved.

Thank you for your attention

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