

COMPASS

Analysis of the competitiveness of European short sea shipping compared to road and rail transport

VLW 2010
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Outline presentation

- Goal of the project : assess the effect of several scenarios on competitiveness SSS
 - Background: MARPOL SOx legislation of 0.1% in ECAs
 - For EC – DG ENV
 - Using ad hoc model
- Data collection – key input
- Key outputs
 - Effects on SSS volumes
 - Effects on emissions
 - Effect on intercontinental trade

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Task 1: data collection


- Freight routes
- Monetary Costs (€/tonkm)
 - SSS
 - Rail
 - Road
- Time costs

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OD Selection Overview

- Starting point: ETIS database
 - Tonnes of commodities transported by SSS, including land legs.

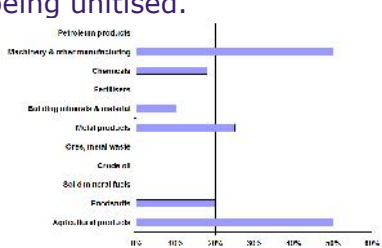


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OD Selection Overview

- Step-1: Select routes carrying commodities most susceptible to being unitised.



Commodity Type	Percentage
Petroleum products	~45%
Metals & other manufacturing	~35%
Chemicals	~25%
Fertilisers	~15%
Building materials & material	~10%
Food products	~10%
Grain, metal waste	~10%
Crude oil	~10%
Solid mineral fuels	~10%
Explosives	~10%
Agricultural products	~10%

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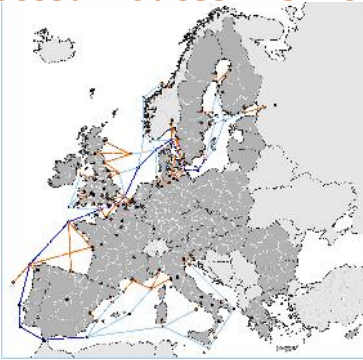
OD Selection Overview

- Step-2: The 26 highest volume country to country corridors were identified. This represented 67% of all unitised flow.
- Step-3: Routes between Ireland and the UK were excluded as there is no alternative to SSS.
- Step-4: Selected routes were compared with those proposed by industry representatives.
- Step- 5: Calculate road/rail volumes using Eurostat

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Selected Routes: 252 OD's



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Shortsea Ship Types:

- The cost structures of the four ship types were derived from ship cost databases and from consultation with industry representatives.
- LoLo Container Ship
- RoRo Unaccompanied Freight
- RoPax (Small)
- RoPax (Large)

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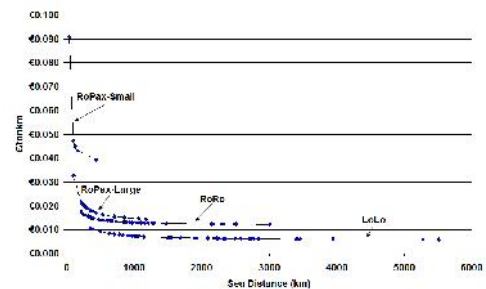
SSS Cost Breakdown:

Ship Type	Cost Structure (€/day)			
	LoLo 600 TEUs	RoRo 300 Trailer	RoPax Small 40 Trailer	RoPax Large 500 Trailers
Guide DWI	710,00	710,00	510,00	1210,00
Manning	61,536	61,531	63,030	57,300
Insurance	50,000	640	5000	6000
Repairs & Maintenance	5000	61,000	61,000	60,000
Stores & Lubr Oil	5000	6000	6000	6000
Administration	6000	6000	61,000	6000
Capital Payments	60,100	60,500	60,000	60,500
Interest	60,000	60,000	60,000	60,000
Gross Margin	60,000	60,000	60,000	60,000
Port	61,000	60,000	60,000	60,000
Fuel (Tonn/day)	200	200	200	200
Fuel (€/day)	100,000	100,000	100,000	100,000
Speed (knots)	14.0	14.0	8.0	20.0
Full Cargo Weight (Tonn)	2,200	2,800	1,000	2,200
Total (€/day)	€16,952	€17,007	€14,180	€18,117

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SSS costs – euro/tonkm



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Rail costs – euro/tonkm

		electric	diesel
0	Agriculture Products and Live Animals	0.0066	0.0078
1	Foodstuffs and Animal Fodder	0.0067	0.0079
2	Solid Mineral Fuels	0.0060	0.0068
3	Crude Oil	0.0048	0.0056
4	Ores and Metal Waste	0.0049	0.0056
5	Metal Products	0.0067	0.0079
6	Crude and Manufactured Minerals, Building Materials	0.0060	0.0068
7	Fertilizers	0.0048	0.0056
8	Chemicals	0.0061	0.0072
9	Machinery, Transport Equipment, Manufactured Articles And Miscellaneous Articles	0.0081	0.0096
10	Petroleum Products	0.0048	0.0056

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Road Costs: REMOVE

€/tonkm - EU average	
COST (€/tonkm)	
repair	0.0098
purchase	0.0241
labour tax	0.0184
labour	0.0172
insurance	0.0064
fuel	0.0154
TAX (€/tonkm)	
registration	0.0001
ownership	0.0017
network	0.0016
insurance	0.0011
fuel	0.0090
TOTAL	0.1046

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Time costs

- Speed
 - SSS
 - Depends on ship
 - Constant over time
 - Rail
 - Increases over time (62 km/h in 2010 – 66 km/h in 2025)
 - Road
 - Decreasing over time (60 km/h in 2010- 58 km/h in 2025)
 - No explicit modelling of driving and rest time regulation
- Value of Time (VOT) – commodity type
- No schedule delay time

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Scenario analyse: Definition scenarios

- Background scenario
 - GDP growth, oil prices: iTREN
- Baseline scenario: iTREN
- 5 Policy scenarios: 5 policies
 - MARPOL – SOx regulation } A
 - eMaritime } B
 - GHG policy } C
 - Extension ECA } D
 - NOx in ECA } E

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Scenario analyse: Modelling

For each OD:

- Calibrating baseline using generalised price and volumes for each OD
 - 2 options: using mainly SSS or using mainly road
 - Using distance: calculate average generalised price
 - CES structure: calculate Keller's alpha
- Changing prices (due to policies) and calculating new volumes for both options
- Given new volumes and effect emission factors: calculate emissions

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Task 2.2: Modelling – step 2

- Effect on (monetary) total costs due to policies
 - SOx regulation: ↑ between 6% (RoPax small) and 29% (LoLo)
 - eMaritime: ↓ between 0.2% (RoPax small) and 0.4% (RoPax large and RoRo)
 - GHG policy: ↑ between 3% (RoPax) and 10% (LoLo)
 - Extension: effect certain OD's
 - NOx: ↑ between 0.6% (RoPax large) and 2.5% (LoLo)

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Scenario analysis: volumes (1)

- Simulation: volumes
 - Policy A: largest decrease: 5.50% on average
 - Effect eMaritime small
 - Policy C: average decrease 7.54%
 - Effect extension ECA small
 - Policy E: average decrease 7.70%
- Effect greatly depends on ship type
- Modal shares

Modal share	Baseline	Policy E	Change in modal share
LoLo	34%	31%	-7%
RoRo	35%	33%	-4%
Ropax Small	13%	12%	-1%
Ropax Large	20%	20%	-2%

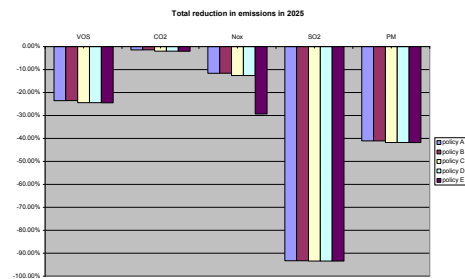
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Scenario analysis: volumes (2)

- Simulation: volumes – commodities
 - Other products, metal and agriculture most affected
 - Link with ship type is stronger than value commodity
- Simulation: volumes – corridors
 - Scandinavia – Central Europe: largest decrease (LoLo, RoRo)
 - Short distances (within Scandinavia, UK-central Europe): small decreases

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Scenario analysis: emissions



Sensitivities

- Everything-else-equal assumption. E.g. Oil prices, fixed transport budget,...
- Cost parameter: for all modes not all costs are taken into account
- Loading factor: decreasing loading factors of SSS increases the effect of the policies
- Responses of the shippers (qualitative analysis): decreasing speed and/or decreasing profit margins might alter results, but not on the long term

Conclusions

- Costs:
 - SSS will see big cost increase
 - But... compared to road it remains relatively cheap
- Policy scenarios:
 - Ship type is very important
 - On average maximum scenario leads to 8% decrease in volumes SSS
 - SOx regulation and GHG largest effect
 - Mitigation measures might have adverse effects