

Environmental Aspects of Short Sea Shipping and Intermodal Logistics Chains

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Introduction and Background

- There is an increasing pressure on the environment caused by transport, particularly rapidly-growing road and air transport.

Freight Transport in EU

Source (DG Energy & Transport)

Mode of transport	Billion tonne-km transported in 2000 in the EU
Road	1348
Rail	249
Inland waterways	125
Short sea Shipping	1270
Oil pipelines	85

Introduction and Background

- ❖ The Common Transport Policy advocates integrated transport systems and a shift to short sea Shipping
- ❖ The European Commission has introduced a regulation to implement the TENs-T programme, including “Sea Motorways” which will also lead to a modal shift

Environmental Impact

- ❖ It is important to understand the environmental aspects associated with the shift of freight from road to sea:
 - ❖ e.g. Improved air quality, decreased noise, etc.on land, but
 - ❖ an increased air pollution, etc. in the coastal environment.

Environmental Impacts of Transport

- Some impacts are common to all modes of transport and therefore comparisons can be made:e.g.
 - Air emissions-local and global
 - Energy consumption
 - Noise
- There are other areas where comparisons should be made e.g.
 - Accidents
 - Congestion
 - Waste

Environmental Impacts of Transport

- ❖ Other impacts are very specific to the mode of transport and therefore direct comparisons are very difficult:
 - e.g. Contamination by antifouling compounds of ships

Air pollution

- CO2 emissions from transport increased by 15% between 1990 and 1998 (TERM 2001).
- 1990 and 1998, Generally, emissions from transport are falling (NOx, VOC).
- Transport is responsible for 24% of the EU's total man-made emissions of CO2 (84%from road)

Emission to air of pollutants in gram
per tonne-km in function of transport mode

In g/tonnekm	CO	CO ₂	No _x	SO ₂	CH ₄	nm-VOC	PM10
Road transport	0,2 – 2,4	50 – 333	0,24 – 3,6	0,03 – 0,4	0,2 – 0,9	0,025 – 1,1	0,005 – 0,2
Rail transport	0,02 - 0,2	9 - 102	0,07 -1,9	0,04 - 0,4	0,02 - 0,9	0,01 - 0,1	0,01 - 0,08
Maritime transport / SSS	0,02 - 0,2	7,7 - 31	0,11 - 0,72	0,05 - 0,51	0,04 - 0,08	0,01 - 0,02	0,002 - 0,04
Inland navigation	0,11	33 – 81	0,26 – 1,45	0,04	-	0,03 - 0,05	0,02

Source: Resource Analysis 2003.

Energy Consumption

Energy consumption per transport mode

Mode of transport	Energy use in MJ/tonne- km
Road	1,8 - 4,5
Rail	0,4 – 1
Maritime transport	0,1 - 0,4
Inland navigation	(0.42-0.56)

Source: CSD, 2001

Energy Consumption

- ❖ Energy consumption by the transport sector has increased by 47% since 1985
- ❖ There has been no increase in the energy efficiency of freight transport by road and little change in rail or shipping.
- ❖ Air transport remains the least energy efficient mode of transport despite technological advances (TERM 2001)

Noise

- ❖ Noise from rail and shipping, are generally considered to be less annoying than that of road (trucks)
- ❖ From an intermodal comparison perspective, the noise levels produced by shipping can be considered as insignificant

(Realise Project 2003)

Accidents

- The environmental and social impacts of transport accidents should be considered e.g. fuel or freight spills
- However it is very hard to assess and compare the impacts

Congestion

- Congestion is mainly associated with road transport and is environmentally and socially damaging.
- Can amplify the environmental impacts e.g. exhaust on congested roads
- It is difficult to assign the damage at modal hubs with any one transport mode, e.g. port/road

Waste

- ❖ **Currently no figures available to help make a comparison!**

Infrastructure

Infrastructure – Land-Use

- ❖ Transport infrastructure is increasing damaging the Land Environment
- ❖ The length of the EU motorway network has increased by more than 70% since 1980
- ❖ During the same period conventional railway lines and inland waterways have fallen by about 9% (TERM2001).
- ❖ The impact is extremely difficult to assess, particularly when looking at intermodal nodes e.g. Ports.

Possible Impacts of Sea Motorways

- ❖ There could also be a considerable improvement to the marine environment by nature of:
 - Reduction in the environmental “footprint” of shipping.
 - Well-defined Sea motorways allow for effective and efficient environmental monitoring, permitting the rapid detection of environmental change.

Possible Impact of Sea Motorways (2)

- Design of new shipping specifically designed for the routes, with features that reduce the environmental impact of shipping.
- Modern Port developments techniques and design (new and upgrading of facilities) can contribute to a reduction in pollution by various means e.g. efficient emissions control, effective waste disposal etc.

Possible Impacts of Sea Motorways (3)

- The efficient policing and enforcement of international, national and local environmental regulations

Conclusions

- Currently there is no consensus on the overall comparative environmental impacts of the various modes of transport
- **Emissions** –Very complicated picture depending on chemical emission. Railways lowest
- **Water Pollution** – Road and rail lowest polluting - SSS and inland waterways highest polluting

Conclusions

- **Land Pollution** SSS and inland waterways least polluting - Road highest polluting
- **Noise Pollution** SSS and inland waterways insignificant – Road and Rail highest levels
- **Land use for Infrastructure** SSS and inland waterways least use- Road highest use

Conclusions

- There is an urgent need for a methodology for the meaningful comparative environmental impact method across all modes of transport
 - Realise project has developed an intermodal comparative tool.
- There is an urgent need for integrated transport plans, particularly looking at increases in rail and shipping

References

- TERM 2001 and 2002
<http://reports.eea.eu.int/term2001>
- Eurostat <http://europa.eu.int/comm/eurostat>
- SEAM Project www.mettle.org/seam
- Realise Project www.realise-sss.org
- www.amrie.org