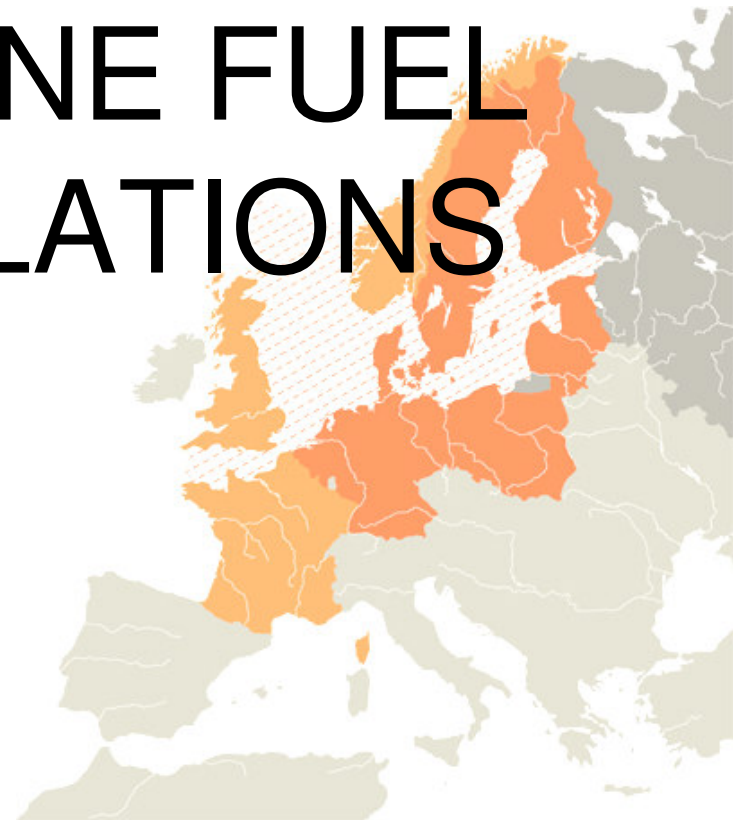


Industry-Group

CONSEQUENCES OF THE IMO'S NEW MARINE FUEL SULPHUR REGULATIONS

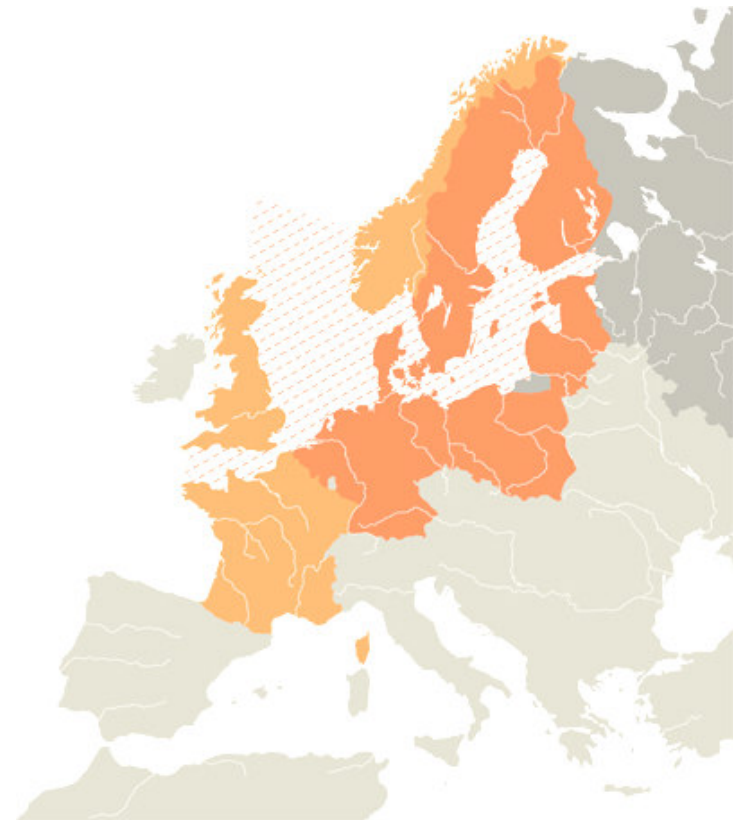
Mikael Castanius, Director
Ports of Sweden (Sveriges Hamnar)
BPO Seminar, Copenhagen 19.01.2010



Amendment of Annex VI

IMO Marpol Regulations

- NO_x
- SO₂
- Decided by MEPC of IMO in April 2008
- Confirmed by MEPC of IMO in October 2008



Regulations

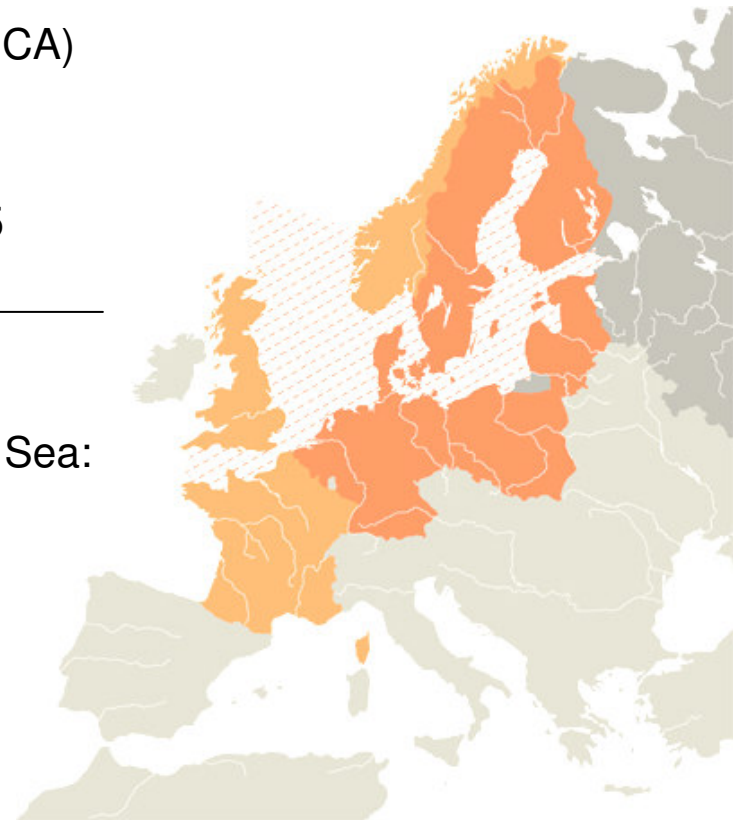
Sulphur regulations for Marine Fuel

Global sulphur limits (including EU countries not in the SECA)

- 4.5 % is maximum today
- 3.5 % from 2012
- 0.5 % globally from 2020 if feasible otherwise from 2025






Sulphur limits in SECA (Sulphur Emission Control Area), which is within the English Channel, North Sea and Baltic Sea:

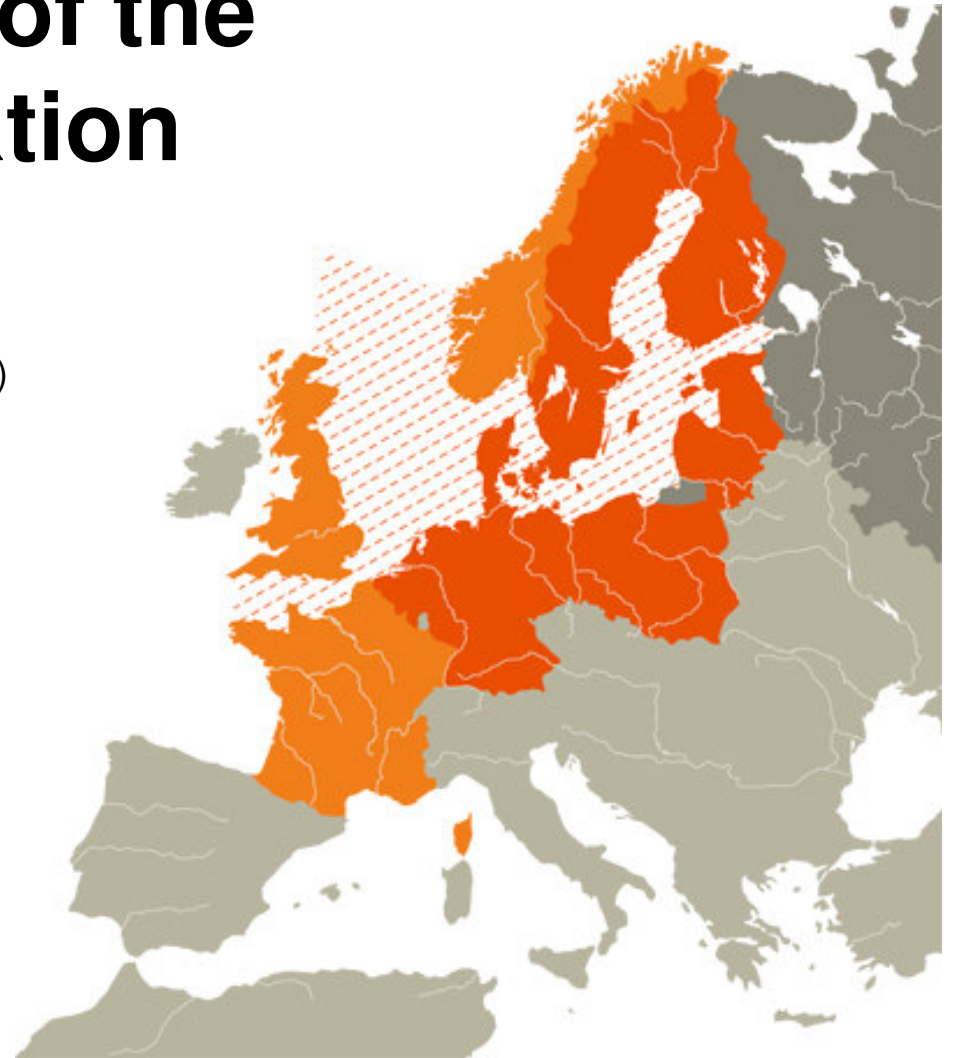
- 1.5 % is maximum today
- 1.0 % from July 2010
- 0.1 % from 2015



Regulations

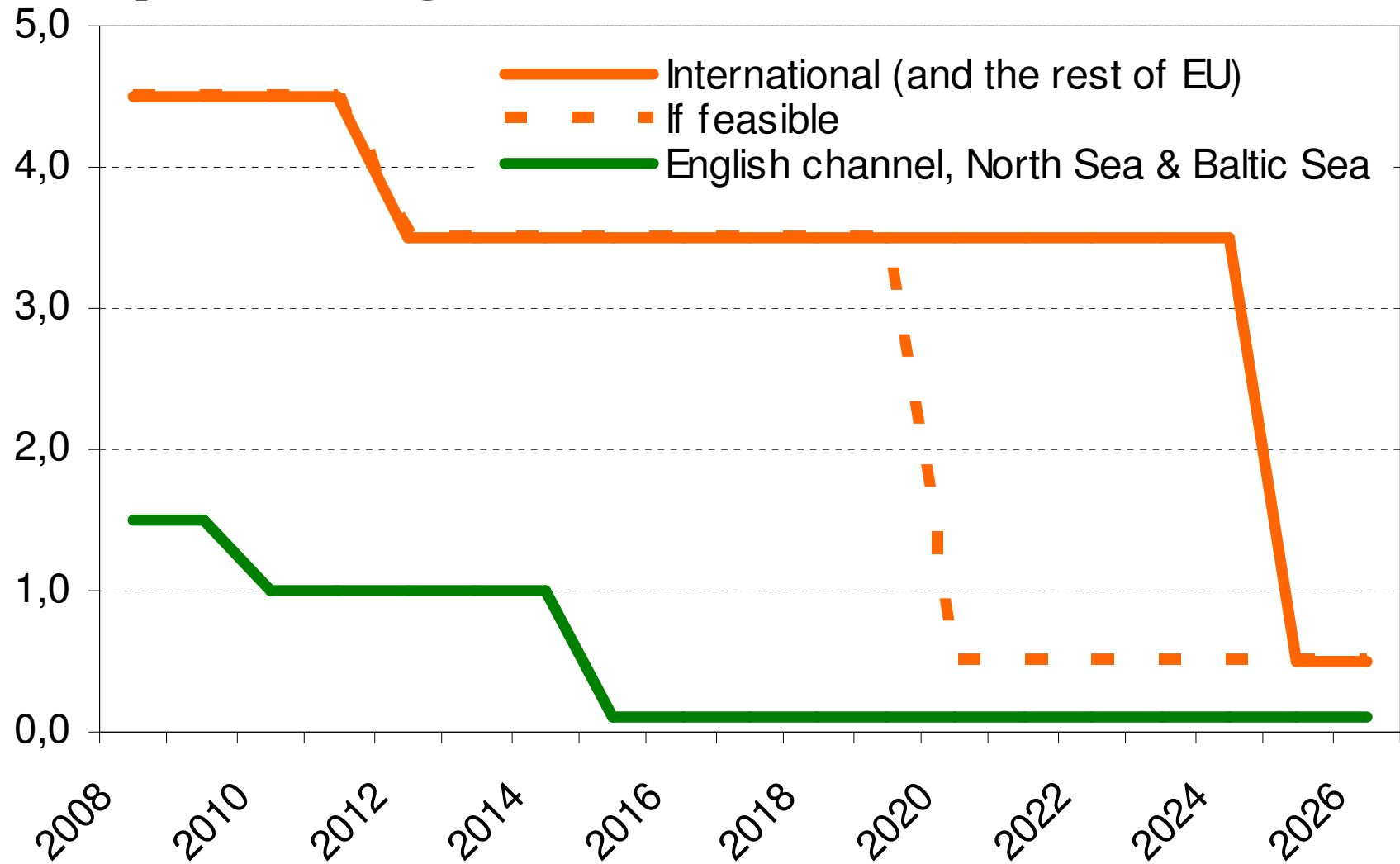
Geographical area of the IMO sulphur regulation

-  The Sulphur Emission Control Area (SECA)
-  Countries with water only in SECA
-  Countries with part of the coast in SECA
-  Countries without coast in SECA
-  Has not signed the Marpol convention



Regulations

Sulphur regulations for Marine Fuel



In EU 0.1% Sulphur for ships at berth

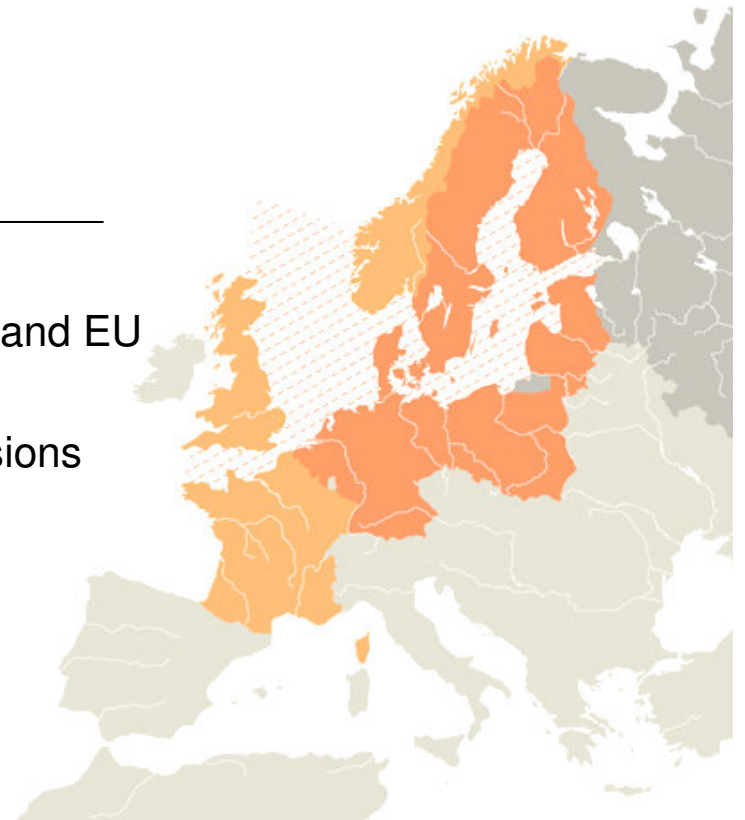


Studies and Impact Assessments

– Conducted after the decision...

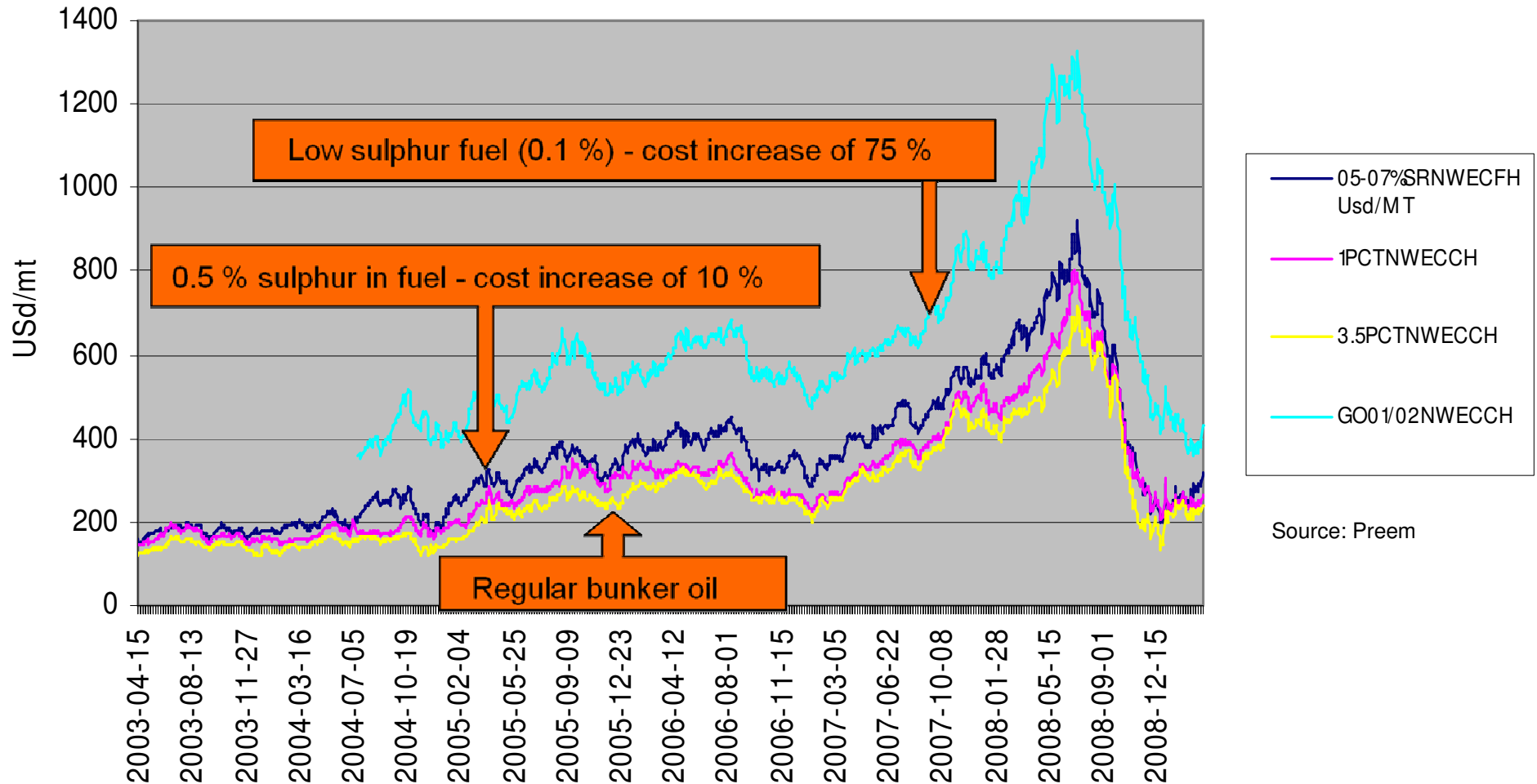
- Impact Assessment in Finland (March 2009)
- Impact Assessment in Sweden (May 2009)
- Impact Assessment in Germany

-
- EU: Study to assess cost/benefit of new IMO standards and EU implementation (12/2009)
 - EU: Study to assess feasibility of and potential for emissions trading (12/2009)
 - EU: Study on distance and on line monitoring of ship emissions (12/2010)



Cost Increase

The IMO decision on sulphur will give a substantial cost increase

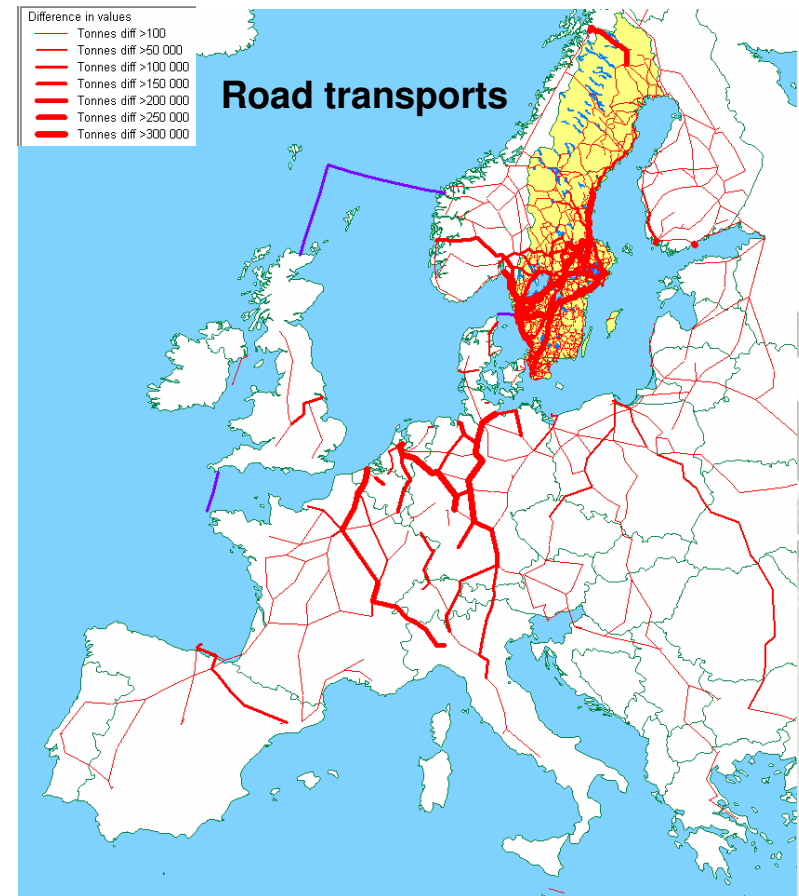
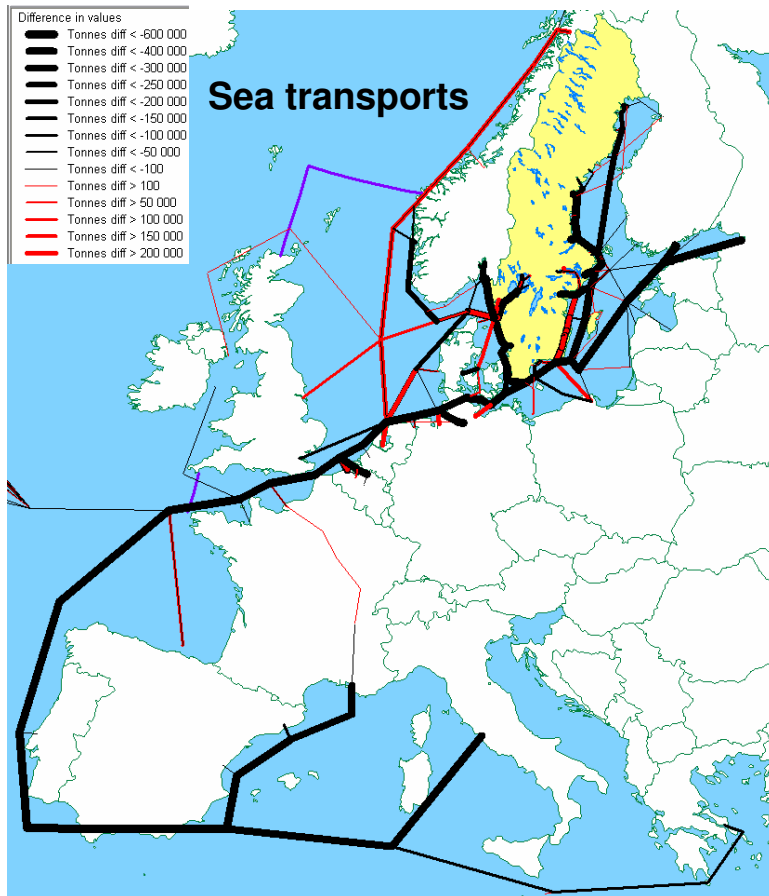


Source: Preem

The light blue line is marine fuel with a 0.1-0.2 % sulphur content and the yellow line is bunker oil, the marine fuel used world wide today. Even though price varies over time the price difference between low sulphur fuel and bunker oil is almost always around 250-300 USD/tonne. Dark blue line is 0,5 % sulphur content in marine fuel.

Modal back-shift

Modal shift from sea to road – not in line with EC goal on motorways of the sea



— Reduced transports

— Increase transports

These maps only show modal back-shift of Swedish products (from a report by the Swedish Maritime Administration). The effect will be much larger when all countries are included in the calculations.

Tonnekilometers

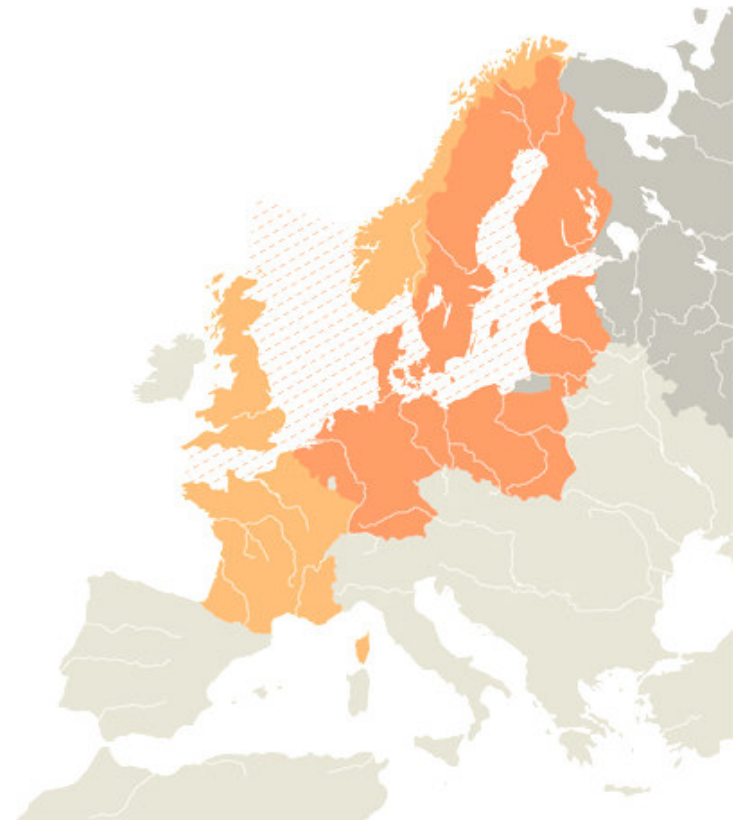
Differences in tonnekilometers

Sea - 10.0 %

Rail + 5.0 %

Road + 3.0 %

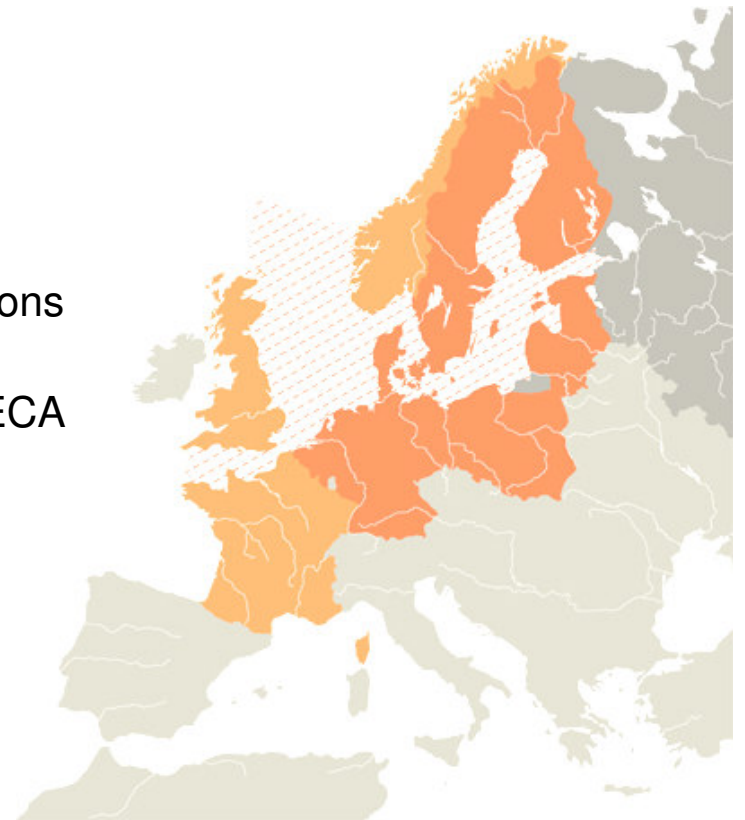
Source: Swedish Maritime Administration



Consequences

Impacts

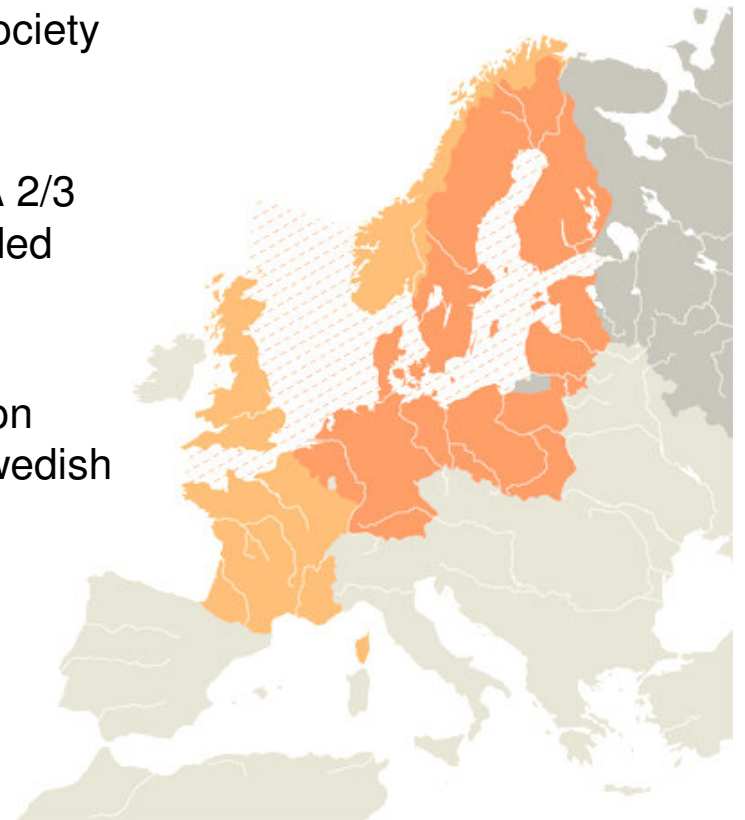
- Cost increase of marine fuel by 45-80 % – average 75 %
- Sea transport cost increase with 30-50 %
- Cost increase in the range of 2-9 €/tonne product
- Modal back-shift to road and rail – increased CO₂ emissions
- Changed logistics flow in Europe in order to avoid the SECA



Consequences

Impacts

- Reduced sulphur emission 146 500 ton of a benefit for society of 0.7 billion €
- 2.8 billion € for fuel increase with fleet operating in SECA 2/3 of the time, to and from Sweden (+ 280 % of recommended cost)
- The additional cost to Swedish Industry will be three billion euro (MEUR 3000), 0.83 % or close to one percent of Swedish GDP per year.



Consequences

Increase In Freight Charges

Freight type	Sulphur content		
	1.0 %	0.5 %	0.1 %
Container	4–13 %	8–18 %	44–51 %
Paper reel	3–10 %	6–14 %	35–40 %
Lorry	3–10 %	6–14 %	35–41 %
Private car	3–10 %	6–14 %	35–41 %
Oil	3–8 %	5–11 %	28–32 %
Freight tonne on bulk carriers	4–11 %	7–15 %	39–44 %
Timber	3–10 %	6–14 %	35–40 %
Steel products	3–10 %	6–14 %	35–40 %



Consequences

Total Fuel Cost Increase – million €

Industries in Sweden	662 USD/ton	+75% = 1160 USD/ton	+150% = 1655 USD/ton
Chemical Industry	546	955	1 365
Minerals and mining	359	628	897
Forest Industry	150	262	374
Agriculture	128	223	319
Soil and rock	53	92	132
Metal Industry	30	53	76
Technology Industry	21	37	53
Food Industry	11	19	27
Forestry	3	6	9
Textiles	0.1	0.3	0.4
Sum	1 300	2 275	3 250
Cost Increase in percent of the total profit in the industry *	1.5 %	2.6 %	3.7 %

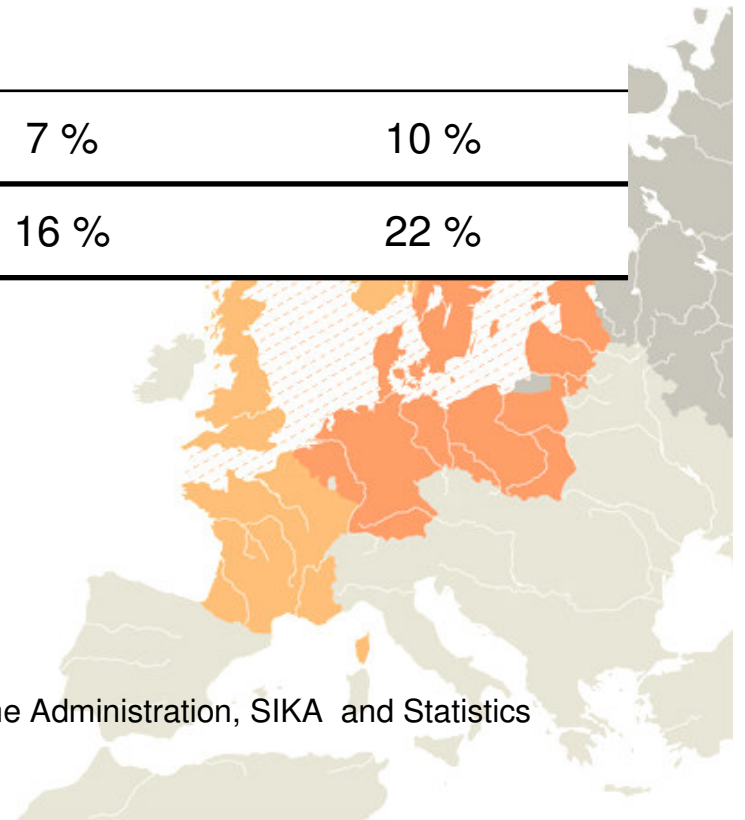
Source: Confederation of Swedish Enterprise with data from Swedish Maritime Administration, SIKa and Statistics Sweden * Gross profit from 2006

Consequences

Total Fuel Cost Increase in Relation to Value Added

Total fuel cost increase by industry sector in relation to value added	662 USD/ton	+75% = 1160 USD/ton	+150% = 1655 USD/ton
Forest Industry	4 %	7 %	10 %
Minerals and Mining	9 %	16 %	22 %

Source: Confederation of Swedish Enterprise with data from Swedish Maritime Administration, SIKA and Statistics Sweden * Gross profit from 2006



Consequences

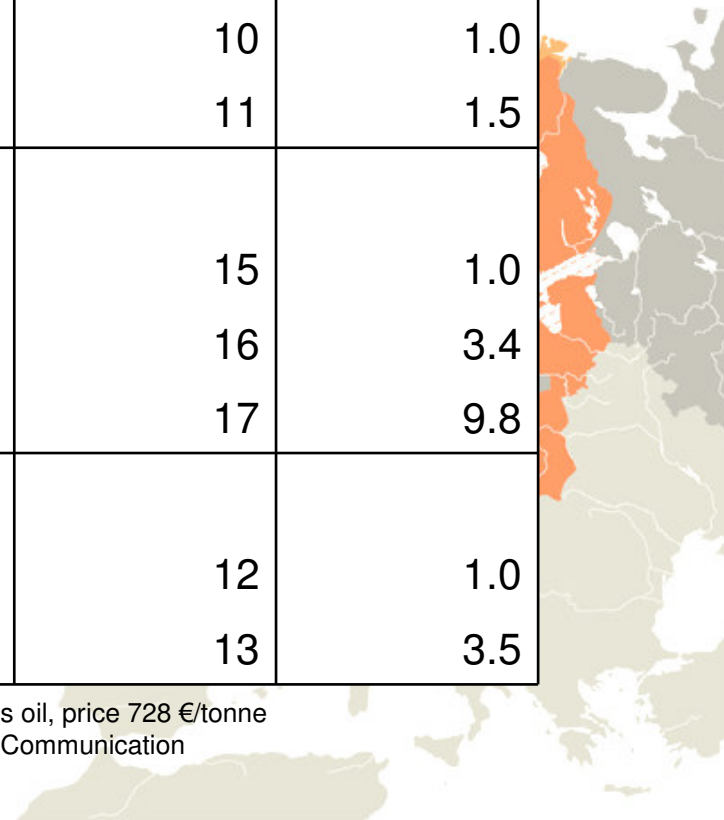
Extra costs of sulphur regulations and emission trade to sea transport

Type of ship / route	1) Sulphur 0.1 %		2) Sulphur 0.5 %	
	%	€/tonne	%	€/tonne
A) Roro-ship				
Helsinki–Lübeck	27	2.8	10	1.0
Helsinki–Rotterdam	31	4.3	11	1.5
B) Container ship				
Helsinki-Hamburg	41	2.8	15	1.0
Helsinki-Hamb.-USA/E.coast	45	9.4	16	3.4
Helsinki-Hamburg-Japan	47	27.4	17	9.8
C) Conventional ship				
Kotka-Great-Britain	33	2.8	12	1.0
Kotka-Egypt	37	9.6	13	3.5

The basic level of costs: IFO 380 LS heavy oil (sulphur 1.5 %), price 446 €/tonne ¹⁾ MGO gas oil, price 728 €/tonne

²⁾ RMG 380 (0.5 %), price 548 €/tonne

Source: Finnish Ministry of Communication



Consequences

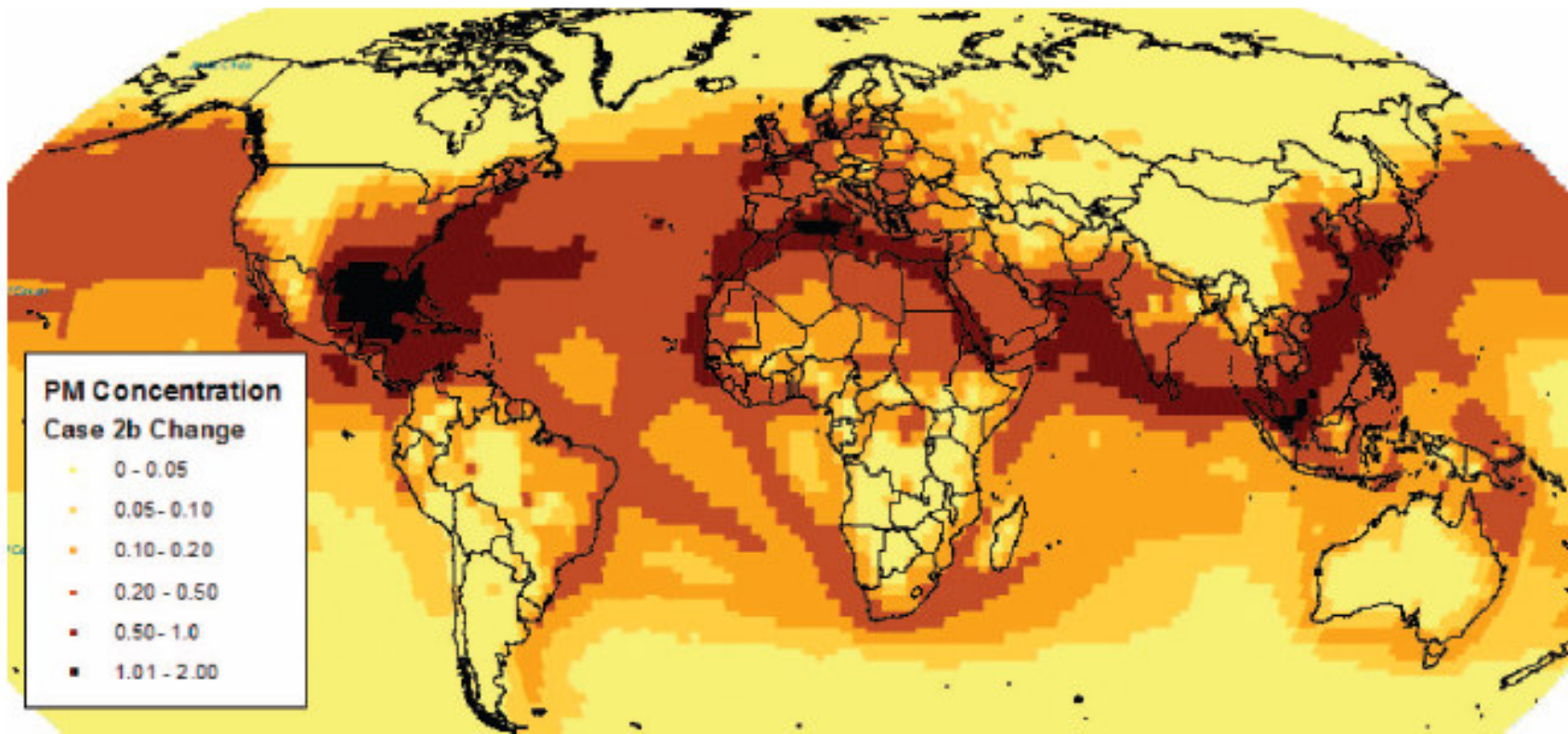
Refineries are concerned

- The European refining industry has also expressed concerns
- To build a new cracker cost today roughly one billion Euro and takes many years to complete
- The tighter sulphur restrictions will double Europe's diesel shortfall, leading to
 - ✓ a price spike for marine fuel
 - ✓ modal backshift in terms of CO₂
 - ✓ a knock-on effect on the car passenger market



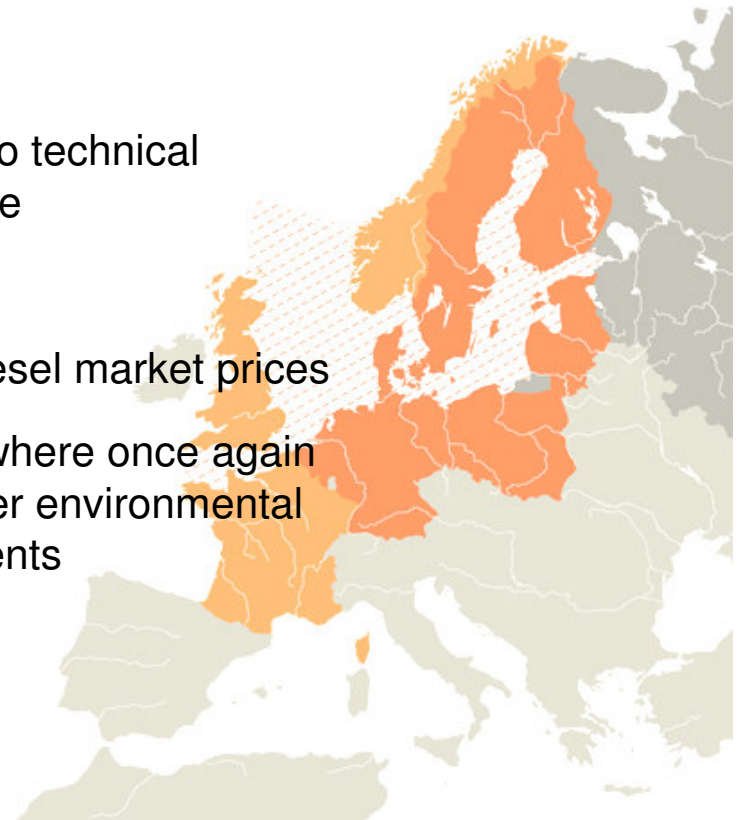
Consequences

Concentration of Particle Matter



Consequences - Summary

- Negative for competitiveness of all north European industries
- Regional rules distortions of internal market
- Not in line with Lisbon agenda
- Modal back-shift
- No Impact Assessment was conducted in advance
- The ship fleet might not even be able to switch fuel due to technical restrictions – also expensive investments over a long time
- Russia?
- Diesel shortage of Europe and knock-on effect on the diesel market prices
- A variation of “carbon leakage” (or a “sulphur leakage”) where once again competitiveness of producing goods in Europe with higher environmental regulations is reduced forcing production to other continents



Thank you for listening and for more information please contact The Industry – Group!

Mikael Castanius

Mikael.castanius@transportgruppen.se

Project leader

Carl Carlsson

Carl.carlsson@sweship.se

