Measure 28: Motorways of the seas

First page:

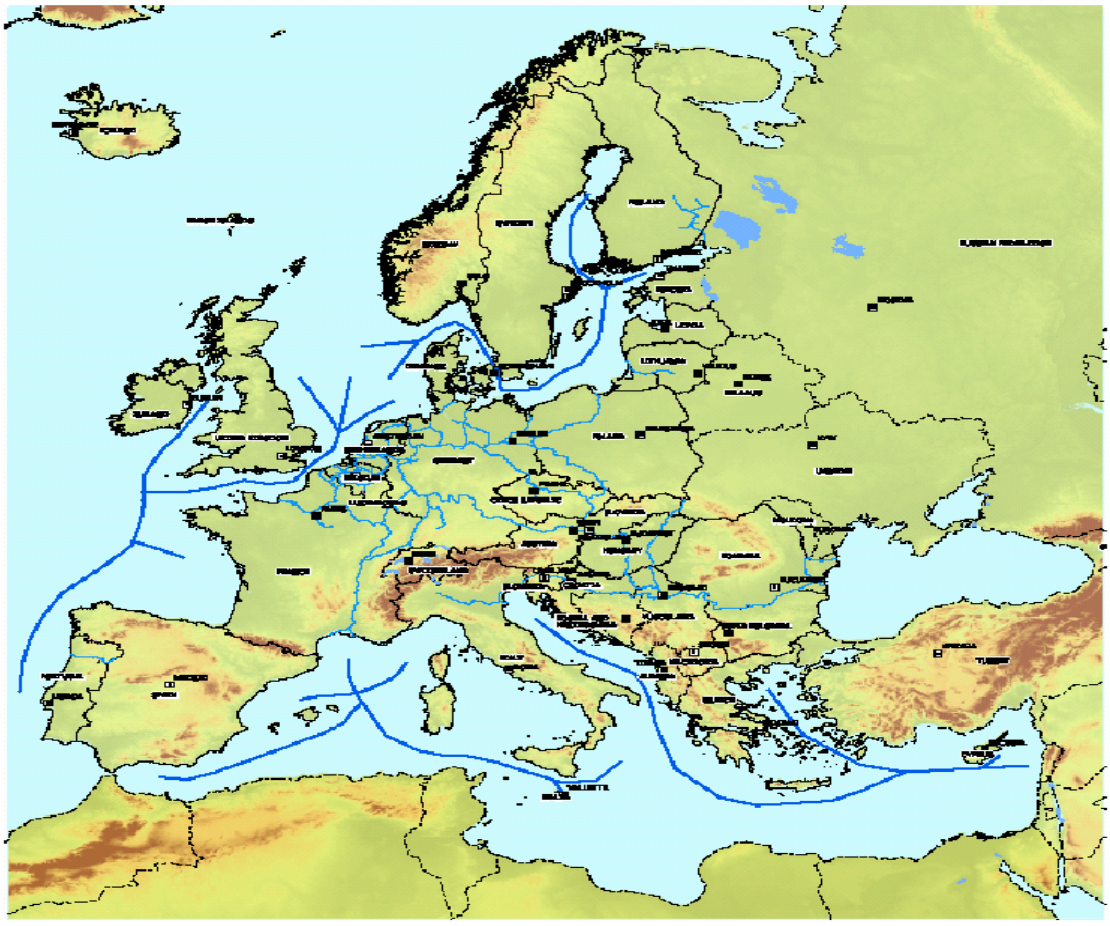
Policy package:
4B: Sea and inland waterway Investment and technologies

Measure 28:
Develop the infrastructure needed to build veritable "motorways of the seas"

What is the problem being addressed ?
Motorways of the Sea (MoS) is a new priority project proposed in the new guidelines for the trans-European transport network. The objective is to create "Maritime links to be treated with the same importance as land links". The trans-European network of motorways of the sea shall consist of facilities and infrastructure concerning at least two ports in two different Member States, including elements such as the port facilities, electronic logistic management systems, safety and security and administrative and customs procedures, as well as infrastructure for direct land a sea access, including ways of ensuring winter access in North Europe ports. More specifically the Measure intends to create projects of common interest and concerning one of the following motorways of the sea:

- Motorway of the Baltic Sea (linking the Baltic Sea Member States with Member States in Central and Western Europe, including the route through the North Sea/Baltic sea Canal – Kiel canal) (2010);
- Motorway of the sea of western Europe (leading from the Iberian peninsula via the Atlantic Arc to the North Sea and the Irish Sea) (2010);
- Motorway of the sea of south-east Europe (connecting the Adriatic Sea to the Ionian Sea and the Eastern Mediterranean to include Cyprus) (2010);
- Motorway of the sea of south-west Europe (western Mediterranean), connecting Spain, France, Italy and including Malta, and linking with the motorway of the sea of south-east Europe (2010).

Map of Motorways of the Sea



Measure's costs and/or benefits:

Its is clear that possible EU-support will only be a part of the total funding. Since the latter are not known yet the true direct costs of the measure are unknown as well. However, as mentioned in COM/2003/155 final (the Programme for the Promotion of Short Sea Shipping) cost estimates seem to indicate that the establishment of new regular shipping links would be considerably less costly than the construction of corresponding new land infrastructure. In addition, the DGTREN-PLANCO Study on TEN-T infrastructure has collected data and provided the following estimate of investments in 230 major ports of Europe, of which 204 located in EU15 and the remaining in the Candidate Countries:

Table 6-24: Investments in TEN-T ports, Member States, million Euro

Country	1996/1997	1998/1999	2000/2001	2002/2003	2004/2005	2006/2010	TOTAL
Austria	4.5	11.6	24.0	31.7	17.6	3.6	**92.9**
Belgium	4,041.3	3,843.5	2,023.6	509.6	389.1	441.5	**11,248.6**
Denmark	47.0	57.2	64.5	35.4	13.1	32.8	**249.9**
Finland	198.5	198.5	198.5	198.2	376.5	495.8	**1,665.8**
France	0.0	224.4	262.0	298.6	183.1	45.9	**1,014.0**
Germany	769.1	1,043.0	1,010.5	701.2	298.4	431.0	**4,253.1**
Greece	45.2	55.7	78.6	89.7	55.2	13.2	**337.7**
Ireland	85.2	77.7	58.3	24.6	27.4	100.7	**373.9**
Italy	0.0	0.0	204.1	477.0	291.4	476.1	**1,448.6**
Luxembourg	#	#	#	#	#	#	#
Netherlands	678.7	686.8	708.5	671.2	592.4	75.0	**3,412.6**
Portugal	27.3	164.1	213.3	197.6	197.2	98.6	**898.2**
Spain	0.0	810.8	785.7	2,279.3	2,285.1	3,705.8	**9,866.7**
Sweden	0.0	0.0	0.0	117.8	108.2	50.7	**276.8**
United Kingdom	321.9	361.2	285.9	489.3	470.5	1,091.9	**3,020.7**
Total	**6,218.6**	**7,534.4**	**5,917.4**	**6,121.4**	**5,305.2**	**7,062.5**	**38,159.5**

does not apply

Investment in port infrastructure in the EU15 Member States (175 maritime ports and 29 maritime/inland and inland ports) amounted to 19,6 billion Euro between 1996 and 2001. Future expenditure in the period between 2002 and 2010 are estimated to be 18,5 billion Euro. The total investment amounts to 38 billion Euro. It is interesting to note that the very high figures reported for Belgium relates mainly to the Port of Antwerp.

Legislative implementation at the EU level:

Decision No 1692/96/EC (Community guidelines for the development of the trans-European transport network) is amended by COM(2003) 564. After the van Miert rapport on the guidelines , the European Commision submitted to Parliament an amended proposal (adding 9 projects to the already adopted projects). Amongst others MoS was added as a priority project. MoS was favourably received by the European Parliament and adopted in April 2004.

What are the objectives ?

According to the Commission's White Paper, the Motorways of the Sea should alleviate major land bottlenecks in the European transport system and enhance the logistic integration of Short Sea Shipping. However, although Short Sea Shipping would be the mode to operate on the Motorways of the Sea, its underlying concept is broader that that of Motorways of the Sea, because, apart from trans-national links between European Union Member States, Short Sea Shipping also includes connections with close third countries (e.g. in the Adriatic sea), domestic connections, and connections from mainland to islands. Therefore, the benefits of the MoS will concerns only a part of international SSS, and in particular they should make it possible to bypass bottlenecks in Europe as part of comprehensive door-to-door logistic chains: obvious examples of the bottlenecks would be the Alps and Pyrenees.

The aim to move substantial flows from road freight transport to the sea will require either a substantial cost reduction in sea transport or a significant increase in the speed of sea transport. Ports connected to the MoS should have adequate hinterland connections and offer a high level of service to short-sea customers (including smooth administrative procedures). Telematics interconnections between ports, on the one hand, and ship's communication systems (such as Vessel Traffic Management and Information Systems – VTMIS), on the other, should be extended and become interoperable to integrate locally distributed systems into a European network. These are the key variables to look at (see second page).

However, it must be questioned whether TEN investments in the few ports in Europe included in the MoS alone will be sufficient. Such investments, in order to be successful, must be related to other investments which target one or the other key variable. The most promising development may be an increase in the speed of sea transport. The present technology allows the design of very fast vessels (70 km/hour). However at these speeds some emission impacts (and fuel consumption) are higher compared to road freight transport. So not all external impacts of transport will improve in this case.
In addition it must be remarked that there is a danger that subsidies from the EC might distorting the sea transport market as one port is selected and another competing port might not be selected. This concerns is manifested in particular by the European Sea Ports Organisation, who supported the objective of the Commission but warned for artificial development of "MoS" as this would give ports not linked to such motorways a disadvantageous status and lead to distortion of competition. ESPO also advised to approach public financing of such motorways and their facilities and services with great care (ESPO, Annual Report 2003).

Interactions with other WP measures:
This measure is closely linked to the White Paper objectives to "Linkup the modes of transport" and "Shifting the balance between modes". There are clear links with Marco Polo Programme and Intermodal Loading Units. It is also related to the present Programme for the promotion of the Short Sea Shipping (COM(2003) 155 final). Finally, the measure is actually part of Measure 44 – Trans-European Networks, being one of the priority projects defined by this measure (Nr. 21).

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Output indicators:
Output indicators that can be used are:

- the number, and nature of services that can be qualified as 'motorway of the sea' and the amount of investments that went into establishing them (both type of data will be known, either by port authorities/ shipping lines or simply by the fact that it is required to provide for funding support). The number of regular short-sea services on links between EU countries, and the number of sailings per week on these links, are currently estimated with the help of the network of Short Sea Promotion Centres.

Outcome indicators: intermediate impacts on transport markets
The impacts of the MoS should be evaluated against those of alternative investments in land links using standard techniques of Cost-Benefit Analysis (CBA). In a CBA these impacts (costs, benefits) are expressed in monetary terms as much as possible, to be able to compare all positive and negative impacts with each other. In particular, a socio-economic CBA should be applied, which goes beyond the profits and losses of an investor and gives full insight in all relevant effects to society. Usually in a social CBA we distinguish three kinds of effects: direct, indirect and external effects. The first two include market variables, while the third include outcome variables (see outcome indicators). All the effects should be quantified in monetary terms and compared to the construction, operating and maintenance costs of the projects concerned.

- **Direct effects** are impacts that directly result from the project, like: i) time effects: time savings when the cargo is in the port (since MoS investments are primarily investments in the ports) and consequently for the users (passenger and shippers of freight) of sea transport; ii) cost effects: door-to-door cost and prices of the new services by the transport via the sea link compared to the same variable via land based links (this is not standard available data but they can be extracted from the market), ad efficiency gains for port operators and shippers; iii) reliability/punctuality effects: for example less delay in port operations
- **Indirect effects** include wider economic effects: increased throughput at the ports may have benefits in terms of more economic growth and better national economic results. Port development can create conditions for an attractive investment climate and for employment growth. In respect to the latter, there is an important employment effect because of and during the realisation of the projects. On the other hand, there is a structurally derived employment effect, as a consequence of the multiplier effect

of the transport sector on other economic sectors. More employment is generated, more value added is created, and more tax benefits shift to the government. However, these kind of effects are hard to quantify and sometimes they are already embedded in the direct impacts. A possible rule of thumb is to quantify roughly these indirect effects as equal to circa 10% of the direct impacts.

As to the indicators representing the direct effects, it is important to distinguish between the point of view of all parties concerned. We define the port to be the entire zone between the maritime entrance on sea-side and the gate on the hinterland-side. The maritime context involves all transport at sea, so excluding all activities within the port. The concept of "Motorways of the Sea" covers both the port and maritime context. The **port context** is particularly complex. In a port context, there are many partied involved: stevedores, shipping lines, port authorities, hinterland transporters, shippers, shipping agents, and unions. Moreover, these can be even further split up. The port system in general comprises facilities (breakwaters, quays, …) and services (transit of ships and transfer of passengers and commodities from and to hinterland modes). The following schematic subdivision of the entire process in a port into 7 major partial processes shall be considered:

1. ship mooring: the ship's approach via river or maritime access, and its mooring at the quay;
2. ship unloading: the unloading of the cargo from the ship's holds to the quay;
3. storage transport: the transportation of the cargo from the quay to the transit storage;
4. storage: transit storage;
5. hinterland loading transport: the transport of the cargo from its transit storage to loading platforms;
6. hinterland loading: the loading of the cargo to inland transport modes;
7. hinterland transport: the departure of an inland transport vehicle from the port.

In addition there are a number of other functions supporting ships and cargo. For ships, these are radar surveillance and traffic management; water, telephone, stores and fuel provision; police and security provision, repairs, fire-fighting, waste disposal; and medical services. For cargo, these are warehousing, security, weighing, lighterage, and rent of equipment. What is important to note here is that a chain is only as strong as its weakest link, and this is certainly true for the production of port services. More precisely, in the subdivision mentioned above, the capacity of each link needs to be adapted to that of each other link. When the potential capacity of one link relatively increases because of innovation, the other links in the chain should also be adapted: only then can the complete potential of the original innovation be realized. In particular, this means that investments in the MoS should be channeled in such a way that the increased capacity of each link in the chain should be the same on average. A more detailed discussion of costs and benefits implied in port activities is provided under measure 29 – Port liberalization of this report.

Besides assessing detailed impacts on port activities of MoS projects, in the CBA the overall impacts on the main maritime operators shall be assessed too. At this regard, United Nations (2001) distinguish three forms of maritime operation and related market actors: industrial transport, charter (non-liner) shipping and liner services. Shippers in industrial transport are mostly industrial companies wanting to ship a specific commodity they produce from a fixed point of origin to fixed destination(s): they mostly have their own ships or at least contract them out for a longer period of time. In charter shipping, ships are chartered under a charter rate (depending on *amount of cargo*) or fixed rate (depending on *period of time* or *deadweight tonnage*) to sail on non-fixed routes. Liner shipping, lastly, usually serves many shippers with one full ship load, be it on a fixed route, and under payment of a charge based on *volume*, *weight* or *value*. Maritime transport costs comprise company overhead, vessel depreciation, vessel operating costs, voyage costs and cargo costs. Overhead costs are by definition hard to allocate to one ship, but for part of them (agency costs and *storage fees*), this is feasible. Operating costs include *crew*, *repair and maintenance*, insurance and *stores*. Voyage costs include *fuel costs*, port dues, and agency fees. Cargo costs are related to *(un-)loading*, storage and *ancillary services*.

Outcome indicators: final impacts on transport users and non users

In the framework of social CBA mentioned above, external effects of MoS will concern changes in the level of:

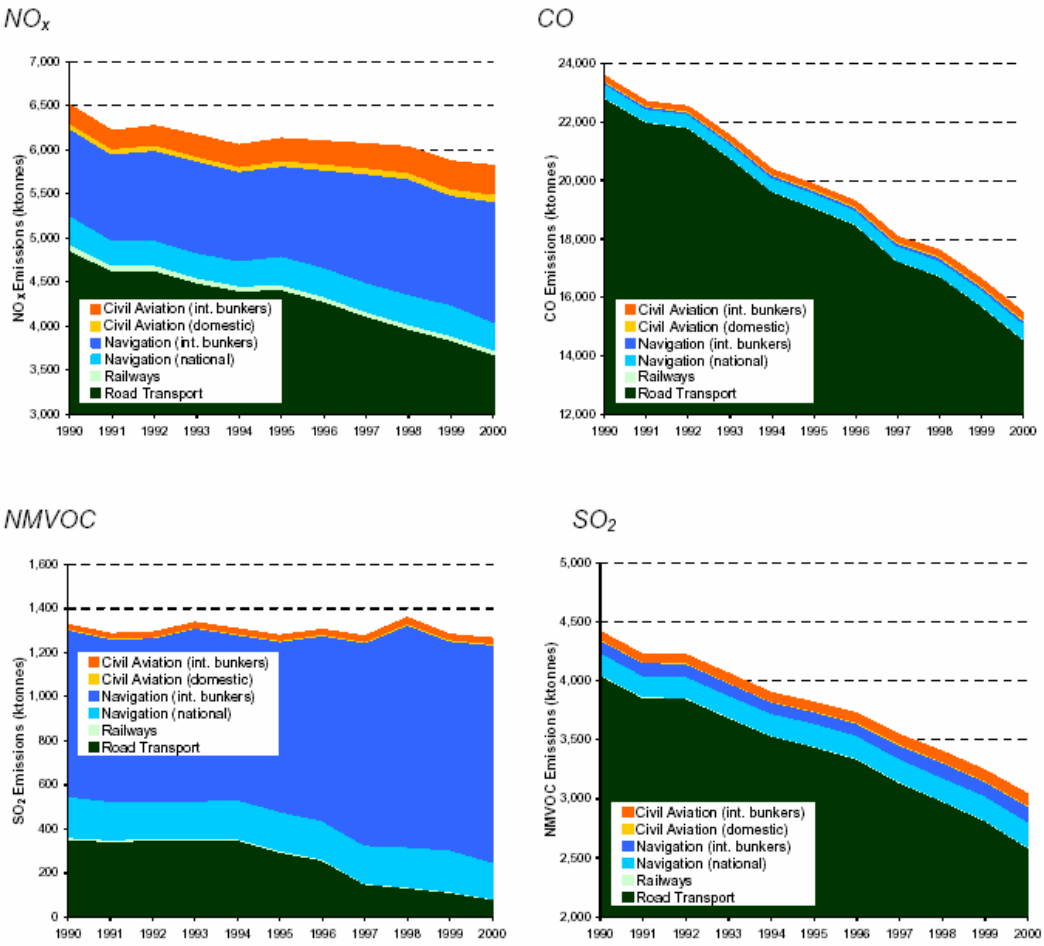
- Transport emissions
- Noise
- Safety

due to the expected shift from road to sea transport as a consequence of MoS realisation.

With regard to air pollutant emissions, it is important to note that shipping is the least polluting mode for

freight transport, except for specific SO_2 and NO_x emissions which may increase, particularly if very fast (70 kph) vessels will be increasingly developed. According to a study for the European Commission (European Commission, 2002), shipping in European waters was responsible for emitting around 2,6 million tonnes of sulphur dioxide and 3,6 million tonnes of nitrogen oxides in 2000. This equates to 39% of total SO_2 emissions and 36% of total NO_x emissions from EU15 countries. The study also demonstrated that 80% of the total shipping emissions of SO_2 and NO_x arise from vessels at sea, other than ferries and fishing boats, with the largest proportion of this figure contributed by vessels movements between EU15 ports (34%). This was substantially higher than previous estimates of 1,9 mtonnes of sulphur dioxide and 2,3 mtonnes of nitrogen oxides done at the European Commission. As it is illustrated in the figure below (source TERM 2002 – Transport emissions of air pollutants by mode indicator fact sheet), as NO_x emissions from road transport continue to decrease, emissions from shipping are an increasingly significant source of total emissions. The same happens for SO_2 emissions from international shipping activities, while emissions from national navigation (inland waterways and domestic shipping) have decreased by over 11% due to fuel sulphur content restrictions.

Figure 6: Emission trends of air pollutants (NO_x, CO, NMVOC and SO_2) by transport type in the EU15, 1990 – 2000



Source: 2002 National CRF submissions to IPCC.

Notes: Data from Germany and Luxembourg is not included.
International navigation and aviation figures are for international bunkers and do not take into full account emissions in the EMEP area from non-EU15 activities.