

Port-Net Study 03-4

EDI and Cargo Flows in the North and Baltic Sea
Region
- an Analysis for Potential Logistical Services



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Logistics until today:

"Logistics is
to secure the availability of
the right good,
in the right quantity,
in the correct status,
at the right place,
at the right time,
for the right customer,
to appropriate costs."

Logistics today and tomorrow:

"Every customer gets his individually
configured product at the agreed day of delivery."

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Abbreviations

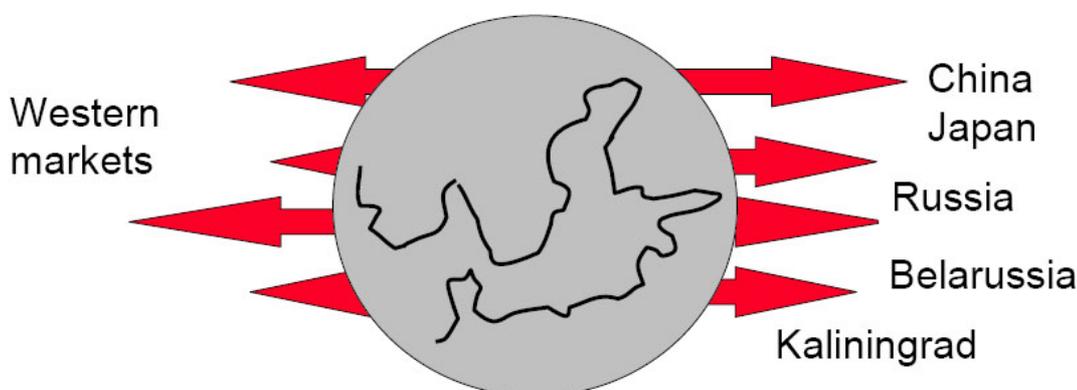
B2B	Business-to-Business
B2C	Business-to-Customer
BSR	Baltic Sea Region
C2C	Customer-to-Customer
bil.	billion
EC	European Commission
ed	Editors
EDI	Electronic Data Interchange
EDIFACT	Electronic Data Interchange For Administration, Commerce and Transport
e.g.	<i>exempli gratia</i> (for example)
est.	estimate
EU	European Union
€	Euro (Currency)
EUROSTAT	European Statistical Body
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GIS	Geographical Information System
GmbH	Gesellschaft mit beschränkter Haftung
i.e.	<i>id est</i> (that is)
ibid.	ibidem
JIS	Just-in-sequence
JIT	Just-in-time
Km	Kilometre
l.	left
Ltd.	Limited
LSP	Logistics Service Provider
mil.	million
NACE	Nomenclature générale des activités économiques
NSR	North Sea Region
NUTS	Nomenclature des unites territoriales statistiques
OEM	Original Equipment Manufacturer
r.	right
RoRo	Roll-on Roll-off
SC	Supply Chain
SCC	Supply Chain Collaboration
SCM	Supply Chain Management
SME	Small and Medium-Sized Enterprises
SMI	Supplier Managed Inventory
t.	tons
TEU	Twenty-foot-Equivalent-Unit (6 meter container)
UK	United Kingdom
VAS	Value Added Service(s)
VAT	Value Added Tax

1 Introduction

The cargo flows in North and Baltic Sea are undergoing strong development. Recent developments of maritime transport in the NSR/BSR have been characterised by an increase in shipping volumes and by the use of larger and more specialized vessels. In particular the transport of oil and related products has increased tremendously in the BSR. In 2005, 17% of the world trade is handled only in the BSR and 30% of EU-Exports go through the BSR. It is expected that a tenfold increase of the trade volume will occur within 20 years.¹

Especially the Baltic Rim functions as a platform for East-West trade (see Figure 1-1) but the integration of the Baltic Rim countries into a homogeneous trading area depends on its logistical networks.

Figure 1-1: East-West Links in the Infrastructural Framework of the Baltic Sea Region (Porter 2001)



Nevertheless, through EU-expansion a somewhat homogenous trading ground has been achieved (excluding Russia), but disparities are still high which make trading in the region a somewhat difficult experience. The limited availability of resources and hindering as well as missing regulations lead to uneven trading grounds.

But, for the implementation of sufficient networks the growth of the Baltic and Russian markets has become a driving force. Through these market demands and the intense trade between Germany and Scandinavia, the BSR is seen as one of the most thriving regions of the world.

Trade with crude oil and refined oil products has been the major part of total trade volumes, especially from Russia and the Baltic states. Oils and other bulk commodities dominate the trade, but are outweighed by high value products groups in terms of transported value. Here, vehicles, machinery and electrical appliances dominate the high value trade while forest and plastic products develop sustained growth rates. Special attention should also be given to the tremendous growth in areas of pharmaceutical products.

The challenge for port areas to cope with increasing cargo flows in these commodity areas is not only concerned with providing the appropriate super- and infrastructure but also to facilitate market mechanisms and supply chains of companies transporting their goods through ports.

¹ Antola, Kivikari 2004

This study focuses on the ongoing cargo flows and possible port services that could be derived from them in the NSR/BSR. Cargo flows will be looked at within two dimensions. Dimension 1 concerns the distribution of cargo flows between countries. Dimension 2 deals with regions and their ports. To arrive at a conclusion for specialized value added services these will be defined and placed in the context of industries and their supply chains in the region. A combination of major players and the analysed cargo flows within case studies then leads to an exemplified view of possible developments in port areas.

To sum it up, the study will give answers to the following questions and issues:

1. Analysis of goods flows
 - What are the major flows of products in the region?
 - How is the international and regional trade in northern Europe structured?
2. Analysis of logistical services
 - Which are the companies in the major supplying industries?
 - Which are the major suppliers of certain parts in the production process of the identified industry segment?
 - Which assembly plants or production facilities exist within the Baltic Sea catchment area?
 - How are the goods flows organised between suppliers and assembly plants or production facilities?
 - Which final products are transported in the Baltic Sea area?
 - Which FDI projects are planned? And how will these projects be integrated in the logistical chain of the investor?
 - What kind of logistical services are needed?
 - What do individual companies need in VAS?

The study will not or can not answer the following questions/issues:

- Which company is shipping what kind of goods from where to where?

This level of detail could not be achieved in general due to confidentiality restrictions of data providers and shipping companies. However, case studies presented in chapters 7-12, give insight looks into certain companies' goods transports. This problem is further adhered to in chapter 3.3.

In addition to these theoretical issues and their practical implications, a proposal for a long-term information system on the cargo flows of the region will be made which has been prototypically implemented for this case. This is described in chapter 13 and will function as foundation for analysis and debate on the practical implications of the ongoing cargo flows for the logistical network in the region.

2 Objects of Analysis

To analyse the cargo flows in the region of concern, it is necessary to identify the objects that are of relevance for cargo flows. First, cargo flows relate specific regions to one another. Second, specific goods are shipped from one place to another. And third, specific companies are shipping their goods while others are actually carrying out the transport and other logistical activities around the specified goods. These three objects of analysis will be described in the following paragraphs.

2.1 Definition and Identification of "Regions"

Map 2-1: Geographical Scope of the Study



Geographical Scope of the study

The geographical coverage of the study is the NSR/BSR. The area consists of the northern countries of Europe. This includes the countries from Scandinavia, the Baltic Region, mainland Europe and the British Isles. The following where subject of the analysis:

Baltic Sea Region:

Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia, Sweden

North Sea Region:

Belgium, Denmark, France (partly) Germany, Netherlands, Norway, UK

Within the European nomenclature² countries are statistically looked at as NUTS 0 Regions. Below this level of spatial differentiation, three levels (NUTS 1-3) are divided to discern categories of administrative boundaries. These levels are then used to build statistical data.

However, the NUTS levels contain more or less differing areas as countries have different administrative boundaries. This might lead to problems of comparability. Furthermore, appropriate and comparable goods flow statistics are only available on NUTS 0 level.

Ports and Regions

The composition of a region is completely arbitrary and, as mentioned, the regional make-up differs substantially in regard to comparable statistics. Regions according to NUTS level therefore do not provide the means to be of use to compare cargo flows. On the other hand, applicable import and export statistics are only available for a few regions based on NUTS levels and rather broad statistical categories.

As this study is basically concerned about ports and the potential implications for their services, the regional dimension of cargo flows is looked at from a ports perspective. It is also

² European Union 2003

possible to associate the manufacturing and shipping companies to certain regions. That makes it possible to relate cargo flows of ports to certain companies that operate plants in the nearby region.

2.2 Definition and Identification of "Products"

Products in one way or the other are the main object of analysis within this study. The central question of their flows between regions and companies as well as possible value added services for them puts them in the centre of the analysis.

For the first part of the analysis a statistical approach needs to be followed as cargo flows will be looked at as a whole in the region. On the European level statistical data on the import and export of products is collected according to four similar standards (CN, HS, SITC, BEC)³. These standards define a number of categories of products.

However, a difference needs to be made between statistics collected at the European level and those collected at the regional level, meaning port statistics. These statistics differ greatly and largely depend on the intertwining relations between statistics collecting port authority and freight operating companies. On the other hand there are port-statistics collected at the state level. They significantly differ from country to country as well. The product or commodity classifications range from broad categories of bulk and general cargo to differentiated freight categories where even general cargo is further divided.

Following this, research led to certain comparability problems concerning the survey of data. Even though data was put together as fitting as possible, there is still a chance of unequally named categories and varying recording standards of data.

For the analysis in this study, the Harmonized System (HS) classification system for products was used looking at import and export relations of countries while no applicable classification system could be identified for the analysis of ports turnovers.

2.3 Definition and Identification of "Shipping Companies"

This concerns not only the companies that conduct the transport and provide differentiated logistical services (i.e. LSPs) but also the producing companies (i.e. OEM) that ship their goods.

Within the European statistical framework companies in general are classified according to different categorization standards. The most commonly used European wide is the NACE standard. It classifies each company according to its activity.⁴ These activity categories can be combined to derive at transport chain clusters.⁵

³ see <http://fd.comext.eurostat.ec.eu.int/xtweb/>

⁴ see Appendix for listing of NACE groups and the database to this study for a detailed categorization

⁵ see GIS-client for clustered NACE categories

3 Research Targets, Data Provision and Methodology

3.1 Relevant Research Targets

Relevant research targets need to be divided into categories concerning their general importance as a freight transmission point or their industrial importance.

The following research targets are looked at:

- Ports
- Major Companies
- Logistical Providers

The provision of data from these research targets, however, puts limits to the statistical results of the study. In the realm of private companies the free provision of company statistics is in most cases not possible.

All ports looked at in this study were enquired concerning turnover in terms of unloaded and dispatched goods in all recorded goods categories.

Statistical data was enquired from major companies in some exemplary cases.

All major LSPs were also asked for statistical data on their cargo flows.

3.2 Relevant Data Providers

Relevant data providers need to be divided into two categories concerning their spatial focus and depth of data. First research is focused on the country level. Second it is concerned with the regional level.

The following data providers are considered:

- EUROSTAT
- Port Authorities
- National statistical authorities
- Industry specific institutions
- Companies
- Logistics Service Providers (LSPs)

These data providers will be looked in short in the following.

EUROSTAT

The collection of statistical data by the European Union is based on several directives by the European Commission. They regulate the collection of data in the EU member countries.⁶ The statistical body of the EU collects these data sets and offers them on different levels of aggregation to the public. Two sets are of importance for this study:

1. Import and Export – 1995 to 2005 data

⁶ See Appendix for EU directives that are applicable for the used statistics.

Data on external trade has relevance concerning the overall trade flows between the countries. It includes current transportation via ports and also trade via other modes of transport that could potentially be of interest for ports to attract. Depending on its location, each country faces different spatial settings for the use of different modes of transport. Therefore the share of maritime transports on total imports or exports varies. Nevertheless these figures illustrate the main traded goods.

Statistics differentiate between trade within the EU and trade between Member States and other countries. Trade within the EU is recorded via the INTRASTAT system and not directly through customs procedures as are trade relations to other countries.

Statistics do not cover goods in transit that is goods that are merely passing across a Member State, by any means of transport, but are not stored there for any but transport reasons.

The data set is differentiated in country of origin and destination, applicable year, type of direction (i.e. dispatched or unloaded) and type of value (i.e. tons or €). The last is important because it provides a different look on the same trade flows. Values in € also relate directly to VAS in terms of absolute potential for additional VAS.

2. Transport by Sea – 2003 and 2004 data

In 2004, the volume of total seaborne transport of goods by sea in EU-25 main ports⁷ could be established at nearly 2,805 million tons. This figure includes the volume of goods transported between the main ports, between main ports and minor ports and between minor and main ports. It does however exclude the volume of freight carried between the minor ports. Of this total volume, 57% referred to international extra-EU-25 transport, 29% to international intra-EU-25 transport, 11% to national transport, the remaining 3% concerned unknown origins or destinations. This data set also includes some data on vessels movements.

Total volume of seaborne transport of goods between EU-25 countries and the European Union (EU-25) is calculated as seaborne transport excluding the national component.

The calculation of the international intra-EU-25 seaborne transport of the European Union (EU-25) excludes in addition double counting between EU countries (as a consequence this total does not consist of the sum of intra-EU "inwards + outwards" declarations of the individual countries).

Port Authorities

Port authorities or similar bodies in charge of the port generally keep track of their cargo turnover. However, this is done in very different ways. Some keep detailed tracks like the port of Hamburg where detailed goods categories are differentiated. Others – in most cases those who have not been operating within a strong regulatory framework the last years – just record basic goods categories. In general detailed data on origin and destination of commodities is not available.

Besides this, different policies towards public opening of data are taken in each country. Nevertheless, member countries of the EU are obligated to report shipping statistics to the

⁷ Ports handling more than 1 million tons of goods or recording more than 200 000 passenger movements annually.

European statistical body Eurostat. This is done within rather broad categories of cargo. In general this is done to provide for a differentiation of maritime trade in foreign trade within the EU.

For the purpose of this study, the problem is at hand for this regional approach and not with the statistical import/export data on the country level.

National statistical authorities

For national purposes, national statistical bodies also collect data on port turnover. This is also done in a differentiated fashion. So data sets vary substantially.

Industry specific institutions

To identify potential within the relevant industries for this study, industry specific institutions provided different studies on economic development of the related industry. These studies are referenced as applicable in the related chapters.

Companies

The final focus of this study is on companies and their goods flows. As companies do not open their goods shipments and related supply chains in detail to the public, company data is limited to general figures on location, turnover, employees, type of activity. This data is provided by a specialised enterprise data provider.⁸ This data can be made usable by deriving trade flow relations through the locations and activities of companies. This is done through the GIS application which is described in the last chapter.

Logistics Service Providers (LSPs)

LSPs are specific form of company that is treated separately due to their nature of activity. Logistics services are the core focus of all trade flows and details on LSPs can therefore provide an insight look on their activity in this regard. Through this, port relations and industrial specializations of LSPs are derived. Data is provided by specific research on these companies.

3.3 Methodological Aspects

Trade and transport data is compiled from various sources and put together as applicable. This is methodologically difficult because inconsistencies can occur while combining different sets of data. When inconsistencies occurred, national and regional statistic sources were given highest priority. If transport data and data on goods flows in supply chains are lacking or not available in the above mentioned sources, estimates were made on the available data. Forecast growth figures were taken from specific studies on trade forecast in the region.⁹

The study takes on two different types of approaches for analysing goods flows and related logistical processes in the region.

- Quantitative: When it comes to the quantitative approach, it is often obvious what kind of information is needed to reach the purpose of the research. The result from a quantitative standpoint can be interpreted with the help of numbers and diagrams. Quantitative information is gathered under structured conditions. Measurements of a number of products in a goods flow can be an example of quantitative information.

⁸ Bureau van Dyke 2006

⁹ i.e. SAI 2006

- Qualitative: Qualitative information can, for example, be verbal statements or written reports that go beyond the quantitative approach. This method's main purpose is to create understanding of relations between entities. It is important to gather information in order to reach a deeper understanding of the problem ahead. Qualitative research is used when it is hard to present and translate the results in numerical data.

Both qualitative and quantitative methods have been used in this research. But the main method must undoubtedly be the qualitative method, where reports concerning the problems have been of great use. One of the quantitative methods in this research has, for example, been to observe numbers and diagrams related to the import and export goods flow between all northern European countries and identify patterns that can tell something about current developments.

Ports have been looked at in a quantitative and qualitative way in order to get a complete picture of future potentials regarding logistical developments. Quantitative figures provide the basis for a mapping of the current logistical processes. Qualitative information provides the building blocks for the port development. However, substantial qualitative information was not always accessible in a way to build some sort of logistical process theory for the embeddedness of the port into its surrounding economic structure. This approach is only hinted at for most ports and requires in depth discussion in a further study.

In general, port figures are compared even if comparability is not completely given. This attempt was made in order to reach a certain understanding of regional differences in rather broad categories of products. On the other hand a difference needs be taken into account when looking at combined statistics at the national level. These are generally recorded with net figures not taking into account the dead weights of transporting vehicles or similar. But port statistics tend to add these figures. This means that statistical figures of ports and those from national statistical bodies differ significantly. If different statistics are used at the level 2 analysis, this is mentioned.

In general, a holistic approach in the analysis of cargo flows is taken. It is attempted to gather information as complete as possible. The implementation of the related GIS application tries to cope with this approach.

4 Level 1 Analysis on Country Level

4.1 Goods Flow within the Baltic and North Sea Region of the European Union

4.1.1 General Development

Looking at the Baltic Sea Region, it comprises a little more than half the area of the EU, the share of its population is 23% and the aggregated GDP about 16%. The countries in the region are very diverse in their makeup and disparities are large. The GDP of Germany for example is more than twice the size of the rest of the countries' GDP together (excluding Russia). But the economies in the BSR are growing faster than the EU average. In 2005 nine out of ten countries had a higher growth rate than the EU average of 2.1%. Taking into account the additional countries in the NSR, the figures are somewhat higher due to the economic strength and size of the UK, the Netherlands and Belgium.

Especially the BSR is a growing centre of economic activity, located at the crossroads between the industrial EU and the East, with rich natural resources and with a population of 300 million people. It is already leading to significant increases in goods flows in the near future in both directions, from east to west and vice versa. In total, 516 ports and terminals in the Nordic-Baltic Sea range had a total port throughput close to 700 million tons in 1998, of which 600 million tons were in international traffic. Germany and Sweden dominate some of the links with 21 million tons, followed by Finland with 12 million tons. Germany is totally dominant in liquid bulk, dry bulk and manufactured goods. Germany's geographical position means that substantial cargo volumes to and from western and southern Europe pass through the country, which also is a gate to central and the southern part of Europe. On the other hand, a strong integration of Russia seems mandatory for a positive future development.

According to forecasts, trade in the region will continue to expand in the years to come, with an annual growth rate between 4 to 6%.¹⁰ Consequently more and larger ships will cross the BSR and the NSR, which means more ships entering the ports in the region. The intra regional trade will play a significant role in the future transport development.

Trade is also dependent on infrastructure. There is a demand for specific transport infrastructure especially within the candidate countries. Lithuania and Latvia emphasise the need to improve the infrastructure regarding tourism. The development of harbours and ports and related infrastructure is slowly going forward. But the countries economies are still comparably low and are in great need of financial aid. For instance, ports in the Baltic States today are just capable of dealing with some kinds of ships. However, these small harbours are considered as an opportunity for regional development.

Economic activity by value in the sub-regions is closely connected to population centres: big metropolitan areas, around bigger cities and densely populated areas. It does not, however, always directly indicate the actual place of production requiring transport.

Global competition and expansion of markets outside the EU have recently influenced relocation of manufacturing activities to the countries with cheaper labour costs and shorter distance to markets. Some of the BSR economies have partly benefited from the recent

¹⁰ SAI 2006

developments. Estonia, Latvia and Lithuania have relatively benefited most from the FDI (FDI) per capita in the BSR. In absolute terms, FDI inward to Poland was about 30 times higher than the FDI outward from Poland.¹¹

Among the BSR economies, there is a substantial growth potential, mostly among the new EU member states and Russia. Some predict that the BSR will be the fastest growing region of Europe in the near future.¹²

4.1.2 Overall Trade Flows

In 2003, trade to and from the countries in the BSR was 1,788 million tons. Imports were 744 and exports 1,044 million tons. 650 million tons gross trade was achieved between the BSR countries in total, with the rest of Europe 769 million tons and the rest of the world 369 million tons. Oil and other liquid bulk with 847 million tons made up 47% of total trade volumes. Norway and Russia together accounted for 67% of this. Dry bulk reached 621 million tons, or 35% of the total trade volume, other dry cargoes 318 million tons or 18% of total trade.¹³

The growth of the international trade volumes of the BSR countries is expected to develop positively but the trade dynamics differ significantly. The relative importance of the BSR as a trade partner for the countries neighbouring the Baltic Sea in terms of volumes is also expected to increase. The share of high value and/or time sensitive goods of total international trade volumes such as vehicles, fruit and vegetables, machinery, electronic goods and electrical equipment shall increase. The import volumes of oil and oil products are expected to decrease.

The European trade pattern shows significantly larger east-west trade volumes than north-south volumes – with a tendency towards even higher imbalances in the future. There is a global trend towards more intraregional trade. It is easier and more convenient to trade with partners who are close by, and it is therefore important to focus on the possibilities that exist within regional trade. The significance of the BSR and NSR as a market and partner varies from country to country. For small and medium-size countries, the BSR is the most important market, whereas for big and powerful countries it is not as important.

For instance, more than 80% of Estonia's and Lithuania's imports are covered by intra BSR trade, and the majority of the exports of Estonia, Latvia and Lithuania is carried out in this area. Latvia's and Estonia's exports to countries in the BSR account for more than 60% of these countries' total exports.

For Germany, imports from the BSR account for about 30% of total imports. The respective export shares (share of intra BSR exports as a proportion of total countries' exports) are generally lower.

In general, the economies of the Scandinavian countries and Poland are also, to a great extent, dependent on the BSR. This is also true because of the fact that for all countries, excluding Germany and Sweden, the largest trading partner is from this area.

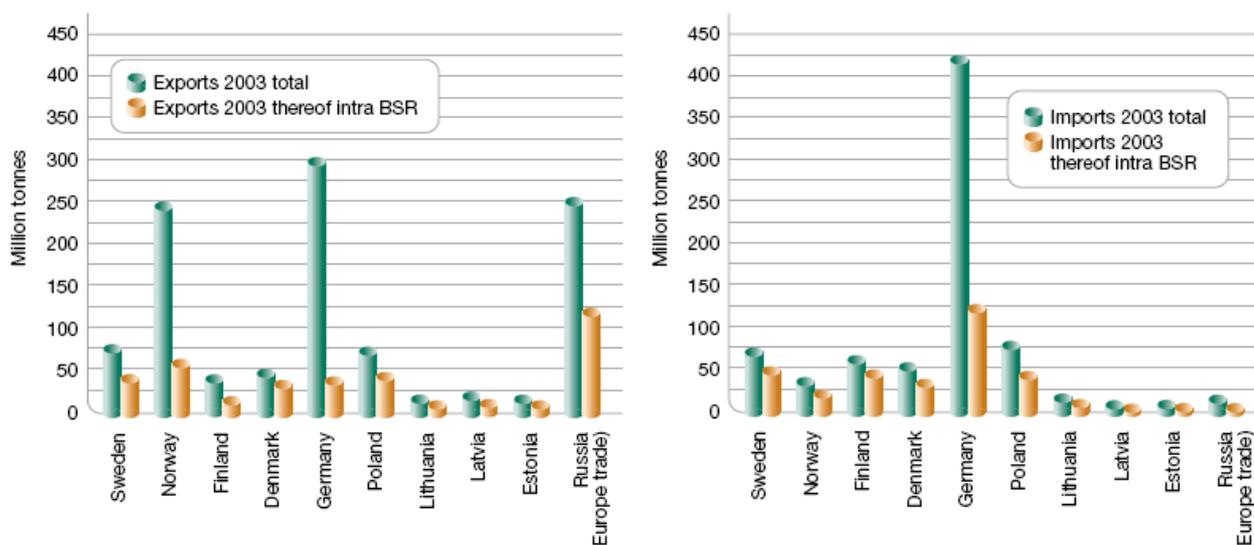
These relations of trade flows in the BSR can be seen in the following charts on exports and imports (Chart 4-1). The dominance of the large and the oil trading economies is evident.

¹¹ European Commission 2004

¹² Antola, Pauli 2004

¹³ SAI 2006

Chart 4-1: Exports (l.) and imports (r.) of BSR countries in mil. t. 2003 (SAI 2006)



A differentiation of trade flows between all countries of the BSR and combination of imports and exports shows that there are certain dominating trade relations (Table 4-1). On the one hand, neighbouring countries obviously tend trade a large share with each other. On the other hand, trade with Germany, Russia and Norway dominates the picture. The two latter are high in trade flows due to large oil trade volumes.

Table 4-1: Intra BSR exports and imports in 1,000 t., 2003 (Eurostat 2005a)

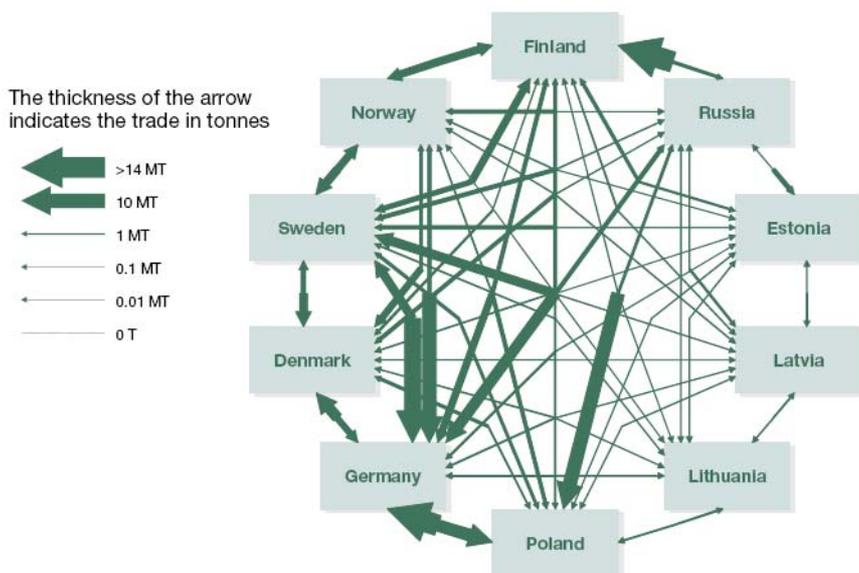
		Imports 1000 t										
From/to		Sweden	Poland	Finland	Denmark	Estonia	Lithuania	Norway	Germany	Russia	Latvia	Total
Exports 1000 t	Sweden	0	1617	5711	6403	264	402	6620	11693	465	247	33421
	Poland	1883	0	2178	2303	146	832	1291	23279	1413	248	33572
	Finland	4365	605	0	1182	1136	96	629	5205	1626	197	15040
	Denmark	8096	574	3328	0	62	127	2107	6560	428	56	21338
	Estonia	2634	72	1765	362	0	230	348	1136	208	567	7322
	Lithuania	1159	926	226	542	561	0	113	1067	608	1443	6645
	Norway	11374	2134	3640	7501	28	31	0	30604	344	30	55685
	Germany	5733	8229	2228	6653	272	481	2457	0	2430	264	28746
	Russia	6602	22641	24680	3198	3450	12164	2098	40113	0	1308	116254
	Latvia	5915	89	640	827	323	352	250	862	186	0	9443
	Total	47760	36886	44395	28970	6241	14715	15912	120519	7708	4360	327464

Measured in tons, Germany is the biggest trading partner for the greatest number of countries – Poland, Russia, Norway and Sweden. Russia is the biggest trading partner not just for Germany, but also for Finland and Lithuania. Sweden is the biggest trading partner for Denmark and Latvia, and Finland has the leading position in Estonia’s foreign trade statistics.

Even when oil is excluded from the trade statistics, Germany remains the dominant trade partner. The intensive growth of Polish-German trade has meant that trade between these countries is the largest international trade exchange in the Baltic Sea Region, followed by the Polish-Russian trade.

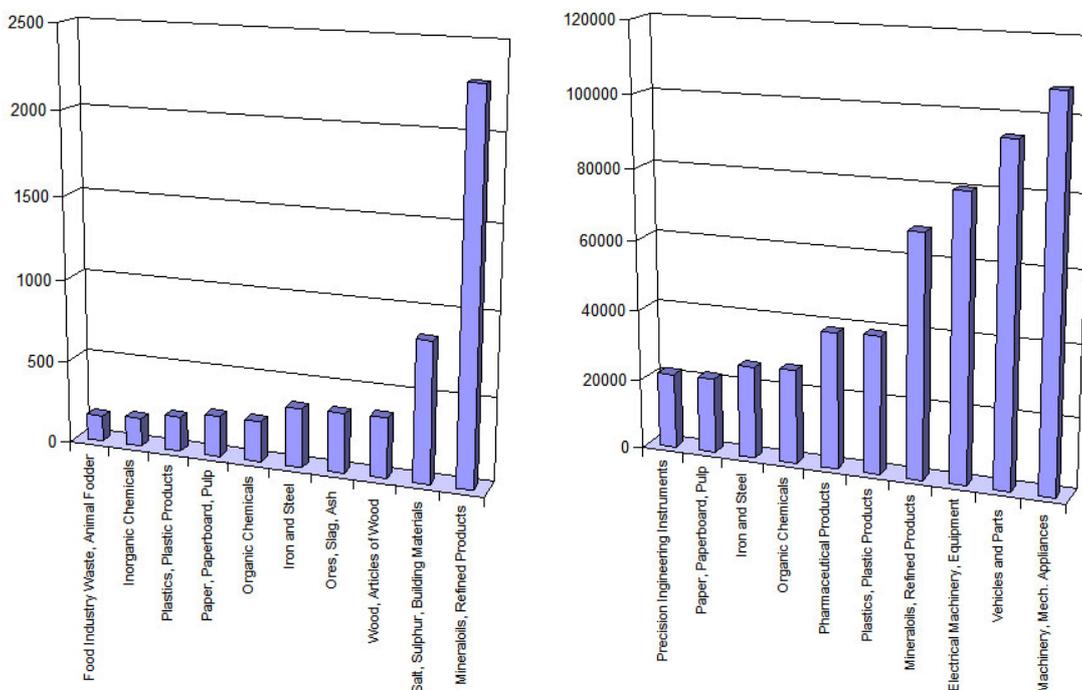
These figures lead to the following visualized trade relations while omitting the oil trade that would lead to distorted picture (Figure 4-1).

Figure 4-1: Total Intra BSR trade, excl. oil, 2003 (SAI 2006)



The oil trade is of major importance for the region (Chart 4-2). It is predicted to remain so in the future. In 2003, about 27% of total imports and exports of the BSR countries were oil/oil products. The following commodities for the NSR/BSR countries are building materials, wood products, ores and iron & steel. Bulk commodities therefore dominate the trade in terms of transported amounts.

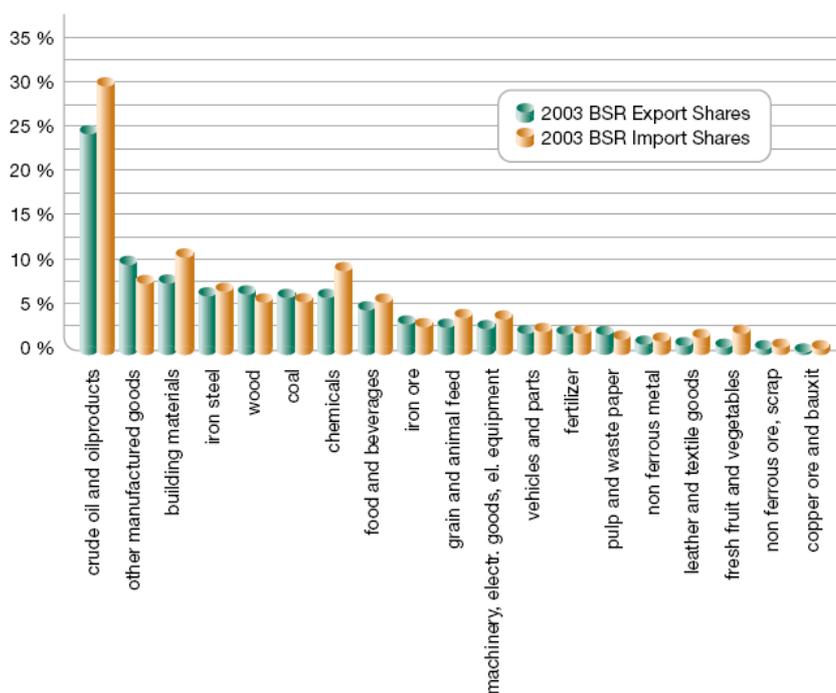
Chart 4-2: Exports from and to Northern European Countries, Main Product Groups in mil. t. (l.) and in mil. €(r.), 2005 (Eurostat 2006)



High value products on the other hand – those commodities that provide much more potential for any kind of value addition in the logistical chain – are dominated by mechanical appliances, vehicles and electronics. Pharmaceutical products are also shipped in amounts of high value.

A combination of imports and exports only for the BSR shows a similar picture (Chart 4-3). In addition to the mentioned commodities, manufactured goods of different kinds, coal, chemicals paper and agricultural products are of importance.

Chart 4-3: Commodity structure (shares) of BSR total imports and exports, 2003 (Eurostat 2003)



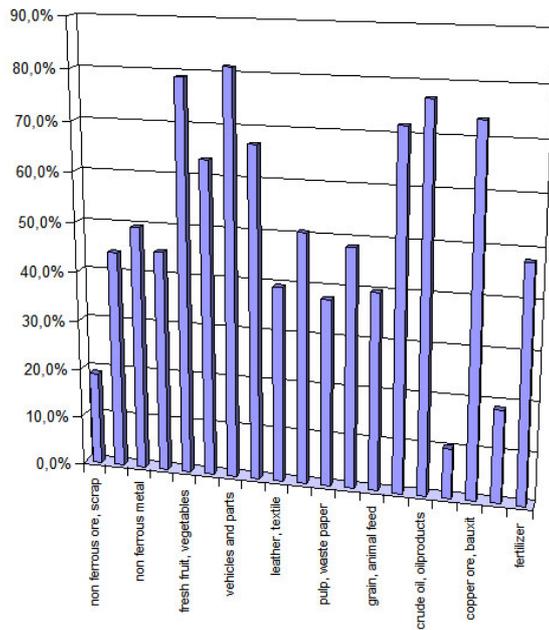
The development of the total trade volumes of the BSR countries, based on 19 SITC commodity groups, shows that all commodity groups are expected to increase in both export and import volumes until 2020, with the exception of iron ore imports.

In terms of volumes, the four most important commodity groups - oil and oil products, building materials and manufactured goods (including paper) - represented about 50% of the export volumes of BSR countries in 2003. Oil/oil products, manufactured goods, building materials and chemicals were the four most important commodity groups, accounting for more than 50% of the import volumes of BSR countries. Since both the volumes traded in different commodity group differ and the expected growth rates also differ, the relative importance of each commodity group on total import and export volumes of the BSR countries until 2020 will change.

Up to 2020, the share of oil and oil products of total exports is expected to increase to about 30%, while their share of imports is likely to decrease to about 28%. The relative importance of high value and/or time-sensitive goods, such as vehicles, fruit and vegetables, machinery, electronic goods and electrical equipment, is expected to increase (higher growth rates compared to lower value goods).

For the imports, it can be concluded that vehicles, machinery, electronic goods, electrical equipment and coal are forecast to increase, while oil and oil products are forecast to decrease. Oil/oil products, manufactured goods, building materials and chemicals will remain the four most important commodity groups. Chart 4-4 shows the most important commodities and their respective growth rates 2003 to 2020.

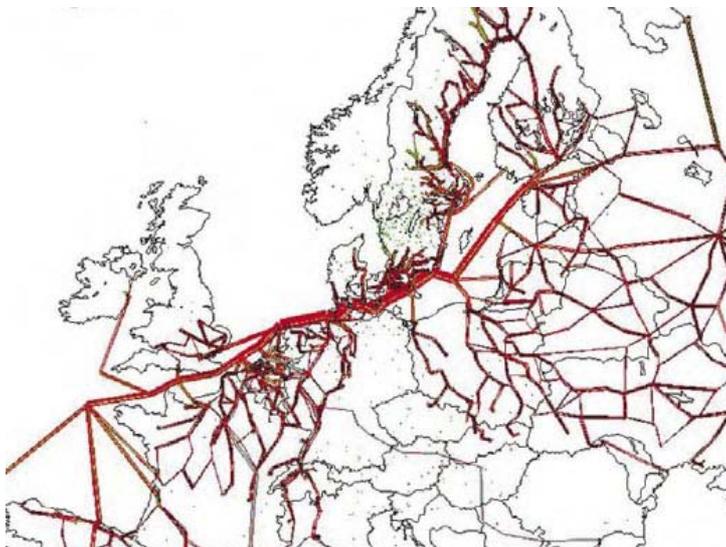
Chart 4-4: Commodity Forecast 2003-2020 for Turnover in t., Growth Potential in % (SAI, 2006)



But of course in the development of the trade in the region many uncertain elements need to be considered that affect the geographical structure of demand. New and improved land transport connections will even in the short run introduce competition to the maritime corridors. On the other hand Russian port capacities and related transport corridors with their effects on the development of all Baltic countries could change the present structure of transit flows. A third uncertain element is the extent to which maritime goods flows are further concentrated. These developments might have a substantial impact on trade flows of the region.

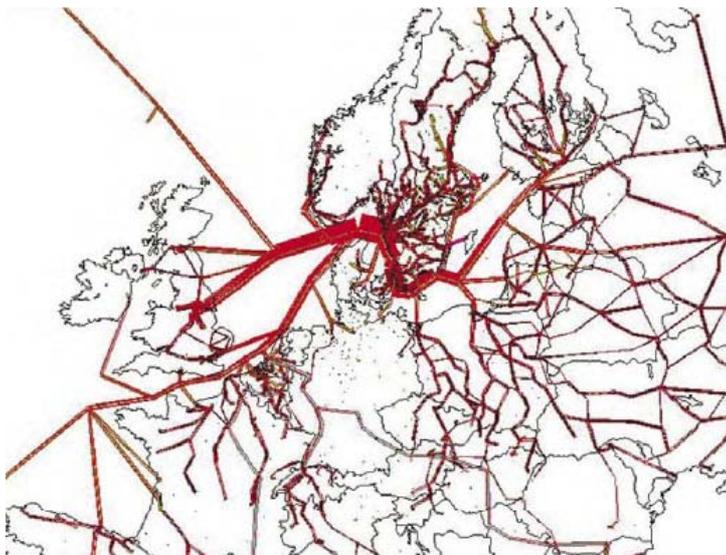
To estimate future developments in different transport corridors in northern Europe, a study was conducted in which different scenarios were simulated.¹⁴ Map 4-1 and Map 4-2 show examples of maritime freight flows (intra-European volumes) via the Skagen Corridor and the Kiel Canal in 2020.

Map 4-1: Transport Intensity 2020 via the Kiel Canal, by Transport Mode (SAI 2006)



¹⁴ see SAI 2006 for further results

Map 4-2: Transport Intensity 2020 via Skagen, by Transport Mode (SAI 2006)



Both corridors serve more or less the same markets, with the exception of transport flows to/from western Sweden and to/from northern UK, which seem to favour the Skagen corridor. Since the Skagen corridor is generally used by ships (often bulk carriers) which exceed the Kiel Canal maximum size limits, the overall transport volumes along the Skagen Corridor are higher compared to those via the Kiel Canal.

4.1.3 Maritime Transport

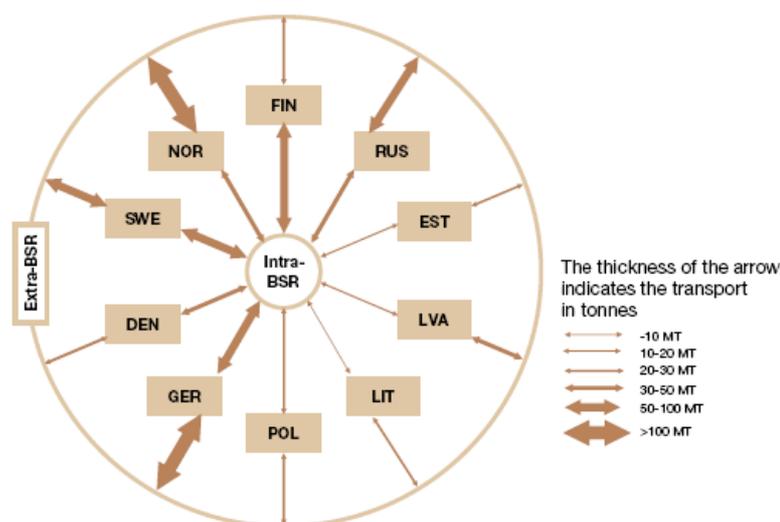
The largest export flows in the region run from northern ports to Germany. Maritime transport has particularly great importance for Finland. Transport from there is approximately 80% by sea. Land transport plays a much more significant role in German, Russian and Polish foreign trade, as many of their largest trading partners are on the same continent.

Approximately 50% of all intra BSR trade is transported by sea. Maritime transport between ports in the BSR and ports outside the BSR accounted for 76% of the total seaborne transport volume in 2003, while the intra BSR maritime transport accounted for 24%. The largest maritime flows in the BSR-region run from major exporting countries, such as Germany, and Norway out of the region.

A major part of the extra BSR transport is destined for or originates from other European countries. Although Norway and Germany are the two biggest exporters of goods from the region, Russian cargoes dominate transports through ports on the Baltic Sea east coast. However, much of Russian trade is transhipped through other countries. In 2003, 81 million tons of goods originating in or destined to Russia were transited through Finland, Estonia, Latvia, Lithuania and Poland which also influenced the development of ports in those countries.

The largest maritime transport flows in the Baltic Sea Region are shown in the figure below (Figure 4-2). Compared to the total trade flow presented earlier, the maritime flow pattern is slightly different.

Figure 4-2: BSR Maritime Transport 2003 (SAI 2006)



In terms of figures the pattern looks as follows (Table 4-2).

Table 4-2: Maritime transport in 1,000 t. 2003 (Institute of Shipping Analysis 2006)

1000 tons To/from	Inbound		Outbound		Total
	Intra BSR	Extra BSR	Intra BSR	Extra BSR	
Norway	9790	13987	27362	151137	202276
Sweden	43157	21701	28142	39024	132024
Finland	35365	15349	22018	22756	95488
Russia	5034	7881	26444	34687	88676
Estonia	1938	1702	13121	21665	38426
Latvia	994	2051	8659	24794	36499
Lithuania	806	3661	3978	21482	29926
Poland	14645	12232	11260	14415	52552
Germany	40450	59724	23973	47228	171375
Denmark	25898	18555	13121	18586	76159
Gross BSR	178078	156842	178078	395774	908772
Net BSR	-	156842	178078	395774	730694

The figures for gross total BSR volumes in the table indicate the size of the total port turnover in the BSR, while the net total BSR figures show the total volume of international maritime transport flows within the BSR.

The biggest intra BSR flows from Norway were to Sweden, Denmark and Germany, where 21 million tons of cargo were exported in 2003. The biggest intra BSR flow from Sweden was to Germany, with some 10 million tons in 2003. The second biggest flow from Sweden was to Finland, with 8 million tons. The largest flow from Sweden outside of the BSR was to the UK, with 5 million tons, and the second largest flow was to the United States, with 4 million tons. From Finland the largest intra BSR flow was to Germany, with 12 million tons. The second largest flow was to Sweden, with 6 million tons. The largest flow from Finland outside of the BSR was to the UK, with 5 million tons, and the second largest flow to Belgium, with 3 million tons. Russia exported approximately 26 million tons of cargo through its Baltic Sea ports to other BSR countries. Of this, 7 million tons were shipped to Sweden and 8 million tons to Finland. Apart from Russian transit cargoes, the biggest flow from Estonia was to Finland, with 4 million tons in 2003. The second largest flow from Estonia was to Sweden, with 3 million tons. Finland was the biggest source for Estonia's own imports with 2 million tons. In addition to 20 million tons of transit goods, Latvia shipped approximately 9 million

tons, of which roughly 6 million tons went to Sweden. Lithuania shipped about 17 million tons of transit cargoes and 8 million tons of its own cargo, of which 4 million tons were exported to the BSR and 5 million tons outside the BSR. The largest intra BSR flows were to Sweden and Germany with 1 million tons each in 2003. The biggest flow from Poland in the BSR was to Germany, with 6 million tons in 2003. The second biggest flow from Poland was to Sweden, with 2 million tons. The largest intra BSR flow from Germany was to Finland with 6 million tons in 2003. The second biggest flow was to Sweden, with 6 million tons. The largest flow from Germany outside the BSR was to the United States. The biggest flow from Denmark to the BSR was to Sweden, with 6.1 million tons of seaborne cargo. The second biggest export flow was to Finland, with 3 million tons in 2003. The two main export destination countries outside the BSR were the Netherlands and the UK, both with 2 million tons.

Taking into account the countries of the NSR and comparing the figures of 2003 with those of 2004, a different statistics shows the importance of the Netherlands, the UK and Belgium for the trade in the region (Table 4-3).¹⁵ But it shows that there are differences in the development of seaborne goods flows looking at different countries. While countries like Germany, the Netherlands and Norway experienced strong growth rates in 2003/04, others go through a declining process like Lithuania, Latvia and Denmark. However, in total amounts these are only small variations.

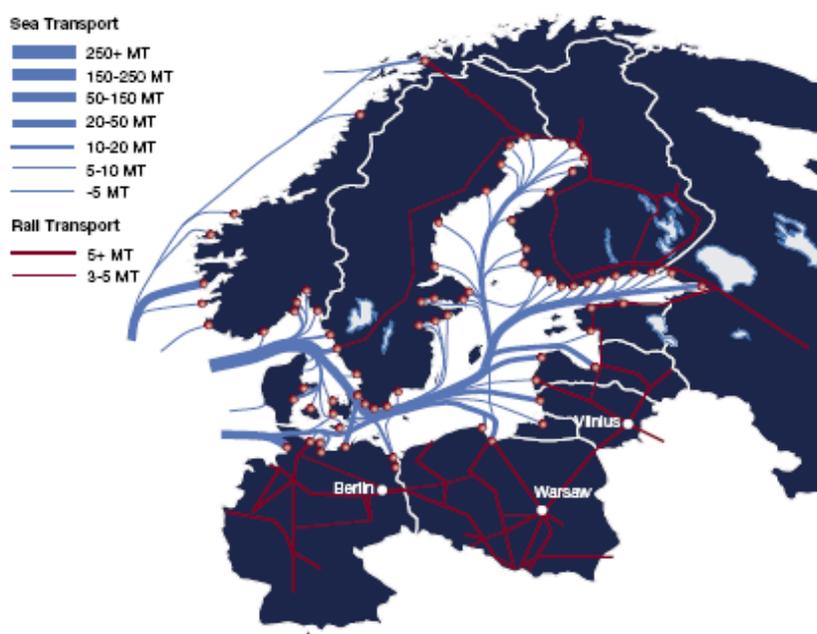
Table 4-3: Gross weight of seaborne goods handled in all ports - in 1,000 t. (Eurostat 2005a)

	2003			2004			Growth 2003 - 2004		
	Inwards	Outwards	Total	Inwards	Outwards	Total	Inwards	Outwards	Total
EU-25	2 144 422	1 248 833	3 393 255	:	:	:	:	:	:
BELGIUM	103 940	77 170	181 110	108 946	78 943	187 889	4.8%	2.3%	3.7%
DENMARK	56 908	47 046	103 954	54 568	45 806	100 373	-4.1%	-2.6%	-3.4%
GERMANY	159 202	95 632	254 834	168 490	103 379	271 869	5.8%	8.1%	6.7%
ESTONIA	4 664	42 383	47 048	4 042	40 767	44 808	-13.4%	-3.8%	-4.8%
LATVIA	3 794	50 858	54 652	3 549	51 281	54 829	-6.5%	0.8%	0.3%
LITHUANIA	4 097	26 146	30 242	4 372	21 470	25 842	6.7%	-17.9%	-14.6%
NETHERLANDS	318 489	91 841	410 330	339 510	101 212	440 722	6.6%	10.2%	7.4%
POLAND	15 171	35 848	51 020	16 522	35 751	52 272	8.9%	-0.3%	2.5%
FINLAND	57 356	47 083	104 439	58 479	48 045	106 524	2.0%	2.0%	2.0%
SWEDEN	88 583	72 870	161 454	90 552	76 798	167 350	2.2%	5.4%	3.7%
UK	323 766	231 896	555 662	342 425	230 645	573 070	5.8%	-0.5%	3.1%
NORWAY	62 769	124 012	186 781	64 918	133 281	198 199	3.4%	7.5%	6.1%

These traffic flows can be visualized according to their origin and destination port. Map 4-3 shows the major trading routes in the BSR with their amount of transported goods. Obvious are the strong relations to the port of Bergen (Norway), Hamburg (Germany), Gdansk (Poland), Klaipeda (Lithuania), Ventspils (Latvia), Riga (Latvia) and Saint Petersburg (Russia). These last mentioned ports are large oil exporting ports.

¹⁵ Differences in the figures result from different recording standards.

Map 4-3: Sea and Rail Routes, all cargoes, Major Ports, 2003 (SAI 2006)



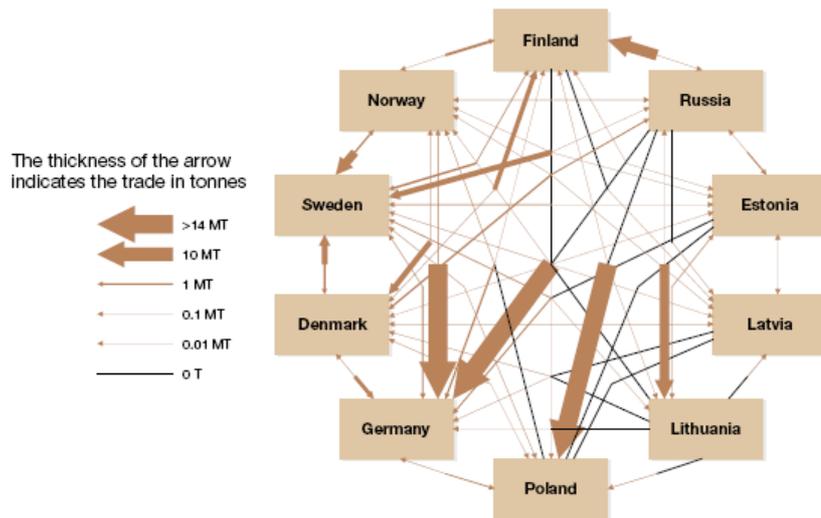
The international maritime transports to and from the BSR and between the BSR countries 2003 totalled 731 million tons of which 329 million tons were liquid bulk, 204 million tons dry bulk, and 197 million tons other dry cargoes. While the extra-BSR maritime transports totalled 553 million tons, the intra BSR transports totalled 178 million tons. Dry bulk was the largest intra BSR commodity (43% or 75 million tons), followed by liquid bulk (34% or 62 million tons), and other dry cargoes (28% or 41 million tons).

The large shares of the total dry bulk transport for Sweden, Norway and Finland result from the fact that practically all bulk cargoes are carried in or out of these countries by ship, while the other countries rely more on rail transport. Germany's large share of the total BSR dry bulk transport is due to large imports of minerals and forest products from Finland and Sweden. Latvia's position results from its large exports of wood, and Poland's and Denmark's positions from the large coal trade. Russia's share of the liquid bulk trade, including transit goods, was approximately 25%.

General cargo flows are mainly channelled through ports in Germany, Denmark, Sweden, Russia and Finland, and major dry bulk flows through ports in the north of Scandinavia and Finland.

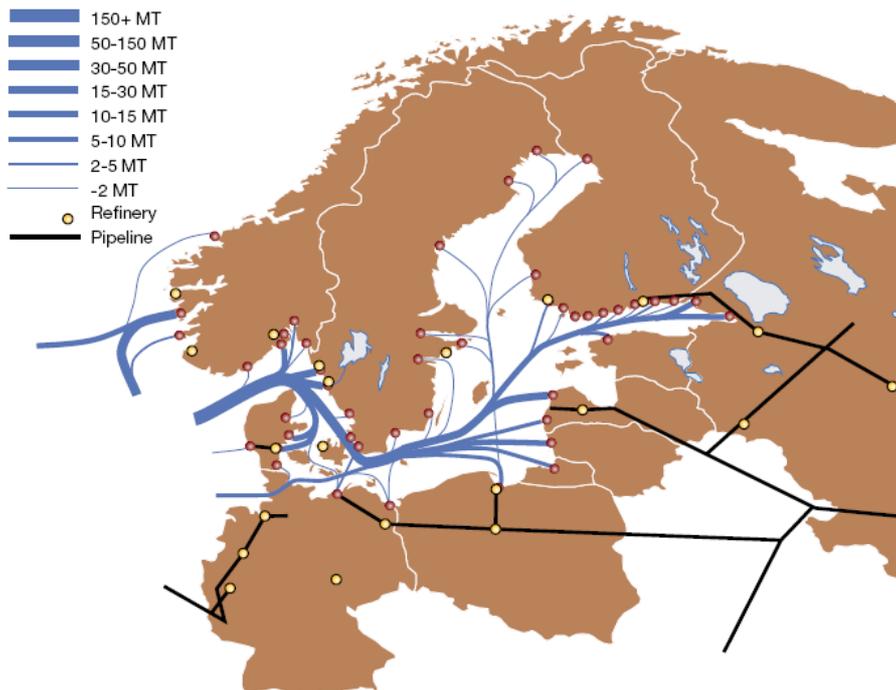
When excluding all other cargo from the trade figures and only analysing the oil trade in the region, the following pattern is achieved (Figure 4-3).

Figure 4-3: Total Intra-Regional Oil Trade (SAI 2006)



Relating this pattern to the regional ports structure, Map 4-5 shows the oil trade flows in the BSR. The dependency on Russian oil is evident as the trade is predominantly from east to west.

Map 4-4: Liquid Bulk Traffic, Major Ports, Refineries, Pipelines, 2003 (SAI 2006)



The current problems concerning Russian oil exports via pipelines through Belarus might lead to a differing picture in the near future. It is expected that Russia will increase its oil exports via the oil port of Primorsk close to Saint Petersburg by roughly 60%. Even though a hot debate has started regarding environmental risks of increased tanker traffic, especially northern German ports are heading for growing volumes of oil.¹⁶

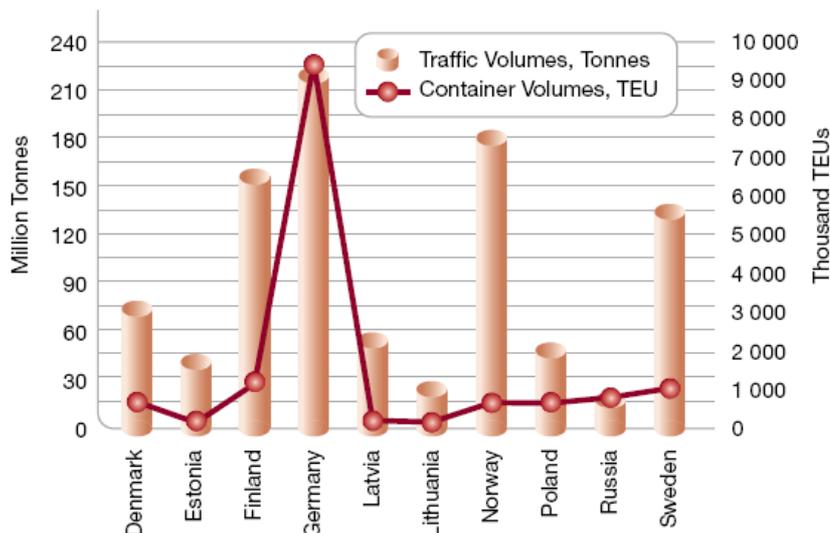
Container Flows

The largest growth rates in comparison of all types of cargo have been experienced in the container turnover. This is the case for all of the world trade and can also be seen in the

¹⁶ Krüger 2007, p. 1

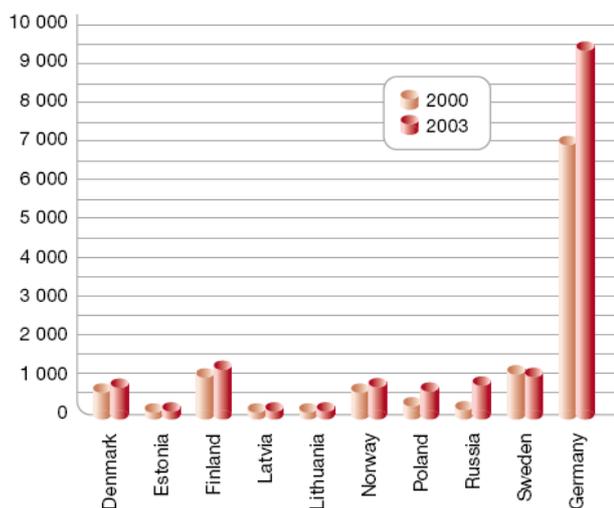
NSR/BSR. Due to the structure of trade in the BSR with large parts of bulk trade, the trade of containers is fairly low compared to total turnover of ports in tons (Chart 4-5). However, these figures are constantly on the rise.

Chart 4-5: Major Ports - Total and container traffic volumes 2003 (SAI 2006)



Ports in the Baltic States and Russia are currently extended to cope with the increasing container trade and the demand of the growing economies for products that fall in the range of general cargo that can most efficiently be transported by container. Today, container traffic is still dominating the trade in the NSR. This can be seen in Chart 4-6 where German ports are heavily occupied in the container trade business.

Chart 4-6: Number of containers shipped 2000 and 2003 (1,000 TEU) (SAI 2006)



Non-containerised cargoes are of much greater importance in the countries of the BSR. In 2003, next to Hamburg and Bremen, Gothenburg was the largest container port in the region, handling some 666,000 containers. Saint Petersburg passed Gothenburg in container volumes in 2005.

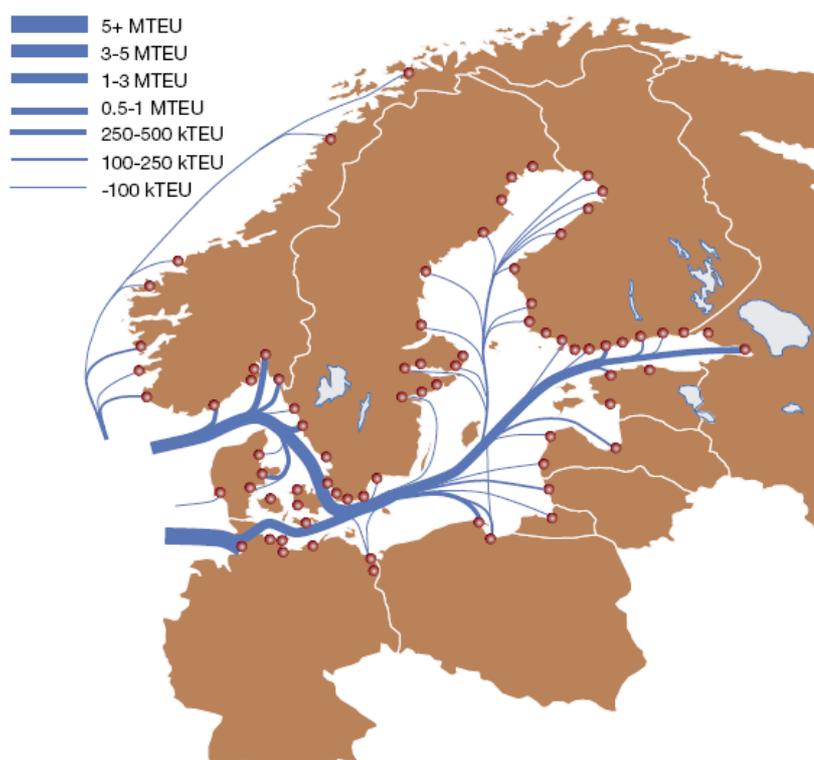
Concerning the Russian trade, more than 75% of all containerised cargoes destined for Russia are transited either via Riga, Tallinn and Klaipeda or via Finland. As the road network in Russia improves, more and more goods will probably go directly to St Petersburg.

About 75% of the total number of TEUs arriving in Finland originates from the four deep sea ports on the continent - Rotterdam, Amsterdam, Antwerp and Hamburg. Helsinki is the main competitor of the port of Saint Petersburg with regard to general cargo.

Another port with a strong development is the port of Gdansk. In 2004 it handled almost twice as many containers as in 2003, from almost 25,000 to about 44,000. Gdynia, the neighbouring port has also seen significant growth; the container traffic more than tripled from 2000 to reach 37,000 TEU in 2004.

There are about 10 ports in the region handling from 100,000 to 300,000 containers per year, all evenly spread in the region. Map 4-5 shows the main trading routes for container traffic.

Map 4-5: Sea Routes, Container Traffic, 2003 (SAI 2006)



4.1.4 Road Transport

Within the EU, the road freight transport sector has been growing constantly over the last decades. The international transport of goods by road has been growing at an average of 2.5% a year between 1999 and 2003. Of the total EU road transport reported in 2003, some 95% was international transport between the EU25 Member States.

It is estimated that 70 million tons of cargo were transported by road between the BSR countries. There are large differences between various parts of the NSR/BSR with respect to road traffic, with very high traffic loads in Denmark, Germany, the Netherlands, Poland, Belgium and a few areas in the Scandinavian countries, and moderate traffic loads in other parts of the BSR.

Traffic loads on major roads in the BSR are highest in and around the urban agglomerations of Berlin and Hamburg in Germany. Furthermore, in Germany and the UK the traffic loads on motorways outside the urban areas are much higher than in other countries, even higher than

in most urban areas of the NSR/BSR. High traffic volumes can be found also on the motorway networks of the Netherlands and Denmark.

When adding the transport volumes between countries, ~30 million tons of internationally traded goods were transported on the roads between the Gulf of Finland and Germany via Estonia, and ~17 million tons between Scandinavia and Germany.

Finland, Estonia, Latvia and Lithuania have a different transportation pattern. Only about a fifth of their transport with other countries is conducted on road, much of this being cargoes to and from Russia.

Road traffic is growing fast in the studied region. This is particularly the case for transport of manufactures and consumer goods produced by or destined for Estonia, Latvia, Lithuania and Poland. This is where the positive effects of trade deregulations and infrastructure improvements will be the strongest.

As a result of growing east west trade and of increasing seaborne transport volumes, intra-regional road traffic volumes will grow, both between ports and their hinterland, and between BSR and non-BSR countries.

4.1.5 Rail Transport

Rail transport in the BSR has experienced a large drop in transport volumes in the past decade. The reduction can be observed for both passenger and freight transport, and is spatially concentrated in the new EU countries. In the 1990s only countries such as Norway and Finland, with rather low volumes, have undergone some growth in rail transport. All other BSR countries have experienced a decline of rail freight volumes.

Poor performance of rail services on insufficient infrastructure can be seen as a reason for the decline. Rapidly increasing availability of private hauliers in some countries and a redirection of trade flows from eastern to western directions can be part of a solution.

Russia shows the highest goods transport volumes. Rail transport volume in tons to Estonia, Latvia and Finland are outweighing those to other BSR countries. This is due to the over 80 million tons of transit goods which is carried between Russia and its neighbouring countries. Other major rail transport lines are between Poland and Germany and between Sweden and Norway (mainly iron ore in transit to be shipped from Narvik). Denmark and Lithuania, on the other hand, have rather low transport volumes by rail.

However, the railways are still a mode of transport with much potential. This can be seen in many European-wide attempts for multi modal transport chains. A renewal of the railways is therefore a key to achieve modal switch to more rail market share. Especially over long distances and concerning relations to the south of Europe, the rail market shows great potential for growth. Map 4-3 on page 18 shows the major rail routes in northern Europe.

4.2 Goods Flow between Countries of the Baltic and North Sea Region

4.2.1 Belgium

The economy of Belgium has capitalized on its central geographic location. Through a highly developed transport network and diversified industrial and commercial base it is thriving. Industry is concentrated mainly in the populous Flemish area in the north. With few natural

resources at hand, Belgium needs to import substantial quantities of raw materials. On the other hand it exports large volumes of manufactured products, making its economy unusually dependent on the state of world markets. About three-quarters of its trade is with other EU countries.

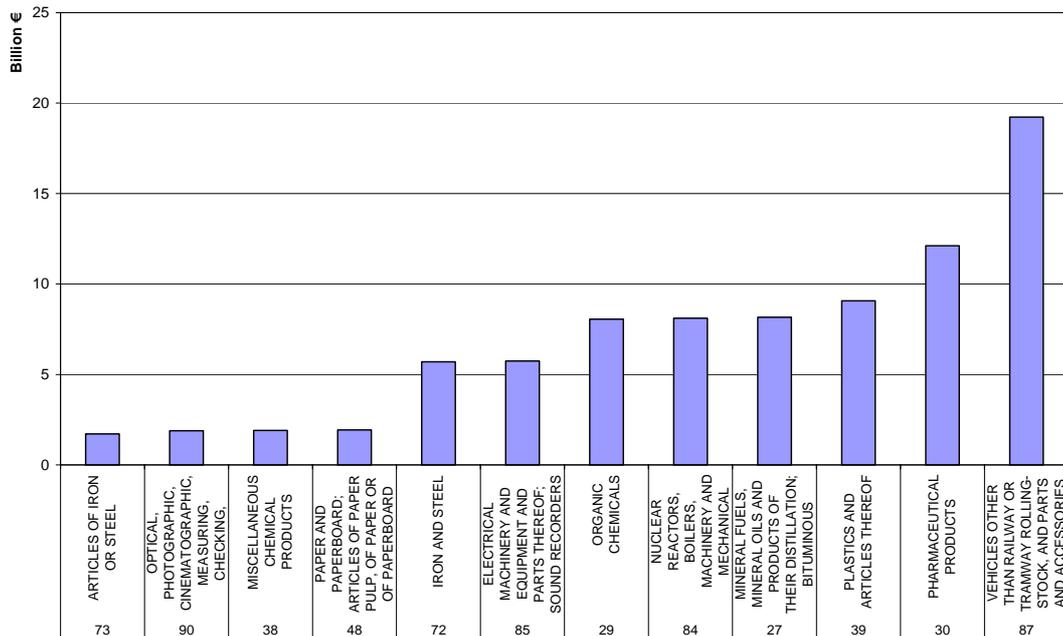
Belgium - Facts	
GDP (purchasing power parity):	€237.6 billion (2005 est.)
GDP (official exchange rate):	€258.2 billion (2005 est.)
GDP - real growth rate:	1.5% (2005 est.)
GDP - per capita (PPP):	€22,924 (2005 est.)
Agriculture - products:	sugar beets, fresh vegetables, fruits, grain, tobacco; beef, veal, pork, milk
Industries:	engineering and metal products, motor vehicle assembly, transportation equipment, scientific instruments, processed food and beverages, chemicals, basic metals, textiles, glass, petroleum
Industrial production growth rate:	-0.2% (2005 est.)
Exports:	€198.7 billion (2005 est.)
Exports - commodities:	machinery and equipment, chemicals, diamonds, metals and metal products, foodstuffs
Exports - partners:	Germany 19.4%, France 17.3%, Netherlands 11.7%, UK 8.2%, US 6.4%, Italy 5.3% (2005)
Imports:	€195.0 billion (2005 est.)
Imports - commodities:	machinery and equipment, chemicals, diamonds, pharmaceuticals, foodstuffs, transportation equipment, oil products
Imports - partners:	Netherlands 17.8%, Germany 17.2%, France 11.4%, UK 6.8%, Ireland 6.5%, US 5.4% (2005)

The geographical location of Belgium in the centre of Europe provides for frequent connections to the neighbouring mainland countries the Netherlands, Germany and France as well as frequent connections to the UK. Most of the transported goods are exported or imported by landside transport modes. But with one of the largest ports in Europe – the port of Antwerp – and one of the largest vehicle handling ports – the port of Zeebrugge – the importance for sea based transport should not be underestimated.

Belgium is one of the largest vehicle exporting countries as can be seen in Chart 4-7. Through close relations to many major car manufacturing plants and price competitive hinterland connections about €19 billion worth in finished vehicles were exported in 2005 via the ports of Zeebrugge and Antwerp and via rail and road to the hinterland (mainly Belgium, France and southern Germany) (see Chapter 7).

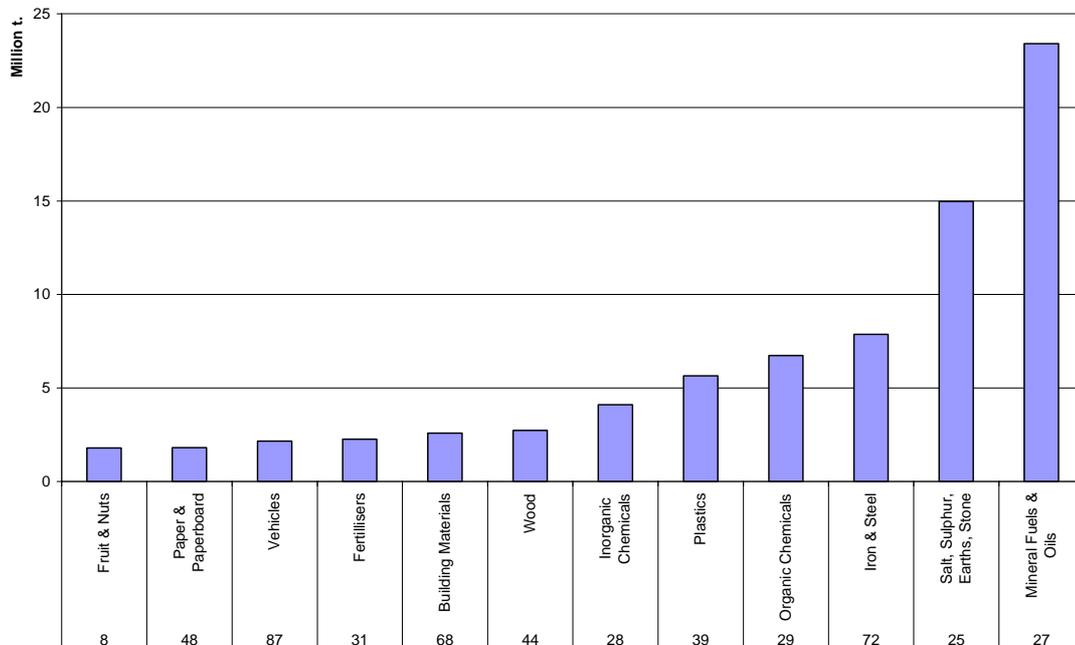
In terms of value the second most important goods category that was exported from Belgium in 2005 was pharmaceutical products. This product category has a high traded value but a very low traded amount due to the fact that the production of small items is expensive in this industry. Pharmaceutical products (~€12 billion) are closely followed by plastics (~€9 billion), mineral fuels (~€8 billion), machinery (~€8 billion), organic chemicals (~€8 billion), electrical appliances (~€6 billion) and iron & steel (~€6 billion).

Chart 4-7: Exported Values in € from Belgium to Countries of the NSR/BSR in 2005 (12 Largest HS2 Product Groups) (Eurostat 2006)



In terms of values in tons, the most heavily traded goods are mineral fuels and oil products (~23 million tons) followed by building materials (~15 million tons). Other bulk goods outweigh high value products in terms of traded amounts as well. Only vehicles are traded with ~2 million tons.

Chart 4-8: Exported Values in t. from Belgium to Countries of the NSR/BSR in 2005 (12 Largest HS2 Product Groups) (Eurostat 2006)

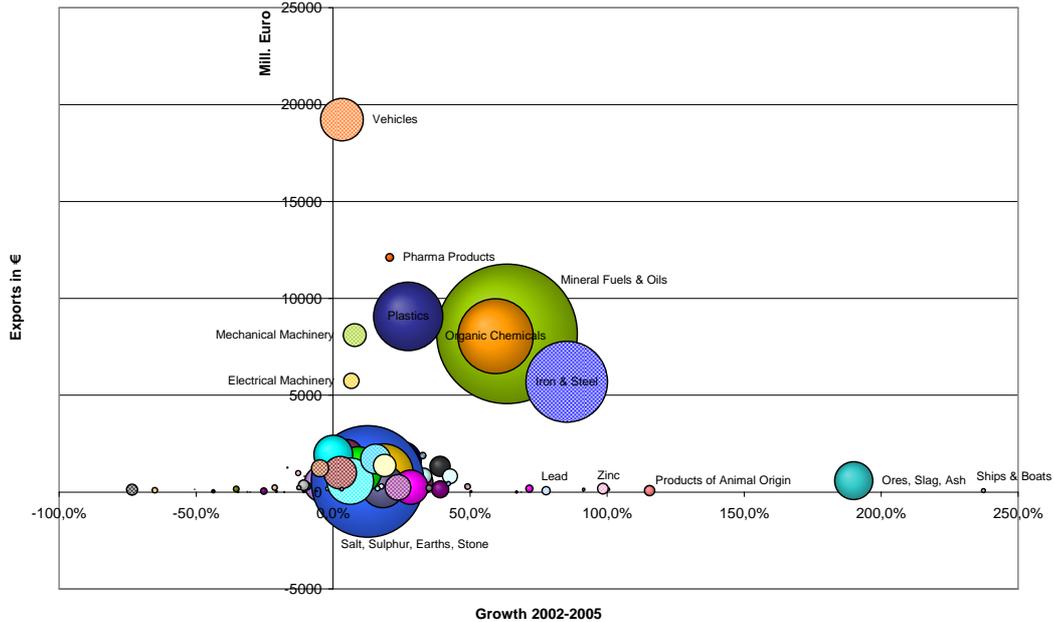


Concerning the development of goods flows from Belgium, Chart 4-9 provides a combined view of traded amounts in € and tons on the growth of goods categories between the years of 2002 and 2005. Vehicles are traded with the highest value but show only a small growth rate. In contrast to that ships & boats show a very high growth but a fairly low traded value.

For the purpose of potential growing goods categories that might provide for growth in logistical services, three exported types of goods need to be mentioned in relation to overall exported goods turnover of Belgium.

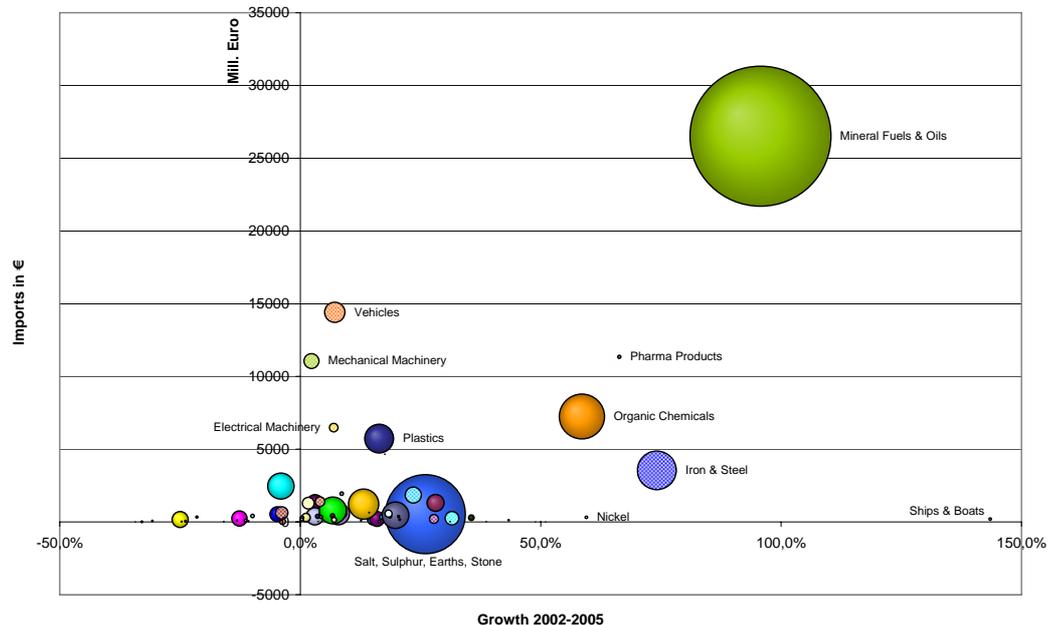
1. Pharmaceutical goods show a growth rate of about 20% with high traded value.
2. Mechanical machinery shows moderated growth rates while goods are of high value.
3. Electrical machinery shows moderated growth rates while goods are of high value.

Chart 4-9: Belgium Exports, Growth 2002-2005 in mil. € Size = Exports in mil. t. (Eurostat 2006)



The imports of Belgium show a completely different picture (see Chart 4-10). Mineral fuels are the dominating commodity in terms of growth, value and amount. Most of the other goods categories developed quite similar over the last few years compared to exported goods.

Chart 4-10: Belgium Imports, Growth 2002-2005 in mil. € Size = Imports in mil. t. (Eurostat 2006)



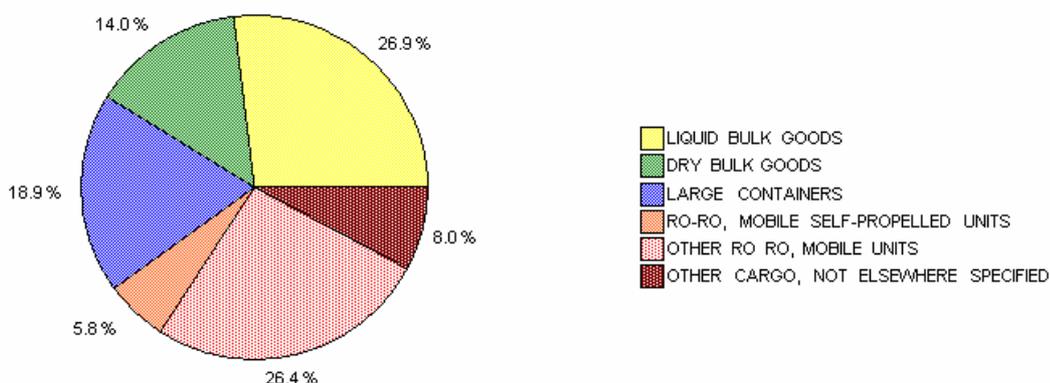
When looking at the transport structure of Belgium, most of the traffic is undertaken by road or rail. While seaside transport provides an efficient means for transshipping goods from the Far East and the Americas and exporting to these areas by deep sea vessels. Related to this fact, feeder connections to the Baltic Sea Region are frequent especially to Finland and Sweden (see Table 4-4).

Table 4-4: Frequency of port calls in country by vessel (Liner Services) coming from Belgium

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Denmark	3 monthly	Lithuania	2 monthly
Denmark	9 weekly	Lithuania	7 weekly
Estonia	24 monthly	Netherlands	32 monthly
Estonia	10 weekly	Netherlands	26 weekly
Finland	1 daily	Norway	17 monthly
Finland	34 monthly	Norway	23 weekly
Finland	46 weekly	Poland	13 monthly
Germany	3 daily	Poland	3 weekly
Germany	48 monthly	Russia	6 monthly
Germany	31 weekly	Russia	14 weekly
Latvia	10 monthly	Sweden	22 monthly
Latvia	4 weekly	Sweden	22 weekly

The trade is split up between bulk commodities, RoRo units and containers as shown in Chart 4-11.

Chart 4-11: Belgium - International intra-EU-25 seaborne transport of goods: share by type of cargo, 2004 (Main ports) (Eurostat 2005a)



4.2.2 Denmark

The economy of Denmark features high-tech agriculture, small-scale and corporate industry and high dependence on foreign trade. It is a net exporter of food and energy. Economic growth gained momentum in 2004 and the upturn accelerated through 2005.

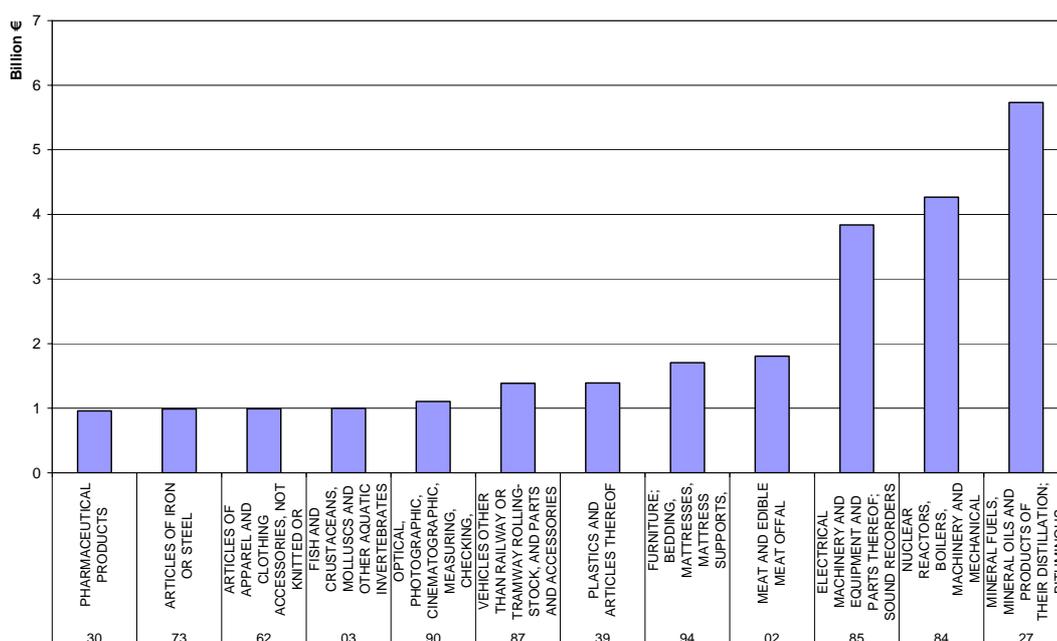
The most important industry sectors in Denmark are metal, chemical, food processing and furniture, windmill, machinery and electronics industry. However, during the past few years, the GDP share of raw material based industries has been reduced in favour of the high-tech industries. Danish industry is characterised by a high number of highly specialised small and medium sized enterprises (SMEs).

In Denmark the industrial concentrations differ from the population concentrations. About two thirds of the industry work force is employed in Jutland and Fyn while the service sector remains concentrated to the Copenhagen region.

Denmark – Facts	
GDP (purchasing power parity):	€139.5 billion (2005 est.)
GDP (official exchange rate):	€179.4 billion (2005 est.)
GDP - real growth rate:	3.2% (2005 est.)
GDP - per capita (PPP):	€25,651 (2005 est.)
Agriculture - products:	barley, wheat, potatoes, sugar beets; pork, dairy products; fish
Industries:	iron, steel, nonferrous metals, chemicals, food processing, machinery and transportation equipment, textiles and clothing, electronics, construction, furniture and other wood products, shipbuilding and refurbishment, windmills, pharmaceuticals, medical equipment
Industrial production growth rate:	1.6% (2005 est.)
Exports:	€62.6 billion (2005 est.)
Exports - commodities:	machinery and instruments, meat and meat products, dairy products, fish, chemicals, furniture, ships, windmills
Exports - partners:	Germany 17.5%, Sweden 13.2%, UK 8.8%, US 6.4%, France 5.5%, Netherlands 5.3%, Norway 5.1% (2005)
Imports:	€55.1 billion (2005 est.)
Imports - commodities:	machinery and equipment, raw materials and semi manufactures for industry, chemicals, grain and foodstuffs, consumer goods
Imports - partners:	Germany 20.5%, Sweden 13.8%, Norway 6.6%, Netherlands 6.6%, UK 6%, China 4.7%, France 4.2%, Italy 4.1% (2005)

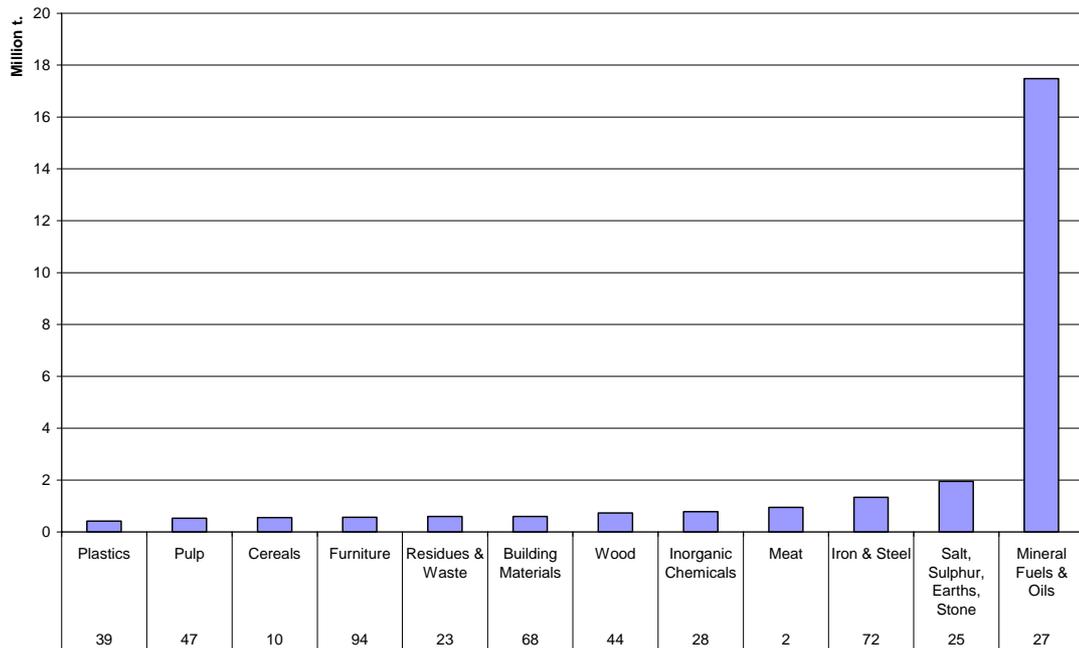
The geographical location of Denmark provides for frequent relations to the surrounding countries of Scandinavia and Germany. Here, Strong trade relations exist. In terms of values the exporting trade of Denmark is dominated by mineral fuels and oil products (~€5.7 billion). This is due to the fact that several oil harbours have developed over the years. Following that, machinery (~€4.3 billion) and electrical appliances (~€4.8 billion) are heavily traded. Other commodities like food products, furniture, vehicles, pharmaceutical products and precision engineering follow.

Chart 4-12: Exported Values in € from Denmark to Countries of the NSR/BSR in 2005 (12 Largest HS2 Product Groups)



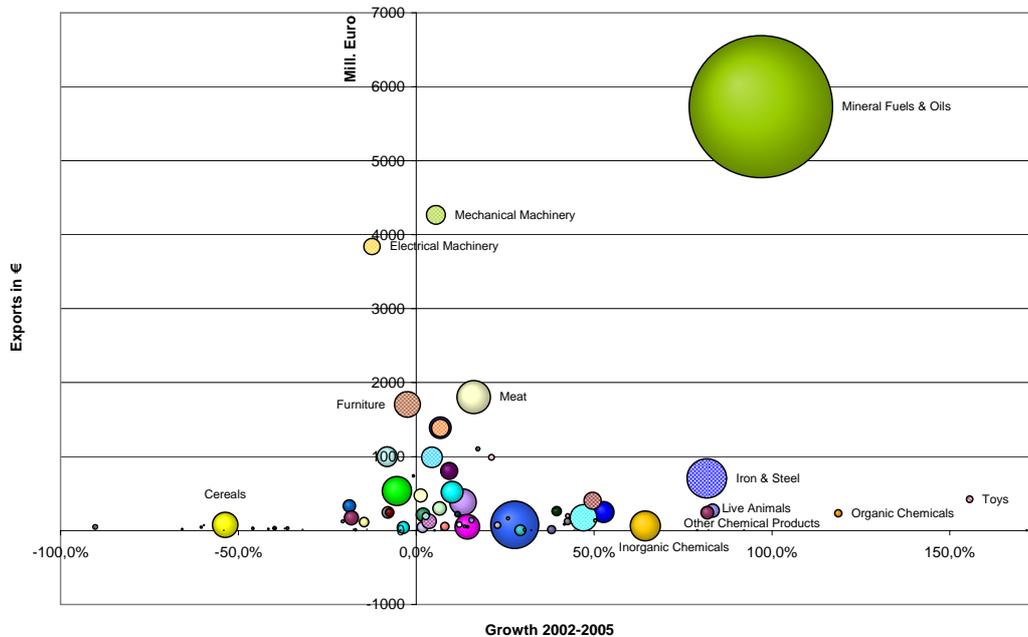
In terms of tons, mineral oils are also by far the dominating commodity (~17.5 million tons). Other bulk goods are of much less importance as are general goods.

Chart 4-13: Exported Values in t. from Denmark to Countries of the NSR/BSR in 2005 (12 Largest HS2 Product Groups)



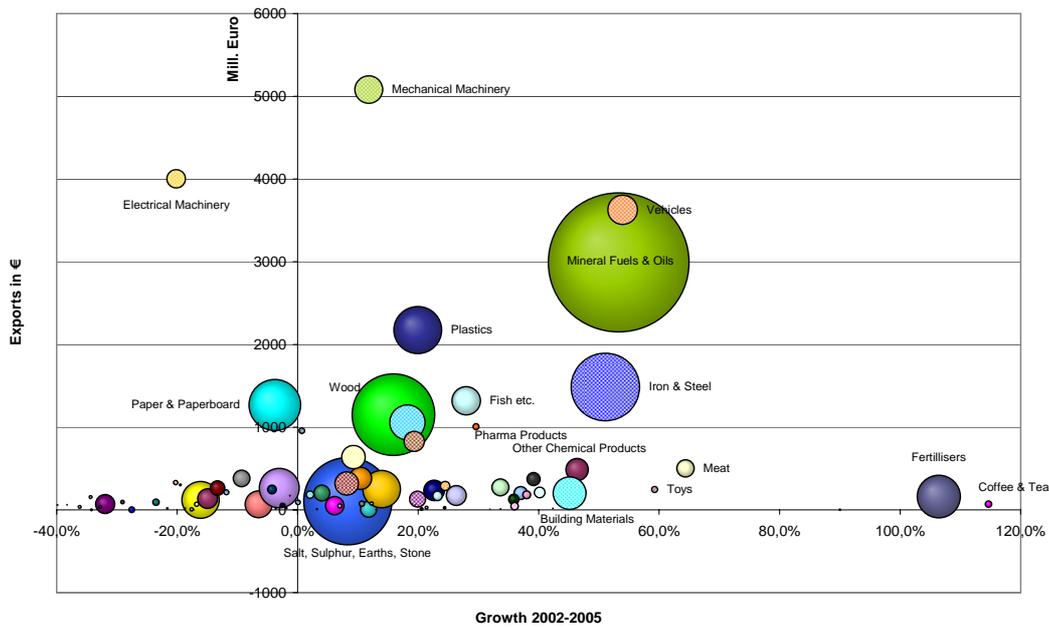
This is also represented in the growth picture for the years 2002 to 2005 (Chart 4-14). Mineral fuels dominate the export of goods from Denmark in terms of value, amount and growth. Growth is only outweighed by toys and organic chemicals. Value is only comparable with mechanical machinery and electrical appliances. However, the latter are on the decline as are cereals.

Chart 4-14: Denmark Exports, Growth 2002-2005 in mil. €. Size = Exports in mil. t. (Eurostat 2006)



The import of goods shows a similar picture (Chart 4-15). Mineral fuels dominate but high value categories like vehicles have undergone a strong growth. This is also true for some bulk and food commodities. Electrical machinery and paper imports are on the decline as well.

Chart 4-15: Denmark Imports, Growth 2002-2005 in mil. € Size = Imports in mil. t. (Eurostat 2006)



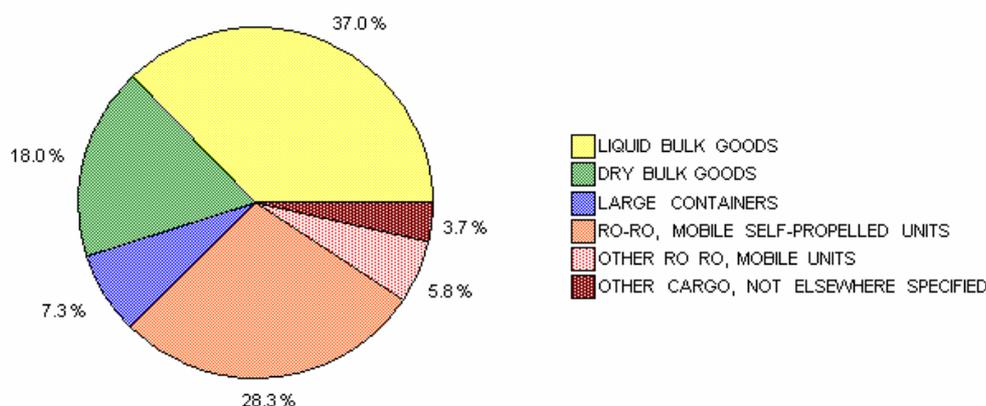
When looking at the transport structure, much of the trade is undertaken by road with Germany but frequent seaborne connections to Sweden, Norway, Germany, the UK, Finland and even Russia are used for transporting large amounts (see Table 4-5).

Table 4-5: Frequency of port calls in country by vessel (Liner Services) coming from Denmark

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	9 weekly	Norway	3 Monthly
Estonia	7 weekly	Norway	15 Weekly
Finland	23 weekly	Poland	2 Monthly
Finland	12 yearly	Poland	1 Weekly
Germany	4 monthly	Russia	2 monthly
Germany	32 weekly	Russia	10 weekly
Latvia	2 weekly	Sweden	1 daily
Lithuania	4 weekly	Sweden	6 monthly
Netherlands	2 monthly	Sweden	28 weekly
Netherlands	10 weekly	UK	3 monthly
Norway	1 daily	UK	14 weekly

This seaborne transport is dominated by liquid bulk, dry bulk and RoRo goods. The latter are a main focus of the Danish transport infrastructure. General cargo is mainly transported by trailers or other mobile units on RoRo vessels.

Chart 4-16: Denmark - International intra-EU-25 seaborne transport of goods: share by type of cargo, 2004 (Main ports) (Eurostat 2005a)



4.2.3 Estonia

Estonia, as a new member of the EU, has transitioned effectively to a modern market economy with strong ties to the West. The economy benefits from strong electronics and telecommunications sectors and is greatly influenced by developments in Finland, Sweden, and Germany, the three major trading partners. It also has a strong food processing and textile industry. Estonian industry is characterised by small enterprises and diversified production. It is, however, dependent on imports for energy and raw materials.

In Estonia, the economic importance of the capital widely out-ranks their population size. Economic development outside the big cities is far less vigorous. There are, however, a number of other cities, which are important in economic terms.

Estonia is known as an important transit country since old days, when products were transported through the country, like a passage from the coast to the inland. In recent years it has emerged as one of the fastest adjusting and developing economies in the BSR. Also the transport infrastructure has been developed fast, mainly due to Estonia's coastal location.

Estonia - Facts	
GDP (purchasing power parity):	€17.2 billion (2005 est.)
GDP (official exchange rate):	€9.0 billion (2005 est.)
GDP - real growth rate:	10.5% (2005 est.)
GDP - per capita (PPP):	€12,899 (2005 est.)
Agriculture - products:	potatoes, vegetables; livestock and dairy products; fish
Industries:	engineering, electronics, wood and wood products, textile; information technology, telecommunications
Industrial production growth rate:	9.7% (2005 est.)
Exports:	€5,483 billion (2005 est.)
Exports - commodities:	machinery and equipment 33%, wood and paper 15%, textiles 14%, food products 8%, furniture 7%, metals, chemical products (2001)
Exports – partners:	Finland 26.5%, Sweden 12.9%, Latvia 8.8%, Russia 6.5%, Germany 6.2%, Lithuania 4.8% (2005)
Imports:	€6,773 billion (2005 est.)
Imports - commodities:	machinery and equipment 33.5%, chemical products 11.6%, textiles 10.3%, foodstuffs 9.4%, transportation equipment 8.9% (2001)
Imports - partners:	Finland 19.8%, Germany 13.8%, Russia 9.4%, Sweden 8.8%, Lithuania 6.1%, Latvia 4.7% (2005)

Since Estonia has become a member of the EU, the eastern border of the country turns out to be the eastern border of the EU. To make it possible for transit volumes to continue to rise, a continued high level of investment in infrastructure as well as transport support functions need to be maintained. From a transport point of view, it can only be expected that a positive development in Russia can help to make the Estonian transit corridor increase its attractiveness for transit cargo, and to maintain the development.

Sea transportation and transportation in general, play a vital role in the Estonian national economy. The main part of transportation income is generated by international shipping and port services. Transit traffic and management of roads are the main activities for more than 3,500 enterprises, which make up nearly 9% of the GDP for Estonia and employ 7% of the workforce. Transit services are a profitable export sector for the nation, and their future development is therefore a top priority in Estonia's economic policy work, especially now after entering the EU. Transport via Estonia has, proportionally, grown the most among the Baltic countries, with the amounts almost doubling to reach 17 million tons over 1993-97. The last year of the period was one of strong growth: transport grew by 18%. Growth in the share of liquid bulk (oil products) was especially strong, and this category now constitutes 47% of transport tonnage.¹⁷

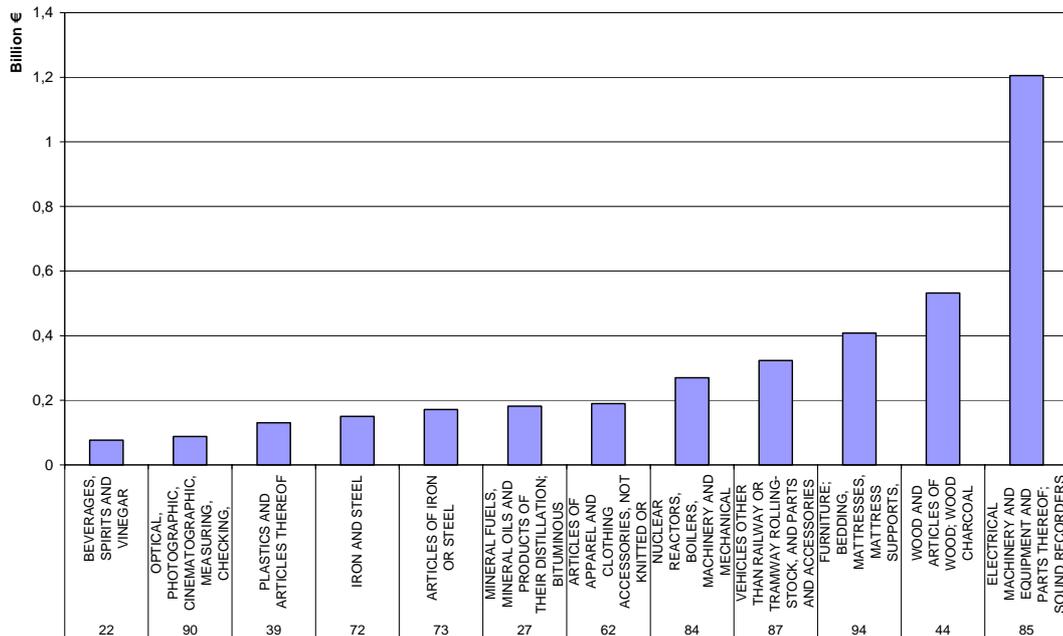
In the last couple of years the Estonian and Finnish flag have been dominant, and their share of the number of port calls is also increasing. When looking at the export-import volumes, most of it is transported by ship, around 48%, 41% respectively 11% by rail respectively road. The general volume of investment in the transport sector represents 20% of the total investment in Estonia. Total port throughput in Estonia amounted to 27 million tons in 1999 and has been continuously growing since then. Of this, 41% are estimated to be intra-regional.¹⁸

The export of goods from Estonia in general is much smaller than that of the other Nordic countries and is comparable to those of the other Baltic States. Estonia exports mostly electrical appliances when looking at exported value (~€1.2 billion). This is particularly interesting as the country has successfully developed a telecommunications cluster that furthers such developments. Depending on the regional environment, wood products are the second most important exported good (~€0.5 billion). A related product category is furniture that is also heavily exported.

¹⁷ Baltic 21 2004b

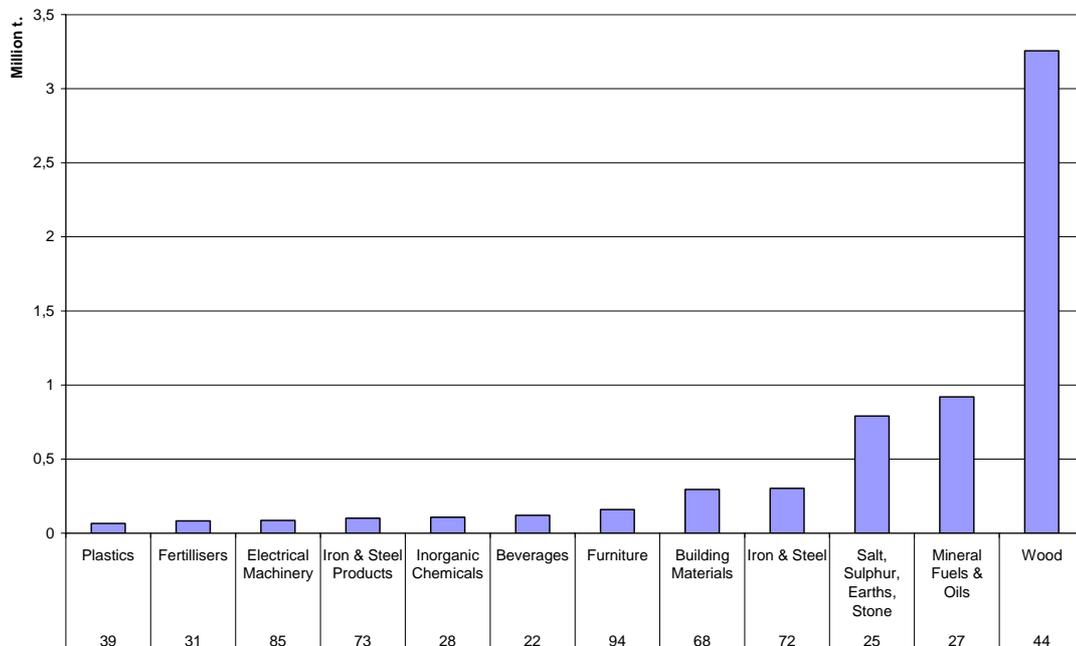
¹⁸ SAI 2000

Chart 4-17: Exported Values in € from Estonia to Countries of the NSR/BSR in 2005 (12 Largest HS2 Product Groups)



In terms of exported tons, the low price-weight relationship is the reason for the overhanging importance of wood exports from Estonia (~3.2 million tons). Some mineral oils from Russia and some building material follow.

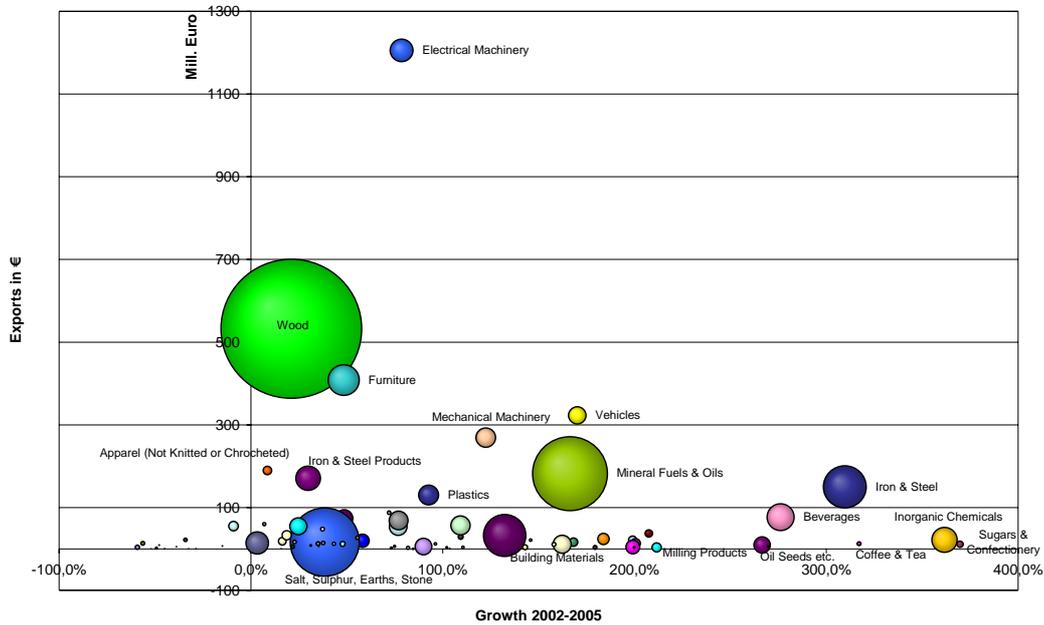
Chart 4-18: Exported Values in t. from Estonia to Countries of the NSR/BSR in 2005 (12 Largest HS2 Product Groups)



The overall importance of wood related products can also be seen in the growth chart (Chart 4-19). Wood and furniture show sound growth rates and high value. But electrical machinery outweighs them by exported value and growth. The growth rates are high in comparison to the old European countries and all Baltic countries exhibit the same phenomenon that growth of

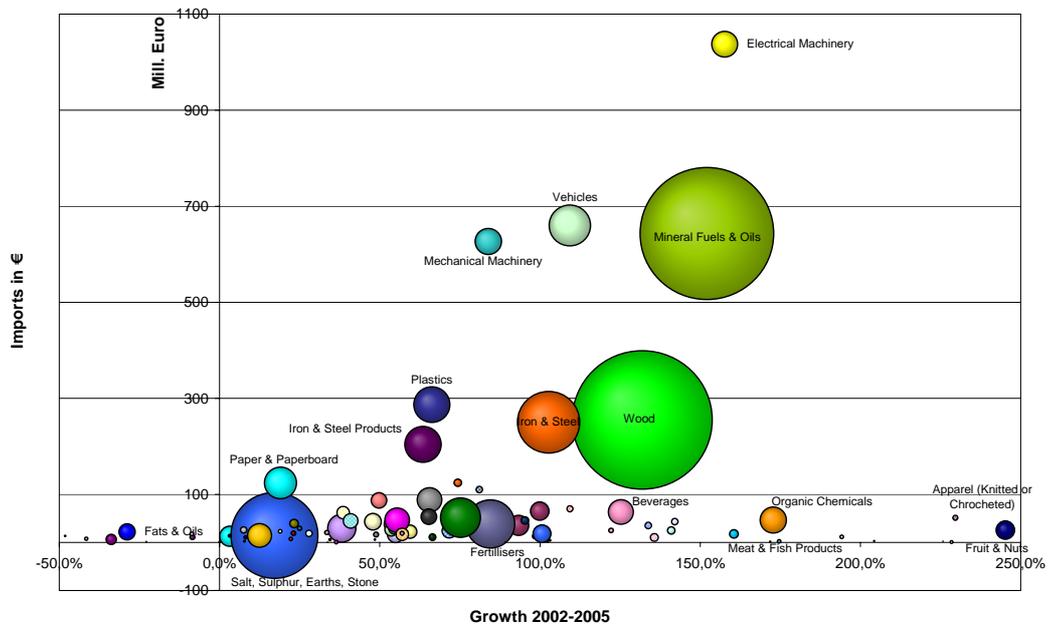
exported goods categories relate to the general economic development of the countries that for the last years have undergone a stronger growth than the old European countries.

Chart 4-19: Estonia Exports, Growth 2002-2005 in mil. €. Size = Exports in mil. t. (Eurostat 2006)



The imports growth chart shows a different picture (Chart 4-20). Even though electrical appliances are also imported with high valued amounts, vehicles and mechanical machinery are also growing in importance for the countries imports. Mineral fuels and wood on the other hand provide the backbone in terms of tons for total imports.

Chart 4-20: Estonia Imports, Growth 2002-2005 in mil. €. Size = Imports in mil. t. (Eurostat 2006)



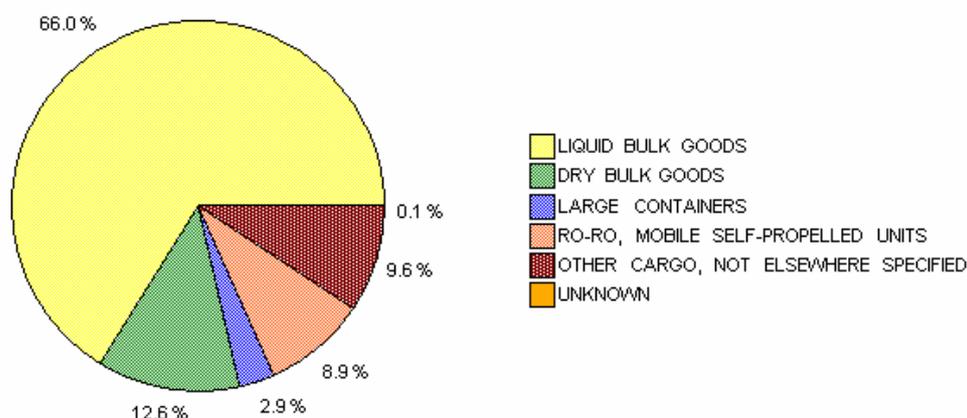
The structure of seaborne transport is heavily dependent on its connections to Finland. Many goods flows are transhipped via Finnish ports to Estonian ports. However connections to Germany are also frequent.

Table 4-6: Frequency of port calls in country by vessel (Liner Services) coming from Estonia

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	2 monthly	Netherlands	2 monthly
Belgium	10 weekly	Netherlands	6 weekly
Denmark	2 monthly	Norway	18 monthly
Denmark	2 weekly	Norway	1 weekly
Finland	13 daily	Poland	3 weekly
Finland	64 monthly	Russia	2 monthly
Finland	25 weekly	Russia	5 weekly
Germany	4 monthly	Sweden	3 daily
Germany	28 weekly	Sweden	42 monthly
Latvia	6 monthly	Sweden	9 weekly
Latvia	9 weekly	UK	22 monthly
Lithuania	2 monthly	UK	7 weekly
Lithuania	4 weekly		

The share of type of cargo is dominated by liquid bulk due to the fact that mineral fuels are one of the main imported and exported goods via the ports. Wood products – as mentioned earlier – are of less importance for the seaborne transport than for total exports.

Chart 4-21: Estonia - International intra-EU-25 seaborne transport of goods: share by type of cargo, 2004 (Main ports) (Eurostat 2005a)



4.2.4 Finland

Finland has a highly industrialized economy with per capita output roughly that of the UK, France, Germany and Italy. Its key economic sector is manufacturing - principally the wood, metals, engineering, telecommunications, and electronics industries. Trade is important and exports equal two fifths of GDP. Finland excels in high-tech exports, especially with mobile phones. Except for timber and several minerals, Finland depends on imports of raw materials, energy, and some components for manufactured goods. Forestry, an important export earner, provides a secondary occupation for the rural population. Rapidly increasing integration with Western Europe will dominate the economic picture over the next several years.

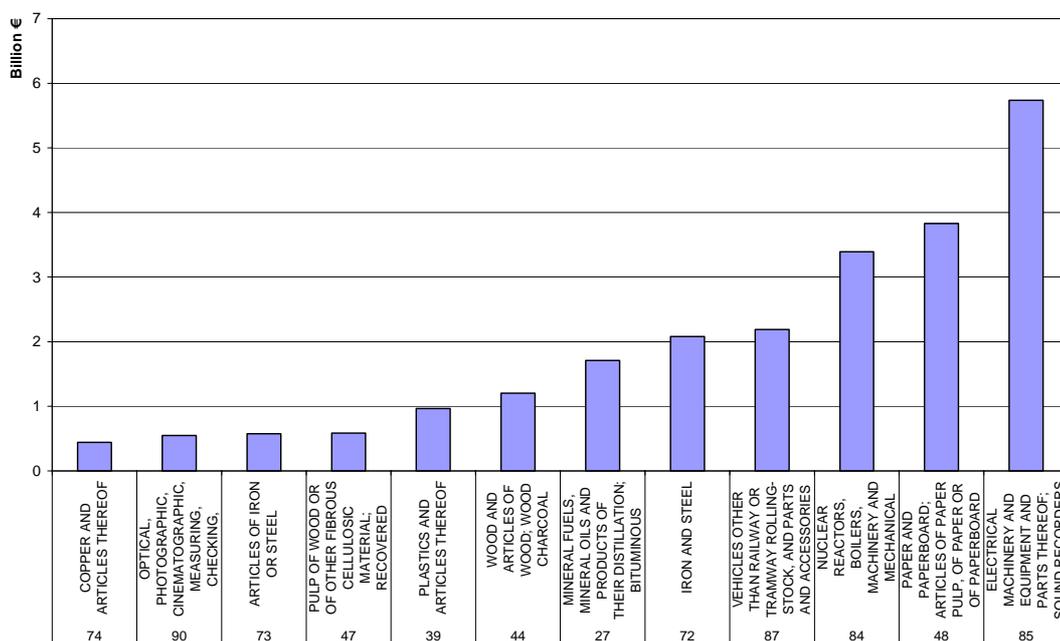
The economic situation in Finland is similar to other European countries, where the rapid growth since the end of the 1990s recession has favoured urbanised areas. Food production is distinctly concentrated in the western parts of the country and forest industry in the central and eastern parts of the country. The sub-regions of south-western Salo and northern Oulu are

most strongly oriented around the electro technical and telecommunications cluster, and in northern Finland the metal and mechanical engineering sectors are also relatively strongly represented. Nevertheless, the Helsinki Metropolitan Area is the biggest economic concentration in Finland.

Finland - Facts	
GDP (purchasing power parity):	€19.3 billion (2005 est.)
GDP (official exchange rate):	€135.8 billion (2005 est.)
GDP - real growth rate:	3% (2005 est.)
GDP - per capita (PPP):	€2,850 (2005 est.)
Agriculture - products:	barley, wheat, sugar beets, potatoes; dairy cattle; fish
Industries:	metals and metal products, electronics, machinery and scientific instruments, shipbuilding, pulp and paper, foodstuffs, chemicals, textiles, clothing
Industrial production growth rate:	-2% (2005 est.)
Exports:	€50.0 billion (2005 est.)
Exports - commodities:	machinery and equipment, chemicals, metals; timber, paper, pulp (1999)
Exports – partners:	Russia 11.2%, Sweden 10.7%, Germany 10.5%, UK 6.6%, US 6.2%, Netherlands 4.8% (2005)
Imports:	€1.6 billion (2005 est.)
Imports - commodities:	foodstuffs, petroleum and petroleum products, chemicals, transport equipment, iron and steel, machinery, textile yarn and fabrics, grains
Imports - partners:	Germany 16.2%, Sweden 14.1%, Russia 13.9%, Netherlands 6.2%, Denmark 4.6%, UK 4.3%, China 4.2% (2005)

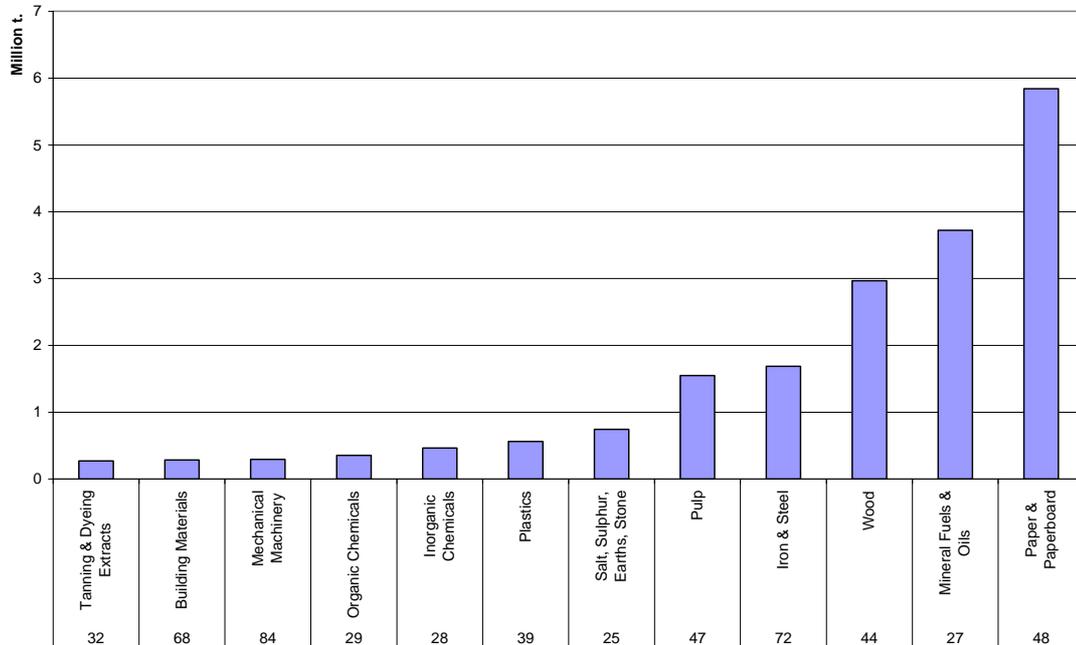
The economy of Finland is currently growing at a rate of 3% (2005). This ensures that maritime growth will at least follow this figure. The Finnish economy exports electrical appliances as their main product group (~€7 billion). Products of the highly competitive electronics and IT industry are shipped worldwide. Paper and Paper Products are the second most important product group (~€3.8 billion). The geographical location of the country provides a lot of resources in this regard and therefore the basis for the industry. Pulp, plastics, iron and steel, machinery, engineering products and vehicles are also among the main products.

Chart 4-22: Exported Values in € from Finland to Countries of the NSR/BSR in 2005 (12 Largest HS2 Product Groups)



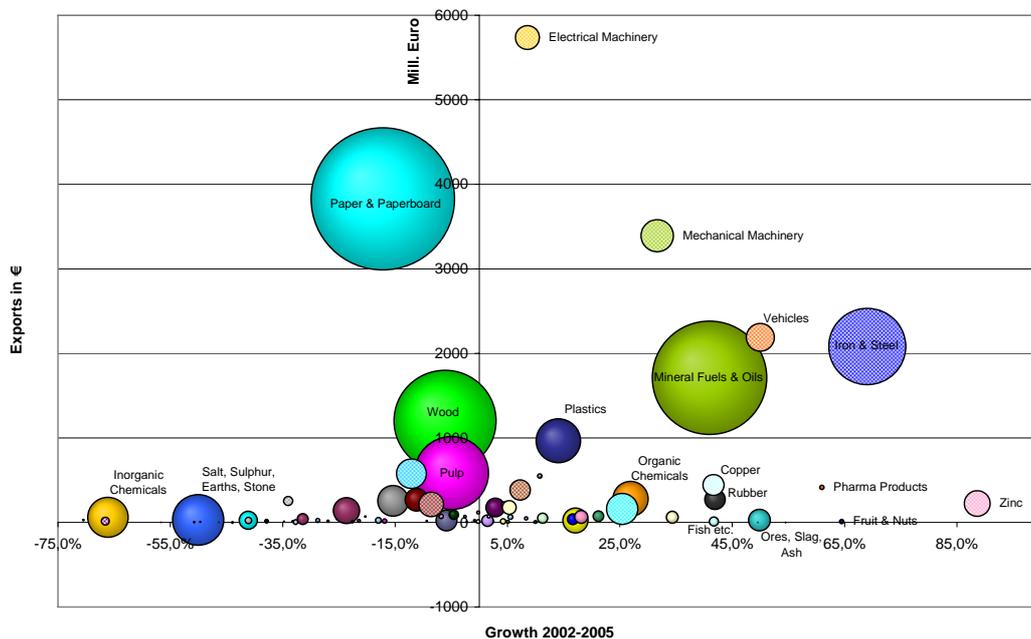
Exported amounts in terms of tons are dominated by paper and paper products (~5.8 million tons). Related products like wood (~3.0 million tons) and pulp (~1.5 million tons) follow. Mineral fuels are turned over in large amounts as well (~3.6 million tons).

Chart 4-23: Exported Values in t. from Finland to Countries of the NSR/BSR in 2005 (12 Largest HS2 Product Groups)



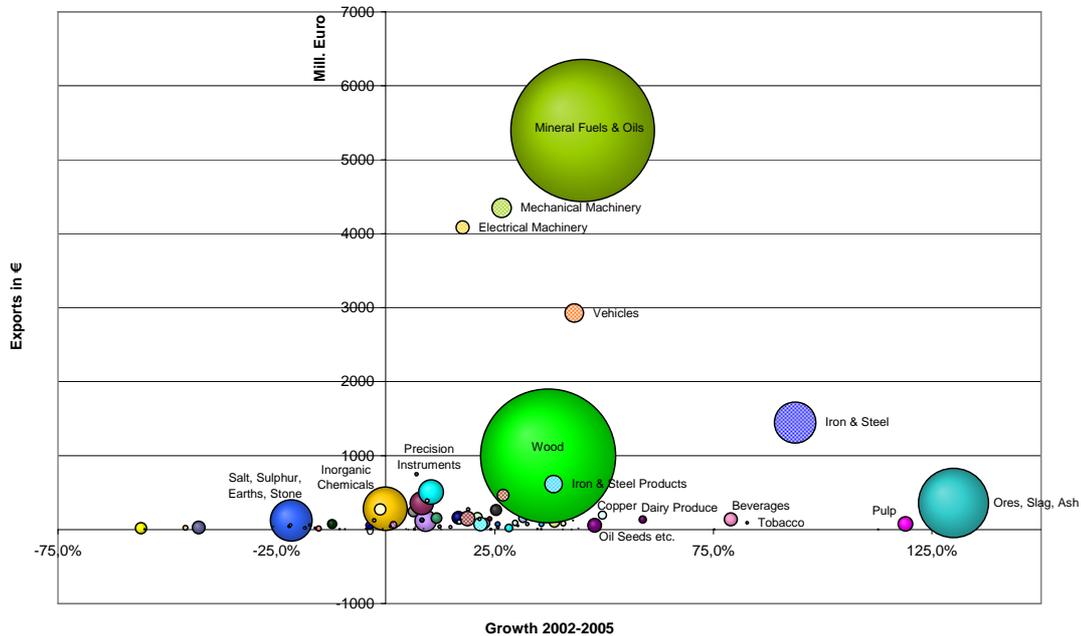
When looking at the growth figures for imported and exported goods for the last few years, one arrives at a differentiated picture. Although paper and paper products dominate the export trade of Finland, they have declined over the last four years. This is also true for the related product groups, wood and pulp. On the other hand high value products like electrical and mechanical machinery, vehicles and pharmaceutical products are on the growth path as are some bulk commodities like mineral oil.

Chart 4-24: Finland Exports, Growth 2002-2005 in mil. €. Size = Exports in mil. t. (Eurostat 2006)



Concerning imports, the Finish economy exhibits a growing importance of high value goods as machinery and vehicles are growing in value, amount and share of total imports.

Chart 4-25: Finland Imports, Growth 2002-2005 in mil. € Size = Imports in mil. t. (Eurostat 2006)



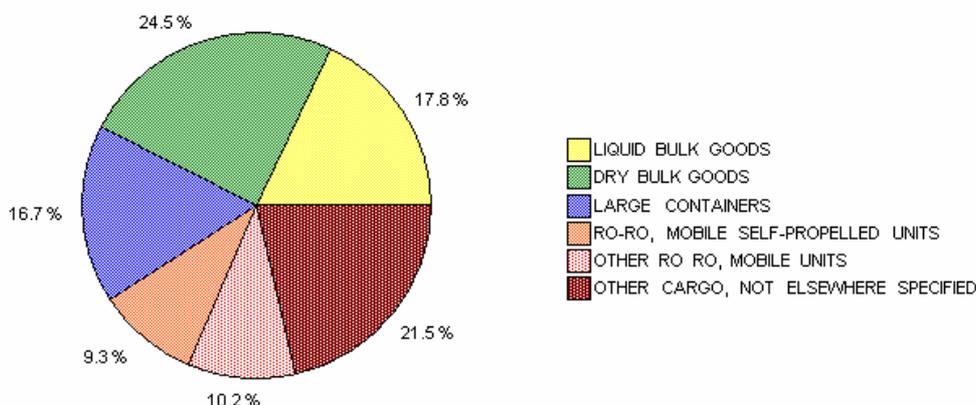
The structure of transports relies heavily on seaborne traffic due to the geographical location of the country. Frequent connections to all countries bordering the Baltic Sea Region and beyond are established.

Table 4-7: Frequency of port calls in country by vessel (Liner Services) coming from Finland

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	35 Weekly	Lithuania	3 weekly
Denmark	11 Monthly	Netherlands	15 monthly
Denmark	16 Weekly	Netherlands	20 weekly
Denmark	12 Yearly	Norway	24 monthly
Estonia	5 Daily	Norway	8 weekly
Estonia	14 monthly	Poland	17 weekly
Estonia	24 Weekly	Russia	13 weekly
Finland	28 monthly	Sweden	11 daily
Finland	52 Weekly	Sweden	27 monthly
Germany	24 monthly	Sweden	22 weekly
Germany	81 Weekly	UK	14 monthly
Latvia	4 Weekly	UK	36 weekly

The transported goods via the Finish ports are almost evenly divided into the broad categories of liquid bulk, dry bulk, containers and RoRo units.

Chart 4-26: Finland - International intra-EU-25 seaborne transport of goods: share by type of cargo, 2004 (Main ports) (Eurostat 2005a)



4.2.5 Germany

Germany's technologically powerful economy - the fifth largest in the world - has become one of the slowest growing economies in the EU. This has only slightly changed for the better in 2006. Growth in 2001-03 fell short of 1%, rising to 1.7% in 2004 before falling back to 0.9% in 2005. Corporate restructuring and growing capital markets are setting the foundation for Germany to meet the challenges of globalization and European economic integration.

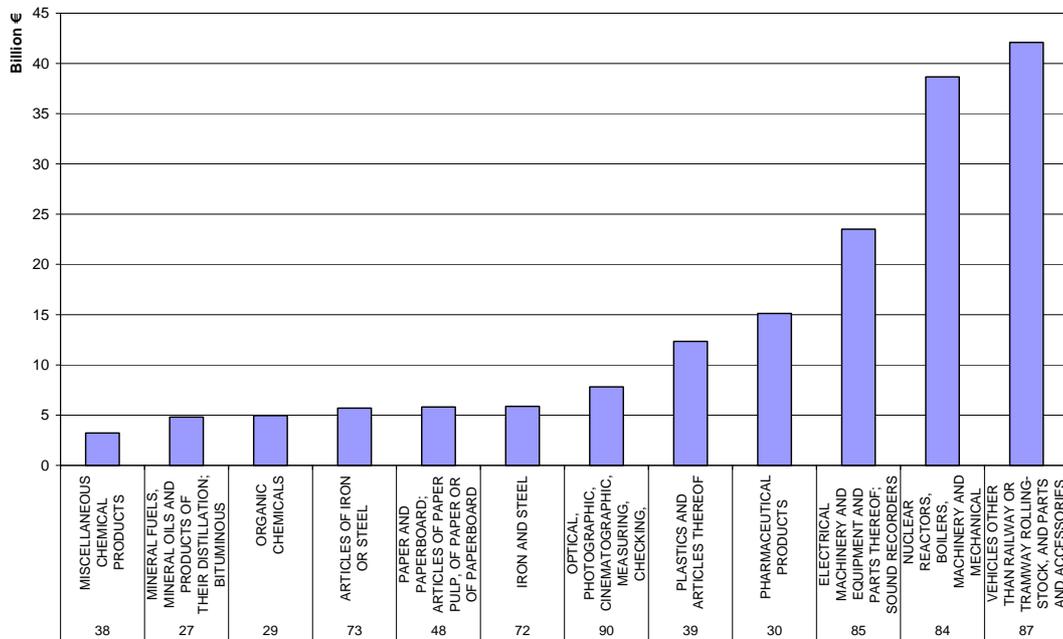
Germany - Facts	
GDP (purchasing power parity):	€1.83 trillion (2005 est.)
GDP (official exchange rate):	€2.01 trillion (2005 est.)
GDP - real growth rate:	0.9% (2005 est.)
GDP - per capita (PPP):	€22,187 (2005 est.)
Agriculture - products:	potatoes, wheat, barley, sugar beets, fruit, cabbages; cattle, pigs, poultry
Industries:	among the world's largest and most technologically advanced producers of iron, steel, coal, cement, chemicals, machinery, vehicles, machine tools, electronics, food and beverages, shipbuilding, textiles
Industrial production growth rate:	2.9% (2005 est.)
Exports:	€748.9 billion (2005 est.)
Exports - commodities:	machinery, vehicles, chemicals, metals and manufactures, foodstuffs, textiles
Exports - partners:	France 10.2%, US 8.8%, UK 7.9%, Italy 6.9%, Netherlands 6.1%, Belgium 5.6%, Austria 5.4%, Spain 5.1% (2005)
Imports:	€90.4 billion (2005 est.)
Imports - commodities:	machinery, vehicles, chemicals, foodstuffs, textiles, metals
Imports - partners:	France 8.7%, Netherlands 8.5%, US 6.6%, China 6.4%, UK 6.3%, Italy 5.7%, Belgium 5%, Austria 4% (2005)

As in most other large economies, Germany's industrial sector has declined in favour of the service sector. Germany is among the world's largest and most advanced producers of iron, steel, cement, chemicals, machinery, motor vehicles, machine tools, electronics and ships. Major German car manufacturers and huge international German based corporations rank among the world's largest firms. The steel & iron industry and the chemical industry remain the backbone of the German basic industry.

The centre of these industries is, however, outside the Baltic Sea Region, in Southern Germany and in North-Rhine Westphalia. Hamburg and Bremen are major port cities which also have relevant producing companies in their hinterland. Berlin, as the federal capital of Germany, is evidently one of the most important economic regions.

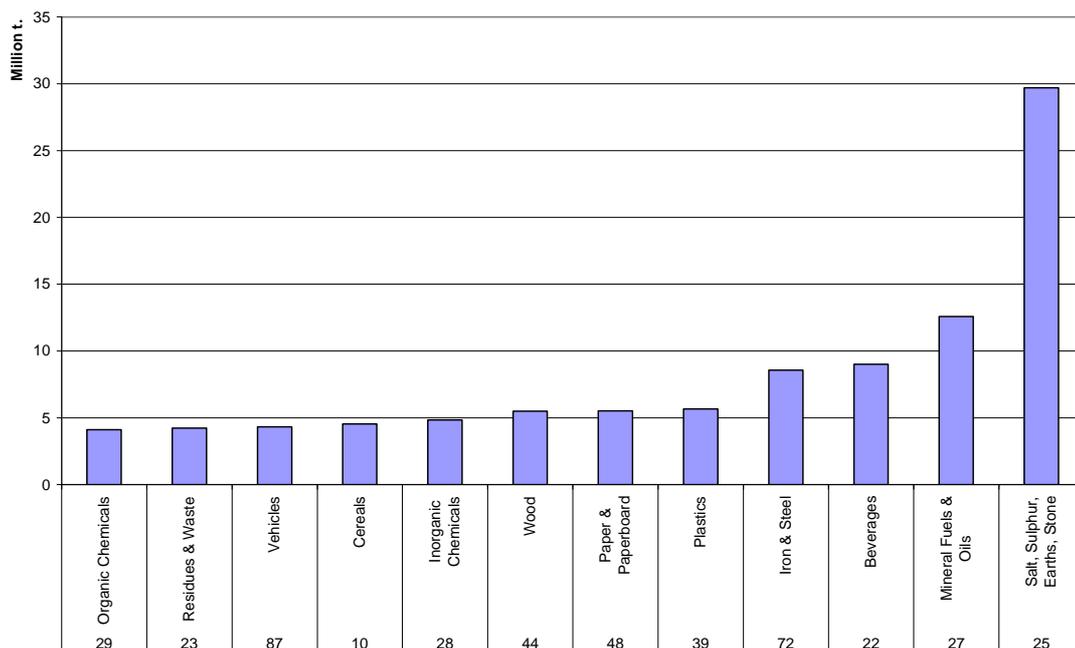
As one of the main car producing companies, vehicles are the major export product group. Vehicles and related parts worth 42 billion € were exported in 2005. That is more than the turnover of the Baltic States. Machinery (~€38 billion), electrical appliances (~€23 billion), pharmaceutical products (~€15 billion) are also exported in large amounts in terms of value.

Chart 4-27: Exported Values in € from Germany to Countries of the NSR/BSR in 2005 (12 Largest HS2 Product Groups)



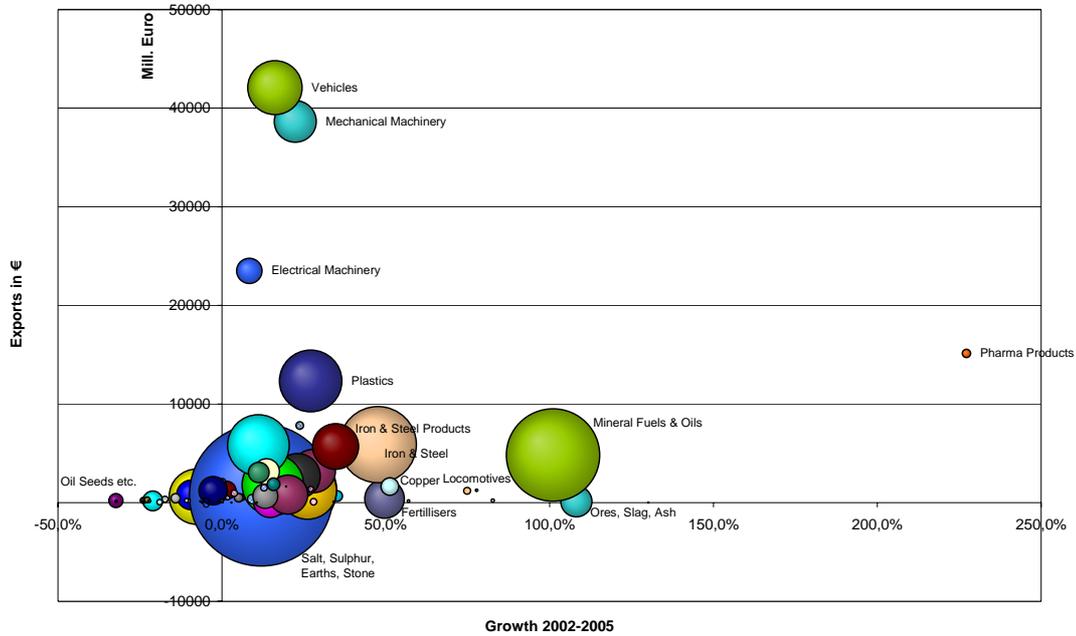
In terms of exported tons, building materials dominate. Roughly 300 million tons were exported in 2005. Of importance are also mineral fuels (~12.5 million tons), beverages (~9 million tons) and iron and steel (~8 million tons).

Chart 4-28: Exported Values in t. from Germany to Countries of the NSR/BSR in 2005 (12 Largest HS2 Product Groups)



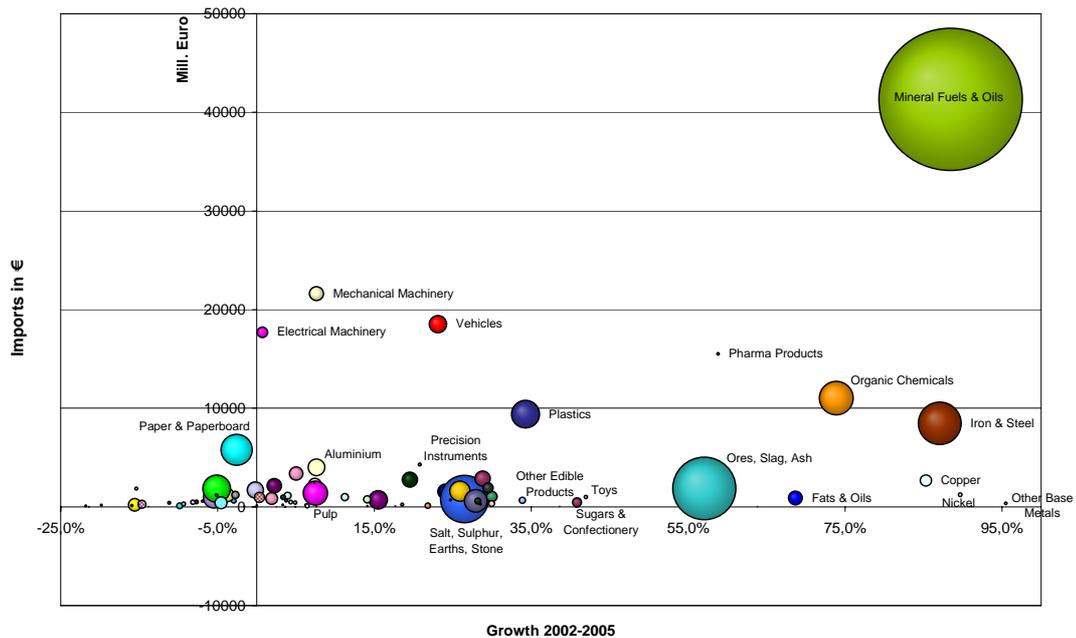
Growing product groups are especially pharmaceutical products that have experienced tremendous growth in exports to northern European countries between 2002 and 2005. The highest value potential is exhibited by the categories vehicles, mechanical machinery and electrical machinery.

Chart 4-29: Germany Exports, Growth 2002-2005 in mil. €. Size = Exports in mil. t. (Eurostat 2006)



Imports are dominated by mineral fuels. They show the highest growth, highest value and largest amount in tons. Potential areas for further value addition while importing are the mentioned categories vehicles, mechanical machinery, electrical machinery and pharmaceutical products.

Chart 4-30: Germany Imports, Growth 2002-2005 in mil. €. Size = Imports in mil. t. (Eurostat 2006)



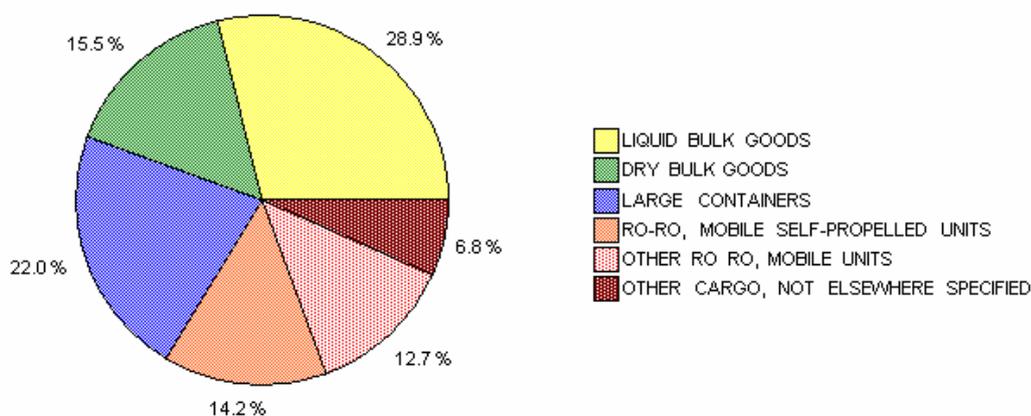
As a traditional country for transit of goods flows, Germany is largely frequented by road and rail transport. However, seaborne traffic is of great importance for connections to Scandinavia, the Baltic States, Russia and overseas. Table 4-8 provides an overview of the frequency of port calls by country of vessels arriving from Germany.

Table 4-8: Frequency of port calls in country by vessel (Liner Services) coming from Germany

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	1 daily	Netherlands	21 monthly
Belgium	28 monthly	Netherlands	20 weekly
Belgium	18 weekly	Norway	1 daily
Denmark	10 daily	Norway	16 monthly
Denmark	12 monthly	Norway	147 weekly
Denmark	13 weekly	Poland	2 monthly
Estonia	2 monthly	Poland	36 weekly
Estonia	24 weekly	Russia	6 monthly
Finland	2 daily	Russia	41 weekly
Finland	18 monthly	Sweden	18 daily
Finland	118 weekly	Sweden	12 monthly
Latvia	3 monthly	Sweden	80 weekly
Latvia	24 weekly	UK	16 monthly
Lithuania	27 weekly	UK	27 weekly

The transported goods from Germany to other northern European countries via ports are rather differentiated. More than 40% are bulk commodities, 22% container traffic and about 27% RoRo units.

Chart 4-31: Germany - International intra-EU-25 seaborne transport of goods: share by type of cargo, 2004 (Main ports) (Eurostat 2005a)



4.2.6 Latvia

Latvia's economy is still in transition and has just recovered from the 1998 Russian financial crisis. This is partly due to a gradual reorientation of exports towards EU countries which lessens Latvia's dependency on Russian trade activities. EU membership since 2004 has proved to be an important step towards economic prosperity.

The economies of Estonia, Latvia and Lithuania have experienced profound structural changes during the last decade. A prominent feature is the rapid growth of the private service sector which today accounts for over half of total employment. In comparison with its neighbours, Latvia has an undersized industrial sector. During the Soviet era, Latvia had the most

diversified industrial base among these countries but much of it was not competitive under the new economic circumstances since the early 1990s.

Latvia - Facts	
GDP (purchasing power parity):	€23.19 billion (2005 est.)
GDP (official exchange rate):	€10.64 billion (2005 est.)
GDP - real growth rate:	10.2% (2005 est.)
GDP - per capita (PPP):	€10,098 (2005 est.)
Agriculture - products:	grain, sugar beets, potatoes, vegetables; beef, pork, milk, eggs; fish
Industries:	buses, vans, street and railroad cars; synthetic fibres, agricultural machinery, fertilizers, washing machines, radios, electronics, pharmaceuticals, processed foods, textiles; note - dependent on imports for energy and raw materials
Industrial production growth rate:	5.6% (2005 est.)
Exports:	€3.58 billion (2005 est.)
Exports - commodities:	wood and wood products, machinery and equipment, metals, textiles, foodstuffs
Exports – partners:	Lithuania 11%, Estonia 10.8%, Germany 10.2%, UK 10.2%, Russia 7.9%, Sweden 7.8%, Denmark 5.3%, Poland 5.3% (2005)
Imports:	€6.04 billion (2005)
Imports - commodities:	machinery and equipment, chemicals, fuels, vehicles
Imports - partners:	Germany 13.9%, Lithuania 13.6%, Russia 8.6%, Estonia 7.9%, Poland 6.4%, Finland 5.9%, Belarus 5.8%, Sweden 5.1% (2005)

Latvia has about 1/3 of its inhabitants in its capital, Riga; the other cities are small. The economic importance of the capital widely out-ranks other locations. However, the harbour cities of Liepaja and Ventspils are of importance.

Latvia plays an important role on a European scale. Although it is a small country, geographically, it is located between the big markets of the Russian Federation and the EU. Latvia is the biggest maritime transport country among the Baltic countries. It transports almost half the goods on the eastern coast of the Baltic Sea. Growth at its ports has therefore been fast, totalling over 80% within a five year period (1999-2004).

Transport via Latvian ports depends largely on transit, which accounts for over 90% of goods transport in the country's most important ports. Total port throughput in Latvia amounted to 47 million tons in 1999 and has continuously growing with high rates since then. Of this, 47% are estimated to be intra-regional.¹⁹

The Latvian economy has a main focus on wood and articles of wood. Due to its geographical location, the exported value of wood products (~€590 million) and the exported amount in tons (~6.5 million tons) are highest. Even though the total amount is much lower than wood exports from Finland or Sweden, it shows the importance of the industry for the country. Parts of the turnover might also be due to the close relations to Russia and transshipment activities through Latvia. This is especially true for the exported volumes of mineral fuels and oils via the oil ports of Latvia (~€140 million, ~1.7 million tons). Other product categories are of less importance like fertilizers, cereals, clothing and iron & steel.

¹⁹ SAI 2000

Chart 4-32: Exported Values in € from Latvia to Countries of the NSR/BSR in 2005 (12 Largest HS2 Product Groups)

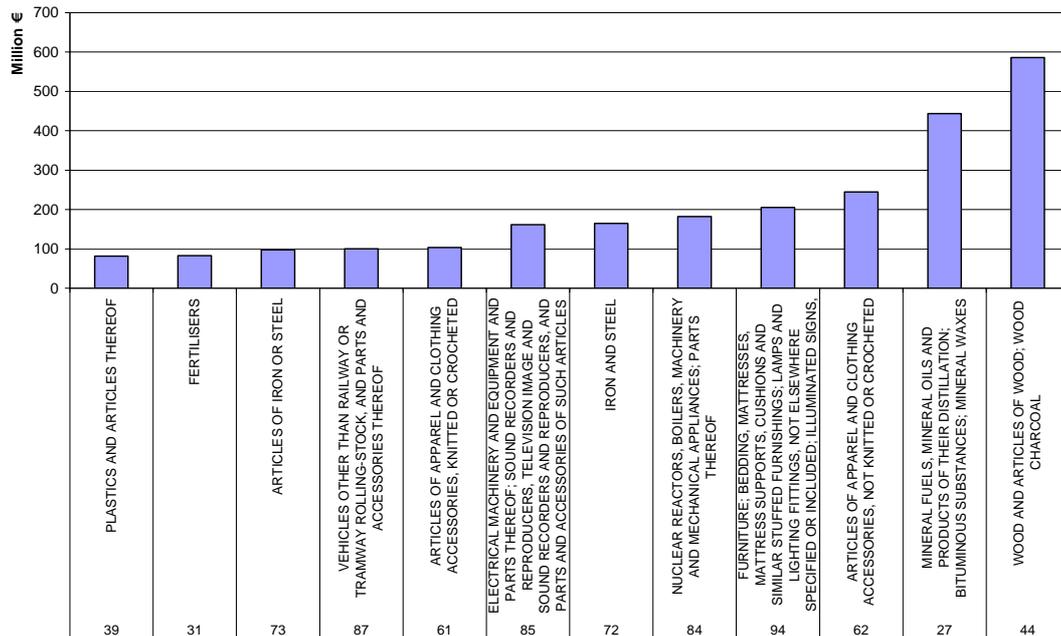
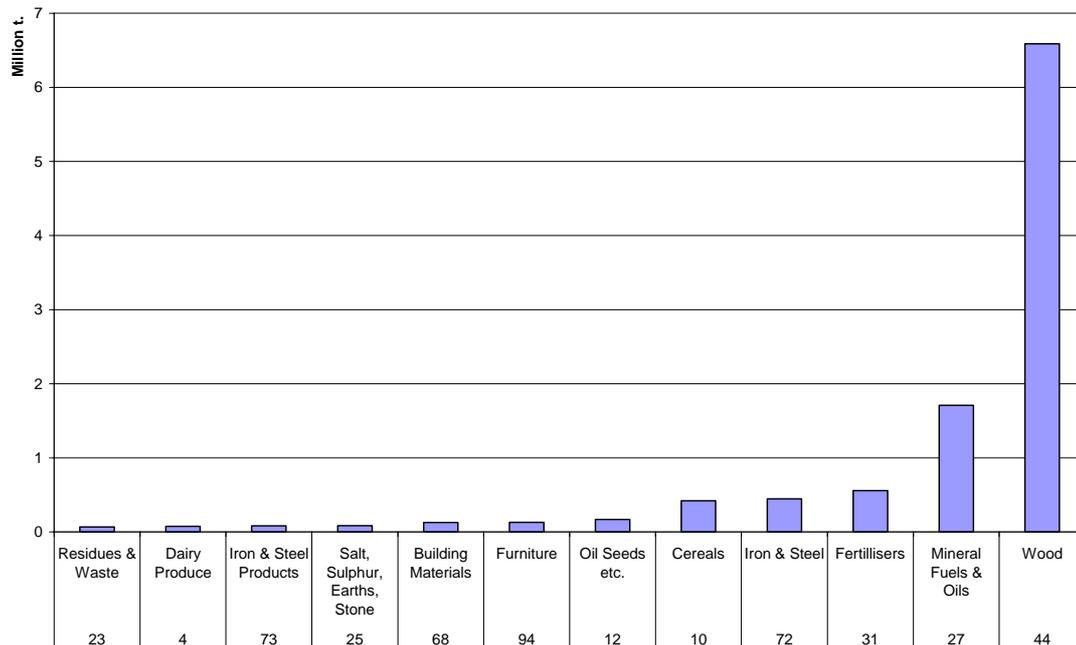
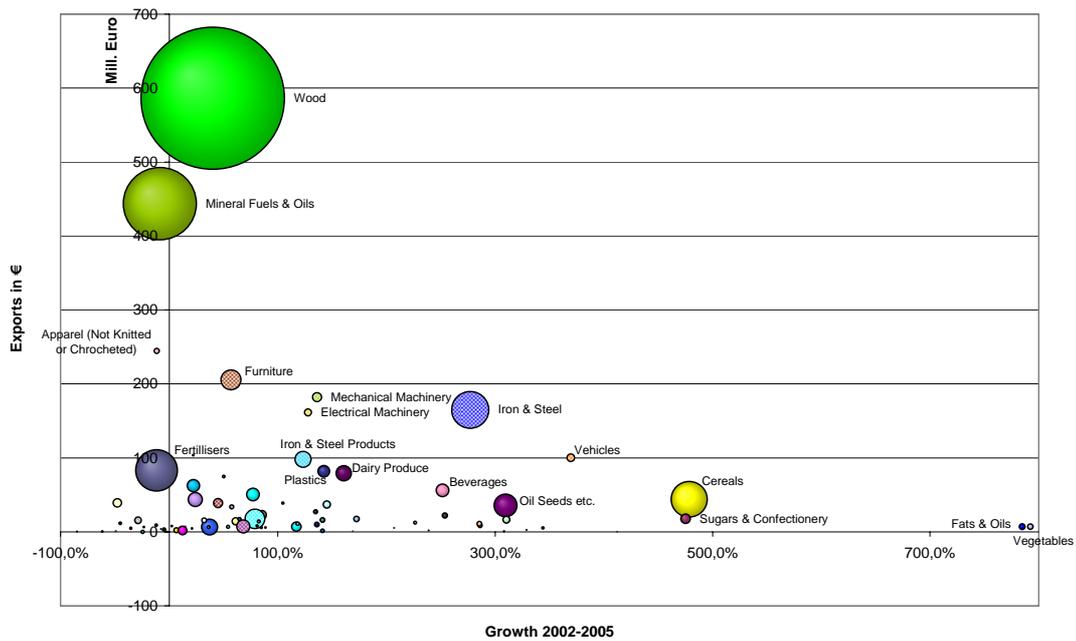


Chart 4-33: Exported Values in t. from Latvia to Countries of the NSR/BSR in 2005 (12 Largest HS2 Product Groups)



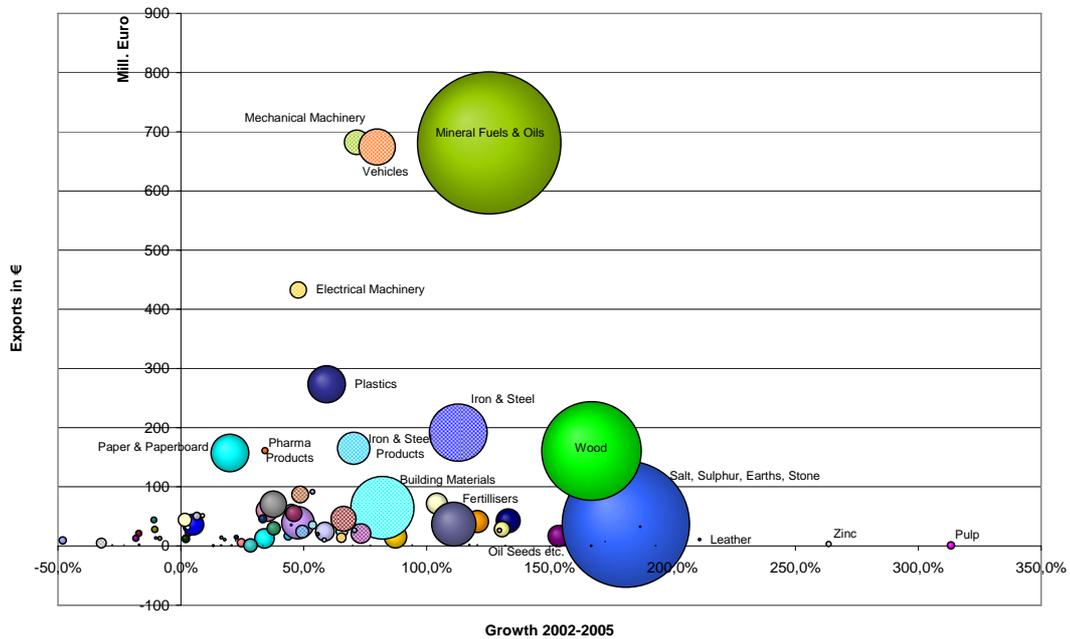
The growth chart presents no different picture than the pure export figures. Wood products are stable in their development. Mineral fuels are slightly on the decline which is due to Russian efforts in building their own oil ports in the Saint Petersburg area. High value products like machinery and vehicles are undergoing large growth rates, while these and other bulk commodities need to be treated with relative respect as fairly low amounts are shipped and tremendous growth developments only represent rather small additional amounts.

Chart 4-34: Latvia Exports, Growth 2002-2005 in mil. € Size = Exports in mil. t. (Eurostat 2006)



Latvian imports is dominated by Russian oil, wood and building materials. Growth rates are rather high as the Latvian economy exhibits a continual growth beyond the European average.

Chart 4-35: Latvia Imports, Growth 2002-2005 in mil. € Size = Imports in mil. t. (Eurostat 2006)



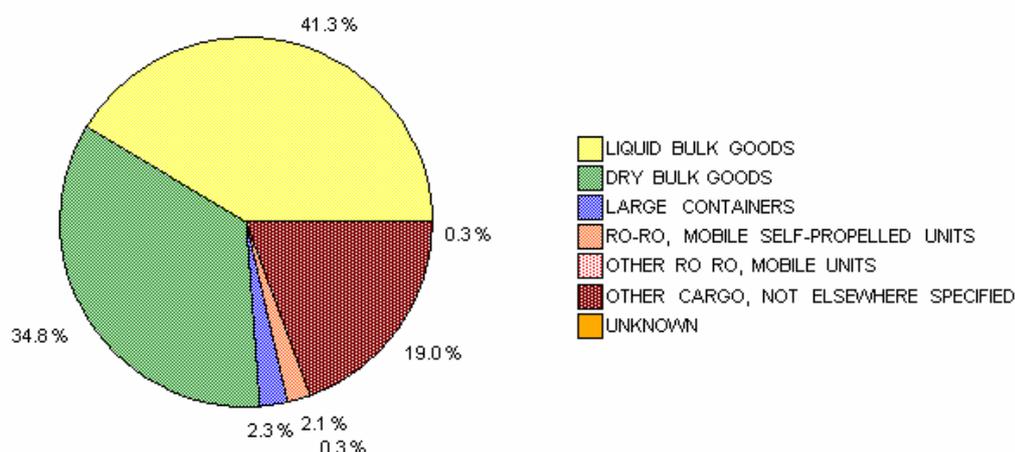
The transport traffic in Latvia is structured in landside connections via rail and road to Russia, Estonia and Lithuania and a growing importance of seaside connections, mainly to Germany, Sweden, Lithuania and the UK. Table 4-9 provides an overview of the frequency of port calls in other countries by vessels arriving from Latvia.

Table 4-9: Frequency of port calls in country by vessel (Liner Services) coming from Latvia

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	4 monthly	Poland	2 monthly
Belgium	2 weekly	Poland	1 weekly
Estonia	4 weekly	Russia	10 monthly
Finland	4 weekly	Russia	4 weekly
Germany	27 weekly	Sweden	1 daily
Lithuania	8 monthly	Sweden	9 weekly
Lithuania	6 weekly	UK	12 monthly
Netherlands	4 weekly	UK	8 weekly
Norway	1 weekly		

The seaborne transport is largely divided into the two main commodities dry bulk (e.g. wood articles) and liquid bulk (e.g. mineral fuels). Other cargo – besides some container and RoRo traffic – can statistically not be disaggregated on this level.

Chart 4-36: Latvia - International intra-EU-25 seaborne transport of goods: share by type of cargo, 2004 (Main ports) (Eurostat 2005a)



4.2.7 Lithuania

The economy of Lithuania is conducting the most trade with Russia. But trade has been increasingly oriented towards the West which is furthered by the EU membership since 2004. Privatization of the large, state-owned utilities, particularly in the energy sector, is nearing completion and least to a more flexible industrial sector. Overall, more than 80% of enterprises have been privatized. Industries like wood and textile have done well in all the Baltic countries since the mid 1990s. The dependence on Russia is still substantial but is gradually decreasing. However, the transit of goods to and from Russia, Ukraine and Belarus is an important business for the country in general and especially for the port of Klaipeda.²⁰

Lithuania's biggest employers are the textiles and food processing industries and especially the textile industry is also exporting large volumes. For the international trade, transit shipments from and to Russia are of major importance for the country as well as for the other Baltic States. This concerns especially mineral and wood products.

Lithuania's top three cities are equal in size, and the capital, Vilnius, is not as dominant in the country as Tallinn and Riga are in their respective countries. Kaunas is the second most

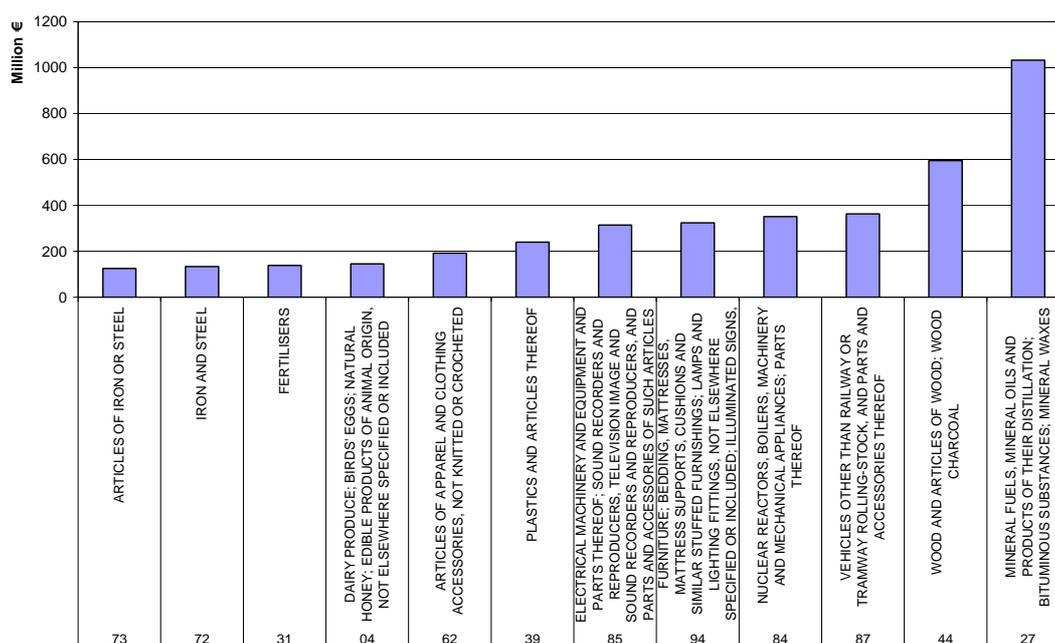
²⁰ SAI 2000

important centre of industry. Klaipeda with its harbour and good inland connections is an important centre of economic activity, particularly for transit cargo.

Lithuania - Facts	
GDP (purchasing power parity):	€36.42 billion (2005 est.)
GDP (official exchange rate):	€17.32 billion (2005 est.)
GDP - real growth rate:	7.5% (2005 est.)
GDP - per capita (PPP):	€10,393 (2005 est.)
Agriculture - products:	grain, potatoes, sugar beets, flax, vegetables; beef, milk, eggs; fish
Industries:	metal-cutting machine tools, electric motors, television sets, refrigerators and freezers, petroleum refining, shipbuilding (small ships), furniture making, textiles, food processing, fertilizers, agricultural machinery, optical equipment, electronic components, computers, amber jewellery
Industrial production growth rate:	7.3% (2005 est.)
Exports:	€8.7 billion (2005 est.)
Exports - commodities:	mineral products 23%, textiles and clothing 16%, machinery and equipment 11%, chemicals 6%, wood and wood products 5%, foodstuffs 5% (2001)
Exports - partners:	Russia 10.4%, Latvia 10.2%, Germany 9.4%, France 7%, Estonia 5.9%, Poland 5.5%, Sweden 5%, US 4.7%, UK 4.7%, Denmark 4.3% (2005)
Imports:	€1.4 billion (2005 est.)
Imports - commodities:	mineral products, machinery and equipment, transport equipment, chemicals, textiles and clothing, metals
Imports - partners:	Russia 27.9%, Germany 15.2%, Poland 8.3% (2005)

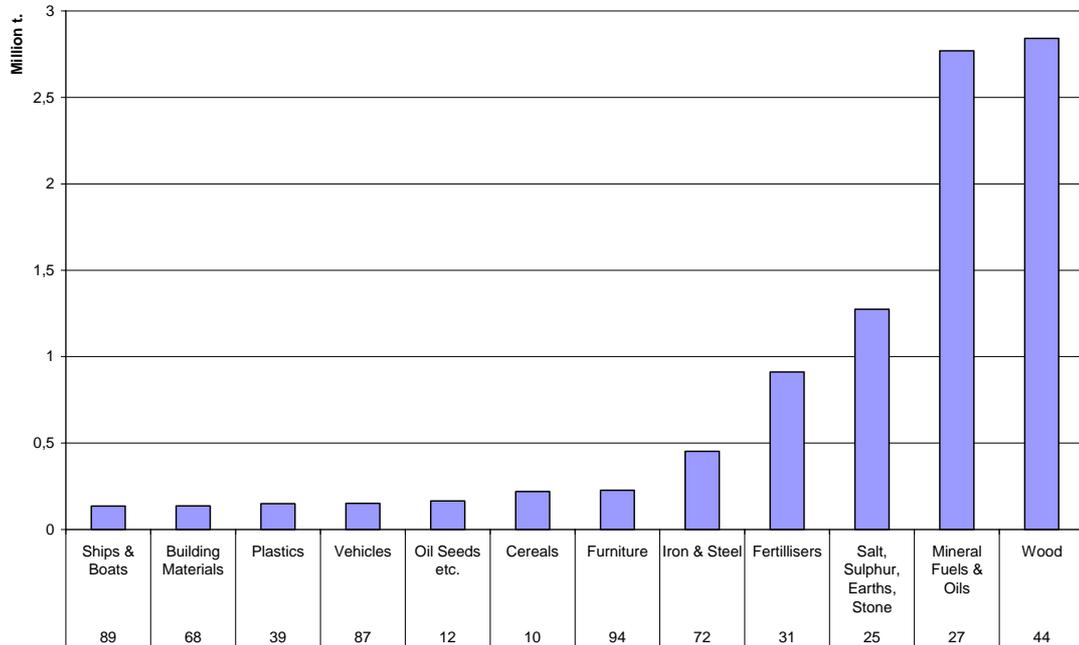
Lithuania is one of the main transshipping countries for Russian oil. Therefore this is the main exported commodity in terms of value (~€1,03 million) and second in terms of amount in tons (~2.7 million tons). Wood products are the second major export category in terms of value (~€600 million) and the main in terms of amount in tons (~2.8 million tons). Following these two major product groups, high value products are growing in importance. Vehicles (~€360 million), mechanical machinery (~€340 million) and electrical appliances (~€300 million) are part of the economical backbone in exports.

Chart 4-37: Exported Values in € from Lithuania to Countries of the NSR/BSR in 2005 (12 Largest HS2 Product Groups)



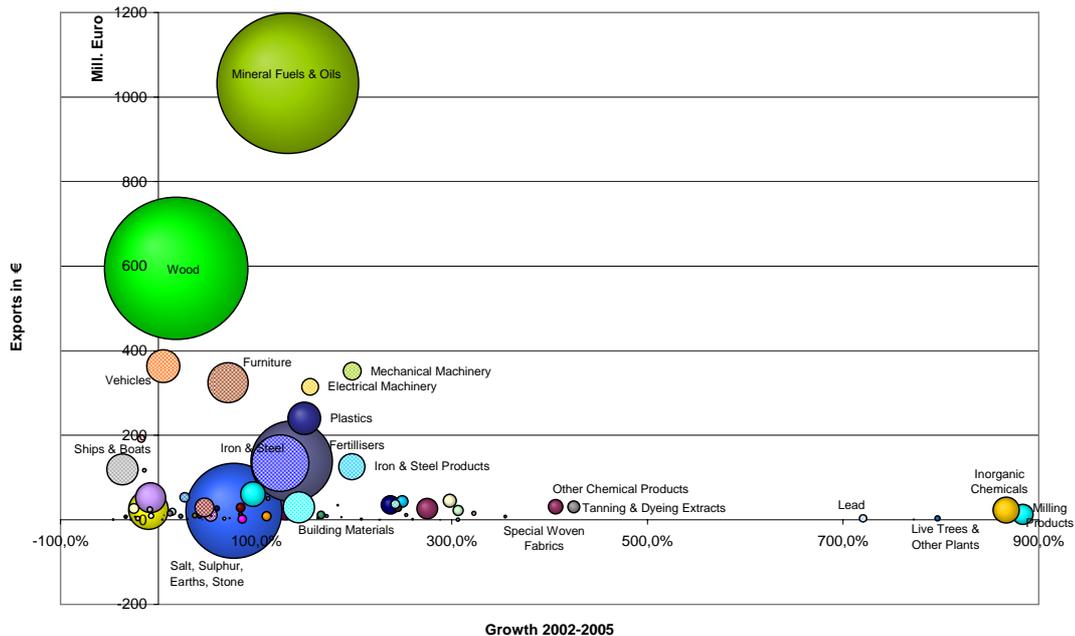
In terms of amount in tons, high value goods are outweighed by bulk commodities like building materials and fertilizers.

Chart 4-38: Exported Values in t. from Lithuania to Countries of the NSR/BSR in 2005 (12 Largest HS2 Product Groups)



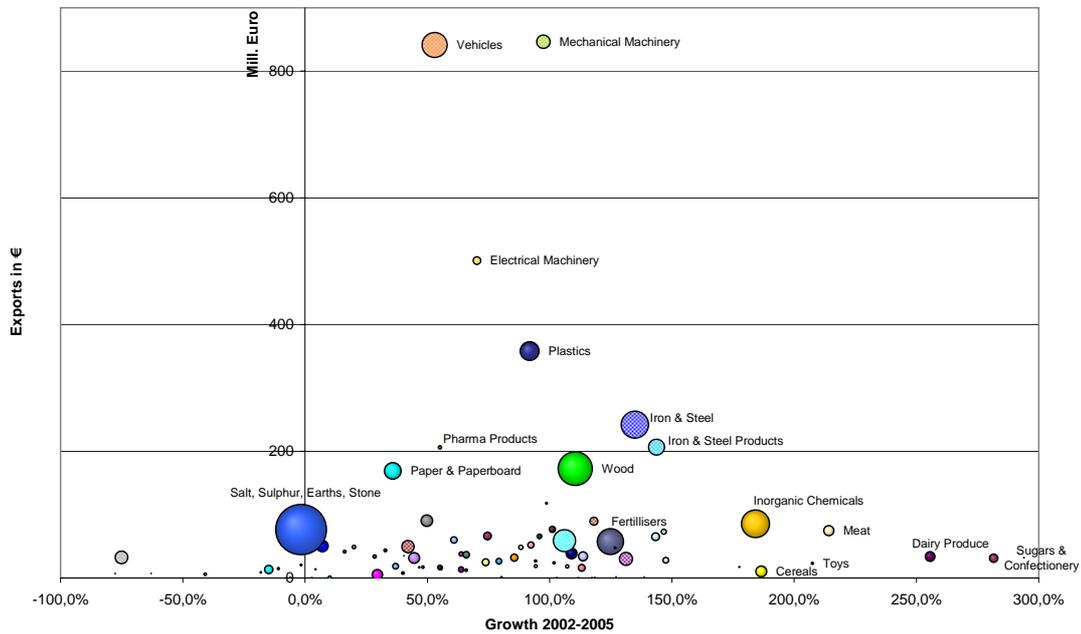
The growth development of Lithuanian exports provides a similar but slightly different picture as that of Latvia. Wood articles are undergoing a stable growth while mineral fuels are still on a higher growth path. The latter is also true for some high value product groups that show potential for future developments in the Lithuanian economy. Especially noticeable are also chemical products.

Chart 4-39: Lithuania Exports, Growth 2002-2005 in mil. € Size = Exports in mil. t. (Eurostat 2006)



Lithuanian imports are developing with high growth rates. Products of high value like vehicles, machinery and pharmaceutical products are imported with substantial growth rates.

Chart 4-40: Lithuania Imports, Growth 2002-2005 in mil. € Size = Imports in mil. t. (Eurostat 2006)



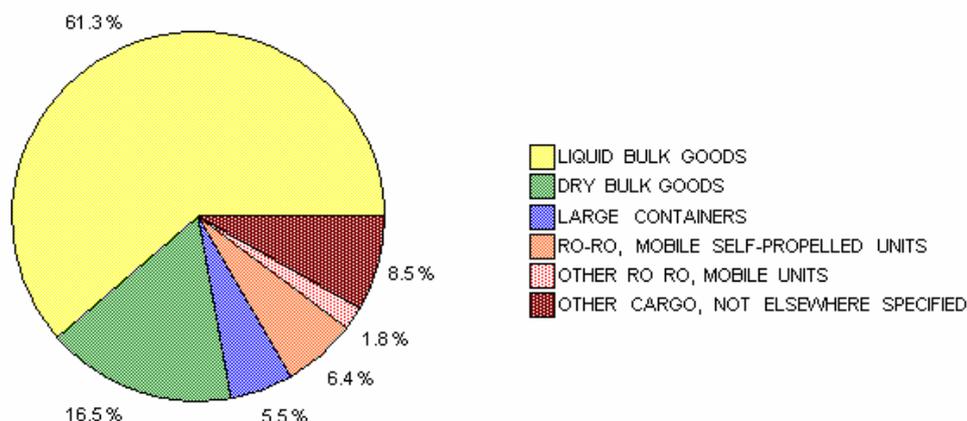
The transport traffic in Lithuania is structured in the landside connections via rail and road to Russia and Latvia and a growing importance of the seaside connections, mainly to Germany, Sweden, Russia and the UK. Table 4-10 provides an overview of the frequency of port calls in other countries by vessels arriving from Latvia.

Table 4-10: Frequency of port calls in country by vessel (Liner Services) coming from Lithuania

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	1 monthly	Norway	5 weekly
Belgium	4 weekly	Poland	1 monthly
Denmark	2 weekly	Poland	5 weekly
Estonia	3 weekly	Russia	4 monthly
Finland	2 weekly	Russia	6 weekly
Germany	24 weekly	Sweden	1 daily
Latvia	2 monthly	Sweden	2 weekly
Latvia	7 weekly	UK	6 monthly
Netherlands	3 weekly	UK	5 weekly

The seaborne transport is largely divided into liquid bulk (e.g. mineral fuels) and the rest.

Chart 4-41: Lithuania - International intra-EU-25 seaborne transport: share by type of cargo, 2004 (Main ports) (Eurostat 2005a)



4.2.8 Netherlands

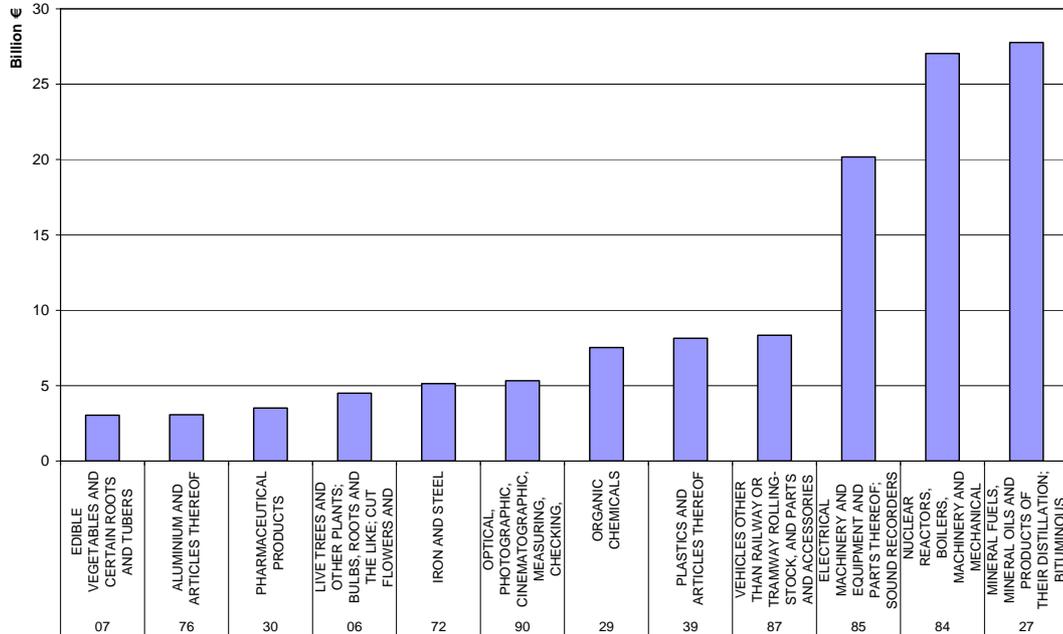
The Netherlands has a prosperous and open economy, which depends heavily on foreign trade. With its centred geographical location it has developed an important role as a European transportation hub. Industrial activity is predominantly in food processing, chemicals, petroleum refining and electrical machinery. A highly mechanized agricultural sector employs no more than 2% of the labour force but provides large surpluses for the food-processing industry and for exports. For these and other advanced developments, the country has become one of the leading European countries for the attraction of FDI.

Netherlands - Facts	
GDP (purchasing power parity):	€367.0 billion (2005 est.)
GDP (official exchange rate):	€128.5 billion (2005 est.)
GDP - real growth rate:	1.5% (2005 est.)
GDP - per capita (PPP):	€22,334 (2005 est.)
Agriculture - products:	grains, potatoes, sugar beets, fruits, vegetables; livestock
Industries:	agro industries, metal and engineering products, electrical machinery and equipment, chemicals, petroleum, construction, microelectronics, fishing
Industrial production growth rate:	-1.4% (2005 est.)
Exports:	€269.1 billion (2005 est.)
Exports - commodities:	machinery and equipment, chemicals, fuels; foodstuffs
Exports - partners:	Germany 24.9%, Belgium 13%, France 9.4%, UK 9.1%, Italy 5.7%, US 4.3%, Spain 4.1% (2005)
Imports:	€240.7 billion (2005 est.)
Imports - commodities:	machinery and transport equipment, chemicals, fuels, foodstuffs, clothing
Imports - partners:	Germany 16.6%, Belgium 9.3%, China 8.8%, US 7.6%, UK 5.8%, France 4.7%, Russia 4.4% (2005)

The geographical location also provides also for hinterland connections to all major economies in the EU and a turnover of goods that is not only for the use of the country itself but largely for transshipment to other regions. This is especially true for the turnover of mineral oils. Rotterdam is the largest oil port in Europe and most of the oil exports of the Netherlands are handled there. Oil is exported in terms of value with ~€27.5 billion and an amount of ~102 million tons.

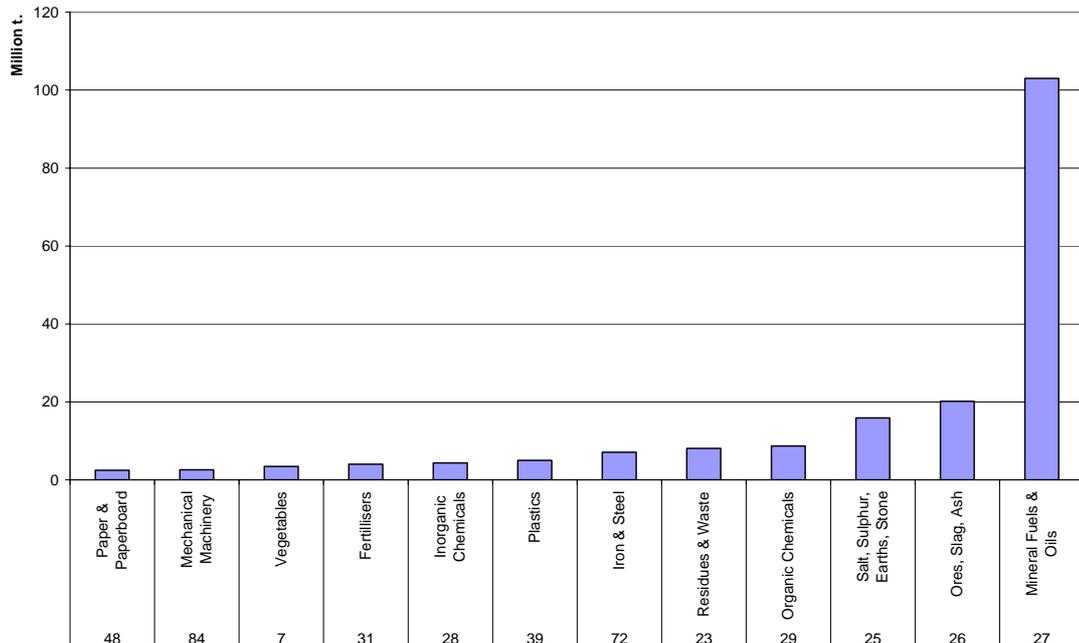
Looking at the value exported, the Netherlands trade a lot in mechanical machinery (~€27 billion), electrical appliances (~€20 billion), vehicles (~€8 billion), plastics (~€7.5 billion) and organic chemicals (~€7 billion).

Chart 4-42: Exported Values in € from the Netherlands to Countries of the NSR/BSR in 2005 (12 Largest HS2 Product Groups)



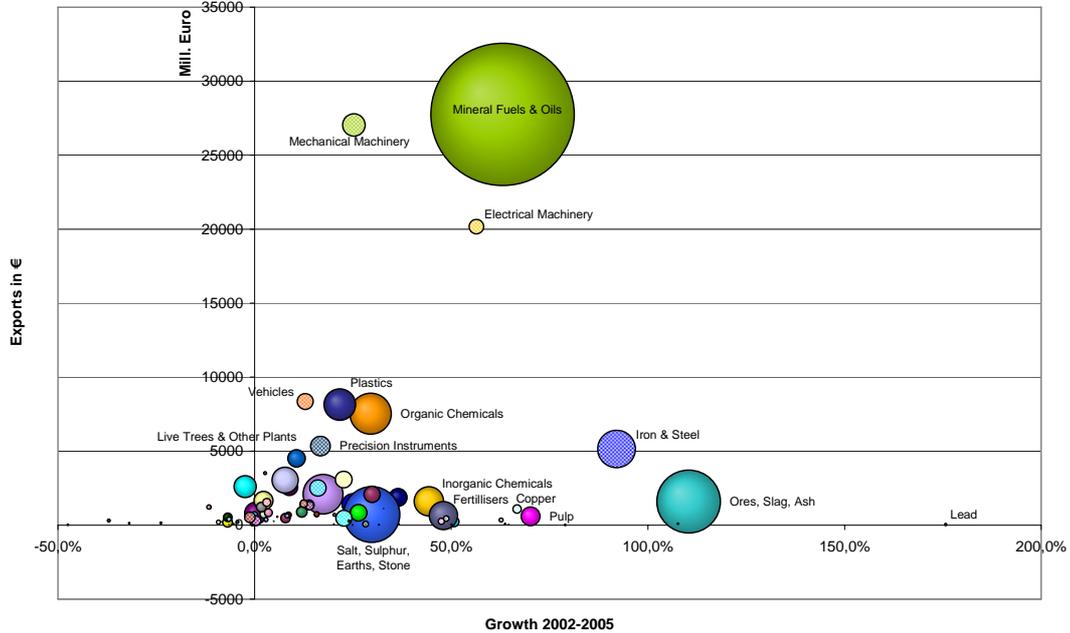
Looking at exported amounts in tons, mineral fuels dominate the trade. Other bulk commodities are of less importance.

Chart 4-43: Exported Values in t. from the Netherlands to Countries of the NSR/BSR in 2005 (12 Largest HS2 Product Groups)



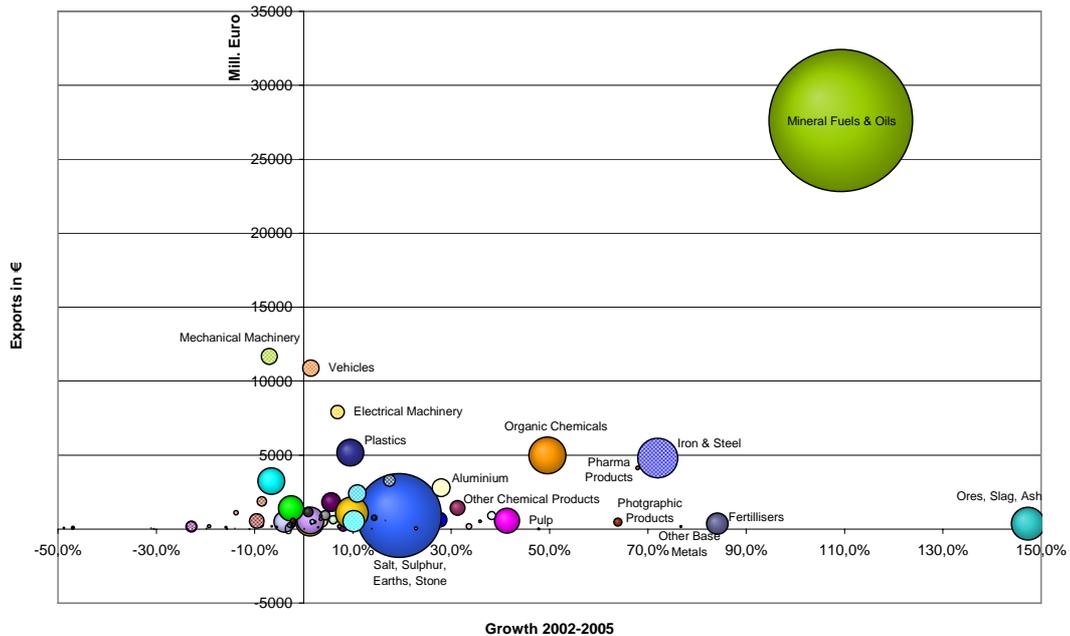
The growth of product groups for exports from the Netherlands shows high growth with some bulk commodities and also some substantial growth within product groups of high value like machinery, vehicles, engineering products and chemicals.

Chart 4-44: Netherlands Exports, Growth 2002-2005 in mil. € Size = Exports in mil. t. (Eurostat 2006)



Imports show high growth in mineral fuels and some bulk commodities. Vehicles remain stable, mechanical machinery is on the decline while electrical machinery is slightly increasing. Furthermore, pharmaceutical and chemical products are increasing tremendously. This shows the growing importance of these product groups in European trade.

Chart 4-45: Netherlands Imports, Growth 2002-2005 in mil. € Size = Imports in mil. t. (Eurostat 2006)



The structure of transport flows from and to the Netherlands is multi modal. Due to its location at the North sea and its connections to Germany and Belgium, the Netherlands

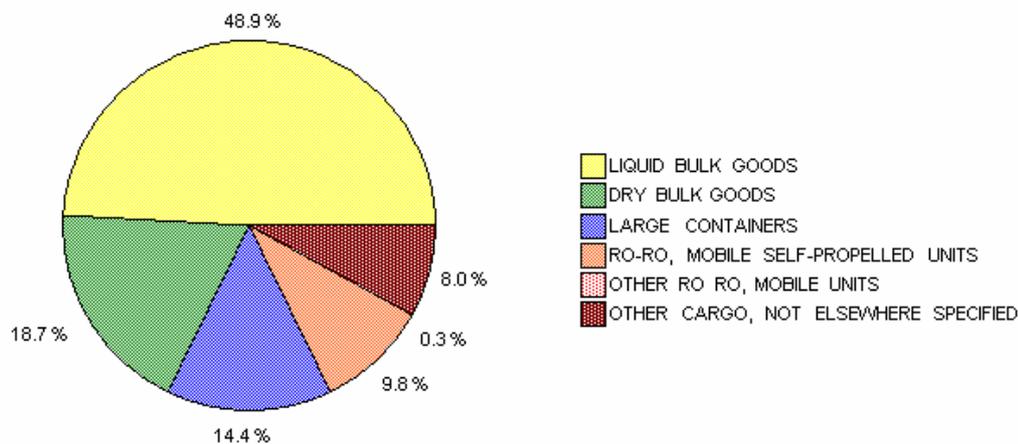
provide a geographically optimal environment for trading goods from the surrounding regions in a global context. Strong maritime connections exist to all neighbouring countries and the BSR.

Table 4-11: Frequency of port calls in country by vessel (Liner Services) coming from Netherlands

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	31 monthly	Norway	41 monthly
Belgium	40 weekly	Norway	28 weekly
Denmark	13 monthly	Poland	12 monthly
Denmark	7 weekly	Poland	5 weekly
Estonia	2 monthly	Russia	2 monthly
Estonia	5 weekly	Russia	19 weekly
Finland	16 monthly	Sweden	12 monthly
Finland	20 weekly	Sweden	25 weekly
Germany	49 monthly	UK	5 daily
Germany	33 weekly	UK	51 monthly
Latvia	2 weekly	UK	71 weekly
Lithuania	5 weekly		

Due to the large imports and exports of mineral oils, its share is almost half the seaborne transport trade (see Chart 4-46).

Chart 4-46: Netherlands - International intra-EU-25 seaborne transport: share by type of cargo, 2004 (Main ports) (Eurostat 2005a)



4.2.9 Norway

Norway has a prosperous capitalistic economy with a combination of free market activity and government intervention. The government controls key areas such as the vital petroleum sector (through large-scale state enterprises). The country has a rich amount of natural resources - petroleum, hydropower, fish, forests, and minerals - and is highly dependent on its oil production and international oil prices, with oil and gas accounting for one-third of exports. Only Saudi Arabia and Russia export more oil than Norway. Norway decided to stay out of the EU during a referendum in November 1994. Nevertheless, it contributes to the EU budget and has gained advantage from European economic integration. After low growth of 1% in 2002 and 0.5% in 2003, GDP growth rose up to 3.3% in 2004 and to 3.7% in 2005.

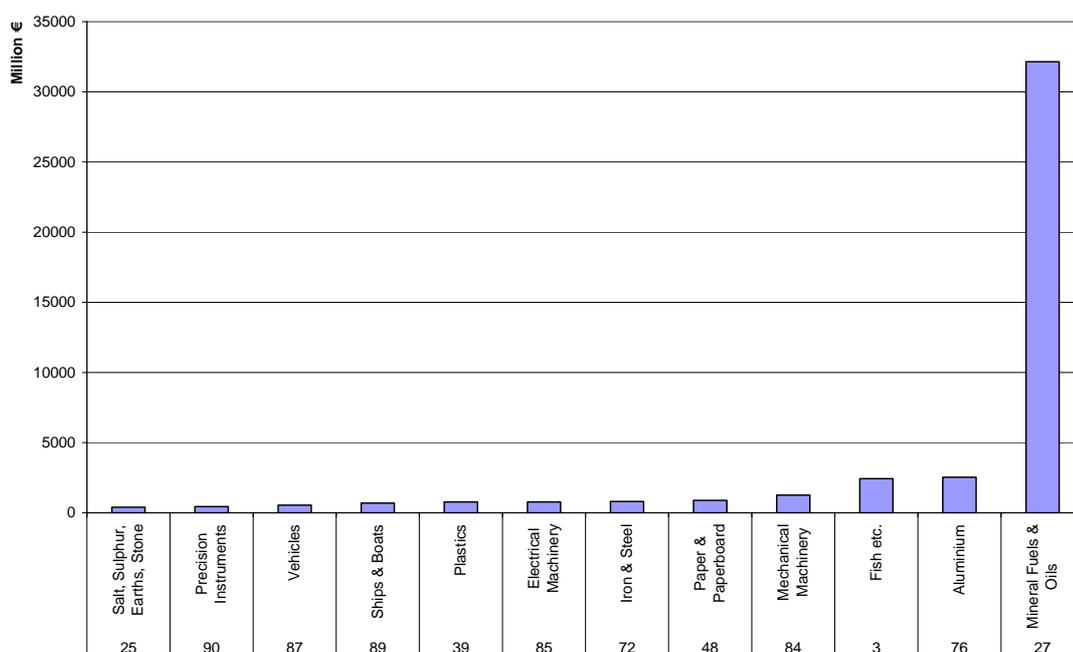
Norway's rich natural resources have led to the development of important related industries such as that of petroleum products, the hydropower industry, fishing, forestry, and minerals. It is also an important shipbuilding country within the offshore sector. Oil and gas industry and

machinery production are the largest industry sectors in Norway. They are concentrated on the west coast as is the fishing/sea farming industry. The latter forms an important part of the Norwegian export industry. The forest industry is concentrated in the central and eastern parts of the country. The biggest service sector concentration is found in the Oslo area.

Norway - Facts	
GDP (purchasing power parity):	€144.8 billion (2005 est.)
GDP (official exchange rate):	€182.0 billion (2005 est.)
GDP - real growth rate:	4% (2005 est.)
GDP - per capita (PPP):	€1,548 (2005 est.)
Agriculture - products:	barley, wheat, potatoes; pork, beef, veal, milk; fish
Industries:	petroleum and gas, food processing, shipbuilding, pulp and paper products, metals, chemicals, timber, mining, textiles, fishing
Industrial production growth rate:	-0.5% (2005 est.)
Exports:	€81.97 billion (2005 est.)
Exports - commodities:	petroleum and petroleum products, machinery and equipment, metals, chemicals, ships, fish
Exports - partners:	UK 25.5%, Germany 12.6%, Netherlands 9.9%, France 9.1%, US 6.7%, Sweden 6.5% (2005)
Imports:	€42.84 billion (2005 est.)
Imports - commodities:	machinery and equipment, chemicals, metals, foodstuffs
Imports - partners:	Sweden 14.6%, Germany 13.6%, Denmark 7.3%, UK 6.8%, China 5.5%, US 5%, France 4% (2005)

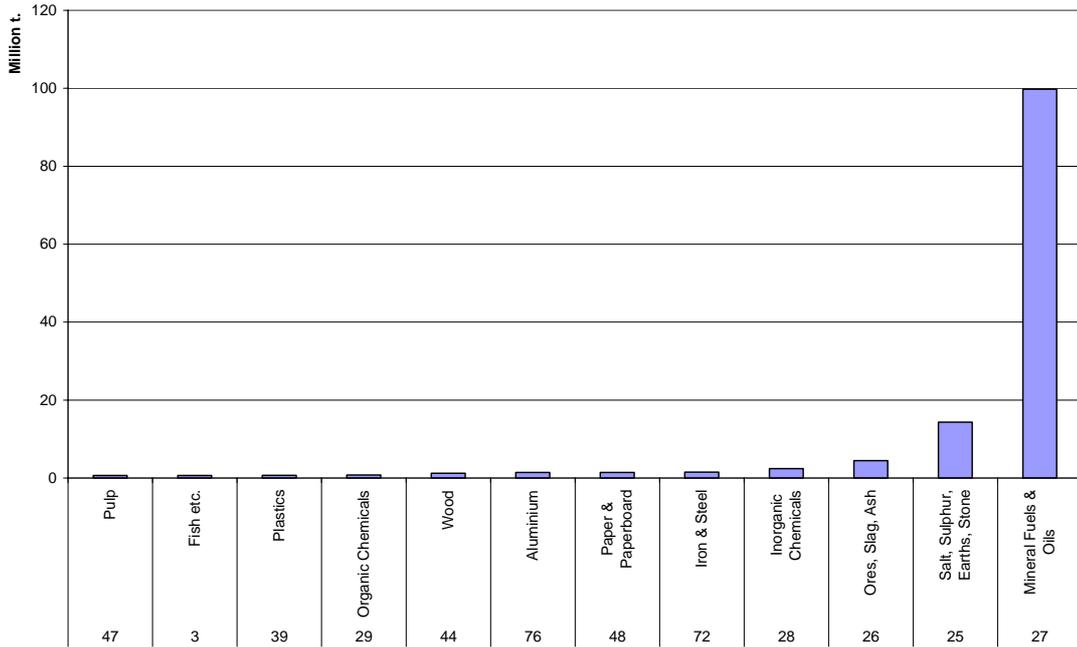
In terms of exported value, the countries trade is dominated by mineral oil products (~€32 billion). All other product groups range less than €3 billion. Of the others, aluminium (~€2.5 billion) and fishing products (~€2.2 billion) are mostly traded. High value products are machinery, electronics, ships & boats and vehicles (all between €0.5 and €1 billion).

Chart 4-47: Exported Values in € from Norway to Countries of the NSR/BSR in 2005 (12 Largest HS2 Product Groups)



Exported values in tons are also dominated by mineral oil products (~100 million tons). Building materials are the second major export group with ~15 million tons. All other products are much less important. Some is from the forest, the chemical and metal industry.

Chart 4-48: Exported Values in t. from Norway to Countries of the NSR/BSR in 2005 (12 Largest HS2 Product Groups)



Obviously, the development of the different product groups was dominated in exports and imports by the petroleum industry.

Chart 4-49: Norway Exports, Growth 2002-2005 in mil. € Size = Exports in mil. t. (Eurostat 2006)

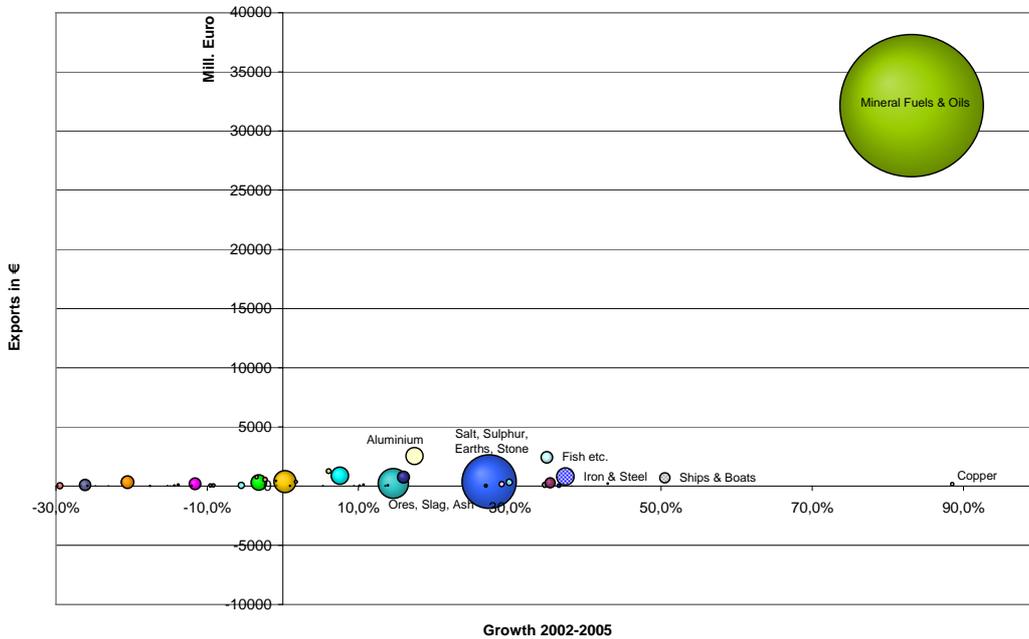
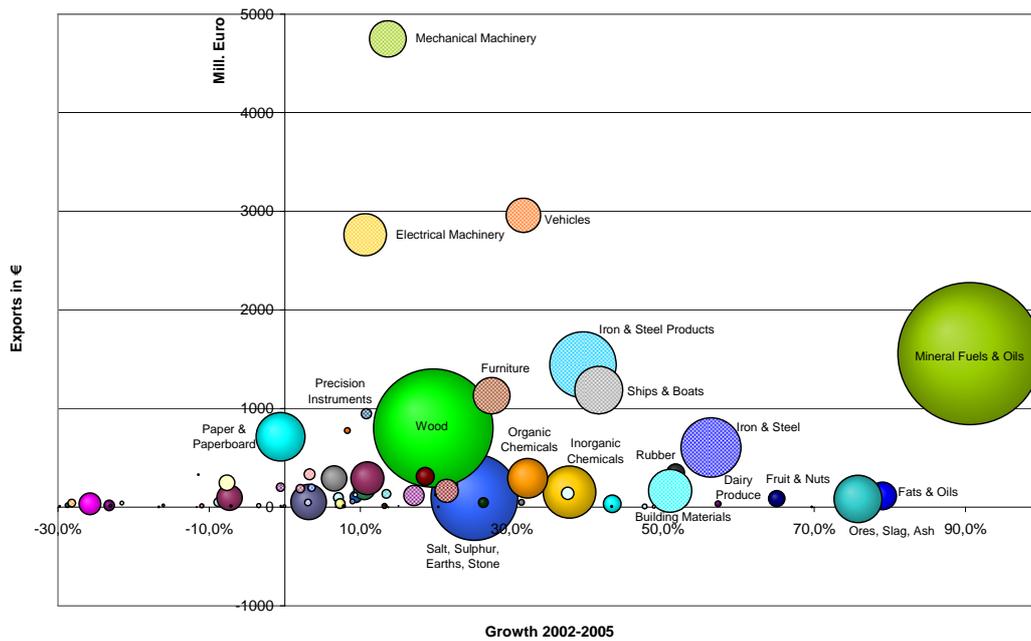


Chart 4-50: Norway Imports, Growth 2002-2005 in mil. € Size = Imports in mil. t. (Eurostat 2006)



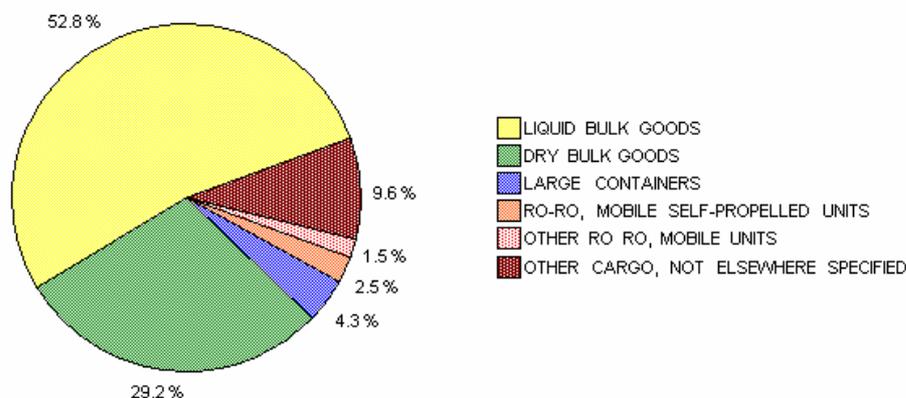
The Norwegian transport structure is limited by the geographical outline of the country. It does not consist of a few large ports that serve the country but rather of many small ports that exist even in remote places. Road traffic is the main mode transport, some rail is also done. Maritime traffic plays an additional role for serving the country. But seaborne transport is essential for importing and exporting to the rest of Europe. That is why frequent connections to the neighbouring countries of the EU are established, especially to Denmark, Germany and Sweden.

Table 4-12: Frequency of port calls in country by vessel (Liner Services) coming from Norway

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	2 monthly	Latvia	1 weekly
Belgium	7 weekly	Lithuania	2 weekly
Denmark	3 daily	Netherlands	6 monthly
Denmark	6 monthly	Netherlands	8 weekly
Denmark	14 weekly	Poland	2 weekly
Estonia	2 weekly	Russia	5 weekly
Finland	6 monthly	Sweden	2 daily
Finland	5 weekly	Sweden	3 monthly
Germany	1 daily	Sweden	10 weekly
Germany	8 monthly	UK	4 monthly
Germany	22 weekly	UK	6 weekly

As Norway is a major player in extracting mineral oils, liquid bulk plays the major role in seaborne transport to other European countries (see Chart 4-51). Dry bulk comprises about one third of transported goods which is mostly wood articles.

Chart 4-51: Norway - International intra-EU-25 seaborne transport of goods: share by type of cargo, 2004 (Main ports) (Eurostat 2005a)



4.2.10 Poland

Poland has continuously pursued a successful transition process. Even so, much remains to be done, the privatization of small- and medium-sized state-owned companies and a liberal law on establishing new firms has encouraged the development of the private business sector, but legal and bureaucratic obstacles are jeopardizing its further development. Poland's agricultural sector is handicapped by surplus labour, inefficient small farms and lack of investment. Restructuring and privatization of "sensitive sectors" (e.g. coal, steel, railroads, and energy) have halted. Poland joined the EU in 2004. And growing exports to the EU contributed to Poland's strong growth in 2004. GDP per capita roughly equals that of the three Baltic States. Poland stands to benefit from nearly €17 billion in EU funds, available through 2006. Farmers have already begun to reap the rewards of membership via booming exports, higher food prices and EU agricultural subsidies.

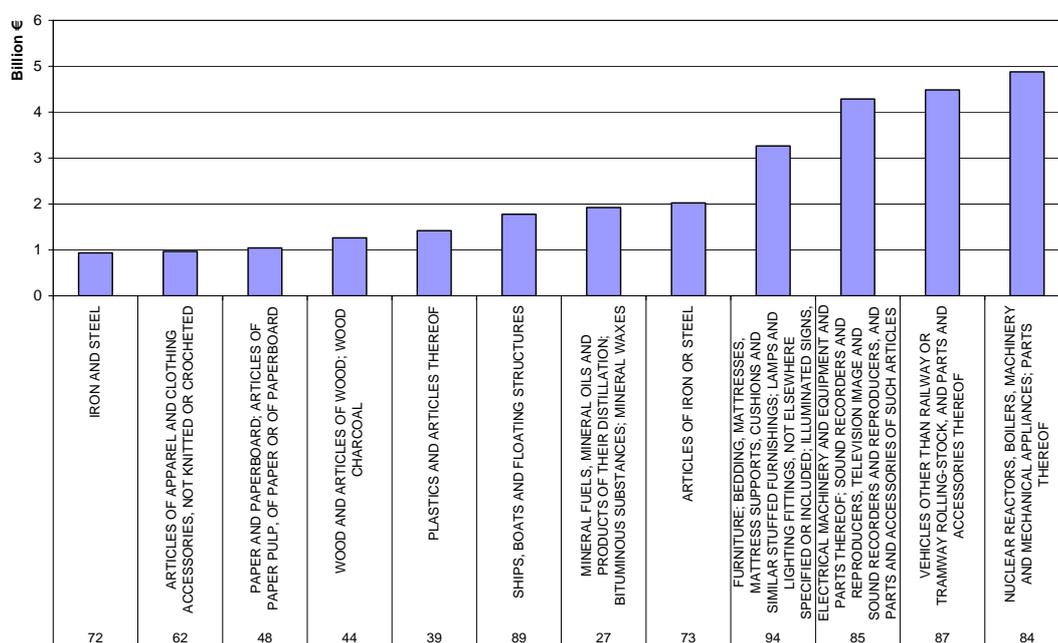
Poland - Facts	
GDP (purchasing power parity):	€372.4 billion (2005 est.)
GDP (official exchange rate):	€181.5 billion (2005 est.)
GDP - real growth rate:	3.4% (2005 est.)
GDP - per capita (PPP):	€9,656 (2005 est.)
Agriculture - products:	potatoes, fruits, vegetables, wheat; poultry, eggs, pork, dairy
Industries:	machine building, iron and steel, coal mining, chemicals, shipbuilding, food processing, glass, beverages, textiles
Industrial production growth rate:	3.7% (2005 est.)
Exports:	€68.34 billion (2005 est.)
Exports - commodities:	machinery and transport equipment 37.8%, intermediate manufactured goods 23.7%, miscellaneous manufactured goods 17.1%, food and live animals 7.6% (2003)
Exports – partners:	Germany 28.2%, France 6.2%, Italy 6.1%, UK 5.6%, Czech Republic 4.6%, Russia 4.4%, Netherlands 4.2% (2005)
Imports:	€70.52 billion (2005 est.)
Imports - commodities:	machinery and transport equipment 38%, intermediate manufactured goods 21%, chemicals 14.8%, minerals, fuels, lubricants, and related materials 9.1% (2003)
Imports - partners:	Germany 29.6%, Russia 8.7%, Italy 6.6%, Netherlands 5.9%, France 5.7% (2005)

Poland has also made massive investments into the production infrastructure, which has caused a rapid growth of industrial production. The three largest industry sectors in the country are food processing and beverage production, vehicle manufacturing and chemical industry.

Poland has a geographically advantageous position in Central Europe, between east and west, north and south. This provides a strong potential for further developments in connections between Scandinavia and the other eastern European countries as well as from Russia to Western Europe. Components like efficiency improvements, ability to attract private capital into the transport sector and choice of strategies will be of importance for the development process. The largest economic concentration is in Mazowieckie region, around the capital Warsaw, from where the major transport routes go out and end.

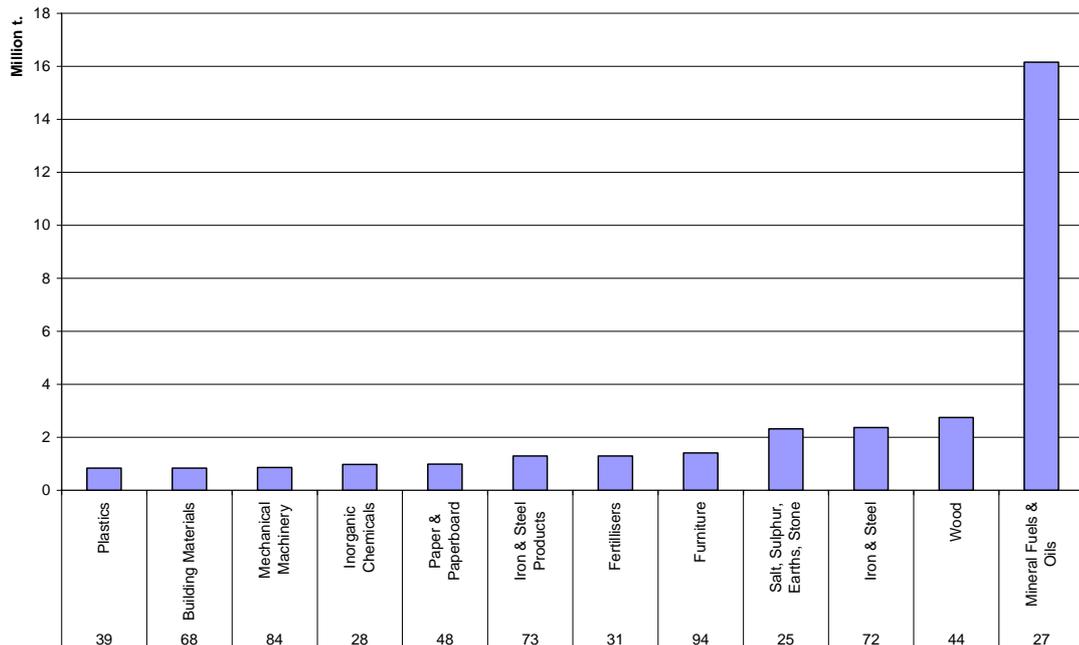
Poland exports in terms of value mainly consist of high value goods categories. Mechanical machinery (~€4.9 billion), vehicles (~€4.5 billion), electrical appliances (~€4.2 billion) and furniture (~€3.3 billion) are the main product groups.

Chart 4-52: Exported Values in € from Poland to Countries of the NSR/BSR in 2005 (12 Largest HS2 Product Groups)



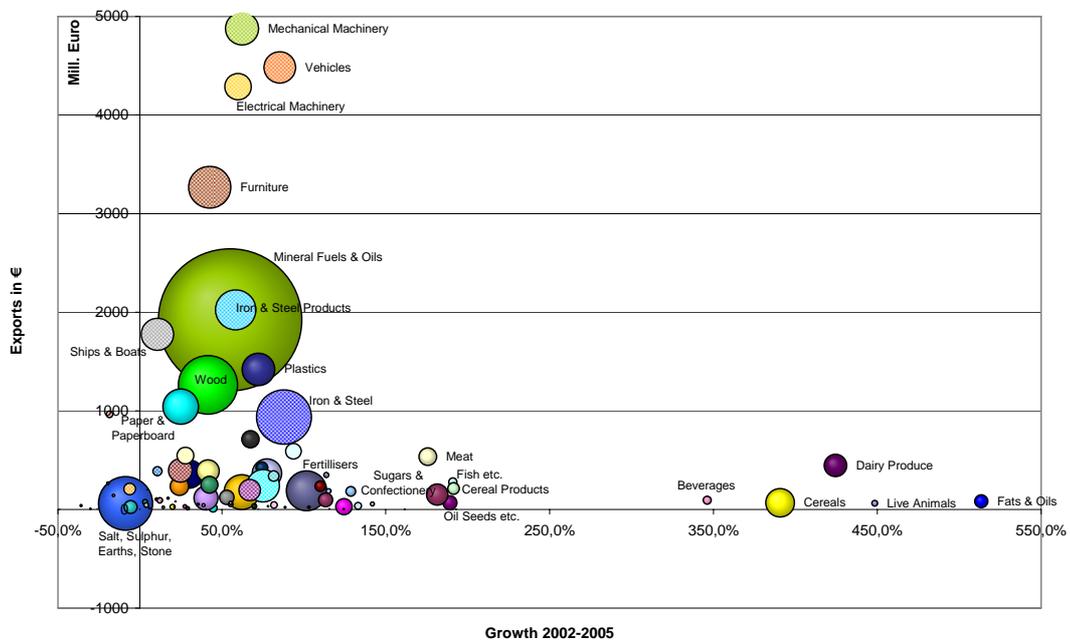
Looking at exports in tons, mineral fuels outweigh all other product groups by far (~16 million tons). The following groups (wood articles, iron and steel, building materials and furniture) are of much less importance (< 2.8 million tons).

Chart 4-53: Exported Values in t. from Poland to Countries of the NSR/BSR in 2005 (12 Largest HS2 Product Groups)



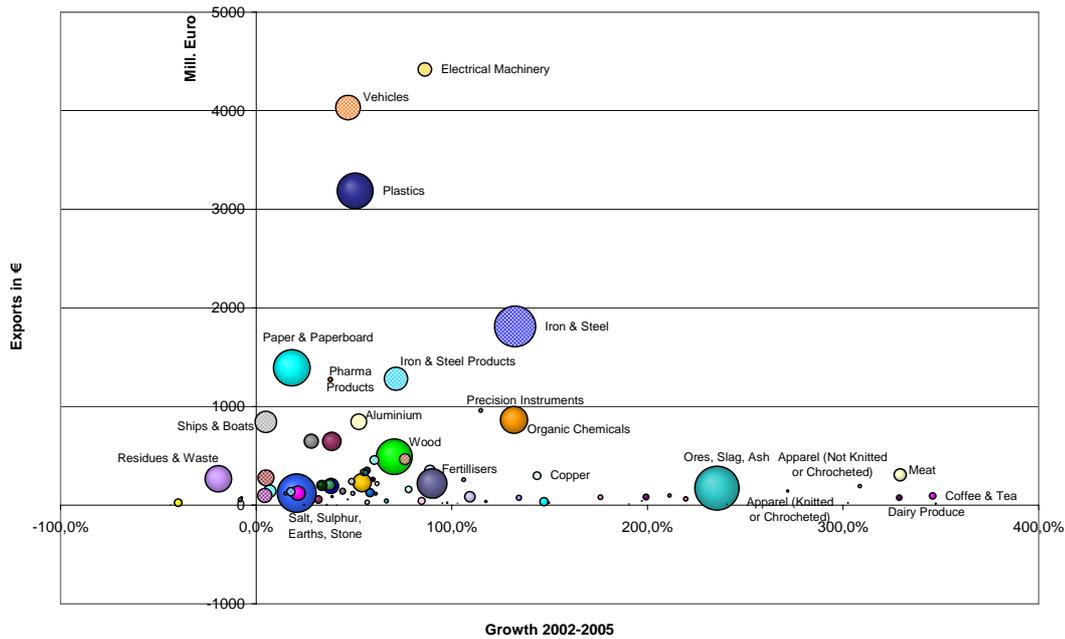
In terms of growth over the last few years, small amounts of food products and cereals achieve tremendous growth rates. High value product groups have not achieved as high growth but nevertheless show rates above 50% between 2002 and 2005 combined with high export values.

Chart 4-54: Poland Exports, Growth 2002-2005 in mil. € Size = Exports in mil. t. (Eurostat 2006)



Imports are dominated by the high value products of electrical machinery and vehicles and the bulk commodities iron and steel, plastics and paper products. Growth has been exhibited in all of these. Growth potential can also be seen in high value areas such as pharmaceutical products as well as precision engineering products.

Chart 4-55: Poland Imports, Growth 2002-2005 in mil. € Size = Imports in mil. t. (Eurostat 2006)



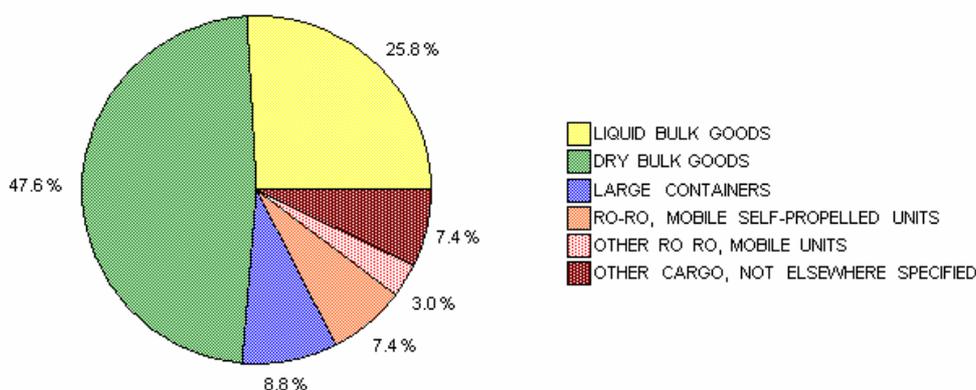
Due to its geographical location on the European mainland, Polish traffic is mainly using road or rail modes. However, for connecting to the Scandinavian countries and even to northern Germany and the UK frequent liner services are established.

Table 4-13: Frequency of port calls in country by vessel (Liner Services) coming from Poland

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	11 monthly	Lithuania	7 weekly
Belgium	4 weekly	Netherlands	12 monthly
Denmark	2 monthly	Netherlands	5 weekly
Denmark	7 weekly	Norway	2 monthly
Estonia	4 weekly	Norway	8 weekly
Finland	3 monthly	Russia	4 monthly
Finland	24 weekly	Russia	7 weekly
Germany	3 monthly	Sweden	7 Daily
Germany	41 weekly	Sweden	5 monthly
Latvia	5 monthly	Sweden	10 weekly
Latvia	1 weekly	UK	21 monthly
Lithuania	4 monthly	UK	14 weekly

Compared to other countries in the region, liquid bulk is not the main commodity within European seaborne trade with Poland. Dry bulk takes up almost half of the share of Polish maritime transports. Containers and RoRo units evenly share most of the rest.

Chart 4-56: Poland - International intra-EU-25 seaborne transport of goods: share by type of cargo, 2004 (Main ports) (Eurostat 2005a)²¹



4.2.11 Russia

Russia's economy has been on a strong growth path for the last years averaging 6.4% annually since the financial crisis of 1998 (5.9% for 2005). High oil prices and a relatively cheap ruble were important drivers of this growth, but investment and consumer-driven demand have started to play a noticeably increasing role since 2000. Real fixed capital investments have averaged gains greater than 10% over the last five years, and real personal incomes have realized average increases over 12%. Strong oil export earnings have allowed Russia to increase its foreign reserves from only € billion to some €133 billion at yearend 2005.

Russia - Facts	
GDP (purchasing power parity):	€1.168 trillion (2005 est.)
GDP (official exchange rate):	€546.0 billion (2005 est.)
GDP - real growth rate:	5.9% (2005 est.)
GDP - per capita (PPP):	€8,108 (2005 est.)
Agriculture - products:	grain, sugar beets, sunflower seed, vegetables, fruits; beef, milk
Industries:	complete range of mining and extractive industries producing coal, oil, gas, chemicals, and metals; all forms of machine building from rolling mills to high-performance aircraft and space vehicles; defence industries including radar, missile production, and advanced electronic components, shipbuilding; road and rail transportation equipment; communications equipment; agricultural machinery, tractors, and construction equipment; electric power generating and transmitting equipment; medical and scientific instruments; consumer durables, textiles, foodstuffs, handicrafts
Industrial production growth rate:	4% (2005 est.)
Exports:	€180.6 billion (2005 est.)
Exports - commodities:	petroleum and petroleum products, natural gas, wood and wood products, metals, chemicals, and a wide variety of civilian and military manufactures
Exports – partners:	Netherlands 10.3%, Germany 8.3%, Italy 7.9%, China 5.5%, Ukraine 5.2%, Turkey 4.5%, Switzerland 4.4% (2005)
Imports:	€2.1 billion (2005 est.)
Imports - commodities:	machinery and equipment, consumer goods, medicines, meat, sugar, semi-finished metal products
Imports - partners:	Germany 13.6%, Ukraine 8%, China 7.4%, Japan 6%, Belarus 4.7%, US 4.7%, Italy 4.6%, South Korea 4.1% (2005)

²¹ Poland only provided detailed information on the port of origin and destination for the two last quarters of 2004, for the two first quarters the origin and destination were provided as unknown.

Oil, natural gas, metals, and timber account for more than 80% of exports, leaving the country vulnerable to swings in world prices. Russia's base of manufacturing companies is outdated and must be replaced or modernized if the country is to achieve broad-based economic growth.

Russia has a complete range of mining and extractive industries producing coal, oil, gas, chemicals, and metals; all forms of machine building, consumer durables, textiles, foodstuffs and handicrafts. However, only a few Russian firms are competitive in international markets. Their industrial production is technologically outdated and very energy intensive. Economic activity is also primarily concentrated in major cities so that the regional disparities in economic development are high.

Russia has almost all of its industrial centres outside the Baltic Sea Region. One of the richest regions is Tyumen, east of the Ural Mountains, where most of the oil is extracted at present. Only Saint Petersburg is in the top ten of the most important Russian industry areas. There is however an important oil industry area in Murmansk and big forest industry concentration in Karelia in the Baltic Sea Region. Other western regions of Russia directly bordering on the Baltic are relatively undeveloped in terms of settlements, economy and company density.

The influence of the EU in the Baltic countries will open up the market in the east, and the Baltic countries will be the gateway to the important export and import country Russia. The Baltic countries will be a key area because of the close location to the east. The proportion of Russian foreign trade is expected to rise. The Baltic Sea is the fastest route to many parts of Russia, and is, therefore, of great importance.

The increased goods flow from these countries will mainly be oil, wood and bulk, mostly because of the gateway to Russia and the countries geographical position. The transit to Russia will increase; since it is a huge market that probably will become even bigger in the future. Because of the smaller market in the Baltic countries, the increase will be smaller than in Russia.²²

An increase in Russian trade with the rest of the EU and also outside EU could contribute to the fact that the goods flows will go through the Baltic States. The Baltic States' ports can also work as consolidation ports for other countries around the Baltic Sea, including Sweden.

Russia's main outbound general cargo flow is either with container feeder traffic to the continent, or as transit traffic to Finland or to Estonia, Latvia and Lithuania, and thereafter by RoRo vessel to either Poland or Germany.

In real figures the Russian export is dominated by mineral fuels and oil products. In 2005, more than 180 million tons (>€15 billion) were exported to other north European countries. All other product groups were of much less importance. But the following other products were traded a lot with the Baltic States, Poland, Scandinavia and Western Europe: forest products (mostly wood), metal industry (iron & steel, cooper, nickel, aluminium), chemicals and building materials. Chart 4-57 and Chart 4-58 provide an overview of the main traded product categories.

²² Brodin 2003

Chart 4-57: Exported Values in € from Russia to Countries of the NSR/BSR in 2005 (12 Largest HS2 Product Groups)

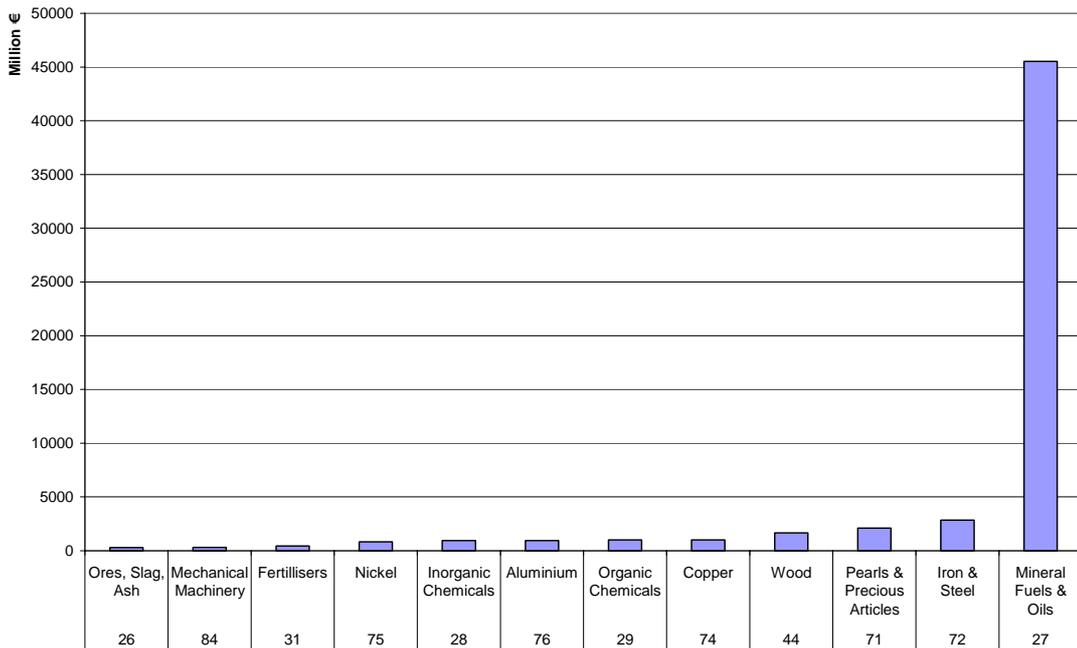
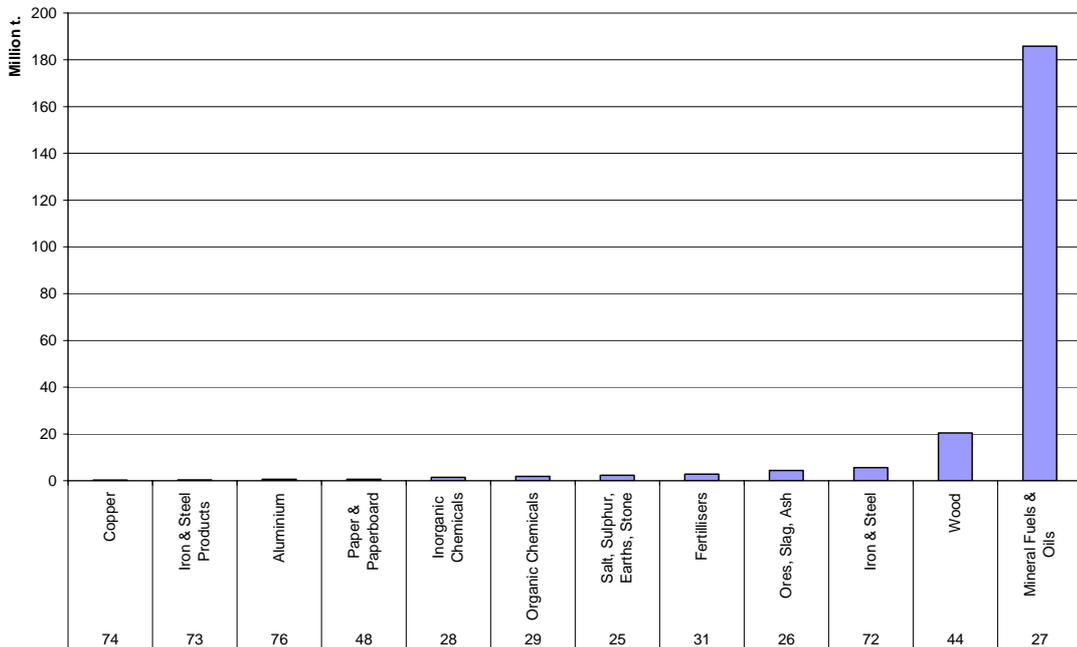
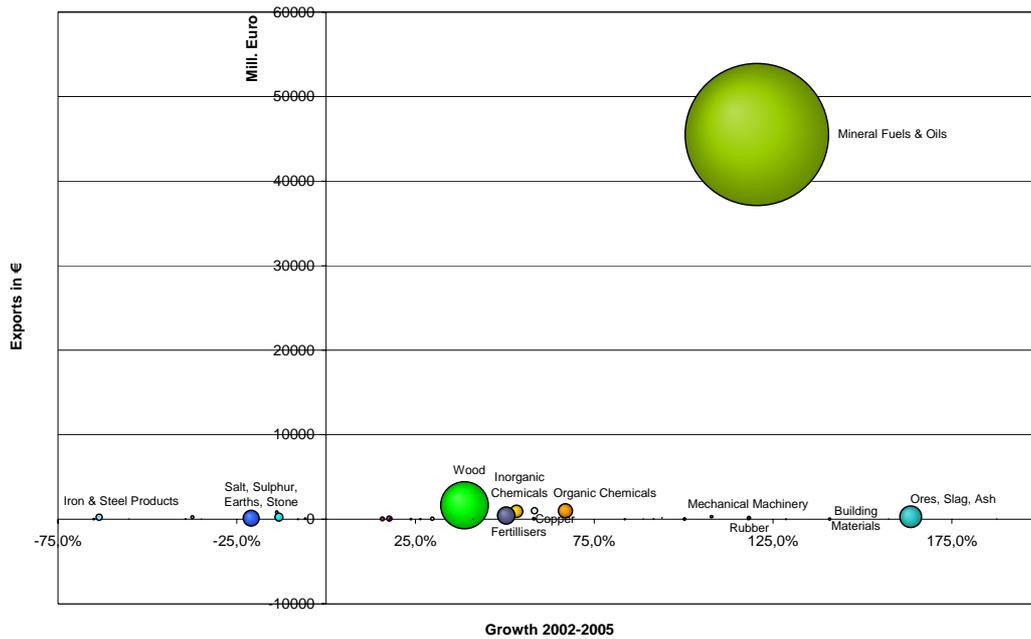


Chart 4-58: Exported Values in t. from Russia to Countries of the NSR/BSR in 2005 (12 Largest HS2 Product Groups)



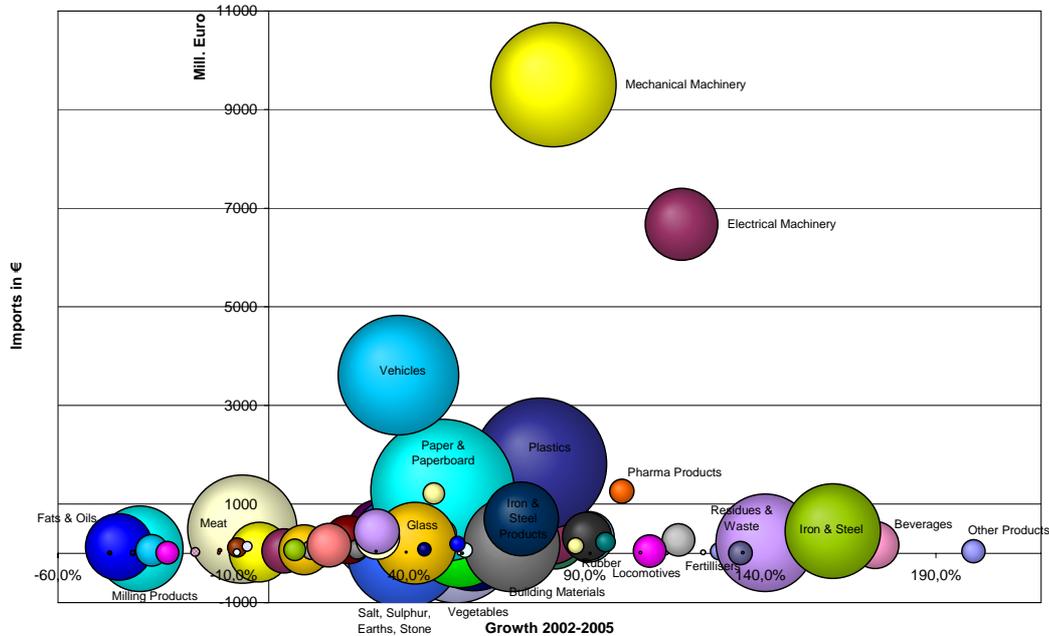
When analysing the growth of the main product categories over the last few years, exports show a clear dependency of the country's economy on the development of the petroleum industry. The growth of crude oil and related refined products was tremendous over the last years and outweighs all other except for ores, slag and ash as well as building materials. But these are not at all traded as heavily as is oil.

Chart 4-59: Russia Exports, Growth 2002-2005 in mil. € Size = Exports in mil. t. (Eurostat 2006)



Imports, however, present a different picture. Here, the increasing demand of consumer products and production related investments is obvious. Product groups like vehicles, machinery, electronics, plastics, pharmaceuticals, beverages all experienced strong growth rates in growing quantities over the last years. This is a generally applicable picture for uprising economies like that of Russia with a large market that is absorbing large quantities of different kinds of consumer and manufacturing related products.

Chart 4-60: Russia Imports, Growth 2002-2005 in mil. € Size = Imports in mil. t. (Eurostat 2006)



However, the Russian transport structure, that needs to handle the growing quantities, is still very much limited. But the ministry of traffic is underway to develop not only a new port infrastructure for the Saint Petersburg area but also improved hinterland connections to these

ports. This will still take some years. Nevertheless, many frequent liner services have been established to the Baltic Sea ports of Russia. In the next years to come, the frequency of connection is likely to increase further as the Russia market is growing fast and is absorbing the products from European countries and other regions faster than they are able to be delivered. Table 4-14 provides an overview of the frequency of port calls in other countries by vessels arriving from Russia.

Table 4-14: Frequency of port calls in country by vessel (Liner Services) coming from Russia

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	2 monthly	Lithuania	4 monthly
Belgium	19 weekly	Lithuania	11 weekly
Denmark	2 monthly	Netherlands	2 monthly
Denmark	6 weekly	Netherlands	20 weekly
Estonia	2 monthly	Norway	8 weekly
Estonia	4 weekly	Poland	1 monthly
Finland	16 weekly	Poland	6 weekly
Germany	2 monthly	Sweden	10 weekly
Germany	39 weekly	UK	9 monthly
Latvia	10 monthly	UK	24 weekly
Latvia	5 weekly		

4.2.12 Sweden

Sweden's economy has achieved a high technological and welfare standard during the last decades. Through a modern distribution system, excellent internal and external communications and a skilled labour force, Swedish companies have internationally gained competitiveness. Timber, hydropower, and iron ore constitute the resource base of the economy which is heavily oriented towards foreign trade. Privately owned firms account for about 90% of industrial output, of which the engineering sector accounts for 50% of output and exports. Agriculture accounts for only 2% of GDP and of jobs. Growth remained sluggish in 2003, but picked up in 2004 and 2005. Integration into the EU has been part of the growing trade interaction with the other European countries and Russia. However, it still needs to be analysed if the Swedish denial of integration into the European Economic and Monetary Union (EMU) and its impacts on the common trading area is limiting the growth of the economy.

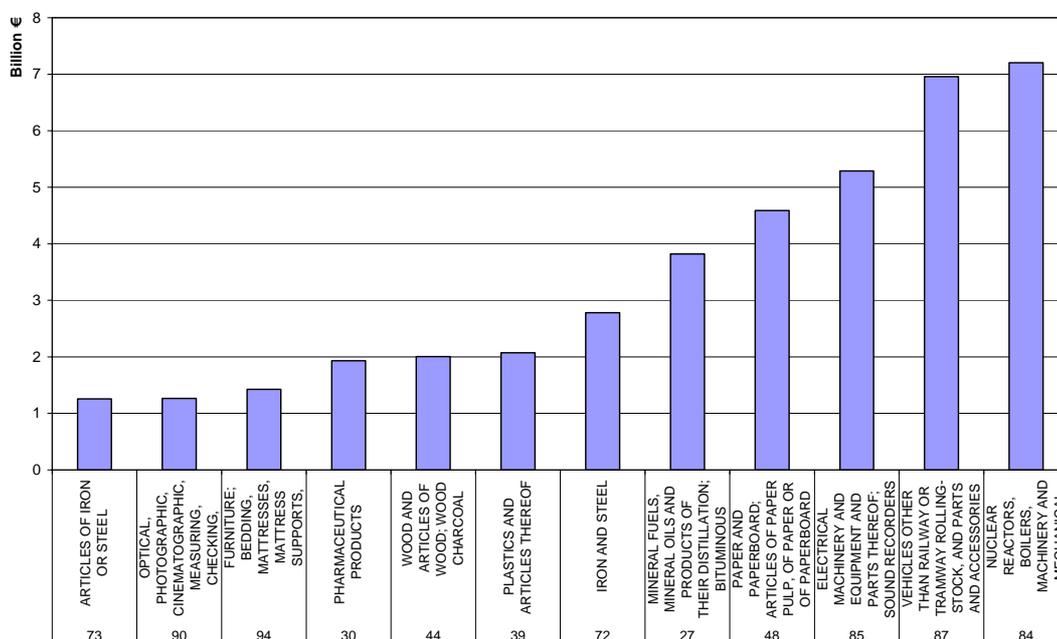
In Sweden, the industrial production is concentrated in sectors that use domestic raw materials, such as timber, iron and other metals. Among the most important production sectors are wood pulp, paper and metal production, car manufacturing, production of machinery, telecommunication and pharmaceutical products.

In Sweden the largest economic concentrations are in the three largest metropolitan regions: Stockholm, Gothenburg and Malmö, and in certain other cities and towns with higher education institutions. These regions are characterised by a more favourable labour market, a larger net influx of inhabitants and a more positive population trend than the country as a whole. The development of companies follows this tendency.

Sweden – Facts	
GDP (purchasing power parity):	€194.1 billion (2005 est.)
GDP (official exchange rate):	€256.6 billion (2005 est.)
GDP - real growth rate:	2.7% (2005 est.)
GDP - per capita (PPP):	€21,966 (2005 est.)
Agriculture - products:	barley, wheat, sugar beets; meat, milk
Industries:	iron and steel, precision equipment (bearings, radio and telephone parts, armaments), wood pulp and paper products, processed foods, motor vehicles
Industrial production growth rate:	1.6% (2005 est.)
Exports:	€93.3 billion (2005 est.)
Exports - commodities:	machinery 35%, motor vehicles, paper products, pulp and wood, iron and steel products, chemicals
Exports – partners:	US 10.6%, Germany 10.2%, Norway 8.7%, UK 7.3%, Denmark 6.5%, Finland 5.7%, France 4.9%, Netherlands 4.5%, Belgium 4.3% (2005)
Imports:	€77.0 billion (2005 est.)
Imports - commodities:	machinery, petroleum and petroleum products, chemicals, motor vehicles, iron and steel; foodstuffs, clothing
Imports - partners:	Germany 17.5%, Denmark 8.9%, Norway 7.8%, UK 6.6%, Netherlands 6.2%, Finland 5.8%, France 5% (2005)

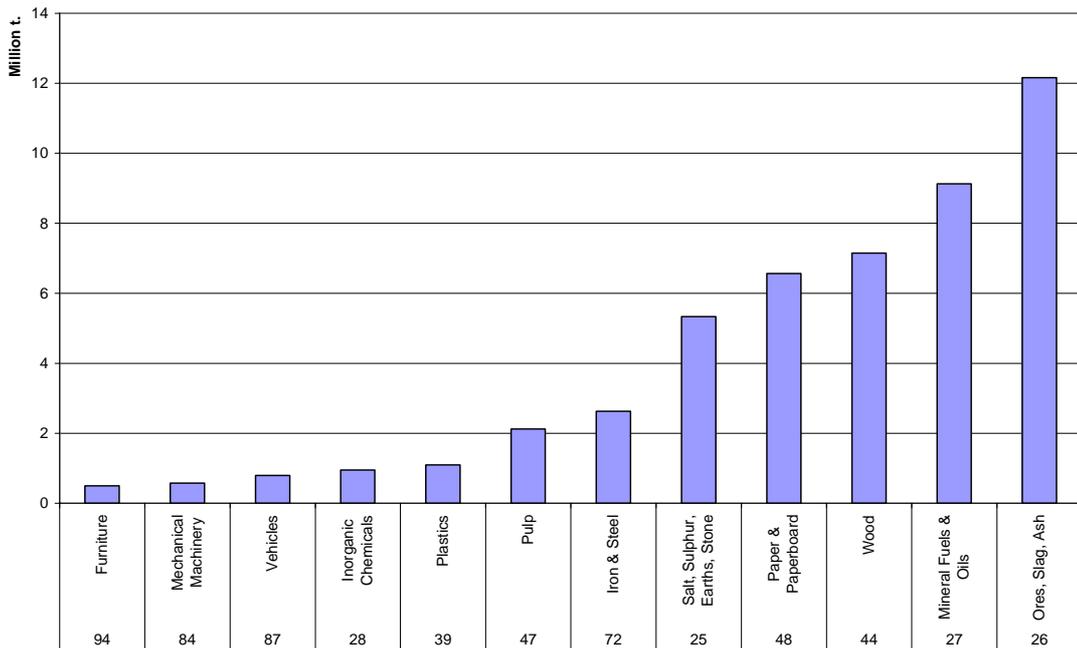
Sweden largely exports high value products from the machinery (~€7.2 billion), vehicles (~€7 billion) and electronics industry (~€3.3 billion). Besides that, bulk commodities like paper products (~€4.6 billion), mineral fuels (~€3.8 billion) and iron and steel (~€2.7 billion) play an important role. The growing importance of pharmaceutical products, furniture and precision engineering should be mentioned.

Chart 4-61: Exported Values in € from Sweden to Countries of the NSR/BSR in 2005 (12 Largest HS2 Product Groups)



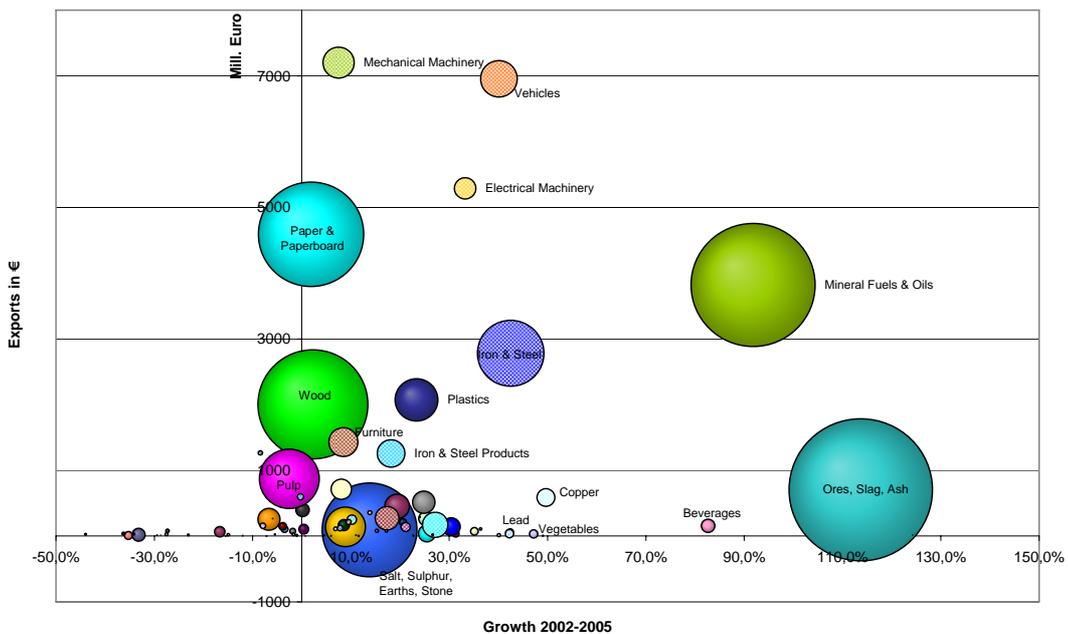
Regarding exports in tons, ores, slag and ash (~12.2 million tons) play the most important role for the Swedish economy followed by mineral fuels (~9 million tons). The large forest industry provides for another large amount of wood (~6.5 million tons) and paper products exports (~6.2 million tons).

Chart 4-62: Exported Values in t. from Sweden to Countries of the NSR/BSR in 2005 (12 Largest HS2 Product Groups)



Regarding these export figures it is interesting to realize that ores, slag and ash are not only the commodity with the largest exported amount but also the one with the strongest growth over the last few years. On the other hand paper, pulp and wood products show a tendency for stagnation. For the Swedish economy we also find – like in most of the other analyzed countries – industries like vehicles and machinery with high valued exports and medium growth rates.

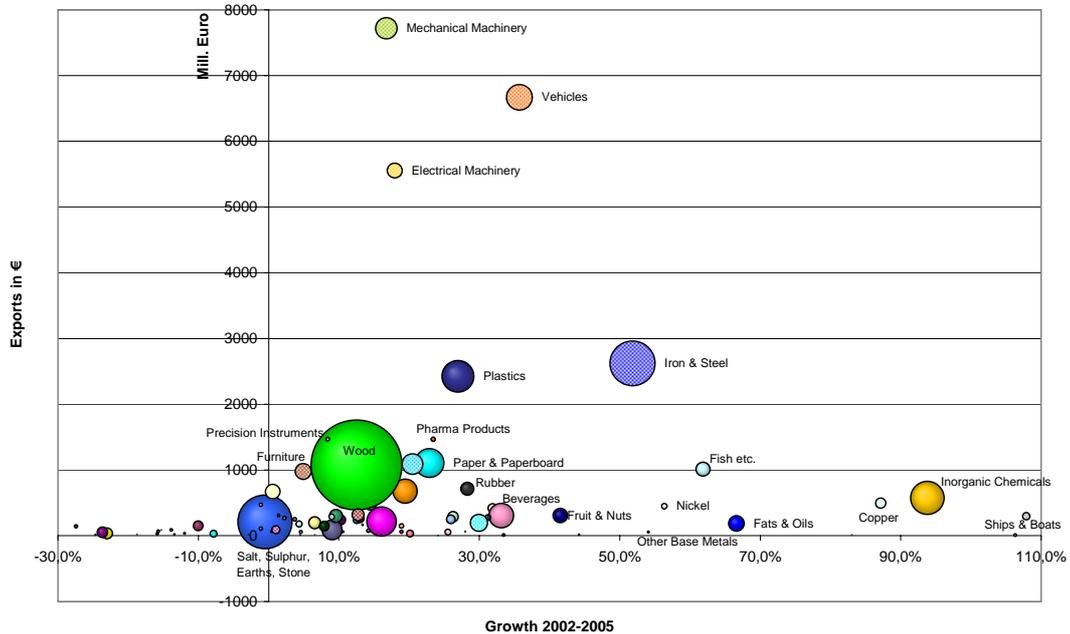
Chart 4-63: Sweden Exports, Growth 2002-2005 in mil. € Size = Exports in mil. t. (Eurostat 2006)



High value industries show a similar growth development for imports as for exports. As for high value products, pharmaceutical products also show a high growth. Besides wood, bulk

commodities are imported only in small amounts and higher and lower growth rates should only reflect variations in industrial demand.

Chart 4-64: Sweden Imports, Growth 2002-2005 in mil. € Size = Imports in mil. t. (Eurostat 2006)



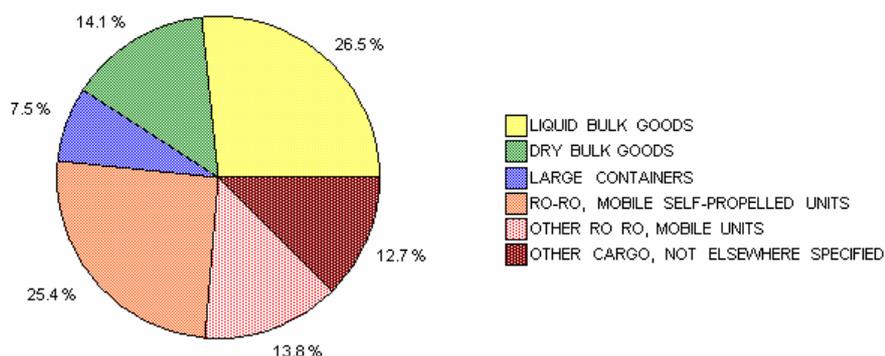
Sweden lies at the core of the Baltic Sea Region. Therefore it can keep close connections to several northern European countries. This is especially true for trade between these countries. The frequency of port calls from vessels arriving from Sweden shows how this has led to numerous liner services that serve the surrounding countries.

Table 4-15: Frequency of port calls in country by vessel (Liner Services) coming from Sweden

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	2 daily	Lithuania	1 daily
Belgium	3 monthly	Lithuania	3 monthly
Belgium	29 weekly	Lithuania	9 weekly
Denmark	57 daily	Netherlands	11 monthly
Denmark	10 monthly	Netherlands	19 weekly
Denmark	34 weekly	Norway	1 daily
Estonia	1 daily	Norway	26 monthly
Estonia	4 monthly	Norway	17 weekly
Estonia	7 weekly	Poland	2 monthly
Finland	10 daily	Poland	6 weekly
Finland	36 monthly	Russia	1 daily
Finland	31 weekly	Russia	6 monthly
Germany	6 daily	Russia	13 weekly
Germany	32 monthly	UK	1 daily
Germany	66 weekly	UK	36 monthly
Latvia	2 monthly	UK	47 weekly
Latvia	17 weekly		

Due to the fact that the regular liner service between Sweden and its neighbouring countries are largely RoRo vessels, the share of RoRo units of intra-EU-25 seaborne transport is rather high. Nevertheless, about 40% is taken up by bulk vessels.

Chart 4-65: Sweden - International intra-EU-25 seaborne transport of goods: share by type of cargo, 2004 (Main ports) (Eurostat 2005a)



4.2.13 UK

The UK is one of the trillion € economies of Western Europe. The Agriculture is intensive, highly mechanized, producing about 60% of food needs with less than 2% of the labour force. The UK has large coal, natural gas, and oil reserves; primary energy production accounts for 10% of GDP, one of the highest shares of any industrial nation. Services, particularly banking, insurance, and business services, account by far for the largest proportion of GDP while industry continues to decline in importance. GDP growth slipped in 2001-03 as the global downturn, the high value of the pound, and the bursting of the "new economy" bubble hurt manufacturing and exports. Output recovered in 2004, to 3.2% growth, but fell in 2005, to 1.7%. Despite slower growth, the economy is one of the strongest in Europe.

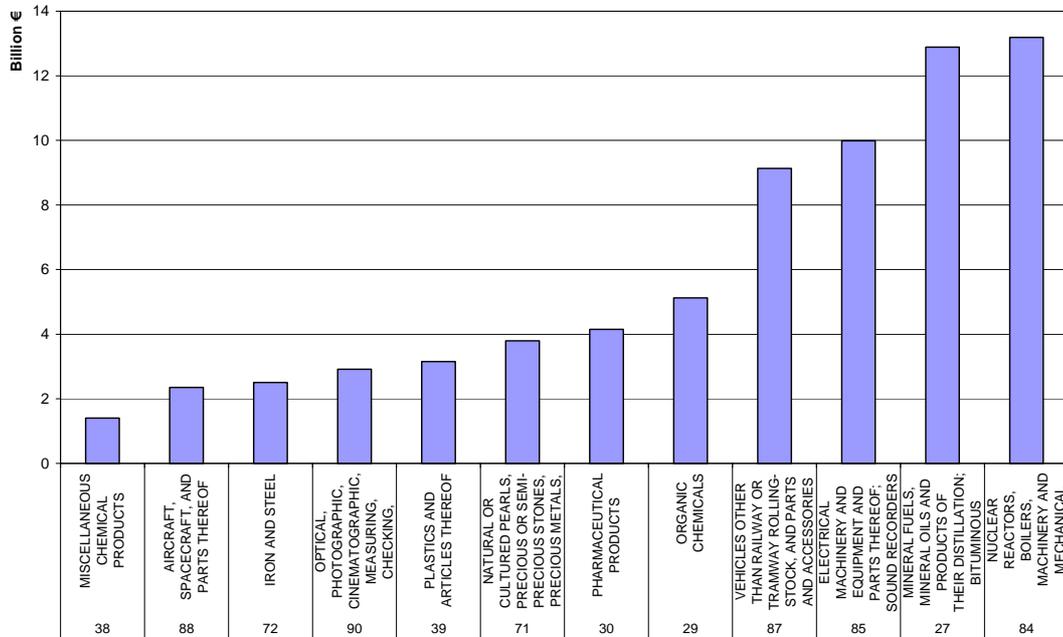
The relatively good economic performance has complicated the government's efforts to make a case for Britain to join the European Economic and Monetary Union (EMU). Like Sweden this has not yet had a large effect on trade between the rest of Europe.

The UK - Facts	
GDP (purchasing power parity):	€1.340 trillion (2005 est.)
GDP (official exchange rate):	€1.642 trillion (2005 est.)
GDP - real growth rate:	1.9% (2005 est.)
GDP - per capita (PPP):	€22,187 (2005 est.)
Agriculture - products:	cereals, oilseed, potatoes, vegetables; cattle, sheep, poultry; fish
Industries:	machine tools, electric power equipment, automation equipment, railroad equipment, shipbuilding, aircraft, motor vehicles and parts, electronics and communications equipment, metals, chemicals, coal, petroleum, paper and paper products, food processing, textiles, clothing, other consumer goods
Industrial production growth rate:	-1.9% (2005 est.)
Exports:	€274.7 billion (2005 est.)
Exports - commodities:	manufactured goods, fuels, chemicals; food, beverages, tobacco
Exports – partners:	US 15.1%, Germany 10.5%, France 8.9%, Ireland 7.3%, Netherlands 5.5%, Belgium 5%, Spain 4.4% (2005)
Imports:	€356.5 billion (2005 est.)
Imports - commodities:	manufactured goods, machinery, fuels; foodstuffs
Imports - partners:	Germany 12.8%, US 8.7%, France 7.1%, Netherlands 6.6%, China 5%, Norway 4.7%, Belgium 4.6%, Italy 4% (2005)

The economy of the UK is a world market leader especially in machinery, electronics, vehicles and a wide range of other industries. Through a variety of natural resources it is able to sustain different kinds of industries and consumer demands beyond its own needs.

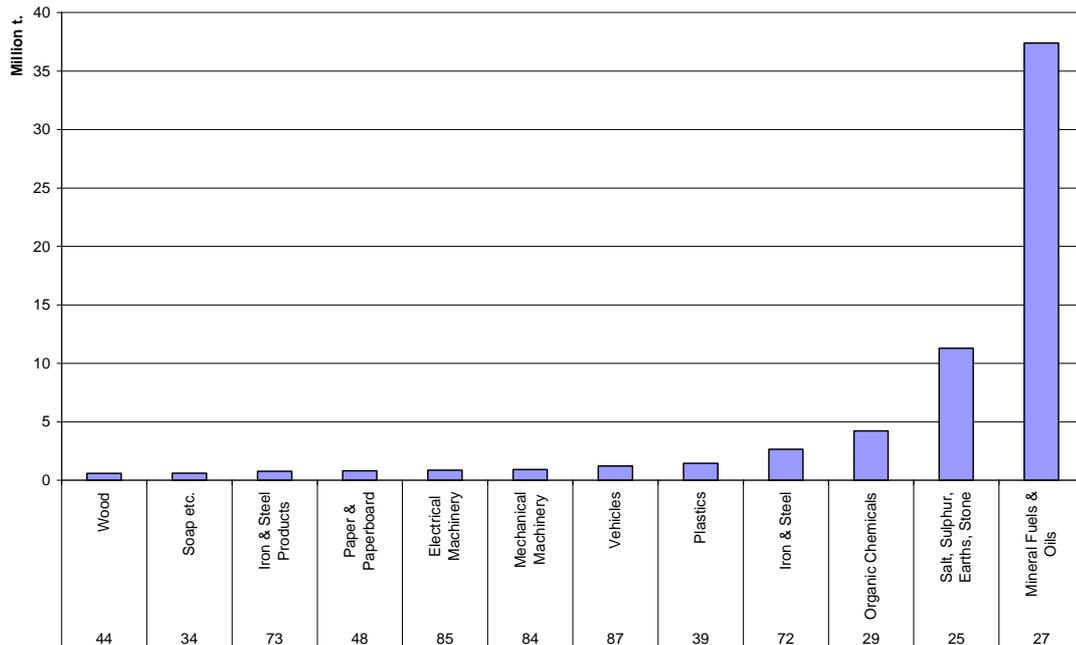
The UK shows a similar export structure as Sweden. Here, machinery is also the main export product group (~€13 billion) in terms of exported value followed by mineral fuels (~€12.6 billion), electrical appliances (~€10 billion) and vehicles (~€9 billion). Another important role is played by the chemical and pharmaceutical products industry.

Chart 4-66: Exported Values in € from the UK to Countries of the NSR/BSR in 2005 (12 Largest HS2 Product Groups)



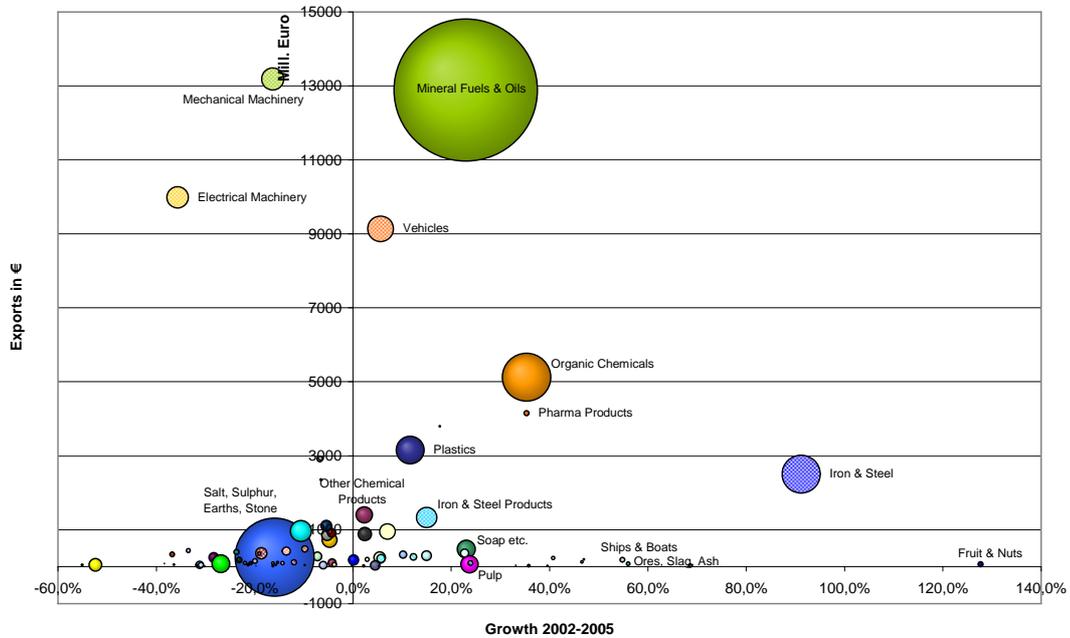
In terms of exported amounts in tons, mineral fuels are dominating the trade from the UK (~37 million tons). Building materials, chemicals, iron and steel and plastics follow.

Chart 4-67: Exported Values in t. from the UK to Countries of the NSR/BSR in 2005 (12 Largest HS2 Product Groups)



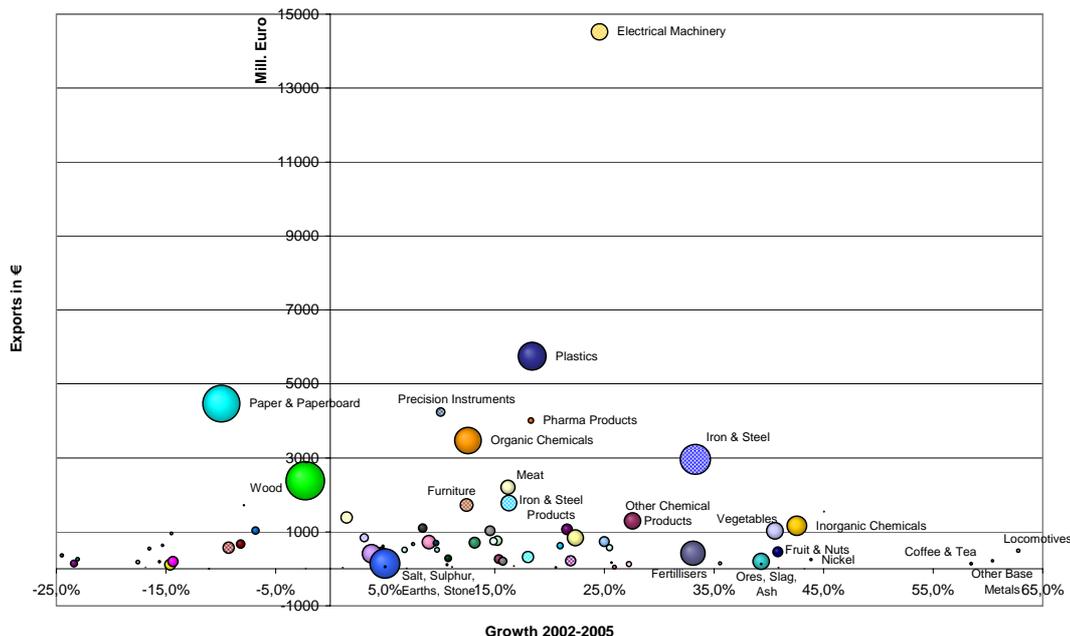
The growth picture shows an interesting development. Although the montane industry has declined tremendously over the last decades, the demand for iron, steel and related products from the UK is growing at high rates. Machinery however has declined over the last few years. High value products that are growing in exports are vehicles and pharmaceutical products.

Chart 4-68: UK Exports, Growth 2002-2005 in mil. € Size = Exports in mil. t. (Eurostat 2006)



Imports show very high growth rates with electronics. Fairly good developments can also be seen with the precision engineering and pharmaceutical industries. Bulk goods like plastics, chemicals and iron and steel also perform well while paper and wood products have declined in their imported values.

Chart 4-69: UK Imports, Growth 2002-2005 in mil. € Size = Imports in mil. t. (Eurostat 2006)



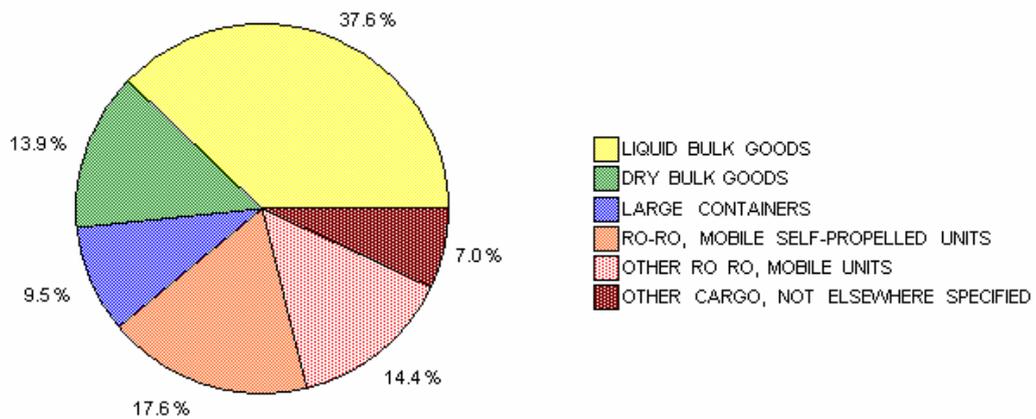
The geographical location of the UK makes it necessary to provide for regular connections to the other surrounding European locations. Frequent liner services are established especially to Belgium, the Netherlands and Germany.

Table 4-16: Frequency of port calls in country by vessel (Liner Services) coming from the UK

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	1 daily	Latvia	1 weekly
Belgium	10 monthly	Lithuania	1 weekly
Belgium	16 weekly	Netherlands	4 daily
Denmark	5 weekly	Netherlands	9 monthly
Estonia	2 monthly	Netherlands	22 weekly
Estonia	3 weekly	Norway	4 weekly
Finland	2 monthly	Poland	2 weekly
Finland	7 weekly	Russia	4 weekly
Germany	5 monthly	Sweden	9 weekly
Germany	20 weekly		

The seaborne transport is divided into a large chunk of liquid bulk (i.e. mineral fuels), some dry bulk and containers and many RoRo units.

Chart 4-70: UK - International intra-EU-25 seaborne transport of goods: share by type of cargo, 2004 (Main ports) (Eurostat 2005a)



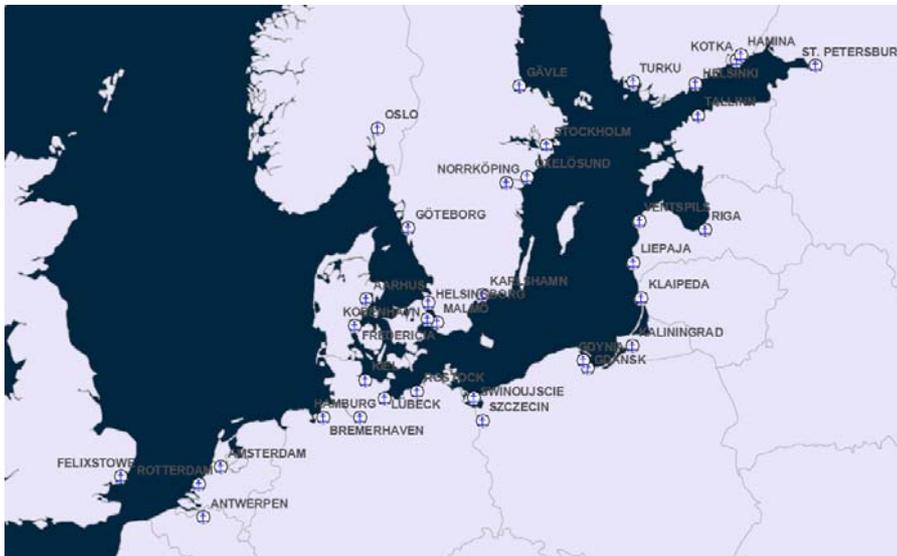
5 Level 2 Analysis on Regional Level

The level 1 analysis gave an insight look on the current development of trading between countries in northern Europe. The second level analysis will focus on the seaborne transport of the goods flows mentioned in the previous chapter.

5.1 Goods Flow between Regions of the Baltic and North Sea Region

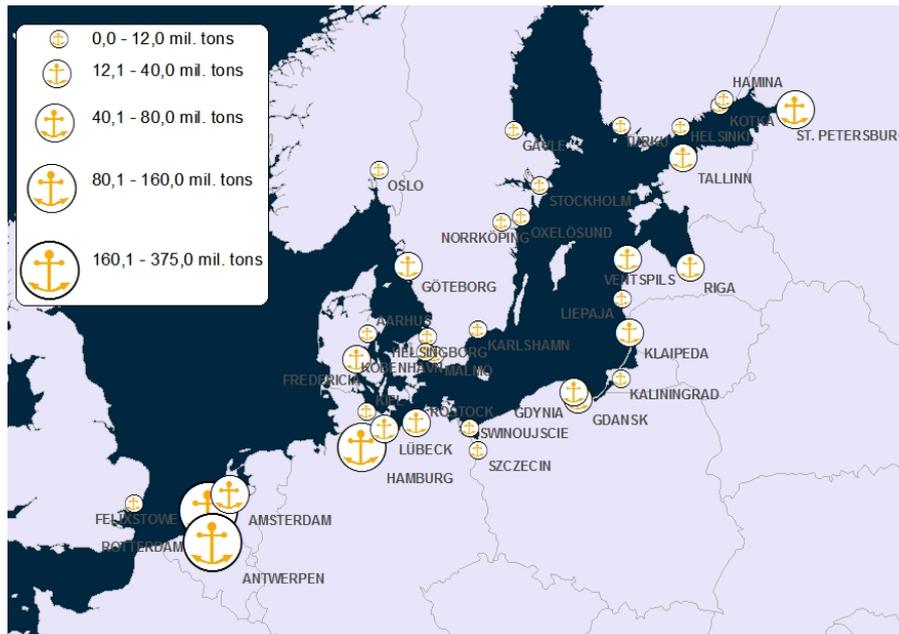
The level 2 analysis tries to identify the major goods flows in a regional perspective. As the focus of this study is on the potential for port areas, ports themselves are the main focus of this chapter. The major ports of each country investigated at level 1 are included in this investigation. Map 5-1 provides an overview of the locations of the major ports. In addition to these a few minor ports were looked at, which play a comparably important role in a specialized logistics area like vehicle turnover.

Map 5-1: Major Evaluated Ports in Study



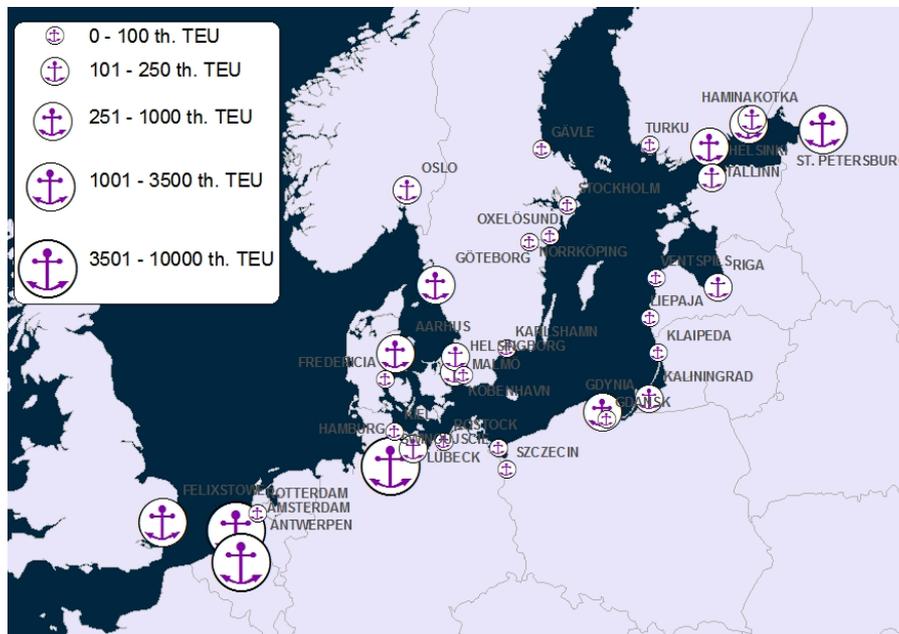
These ports were chosen depending on their overall importance in terms of total turnover and TEU turnover in 2005. The turnover of the major ports in the region reflects in some ways the logistical importance and the importance for the hinterland of each port in the region. Map 5-2 shows the regional total turnover make up in the major ports in NSR and BSR. The handling of goods is dominated by the ports of Rotterdam, Amsterdam and Hamburg which are all mainly operating in the overseas cargo business.

Map 5-2: Total Turnover 2005



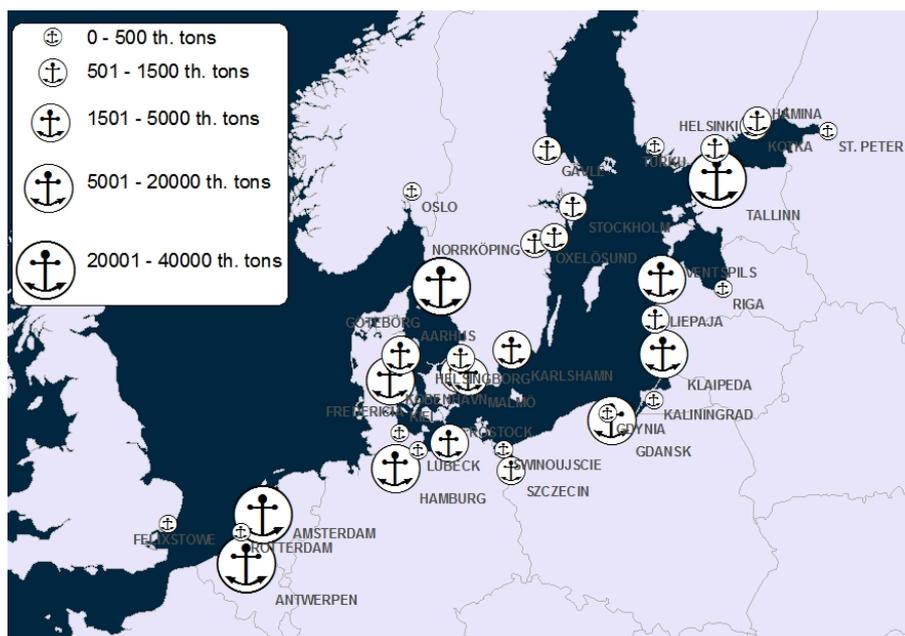
However, each port in the region has gone along a different historical development path that has led to different specializations. Therefore, in some ports the container respectively the bulk turnover is more developed. Map 5-3 shows the distribution of TEU turnover in 2005 for the major ports. The container turnover has been highest in the ports of Rotterdam, Antwerp, Hamburg, Saint Petersburg and Felixstowe.

Map 5-3: Total TEU Turnover 2005



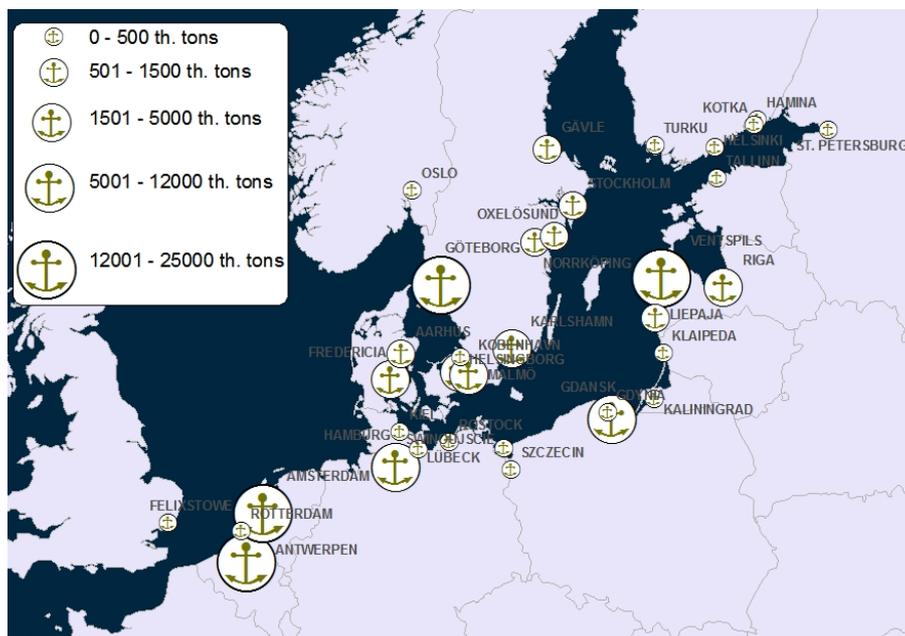
Looking at the bulk turnover, the tendencies of ports for a specialization in bulk become evident. In Map 5-4 the turnover of liquid bulk is shown. Liquid bulk is mainly crude oil, related mineral oil products and chemicals. Here, the relevance of transshipment through the Baltic States is clearly seen.

Map 5-4: Total Liquid Bulk Turnover 2005



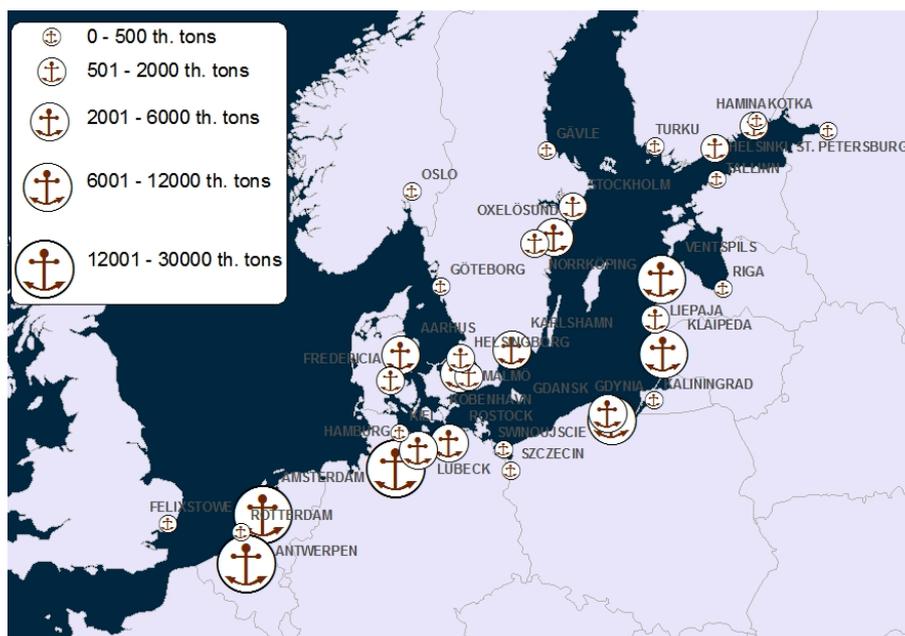
The turnover of only mineral oil products shows a turnover differentiation related to the locations of refineries but is - except some small differences – basically similar to total liquid bulk turnover.

Map 5-5: Total Mineral Oil Turnover 2005



The turnover of dry bulk commodities, like fertilizers, building materials or ores, is of major importance for the Baltic States. Nevertheless, all ports – except those that rather serve as ferry ports – handle fairly large amounts of dry bulk. Map 5-6 shows the distribution of the turnover of these commodities.

Map 5-6: Total Dry Bulk Turnover 2005



5.2 Goods Flow between Ports

Cargo flows between ports provide the foundation for the provision of logistical services in port areas. The handled goods show the kind of goods that are in need of general turnover handling, but statistics also show, what kind of goods do not go through the port of concern. Those might exhibit potential for further attraction of these goods categories by implementing certain related logistical services, especially value added services.

As seen in the previous chapter, each port evaluated in this study exhibits a different kind of specialization on certain types of commodities. This has led to different relations to the respective hinterland and varying national integrations. In the following the regional cargo flows through the major ports will be analysed to arrive at an understanding of the regional diversity of goods flows and to show the relative specializations of the ports in order to find potential for VAS in the respective port regions.

5.2.1 Belgium

The geographical location of Belgium lies in favour of the transshipment of goods from deep sea transport via feeder vessels to the countries of the European North. Its main ports are Antwerp, Zeebrugge and Vlissingen. The first will be looked at next, the second and third only in regards to vehicle turnover.

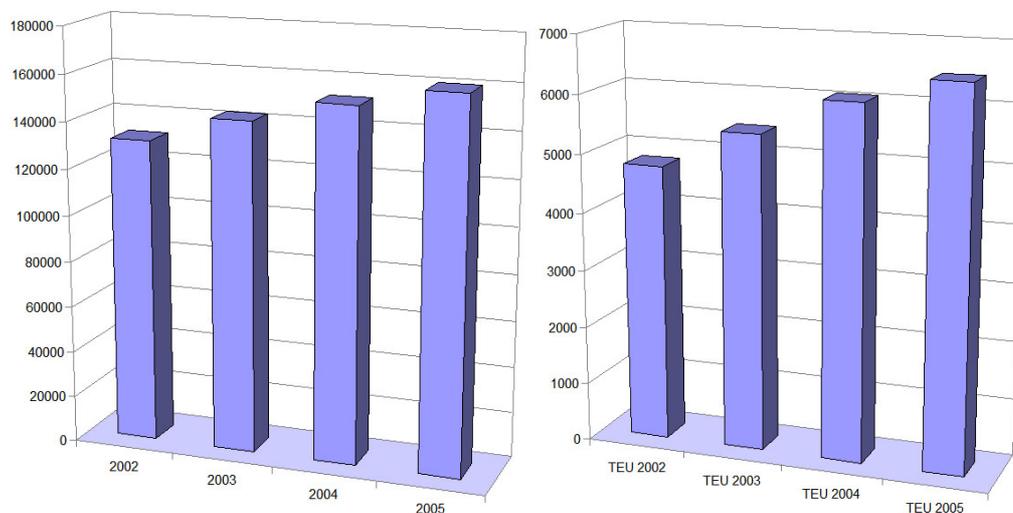
Antwerp²³

The port of Antwerp is one of the largest ports in Europe in terms of total and TEU turnover. It has achieved world class competitiveness although it is situated 80 km from the Belgian shore. However, this rather central location in Europe compared to other ports at the North Sea has proved to be important for efficient hinterland connections. The port is located directly within the so called blue banana of Europe with the highest population and company density. Within 1,000 km around the port, ~620 million people reside. The hinterland

²³ <http://www.portofantwerp.be>

connections are fairly well established with railroads, inland waterways and highways connecting to the nearby regions.

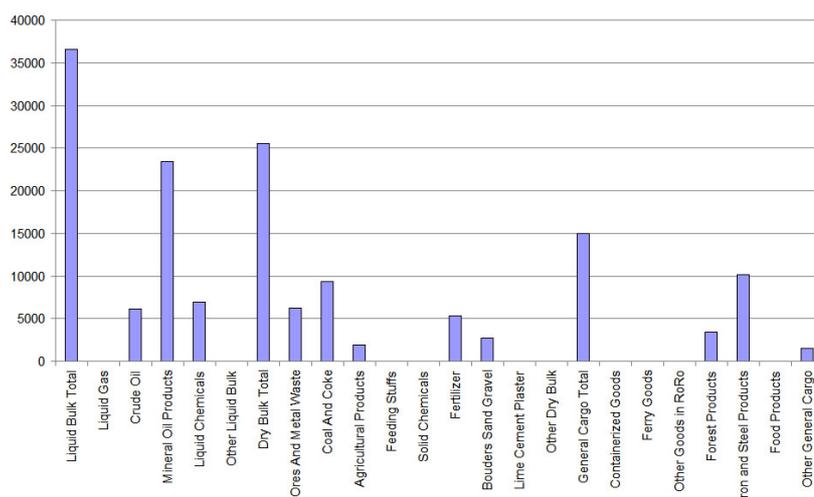
Chart 5-1: Port of Antwerp, Total (1,000 t., l.) and TEU Turnover (1,000 TEU, r.) 2002-2005



Total turnover reached 160 million tons in 2005 and was second largest in Europe after the port of Rotterdam. Growth has been averaging 6.7% from 2002 to 2005. Growth in the container turnover has been much greater. In 2005, it reached a peak of 6.5 million TEU and an average growth of 10.8% was achieved from 2002 to 2005. In the North Range of ports, Antwerp ranks third in TEU turnover after Rotterdam and Hamburg.

The turnover is therefore dominated by container handling. But liquid bulk is also of importance for the port, especially mineral oil products from surrounding refineries. Dry bulk is the second largest bulk commodity with large amounts of coal & coke, ores and scrap and fertilizer products.

Chart 5-2: Port of Antwerp - Commodity Turnover 2005 in 1,000 t.²⁴



As one of the largest ports in the world, Antwerp is served by about 800 liner services from around the world. For the NSR and BSR, the port of Antwerp is served by the following frequent liner services²⁵:

²⁴ Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

"K" Line, Maersk, ACL, Magemar NV, AGS Shipping, Maghreb/CL Line Bremen, Andrew Weir, Mann Lines, Anmar Line, MG Shipping, Armada Lines, MISC, BACO-LINER, Montemar Maritima S.A., Baltic Sea Line, MSC, Bonyad, Mundial Ro/Ro, Borchard Lines, NATVAR PARIKH INDUSTRIES Ltd., Break Bulk Caspian Line, NMT Lines, Brointermed, Normed Line, BULCON, North-Western Shipping Lines, C.M.N. International, NSC-Arkhangelsk, Cantabrico TransWeco, NWL, CCS, OOCL, CMA – CGM, OPDR, Compania Transatlantica Espanola, P&O Nedlloyd, Concorde Container Line, Pal Line, Consolidated Container Services, Portconnect, Contship, Portlink NV, Delmas, Rhenus Logistics NV, Eimskip, Rhine Line, ESF Euroservices, Rulewave, EUKOR, Safmarine, Fast Lines, Samskip, Ferryway NV, Sea-Cargo, Finnlines, Senator Lines, FOCS Container Service, Sloman Neptun, Gearbulk Pool Ltd., Team Lines, Grimaldi, TECO, H.Stinnes, Transfennica, Hamburg Süd, Transsteel Line, Hapag-Lloyd, Turkon Line, Hartel, Unifeeder, Hyundai Merchant Marine, Van Uden Ro-Ro, ISCONT LINES, Wallenius Wilhelmsen, LALINE and Will-Nor Line.

These shipping companies provide direct liner connections to basically all countries in the NSR and BSR. Most frequent are connections to Germany, Finland, the Netherlands, Norway and Sweden. A growing number of connections to Russia are also being established.

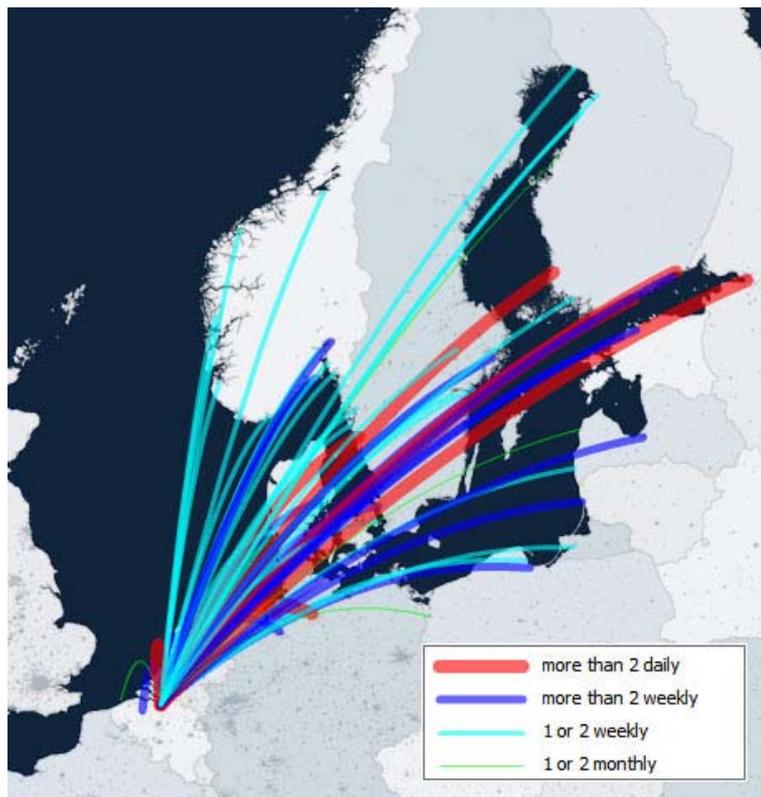
Table 5-1: Frequency of port calls in country by vessels (Liner Services) coming from Antwerp

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	1 Monthly	Latvia	4 weekly
Belgium	3 weekly	Lithuania	2 monthly
Denmark	3 monthly	Lithuania	7 weekly
Denmark	9 weekly	Netherlands	32 monthly
Estonia	24 monthly	Netherlands	26 weekly
Estonia	10 weekly	Norway	17 monthly
Finland	1 daily	Norway	23 weekly
Finland	34 monthly	Poland	13 monthly
Finland	46 weekly	Poland	3 weekly
Germany	3 daily	Russia	6 monthly
Germany	48 monthly	Russia	14 weekly
Germany	31 weekly	Sweden	22 monthly
Latvia	10 monthly	Sweden	22 weekly

Map 5-7 shows of certain individual port connections from the port of Antwerp to the NSR and BSR. The most important connections are to Rotterdam, Bremerhaven, Hamburg, Gothenburg, Rauma, Helsinki, Hamina, Saint Petersburg and Tallinn. It can be clearly seen that Antwerp does not serve the UK with liner services. Secondly, the demand of the Russian market can be interpreted in this regard as the transshipment of goods is largely handled by Finish ports.

²⁵ see Database and GIS-Client for Details

Map 5-7: Frequent Liner Services from Antwerp (ESN 2006)



This leads to the conclusion that much of turnover comes from overseas traffic or cargo flows from central and southern Europe where the port of Antwerp functions as a transshipment port for short sea shipping to the countries of the BSR. This is similarly true for the other direction.

5.2.2 Denmark

Denmark has a total of about 130 cargo and ferry ports distributed throughout the country. These ports differ considerably in terms of size and profile. Due to the geography of the country, most of these ports are small ferry ports. And about 95% of port calls are ferry calls.

The country's major ports in terms of turnover are Fredericia, Aarhus, Statoil Port and Copenhagen. The Statoil Port is a special port and solely functions as a terminal for mineral oil and related products. On national level, mineral oil is only part of the turnover. Total turnover roughly shares one third liquid bulk, one third solid bulk and another general cargo. In general trade terms, 43% of these goods are imports, 32% exports and 12-13% national transport between ports.²⁶

Around half of the total cargo turnover in Danish ports is handled by the six largest ports. The 17 largest ports handle 80% of total cargo turnover. Access to port services is open to all companies in Danish ports. The possibilities for the Danish ports to carry out port services are regulated by the port law. The limited liability ports have access to stevedoring, but the main principle is that port services are carried out by private companies. This gives way to extended possibilities for LSPs to offer services in port areas.

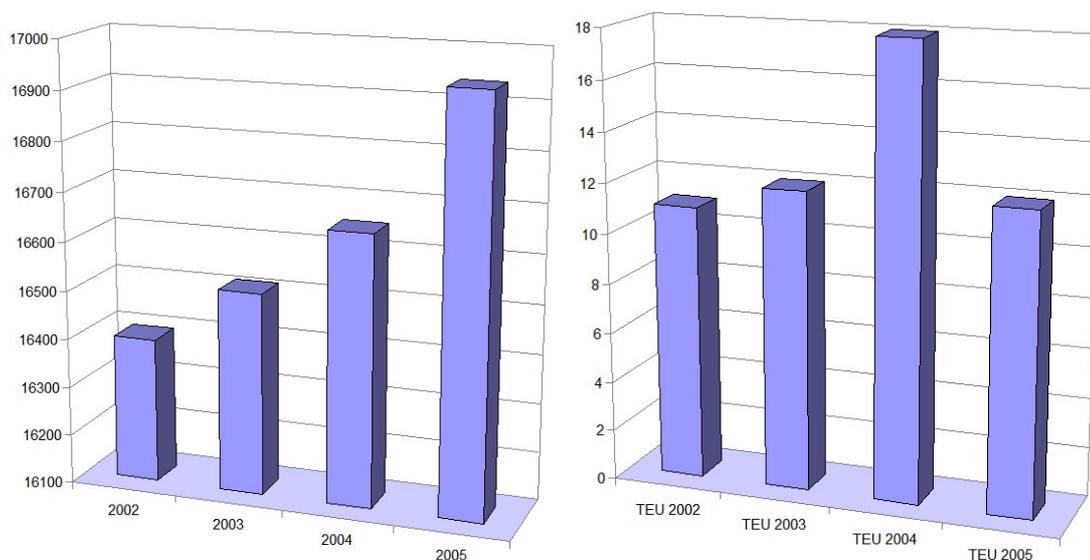
Fredericia²⁷

²⁶ Rytönen et al. 2002, p. 54

²⁷ <http://www.adp-as.com>

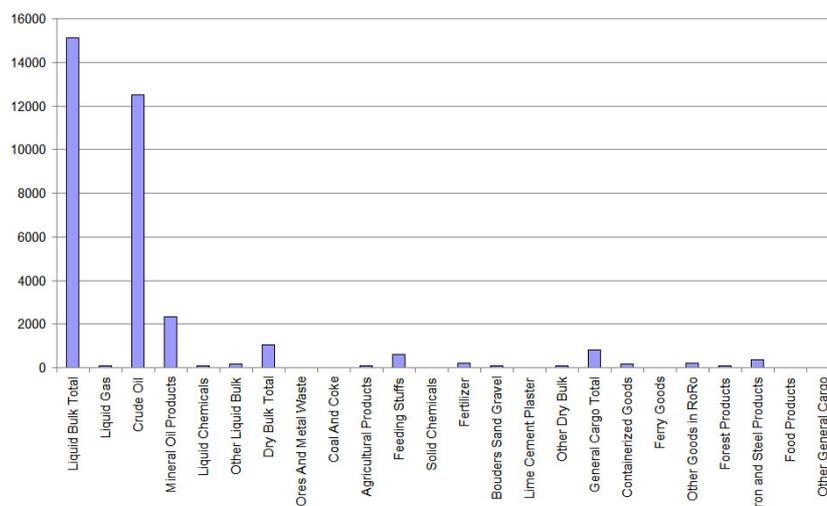
The port of Fredericia is Denmark's largest cargo port with an annual turnover of 16.9 million tons and 12 thousand TEU in 2005. However, the total turnover has not changed much over the years. The major part of cargo turnover consists of mineral oil and related products but it is not experiencing the strong growth on this market. Crude oil from the Danish oil fields in the North Sea is conveyed through a pipeline across Jutland to the Fredericia terminal. Here the oil is dispatched by sea or processed by the Shell refinery in Fredericia. In 2005, 89% of total turnover was liquid bulk (i.e. mineral oil and related products). Turnover of general cargo and containers has been small in comparison and is fluctuating which is common with such small absolute amounts.

Chart 5-3: Port of Fredericia, Total (1,000 t., l.) and TEU Turnover (1,000 TEU, r.) 2002-2005



The commodity chart (Chart 5-4) shows this distribution of cargo turnover and the dominance of oil products.

Chart 5-4: Port of Fredericia - Commodity Turnover 2005 in 1,000 t.²⁸



As the commodity structure is rather monotonous, only a few shipping companies provide liner services to the port of Fredericia. It is served by the following frequent liner services²⁹:

²⁸ Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

"K" Line, Fredericia Shipping, Shipping.dk, Baltic Line, Maersk, Trybom, DFDS Tor Line, NMT Lines and Unifeeder.

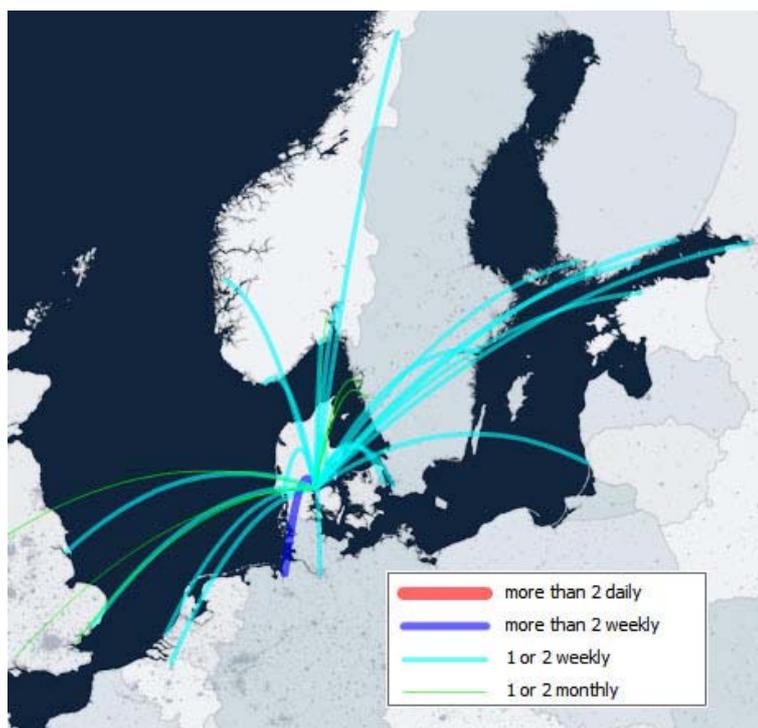
Nevertheless, connections are established to nearly all countries of the NSR and BSR. Table 5-2 presents an overview of the port calls from different countries. These are rather few but irregular port calls of tankers are omitted.

Table 5-2: Frequency of port calls in country by vessels (Liner Services) coming from Fredericia

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	1 weekly	Norway	1 monthly
Denmark	5 weekly	Norway	6 weekly
Estonia	2 weekly	Russia	2 weekly
Finland	3 weekly	Sweden	2 monthly
Germany	6 weekly	Sweden	2 weekly
Lithuania	2 weekly	UK	3 monthly
Netherlands	1 weekly	UK	3 weekly

General cargo connections are established to all major regions while oil related connections are mostly related to the Danish extraction of crude oil from the North Sea.

Map 5-8: Frequent Liner Services from Fredericia (ESN 2006)



In general, the port of Fredericia is a rather small port with a strong specialization in the handling of oil products.

Aarhus³⁰

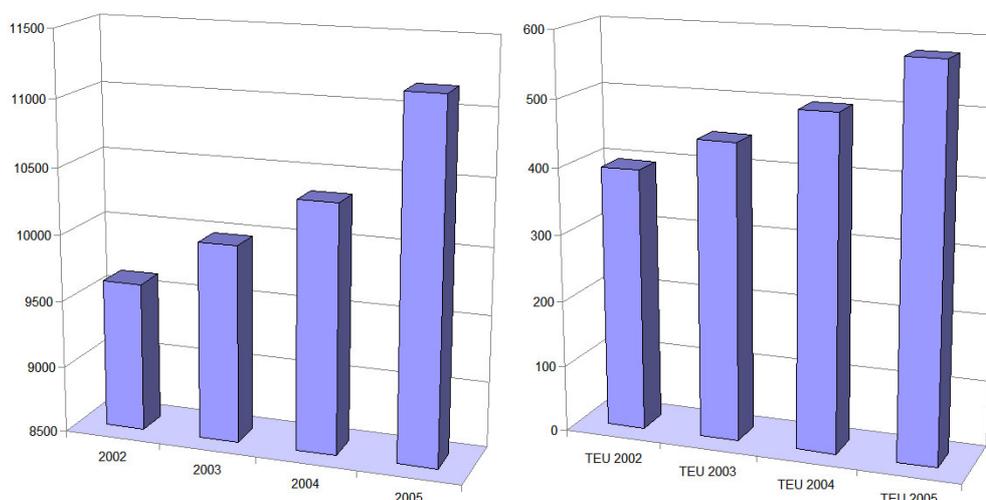
The second largest port in Denmark is the port of Aarhus with an annual turnover of 11.2 million tons and 581 thousand TEU in 2005 – 10% of which is by ferry. Growth of total turnover was averaging 5.1% between 2002 and 2005 for turnover. The development of

²⁹ see Database and GIS-Client for Details

³⁰ <http://www.aarhushavn.dk>

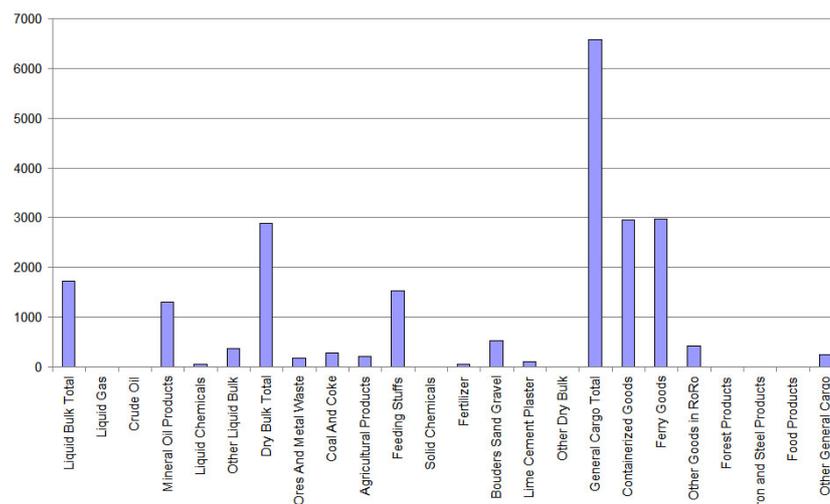
container handling has been much stronger. Here, growth averaged 16.2% for the same period.

Chart 5-5: Port of Aarhus, Total (1,000 t., l.) and TEU Turnover (1,000 TEU, r.) 2002-2005



The port of Aarhus is the most important container port in Denmark and the second largest of the Scandinavian countries after the port of Gothenburg. The port consists of a container terminal (run by Maersk Sealand Terminal), a bulk terminal, wood, oil and paper terminals as well as a ferry terminal. All types of commodities are handled by the port. This becomes evident by the differentiation of the commodity structure in Chart 5-6. Most part of the turnover falls in the category of general cargo. For Aarhus, this includes containerized goods as well as ferry and RoRo goods. These broad categories also include more differentiated products like forest and food products. As the port of Aarhus is the main general cargo handling port for Denmark, a large amount of the overseas trade is handled here that does not arrive by road via Germany.

Chart 5-6: Port of Aarhus - Commodity Turnover 2005 in 1,000 t.³¹



The importance for the general cargo business has to frequent container, RoRo and ferry liner services. The port of Aarhus is served by the following frequent liner services³²:

³¹ Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

³² see Database and GIS-Client for Details

"K" Line, MSC, Containerships, POL-LEVANT Shipping Lines Ltd, Eimskip, Safmarine, Finnlines, Samskip, Hamburg Süd, Scandlines, Hyundai Merchant Marine, Sea-Trans, IRISL (The Islamic Republic of Iran Shipping Lines)/Kaylon Shipping, TECO, KCS Kattegat Container Service, Turkon Line, Maersk, Unifeeder and Mols-Linien A/S.

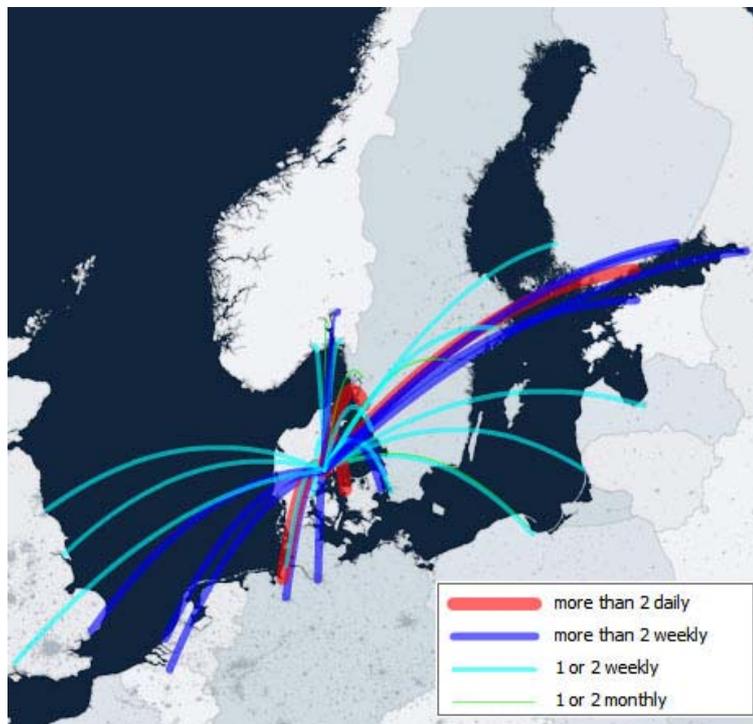
Many of these regularly call at the port of Aarhus so that a connections structure has been established that highly serves the countries of Finland, Germany and Sweden.

Table 5-3: Frequency of port calls in country by vessels (Liner Services) coming from Aarhus

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	6 weekly	Netherlands	7 weekly
Denmark	14 daily	Norway	2 monthly
Denmark	7 weekly	Norway	6 weekly
Estonia	5 weekly	Poland	2 monthly
Finland	17 weekly	Poland	1 weekly
Finland	6 yearly	Russia	2 monthly
Germany	4 monthly	Russia	6 weekly
Germany	21 weekly	Sweden	4 monthly
Latvia	2 weekly	Sweden	19 weekly
Lithuania	2 weekly	UK	10 weekly
Netherlands	2 monthly		

For the importance of individual ports, the ports of Helsinki, Gothenburg, Bremerhaven and Kalundborg are served more than twice daily.

Map 5-9: Frequent Liner Services from Aarhus (ESN 2006)

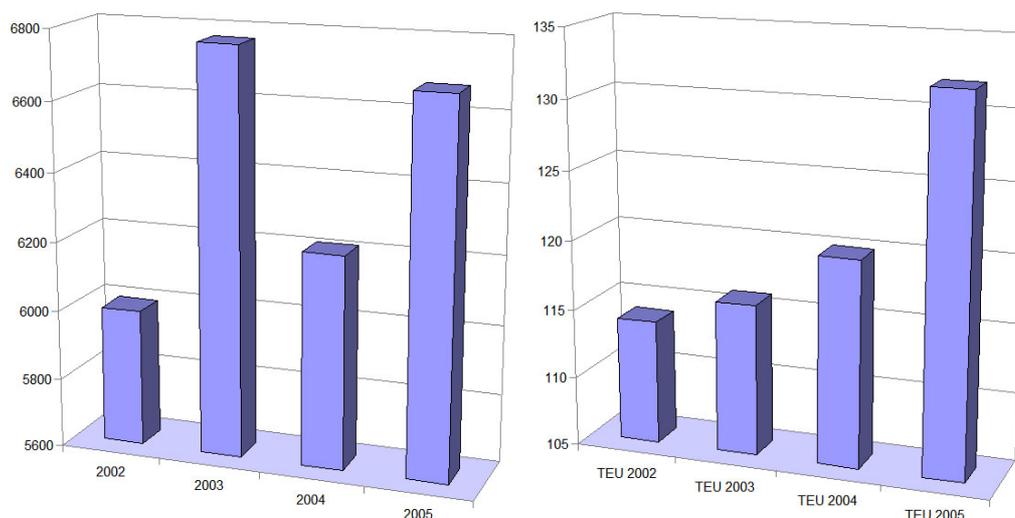


The port is currently enlarged to reach a capacity of 20 million tons per year. A new container terminal was opened in 2001 with a berthing depth of 14 million, three Panamax bridges and a capacity of 200.000 TEU per year. This will be the foundation of extended handling of containers and other general cargo goods.

Copenhagen³³

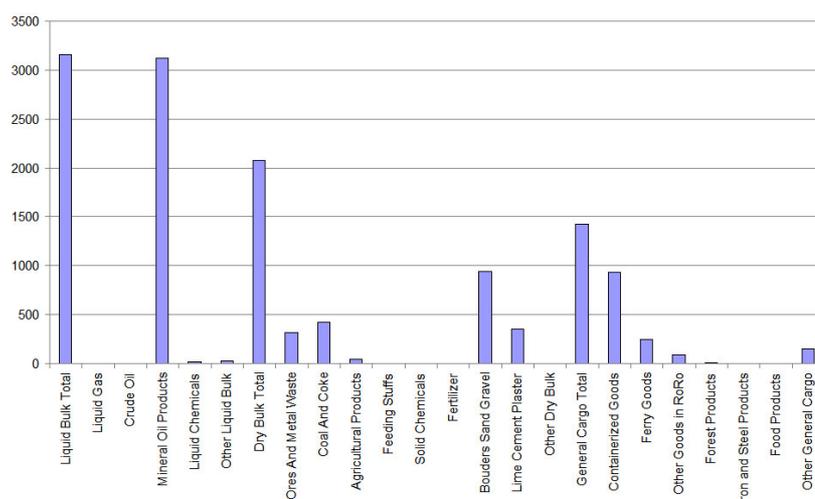
The port of Copenhagen is Denmark's third largest cargo turnover port. In 2005, 6.7 million tons were handled and an average growth of 4% was achieved from 2002 to 2005. The turnover of containers has been rather small. The port handled 132 thousand TEU in 2005 and averaged a growth of 5% over the last years. However, the development of the port is experiencing a structural change as the port of Copenhagen now cooperates with the adjacent port of Malmö. This cooperation now functions as one port. The concept was to create a productive, ultra-modern harbour capable of providing its customers and the region with an efficient transport service.³⁴

Chart 5-7: Port of Copenhagen, Total (1,000 t., l.) and TEU Turnover (1,000 TEU, r.) 2002-2005



As far as the commodity structure is concerned, the port of Copenhagen alone handles a fairly large amount of mineral oil products which can be related to the fuel demand of the surrounding agglomeration of the Öresund region. Dry bulk and general cargo follow after.

Chart 5-8: Port of Copenhagen - Commodity Turnover 2005 in 1,000 t.³⁵



³³ <http://www.cmpport.com>

³⁴ This study tries to separately analyse the two parts of the port of Copenhagen-Malmö, although the handling of goods is increasingly shared according to competency.

³⁵ Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

As the port of Copenhagen is a small port, it is only served regularly by the following liner services³⁶:

Cotunav, Sea-Trans, DFDS Tor Line, Turkon Line, Finnlines, Unifeeder and Hyundai Merchant Marine.

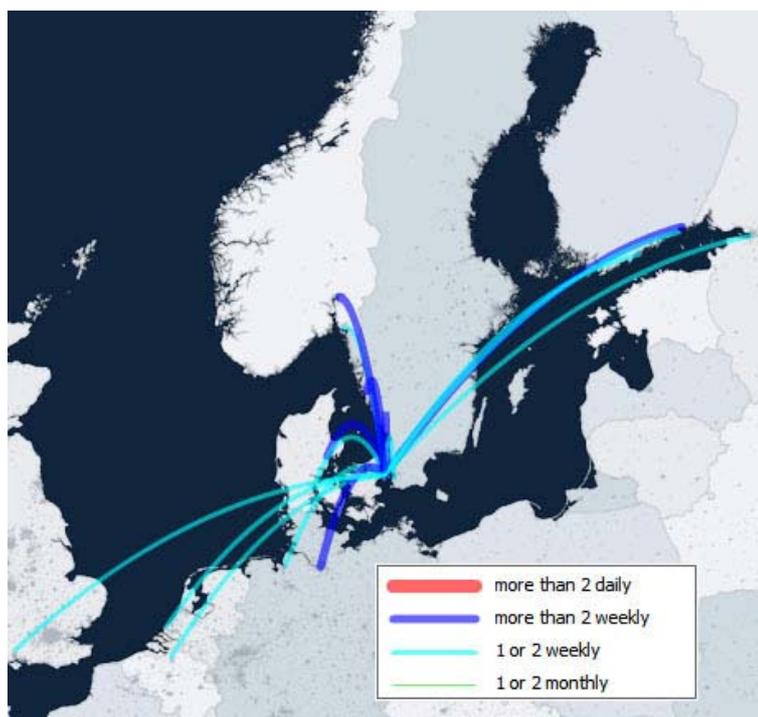
These are distributed by destination only to a few countries, mainly Sweden, Norway and Germany.

Table 5-4: Frequency of port calls in country by vessels (Liner Services) coming from Copenhagen

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	2 weekly	Norway	1 daily
Denmark	5 weekly	Norway	3 weekly
Finland	3 weekly	Russia	2 weekly
Finland	6 yearly	Sweden	1 daily
Germany	5 weekly	Sweden	7 weekly
Netherlands	2 weekly	UK	1 weekly

Map 5-10 shows the called ports by regular liner services. Main ports are: Helsingborg, Aarhus, Gothenburg, Oslo and Hamburg.

Map 5-10: Frequent Liner Services from Copenhagen (ESN 2006)



This leads to the conclusion that the port of Copenhagen has a limited number of trading relations but nonetheless serves a large urban agglomeration with a respective demand. The cooperation with the port of Malmö might lead to a diversified provision of logistical services according to each competency. But the nearby ports of Trelleborg and Helsingborg in Sweden take up a whole lot of the road based transport that is going by RoRo vessel to Sweden. And on the other hand, the building of the Öresund Bridge has nullified the ferry traffic between Copenhagen and Malmö. So, only long distance vessel connections have become of importance for the port.

³⁶ see Database and GIS-Client for Details

5.2.3 Estonia

The development of maritime transport in Estonia has been rapid. For example, from 1995 to 1999 the increase of the annual transport rate was doubled. More than 90% of the transit via Estonia and a major part of the cargo imported to or exported from Estonia goes through the Estonian seaports.

In total, there are about 30 ports which are involved in merchant shipping, but most of the cargo is concentrated at the port of Tallinn. Other ports with considerable international cargo turnover are Kunda Port, Miiduranna Port, Vene Balti Port and Sillamäe Port. There are some additional private ports with international traffic.

Tallinn³⁷

The port of Tallinn consists of five ports: Muuga, Old City Harbour, Paljassaare, Paldiski South Harbour and Saaremaa Port. The Port of Tallinn Ltd. is the biggest port enterprise in Estonia and one of the largest contributors to GDP. The port is strategically located in the middle of the coastline. The port handles all kinds of cargo, with the Muuga port being by far the most important one. The port, compared to others in Estonia, is technically well equipped. In Estonia, the Tallinn region also experiences the most intense traffic concentration.

Today, the port has been turned into a multipurpose port with a capacity to handle oil products, coal, fertilizers, metals, cars, containers and many other types of Ro-Ro and Lo-Lo cargoes. There are a total of 25 handling companies working in the harbour. The majority of them and also the biggest, work with the handling of oil products, which has expanded fastest of all cargo products during last couple of years. Estonia and Russia are also exporting paper-wood via the port of Muuga to the Swedish paper industry which is mainly located along the coastline.

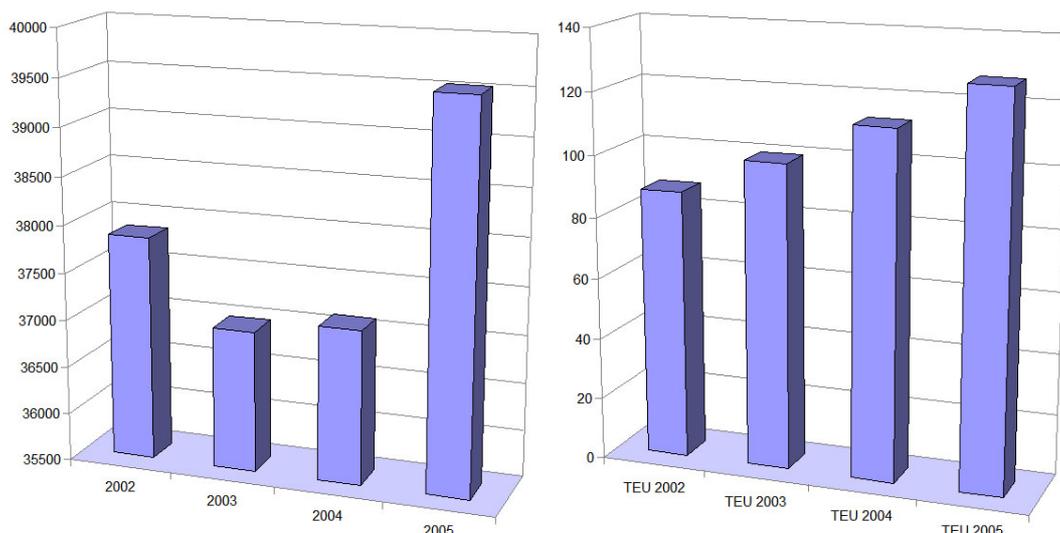
The City Port has turned into a passenger port that serves for ~6 million passengers per year during the last three years. Still, some transportation of goods, a mix of clean goods, like containers and metal occurs.

In 2005, the Port of Tallinn handled 39.5 million tons of cargo, from which transshipment of goods constituted the main part. By the increase of total cargo throughput (29.4 million tons in 2000³⁸) the Port of Tallinn holds one of the leading positions in the Baltic Sea Region. This serves as a confirmation of the favourable geographical location of the port in relation to the Russian raw materials market and of the competitiveness of the offered services as compared to other ports in the region.

³⁷ <http://www.ts.ee>

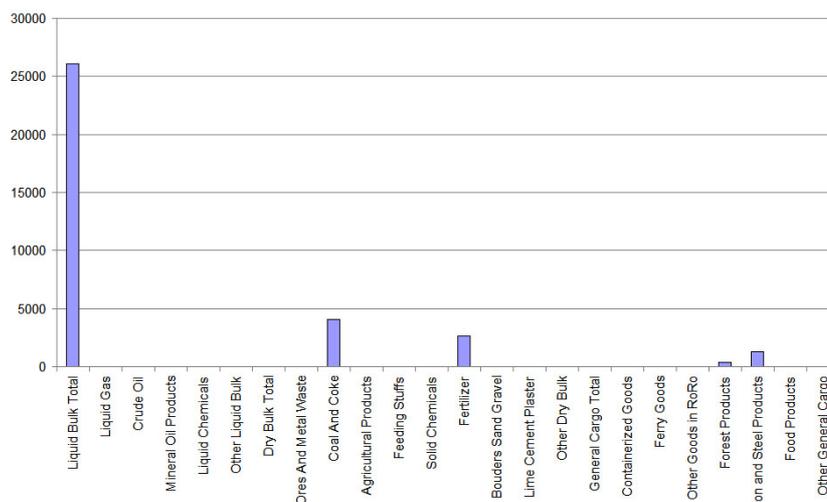
³⁸ Rytönen et al. 2002, p. 33

Chart 5-9: Port of Tallinn, Total (1,000 t., l.) and TEU Turnover (1,000 TEU, r.) 2002-2005



The commodity structure is dominated, as mentioned, by the transshipment of crude oil and related mineral oil products. All other commodities are traded much less. Nonetheless, they are of importance for the regional economy. Chart 5-10 gives only a fragmented picture of reality. Many of the Estonian products from the forest and telecommunications industry are exported via the port of Tallinn.

Chart 5-10: Port of Tallinn - Commodity Turnover 2005 in 1,000 t.³⁹



As the port of Tallinn has become a major player for the trade with the Baltic States but also as a transshipment port for goods from and to Russia, it is served by a number of frequent liner services⁴⁰:

Baltic Line, Eckerö Line, OOCL, Transfennica, Baltic Scandinavian Lines, Finnlines, Samskip, Unifeeder, Break Bulk Caspian Line, Maersk, Scanrapid Eesti OÜ, Viking Line, Cantabrico TransWeco, Mann Lines, Tallink, ZIM Israel Nav, CH-Line, Maras Linija, Team Lines, CMA – CGM, MSC and TECO.

These shipping companies provide connections to almost all countries from the NSR and BSR. Most frequent are vessel connections to the neighbouring countries of Latvia, Finland and Sweden, but also to Germany.

³⁹ Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

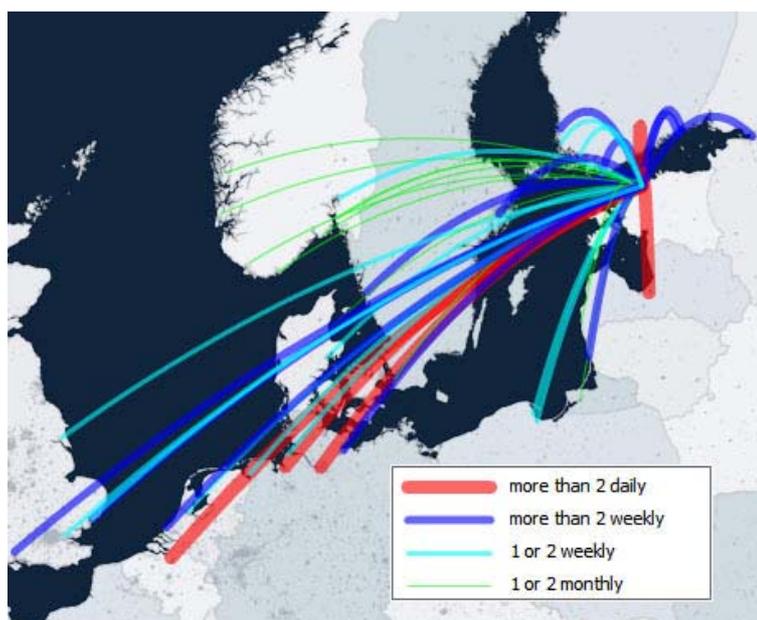
⁴⁰ see Database and GIS-Client for Details

Table 5-5: Frequency of port calls in country by vessels (Liner Services) coming from Tallinn

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	2 monthly	Netherlands	2 monthly
Belgium	10 weekly	Netherlands	6 weekly
Denmark	2 monthly	Norway	18 monthly
Denmark	2 weekly	Norway	1 weekly
Finland	13 daily	Poland	3 weekly
Finland	64 monthly	Russia	2 monthly
Finland	25 weekly	Russia	5 weekly
Germany	4 monthly	Sweden	3 daily
Germany	28 weekly	Sweden	42 monthly
Latvia	6 monthly	Sweden	9 weekly
Latvia	9 weekly	UK	22 monthly
Lithuania	2 monthly	UK	7 weekly
Lithuania	4 weekly		

Regarding individual ports, most frequent services have been established to Helsinki, Riga, Hamburg, Bremerhaven and Antwerp.

Map 5-11: Frequent Liner Services from Tallinn (ESN 2006)



In general, the port of Tallinn plays a crucial role in the development of the Russian trade in the near future. Plans for port expansion are underway that are targeted at the transshipment of Goods for the Russian market.

5.2.4 Finland

In Finland, there are about 50 ports with international traffic. Most of them are small and the share of the ten largest ports was 73% of all cargo handled in Finnish ports in 2003. The largest ports are: Helsinki, Kotka, Naantali, Hamina, Turku, Pori and Rauma. Most public ports in Finland are owned by a municipality and operate as public utilities, meaning that, in principle, the port makes its necessary investments using its own income. Private stevedoring companies operate the cargo handling in ports which might make potentials in logistical services to be made much more easily available for shipping companies than elsewhere.

There are also several privately owned ports, which are usually owned by industrial enterprises and are situated close to their production plants. Examples of owners of private ports are companies in the forest industry, steel industry, chemical industry, oil industry, building industry and power plants.

The total projected maritime cargo transport in Finnish ports will be over 100 million tons in 2010 and will be near 130 million tons in 2020. The transport route via the Baltic Sea is the basic sea route for the Finnish industry, due to the fact that almost all of the transit traffic through Finland uses the sea route.

About 90% of Finnish seaborne transport is inside the EU countries. Roughly 58% of imports have its origin inside the BSR, and 40% of exports are shipped to destination ports in the BSR.⁴¹ The biggest commodity groups in export have been paper, paperboard, sawn wood, general cargo and mineral oil while imports are dominated by mineral oils, general cargo, coal, coke, ore and concrete.

Hamina⁴²

The port of Hamina is located at the south-eastern coastline of Finland close to the Russian border. During the time of the Soviet Union, the port was known as a transshipment port and export port for forest products. After the disintegration of the Soviet Union, transshipment temporarily decreased but due to the growing Russian economy it is growing again, especially in the areas of container traffic, forest products and vehicles. The port is concentrated on ferry and RoRo traffic, container traffic and liquid bulk transport.

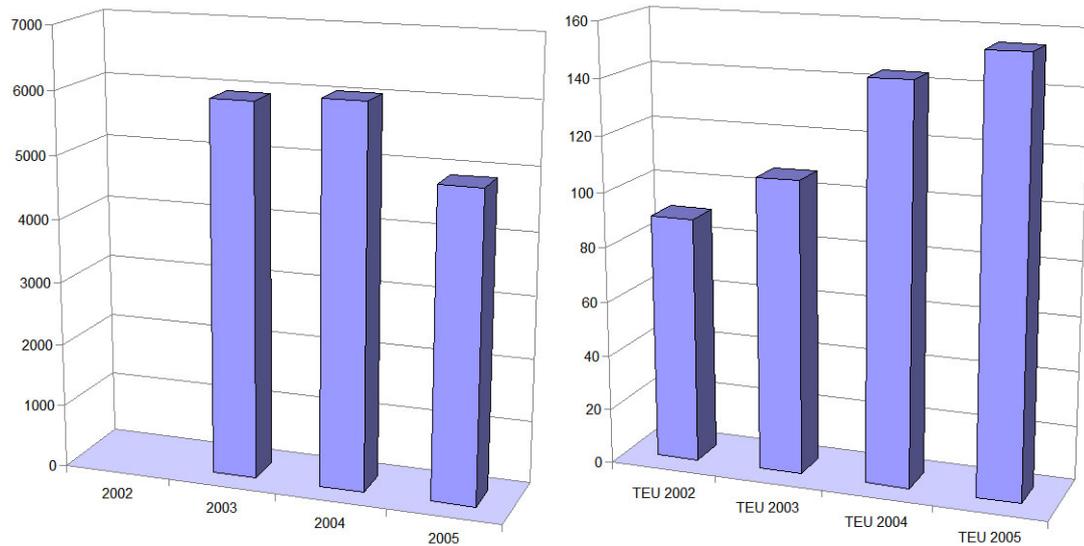
In conjunction with Kotka, the port of Hamina is increasingly functioning as a transshipment port for Russia and Estonia. It is also handling a lot of forest products, minerals and chemicals. The oil transshipment, however, has declined over the years as Estonia has taken over large parts of it.

In 2005, total turnover reached 4.9 million tons which is decline from the previous years. On the other hand, container turnover is growing substantially. 155 thousand TEU were handled in 2005 while averaging a growth of ~20% per year from 2002 to 2005.

⁴¹ Ojala 2005

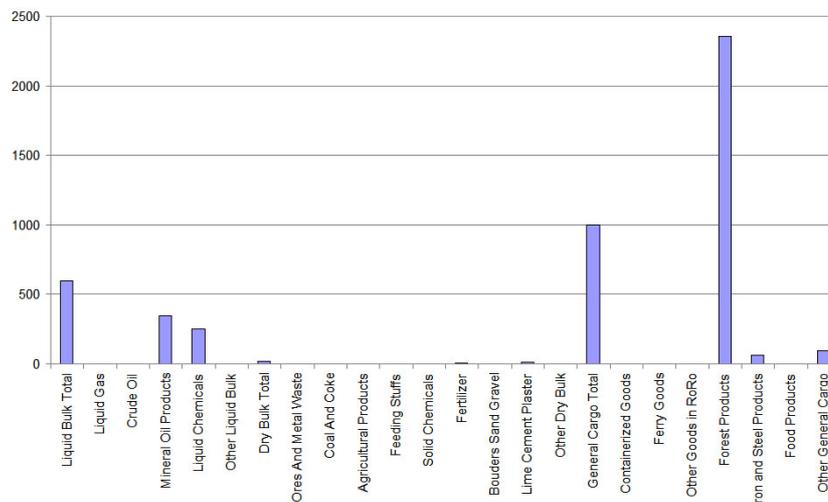
⁴² <http://www.portofhamina.fi>

Chart 5-11: Port of Hamina, Total (1,000 t, l.) and TEU Turnover (1,000 TEU, r.) 2002-2005⁴³



The commodity structure of the port of Hamina is dominated by the turnover of forest products, i.e. wood articles, paper, paperboard and pulp. Furthermore the transshipment as well as the import and export of general cargo for the Finish industry are of importance. Transshipment of liquid bulk in the form of mineral oil products from Russia is also a main activity. All other categories are much less important.

Chart 5-12: Port of Hamina - Commodity Turnover 2005 in 1,000 t.⁴⁴



To handle these kinds of commodities, the port of Hamina is served by the following frequent liner services which are in most cases RoRo ferries and container vessels⁴⁵:

"K" Line, Echoship, Sea-Trans, Cantabrico TransWeco, Eimskip, Team Lines, CMA – CGM, Finnlines, Transfennica, Combisped, Maersk, Unifeeder, Consolidated Container Services, OOCL, UPM-Seaways and ZIM Israel Nav.

These shipping companies are providing regular connections mainly to Sweden, Germany, the UK, Belgium, Denmark, Russia and other ports in Finland.

⁴³ For 2002 no total turnover data available

⁴⁴ Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

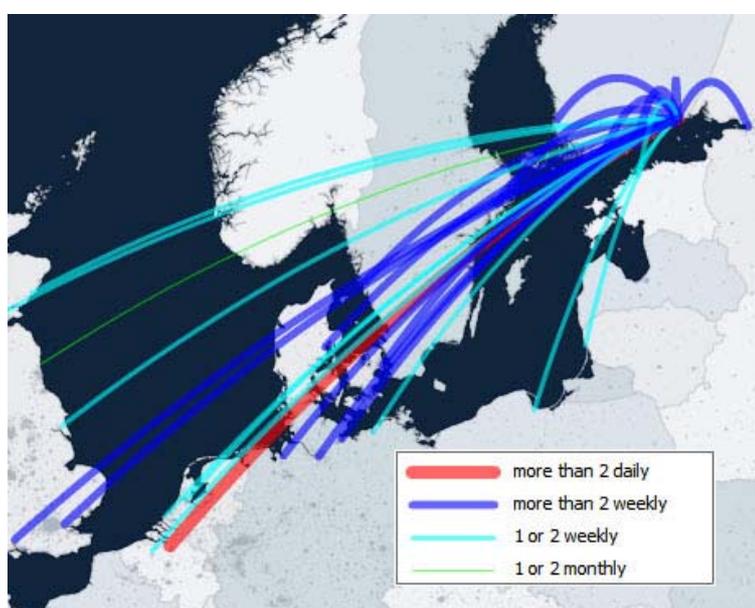
⁴⁵ see Database and GIS-Client for Details

Table 5-6: Frequency of port calls in country by vessels (Liner Services) coming from Hamina

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	12 weekly	Netherlands	2 weekly
Denmark	12 yearly	Poland	1 weekly
Estonia	1 weekly	Russia	3 weekly
Finland	20 monthly	Sweden	20 monthly
Finland	17 weekly	Sweden	3 weekly
Germany	14 weekly	UK	11 monthly
Lithuania	1 weekly	UK	8 weekly

As a rather small port fairly many relations to the important ports of the other countries in the NSR and BSR have been established. Strongest connections are to Antwerp and the major ports of Germany, Sweden, Denmark and The UK.

Map 5-12: Frequent Liner Services from Hamina (ESN 2006)



The port of Hamina has developed a regional specialization in forest products that corresponds to the regional industries' competency. The increasing flow of forest products via the Baltic Sea makes a continual expansion of the ports activities in this sector reasonable.

Helsinki⁴⁶

The port of Helsinki is the largest container and general cargo port in Finland. The share between import and export is almost even. Helsinki is also a large multi purpose port with handling of largely unitized RoRo cargo.

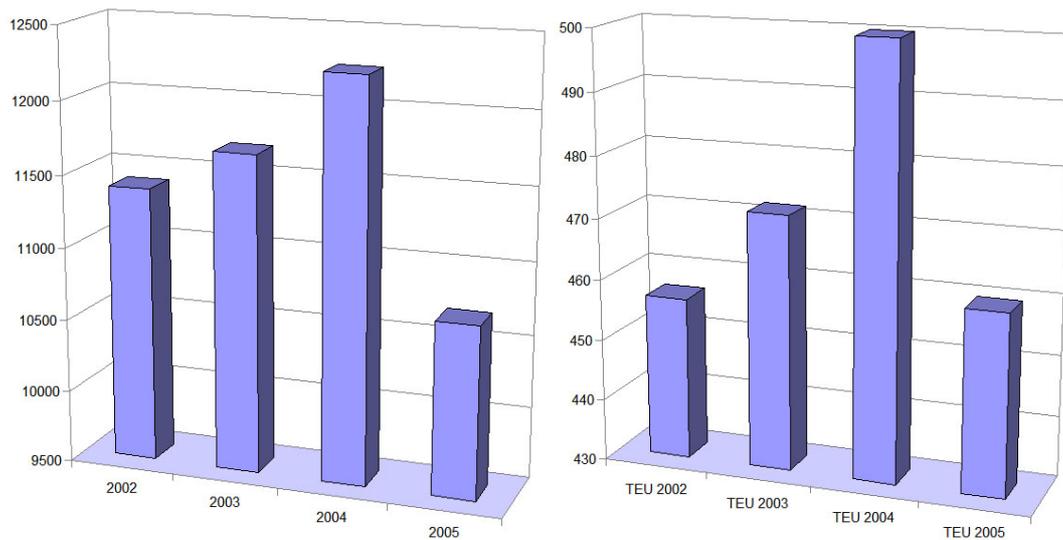
Its market share is about 39% of Finland's imports and 18% of exports. Looking only at containers, it accounts for 54% of incoming and 40% of outgoing units.⁴⁷

In 2005, the port reached a total turnover of 10.7 million tons which was less than the previous year when it reached a peak of 12.2 million tons. It led to a negative average growth of -1.8% per year from 2002 to 2005. Turnover of containers drop a small amount as well with 460 thousand TEU in 2005 compared to 500 thousand TEU in 2004. But it nevertheless grew on average about 0.4% per year over the last years.

⁴⁶ <http://www.portofhelsinki.fi>

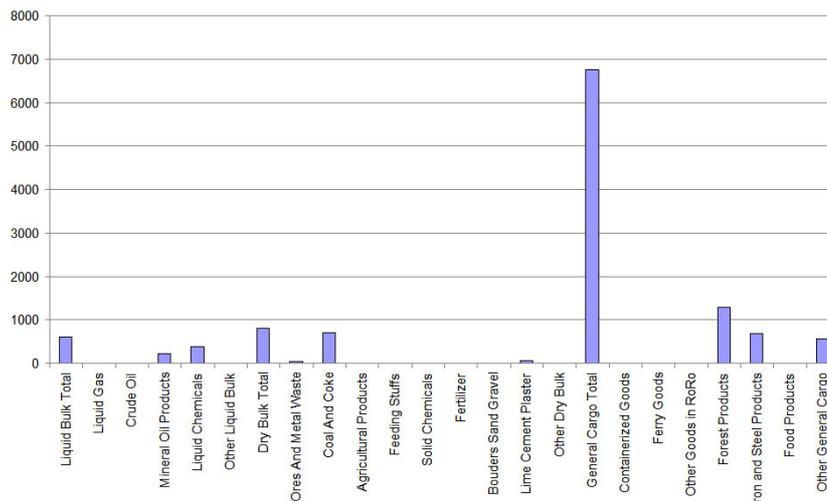
⁴⁷ Rytkönen et al. 2002, p. 20

Chart 5-13: Port of Helsinki, Total (1,000 t., l.) and TEU Turnover (1,000 TEU, r.) 2002-2005



The commodity structure is dominated by general cargo turnover. Liquid and dry bulk cargo is much less important. Forest products take up a large part of the cargo.

Chart 5-14: Port of Helsinki - Commodity Turnover 2005 in 1,000 t.⁴⁸



The general cargo for the main part arrives at Helsinki with RoRo ferries and in containers. The operating shipping companies are to be found within these two categories. The frequent liner services are then provided by the following⁴⁹:

"K" Line, Hacklin Seacont, Tallink, ACL, Maersk, Team Lines, CMA – CGM, MSC, TECO, Containerships, OOCL, UECC, Eckerö Line, Polfin Line/Euroafrica Co. Ltd., Unifeeder, Eimskip, Samskip, Viking Line, ESF Euroservices, Scandlines, Wallenius Wilhelmsen, Finnlines, Sea Wind Line, ZIM Israel Nav, Grimaldi and Silja Line Cargo.

The frequency of port connections to other countries is generally high as many of the services call at the port of Helsinki once a day or every two days. So, all surrounding countries are served by vessels arriving from Helsinki. High amounts of port calls are especially registered in Estonia, Sweden, Germany, the UK and other ports of Finland.

⁴⁸ Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

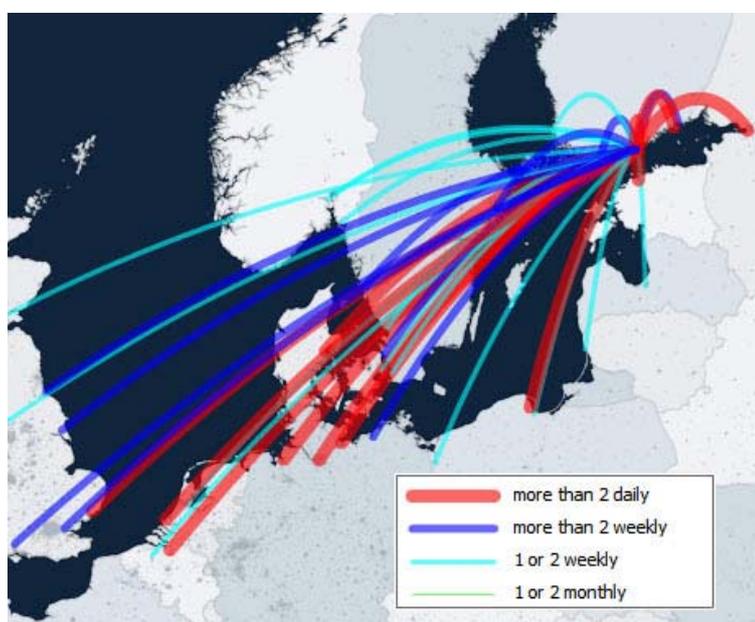
⁴⁹ see Database and GIS-Client for Details

Table 5-7: Frequency of port calls in country by vessels (Liner Services) coming from Helsinki

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	17 weekly	Netherlands	4 monthly
Denmark	12 weekly	Netherlands	16 weekly
Estonia	5 daily	Norway	4 weekly
Estonia	12 monthly	Poland	15 weekly
Estonia	19 weekly	Russia	9 weekly
Finland	20 weekly	Sweden	2 daily
Germany	35 weekly	Sweden	12 weekly
Latvia	2 weekly	UK	2 monthly
Lithuania	2 weekly	UK	25 weekly

Regarding individual port connections, the most frequent connections are established to Saint Petersburg, Kotka, Tallinn, Gdansk, Lübeck, Hamburg, Bremerhaven, Aarhus, Rotterdam, Antwerp and Felixstowe.

Map 5-13: Frequent Liner Services from Helsinki (ESN 2006)



Although the turnover of the port of Helsinki has been on the decline in recent years, the importance of trade via the Baltic Sea between central Europe and Finland is growing in importance in relation to the nearby Russian market.

Kotka⁵⁰

The port of Kotka is located at the south-eastern coastline of Finland close to the Russian border. During the time of the Soviet Union, the port was known as a transshipment port and export port for forest products. After the disintegration of the Soviet Union, transshipment temporarily decreased but due to the growing Russian economy it is growing again, especially in the areas of container traffic, forest products and vehicles.

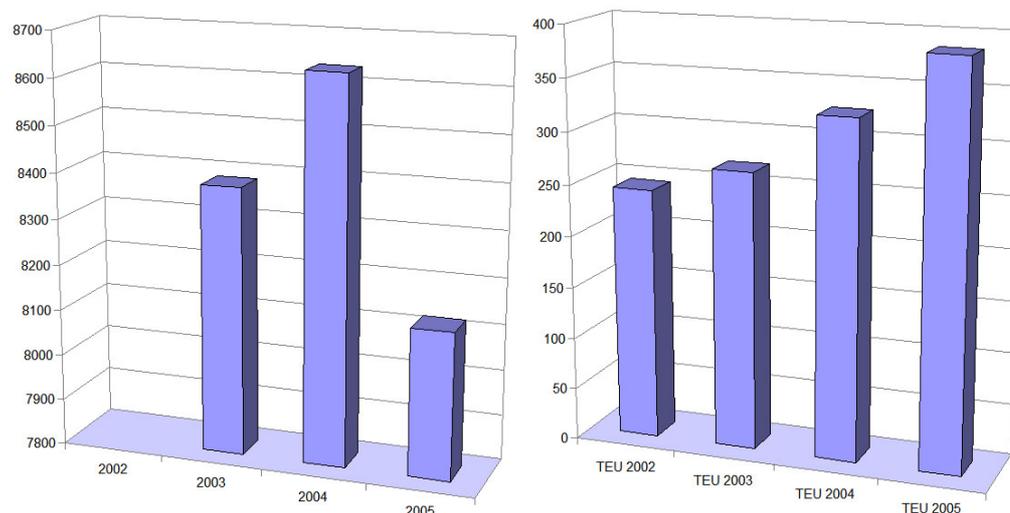
Kotka is concentrated on exporting Finnish forest products and is lately also transshipping large volumes of finished vehicles to Russia. Besides Hamina, the port of Kotka is also functioning in part as a transshipment port for Estonia. It is also handling a lot of forest products, minerals

⁵⁰ <http://www.portofkotka.fi>

and chemicals. The oil transshipment has declined over the years as Estonia has taken over large parts of it.

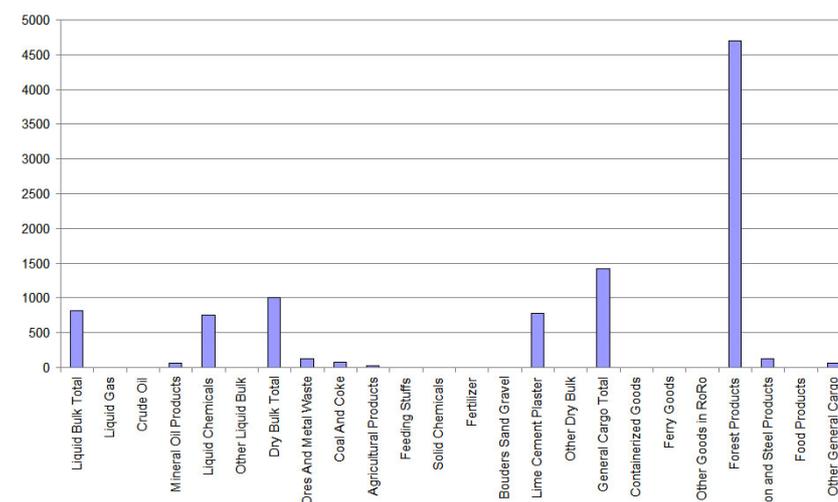
In 2005, the port of Kotka achieved a total turnover of 8.1 million tons which was somewhat less than 2004 (8.6 million tons). The situation was similar to that of Hamina. The TEU turnover also followed this pattern growing at an average of 16.7% per year from 2002 to 2005 and reaching 387 TEU in 2005.

Chart 5-15: Port of Kotka, Total (1,000 t., l.) and TEU Turnover (1,000 TEU, r.) 2002-2005⁵¹



The commodity structure is identical to that of Hamina showing large quantities handled in the area of forest products, some general cargo and liquid and dry bulk. However, liquid bulk includes mainly liquid chemicals instead of mineral oils.

Chart 5-16: Port of Kotka - Commodity Turnover 2005 in 1,000 t.⁵²



To handle these kinds of commodities, the port of Kotka is served by the following frequent liner services which are in most cases RoRo ferries and container vessels⁵³:

CMA – CGM, Maersk, UECC, Eimskip, MSC, Unifeeder, ESF Euroservices, SolNiver Lines, UPM-Seaways, Finnlines, Spliethoff, Wagenborg Shipping B.V., Hartel, Team Lines and ZIM Israel Nav.

⁵¹ For 2002 no total turnover data available

⁵² Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

⁵³ see Database and GIS-Client for Details

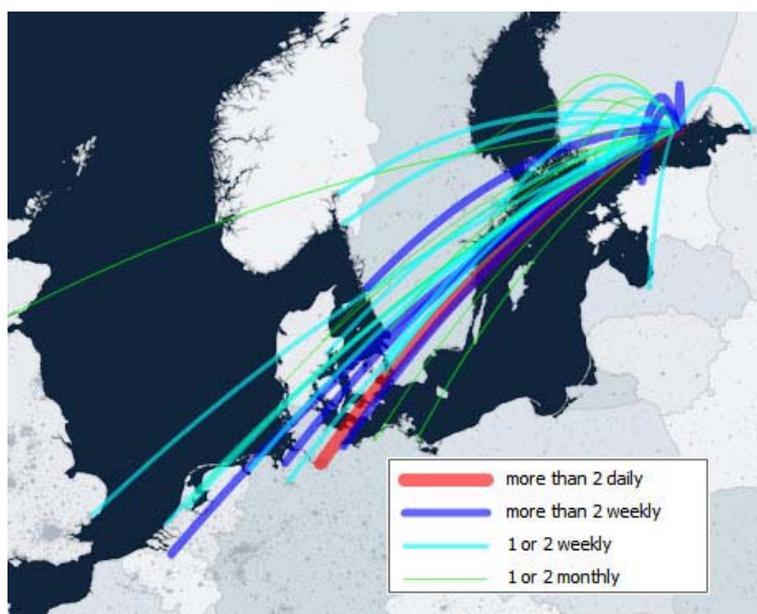
These shipping companies are providing regular connections mainly to Germany, Sweden, the Netherlands, Denmark and other ports in Finland. Growing transshipment via Saint Petersburg has not been integrated into these figures.

Table 5-8: Frequency of port calls in country by vessels (Liner Services) coming from Kotka

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	4 weekly	Netherlands	7 monthly
Denmark	4 monthly	Netherlands	2 weekly
Denmark	3 weekly	Norway	4 monthly
Estonia	3 weekly	Norway	2 weekly
Finland	4 monthly	Russia	1 weekly
Finland	15 weekly	Sweden	5 monthly
Germany	9 monthly	Sweden	6 weekly
Germany	20 weekly	UK	1 monthly
Latvia	2 weekly	UK	1 weekly

The most important individual liner connections of frequent liner services are for the port of Kotka to Hamburg, Lübeck, Bremerhaven, Antwerp, Aarhus, Tallinn, Hamina and Helsinki.

Map 5-14: Frequent Liner Services from Kotka (ESN 2006)



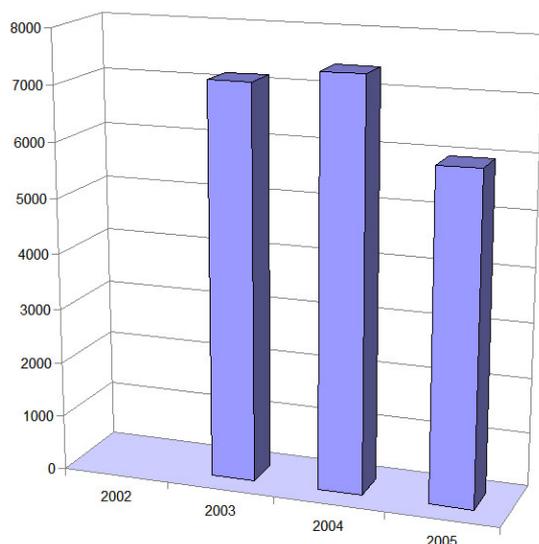
The same as for Hamina is true for the port Kotka. It has developed a regional specialization in forest products that corresponds to the regional industries' competency. The increasing flow of forest products via the Baltic Sea makes a continual expansion of the ports activities in this sector reasonable. In addition the port of Kotka has specialized in vehicle transshipment to Russia. This special trade along with trade in other general cargo areas will be key for the future development of the port.

Naantali⁵⁴

The port of Naantali is an important port for the Finish turnover of mineral oils. The capacity of the port was already utilized to its full extent in 2001. The total cargo volume reached close to 7 million tons and has been turning around this amount in the last years. In 2005, it reached a total turnover of ~6 million tons.

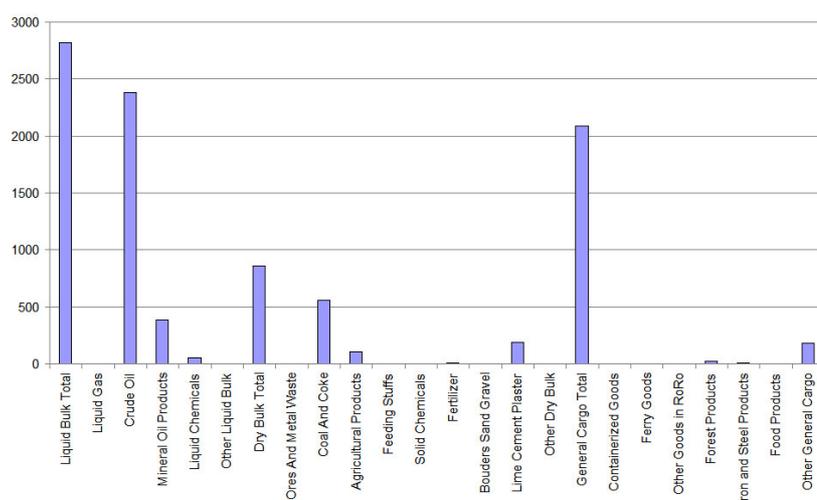
⁵⁴ <http://www.naantali.fi/satama/>

Chart 5-17: Port of Naantali, Total Turnover (1,000 t., l.) 2002-2005⁵⁵



Almost half of this total turnover is the handling of crude oil and related mineral oil products from Russia and the NSR. The rest is roughly 2 million tons of general cargo and less than 1 million tons of dry bulk.

Chart 5-18: Port of Naantali - Commodity Turnover 2005 in 1,000 t.⁵⁶



The port of Naantali is only served by one frequent liner service⁵⁷: Oy Finnlink Ab Naantali calls at the port three times daily. All other traffic is non-frequent. That basically relates to the shipping of oil. The general cargo turnover is high due to the daily connections of ferries to Mariehamn on the island Aland between Finland and Sweden.

Therefore, the port of Naantali is a specialized port in the area of oil turnover. Furthermore, the closeness of the port of Turku leads to regional dependency and interaction of cargo flow attraction where the port of Turku provides for more suitable facilities for the handling of general cargo besides ferry traffic. However, the continuous expansion of the oil trade between Russia and the rest of Europe will probably keep the turnover of the port of Naantali growing as long as the limit for handled amounts will be extended.

⁵⁵ For 2002 no total turnover data available

⁵⁶ Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

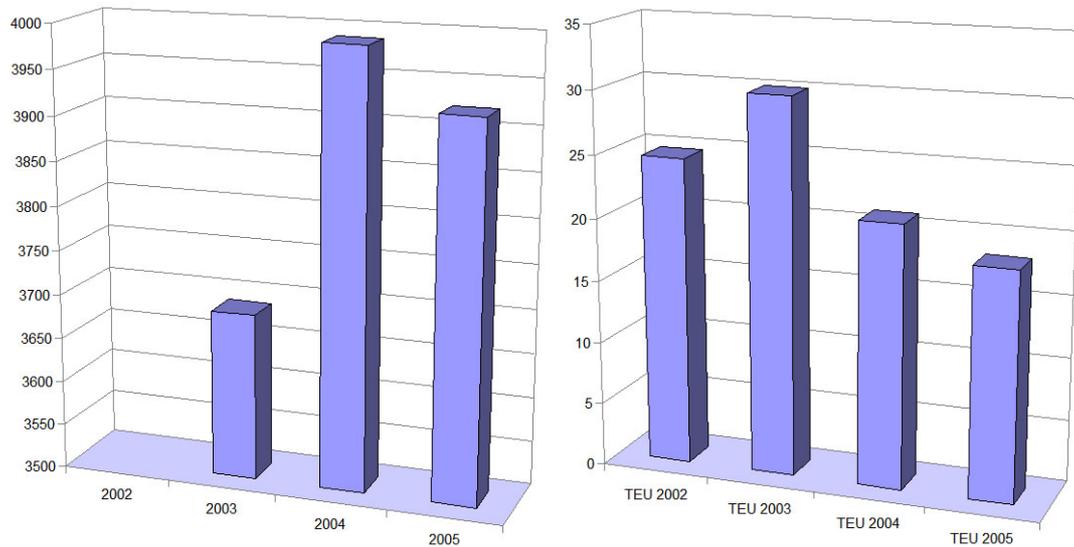
⁵⁷ see Database and GIS-Client for Details

Turku⁵⁸

The port of Turku is a multi purpose port like the port of Helsinki. Passenger traffic and unitized cargo are the main issues. RoRo traffic represents around 90% of total freight volumes. The port contains ferry, RoRo, container and passenger terminals.

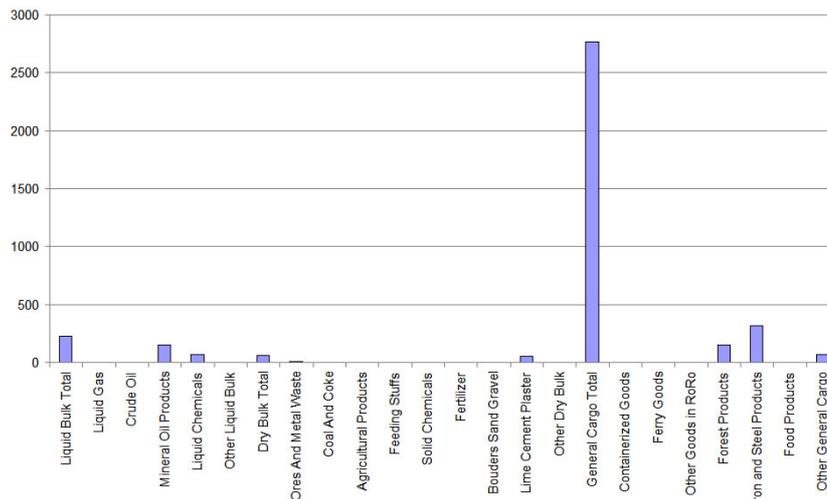
In 2005, the port achieved a total turnover of 3.9 million tons and a TEU turnover of 18 thousand.

Chart 5-19: Port of Turku, Total (1,000 t., l.) and TEU Turnover (1,000 TEU, r.) 2002-2005⁵⁹



Container turnover has not been the focus of business for the port but general cargo is the major commodity group. Most of this commodity is handled by the RoRo traffic with Turku.

Chart 5-20: Port of Turku - Commodity Turnover 2005 in 1,000 t.⁶⁰



The port of Turku is served by the following frequent liner services of which most provide RoRo vessels for transport⁶¹:

⁵⁸ <http://www.port.turku.fi>

⁵⁹ For 2002 no total turnover data available

⁶⁰ Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

⁶¹ see Database and GIS-Client for Details

Baltic Line, Hartel, R.M.S., Team Lines, Eimskip, Mann Lines, Sea Wind Line, Viking Line, Finnlines, Powerline and Silja Line Cargo.

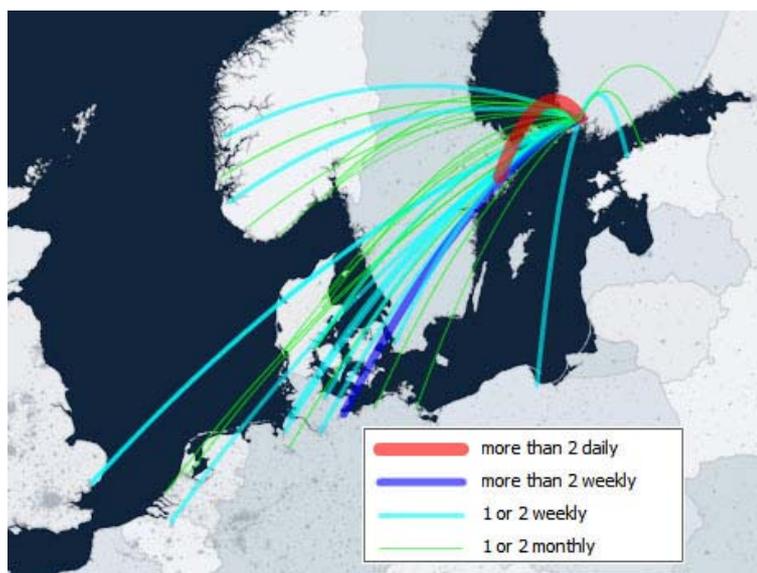
Connections of these shipping companies have been established mainly to Sweden and Germany.

Table 5-9: Frequency of port calls in country by vessels (Liner Services) coming from Turku

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	2 weekly	Netherlands	4 monthly
Denmark	7 monthly	Norway	20 monthly
Denmark	1 weekly	Norway	2 weekly
Estonia	2 monthly	Poland	1 weekly
Estonia	1 weekly	Sweden	6 daily
Finland	4 monthly	Sweden	2 monthly
Germany	15 monthly	Sweden	1 weekly
Germany	12 weekly	UK	2 weekly

Regarding most frequently services ports from Turku, there are two to mention: Stockholm and Lübeck.

Map 5-15: Frequent Liner Services from Turku (ESN 2006)



The port of Turku has its strength in connection with the port of Naantali. The port of Naantali handles the bulk cargo and Turku the general cargo. But, as Turku is not as close to the Russian market compared to ports like Hamina and Kotka, much of the transshipment of goods will move by the port.

5.2.5 Germany

Hamburg and Bremerhaven are the biggest ports in Germany. They are both serving North and Baltic Sea traffic while the smaller ports at the Baltic Sea largely serve this area. The largest are Kiel, Lübeck and Rostock. Furthermore there are a few smaller ports in both areas that are not looked at more closely in this study like Cuxhaven, Emden, Wilhelmshaven, Puttgarden, Wismar or Sassnitz.

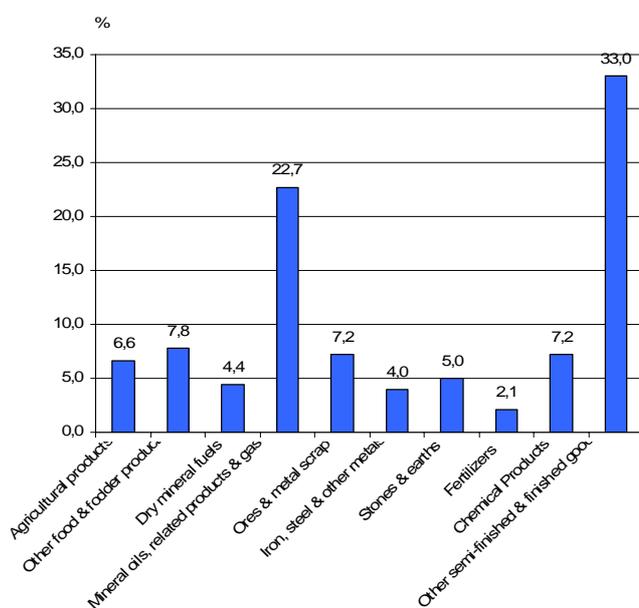
Cargo handling activities are generally carried out by private enterprises. These are usually owned, in part or fully, by the state or the local community.

Container volumes are mainly concentrated in the two above-mentioned predominant ports for overseas traffic, namely Hamburg and Bremerhaven. The Baltic Sea ports largely deal with ferry and RoRo traffic. Wilhelmshaven is a major port for liquid bulk. Duisburg is the largest inland waterway port in Europe. So there is a marked difference between the maritime traffic that passes through the North Sea and that which traverses the Baltic Sea.

The main driving forces in Germany's port development are the general growth rate in the Baltic are the Russian market as well as the growing importance of Far East trade, improvements of hinterland connections especially in the region of Mecklenburg-Vorpommern.

The general structure of seaborne trade for the ports in northern Germany is dominated by semi-finished and finished goods as shown in Chart 5-21. This relates to the importance of the manufacturing industry in Germany. The importance for mineral oils and related products is due to the large amounts that are traded in this area in the NSR and BSR.

Chart 5-21: Goods categories in seaborne transport, share of total German turnover in ports (Bundesamt für Statistik 2006)



Bremen/Bremerhaven⁶²

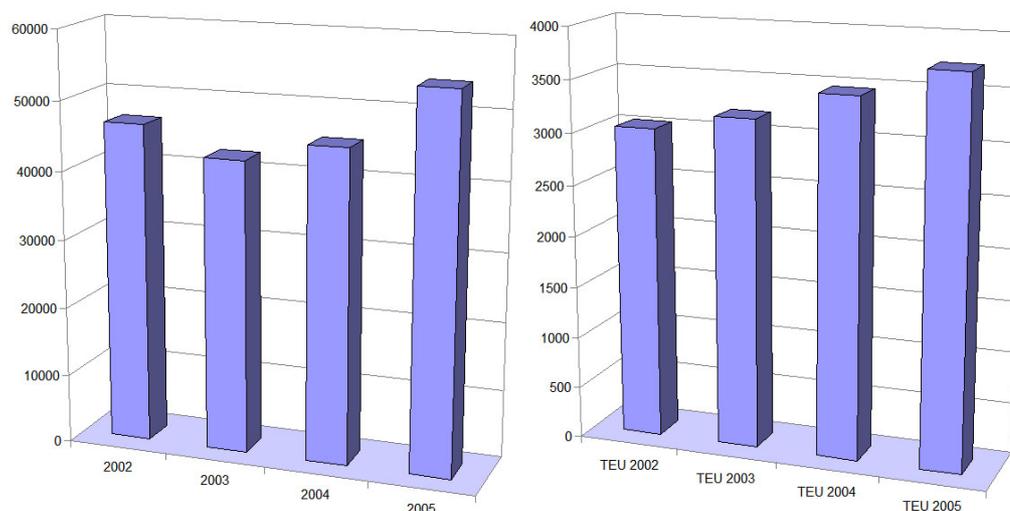
Besides Hamburg, the port of Bremen and Bremerhaven is the largest port in Germany. In some ways like the government of the ports, the two ports can be treated as one port. They are also statistically handled as one port. However, regarding the importance in turnover and specialization in VAS areas, the Bremen city port is declining in relevance compared to Bremerhaven not only due to the larger distance to the North Sea. Bremerhaven has taken up most of the turnover of containers and has been developing the largest terminal for turnover of finished vehicles in Europe. Nowadays the operator, the BLG, is the largest car terminal operator in Europe.

Concerning total turnover, the port of Bremen/Bremerhaven reached a peak of 54.2 million tons in 2005, averaging a growth rate of 5.9% from 2002 to 2005. The recent recessionary years 2003 and 2004 were also experienced in the handling of goods at the port as is seen in Chart

⁶² <http://www.keyports.de> and <http://www.bremenports.de>

5-22. Container turnover on the other hand achieved high growth rates throughout this period, averaging 7.3% over the last years and reaching 3.7 million TEU in 2005.

Chart 5-22: Port of Bremen/Bremerhaven, Total (1,000 t., l.) and TEU Turnover (1,000 TEU, r.) 2002-2005



The commodity structure is dominated by semi-finished and finished general cargo goods. This includes vehicles of which 1.53 million units were handled in 2005 by the BLG, incoming 512 thousand from all over the world and outgoing 1.02 million finished vehicles.⁶³

Table 5-10: Port of Bremen/Bremerhaven - Turnover of seaborne goods in 2005 according to goods categories in 1,000 units (Bundesamt für Statistik 2006)

Goods category	Dimension	Unloaded		Loaded		Total	
		2005	Change to 2004 in %	2005	Change to 2004 in %	2005	Change to 2004 in %
Goods							
Agricultural products	tons	1 178	39,6	1 188	132,1	2 366	74,5
Other food and fodder products	tons	1 330	169,1	1 960	211,2	3 290	192,7
Dry mineral fuels	tons	1 216	- 19,2	42	847,8	1 259	- 16,6
Mineral oils, related products and gases	tons	2 015	21,3	80	- 60,5	2 095	12,4
Ores and metal scrap	tons	3 749	- 17,5	242	11,0	3 991	- 16,2
Iron, steel and other metals	tons	275	- 23,4	2 739	26,2	3 014	19,1
Stones and earths	tons	1 349	14,0	510	62,3	1 859	24,1
Fertilizers	tons	43	- 22,2	14	- 1,8	58	- 18,0
Chemical Products	tons	589	92,8	1 402	601,1	1 991	294,0
Other semi-finished and finished goods	tons	12 817	- 5,8	13 917	- 15,9	26 734	- 11,3
incl.: special goods ¹⁾	tons	8 430	- 19,0	6 590	- 44,2	15 020	- 32,4
Total	tons	24 560	0,0	22 095	6,2	46 655	2,8
incl.: ferry traffic ²⁾	tons	720	18,8	1 034	11,0	1 755	14,0
Type of cargo							
Bulk	tons	8 193	- 9,1	529	- 13,9	8 721	- 9,4
General cargo	tons	16 368	5,3	21 566	6,8	37 934	6,1
incl.: container loads	tons	13 647	5,7	16 153	6,1	29 800	5,9
truck loads	tons	21	10,7	58	342,6	79	145,7
Containers	TEU	1 799	8,4	1 942	3,9	3 741	6,0
incl.: loaded Containers	TEU	1 448	7,0	1 747	6,8	3 195	6,9
Also:							
Deadweight of containers	tons	3 630	8,3	3 920	3,9	7 550	6,0
Deadweight of vehicles	tons	7	14,6	16	241,5	22	115,0

⁶³ BLG 2006a

- 1) Used packaging, construction equipment, circus goods, etc., mover goods, precious metals, other general cargo.
 2) RoRo ferries, RoRo container vessels and passenger ferries.

From the port of Bremerhaven a large number of regular liner services start⁶⁴. Considering only the region of concern (NSR and BSR), it is served by the following frequent liner services⁶⁵:

ACL, IMCL InterMarineContainer Lines, Oy Saimaa Lines Maritime Ltd, BCL, Kursiu Linija, Reval Logistik AS, BML Bremen Malären Line, Maersk, Safmarine, CMA – CGM, Mann Lines, Swan Container Line, CoNor Line, MSC Mediterranean Shipping, Team Lines, DFDS Tor Line, Mundial Ro/Ro, TECO, ESF Euroservices, NMT Lines, UECC, Eurogate, Northsea Container Line, Unifeeder, Hamburg Süd, NWL, Wallenius Wilhelmsen, Hual and OPDR.

These shipping companies provide services to all countries in the region. Ports are called mainly in Belgium, Denmark, Finland, Germany, Norway and Sweden. Most of the services are conducted by container and RoRo vessels.

Table 5-11: Frequency of port calls in country by vessels (Liner Services) coming from Bremerhaven

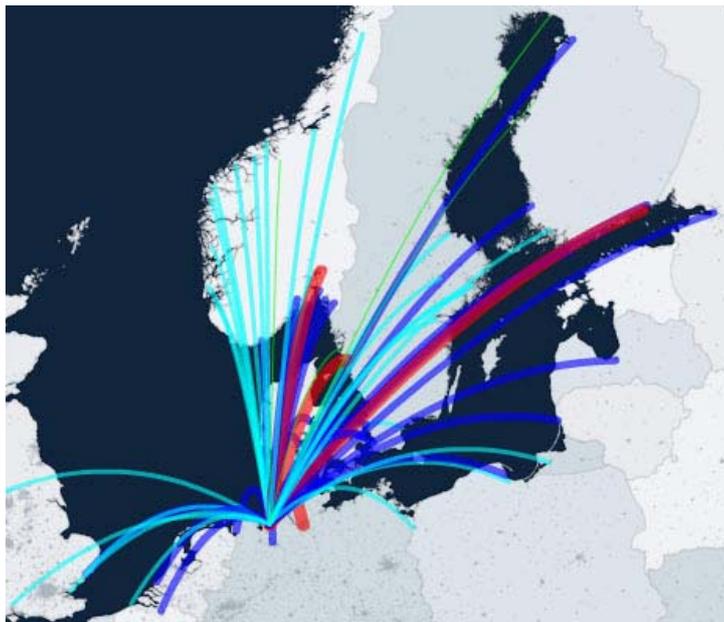
Country of called ports	Frequency of ports calls	Country of called ports	Frequency of ports calls
Belgium	1 daily	Lithuania	7 weekly
Belgium	4 monthly	Netherlands	2 monthly
Belgium	8 weekly	Netherlands	6 weekly
Denmark	1 monthly	Norway	15 monthly
Denmark	15 weekly	Norway	44 weekly
Finland	6 monthly	Poland	9 weekly
Finland	36 weekly	Russia	7 weekly
Germany	3 daily	Sweden	4 monthly
Germany	4 monthly	Sweden	30 weekly
Germany	26 weekly	UK	8 monthly
Latvia	7 weekly	UK	7 weekly

The main ports that are called from Bremerhaven are: Hamburg, Gothenburg, Oslo and Kotka. Furthermore there are frequent calls to all the major ports of the respective countries in the region.

⁶⁴ Here, only Bremerhaven is considered. Bremen presents no different picture.

⁶⁵ see Database and GIS-Client for Details

Map 5-16: Frequent Liner Services from Bremerhaven (ESN 2006)



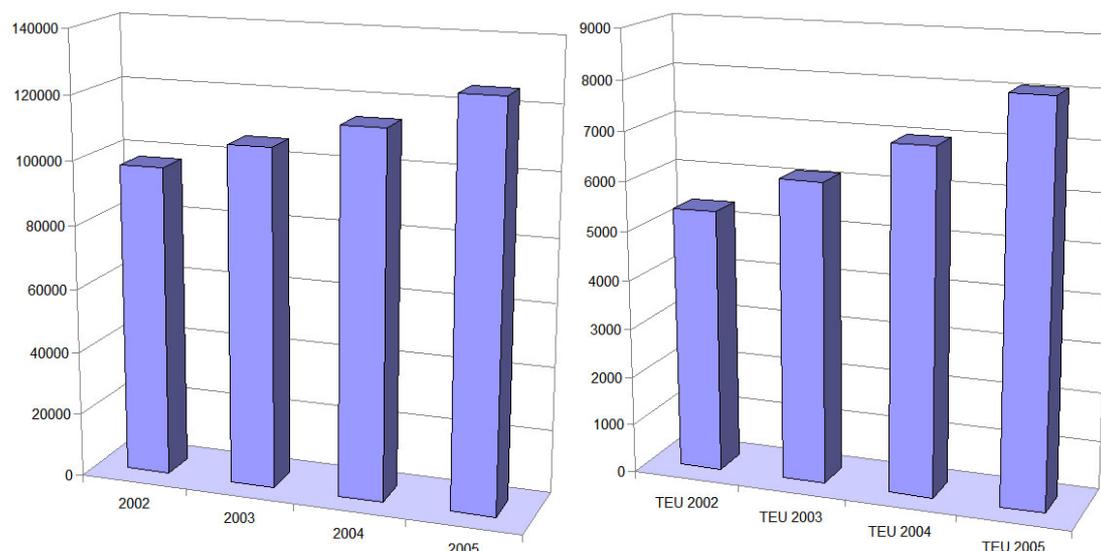
In general, the importance of the port of Bremen/Bremerhaven is high for the NSR and BSR. Large quantities of cargo that arrive from overseas are transhipped for short sea feeding to the smaller ports in the NSR and BSR. This is especially true for the handling of vehicles. The BLG has been doing best practice work in relation to logistics beyond the traditional handling of goods incorporating more and more VAS and supply chain related processes into the handling process at the port of Bremerhaven. This example presents vivid picture of aim of this study to identify potential of similar future activities for ports in vehicle handling or other areas.

Hamburg⁶⁶

Hamburg is the largest universal seaport of Germany and the eighth biggest container handling port in the world. The total turnover was 125.7 million tons in 2005 and within the three previous years it grew by roughly 8.8% on average per year from 2002 to 2005. Container turnover was 8.1 million TEU in 2005 and has been growing by 14.6% per year.

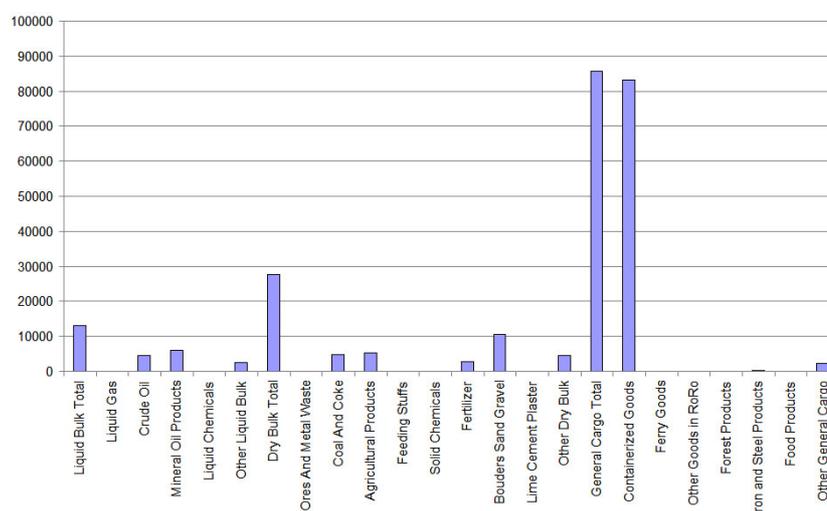
⁶⁶ <http://www.hafen-hamburg.de>

Chart 5-23: Port of Hamburg, Total (1,000 t, l.) and TEU Turnover (1,000 TEU, r.) 2002-2005



The port of Hamburg forms the most important gateway for the exchange of the EU and Eastern European cargoes. Nordic countries represent a significant part of the total throughput of the port. From its annual turnover approximately half is bulk cargo and the rest general cargo, mainly in containers. The amount of liquid cargo has been about 14 to 17 million tons annually, depending on the year. In comparison, this is less than in other ports due to the fact that the port of Hamburg is mainly handling general cargo of all kinds. Most of this cargo arrives in container at the port and is used either in the Hamburg metropolitan area or is shipped further by rail, road or barge.

Chart 5-24: Port of Hamburg - Commodity Turnover 2005 in 1,000 t.



A detailed analysis of the goods categories shows that semi-finished and finished goods dominate the general cargo and it is growing at high rates not only for unloaded but also for loaded goods. A growth is also experienced in the areas of agricultural and food products as well as iron & ores.

Table 5-12: Port of Hamburg - Turnover of seaborne goods in 2005 according to goods categories (Bundesamt für Statistik 2006)

Goods category	Dimension	Unloaded		Loaded		Total	
		2005	Change to 2004	2005	Change to 2004	2005	Change to 2004

Port-Net: "EDI and Cargo Flows in the North and Baltic Sea Region - an Analysis for Potential Logistical Services"

			in %		in %		in %
Goods							
Agricultural products	tons	3 613	14,3	3 810	50,7	7 422	30,5
Other food and fodder products	tons	9 496	11,8	6 439	9,4	15 935	10,8
Dry mineral fuels	tons	4 636	- 6,2	75	164,9	4 711	- 5,2
Mineral oils, related products and gases	tons	8 560	3,4	2 624	16,8	11 184	6,3
Ores and metal scrap	tons	11 290	6,7	1 328	12,4	12 618	7,2
Iron, steel and other metals	tons	2 180	10,5	2 826	14,0	5 006	12,5
Stones and earths	tons	3 113	- 3,8	1 712	35,9	4 825	7,3
Fertilizers	tons	273	- 2,6	2 890	- 1,1	3 163	- 1,2
Chemical Products	tons	3 843	7,3	7 241	7,1	11 084	7,2
Other semi-finished and finished goods	tons	17 174	9,6	15 130	7,8	32 304	8,7
incl.: special goods ¹⁾	tons	895	31,0	889	8,0	1 784	18,4
Total	tons	64 178	6,6	44 075	12,1	108 253	8,8
incl.: ferry traffic ²⁾	tons	158	- 23,7	407	6,7	565	- 4,0
Type of cargo							
Bulk	tons	29 995	1,6	10 084	22,8	40 079	6,2
General cargo	tons	34 183	11,5	33 991	9,2	68 173	10,3
incl.: container loads	tons	32 645	11,7	32 792	10,0	65 438	10,8
truck loads	tons	4	228,3	8	229,6	11	229,2
Containers	TEU	4 206	16,0	3 879	14,8	8 084	15,4
incl.: loaded Containers	TEU	3 586	14,0	3 243	10,5	6 829	12,3
Also:							
Deadweight of containers	tons	8 524	16,0	7 860	14,8	16 384	15,4
Deadweight of vehicles	tons	3	50,9	1	187,6	4	77,6

1) Used packaging, construction equipment, circus goods, etc., mover goods, precious metals, other general cargo.

2) RoRo ferries, RoRo container vessels and passenger ferries.

Due to the international importance of the port of Hamburg, frequent liner services have been established by a large number of shipping companies and LSPs. The following are providing services to ports in the NSR and BSR⁶⁷:

"K" Line, Grimaldi, NSA Kiel, AGS Shipping, Hacklin Seacont, NWL, Andrew Weir, Hamburg Süd, OOCL, Anmar Line, Hapag-Lloyd, OPDR, BACO-LINER, Hartel, Oy Saimaa Lines, Maritime Ltd, Baltic Line, Höegh Autoliners, P&O Nedlloyd, BCL, Hyundai Merchant Marine, POL-LEVANT Shipping Lines Ltd, BML Bremen Malären Line, IMCL InterMarineContainer Lines, Ruukki Logistics, Bonyad, ISCONT LINES, Samskip, BULCON, Kursiu Linija, SCI Line, C.M.N. International, Lloyd Triestino di Navegazione, Senator Lines, CMA – CGM, LPS, SL-FEEDER, CoNor Line, Lubecon, SSL, Containerships, Lys-Line, Startainer, Contship, Mac Andrews, Swan Container Line, Delmas, Maersk, Team Lines, Delphis, Maghreb/CL Line Bremen, TECO, Delta Shipping Service B.V., MG Shipping, Transkompass, DFDS Tor Line, MISC, TransMarine, Eimskip, Montemar Maritma S.A., Turkon Line, ESF Euroservices, MSC, Unifeeder, Euro Container Line, Mundial Ro/Ro, Van Uden Ro-Ro, Eurogate, NATVAR PARIKH INDUSTRIES Ltd., Wallenius Wilhelmsen, Eurosib, Northern Shipping Company, ZIM Israel Nav, Evergreen and Northsea Container Line.

These liner services provide a structure of connections to all countries in the region:

Table 5-13: Frequency of port calls in country by vessels (Liner Services) coming from Hamburg

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	1 daily	Lithuania	21 weekly
Belgium	28 monthly	Netherlands	17 monthly
Belgium	18 weekly	Netherlands	19 weekly
Denmark	8 monthly	Norway	8 monthly

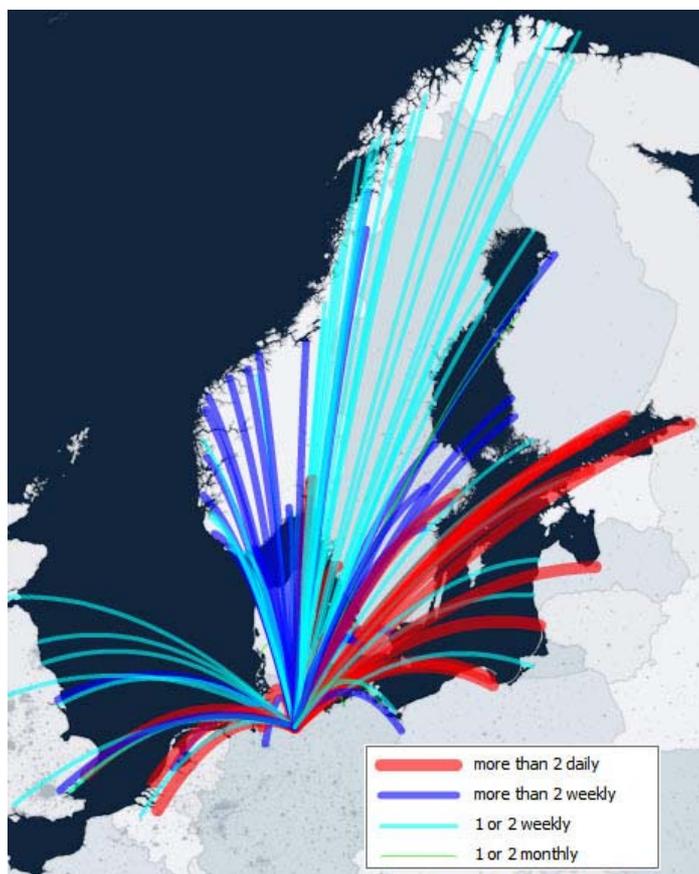
⁶⁷ see Database and GIS-Client for Details

Denmark	13 weekly	Norway	140 weekly
Estonia	2 monthly	Poland	2 monthly
Estonia	16 weekly	Poland	35 weekly
Finland	12 monthly	Russia	6 monthly
Finland	63 weekly	Russia	30 weekly
Germany	4 daily	Sweden	10 monthly
Germany	13 monthly	Sweden	68 weekly
Germany	20 weekly	UK	16 monthly
Latvia	14 weekly	UK	26 weekly

Connections to individual ports are provided most often to all major ports of the BSR and NSR. Map 5-17 shows the most frequent services in red.

The investments in port infrastructure (i.e. Container Terminal Altenwerder, deepening of the Elbe river) have expanded the capacities significantly and further developments follow along the same path as the growth rates of the turnover have underlined the importance of the port of Hamburg.

Map 5-17: Frequent Liner Services from Hamburg (ESN 2006)

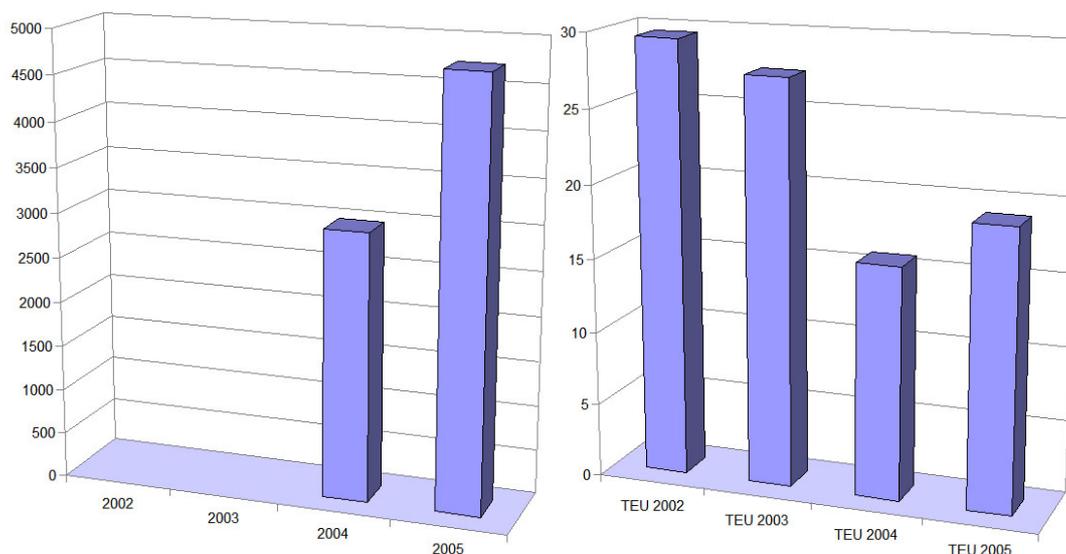


Kiel⁶⁸

The port of Kiel is an important ferry port and has main links to Norway (Oslo) and Sweden (Gothenburg). There are 9 different terminals that all focus on different types of cargo. The annual total turnover was 4.7 million tons in 2005. The handling of containers is of less importance for the port. TEU turnover only reached 19 thousand in 2005 and has been declining by -10% on average between 2002 and 2005.

⁶⁸ <http://www.port-of-kiel.de>

Chart 5-25: Port of Kiel, Total (1,000 t., l.) and TEU Turnover (1,000 TEU, r.) 2002-2005⁶⁹



The commodity structure has been dominated by general cargo turnover in ferry traffic. However, amounts are fairly low in comparison.

Table 5-14: Port of Kiel - Turnover of seaborne goods in 2005 according to goods categories (Bundesamt für Statistik 2006)

Goods category	Dimension	Unloaded		Loaded		Total	
		2005	Change to 2004 in %	2005	Change to 2004 in %	2005	Change to 2004 in %
Goods							
Agricultural products	tons	2	- 69,1	89	- 36,0	91	- 37,5
Other food and fodder products	tons	22	- 38,2	12	- 45,2	34	- 40,8
Dry mineral fuels	tons	402	- 3,8	-	-	402	- 3,8
Mineral oils, related products and gases	tons	312	28,0	0	- 81,4	313	27,2
Ores and metal scrap	tons	-	- 100,0	22	- 13,2	22	- 14,6
Iron, steel and other metals	tons	9	- 27,6	-	-	9	- 27,6
Stones and earths	tons	171	- 4,8	14	12,2	185	- 3,6
Fertilizers	tons	13	0,0	-	-	13	0,0
Chemical Products	tons	3	- 52,7	-	- 100,0	3	- 64,8
Other semi-finished and finished goods	tons	925	8,1	1 101	8,8	2 026	8,5
incl.: special goods ¹⁾	tons	894	8,9	1 033	8,7	1 927	8,8
Total	tons	1 860	5,0	1 239	2,0	3 099	3,8
incl.: ferry traffic ²⁾	tons	895	8,4	1 090	9,8	1 984	9,2
Type of cargo							
Bulk	tons	922	4,2	131	- 32,2	1 053	- 2,4
General cargo	tons	937	5,8	1 108	8,4	2 045	7,2
incl.: container loads	tons	46	60,9	130	10,0	176	20,0
truck loads	tons	724	2,5	748	3,8	1 471	3,2
Containers	TEU	9	22,1	9	15,3	19	18,6
incl.: loaded Containers	TEU	3	54,5	8	5,7	11	16,3
Also:							
Deadweight of containers	tons	19	22,0	19	14,9	38	18,4
Deadweight of vehicles	tons	792	- 0,1	728	- 2,5	1 519	- 1,3

1) Used packaging, construction equipment, circus goods, etc., mover goods, precious metals, other general cargo.

2) RoRo ferries, RoRo container vessels and passenger ferries.

⁶⁹ Port of Kiel: No data available for total turnover in 2002 and 2003

The liner service structure shows only a few shipping companies that serve the port of Kiel mainly by RoRo ferries⁷⁰:

Color Line, SCF, DFDS Lisco, Stena Line, DFDS Tor Line, TransMarine and Mann Lines.

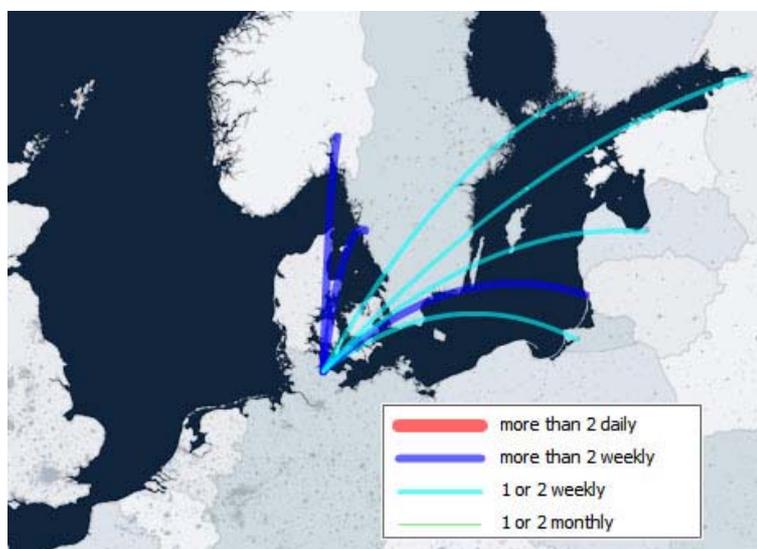
Frequent services are established by these companies to only a few destination, mainly to Sweden, Norway and Lithuania.

Table 5-15: Frequency of port calls in country by vessels (Liner Services) coming from Kiel

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Finland	1 weekly	Norway	1 daily
Latvia	2 weekly	Russia	3 weekly
Lithuania	6 weekly	Sweden	1 daily

The major ports connected to Kiel are Gothenburg, Oslo and Klaipeda. Intensified connections to Saint Petersburg are underway.

Map 5-18: Frequent Liner Services from Kiel (ESN 2006)



The turnover the port of Kiel is dominated by passenger ferries and RoRo-traffic that offer relations to a few ports in the Baltic Sea Region. Most of this traffic is conducted with Klaipeda. The liner service LISCO provides a daily departure schedule with freight ferries that also have some passenger capacity. About one tenth of the cargo is containers and the exports are much higher than imports. The second strongest relation is to Russia. Departures to Saint Petersburg, Kaliningrad and Vyborg are offered. The last years showed strong growth in transported goods on this relation.

The traffic with Estonia and Latvia is only scarcely developed. Much of this and other traffic is routed via the strategically better located ports of Lübeck and Rostock. The Sweden traffic varies over the last couple of years but the relation to Gothenburg is one the most important for the port of Kiel. The Norway traffic is dominated by passenger ferries with less transport of goods. The traffic to Finland has dropped heavily through the loss of the Rauma service and now basically handles paper imports.

Due to these different developments traffics to Scandinavia and to the Baltic Countries/Russia have evenly developed. Conventional goods show now apparent dynamics. There are only a

⁷⁰ see Database and GIS-Client for Details

few to mention: mineral oil products from Sweden, building material from Norway as well as cereal exports to ports external to the Baltic Sea Region.

Table 5-16 gives an overview of the distribution of cargo by country. Vehicles and machinery are generally most important coming – due to the frequent connections – from Lithuania, Sweden and Russia and going mainly to Lithuania, Norway, Sweden and Russia. Russia's figures should have been on the rise since the data of these figures.

Table 5-16: Kiel - Turnover of Goods Categories According to Origin and Destination Country 2001 (Statistisches Bundesamt 2001)

NSTR	0	1	2	3	4	5	6	7	8	9	Total
Goods Categories	Agricultural Products	Other Foodstuffs	Dry Mineral Fuels	Mineral Oil Products	Iron Ore, Scrap	Iron, Steel	Stones, Earths	Fertilizers	Chemical Products	Vehicles, Machinery	Total
Unloaded											
Sweden	1,4			143,3			3,7			270,7	419,1
Norway		1,2					179,4		8,9	171,7	361,2
Lithuania								1,3		320,6	321,9
Russia	6,8	4,8					2,8	2,2	0,4	201,7	218,7
Finland							9,6			169,7	179,3
Estonia		1		10						60,7	71,7
Latvia				18,3						29,9	48,2
Denmark	22,8						5	11,5		0,4	39,7
Poland		15,7						0,7		1,7	18,1
Other	28,2	21,8		0,4		2	3,3	3,9		4,3	63,9
Sum	59,2	44,5	0	172	0	2	203,8	19,6	9,3	1231,4	1741,8
Loaded											
Lithuania										448,8	448,8
Norway	2,2	2,1			21,8		32,3			246,6	305
Sweden	19,3	22,3								239	280,6
Russia		0,6								176	176,6
Estonia										46,2	46,2
Latvia										29,1	29,1
Finland	3,3				4						7,3
Poland	1,1										1,1
Denmark	0,5	0,5									1
Other	193,9	15,3			9,1					0,1	218,4
Sum	220,3	40,8	0	0	34,9	0	32,3	0	0	1185,8	1514,1

The turnover of bulk in general tends to decline but differs depending on the type of good. The turnover of mineral oil products dropped tremendously over the last ten years while bulk goods like cereals and building materials have undergone a growth. The main reason for that is the location shift of large amounts of the paper turnover to the port of Lübeck. Most of the

break bulk goods are transport by RoRo vessels anyway, meaning that Lübeck offers a wider range of such liner services.

Hinterland Relations

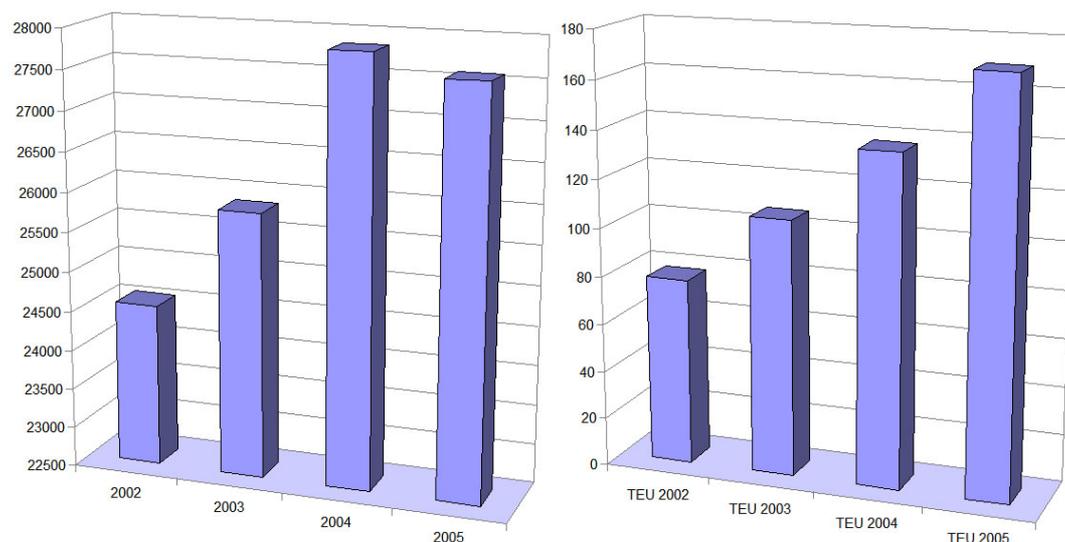
The main development tendencies for the hinterland relations of the port are based on the growing importance of the ferry and RoRo traffic especially to Russia and the Baltic states while dropping the paper imports from Finland. From this perspective it is expected that the share of traffic that originate in the surrounding federal state of Schleswig-Holstein that is mainly based on bulk goods has dropped below 30%. Through the discontinuance of paper imports the main traffic routes to and from the port of Kiel have moved their concentration from southern Germany to North Rhine-Westphalia. As the growth potential is highest with the trade between southern Germany and the Baltic countries, no compensation could occur. So it is plausible to estimate that roughly 30% of the ferry and RoRo transports and 25% of total transports are handled with North Rhine-Westphalia.

Lübeck/Lübeck-Travemünde⁷¹

The port of Lübeck is the major port at the coast of the Baltic Sea with frequent liner connections to most of the countries in the BSR. The port actually consists of five different port terminals that each serve in a different way. However, the main transport modes are RoRo and ferry traffic. The main transported goods are forest products, general cargo in RoRo units, fruits, break bulk, vehicles. And it also serves as a main port for passenger traffic and cruise liners in the region.

In 2005, the total turnover of the ports of Lübeck was 27.5 million tons and achieved an average growth of 4% per year between 2002 and 2005. Container turnover has been on the growing path in Lübeck due to the connections to the port of Hamburg. In 2005, 170 thousand containers were handled in Lübeck. On average, 30% growth per year was achieved over the last years. This is one of the highest growth rates in the studied region.

Chart 5-26: Port of Lübeck, Total (1,000 t., l.) and TEU Turnover (1,000 TEU, r.) 2002-2005



⁷¹ <http://www.lhg-online.de>

The turnover in the port of Lübeck is dominated by trailer traffic on RoRo vessels to Finland and Sweden. This includes mainly paper and paperboard products and other semi-finished and finished goods.

Table 5-17: Port of Lübeck - Turnover of seaborne goods in 2005 according to goods categories (Bundesamt für Statistik 2006)

Goods category	Dimension	Unloaded		Loaded		Total	
		2005	Change to 2004 in %	2005	Change to 2004 in %	2005	Change to 2004 in %
Goods							
Agricultural products	tons	1 000	- 4,9	682	- 15,4	1 682	- 9,4
Other food and fodder products	tons	7	- 73,0	32	- 25,8	39	- 43,1
Dry mineral fuels	tons	-	-	-	-	-	-
Mineral oils, related products and gases	tons	-	-	-	- 100,0	-	- 100,0
Ores and metal scrap	tons	26	- 37,0	18	- 40,4	43	- 38,4
Iron, steel and other metals	tons	229	- 5,0	153	- 5,3	382	- 5,1
Stones and earths	tons	337	- 28,1	38	103,9	375	- 23,1
Fertilizers	tons	254	- 4,1	11	- 68,3	265	- 11,5
Chemical Products	tons	510	0,8	510	2,0	1 020	1,4
Other semi-finished and finished goods	tons	8 295	- 4,5	6 748	7,3	15 043	0,4
incl.: special goods ¹⁾	tons	4 438	- 3,4	6 045	7,0	10 483	2,3
Total	tons	10 657	- 5,5	8 191	3,9	18 848	- 1,7
incl.: ferry traffic ²⁾	tons	9 511	- 4,2	7 727	3,1	17 239	- 1,1
Type of cargo							
Bulk	tons	737	- 24,5	233	- 34,4	970	- 27,1
General cargo	tons	9 920	- 3,8	7 958	5,7	17 878	0,2
incl.: container loads	tons	559	11,4	1 190	25,5	1 749	20,6
truck loads	tons	8 935	- 4,6	6 354	2,0	15 289	- 1,9
Containers	TEU	42	17,6	100	31,9	142	27,4
incl.: loaded Containers	TEU	42	17,6	100	31,9	142	27,4
Also:							
Deadweight of containers	tons	85	17,9	202	31,8	287	27,4
Deadweight of vehicles	tons	3 725	- 0,9	3 645	0,8	7 370	- 0,1
1) Used packaging, construction equipment, circus goods, etc., mover goods, precious metals, other general cargo.							
2) RoRo ferries, RoRo container vessels and passenger ferries.							

The commodities are transported by the following frequent liner services⁷²:

CH-Line, M-real corporation, Transfennica, Combisped, Nordö-Link, TT-Line, DFDS Tor Line, Powerline, Ventlines, Finnlines, Scandlines, Lehmann and Stena Line.

⁷² see Database and GIS-Client for Details

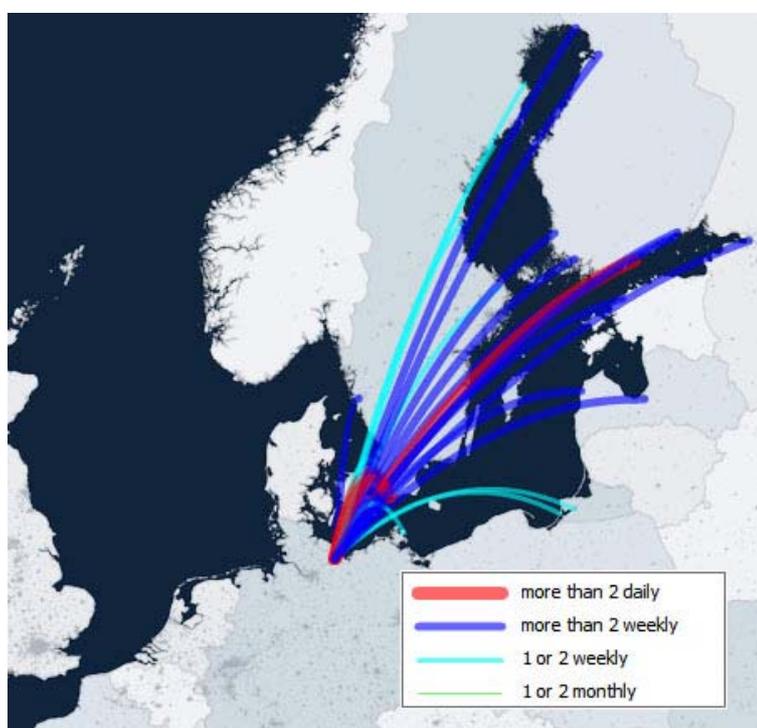
Most of these are RoRo shipping companies. This mode of traffic also implies the greatest growth rates for the coming years. Connections are mainly established to Finland and Sweden.

Table 5-18: Frequency of port calls in country by vessels (Liner Services) coming from Lübeck

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Estonia	6 weekly	Latvia	8 weekly
Finland	1 daily	Russia	8 weekly
Finland	42 weekly	Sweden	11 daily
Germany	2 weekly	Sweden	12 weekly
Latvia	3 monthly		

The major ports connected to the port of Lübeck in terms of frequency are: Helsinki, Trelleborg and Malmö. Frequent relations also exist to Saint Petersburg, Kotka, Hamina, Turku, Gothenburg and others. Ports in the NSR are not regularly served. This shows the major focus of the port of Lübeck solely on BSR transport.

Map 5-19: Frequent Liner Services from Lübeck (ESN 2006)



The turnover in the port is dominated by ferry and RoRo traffic which accounts for roughly 89% of total turnover. The strongest traffic links exist between Lübeck and the Swedish ports of Malmö, Trelleborg and Gothenburg as well as the Finish ports of Helsinki, Hanko and Turku. Further ports are serviced less frequently but play an important role in the diversified paper transport network that is served via the port of Lübeck.

Table 5-19: RoRo Ferry Traffic at the Port of Lübeck, Unloaded and Loaded Goods per Port 2005, 11 Strongest Relations (Lübecker Hafengesellschaft mbH 2006)

Port	Unloaded	Loaded	Total
1. Trelleborg	3067005	3340203	6407208
2. Malmö	3023485	3229398	6252883
3. Helsinki	1191295	1469123	2660418
4. Hanko	1001726	897473	1899199
5. Gothenburg	751145	881053	1632198

6.	Turku	573074	547703	1120777
7.	Kotka	833241	90260	923501
8.	Rauma	658553	79758	738311
9.	Saint Petersburg	182806	341064	523870
10.	Riga	216355	283912	500267
11.	Husum (Sweden)	359785	31197	390982

Apart from the ferry traffic the turnover of other forest products and cereals plays an important role. Other bulk commodities like metals and chemical products are mainly transported as break bulk through RoRo and ferry services.

Looking at turnover by country, the turnover is dominated by goods from Sweden and Finland. However, this includes transhipped goods from Russia going through Finish ports.

Table 5-20: Lübeck - Turnover of Goods Categories According to Origin and Destination Country 2001 (Statistisches Bundesamt 2001)

NSTR	0	1	2	3	4	5	6	7	8	9	
Goods Categories	Agricultural Products	Other Foodstuffs	Dry Mineral Fuels	Mineral Oil Products	Iron Ore, Scrap	Iron, Steel	Stones, Earths	Fertilizers	Chemical Products	Vehicles, Machinery	Total
Unloaded											
Sweden	438				2	211,6	40,9	1,5	465,9	3766,2	4926,1
Finland	457,2					81,1	9,5	3,5	284,9	3692,3	4528,5
Norway	0,8					6,6	384,3	5,7			397,4
Denmark	21,9						61,8	23,4		0,2	107,3
Estonia							58,3	34,7	1,1		94,1
Russia	29,2							42,6			71,8
Lithuania							2,1	49,4			51,5
Latvia						5,6		22,6		19,3	47,5
Poland	0,5	0,6						13,7			14,8
Other	58,2					0,1	9,7	24,6	2,7		95,3
Sum	1005,8	0,6	0	0	2	305	566,6	221,7	754,6	7478	10334
Loaded											
Sweden	476	32,6			10	119	40,8	20,8	228,5	2980,4	3908,1
Finland	111,1					118,1	6,4		351,5	1696,2	2283,3
Norway	46	23,3			38,4		37	2,2			146,9
Denmark	8,8	8,6			15,4		8,2	42,4		0,1	83,5
Latvia										20,9	20,9
Russia	17										17
Poland	10,6	4,6								0,2	15,4
Lithuania	1,4									0,2	1,6
Other	177,4	12,2			9		6,3	1,5		0,3	206,7
Sum	848,3	81,3	0	0	72,8	237,1	98,7	66,9	580	4698,3	6683,4

The turnover of bulk is dominated by break bulk goods, especially paper and machinery. Currently the turnover with finished vehicles has been growing with high rates and it is expected to continue due to the strong demand from the Russia market. These are for the most part transported via ferry or RoRo liner services. The turnover of paper has increased tremendously over the last ten years while wood and metals have stagnated. Other bulk goods show a growing tendency, especially through a growing cereal turnover. Building Materials

are also transported in large volumes as well as fertilizers. The turnover of liquid bulk is deniable.

Lübeck has a special focus on paper. The turnover of paper has been growing with high rates over the last few years and the second largest paper producing company, StoraEnso, is currently integrating the port into its logistics system. This is done mainly by putting a new shipping line into operation: TransLumi. The liner service is taking up its cargo in Kemi and Oulu in Finland, and Gothenburg in Sweden, and is then going to Lübeck. From there the paper is transported by train to central Europe. Through this process, the flows of paper products shall move faster, safer and in larger quantities from northern to central Europe. Regular RoRo liner services are being extended and new modern RoRo vessels are put into operation. StoraEnso alone has handled 850,000 tons of paper in 2006 and it is expected to reach the one million mark in 2007.⁷³

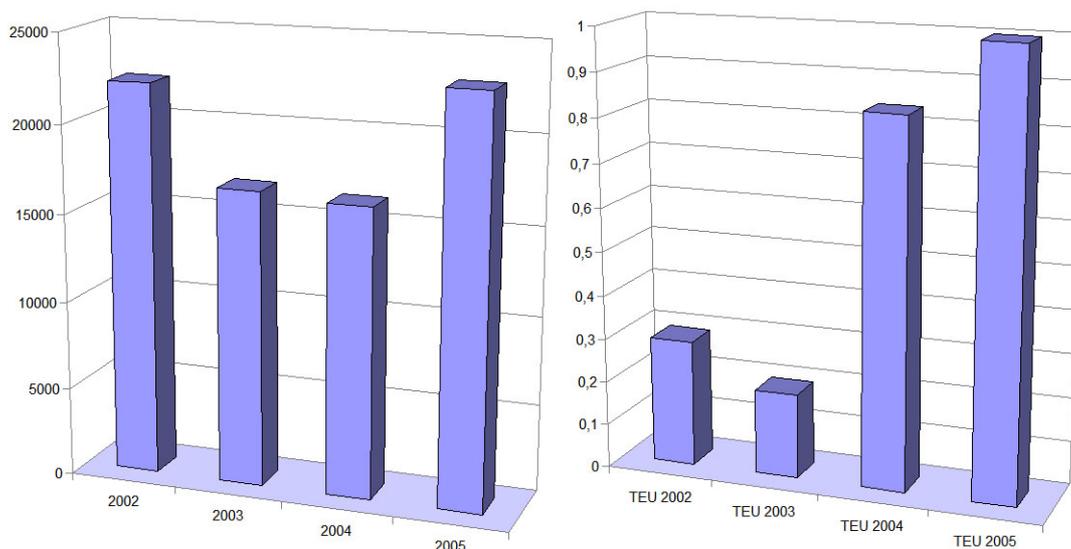
Hinterland Relations

The turnover of bulk goods as remained stable over the last few years. This implies that the turnover share of Schleswig-Holstein and Niedersachsen which constitute the hinterland for these goods remained under 10%. The most important hinterland connections for bulk can be found with North Rhine-Westphalia (> 20%), Baden-Württemberg (~10%) and Bavaria (~10%). The latter has also grown because of paper import shifted from Kiel to Lübeck. For the share of the rest of Western Europe a share of roughly 17% is estimated.

Rostock⁷⁴

The port of Rostock has become a modern ferry port that still has a strong reputation as a port for bulk cargo. Main ferry connections are to south Sweden, Denmark and Finland. In 2005, the port achieved a total turnover of 22.9 million tons, averaging a growth of 4.4% per year from 2002 to 2005. Container turnover is rather deniable because the main focus of the port is the turnover of bulk goods and ferry traffic.

Chart 5-27: Port of Rostock, Total (1,000 t., l.) and TEU Turnover (1,000 TEU, r.) 2002-2005

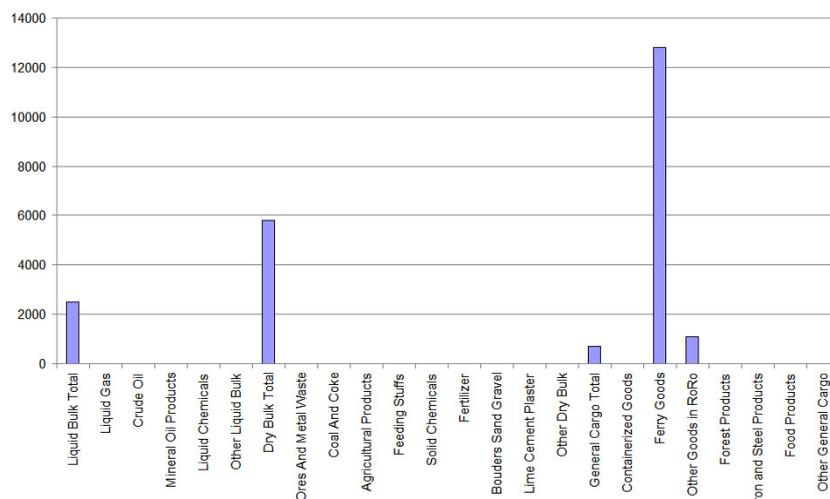


⁷³ Teichmann 2007, p. 12.

⁷⁴ <http://www.rostock-port.de>

The commodity structure has been dominated by the ferry traffic, i.e. trailers with general cargo and bulk in the form of dry and liquid bulk. The latter has become the main focus as the port is promoting itself the major German bulk port at the Baltic Sea.

Chart 5-28: Port of Rostock - Commodity Turnover 2005 in 1,000 t.⁷⁵



The commodity structure in figures shows the equal importance of bulk and general cargo. Most of the general cargoes are semi-finished and finished goods arriving and leaving by ferries.

Table 5-21: Port of Rostock - Turnover of seaborne goods in 2005 according to goods categories (Bundesamt für Statistik 2006)

Goods category	Dimension	Unloaded		Loaded		Total	
		2005	Change to 2004 in %	2005	Change to 2004 in %	2005	Change to 2004 in %
Goods							
Agricultural products	tons	324	- 4,0	2 449	87,4	2 773	68,6
Other food and fodder products	tons	31	679,2	212	- 25,5	243	- 15,7
Dry mineral fuels	tons	1 145	- 3,6	0	x	1 145	- 3,6
Mineral oils, related products and gases	tons	1 220	20,3	640	- 37,1	1 860	- 8,4
Ores and metal scrap	tons	451	- 57,2	82	- 24,7	534	- 54,1
Iron, steel and other metals	tons	140	- 19,0	47	- 44,2	187	- 27,3
Stones and earths	tons	809	0,4	549	25,2	1 358	9,1
Fertilizers	tons	220	- 32,5	499	5,4	719	- 10,1
Chemical Products	tons	507	2,5	243	28,5	750	9,7
Other semi-finished and finished goods	tons	3 909	8,4	3 669	5,9	7 578	7,2
incl.: special goods ¹⁾	tons	3 524	11,7	3 427	7,7	6 950	9,7
Total	tons	8 758	- 2,7	8 389	13,9	17 147	4,8
incl.: ferry traffic ²⁾	tons	3 996	8,8	3 503	4,8	7 499	6,9
Type of cargo							
Bulk	tons	4 378	- 10,6	4 339	24,3	8 717	4,0
General cargo	tons	4 380	6,6	4 050	4,5	8 430	5,6
incl.: container loads	tons	3	18,8	6	- 36,5	8	- 25,7
truck loads	tons	3 699	5,3	3 477	4,9	7 177	5,1
Containers	TEU	0	- 27,0	1	- 12,4	1	- 15,8
incl.: loaded Containers	TEU	0	21,5	1	3,0	1	6,2

⁷⁵ Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

Also:							
Deadweight of containers	tons	0	- 25,6	1	- 13,6	1	- 16,4
Deadweight of vehicles	tons	2 919	4,8	2 814	3,8	5 734	4,3
1) Used packaging, construction equipment, circus goods, etc., mover goods, precious metals, other general cargo.							
2) RoRo ferries, RoRo container vessels and passenger ferries.							

For the port of Rostock the ferry and RoRo transports carry the load of total port turnover. The most important relation is to the port of Trelleborg in Sweden. Other frequent connections include liner services to Gedser in Denmark, south and west Finland – especially for forest products and to the Latvian port of Liepaja. The port is served by the following frequent liner services⁷⁶:

Attica Ro-Ro, Norlines, Transfennica, BKO Shipping, Pool-Carriers, TT-Line, Hartel, Scandlines, Norcargos and Superfast Ferries.

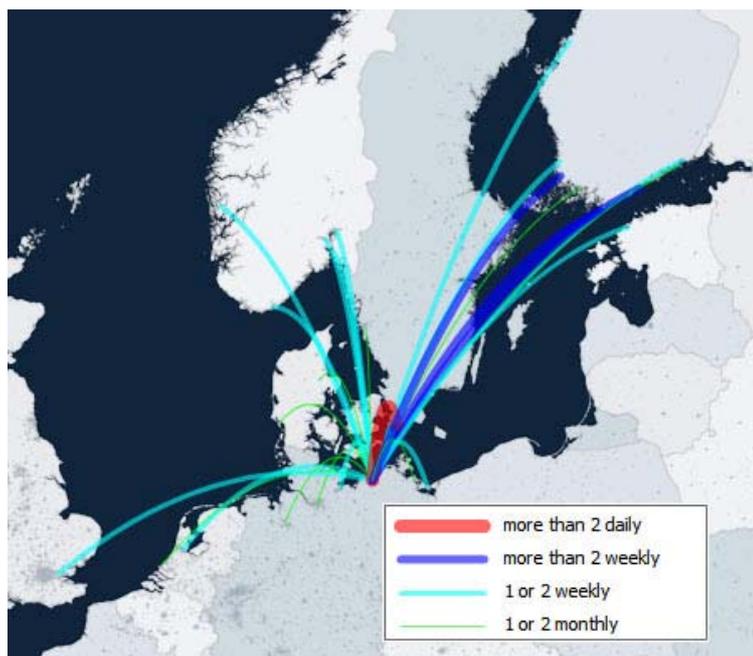
These shipping companies mainly serve relations to Denmark, Finland and Sweden connecting a few ports with daily RoRo vessels.

Table 5-22: Frequency of port calls in country by vessels (Liner Services) coming from Rostock

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Denmark	10 daily	Netherlands	4 monthly
Denmark	4 monthly	Netherlands	1 weekly
Estonia	2 weekly	Norway	8 monthly
Finland	1 daily	Norway	7 weekly
Finland	6 monthly	Poland	1 weekly
Finland	12 weekly	Sweden	6 Daily
Germany	6 monthly	Sweden	2 monthly
Germany	2 weekly	UK	1 weekly

The major ports connected with the port of Rostock are: Trelleborg, Helsinki, Hango and Uusikaupunki.

Map 5-20: Frequent Liner Services from Rostock (ESN 2006)



⁷⁶ see Database and GIS-Client for Details

The largest single commodity that is loaded and unloaded in Rostock is mineral oil products from Estonia, Sweden, Latvia and Lithuania. Coal for the local power plant arrives from Russia and Poland. Iron Ore is unloaded mainly from Norway, Finland and Brazil. Building materials from Norway and Sweden are on the decline. Grain for the malt plant located in the harbour is shipped from Denmark and cement arrives from the German port of Brunsbüttel.

Concerning exports cereals are the most important good. They are mainly shipped to Algeria, Saudi-Arabia and many other locations around the globe. The same is true for rapeseeds and sugar canes. The loading of crude oil is not a regular activity as only exceeding amounts of needed quantities for the local refineries arrive at the port.

Table 5-23: Rostock - Turnover of Goods Categories According to Origin and Destination Country 2001 (Statistisches Bundesamt 2001)

NSTR	0	1	2	3	4	5	6	7	8	9	
Goods Categories	Agricultural Products	Other Foodstuffs	Dry Mineral Fuels	Mineral Oil Products	Iron Ore, Scrap	Iron, Steel	Stones, Earths	Fertilizers	Chemical Products	Vehicles, Machinery	Total
Unloaded											
Sweden	9,7			322,9	12,6		199,1			2190,5	2734,8
Norway			20,3	34,3	781,5	11,2	394,6	18		0,1	1260
Finland	69,9	0,7	25,3	47,1	248,1	33,8	4,6	2,1	7,8	477,2	916,6
Russia	1,7		379,7	15,4	215,3	61,9		57,7	5,5	7,9	745,1
Latvia	42,8	0,5	39,8	313,3	5,9	14,1	178,6	3,7	57,6	25,5	681,8
Denmark	126	0,2	0,1	11,8	0,4	24,7	18,7	5,8	1,5	400,3	589,5
Estonia	1,3		38	429,5		35,7	55,8	4,4		0,2	564,9
Germany	38,5			21,9		3,6	192,9	71,7	180,6	0,1	509,3
Poland	1,5		312,9	11		0,1		14,2	8,1	1,7	349,5
Lithuania				222,7	1			44,8			268,5
Netherlands	2,3			108,5			6,5	23	118,9	1,4	260,6
UK	9,4			89,8		5,2	90,7	7,9		0,1	203,1
Brasil					126,9						126,9
Other	20,9		160,5	95,1	63,2	32,6	34,4	0,6	21,5	4,1	432,9
Sum	324	1,4	976,6	1723,3	1454,9	222,9	1175,9	253,9	401,5	3109,1	9643,5
Loaded											
Sweden	102,1	72,3		3,2	2,9		94,8	40,7	1,2	1893,3	2210,5
Denmark	26	46,8		5,3	12,9	2,6	0,3	95,5	1	464,7	655,1
Algeria	546,7	3									549,7
Netherlands				407,8	2,9			26,3	57,6		494,6
Germany	16,6	12,4		191	0,1			224,5	4,9	1,6	451,1
Saudi-Arabia	352	55									407
UK	44	58,5						53,5	60,1	0,2	216,3
France	15,5	3,9		160	3,4	19,4			10,1		212,3
Greece	187,1										187,1
Portugal	155,5	18				10,2				0,2	183,9
Finland	29,7	19,6		0		20	6,6	5	2,5	92,6	176
Norway	21,1				33,9	56,2	47,4	8,3	4,5	0,2	171,6
Latvia	1,6	30,8		0,1	0,1	2,4	5,7		2,7	51,1	94,5
Estonia	6,3	38,7					2,2				47,2
Russia	8,9	33,9								0,7	43,5
Lithuania	1,5	13,2					4,3			0,3	19,3
Poland	12,8			1,2	2,5	0,5				0,1	17,1
Other	876,7	134,1		163,2		68,1		32,2	8,7	1,5	1284,5

Sum	2404,1	540,2	0	931,8	58,7	179,4	161,3	486	153,3	2506,5	7421,3
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The turnover of bulk in the most important German bulk port at the Baltic Sea shore has declined over the last ten years. This was the case for liquid bulk as well as dry bulk. But for dry bulk, differences in the goods categories could be evaluated. While cereals, iron ore and coal could at times achieve high growth, building materials, scrap and fertilizers could not.

Table 5-24: Turnover according to main goods categories in mil. t.

	2001	2002	2003	2004	2005
Liquid Bulk	3,1	3,3	2,2	2,5	2,5
Dry Bulk	6,5	6,7	6,4	5,4	5,8
General Cargo	0,9	0,7	0,7	0,6	0,7
Ferry Goods	9,1	10,5	11,2	12,0	12,8
RoRo Goods	0,9	1,0	1,1	1,3	1,1
Total	20,5	22,2	21,6	21,8	22,9

For the port of Rostock bulk goods heavily depend on a few importing or exporting companies so that variabilities only reflect market or company changes of the specified bulk good. For instance coal turnover is dominated by imports of one power station and fertilizer turnover by imports and exports of one producing company.

The decline in break bulk can also be traced back to declining metal exports. Due to an extended refinement process at the steel plant in Eisenhüttenstadt, less raw materials were exported while steel plates are distributed over a larger logistical network.

Hinterland Relations

For the port of Rostock certain developments have improved the conditions for hinterland connections. The infrastructure was upgraded through the building of the motorway BAB20 and other improved motorways further south. Because of increasingly heavy loaded trucks this has become a competitive factor.

Regarding the conventional turnover roughly 15% is handled by the local industry. 35 to 45% are shared by the industry in the surrounding federal state Mecklenburg-Vorpommern (e.g. cereals, sugar, building materials, mineral oil products), 20 to 30% by Brandenburg (e.g. ores, cereals, steel) and 9% by Saxony (e.g. mineral oil products). Another 8% are transit shipments of Russian mineral oil via pipelines.

Basic developing factors haven't changed much over the last years in regards to the hinterland relations for the port of Rostock. But the improved infrastructure to the west and to the south has underlined the hinterland connections to southern Germany, Austria and Italy.

5.2.6 Latvia

In Latvia there are ten commercial ports, of which three dominates the goods volumes completely. The main ports are Ventspils, Riga and Liepaja, where Ventspils dominates the volume with the port's focus on handling liquid bulk products.

The growth of transport in Latvian ports arises from goods other than the traditional oil. At Riga, the transport of containers and metal has grown. Railway statistics show that the significance of the Belarus area has risen, with growth having increased by as much as 83% last year.

There are three major ports in Latvia – Liepaja, Riga and Ventspils, as well as seven smaller ports with local significance, which are situated along the entire length of the coastline of Latvia. The ports of Riga and Ventspils are operated as free economic zones, and the port of Liepaja is a part of Liepaja's special economic zone (SEZ).

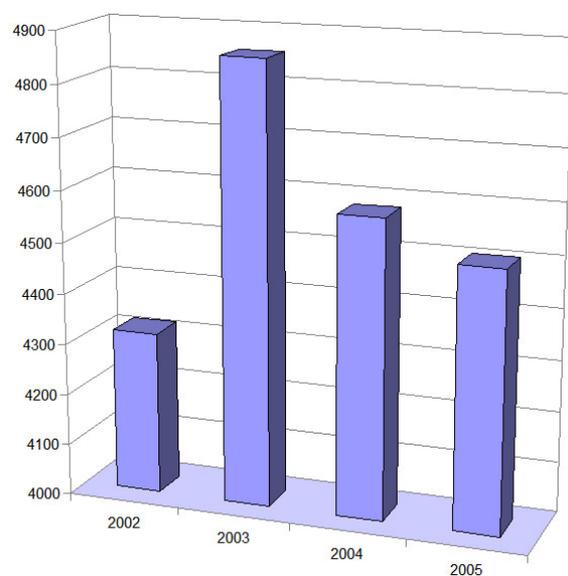
The main transit flows through Latvia are in the east-west direction. 80% of total turnover is going in this direction.

Due to the fact that Russia is building up new oil terminals (Primorsk and Batareinyaya) and is reconstructing existing ports, the role of the Baltic ports as the main transit links is declining. Parts of the current transshipment volumes are already handled in Russian ports. However, the special economic conditions, modern facilities and an advantageous climate for investments may keep the business running ahead.

Liepaja⁷⁷

Traditionally Liepaja is an industrial, commercial and transit centre with a strategic importance for export from Russia to the West and vice versa. The port of Liepaja is part of the Liepaja free zone with certain exemptions on customs duty, tax and VAT. It was a former military port during the Soviet time but has rapidly transferred to a business oriented port. Due to its status as a special economic zone, it is growing fast. The cargo throughput reached 4.5 million tons in 2005. However, turnover has been declining from 2003 to 2005.

Chart 5-29: Port of Liepaja, Total Turnover (1,000 t., l.) 2002-2005

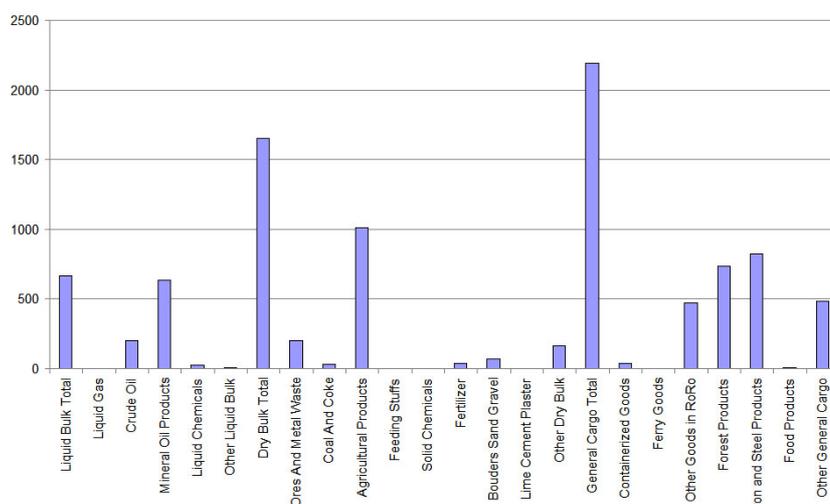


The commodity structure is dominated by general cargo and dry bulk. But it is not used for only one kind of liquid bulk as is the case for other ports in the Baltic States. Although crude and mineral oil products play an important role, they are outweighed by agricultural products. Further more due to its location the port of Liepaja is handling large quantities of forest

⁷⁷ <http://www.liepaja.lv>

products, some from the country's own producing companies and some from Russia. And iron & steel products are of importance.

Chart 5-30: Port of Liepaja - Commodity Turnover 2005 in 1,000 t.⁷⁸



The share of grain and wood chips has substantially increased over the last years. In 2005 the following turnover shares were attained⁷⁹:

- Steel and related metal products 62.8% (Production export of JSC Liepajas Metalurgs 35.5%, 2. Transit cargo 27.3%)
- Timber and other wood products 5%
- Mineral fertilizers 5%
- Agricultural products 22.5%
- Provisions 4% (i.e. sugar, rice, fishmeal)

To handle these goods, the port of Liepaja is served by the following frequent liner services⁸⁰: Break Bulk Caspian Line and Rhenus Logistics NV. All other traffic is non-frequent. Major connections exist to the following countries:

Table 5-25: Frequency of port calls in country by vessels (Liner Services) coming from Liepaja

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	1 monthly	Poland	1 monthly
Latvia	1 monthly	Russia	4 monthly
Lithuania	3 monthly	UK	6 monthly

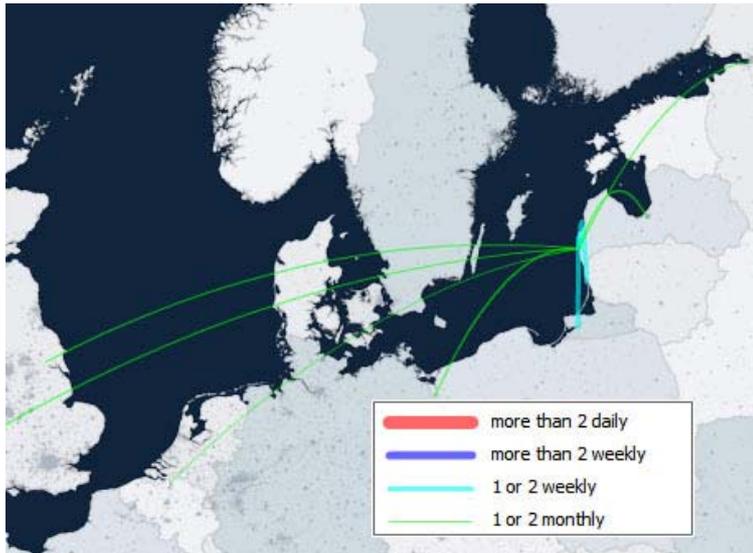
Major connections to individual ports are only few on a regular schedule. Map 5-21 provides an overview.

⁷⁸ Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

⁷⁹ http://www.liepajaport.lv/cargo_structure.html (14.07.2006)

⁸⁰ see Database and GIS-Client for Details

Map 5-21: Frequent Liner Services from Liepaja (ESN 2006)



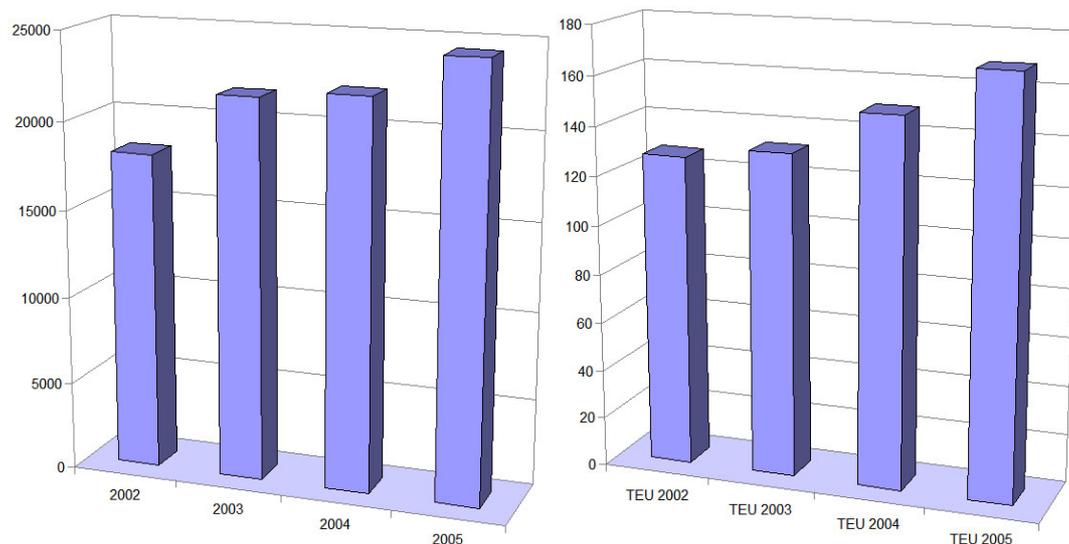
Riga⁸¹

The port of Riga largely handles general cargo. It is a main port for general cargo in Latvia. The port is specialized on ferry and RoRo traffic. But there are also some capacities for bulk.

Approximately 80% of cargo turnover involves the transshipment to and from countries of the former Soviet Union and the main goods categories are general cargo, containers, various metals, wood, coal, mineral fertilizers, chemical goods, mineral oils and food products.

In 2005, 24 million tons were handled at the port of Riga and turnover grew by an average of 10.7% per year between 2002 and 2005. Container turnover grew at a similar rate of 10% per year and reached an absolute amount of 169 thousand TEU in 2005.

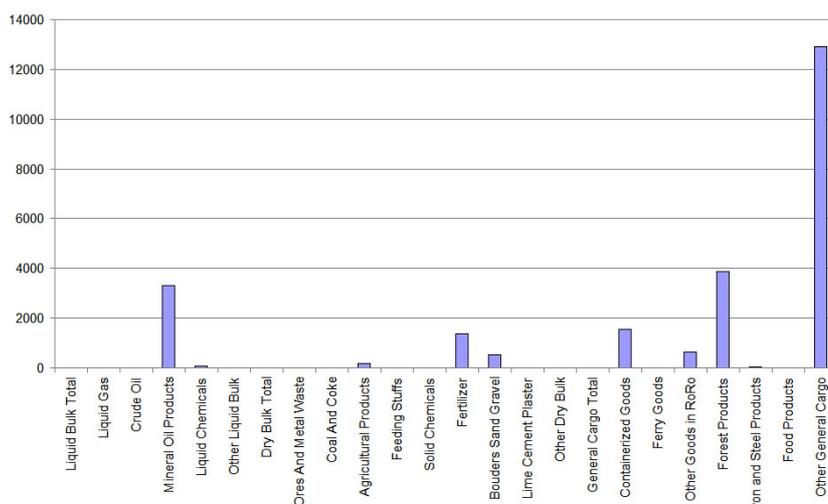
Chart 5-31: Port of Riga, Total (1,000 t., l.) and TEU Turnover (1,000 TEU, r.) 2002-2005



The commodity structure looks like it was mentioned. Most of the turnover is general cargo of all kinds of products needed in the region and some destined for Russia. Forest products are handled, some containers, mineral oil products and dry bulk.

⁸¹ <http://www.freeportofriga.lv>

Chart 5-32: Port of Riga - Commodity Turnover 2005 in 1,000 t.⁸²



The port of Riga is served by the following frequent liner services⁸³:

Baltic Sea Line, Kursiu Linija, Riga Sea Line, Break Bulk Caspian Line, Maersk, Samskip, CMA – CGM, Maras Linija, Team Lines, DFDS Tor Line, MSC, Unifeeder, ESF Euroservices, Rhenus Logistics NV and ZIM Israel Nav.

These liners mainly serve connections to Germany and the neighbouring countries.

Table 5-26: Frequency of port calls in country by vessels (Liner Services) coming from Riga

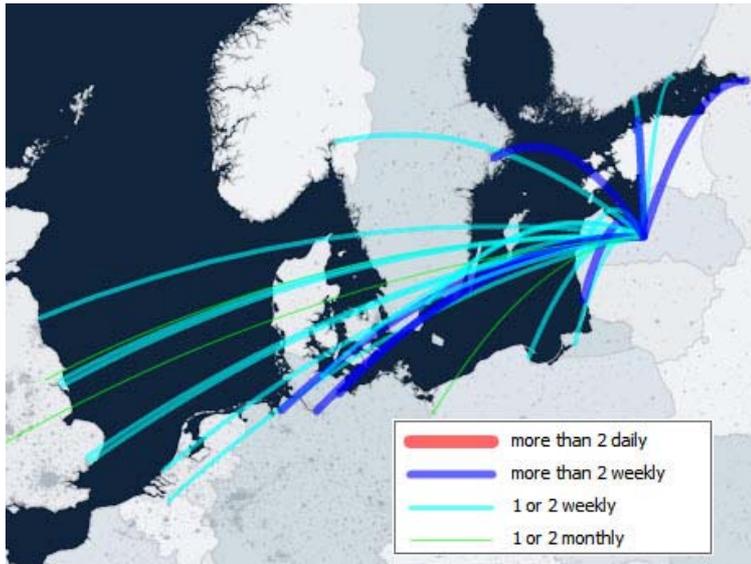
Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	3 monthly	Norway	1 weekly
Belgium	2 weekly	Poland	1 monthly
Estonia	4 weekly	Poland	1 weekly
Finland	4 weekly	Russia	4 monthly
Germany	23 weekly	Russia	4 weekly
Latvia	3 monthly	Sweden	6 weekly
Lithuania	3 monthly	UK	6 monthly
Lithuania	6 weekly	UK	8 weekly
Netherlands	4 weekly		

The main called ports are in this regard: Bremerhaven, Hamburg, Lübeck, Stockholm, Klaipeda, Tallinn and Saint Petersburg as can be seen in Map 5-22.

⁸² Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

⁸³ see Database and GIS-Client for Details

Map 5-22: Frequent Liner Services from Riga (ESN 2006)



Ventspils⁸⁴

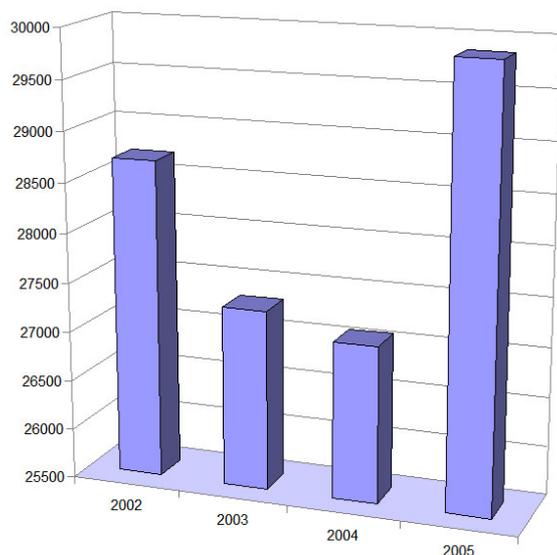
The port of Ventspils is the leading export port of the Baltic States. Its total turnover was 29.9 million tons in 2005, averaging a growth rate of small 1.5% per year between 2002 and 2005. Over two thirds of Latvia's cargo is going through Ventspils. And this has been a low cost opportunity for certain companies due to the established "Law of Ventspils Free Port" which has given exemptions on customs duty, tax and VAT.

The Port of Ventspils can be considered as one of the most important and biggest ports for transshipment of northwest Russian crude oil and it has been the most affected by the Russian shift of export products to their own terminals in the Gulf of Finland that are being build. The crude oil and the oil product transshipment terminals form the largest terminal complex on the East Baltic Sea coast. But concerning the construction of new Russian oil ports in the Gulf of Finland, the port of Ventspils does not see them as a threat to business. The growing oil production rates in Russia, especially in the Caspian area, keep the port authority confident of the future. Furthermore, Ventspils has lowered the transit fees in order to maintain the competitiveness.⁸⁵

⁸⁴ <http://www.portofventspils.lv>

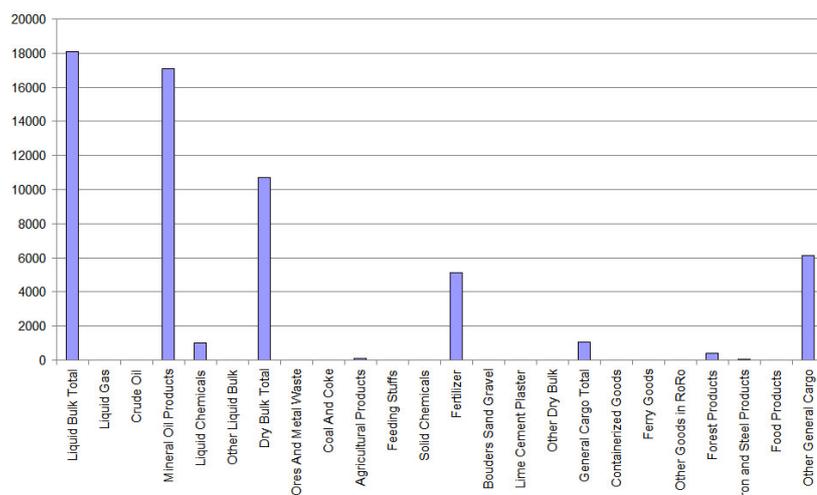
⁸⁵ Rytkönen 2002, p. 34

Chart 5-33: Port of Ventspils, Total (1,000 t., l.) 2002-2005



20% of world potash, 10% of the ammonia and 14% of Russian oil exports have gone through the Ventspils port annually. Regarding overall turnover, mineral oil shares more than 70%. It is followed by dry bulk (including fertilizers) and general cargo.

Chart 5-34: Port of Ventspils - Commodity Turnover 2005 in 1,000 t.⁸⁶



The port of Ventspils Liepaja is served only by a few frequent liner services⁸⁷:

Break Bulk Caspian Line, Scandlines, DFDS Tor Line and Ventlines.

All other traffic is not as frequent.

Table 5-27: Frequency of port calls in country by vessels (Liner Services) coming from Ventspils

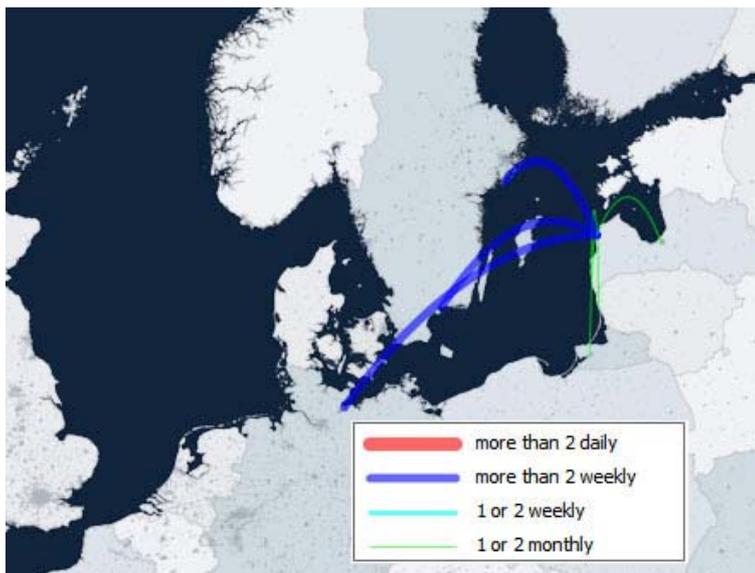
Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Germany	4 weekly	Russia	2 monthly
Latvia	4 monthly	Sweden	1 daily
Lithuania	2 monthly	Sweden	3 weekly

Major connections to other ports are shown in Map 5-23.

⁸⁶ Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

⁸⁷ see Database and GIS-Client for Details

Map 5-23: Frequent Liner Services from Ventspils (ESN 2006)



5.2.7 Lithuania

There is one large port in Lithuania, Klaipeda, which is owned by the state. Before the restoration of independence of Lithuania in 1991 there were two separate ports: sea commercial port and fishing port. The state manages all those objects via the State Enterprise Klaipeda State Seaport Authority, whose main objective is to permanently develop the port, maintain its competitiveness and increase cargo handling volumes. All stevedoring companies are private.

In addition to the port of Klaipeda, there is the Butinge terminal, which is mainly used for loading Russian crude oil, but can also handle import cargoes.

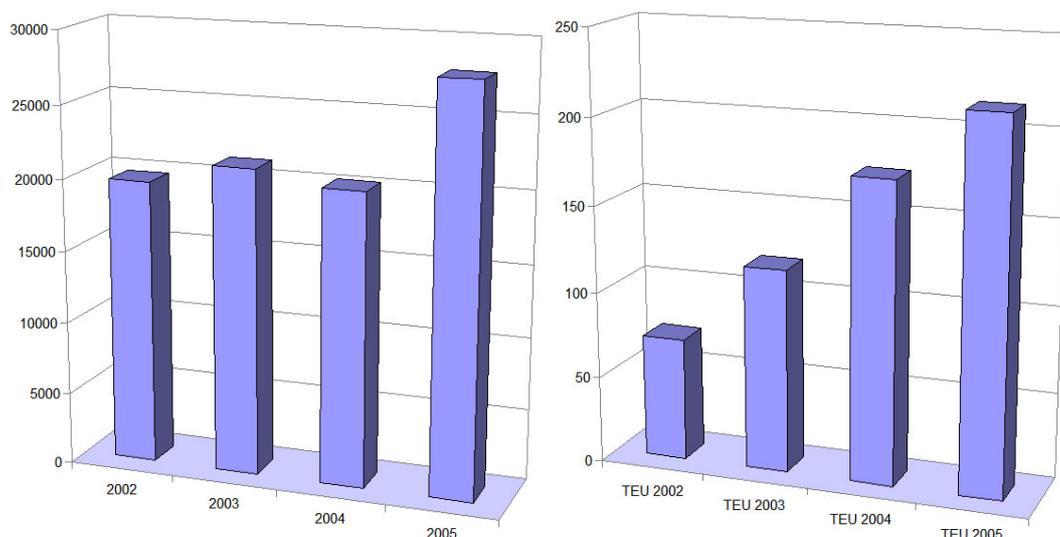
Klaipeda⁸⁸

The Port of Klaipeda, is the only seaport in Lithuania, apart from the Butinge oil terminal and is of major significance for the Lithuanian transport sector in particular and the Lithuanian economy in general. The Port of Klaipeda can be considered as one of the largest ferry and RoRo ports in the Baltic States. It was constructed in 1959 for export of crude oil to western countries and capacity has been increased to 6.6 million tons. In the last couple of years the port has not been developed at the same rate as other ports around the Baltic region, because of the financial background of the country. Overall, transport at Klaipeda developed more slowly than at competing ports.

East-west traffic corresponds with 85% of total transport and 65% is transshipment, mainly from Russia. Total throughput was 27.9 million tons in 2005 of which ~80% represented exports. Turnover grew by 13.6% per year between 2002 and 2005. The turnover of containers experienced an even stronger dynamic over the last years. While the handling grew by about 45% per year from 2002 to 2005, it reached a peak of 214 thousand TEU in 2005.

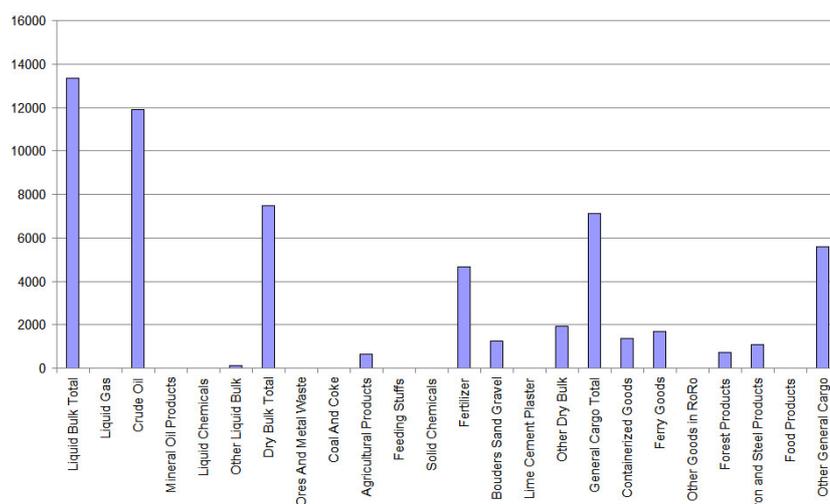
⁸⁸ <http://www.portofklaipeda.lt>

Chart 5-35: Port of Klaipeda, Total (1,000 t., l.) and TEU Turnover (1,000 TEU, r.) 2002-2005



Crude oil is the largest single commodity handled at the port of Klaipeda. Other important cargo groups are dry bulk, general cargo and liquid bulk. Fertilizer and forest products also play an important role at the port.

Chart 5-36: Port of Klaipeda - Commodity Turnover 2005 in 1,000 t.⁸⁹



The port of Klaipeda is served by the following frequent liner services⁹⁰:

BCL, Kursiu Linija, Samskip, Break Bulk Caspian Line, Maras Linija, Scandlines, CMA – CGM, MSC, Team Lines, DFDS Lisco, OOCL, Unifeeder, ESF Euroservices, Rhenus Logistics NV and ZIM Israel Nav.

These shipping companies mainly serve connections to Germany, Sweden and the surrounding countries.

⁸⁹ Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

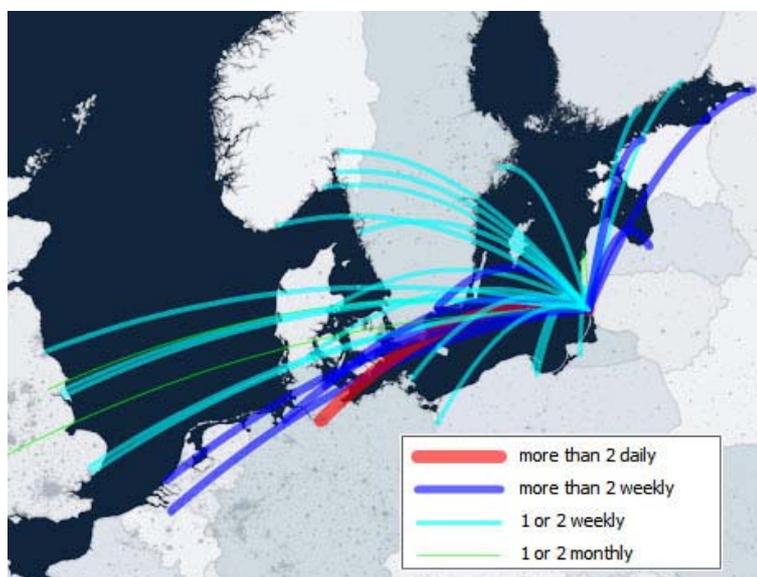
⁹⁰ see Database and GIS-Client for Details

Table 5-28: Frequency of port calls in country by vessels (Liner Services) coming from Klaipeda

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	1 monthly	Norway	5 weekly
Belgium	4 weekly	Poland	1 monthly
Denmark	2 weekly	Poland	5 weekly
Estonia	3 weekly	Russia	4 monthly
Finland	2 weekly	Russia	6 weekly
Germany	24 weekly	Sweden	1 daily
Latvia	2 monthly	Sweden	2 weekly
Latvia	7 weekly	UK	6 monthly
Netherlands	3 weekly	UK	5 weekly

The main connections from Klaipeda are to Hamburg, Antwerp, Rotterdam, Bremerhaven, Kiel, Karlshamn, Riga, Tallinn and Saint Petersburg.

Map 5-24: Frequent Liner Services from Klaipeda (ESN 2006)



Lithuania's importance for Russia will become important, especially after Lithuania has joined the EU. There have been plans to develop Klaipeda and the Russian Kaliningrad together, and to avoid competition by dividing flow of goods between these two ports. The important issue will be the general development of the railway tariff-policy of Russia which will influence the development of these ports significantly.

5.2.8 Netherlands

The Netherlands operate only a few ports but these are rather large. The port of Rotterdam is the largest port in Europe, taking a major position in supply chains and logistical processes in the whole of Europe. The port of Amsterdam is small compared to its neighbour but nevertheless it belongs to the main ports in the NSR region. Overall the ports of the Netherlands make a substantial contribution to the cargo turnover of the NSR and BSR.

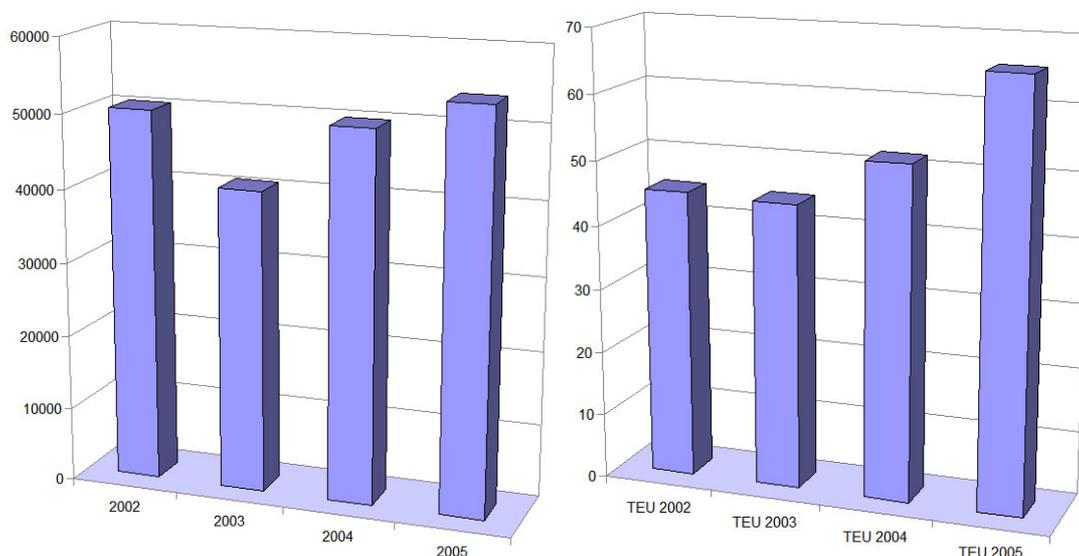
Amsterdam⁹¹

In 2005, 53 million tons were handled at the port of Amsterdam. An average growth of 3.8% per year was achieved from 2002 to 2005. Container turnover reached an amount of 65

⁹¹ <http://www.portofamsterdam.com>

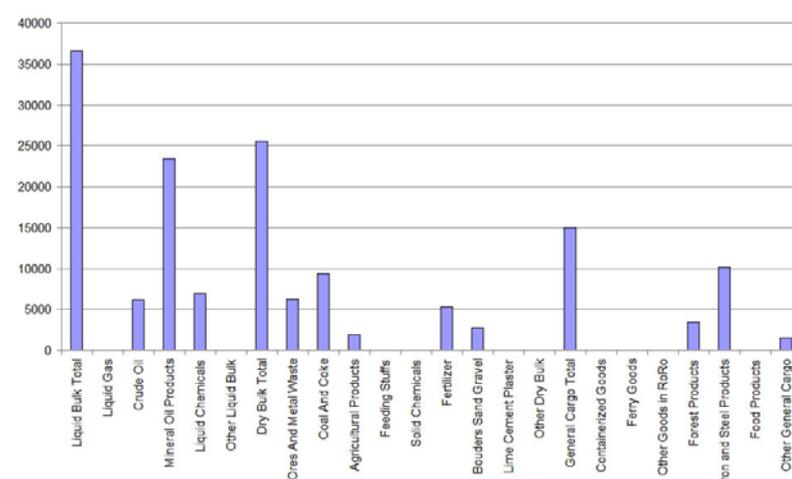
thousand TEU in 2005 and an average growth of 14% was achieved. Therefore, the container turnover is growing but it does not have that much of importance in comparison to other ports in the region. Containers are generally handled at Antwerp or Rotterdam.

Chart 5-37: Port of Amsterdam, Total (1,000 t., l.) and TEU Turnover (1,000 TEU, r.) 2002-2005



The commodity structure is dominated by bulk goods in terms of tons. Dry bulk is most important followed by mineral oil products. The refineries nearby are a major contributor to the turnover. Substantial amounts of the oil from the NSR are refined in the region of the port. General cargo is also handled in large quantities.

Chart 5-38: Port of Amsterdam - Commodity Turnover 2005 in 1,000 t.⁹²



The port of Amsterdam is served by the following frequent liner services⁹³:

BKO Shipping, Hartel, P&O Nedlloyd, DFDS Seaways, Maersk, Pal Line, Dutch Feeder Lines, MISC, Scan-Baltic Express (OOCL), Finnlines, Nedlines, Sea-Cargo, Grimaldi, NYK Line Europe, Spliethoff, Hapag-Lloyd and OOCL.

These shipping companies provide regular liner services to the following countries:

⁹² Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

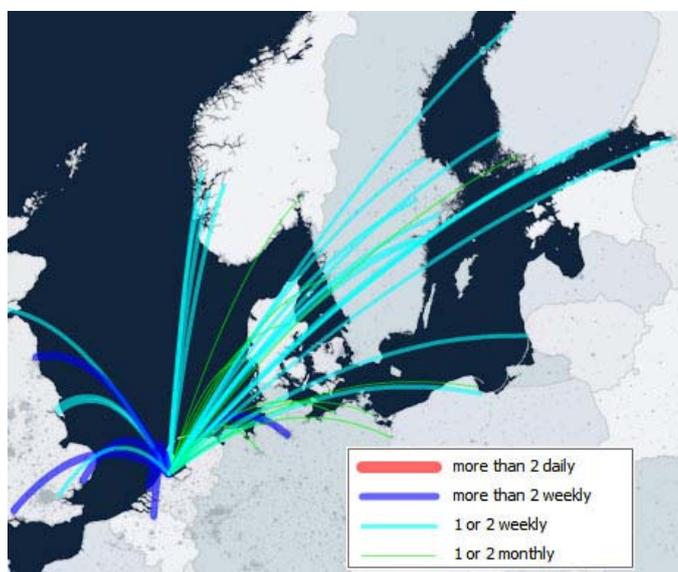
⁹³ see Database and GIS-Client for Details

Table 5-29: Frequency of port calls in country by vessels (Liner Services) coming from Amsterdam

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	5 monthly	Norway	4 monthly
Belgium	1 weekly	Norway	5 weekly
Denmark	4 monthly	Poland	6 monthly
Finland	7 monthly	Poland	1 weekly
Finland	6 weekly	Russia	2 weekly
Germany	21 monthly	Sweden	2 monthly
Germany	5 weekly	Sweden	6 weekly
Lithuania	1 weekly	UK	2 daily
Netherlands	12 monthly	UK	13 monthly
Netherlands	2 weekly	UK	3 weekly

Major connections are maintained mainly to the nearby regions as is seen in Map 5-25.

Map 5-25: Frequent Liner Services from Amsterdam (ESN 2006)



Amsterdam plays an important role as a distribution point for incoming and outgoing cargo to and from continental Europe. A major portion of the raw materials unloaded in Amsterdam is processed to customer specification. Value-added logistics is one of the port's main activities.

In addition, the strength of the port of Amsterdam lies to a large extent in the infrastructure. Amsterdam has excellent links to waterways, road, rail and air. Because of these transport facilities, Amsterdam is increasingly a preferred location of international companies concentrating their distribution for (North Western) Europe in one central location.

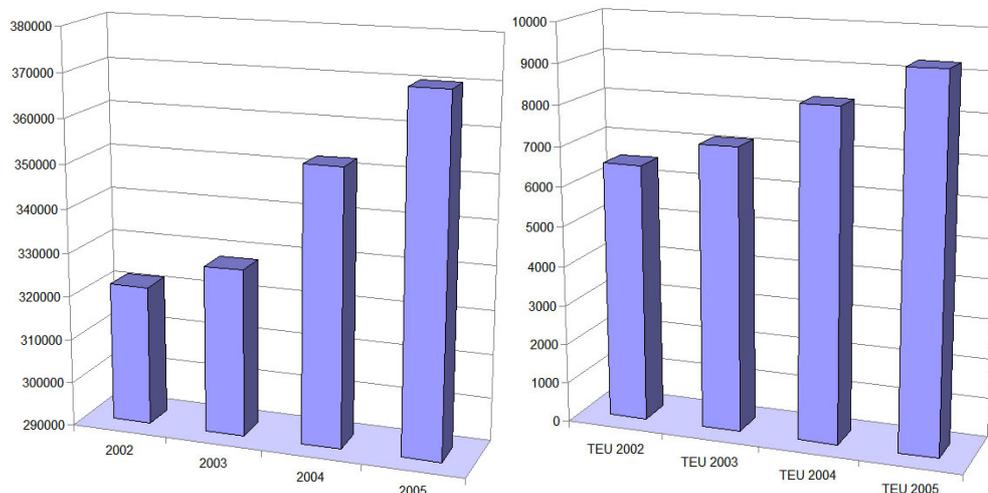
Rotterdam⁹⁴

Rotterdam is the largest port in Europe. Since 2004 Asian ports have outgrown its turnover. The most important areas of business for the port are the petrochemical industry and general cargo transshipment. The port functions as a major transit location for transport of bulk and other goods between the European continent and other parts of the world. From Rotterdam transport can be undertaken by ship, barge, rail or road.

⁹⁴ <http://www.portofrotterdam.com>

In 2005, the port of Rotterdam reached a peak in total turnover with 370 million tons after years of strong growth with an average of 4.8% per year between 2002 and 2005. The port is also handling the largest amount of containers in Europe with 9.3 million TEU in 2005. On average this turnover grew by 12.6% over the last years.

Chart 5-39: Port of Rotterdam, Total (1,000 t., l.) and TEU Turnover (1,000 TEU, r.) 2002-2005



To handle all these goods, a large number of frequent liner services have been established. Mainly all important shipping companies are in one way or the other related to Rotterdam. The port is served by the following frequent liner services for the NSR and BSR⁹⁵:

"K" Line, Eurofeeders Ltd, Normed Line, AGS Shipping, Evergreen, Northsea Container Line, Armada Lines, Express Container Line, NWL, BG Freight Line, Ferryway NV, OOCL, Borchard Lines, FOCS Container Service, OPDR, Bridge Baltic Line, Hamburg Süd, P&O Ferries, Brointermed, Hartel, P&O Nedlloyd, BULCON, Holland Maas Shipping/HMS, Pal Line, C.M.N. International, Hyundai Merchant Marine, Portconnect, CMA – CGM, Jönsson Nova Line, Portlink NV, Cobelfret Ferries NV, Kursiu Linija, Ruukki Logistics, Compania Transatlantica Espanola, LALINE, Safmarine, Concorde Container Line, Lloyd Triestino di Navegazione, Samskip, CoNor Line, Lys-Line, SCI Line, Containerships, Mac Andrews, Sea-Cargo, Contship, MACPAK CONTAINER SERVICE, Sloman Neptun, Delphis, Maersk, SolNiver Lines, Delta Shipping Service B.V., MISC, TECO, DFDS Tor Line, Montemar Maritma S.A., Unifeeder, Eimskip, MSC, Wallenius Wilhelmsen, ESF Euroservices, NATVAR PARIKH INDUSTRIES Ltd., X-Press Container Line and ZIM Israel Nav.

These shipping companies offer connections to all countries of the NSR and BSR. The most frequent connections are to the neighbouring Belgium and UK, Germany, Norway and Sweden.

Table 5-30: Frequency of port calls in country by vessels (Liner Services) coming from Rotterdam

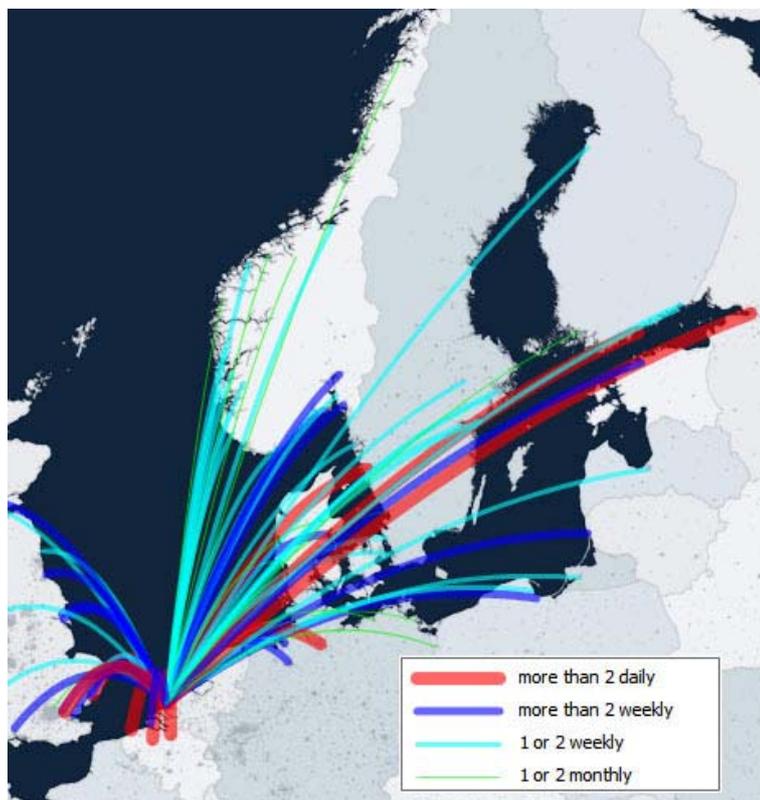
Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	26 monthly	Netherlands	11 weekly
Belgium	39 weekly	Norway	37 monthly
Denmark	9 monthly	Norway	23 weekly
Denmark	7 weekly	Poland	6 monthly
Estonia	2 monthly	Poland	4 weekly
Estonia	5 weekly	Russia	2 monthly
Finland	9 monthly	Russia	17 weekly
Finland	14 weekly	Sweden	10 monthly
Germany	28 monthly	Sweden	19 weekly
Germany	28 weekly	UK	3 daily

⁹⁵ see Database and GIS-Client for Details

Latvia	2 weekly	UK	38 monthly
Lithuania	4 weekly	UK	68 weekly
Netherlands	2 monthly		

Looking at the individual ports, all major ports in each country are served. In particular, most frequent connections exist to the ports of Belgium, Felixstowe, Hamburg, Gothenburg, Helsinki and Saint Petersburg.

Map 5-26: Frequent Liner Services from Rotterdam (ESN 2006)



5.2.9 Norway

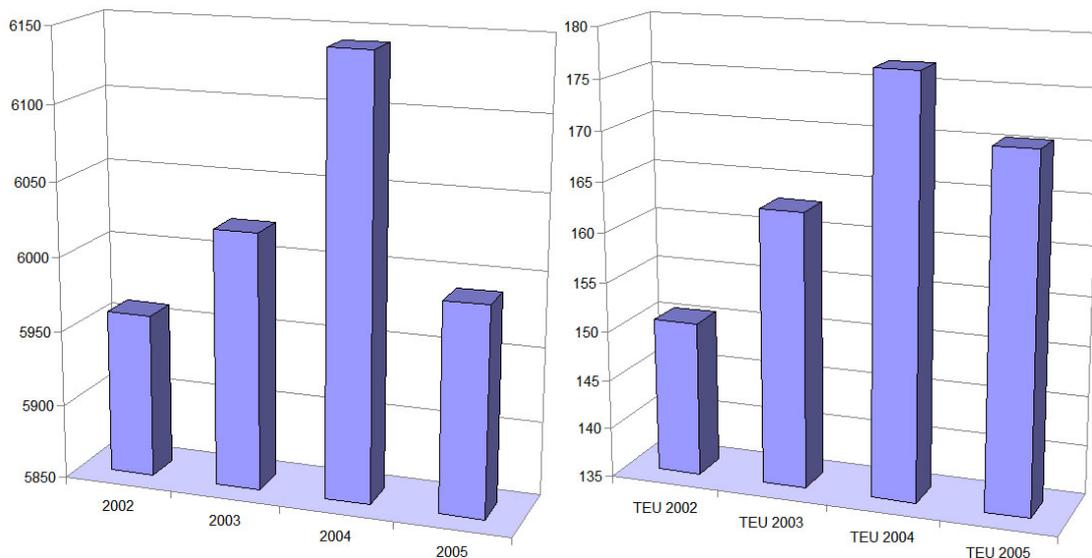
There are some 60 public ports in Norway. But the government has nominated ten ports as "ports of national interest". In addition there are a number of private industrial ports. Due to the size of the country and the historical development, these many ports exist to provide an efficient way of distributing over the whole country. Most ports are fairly small and just supply the nearby area. Only the port of Oslo has reached a considerable size not only because of the regional agglomeration. The region of Oslo is the major focal point for cargo flows arriving from the north and west of the country.

Oslo⁹⁶

The port of Oslo is generally known as a ferry and cruise liner vessel port. But it also handles fair amounts of goods. In 2005, about 6 million tons were handled which is similar to the previous years. The turnover of containers was 170 thousand in 2005 which a rather small amount but it grew on average by 4.4% between 2002 and 2005.

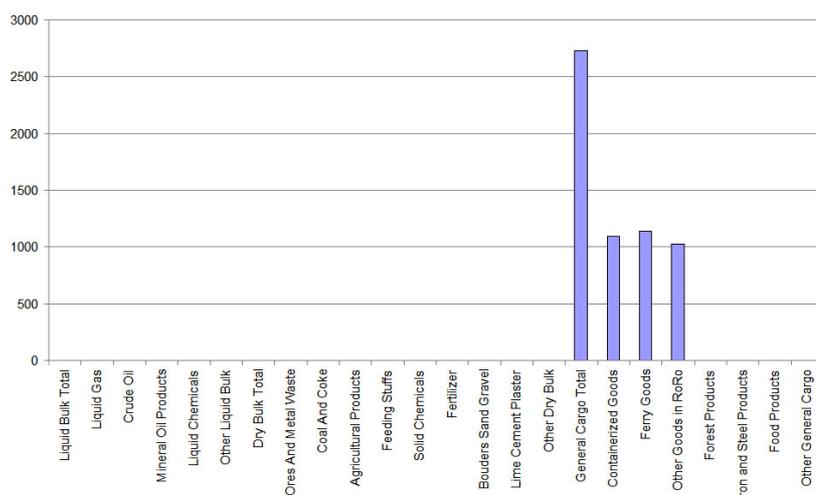
⁹⁶ <http://www.ohv.oslo.no>

Chart 5-40: Port of Oslo, Total (1,000 t., l.) and TEU Turnover (1,000 TEU, r.) 2002-2005



Due to its focus on ferry traffic, most of the cargo handled in Oslo is general cargo on trailers. It is almost evenly shared by containerized goods, ferry goods and other goods transported via RoRo vessels.

Chart 5-41: Port of Oslo - Commodity Turnover 2005 in 1,000 t.⁹⁷



That is why it is obvious that most of the frequent liner services operated from the port of Oslo are ferry or RoRo services⁹⁸:

Color Line, Maersk, Sea-Cargo, DFDS Tor Line, MSC, Stena Line, DK-Nor, Norcarg, Team Lines, Finnlines, Norge-Rhin Linjen, UECC, Hartel, Norlines, Unifeeder, Hyundai Merchant Marine, R.M.S., Will-Nor Line, LALINE, Samskip, ZIM Israel Nav, Lys-Line and Scandinavian Seaways.

The frequency of port calls of these liner services is especially high for ports on the west coast of Sweden where cargo is distributed to. Countries like Germany, Denmark and Sweden are also frequented very often.

⁹⁷ Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

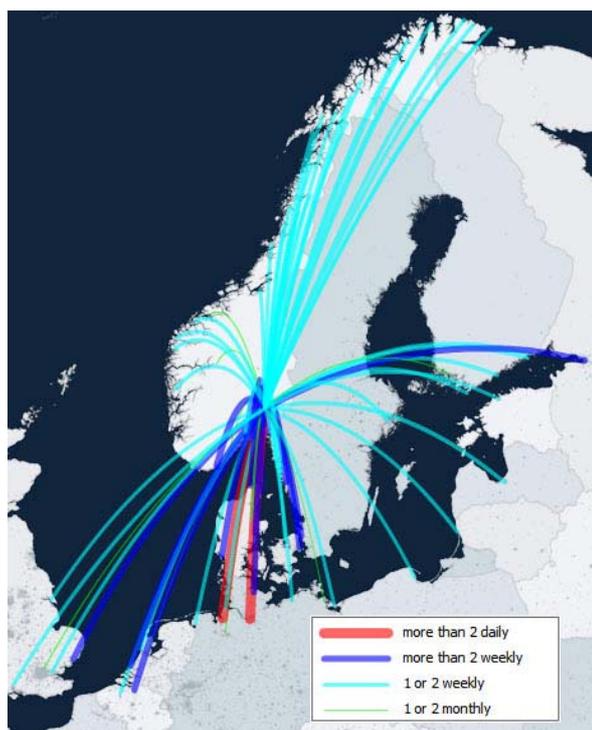
⁹⁸ see Database and GIS-Client for Details

Table 5-31: Frequency of port calls in country by vessels (Liner Services) coming from Oslo

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	2 monthly	Lithuania	2 weekly
Belgium	7 weekly	Netherlands	6 monthly
Denmark	3 daily	Netherlands	8 weekly
Denmark	6 monthly	Norway	44 monthly
Denmark	14 weekly	Norway	69 weekly
Estonia	2 weekly	Poland	2 weekly
Finland	6 monthly	Russia	5 weekly
Finland	5 weekly	Sweden	2 daily
Germany	1 daily	Sweden	3 monthly
Germany	8 monthly	Sweden	10 weekly
Germany	22 weekly	UK	4 monthly
Latvia	1 weekly	UK	6 weekly

Map 5-27 shows the liner services that are connecting to the port of Oslo. The main connections are to Bremerhaven and Hamburg. This shows the importance of these two ports for the transshipment of goods to Norway via these ports.

Map 5-27: Frequent Liner Services from Oslo (ESN 2006)



5.2.10 Poland

The major commercial seaports in Poland are two twin ports: Gdansk and Gdynia and Szczecin-Swinoujscie. The latter are run by the same port authority while the former are in direct competition to each other. These ports together handle more than 95% of the total throughput, which is about 50 million tons. General cargo and container volumes have been greatly developed during the last years.

Both Gdynia and Gdansk are located in the same county and on the basis of political decisions made earlier, Gdansk specialises in bulk and Gdynia in container and general cargo. The

situation now after the reorganisation of ports is that there is growing competition between these ports for containerized goods. Gdynia is totally dominant in general cargo and containers, but Gdansk has plans to also build a new container terminal to be able to compete in the fast growing container feeder market. Competition between the ports points to a need for new investment.

Kolobrzeg, Police and Elblag are other ports of less regional significance.

The port sector in Poland has undergone major changes in the last few years to gradually become more like the "standard" EU port with a port authority performing a landlord function and various companies performing services in the ports.

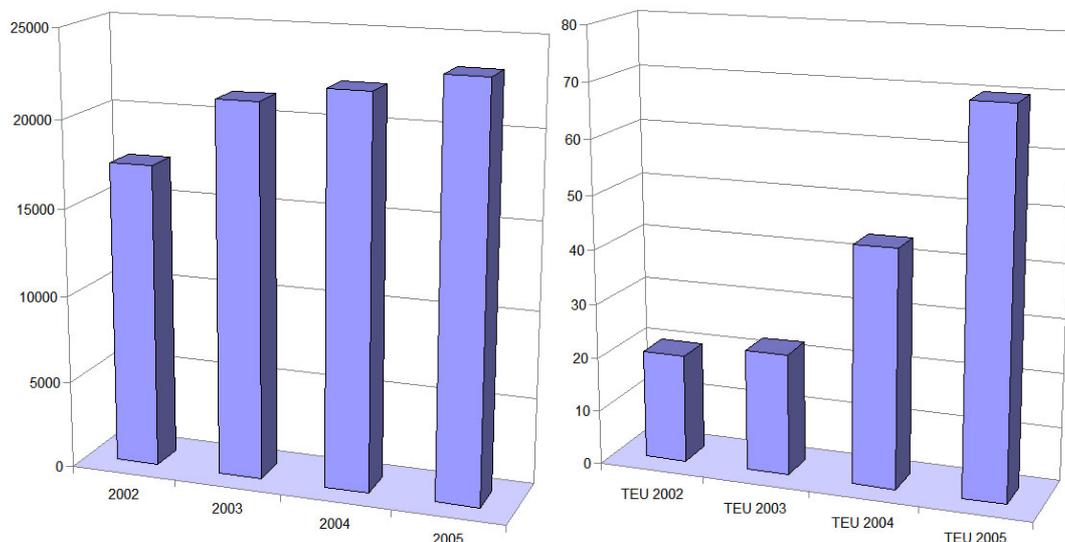
Gdansk⁹⁹

The port of Gdansk is the largest port in Poland. It has two separate ports:

1. Inland Port – specialized on the handling of containers; general cargo; terminals for sulphur, salts, soda, chemicals, fertilizers, coal, grain, and other bulk goods.
2. Northern Port – specialized on coal, mineral fuels and other liquid bulk.

In 2005, the port of Gdansk handled 23 million tons. On average, 10.7% of growth was reached between 2002 and 2005. Turnover of containers reached an amount of 70 thousand TEU in 2005.

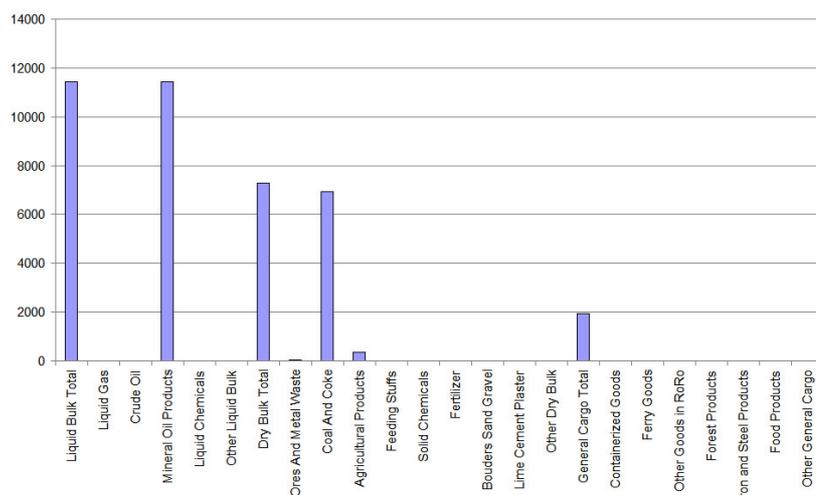
Chart 5-42: Port of Gdansk, Total (1,000 t., l.) and TEU Turnover (1,000 TEU, r.) 2002-2005



The commodity structure of the port of Gdansk is dominated by the turnover of mineral oil products and coal & coke. Some general cargo and container turnover is added to that.

⁹⁹ <http://www.portgdansk.pl>

Chart 5-43: Port of Gdansk - Commodity Turnover 2005 in 1,000 t.¹⁰⁰



To transport these goods the following frequent liner services exist from Gdansk¹⁰¹:

BCL, IMCL InterMarineContainer Lines, Polish Baltic Shipping Co, Containerships, Kursiu Linija, Spliethoff, Delphis, Maersk, Team Lines, DFDS Tor Line, Mann Lines, Venbulk Service GmbH, Euro Marine Carrier, MISC, Hartel and OOCL.

The frequency of connections is shown in Table 5-32.

Table 5-32: Frequency of port calls in country by vessels (Liner Services) coming from Gdansk

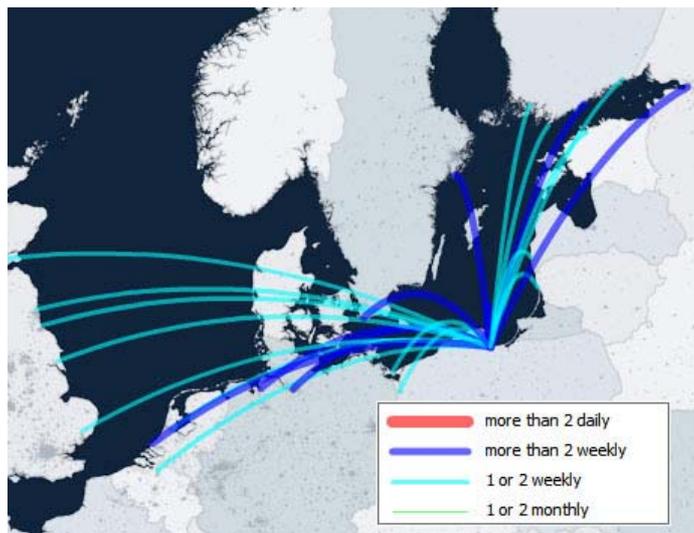
Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	3 monthly	Netherlands	4 Monthly
Belgium	2 weekly	Netherlands	4 Weekly
Estonia	1 weekly	Poland	4 Monthly
Finland	3 monthly	Poland	5 Weekly
Finland	5 weekly	Russia	3 Weekly
Germany	12 weekly	Sweden	7 Weekly
Latvia	3 monthly	UK	9 Monthly
Lithuania	3 monthly	UK	5 Weekly
Lithuania	1 weekly		

Looking at individual port connections, frequency to the ports of Rotterdam, Bremerhaven, Hamburg, Trelleborg, Helsinki and Saint Petersburg is high.

¹⁰⁰ Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

¹⁰¹ see Database and GIS-Client for Details

Map 5-28: Frequent Liner Services from Gdansk (ESN 2006)

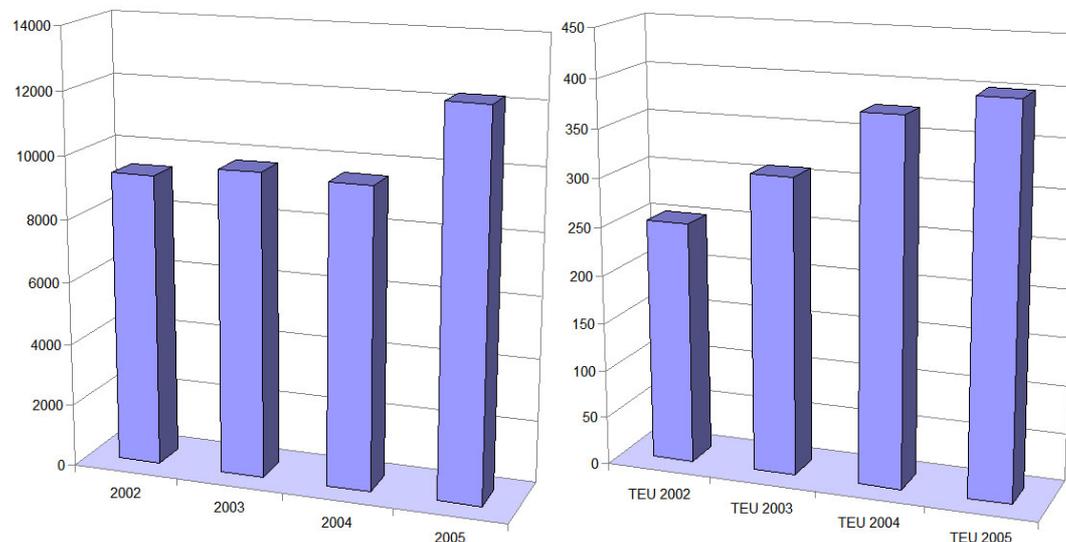


The Port of Gdansk has a network of rail connections with the hinterland providing relations in all strategic directions.

Gdynia¹⁰²

The port of Gdynia is the second largest port in Poland. In 2005 the total turnover was 12.2 million tons, averaging a growth rate of 10% per year from 2002 to 2005. Container turnover reached 400 thousand TEU in 2005 with an average growth of 17% per year.

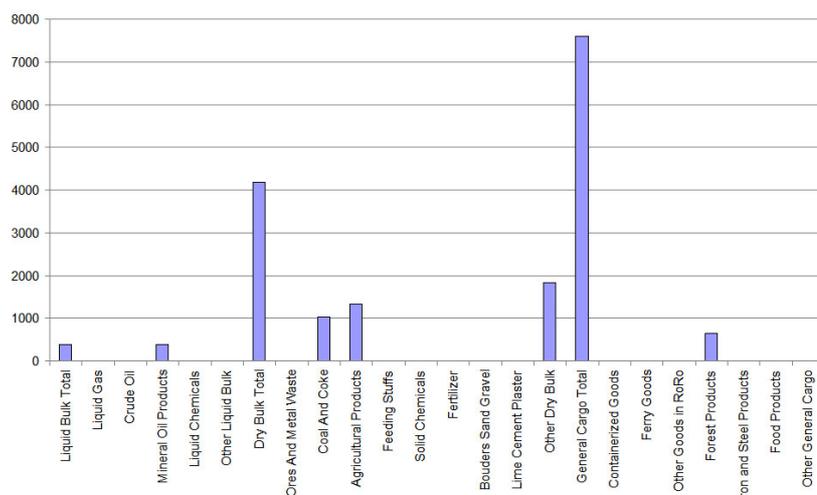
Chart 5-44: Port of Gdynia, Total (1,000 t., l.) and TEU Turnover (1,000 TEU, r.) 2002-2005



In comparison to the port of Gdansk, the commodity structure differs significantly due to the strategical division of the two ports. Gdynia handles largely general cargo. Its focus on container traffic adds to that. But in general the port handles all kinds of cargo including large amounts of dry bulk and some liquid bulk.

¹⁰² <http://www.port.gdynia.pl>

Chart 5-45: Port of Gdynia - Commodity Turnover 2005 in 1,000 t.¹⁰³



The port of Gdynia is served by the following frequent liner services¹⁰⁴:

APL, Hamburg Süd, Polfin Line, BCL, Hartel, POL-LEVANT Shipping Lines Ltd, CCS, IMCL InterMarineContainer Lines, Spliethoff, CMA – CGM, Mac Andrews, Stena Line, Delphis, Maersk, Team Lines, Euroafrica Linie Zeglugowe, Mann Lines, Transfennica, Finlines, MSC, UECC and ZIM Israel Nav.

These shipping companies mainly connect to ports in Sweden, Germany and Finland. Most other main ports are served less frequently as well.

Table 5-33: Frequency of port calls in country by vessels (Liner Services) coming from Gdynia

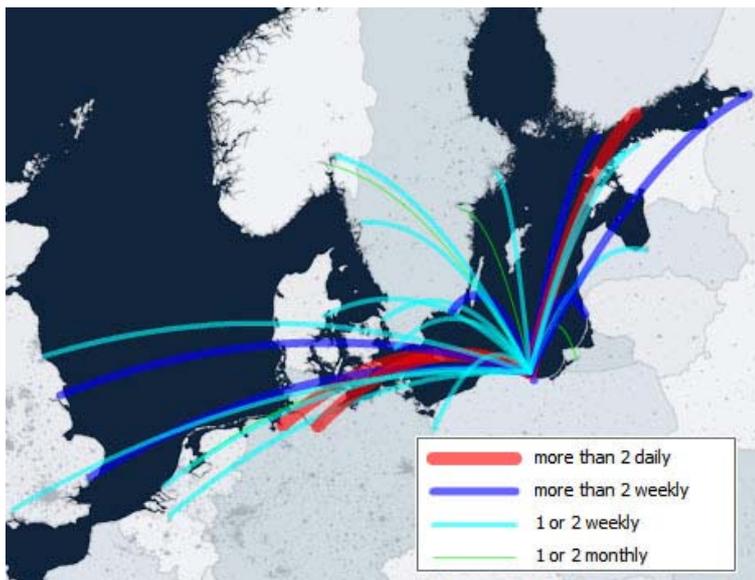
Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	2 monthly	Netherlands	1 weekly
Belgium	2 weekly	Norway	2 monthly
Denmark	2 monthly	Norway	1 weekly
Denmark	1 weekly	Poland	5 monthly
Estonia	3 weekly	Poland	5 weekly
Finland	16 weekly	Russia	2 monthly
Germany	3 monthly	Russia	3 weekly
Germany	23 weekly	Sweden	2 daily
Latvia	1 weekly	Sweden	5 monthly
Lithuania	5 weekly	Sweden	3 weekly
Netherlands	4 monthly	UK	9 weekly

Ports that are most often frequented are: Hamburg, Bremerhaven and Helsinki. Other important and potentially growing relations are to Saint Petersburg and Karlskrona.

¹⁰³ Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

¹⁰⁴ see Database and GIS-Client for Details

Map 5-29: Frequent Liner Services from Gdynia (ESN 2006)

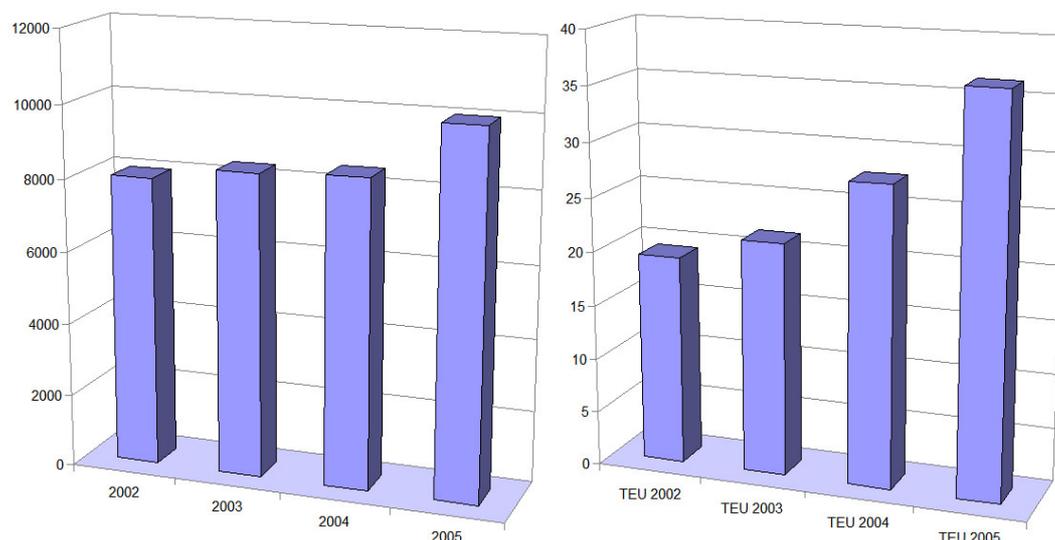


Szczecin/Swinoujscie

*Szczecin*¹⁰⁵

The port of Szczecin is located 65 km from the open sea at the river Oder. The port is also connected to the German inland waterway system which provides for multimodal hinterland connections. In 2005, it achieved a total turnover of 10 million tons. The growth averaged about 8% per year from 2002 to 2005. Container turnover reached 36.5 thousand TEU and has been fairly low in comparison to other ports in Poland.

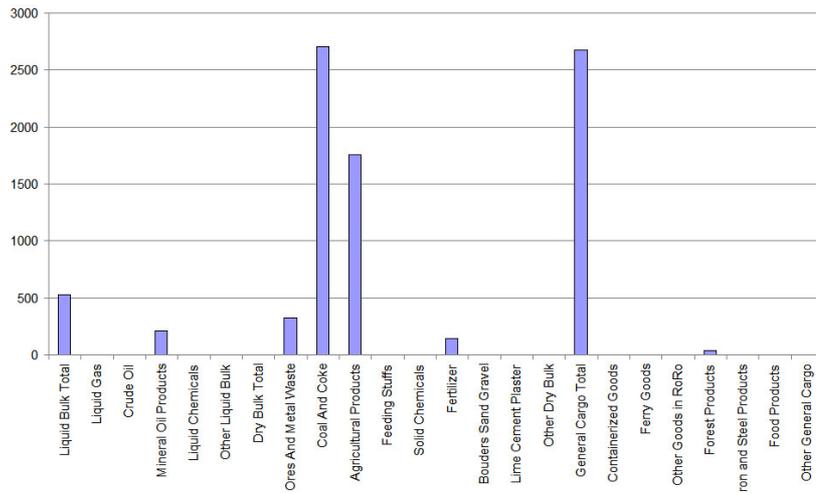
Chart 5-46: Port of Szczecin, Total (1,000 t., l.) and TEU Turnover (1,000 TEU, r.) 2002-2005



The bulk cargo port handles steel products, unitised general cargo, timber and bulk cargo. The coal port specialises in handling and storing coal, other bulk cargo and various kinds of general cargo, animal feed and liquid cargo. The MAS port handles ores and ore concentrates, coal and other bulk and general cargoes.

¹⁰⁵ <http://www.port.szczecin.pl>

Chart 5-47: Port of Szczecin - Commodity Turnover 2005 in 1,000 t.¹⁰⁶



The port of Szczecin is served by the following frequent liner services¹⁰⁷:

BCL, Maersk, Fast Lines, Magemar NV, Finnlines, Polfin Line, Hartel and Rhenus Logistics NV.

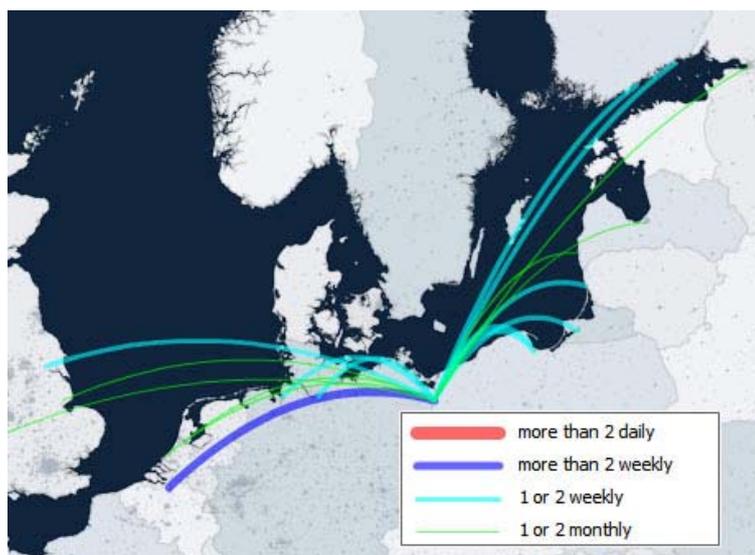
These shipping companies serve the following countries:

Table 5-34: Frequency of port calls in country by vessels (Liner Services) coming from Szczecin

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	6 monthly	Netherlands	4 monthly
Finland	3 weekly	Poland	4 monthly
Germany	3 weekly	Poland	3 weekly
Latvia	2 monthly	Russia	2 monthly
Lithuania	1 monthly	Russia	1 weekly
Lithuania	1 weekly	UK	12 monthly

Most frequent liner services are therefore established to Antwerp as is seen in Map 5-30.

Map 5-30: Frequent Liner Services from Szczecin (ESN 2006)



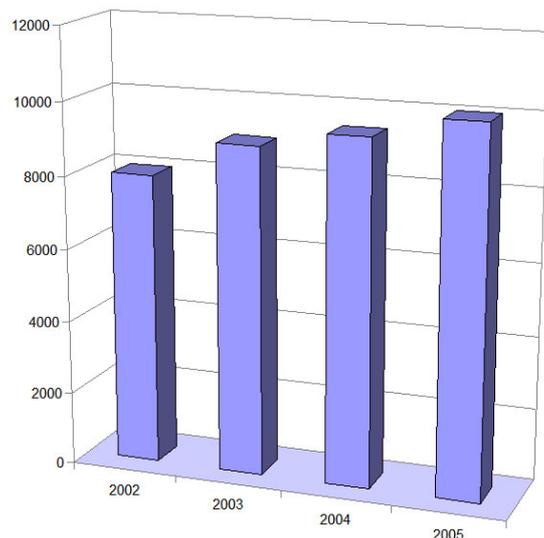
¹⁰⁶ Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

¹⁰⁷ see Database and GIS-Client for Details

Swinoujście¹⁰⁸

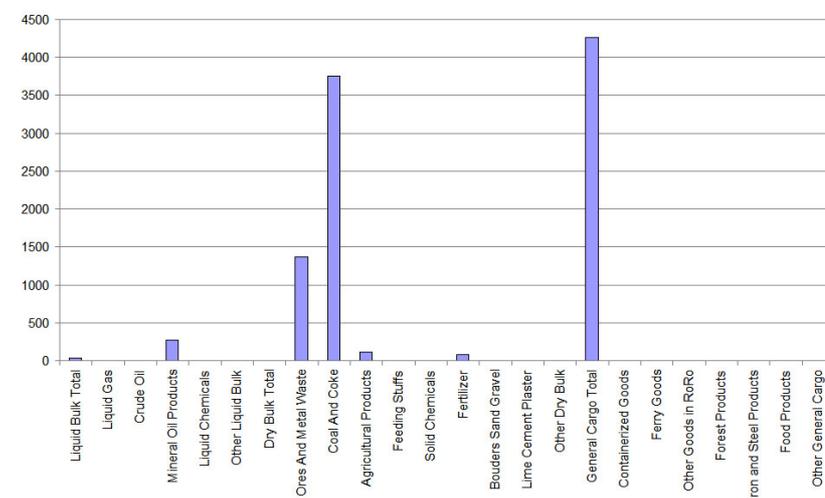
The port of Swinoujście is located at the mouth of the river Swine and can handle larger vessels than the port of Szczecin due to draft restrictions. Annual turnover was 10 million tons in 2005 which is the same as that of its sister port. Growth has been the same as that of Szczecin. It inhabits terminals for oil, coal, chemicals and raw materials.

Chart 5-48: Port of Swinoujście, Total Turnover (1,000 t., l.) 2002-2005



The commodity structure is divided into general cargo and dry bulk mainly in the form of coal & coke.

Chart 5-49: Port of Swinoujście - Commodity Turnover 2005 in 1,000 t.¹⁰⁹



The port of Swinoujście is served by the following frequent liner services¹¹⁰:

BCL, Polish Baltic Shipping Co, Euroafrica Linie Zeglugowe, Unity Line and Norcargo.

The port has frequent ferry and cargo connections to Germany, Denmark, Sweden and Finland. Some of the turnover is transhipped via the direct link to the German inland waterway system.

¹⁰⁸ <http://www.phs.com.pl>

¹⁰⁹ Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

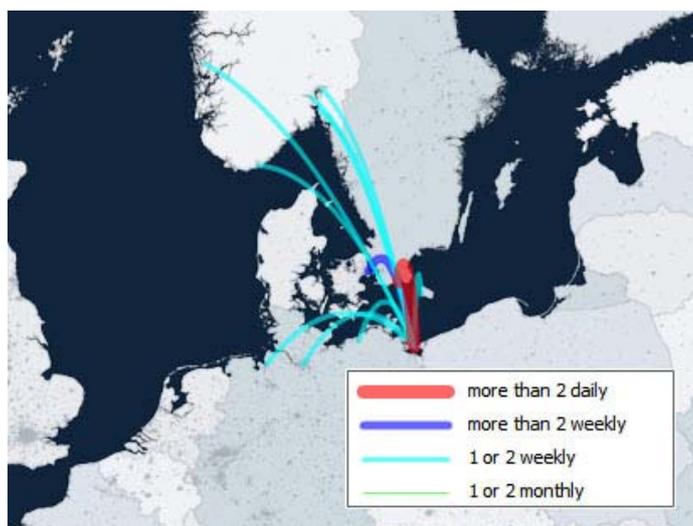
¹¹⁰ see Database and GIS-Client for Details

Table 5-35: Frequency of port calls in country by vessels (Liner Services) coming from Swinoujscie

Country of called ports	Frequency of port calls
Denmark	6 weekly
Germany	3 weekly
Norway	7 weekly
Sweden	5 daily

Most frequent connections are to the ports of Ystad and Copenhagen.

Map 5-31: Frequent Liner Services from Swinoujscie (ESN 2006)



5.2.11 Russia

After the recent reorganisation of the Russian maritime sector, Rosmorport is the owner of all ports in Russia. Rosmorport in its turn is under the direction of the Federal Agency for Maritime and River Transport, an agency of the Ministry of Transport. But operators of the ports vary and especially in Saint Petersburg there are several; almost one for each terminal.

In the BSR, there are five Russian ports, which are shown in official statistics: Kaliningrad, Saint Petersburg, Primorsk, Vysotsk and Vyborg. Port of Ust-Luga is in use, too, but only a part of the planned construction has so far been realised. In addition to these Baltic ports, there are two large ports in the North West, Arkhangelsk and Murmansk, which belong to the BSR in its widest description but which are not considered any further.

The share of the main Russian Baltic ports, Saint Petersburg and Kaliningrad, was 22% at the end of the 1990s.¹¹¹ And it should not have changed much since then. But taking into account the large figures of the Russian oil transshipment handled by the Baltic States, it is evident that in spite of the apparent large volume handled by the Black Sea ports, the Baltic Sea has a great importance for Russian trade and transport.

Saint Petersburg¹¹²

The port of Saint Petersburg consists of many different ports, and the expression Greater Port of Saint Petersburg is used to cover the entity of all companies handling cargo at port terminals inside the City of Saint Petersburg area. The Joint Stock Company Sea Port of Saint Petersburg is the biggest of these companies.

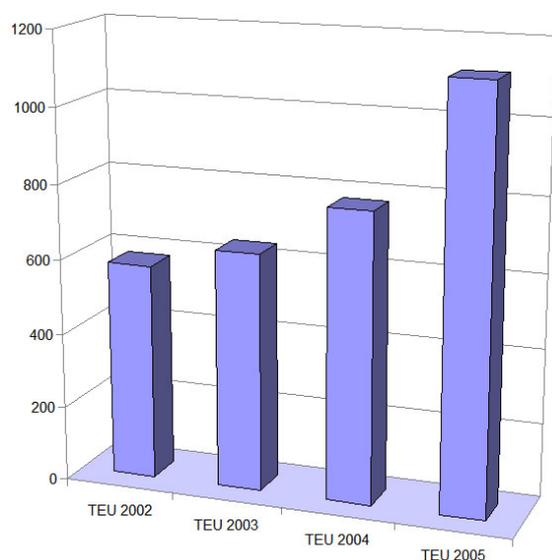
¹¹¹ Rytkönen 2002, p. 24

¹¹² <http://www.seaport.spb.ru>

Because of the diversified structure of the port, it is difficult to arrive at total turnover figures that are consistent. However, combined figures are available for the JSC Seaport Saint Petersburg group of companies which shared about 23% in 2005 in the Greater Freight Port of Saint Petersburg. The structure of cargo in 2005 was dominated by bulk (45%) and steel (21%). The companies group processed 6.9 million tons of general cargo (+ 6% compared to 2004), including ferrous metals 2.7 million tons (+ 10%), non-ferrous metals 1.5 million tons (+ 13.3%) and forest products 1.1 million tons (+ 1%). The volume of transshipment of bulk cargo was 5.9 million tons (- 11.6%).¹¹³

The turnover of containers has undergone high growth over the last years. In 2005, 1.1 million TEUs were handled in all ports of Saint Petersburg. The main container terminal, the First Container Terminal of Saint Petersburg, alone handled 722 thousand TEU in 2005. For the whole port TEU turnover reached 1.1 million containers in 2005 which was an increase of 12.6% per year from 2002 to 2005 on average.¹¹⁴

Chart 5-50: Port of Saint Petersburg, Total TEU Turnover (1,000 TEU, r.) 2002-2005



The port of Saint Petersburg is served by the following frequent liner services¹¹⁵:

"K" Line, Hyundai Merchant Marine, POL-LEVANT Shipping Lines Ltd, AGS Shipping, Mac Andrews, Rhenus Logistics NV, Break Bulk Caspian Line, Maersk, Samskip, CMA – CGM, Maras Linija, SCF, Containerships, MISC, Silja Line Cargo, Delta Shipping Service B.V., MSC, Swan Container Line, ESF Euroservices, North-Western Shipping Lines, Team Lines, Eurosis, NSC-Arkhangelsk, Unifeeder, Finnlines, OOCL and ZIM Israel Nav.

These shipping companies serve the following countries:

Table 5-36: Frequency of port calls in country by vessels (Liner Services) coming from Saint Petersburg

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	1 monthly	Lithuania	5 weekly
Belgium	13 weekly	Netherlands	2 monthly
Denmark	2 monthly	Netherlands	18 weekly
Denmark	6 weekly	Norway	8 weekly
Estonia	2 monthly	Poland	1 monthly

¹¹³ http://www.seaport.spb.ru/new/itag_2005y1.doc (24.01.2006)

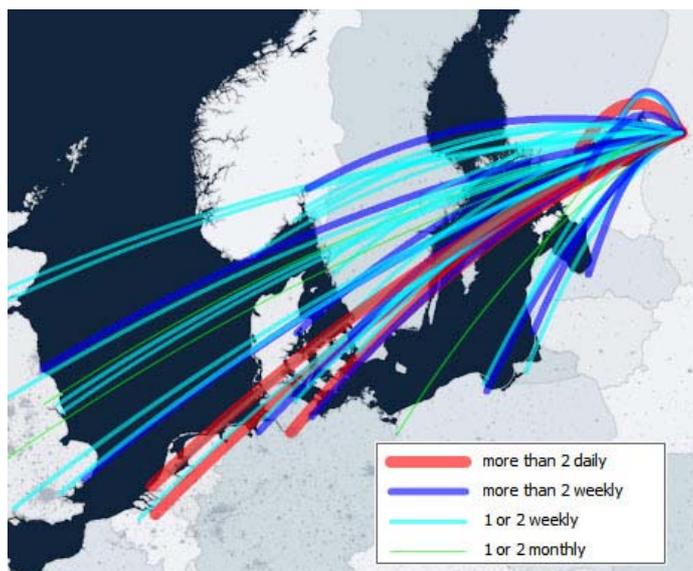
¹¹⁴ <http://www.container.ru/English/FCT/About/Stat/index.html> (09.01.2007)

¹¹⁵ see Database and GIS-Client for Details

Estonia	4 weekly	Poland	5 weekly
Finland	16 weekly	Russia	3 monthly
Germany	2 monthly	Russia	1 weekly
Germany	27 weekly	Sweden	10 weekly
Latvia	8 monthly	UK	3 monthly
Latvia	4 weekly	UK	17 weekly
Lithuania	3 monthly		

Ports that are most frequently called from vessels arriving from Saint Petersburg include Antwerp, Rotterdam, Hamburg and Helsinki.

Map 5-32: Frequent Liner Services from Saint Petersburg (ESN 2006)



Connections to all major ports in the region are established and are a signal for the growing importance of trade with Russia. Especially links to transshipping port like the Finish ports of Hamina and Kotka will grow in the near future as long as port capacities in the Saint Petersburg area are not able provide sufficient handling facilities and transport infrastructure.

Kaliningrad¹¹⁶

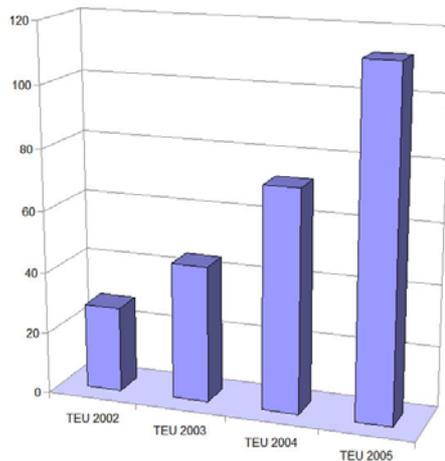
The Port is the most western by comparison with the other Baltic ports and has the closest distance to the ports of Western Europe. The port of Kaliningrad was opened for foreign vessels in 1991. In 1992 following the market reforms in Russia the port was reorganised into a joint stock company "Sea Commercial Port of Kaliningrad". The port complex consists of two merchant ports and a state fishing port.

The annual throughput of the port consists mainly of break bulk (49%), general cargo (35%), timber (18%) and grain (7%).¹¹⁷ Kaliningrad is also experiencing rapid growth in containerization. In 2005, 112 thousand TEU were handled. And on average, the growth rate was 59% per year.

¹¹⁶ <http://www.russeeds.ru/port/english/index.html>

¹¹⁷ Rytkönen et al. 2002

Chart 5-51: Port of Kaliningrad, Total TEU Turnover (1,000 TEU, r.) 2002-2005



The port of Kaliningrad is served by the following frequent liner services¹¹⁸:

Finnlines, North-Western Shipping Lines, Kursiu Linija, Rhenus Logistics NV, Maras Linija and TransMarine.

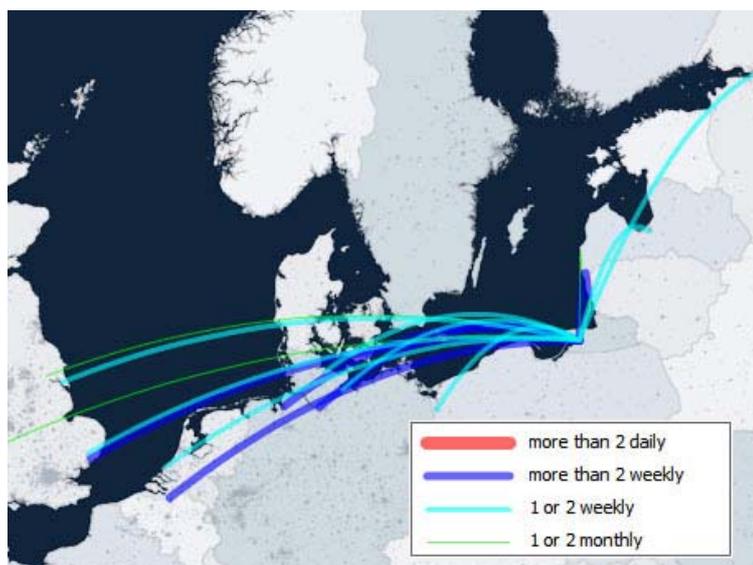
These shipping companies offer connections to the following countries:

Table 5-37: Frequency of port calls in country by vessels (Liner Services) coming from Kaliningrad

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	1 monthly	Netherlands	2 weekly
Belgium	6 weekly	Poland	1 weekly
Germany	12 weekly	Russia	1 monthly
Latvia	2 monthly	Russia	1 weekly
Latvia	1 weekly	UK	6 monthly
Lithuania	1 monthly	UK	7 weekly
Lithuania	6 weekly		

Connections are especially intensified to the ports of Antwerp, Felixstowe, Bremerhaven, Hamburg and Klaipeda as seen in Map 5-33.

Map 5-33: Frequent Liner Services from Kaliningrad (ESN 2006)



¹¹⁸ see Database and GIS-Client for Details

Due to the increasing demand from the Russian market, the port of Kaliningrad is growing in importance. Compared to the ports in the Saint Petersburg area, the distance to other ports in the NSR and BSR – and therefore the travel time – is much less and that is why provides for more efficient transport flows to and from Russia if rail and road traffic through Poland or Lithuania develops competitive pricing to the major agglomerations of Russia (e.g. Moscow area).

5.2.12 Sweden

There are more than 50 commercial ports in Sweden. In addition, there are several industrial ports serving various basic industries. Almost all port companies have incorporated the local stevedoring company and they are now operating as a single entity.

Cargo handling is mainly performed by the port companies themselves. In cases where there is a separate stevedoring company, it is normally owned jointly by the port authority or company and some cargo owners. The "stevedoring monopoly" is strictly adhered to in many Swedish ports. This provides a special case for implementing additional logistical services like VAS.

Ferry traffic in Sweden is concentrated to few ports. The 5 largest ferry ports are sharing 90% of the truck traffic and passenger volume. The biggest ports according to total turnover are Gothenburg, Brofjorden, Trelleborg, Helsingborg, Karlshamn, Malmö, Oxelösund, Stockholm, Gävle and Norrköping. Brofjorden can be considered as a special case for a port as it is solely run by the mineral oil company Preem Petroleum AB and therefore only handles mineral oil and related products. It is not analysed any further. The share of oil for Sweden in general is about 38 to 40%. The container traffic is mainly concentrated on Gothenburg and Helsingborg. They handle together more than 70% of the total container volume. Machines and general cargo equal around 15% of total cargo volume, forest products 13%, minerals and related products 11% and the rest 23%.¹¹⁹

Geographically, around 50% of total volume is transported via the ports of the west coast. More than 10% through the ports of the south coast, 20% through ports on the Baltic coast and the rest through ports along the northern coast.

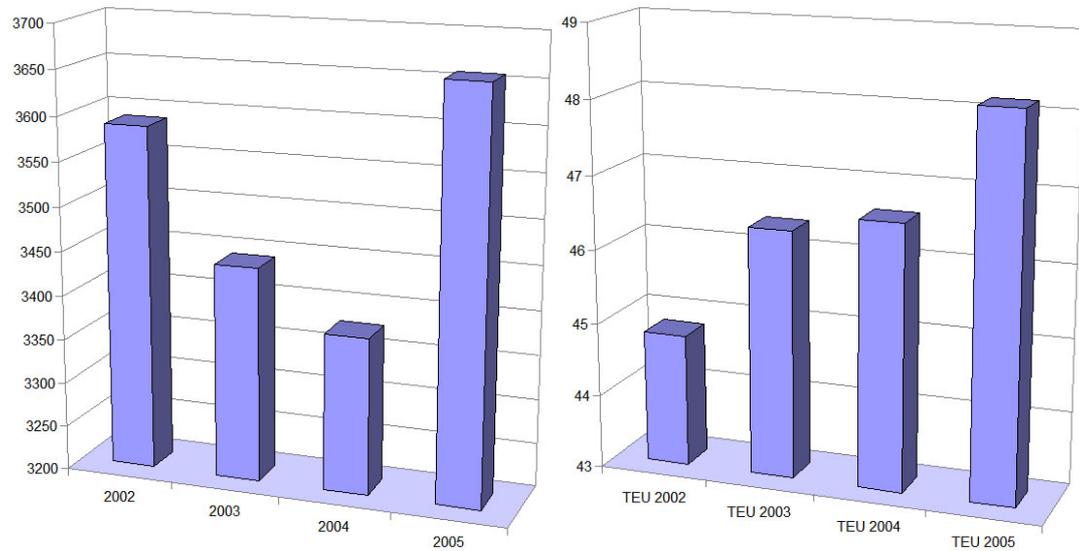
Gävle¹²⁰

The port of Gävle reached a total turnover of 3.6 million tons in 2005 and a small average growth of 0.8% per year from 2002 and 2005. Container turnover is rather small in comparison with 48 thousand TEU in 2005.

¹¹⁹ Rytönen 2002, p. 57

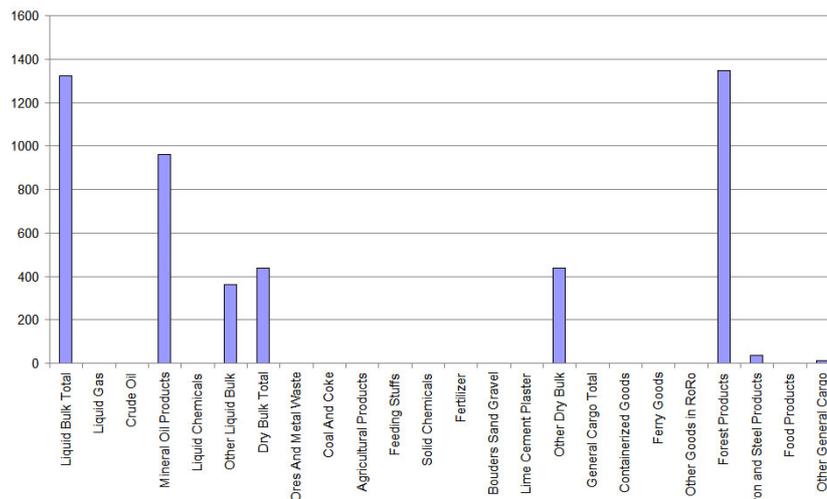
¹²⁰ <http://www.gavle.se/hamn>

Chart 5-52: Port of Gävle, Total (1,000 t., l.) and TEU Turnover (1,000 TEU, r.) 2002-2005



The port of Gävle is largely handling forest products and bulk goods. Liquid bulk – especially mineral oil products – are of importance for the port.

Chart 5-53: Port of Gävle - Commodity Turnover 2005 in 1,000 t.¹²¹



The port of Gävle is served by the following frequent liner services¹²²:

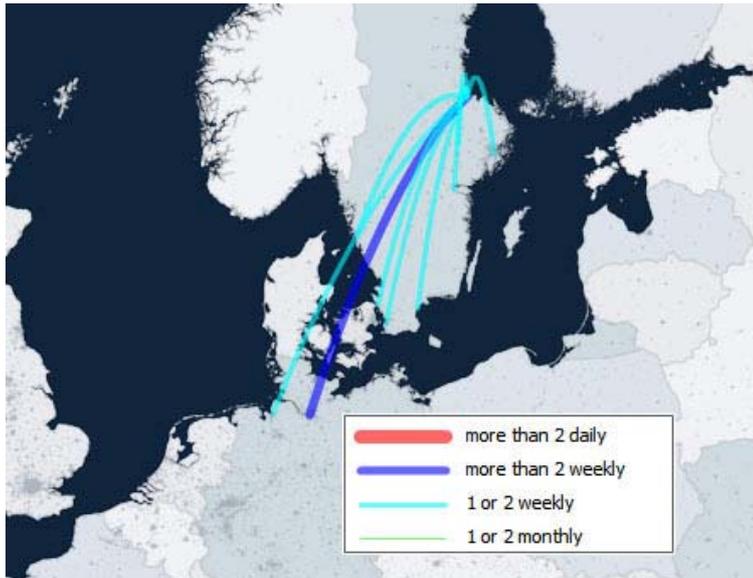
Hamburg Süd, Team Lines and ZIM Israel Nav.

Germany is served five times weekly and other ports in Sweden 13 times weekly.

¹²¹ Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

¹²² see Database and GIS-Client for Details

Map 5-34: Frequent Liner Services from Gävle (ESN 2006)



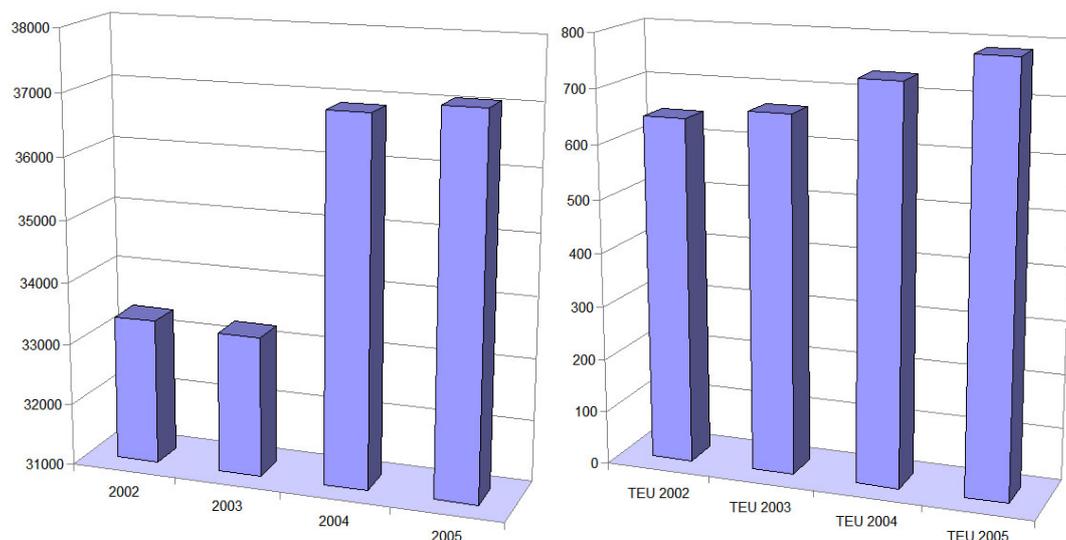
Gothenburg¹²³

The port of Gothenburg is the largest port of the Nordic region of the Baltic Sea. It serves the whole northern part of the BSR.

The port has nine different harbours specialized on different functions. The northern side of the port (i.e. Skandia Harbour) is the container, passenger and car terminal. The Älvsborg Harbour serves as a RoRo terminal and the Free Port handles bulk cargo. Three other harbours on the north side handle with oil, and on the south side there are three terminals along the riverside with freight and passenger terminals.

In 2005, the port achieved a total turnover of 36.5 million tons, averaging a growth rate of 4.3% per year from 2002 and 2005. Container turnover grew at a similar rate of 3.4% per year and reached 788 thousand TEU in 2005.

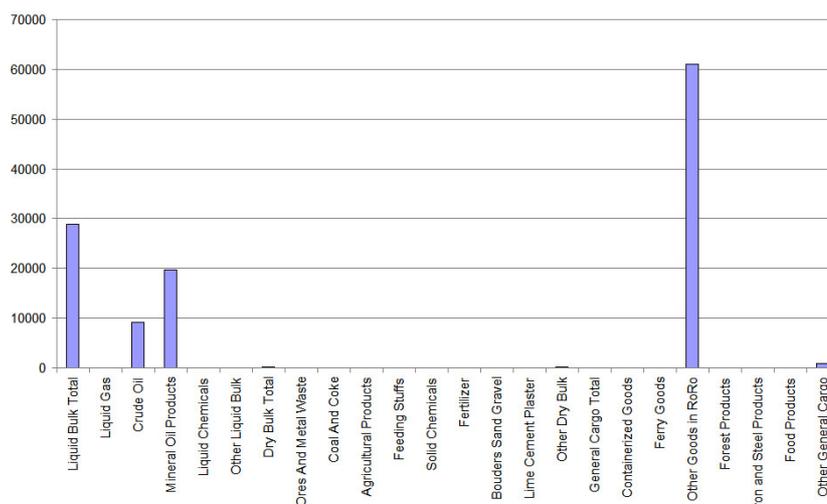
Chart 5-54: Port of Gothenburg, Total (1,000 t., l.) and TEU Turnover (1,000 TEU, r.) 2002-2005



The cargo turnover comprises almost 30 million tons of mineral oil and about 60 million tons of cargo from RoRo traffic.

¹²³ <http://www.portgot.se>

Chart 5-55: Port of Gothenburg - Commodity Turnover 2005 in 1,000 t.¹²⁴



Because of this structure of cargo in the port of Gothenburg, the port of Gothenburg is mainly served by RoRo vessels. The following frequent liner services operate from the port¹²⁵:

"K" Line, Evergreen, Safmarine, ACL, Finnlines, Sroman Neptun, Cantabrico TransWeco, Hamburg Süd, Stena Line, Cobelfret Ferries NV, Hapag-Lloyd, Team Lines, Confern (Cooperation), Hartel, TECO, Consolidated Container Services, Höegh Autoliners, Unifeeder, Containerships, Hyundai Merchant Marine, Van Uden Ro-Ro, Contship, Maersk, Wallenius Wilhelmsen, Cotunav, Maras Linija/Kursiu Linija, X-Press Container Line, DFDS Tor Line, MISC, ZIM Israel Nav, Eimskip, MSC, EUKOR, NMT Lines, Euro Marine Carrier and OOCL.

These shipping companies have established the following structure of liner service operation:

Table 5-38: Frequency of port calls in country by vessels (Liner Services) coming from Gothenburg

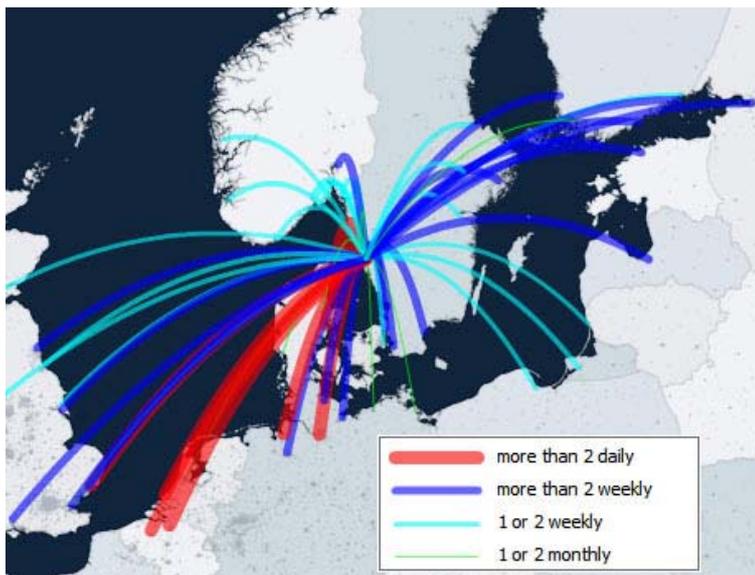
Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	2 daily	Lithuania	2 weekly
Belgium	18 weekly	Netherlands	11 monthly
Denmark	9 daily	Netherlands	11 weekly
Denmark	6 monthly	Norway	6 monthly
Denmark	23 weekly	Norway	13 weekly
Estonia	2 monthly	Poland	2 weekly
Estonia	4 weekly	Russia	1 daily
Finland	26 monthly	Russia	5 monthly
Finland	12 weekly	Russia	7 weekly
Germany	2 daily	Sweden	20 monthly
Germany	21 monthly	Sweden	22 weekly
Germany	31 weekly	UK	1 daily
Latvia	2 monthly	UK	15 monthly
Latvia	4 weekly	UK	29 weekly
Lithuania	3 monthly		

Connections to individual ports have been established to all major ports in the region and a few smaller ones. Main connections exist to the ports of Frederikshavn, Rotterdam, Antwerp, Zeebrugge, Bremerhaven, Hamburg and Aarhus as shown in Map 5-35.

¹²⁴ Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

¹²⁵ see Database and GIS-Client for Details

Map 5-35: Frequent Liner Services from Gothenburg (ESN 2006)



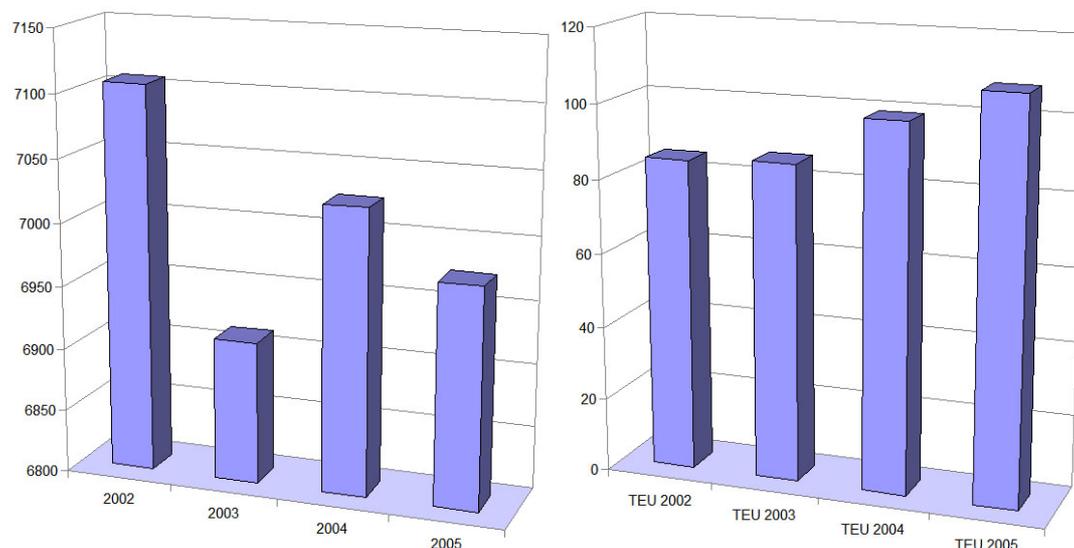
The port of Gothenburg as also gained a competitive advantage in the turnover of finished vehicles over the last years. Due to the nearby production plants of Volvo and Saab and because of appropriate facilities, the port handled 313.7 thousand finished vehicles in 2005. With this amount the port of Gothenburg is ranked among the major vehicle exporting and importing ports.

Helsingborg¹²⁶

The port of Helsingborg is located in the southern part of Sweden and has four separate terminals. West harbour for unitized cargo, north harbour for ferry traffic, south harbour having more diversified operations and the bulk harbour.

In 2005, the port achieved a total turnover of 6.9 million tons which has been 1.8% less than the previous year. Turnover has been around 7 million tons for a couple of years. TEU turnover was 108 thousand in 2005 which previously experienced an annual growth of 8.5% from 2002 to 2005.

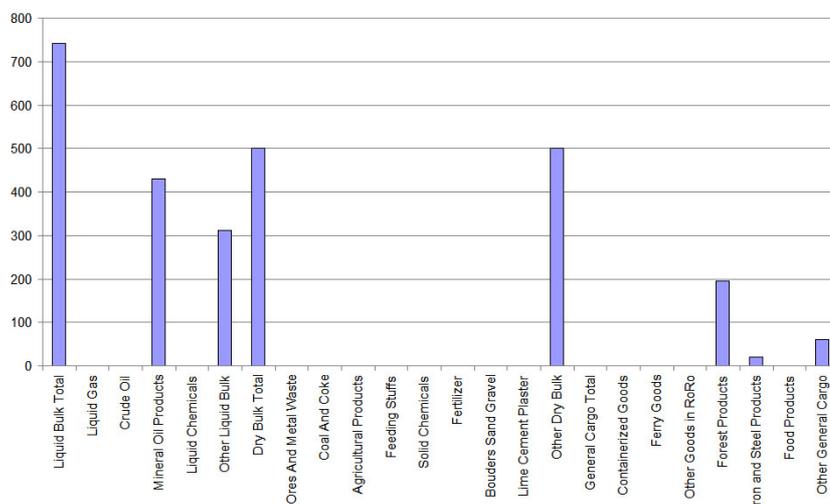
Chart 5-56: Port of Helsingborg, Total (1,000 t, l.) and TEU Turnover (1,000 TEU, r.) 2002-2005



¹²⁶ <http://www.port.helsingborg.se>

The commodity structure of the port of Helsingborg is split up in almost 750 thousand tons of liquid bulk (mainly mineral oil products), 500 thousand tons of dry bulk and 200 thousand tons of forest products.

Chart 5-57: Port of Helsingborg - Commodity Turnover 2005 in 1,000 t.¹²⁷



The port of Helsingborg is served by the following frequent liner services¹²⁸:

Containerships, MSC, Transatlantic, Contship, OOCL, TT-Line, DFDS Tor Line, Samskip, Unifeeder, Hamburg Süd, Scandlines, ZIM Israel Nav, Hyundai Merchant Marin and Sloman Neptun.

These shipping companies have established the following liner service structure:

Table 5-39: Frequency of port calls in country by vessels (Liner Services) coming from Helsingborg

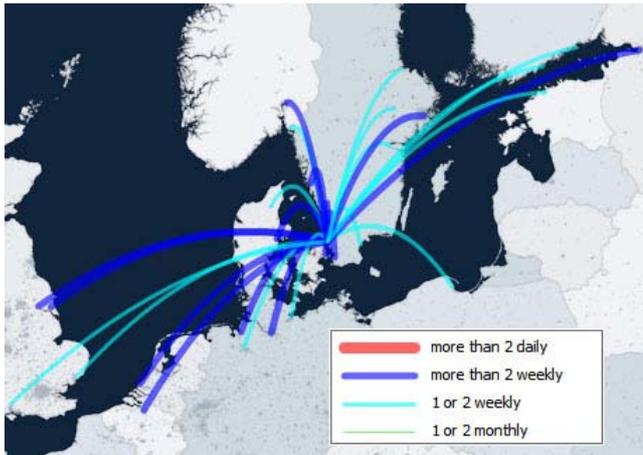
Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	3 weekly	Norway	1 daily
Denmark	48 daily	Norway	3 weekly
Denmark	8 weekly	Poland	1 weekly
Estonia	2 weekly	Russia	3 weekly
Finland	3 weekly	Sweden	9 monthly
Germany	3 monthly	Sweden	22 weekly
Germany	11 weekly	UK	9 weekly
Netherlands	3 weekly		

Map 5-36 shows this structure with the main port relations:

¹²⁷ Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

¹²⁸ see Database and GIS-Client for Details

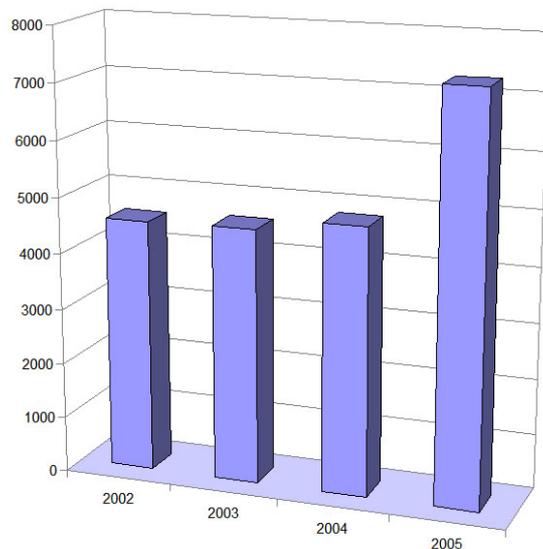
Map 5-36: Frequent Liner Services from Helsingborg (ESN 2006)



Karlshamn¹²⁹

The port of Karlshamn is a small but strongly growing port with expanding handling capacity. Due to highly frequented connections to the Baltic States it has performed well and offers a variety of services for all kinds of cargo. In 2005, the port of Karlshamn achieved tremendous growth compared to the previous years with a total turnover of 7.3 million tons (4.8 million tons in 2004). Container turnover, however, is deniable compared to other ports.

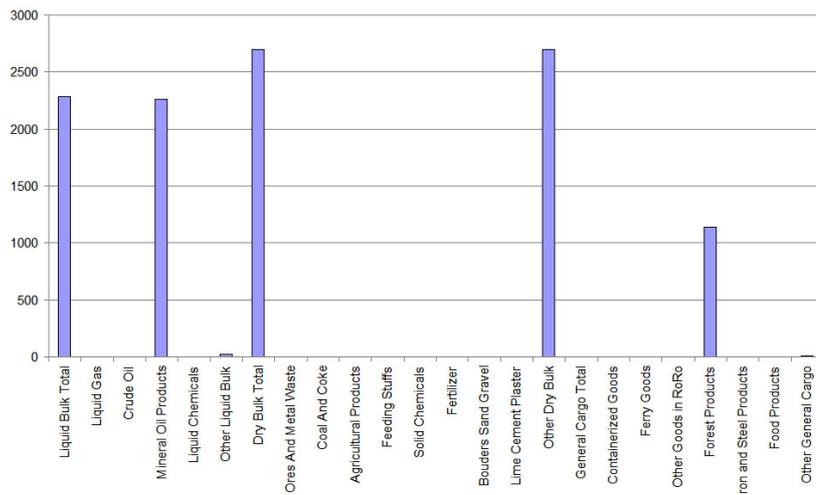
Chart 5-58: Port of Karlshamn, Total Turnover (1,000 t., l.) 2002-2005



Karlshamn has a commodity structure with large amounts of liquid and dry bulk and some forest products. The port is less important for turnover of general cargo.

¹²⁹ <http://www.karlshamnshamn.se>

Chart 5-59: Port of Karlshamn - Commodity Turnover 2005 in 1,000 t.¹³⁰



The port of Karlshamn is served by the following frequent liner services¹³¹:

DFDS Lisco, Jönsson Nova Line, DFDS Tor Line, Scandlines and International Shipbrokers Ltd.

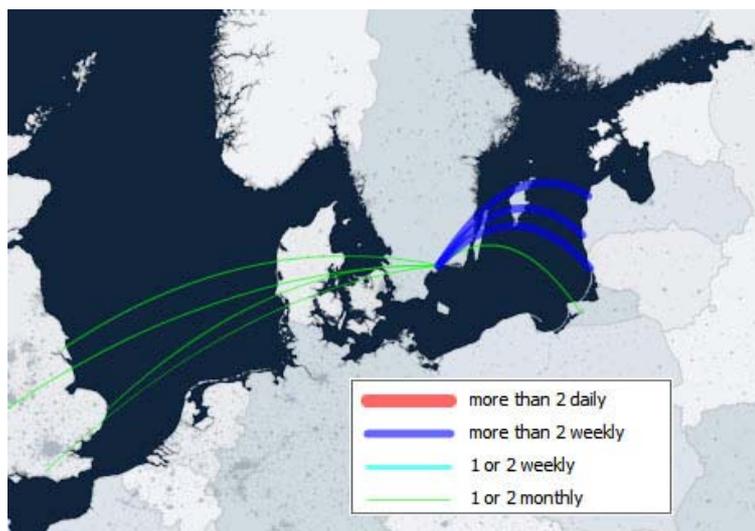
The traffic to and from Karlshamn is of major importance for the Baltic States trade. Frequent port calls from Karlshamn are established to Latvia and Lithuania.

Table 5-40: Frequency of port calls in country by vessels (Liner Services) coming from Karlshamn

Country of called ports	Frequency of port calls
Latvia	9 weekly
Lithuania	1 daily
Lithuania	6 weekly
Russia	1 monthly
UK	6 monthly

The major ports in the Baltic States are Ventspils, Liepaja and Klaipeda.

Map 5-37: Frequent Liner Services from Karlshamn (ESN 2006)



¹³⁰ Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

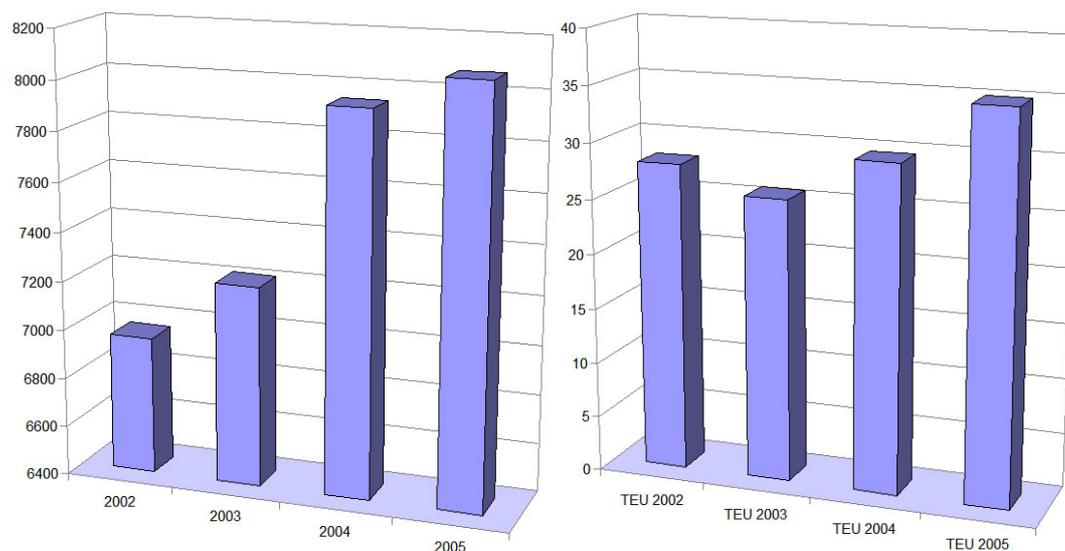
¹³¹ see Database and GIS-Client for Details

Malmö¹³²

The development of the port experienced a structural change as the port of Malmö now cooperates with the adjacent port of Copenhagen. The concept was to create a productive, ultra-modern harbour capable of providing its customers and the region with an efficient transport service. This cooperation now functions as one port.¹³³

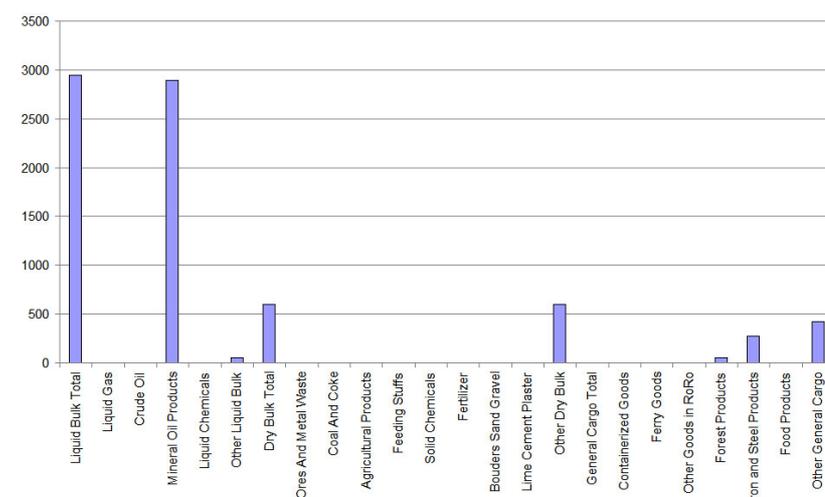
In 2005, the port of Malmö (without Copenhagen) reached a total turnover of 8 million tons, averaging a growth rate of 5.1% per year between 2002 and 2005. Container turnover was rather small with 35 thousand TEU in 2005 and only a little growth over the last years.

Chart 5-60: Port of Malmö, Total (1,000 t, l.) and TEU Turnover (1,000 TEU, r.) 2002-2005



The commodity structure was dominated by mineral oil products in terms handled amounts of tons. Dry bulk, iron & steel products as well as forest products and some general cargo complete the picture.

Chart 5-61: Port of Malmö - Commodity Turnover 2005 in 1,000 t.¹³⁴



¹³² <http://www.cmpport.com>

¹³³ This study tries to separately analyse the two parts of the port of Copenhagen-Malmö, although the handling of goods is increasingly shared according to competency.

¹³⁴ Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

The port of Malmö is served by the following frequent liner services¹³⁵:

"K" Line, Hamburg Süd, Sloman Neptun, Baltic Line, Nordö-Link, Unifeeder, Finnlines, OOCL and ZIM Israel Nav.

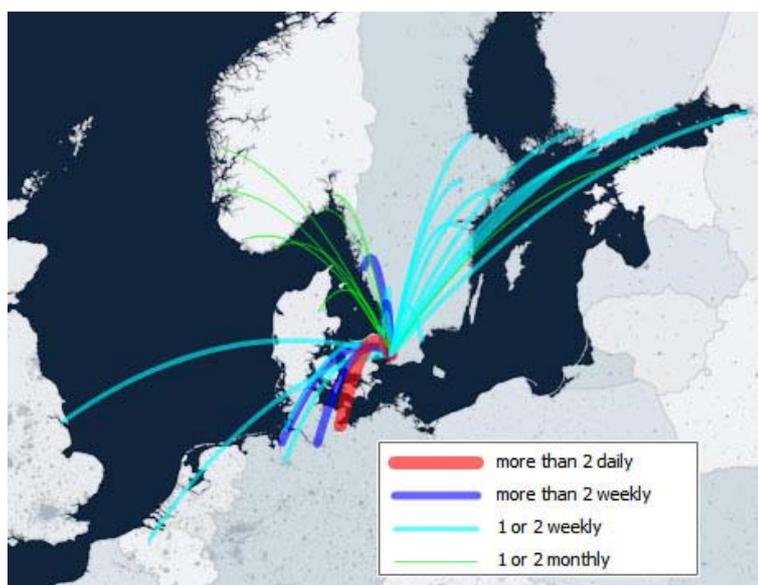
Main relations have been established to Germany, Denmark and other ports in Sweden.

Table 5-41: Frequency of port calls in country by vessels (Liner Services) coming from Malmö

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	1 weekly	Germany	7 weekly
Denmark	2 monthly	Norway	18 monthly
Denmark	2 weekly	Russia	2 weekly
Estonia	2 monthly	Sweden	9 monthly
Finland	4 weekly	Sweden	20 weekly
Germany	4 daily	UK	1 weekly
Germany	3 monthly		

Major individual port connections have been established to Lübeck, Gothenburg, Hamburg and Bremerhaven.

Map 5-38: Frequent Liner Services from Malmö (ESN 2006)



Besides large amounts of bulk turnover, the port of Malmö has also developed strength in vehicle handling. Specialized facilities have been built to offer VAS and serve the incoming finished vehicles. In 2005, 261 thousand cars were handled at Malmö. This ranks the port among the fifteen largest vehicle handling ports in Europe.

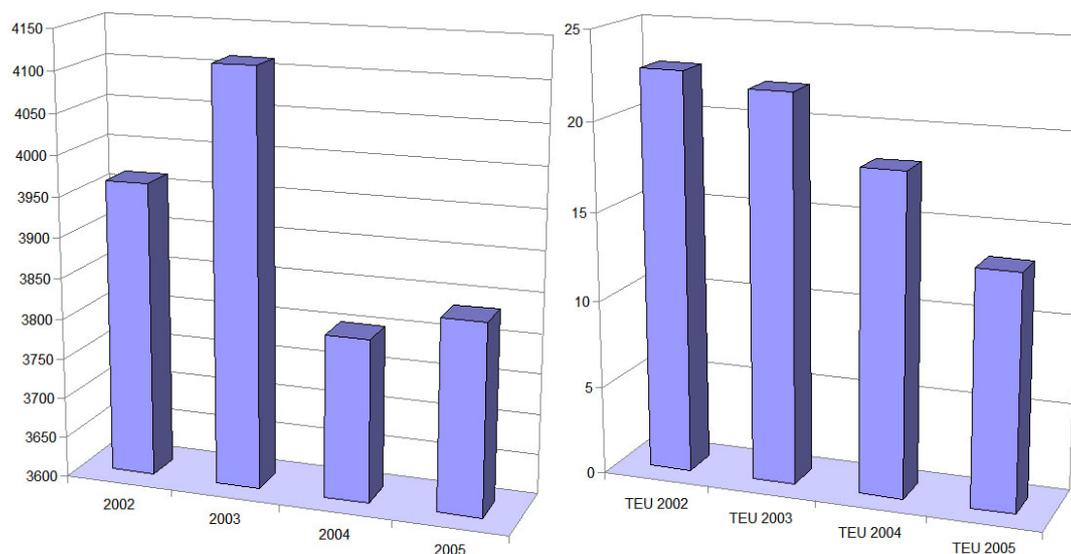
Norrköping¹³⁶

The port of Norrköping is a rather small port but offers a wide range of cargo handling capabilities and has a large surrounding market due to its central location in Sweden. It has experienced a slight decline in total turnover over the last few years with -1% per year between 2002 and 2005. It reached a turnover of 3.8 million tons and 13 thousand TEU (-15.8% decline).

¹³⁵ see Database and GIS-Client for Details

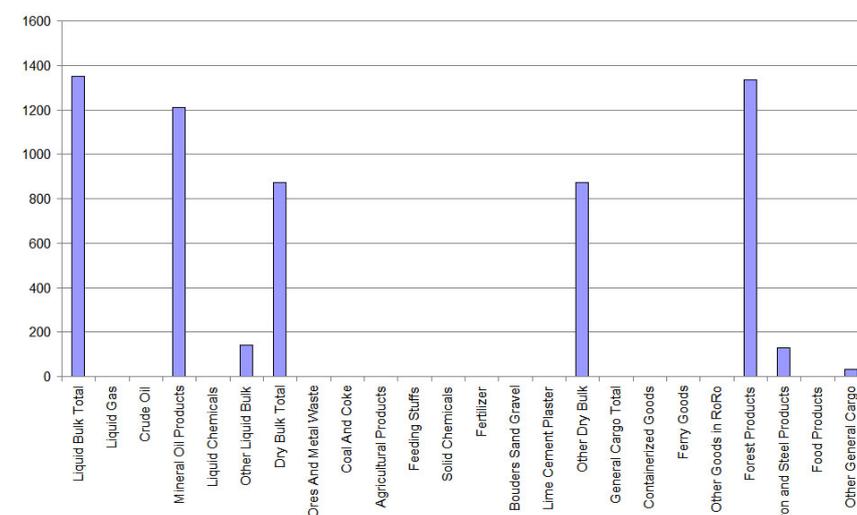
¹³⁶ <http://www.norrkoping-port.se>

Chart 5-62: Port of Norrköping, Total (1,000 t., l.) and TEU Turnover (1,000 TEU, r.) 2002-2005



The commodity structure is dominated by large amounts of forest products in all its varieties ranging from wood articles to paper and pulp. Mineral oil products and dry bulk is also handled in large quantities. This structure underlines the importance of the port for the regional forestry and bulk industry.

Chart 5-63: Port of Norrköping - Commodity Turnover 2005 in 1,000 t.¹³⁷



The port of Norrköping is served by the following frequent liner services¹³⁸:

Hamburg Süd, Nova Line, Team Lines, Jönsson Nova Line, Pal Line, Uner Shipping, Moermann, POL-LEVANT Shipping Lines Ltd and ZIM Israel Nav.

Other shipping companies – mostly bulk trading companies – serve the port in a rather irregular fashion that is not mapped at this time. Nevertheless, Table 5-24 shows the major port calls in other countries by vessels arriving from Norrköping.

¹³⁷ Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

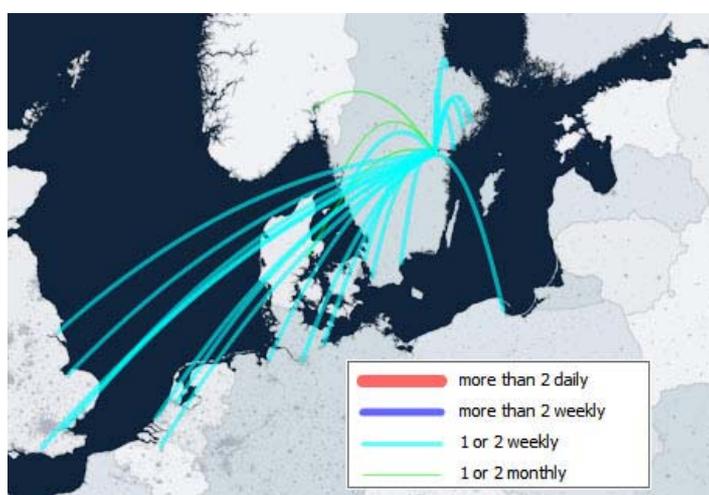
¹³⁸ see Database and GIS-Client for Details

Table 5-42: Frequency of port calls in country by vessels (Liner Services) coming from Norrköping

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	3 monthly	Poland	2 monthly
Belgium	2 weekly	Poland	2 weekly
Denmark	2 monthly	Sweden	2 monthly
Germany	2 monthly	Sweden	16 weekly
Germany	5 weekly	UK	5 monthly
Netherlands	2 weekly	UK	4 weekly
Norway	2 monthly		

This leads to a diversified mapped structure of individual port calls where many connections have been established to the NSR.

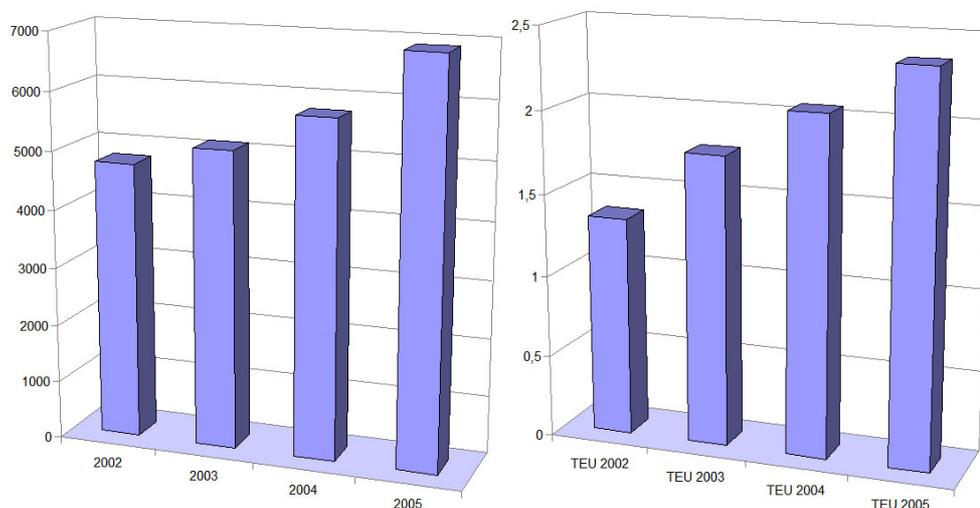
Map 5-39: Frequent Liner Services from Norrköping (ESN 2006)



Oxelösund¹³⁹

The port of Oxelösund is a small industrial port with long term contracts in the bulk and iron & steel industry. It has experienced a large increase in bulk traffic over the last years. In 2005, a turnover of 6.9 million tons was achieved, averaging a growth rate of 13.2% per year between 2002 and 2005. On the contrary, container turnover was deniably small.

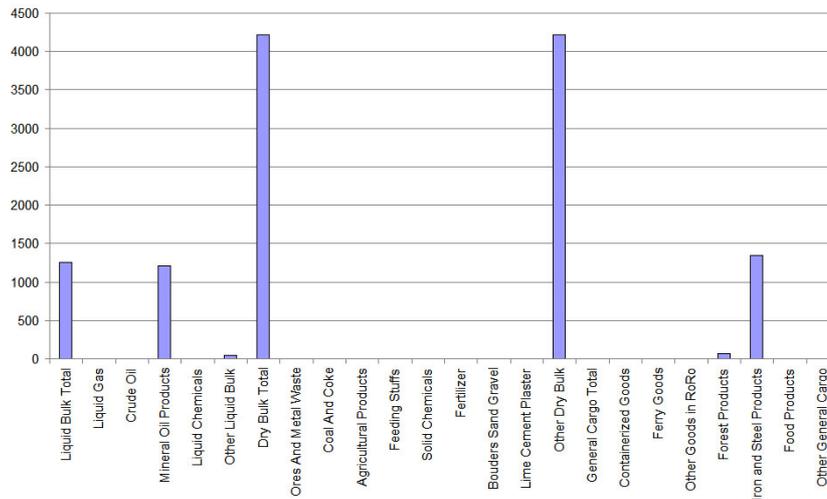
Chart 5-64: Port of Oxelösund, Total (1,000 t., l.) and TEU Turnover (1,000 TEU, r.) 2002-2005



¹³⁹ <http://www.oxhamn.se>

The commodity structure is dominated by dry bulk, iron & steel products and mineral oil products.

Chart 5-65: Port of Oxelösund - Commodity Turnover 2005 in 1,000 t.¹⁴⁰



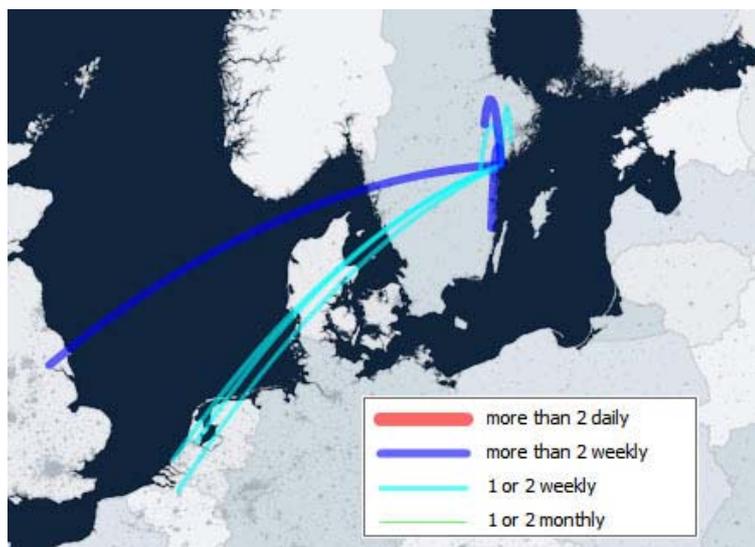
The port of Oxelösund is only served by the frequent liner services Pal Line¹⁴¹. Other shipping companies are serving Oxelösund irregularly. But strong ties have been established to ports in the NSR (Belgium, the Netherlands and the UK).

Table 5-43: Frequency of port calls in country by vessels (Liner Services) coming from Oxelösund

Country of called ports	Frequency of port calls
Belgium	1 weekly
Germany	1 weekly
Netherlands	2 weekly
Sweden	8 weekly
UK	3 weekly

This leads to the following mapping of major individual port connections in Map 5-40.

Map 5-40: Frequent Liner Services from Oxelösund (ESN 2006)



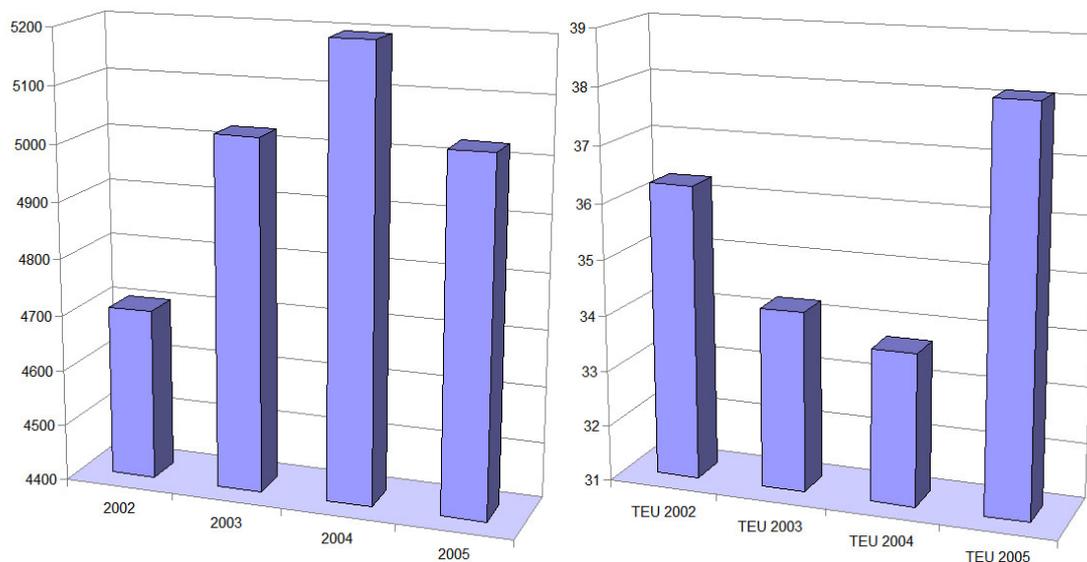
¹⁴⁰ Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

¹⁴¹ see Database and GIS-Client for Details

Stockholm¹⁴²

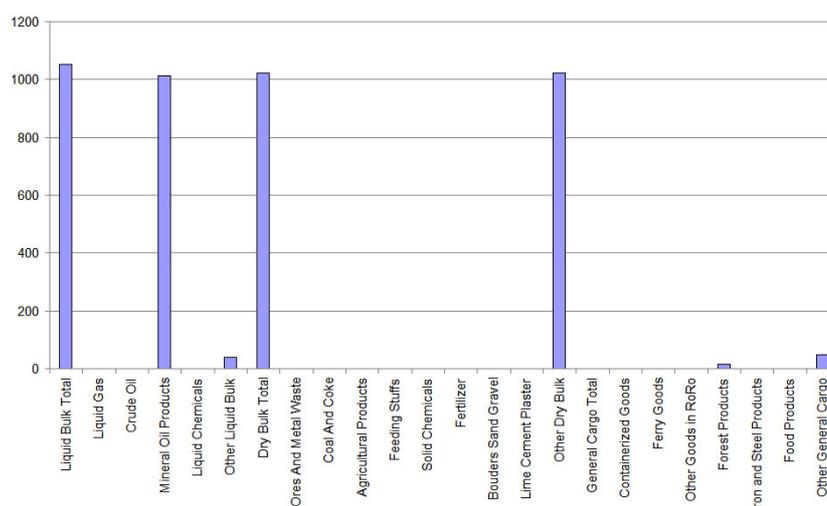
The port of Stockholm actually consists of several smaller ports that all focus on different aspects of cargo. In general, it is mostly know as a ferry and cruise liner port. But it nonetheless achieved a total turnover of 5 million tons in 2005, averaging a growth rate of 2.3% per year between 2002 and 2005. Container turnover has been small with 38 thousand TEU in 2005.

Chart 5-66: Port of Stockholm, Total (1,000 t., l.) and TEU Turnover (1,000 TEU, r.) 2002-2005



The commodity structure in terms of tons is equally dominated by dry bulk and mineral oil products. General cargo is generally transported in containers which is not recorded in port statistics mapped in Chart 5-67.

Chart 5-67: Port of Stockholm - Commodity Turnover 2005 in 1,000 t.¹⁴³



The port of Stockholm is served by the following frequent liner services¹⁴⁴:

Cantabrico TransWeco, MSC, Tallink, Consolidated Container Services, Riga Sea Line, Team Lines, Contship, Sea Wind Line, Viking Line, Hamburg Süd, Silja Line Cargo, ZIM Israel Nav, Maersk and Sloman Neptun.

¹⁴² <http://www.portsofstockholm.com>

¹⁴³ Commodities with no record are only not recorded within that statistical commodity group. They might have been recorded in a similar category. See chapter 3.3.

¹⁴⁴ see Database and GIS-Client for Details

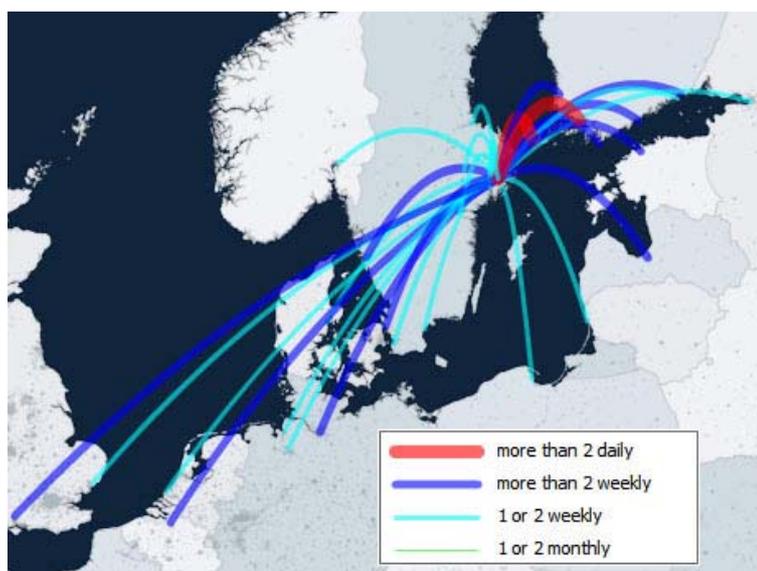
These shipping companies have established the following port call structure according to called country. Main destinations are Finland and other ports in Sweden.

Table 5-44: Frequency of port calls in country by vessels (Liner Services) coming from Stockholm

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	4 weekly	Lithuania	1 weekly
Denmark	1 weekly	Netherlands	1 weekly
Estonia	1 daily	Norway	1 weekly
Estonia	1 weekly	Poland	1 weekly
Finland	10 daily	Russia	1 weekly
Finland	10 monthly	Sweden	9 monthly
Finland	12 weekly	Sweden	16 weekly
Germany	3 monthly	UK	10 monthly
Germany	6 weekly	UK	1 weekly
Latvia	4 weekly		

Main individual port relations include connections to Turku and Mariehamn on the island of Åland between Finland and Sweden.

Map 5-41: Frequent Liner Services from Stockholm (ESN 2006)



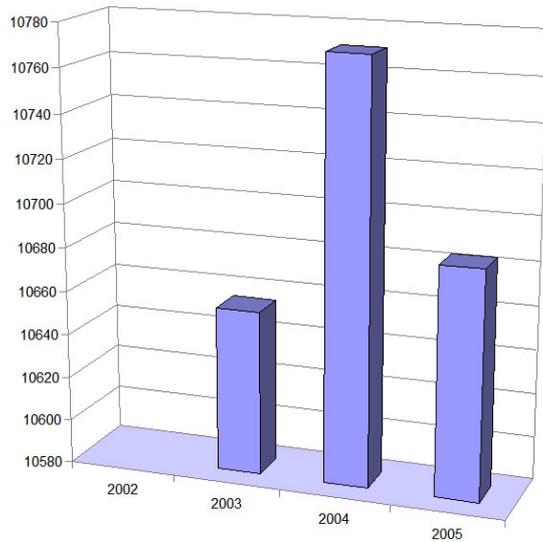
Trelleborg¹⁴⁵

The port of Trelleborg is situated in the southernmost part of Sweden. It is the third largest port in Sweden in terms of total turnover. Almost all of it is handled by ferry traffic. The ferry services between the port Trelleborg and the German ports of Sassnitz, Rostock and Lübeck-Travemünde belong to the most frequent ferry connections in the BSR.

In 2005, 10.7 million tons of cargo was handled in total. Most of the cargo is arriving at Trelleborg via ferries and RoRo vessels. Truck traffic from these liner services showed the largest increase over the last years. 7.9 million tons were handled in 2004, amounting to 485 thousand vehicles arriving at the port. Combined traffic (truck and rail) reached 52 thousand units and conventional rail traffic transported 2.7 million tons.

¹⁴⁵ <http://www.trelleborgshamn.se>

Chart 5-68: Port of Trelleborg, Total Turnover (1,000 t., l.) 2002-2005

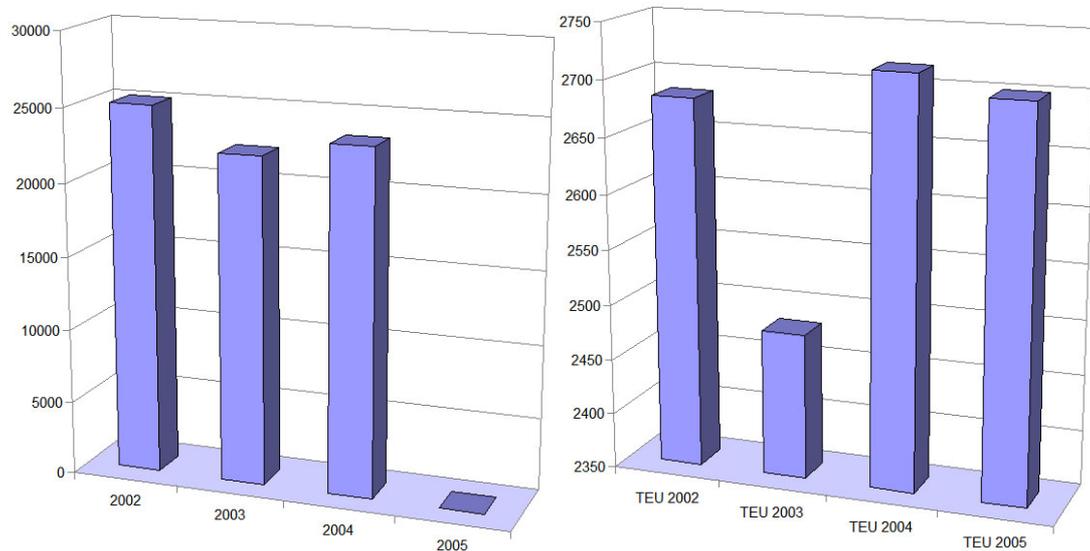


5.2.13 UK

Felixstowe¹⁴⁶

The port of Felixstowe is a regional port with a main focus on container turnover and growing international importance. In 2005, 2.7 million TEU were handled. But the increase has been comparably low at Felixstowe, averaging a growth rate of only 0.4% between 2002 and 2005. In contrast to container turnover, total turnover has been fairly low with 23 million tons in 2004.

Chart 5-69: Port of Felixstowe, Total (1,000 t., l.) and TEU Turnover (1,000 TEU, r.) 2002-2005¹⁴⁷



Due to container focus, the port of Felixstowe is mainly served by the following frequent container liner services¹⁴⁸:

"K" Line, ISCONT LINES, Portconnect, Andrew Weir, LALINE, Portlink NV, Armada Lines, Mac Andrews, Safmarine, BG Freight Line, MACPAK CONTAINER SERVICE, Samskip, BULCON, Maersk, SCI Line, COMAR, MISC, Senator Lines, Delmas, MSC, Sloman Neptun, Delphis, NATVAR PARIKH INDUSTRIES Ltd.,

¹⁴⁶ <http://www.portoffelixstowe.co.uk>

¹⁴⁷ Port of Felixstowe: No data available for total turnover in 2005

¹⁴⁸ see Database and GIS-Client for Details

TECO, Eurofeeders Ltd, NAVIERA PINILLOS S.A., Turkon Line, Finnlines, Nenufar Shipping, Unifeeder, FOCS Container Service, NorfolkLine Shipping, ZIM Israel Nav, Hamburg Süd, OPDR, Holland Maas Shipping/HMS and P&O Nedlloyd.

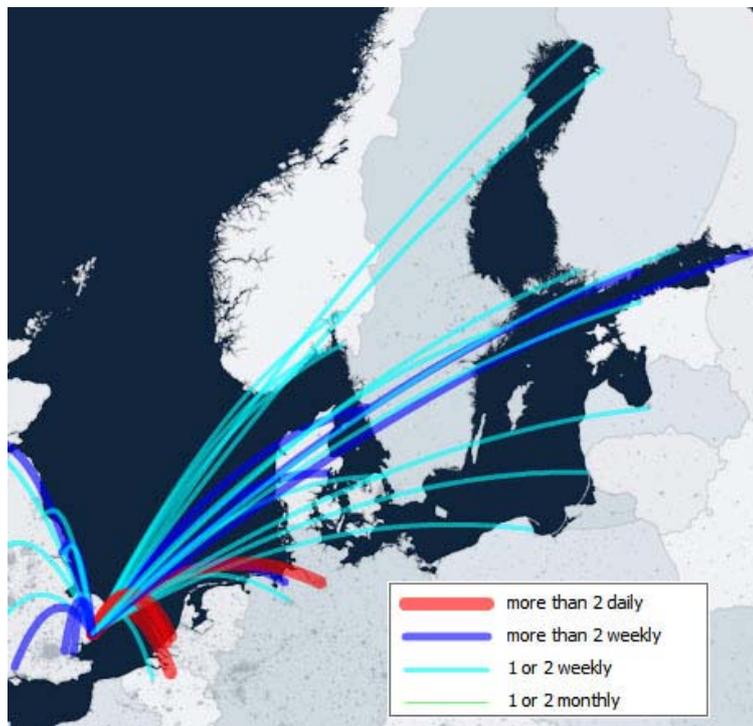
Most frequent connections have been established to the nearby countries of Belgium, the Netherlands, Germany and other ports in the UK.

Table 5-45: Frequency of port calls in country by vessels (Liner Services) coming from Felixstowe

Country of called ports	Frequency of port calls	Country of called ports	Frequency of port calls
Belgium	1 daily	Lithuania	1 weekly
Belgium	10 monthly	Netherlands	4 daily
Belgium	16 weekly	Netherlands	9 monthly
Denmark	5 weekly	Netherlands	22 weekly
Estonia	2 monthly	Norway	4 weekly
Estonia	3 weekly	Poland	2 weekly
Finland	2 monthly	Russia	4 weekly
Finland	7 weekly	Sweden	9 weekly
Germany	5 monthly	UK	3 daily
Germany	20 weekly	UK	1 monthly
Latvia	1 weekly	UK	18 weekly

Individual port connections are most frequent to the ports of Antwerp, Rotterdam, Scheveningen and Hamburg.

Map 5-42: Frequent Liner Services from Felixstowe (ESN 2006)



6 Analysis of potential "Value Added Services"

The previous chapter summed up the individual strength of the major ports in the NSR and BSR and regional distribution patterns. This has laid the foundation for an analysis of the make up of these goods flows and how the end up/start in port areas and how they integrate into supply chains of industries and their companies. The last chapters only gave some hints on the exact origin of products handled at the respective ports. The following tries to clarify the ports position in this regard looking at supply chains in general, related logistical services and six industry case studies.

6.1 Foundations for Added Value Potential in Northern Europe

Ports have always been the culminating location of cargo flows from one point to the other. In a world of increased sourcing of goods from disperse locations and globalized production processes, the function of ports as logistical hubs has been developed further. Nowadays, the transport and handling of goods goes beyond the traditional functions of a port. In general, one can say that "logistics is the process of planning, implementing and controlling the efficient, effective flow and storage of raw materials, in-process inventory, finished goods, services and related information from point of origin to point of consumption (including inbound, outbound, internal and external movements) for the purpose of conforming to customer requirements."¹⁴⁹ This has not only led to a different perspective on logistical activities but has also raised the expectations of producing companies shipping their goods on the standards provided by LSPs, especially ports. Ports are increasingly looked at as a specialized LSP.

Implied in the definition is that the logistical process provides a systematical framework for decision making that integrates transportation, inventory levels, warehousing space, materials handling systems, packaging and other related activities that encompass appropriate trade-offs involving costs and services. Another definition of logistics says that logistics involves the efficient and effective management of inventory, whether in motion or in rest, to satisfy customer requirements and organisational objects. An important aspect of the later definition is that the transportation service is recognised as inventory in motion; therefore, the true cost is more than the actual rate charged by the transportation company.¹⁵⁰

The foundation for the development of any kind of value added service is the implementation of certain kinds of logistical processes. These in return bear the potential for the incorporation of services that go beyond the traditional comprehension of logistical services and add value to the handled products. The following logistical categories provide a framework for the categorization and the question is where to derive additional services from.

1. **Transport:** Transportation is the part in the material flow that most people connect with logistics. The planning of transportation comprises, among other activities, the choice of transport mode, route planning and the planning of possible consolidation.
2. **Warehousing:** This area contains storage- design, handling and efficiency. Managing of the total warehouse investments, models and methods to use when determining lot sizes and safety stock are some of the basic activities when it comes to warehousing and storage.

¹⁴⁹ Coyle, Bardi, Novack 1999

¹⁵⁰ *ibid.*

3. **Materials handling and packaging:** This area is of high importance and can create great problems within the supply chain if something goes wrong. Physical activities in warehousing such as the choice of equipment and facilities for internal transports and the packaging handling are significant issues.
4. **Order handling and customer service:** Ordering, order receiving, order handling and delivery are some very typical logistical activities. The contact with the customer is a key issue here, by giving the customer the accurate information concerning the state of the order, the product accessibility and time for delivery, one can gain great advantages. It is also a very critical point for the shape of the whole logistical system.
5. **Prognoses:** The logistics department of a company administrates this very central part, which is based on sales forecast and sale plans. For prognoses concerning the actual flow of material, they have to be very detailed, which is why the warehouse management and this area are very closely related.
6. **Production planning:** The main objective when it comes to production planning is to make sure that the production capacity will be used efficiently. At the same time, the company has to manufacture what the market wants and needs in the right amount, which is the key to success. What determines the capacity of the logistical activities is the company's rules of priority, lot sizes and differences in production capacity.
7. **Purchasing and materials management:** Purchasing and sales of raw material, components and completed goods, supplier selection, ordering and receiving goods, among other activities are central issues within this area under discussion. All this, combined with high quality and deliveries at the right time, are decisive for the price of the product. The quality of the suppliers and their logistical process are as important as the quality of the company's own logistical performance. That is why a good relationship with the suppliers is of high importance.
8. **Other activities:** In addition to the seven activities that have been mentioned above, there are numerous other logistical activities needed to make a logistical chain work properly. They can be about keeping spare parts in storage, dealing with returned/damaged goods, services and other types of service and maintenance activities. But other activities can also include services that are part of the actual production process of a certain product.

Especially the last category provides room for activities that go far beyond the traditional handling of goods. And in this area, development tendencies towards individualized services for more intense integration of the supply chain are strong. Besides this tendency, the following logistical trends could be observed for the last decades in the BSR:¹⁵¹

- Restructuring of logistical systems by spatial concentration of production; through reduction in plant numbers, or increased plant specialization ('focused production'); spatial concentration of inventory
- Realignment of supply chains by wider geographical sourcing of supplies, wider distribution of finished products and concentration of international trade to hub ports

¹⁵¹ Baltic 21 2004b, Bowersox et al. 2002, Buchholz 2002, Coyle et al 1999, Hoffmann 2004, Panayides 2006, Song et al. 2001

- Rescheduling of product flow by adoption of Quick Response and ECR (Efficient Consumer Response) in retail distribution and concentration of international trade to hub ports
- Changes in management of transport resources by improvement in transport's relative cost/performance, increased use of outside transport / distribution contractors, changes in vehicle size regulations and in handling systems and combination of transport modes towards intermodal transport chains
- Changes in product configuration/design by increase in complexity and sophistication of product

The observed logistical trends are assumed to have the following effects on transport:

- Increase of the average transport distance
- Concentration of flows on links and nodes
- Optimisation in use of transport resources

Despite the optimisation in use of transport resources, these logistical trends lead to a strong overall growth in transport activity which was referenced in the previous chapters.

On the other hand, these tendencies show that the shipping companies have changed their activities in logistics and have tried to fit these to their individual needs in globalized sourcing activities. In general, industries operate with differing supply chains and differentiated needs for logistical services and they also have differentiated views on outsourcing logistical services. But an additional strong tendency has been observed: outsourcing of logistical activities has become a major concern of many companies across different industries in order to focus on their respective core activities and remain competitive. Over the last years, this has led to a growing market for specialized logistical services.¹⁵²

Competitiveness is a key phrase, often stated in regards to logistical activities. And it has been putting pressure on the transport sector. Large potentials for improvement have been realised in many companies' supply chains. In case of the automotive industry, 35% of the companies' innovations result from supply chain improvements. Further more, automotive companies like the Toyota Motor Company of Japan implement supply chains with 60% of the company's innovations.¹⁵³

However, an improved supply chain of one company is not necessarily applicable to another company with different needs. And certainly, standard logistical activities that were used in previous years are also not as efficient and not as fast enough for individual companies' needs.

So, any kind of logistical service and especially the provision of VAS must be specifically rated according to the companies needs. And furthermore, an overall needed for VAS can not be identified in general because every company has outsourced – if it does at all – different parts of supply chain. Different potentials for VAS can therefore be found in each industry where supply chains are generally similar.

However, there are certain kinds of services that add value that are applicable everywhere and are not industry- or company-specific.

¹⁵² Klaus, Kille 2006

¹⁵³ Coia 2003

6.2 Developments within the Logistics Industry

Rapid changes in the business environment have created new obstacles for companies to keep their business functions competitive for an increasingly globalized market. This is the case for OEM companies and even more so for companies in the logistics business. They need to look beyond traditional ways of doing business and envision themselves to accomplish new, formerly unknown, tasks. Over the last few years the potential for logistics management has grown as an enabler to arrive at a better understanding of logistical chains and improved competitiveness. The development of logistical management has been sped up by an increasing focus of collaboration within chains of added value. Furthermore improved decision-making capabilities through financial-, warehousing- and inventory management concepts have led to a growth in importance of logistical activities.

Trying to identify potentials for added value in northern Europe, the tendencies in the European logistics market need to be looked at. As a clear relationship between the demand for freight transport and economic growth can be established, it still has to be kept in mind that the freight transport volume outweighs the amount of goods produced and imported because of the fact that cargo is handled numerous times within multi-modal transport chains.

The situation in Europe has changed from one in which many plants and distribution centres were working exclusively for one national market. With ongoing economic integration, one European plant or one European distribution centre/hub may cater for the entire EU market. This is true for many companies located in Europe. The larger ones, however, tend to build on regional distribution centres in order to handle the amounts of goods more efficiently.

Distribution centres that incorporate different logistical functions currently are the focal point of logistical activities. This function can especially be filled by port areas due to their strength in intermodal changes of transport. In order to provide for further developments, the logistical centre in a port should be open to external logistical companies. As the primary function of a port is the transshipment of goods, ports must also offer their customers the required combination of facilities, quality and price of services.

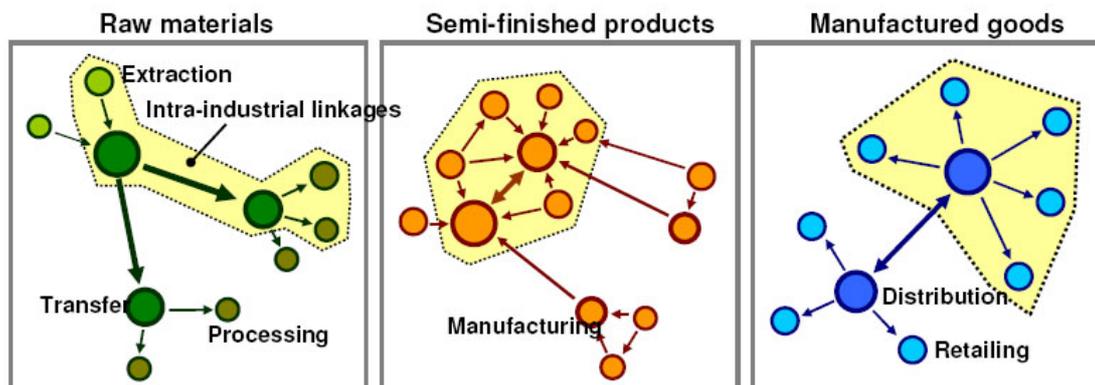
The whole phenomenon of restructuring logistical processes can be combined in the mentioned activity of logistical management. This oversees and integrates value added chains and is the main focus for developing any new value added services. This should also be the focus of LSPs operating in a port area in order to provide the best possible service for the customer.

6.2.1 Cargo Flows and Supply Chains

Supply Chain Differentiation

A further aspect is the differentiation of supply chains according to industries. Each industry has a different level of complexity regarding its structure of supply and complexity of the final product. In general, a differentiation can be made between production systems of (a) raw materials, (b) semi-finished products and (c) manufactured goods. The level of complexity of the final product is rising from (a) to (c). The level of supply chain links on the other hand is different in each case (see Figure 6-1). Raw materials are bulk goods with generally close connections from the point of extraction to the point of processing or intermodal change for long-distance transport. These connections are extremely cost related.

Figure 6-1: Production Systems and Types of Transported Freight (Rodrigue 2006)



The transport chain for semi-finished goods is rather complex by comparison. Depending on the kind of product, more or less transport relations are to be followed between different processing steps of the whole production process. As long as the producing company is vertically integrated in terms of corporate structure and location logistical activities will be few. If the company or corporate structure is vertically disintegrated, logistical activities will be much more.

Finished goods have a fairly simple transport chain. In most cases it runs from the company finishing the product to wholesale and then to retail. Nevertheless, reality never reaches this simplicity. Products can always go along different paths and can be further serviced through their logistical life cycle.

These broad categories of supply chains can also be found in evaluated region. Especially in the BSR, liquid bulk goods like mineral oils or dry bulk like fertilizers are transported in large quantities. They follow the described transport chain of raw materials with the closest relations to the markets of destination due to the high volumes that directly cost related. They are transported with special vessels and are in need of specialized terminal facilities. Semi-finished and manufactured goods are transported in different ways. In the current development towards increasing containerization, more and more goods of this category are handled this way. Especially in the BSR the RoRo trailer traffic is also very important in this respect.

It shows that logistical demands are different depending on the stage of the production process of a product.

Supply Chains and VAS

In many cases, logistical services – especially VAS – have not only something to do with the stage that the product is in but also with the location where the product is currently placed. Depending on the value that is added, it is related to the stage reached in the supply chain or transport chain. Some logistical services can only be performed at certain locations. In most cases these are distribution hubs or traffic nodes where goods flows move together. These hubs or nodes are strategically placed at a specific location that provides advantages in transportation costs and efficiency. But there are also services that can only be performed at certain locations because means of transport restrict the transport chain. Services like pre-delivery inspections can only be performed close to the destination market; otherwise an additional long transportation process would make the service obsolete.

That is why VAS should and have to function as part of a supply/production chain. For a third party LSP this puts the question if integration into the chain is possible.

Besides the question of strategical and spatial implementation of VAS, products are not always accessible to perform services with in a way that value is added. If for instance products are shipped through a port in a container, they are not necessarily predestined for VAS because any additional unloading of the container would add extra costs. Therefore it can be concluded that containerized cargo flows can only be serviced with VAS before the location of storing the container and after unloading its content for further distribution or manufacturing. This leads to the question if it is cost efficient to provide VAS in a port area where the container is only transhipped.

In a location where the point of added value can incorporate several value chains it might, however, be possible to achieve scale effects by combined value addition.

Supply Chain Collaboration

The mentioned developments also point to the need for developing new collaborative forms of logistical activities within such chains. The integration of supply chains is more and more expected to grow from supply-based concept to a model that relates several equally important companies in one supply chain, distributing the whole production and transportation process over many players.¹⁵⁴ However, this is not yet implemented in many cases. But in the coming years, more and more semi-finished goods are expected to be shipped. The automotive and electronics industries are the most developed in this regard, engaging more and more companies that supply completely finished modules that only need to be built into the final product.

This concept potentially opens up new possibilities for LSPs in regards to the integration of value added services. These new forms of collaboration will then develop as an essential part for competitiveness with trust based network relations between OEM companies, their suppliers and LSPs.

This model is in favour of ongoing developments towards more and more individualized mass production. This requires focusing on core competencies and has led to outsourcing activities in many supply chains that are followed by necessary collaborations. Prominent examples from the automotive industry are Volkswagen Logistics and Volvo Logistics that have taken all logistical activities of OEM and are working as a collaborative partner in the supply chains.

The benefit of supply chain collaboration will then be the ease of implementing VAS into the supply chain of a company network as it is a goal of this company network to share in the production process regardless if the servicing company is a manufacturing company or a LSP.

LSPs

Nonetheless, the LSP plays a crucial role in the integration process of the supply chain. It is the linking factor between the manufacturing companies. They are the shaping entities of the cargo flows in a region. The shipping company is generally not concerned about the way that its goods are going as much as the transportation and handling process is fast and cost competitive. But the LSP is as it is its business capital.

Currently tendencies have developed several forms of LSPs. They all focus on a different aspect of logistics in a supply chain and play different roles in the NSR and BSR. They are called first, second, third and fourth party logistical service providers (1-4PLs):

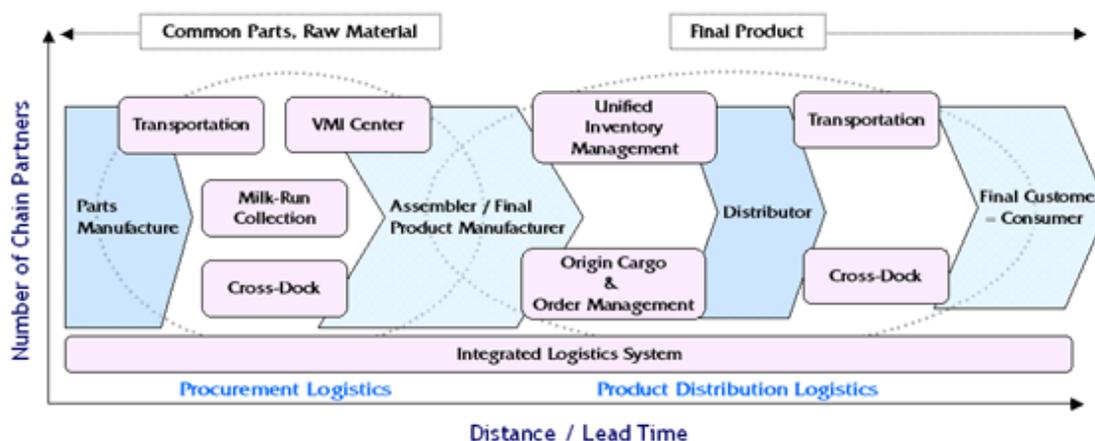
¹⁵⁴ Wildemann 2004a

- 1PLs: plant logistics
- 2PLs: first outsourcing step - external logistics service (handling, storage)
- 3PLs: additional services - IT-services, value addition, contract logistics
- 4PLs: network management - bundling of third party services, supply chain management

The first have already existed for a long time and can be best described as the traditional business of a LSP. However, even 1PLs are experiencing new tasks in the face of globalizing plant networks. For instance, even though Volvo Logistics is a 3PL that offers all kinds of additional services it mainly handles the cargo flows between the Swedish and Belgian plants of Volvo. But in general LSP are providing more and more additional services and it can be observed that all major LSPs have outgrown stages of 2PL and are offering a variety of services to suit the needs of their customers. 4PLs are a special case and it is doubted if it even exists. But a group of LSP has developed that are experienced enough to offer specialized supply chain management without any actual handling and servicing of goods.

The logistical processes have continuously become more and more complex and OEM companies and their globally sourced suppliers are not capable of handling these. Figure 6-2 shows a simplified picture of a supply chain as an integrated logistical system as it is seen nowadays.

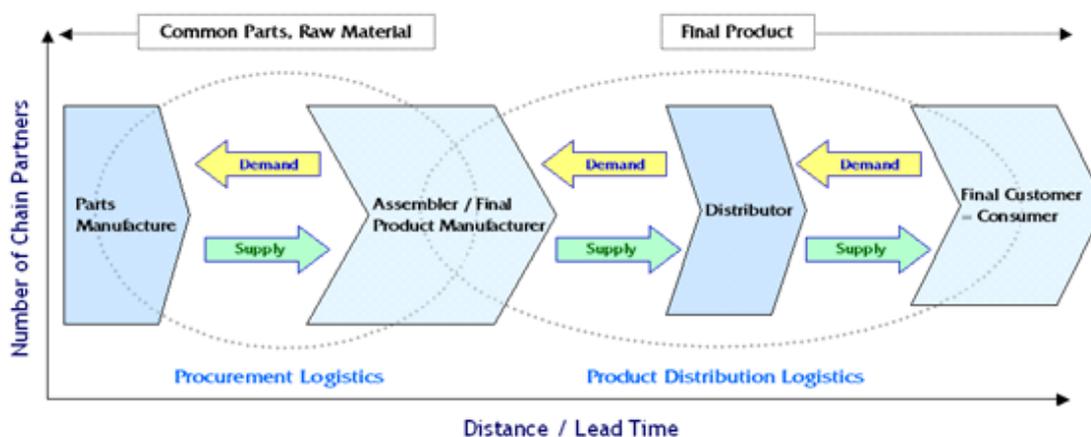
Figure 6-2: Integrated Production Chain¹⁵⁵



This process has become even more complex due to increased possibilities to intervene in the production process either by the manufacturer or the final customer with information technology as seen in Figure 6-3.

¹⁵⁵ <http://www.nyklogistics.com>

Figure 6-3: Synchronization with Customer Demand¹⁵⁶



So, the integration of the transportation processes and related supply chains is affecting the logistics industry as well as ports. But for the concern of this study one question remains: Where do port logistics fit in? Is a port even capable of providing additional services? Answers to this will be developed in the following chapters.

6.2.2 Potential for Contract Logistics and Concepts like 3PLs, 4PLs

But are we talking about a business area that generally provides potential for growth in the future? Do logistical activities that are individualized for certain companies' supply chains offer potential? Part of an answer to this question is found in contract logistics. Contract logistics describe the granting of long-term logistical contracts to logistical service providers. This include

- the integration of several logistical functions into one complex package of services (including not only transport, storage or order processing),
- the individual design of logistical services developed for the needs of the shipping company and
- long-term contract security (at least one year contracts between service provider and the shipping company in written form in contrast to transaction-based business connections).

Therefore contract logistics do not include standardized services like the handling of bulk or general cargo. This differentiation is especially important as it helps to identify added value within logistical chains.

Service providers in this sector are generally classified as 3PLs. This term relates to the position of the service provider in the logistical chain between the shipping company and the customer, supplier or manufacturer and sees logistical activities in one sense as a complex package of tasks.

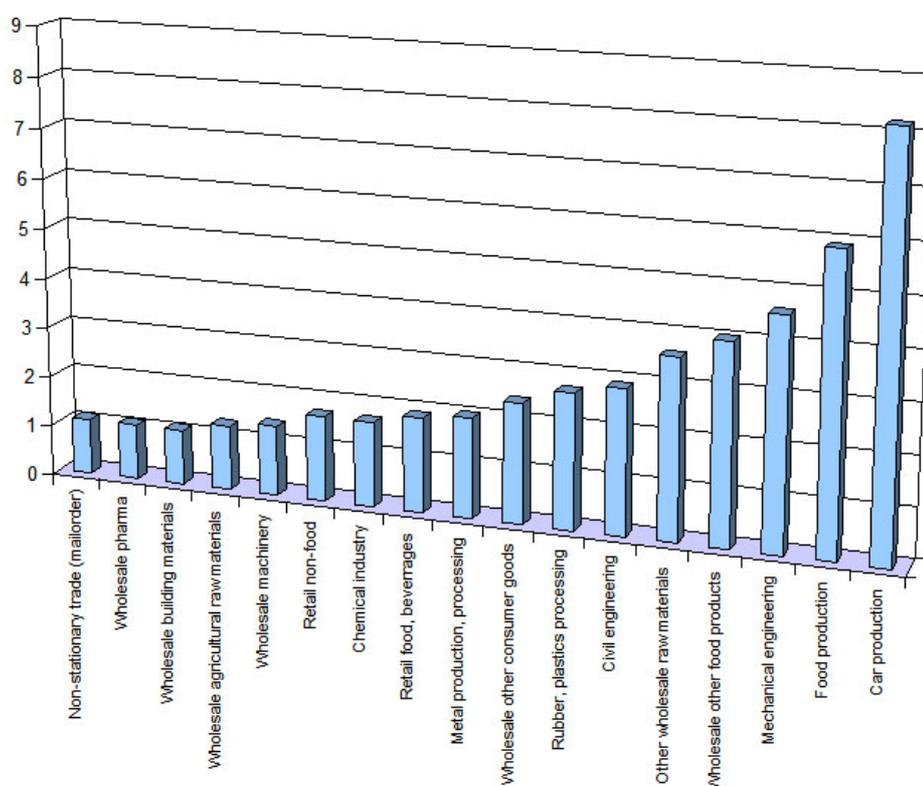
The logistical industry has identified the concept of contract logistics as a business area with a lot of growth potential for the logistical service industry. It is frequently referred as “logistical solutions” and logistical service providers are offering services with this term.

¹⁵⁶ *ibid.*

A provision of so called solutions describes best the situation in the logistical industry. A large part of logistical activities of shipping companies is very much industry- and company-specific and in most cases largely integrated with the core activities of these companies that it is only feasible to design individualized and integrated logistical services with long-term contracts which can be outsourced. Since the 1980 chances through this model are increasingly realised and taken advantage of. Major players pioneering in this area in Germany include FIEGE and RHENUS and on an international level EXEL and RYDER.

For a study on the German logistical service market a potential evaluation of the contract logistics market was conducted in 2005. As the German market has a substantial impact on northern Europe, lines of development in the whole region can be drawn from here. The following chart shows the major results from this study:¹⁵⁷

Chart 6-1: Estimation of Potential for Contract Logistics in Germany in bil. €, based on figures until 2005 (Klaus, Kille 2006, p. 119)



This evaluation gives an overview on the possibilities of the logistics market in relation to certain industries. As potentials for further developments in port areas are the goal of the results of this study, the previous estimates show the industries that can be ruled out for additional investments and those that have a potential for investments in terms of logistical infrastructure and additional services.

The largest potential for contract logistics is estimated in the car manufacturing industry followed by food production and mechanical engineering. After these there seems to be a large potential within logistical chains for wholesale companies. Due to the fact that products must have achieved a final manufacturing status when they arrive at a wholesale company to be sold to end customers or further processing companies, a whole logistical chain must have been gone through.

¹⁵⁷ Klaus, Kille 2006

In the following these figures will be looked at as a foundation for the development of value added services. The realisation of these potentials will then be focused on. For the whole German economy currently outsourced activities account for about 15.6 billion €. This relates to the frequently quoted estimate that the implemented European contract logistics market accounts for roughly 40 billion €¹⁵⁸

Along with the potential for contract logistics a tendency can be observed that those industries with the strongest potential for contract logistics are also the fittest concerning their developments in logistics.¹⁵⁹ A study on logistical potentials¹⁶⁰ revealed that electronics, vehicles and chemicals are the fittest in this regard in Germany. This could be expected but a difference needs to be made between the top 10 companies in one industry and the rest. On average companies achieve at most 74% of logistical benchmarks of the top 10. A great difference in logistics performance can therefore be identified. But this is not only a negative finding. This performance gap can also be perceived as the sum of unused logistics potential within the industries. And for the averaging companies it needs only to be tapped at to catch up with the top 10.

If the logistical benchmark is broken down the gap between high performing companies and the average is even greater. For example the companies in the vehicles industry arrive at a high level of 86% with the performance of their own and external logistical services, averaging companies can only perform with 57%.

The make or buy decision shows a similar picture. In electronics averaging companies look at outsourcing as rather unimportant (26%). For the industry leaders this area is much more important with 86% on average. From this follows that the potential for outsourcing is not even close to be seen as of strategic importance for competitive company developments. And this follows for all main industries.

Another important aspect is the proportion of logistical costs compared to total costs within an industry. For Germany an average of 16% is spent on logistics. This contrasts heavily with carelessness of companies with this area of business. But of course this differs within every industry. Financial service providers for example only account 4% of logistical costs compared to the mail order business that deals with 22%.

It can be concluded that there is a potential for additional services ranging from contract services to general logistical services but differences can be observed between industries. This completes the picture of the evaluation of supply chains.

6.2.3 "Value Added Services" – a Definition

In general the term "value added service" describes services of a LSP that are undertaken prior, during and/or after the core logistics activity for a certain product. Such services create additional value for the customer compared to the standard product that has not gone through this service. They are part of a strategy of differentiation with the supply chains of producing companies.

However, this term has become a glittering management term and OEM companies as well as LSPs are seeing it differently. So, it is impossible to arrive at a consistent definition. Some

¹⁵⁸ Klaus, Kille 2006, p. 121; Transport Intelligence 2003, p.32

¹⁵⁹ Jahns, Langenhan, Walter 2005

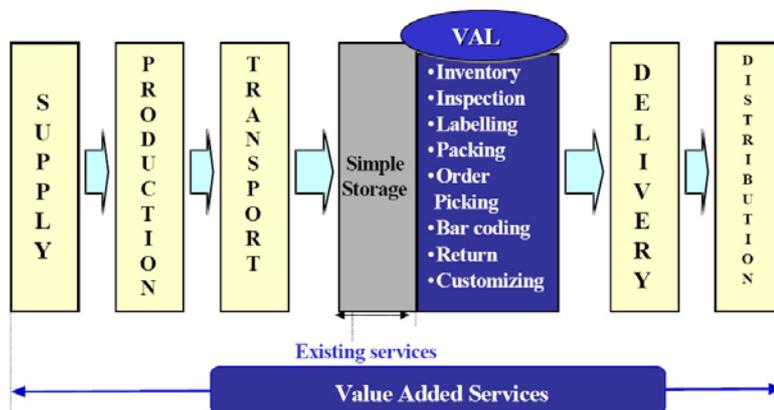
¹⁶⁰ *ibid.*

regard certain possible value added service as core competencies that are impossible to outsource, others do not. Even if the key phrase to success for a producing company is "to identify and support activities that create value as contrasted to those that only increase revenue or decrease costs"¹⁶¹, every management regards different aspects as competencies that are impossible to create a VAS from by a LSP.

To integrate value added service into a warehouse or a port location leads to the development of a distribution centre that can evolve to meet the needs of today's customers. It uses information technology (i.e. EDI) to become an integral part of the supply chain that it serves and bridges the gap of tomorrow's demand-based requirements. While vendor compliant labelling and store-ready packaging are the most common tasks of value added services, a much broader meaning can be applied. A distribution centre can not only be used for storing inventory but for responding to orders of any kind. Therefore value added services need to support customer service strategies that drive customer retention, revenues, and profit.¹⁶² This leads to close cooperations between LSPs and their customers that develop tight links between the producing companies and the end customer.

Generally speaking distribution centres are part of supply chains and can complete production activities to postpone specialization and refine product characteristics. This can also include reassembly or product correction and refurbishment. From this perspective distribution centres and their warehousing facilities can be seen as the last stage of production or in case of the supply of parts as a stage prior to OEM production. A simple logistical chain can look as follows in:

Figure 6-4: Point of Added Value



The possibilities of providing services with some form of value addition can be categorized in order to relate their functionality for certain industry-specific supply chains, as we will see later.¹⁶³

1. **Packaging.** Logistics centres have been introducing packaging functions as well.
2. **Specialist or niche services,** where the operation is specifically designed for a particular product. The development of hanging textiles distribution is a typical example. Here the entire distribution operation, from production point through finished goods warehousing, primary transport, depot, delivery transport and into the retail store, is all provided on

¹⁶¹ Bowersox, Closs, Copper 2002

¹⁶² Altekar 2005, p. 285

¹⁶³ Rushton 2001, p. 62-63.

hanging rails. Products are thus moved as "sets" of garments on hangers. Some of the storage operations are very sophisticated automated systems.

3. **Localizing and customizing.** In international logistics, shippers are placing greater emphasis not only on the quality of goods but also on customer needs and country requirements. Recognizing this new shipper's demand for customizing some shippers have resorted to providing these services by offering unique offers.
4. **Time reliable services,** which are set up to support the just-in-time operations of major manufacturers. As a typical investment you'll find sequencing centres that have been developed in the automotive industry to support line-side production. For example TNT, Hays, and Ryder provide these in the UK for the OEM companies Rover, General Motors, and Nissan. Here line-ready production modules are supplied directly to the production line so that the relevant components can be introduced into the manufacturing process at exactly the appropriate time.
5. **Assembly.** The home electronics industry offers a number of examples where basic products, such as PC monitors or processing units are initially distributed to the relevant market before being finally made ready for the final customer. This can also include the labelling of the equipment and the installation of the final software and addition of documentation in the language of the end customer. This is often done by a third-party LSP.
6. **Repacking** describes the need for additional services to blister-pack two different items that are to leave as a distinct retail or mail order product. Products of different origins are newly combined into one set of products for the end customer or further integration into a production process.
7. **Refurbishment.** Due to current environmental legislation many manufacturing companies have developed tasks to re-engineer their products to reuse parts from some used products in new ones. A reversed supply chain is then implemented which is not an easy task as most distribution operations are geared towards the end customer and not back. Third-party companies have tackled this opportunity and are now offering return-and-refurbishment services.
8. **Installation and instruction.** Recently, installation and instruction services have emerged as important functions in logistics centres. Shippers have either independently or jointly designated some space in the logistics centres for installing goods at the warehouse, which they have received from the suppliers. Some logistics centres have also become involved in education and instruction and turned themselves into similar customer service centres for end users.
9. **Quality control and testing of products.** Recently, logistics centres have been providing quality control and product testing services in addition to assembly services. Quality control and product testing services are expected to prosper both globally and domestically.
10. **Packaging return services** are also related to environmental issues in order to reuse packaging or provide for their appropriate disposal. Especially in the food industry a number of third-party LSPs have set up reverse logistics. This also includes the development of recycling centres for the disposal of waste and the repair and washing of reusable containers.

11. **Product training on customer's premises.** Increasingly, customers are demanding that logistics centres provide product-training services on their own premises. This trend is particularly noticeable in the case of electronics companies. Customers are using logistics centres to offer more flexible service offerings and reduce the cost of personnel training.
12. **Bonded exhibition.** To increase the distribution function, especially for bonded products, port authorities should examine the possibility of building exhibition facilities. It should be said, however, that the exhibition should be arranged systematically so as to avoid confusion with warehouse facilities.
13. **Cargo related services** deal with tasks like inventory management, logistical chain management, merchandising, telesales/e-commerce, fleet management, packaging management, information management, contract hire and consulting.

These different possibilities in implementing services provide a wide range of ways for servicing even in port areas.

6.2.4 EDI and "Value Added Services"

In order to make the above mentioned logistical activities work together, one will need a well functioning information and communication system, for example an EDI (Electronic Data Interchange) system, to be implemented throughout the supply chain.

An information system is a specialised type of system and can be defined as a set of interrelated elements or components that collect (input), manipulate (process) and disseminate (output) data and information in order to provide a feedback mechanism to meet an predetermined objective. The value of the information is directly linked to how it helps the decision makers achieve their organisations goals. For example, the value of information might be measured in the time required to make a decision or in increased profits to the company.

EDI is an inter-company, application-to-application communication of data in standard format, permitting the recipient to perform the functions of standard business transactions, such as processing orders. Connecting corporate computers among organisations is the idea behind EDI, which uses network systems and follows standards and procedures that allow output from one system to be processed directly as an input to other systems, without human intervention. With EDI, the computers of customers, manufacturers and suppliers can be linked. This technology almost eliminates the need for paper documents and substantially cuts down on costly errors. Customer orders and inquiries are transmitted from the customer's computer to the manufacturer's computer. The manufacturer's computer can then determine when new supplies are needed and can automatically place orders by connecting with the supplier's computer.

EDI plays an increasingly important role for the development of logistical chains and services. The term sums up all electronic procedures for asynchronous and automatic exchange of structured data messages between application systems of diverse institutions. In a world of growing dependence on information technology and their facilitation of business processes, these procedures have rightfully found their place in logistics.

But EDI is generally looked at differently like the role of VAS and outsourcing of logistical services. Some regard it as their competency within customer services; others define it as an ideal for an outsourced value added service.

Nevertheless, the key role of EDI remains: the interchange of data about the ongoing physical transport chains that are based on contracts between LSPs and their customers.

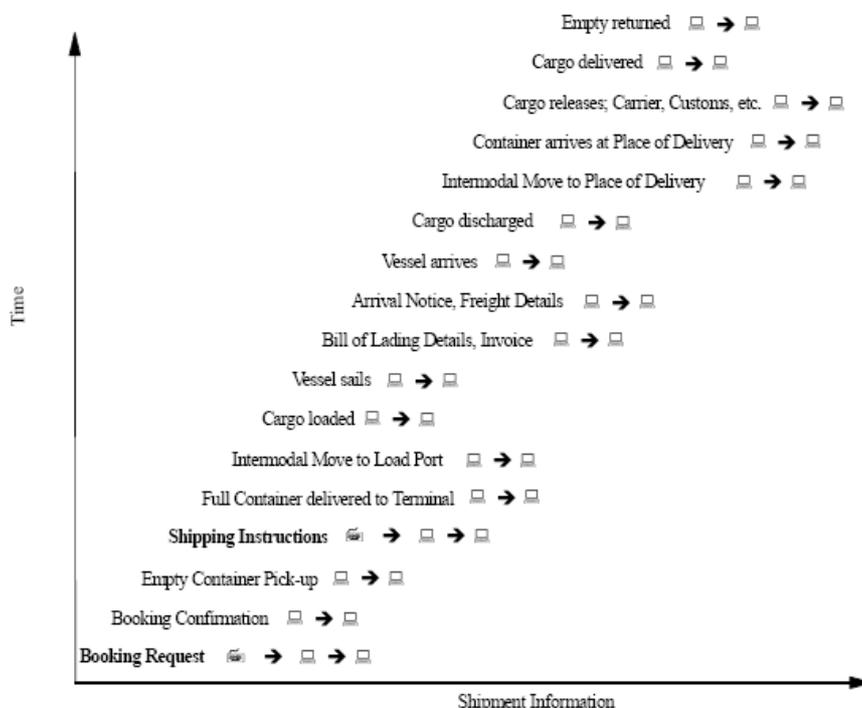
Today, basically all shipments within a logistical chain are accompanied by some form of EDI. In general these data exchanges are business capital and therefore impossible to obtain and to map for the NSR/BSR. However, in general EDI flows are related to overall trade flows between countries. But the evaluation of industries following chapter 6 will identify logistical chains that are using EDI or have a potential for the implementation of additional EDI processing of product data.

The latter is an important approach for the implementation of additional value added services. As seen in the previous chapter many potential value added services heavily rely on EDI to be processed with the product. Furthermore there is also a wide range of possible value added services that add value through processing data that arrives via EDI. This includes:

- Preparation of digital data that accompanies cargo
- Production of documentation
- Tracking and tracing
- Customs

To provide for seamless integration of different IT-systems, standards for EDI have been implemented. The most common is the EDIFACT-standard (Electronic Data Interchange for Administration, Commerce and Transport). Figure 6-5 shows is simple transport chain in EDI.

Figure 6-5: EDI-Connections between customer and LSP (Pawlik 1999)



As recent discussions show, the development of EDI in logistical processes will be further fortified through the implementation of Radio Frequency Identification (RFID). This automatic identification method relies on storing and remotely retrieving data using devices called RFID tags or transponders. An RFID tag is an object – in most cases a label – that can be attached to or incorporated into a product for the purpose of identification using radio

waves. Chip-based RFID tags contain silicon chips and antennas. Passive tags require no internal power source compared to active tags.

6.3 Identification of Industries with Potential for "Value Added Services"

Even though large amounts of certain commodities might be traded between countries of northern Europe and the product groups with a lot of growth potential can be identified, it is not at all evident which products provide potential for value added services. Potential product groups are those that

1. Are accessible at a specified stage in the logistical chain in a way that puts no indispensable efforts and costs to the logistical process,
2. Are not completely finished in their production, finishing, individualizing, packaging and labelling process and
3. Can be supported in their distribution through means of additional logistical services.

For instance, packaging of goods in containers puts a barrier on providing value added services for these goods at stages and in regions where the goods are not supposed to be unpacked.

As was hinted at before, main cargo flows in NSR/BSR have differentiated needs for logistical services. A general difference can be made between VAS for commodities like liquid and dry bulk cargo and general cargo. Bulk cargo puts demands on the LSP that largely have to do with the handling of large volumes. The LSP is then concerned with raw or refined products that are generally used in an early stage of the product chain. From this perspective two broad alternatives can be identified:

- If not manufactured/refined, only basic logistical services needed.
- If manufactured/refined, additional services are possible.

In most cases VAS are reduced to EDI and refinement of large bulk volumes through facilities of partnering companies. Due to rather complex refinement processes, there is usually no LSP involved who does any kind of value addition. However, tagging or EDI related services are possible.

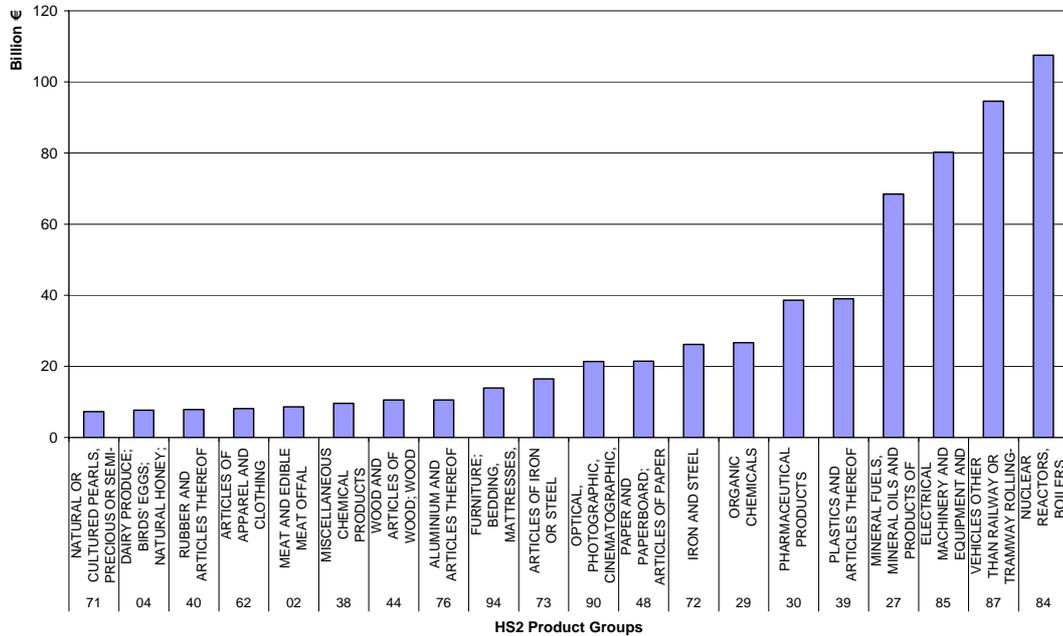
Regarding general cargo, different perspectives are thinkable. Depending on the supply chain status of the concerned product, more or less logistical services are needed

- Some industries heavily depend on efficient logistical services as their supply chains incorporate a large number of 1st, 2nd and 3rd tier suppliers and worldwide retailers/customers (e.g. Automotive)
- Others rely on rather small supply chains but heavily depend on sophisticated logistical services in relation to time, security and/or labelling/packaging (e.g. Pharmacy, Food)

For general cargo goods, VAS are increasingly offered by LSPs and incorporated in the production process of companies. As we are dealing with potentials for further investments of the companies in the NSR/BSR, industry growth rates have to be kept in mind. They hint at positive or negative developments within the industry and show, in comparison with

technological and financial developments, if investments in new logistical activities might be possible. Chart 6-2 shows the combined export figures of the evaluated countries which show the importance of each product group and related industry for the trade in the region.

Chart 6-2: Combined exports from and to northern European countries in € according to HS2 product groups in 2005 (Eurostat 2006)



High traded values are achieved in industries with complex supply chains like machinery, vehicles or electronics. This relates to the potential that was estimated in chapter 6.2.2 on potential for contract logistics. These areas offer potential possibilities for integrating VAS in the supply and production chain where the OEM is willing to outsource the respective parts of his production process.

Examining the trade patterns in their growth developments over the last years, this finding is underlined. Chart 6-3 and Chart 6-4 show the strongest growing product groups in the export trade between northern European countries. Product groups like vehicles are also among the strongest growing groups and therefore inherit potential for further possibilities to offer logistical services to this industry that would help improve the efficiency of the production chain of the respective company.

Chart 6-3: Absolute export growth between northern European countries from 2000 to 2005 in € [blue] and tons [red] (25 strongest growing HS2 product groups) (Eurostat 2006)

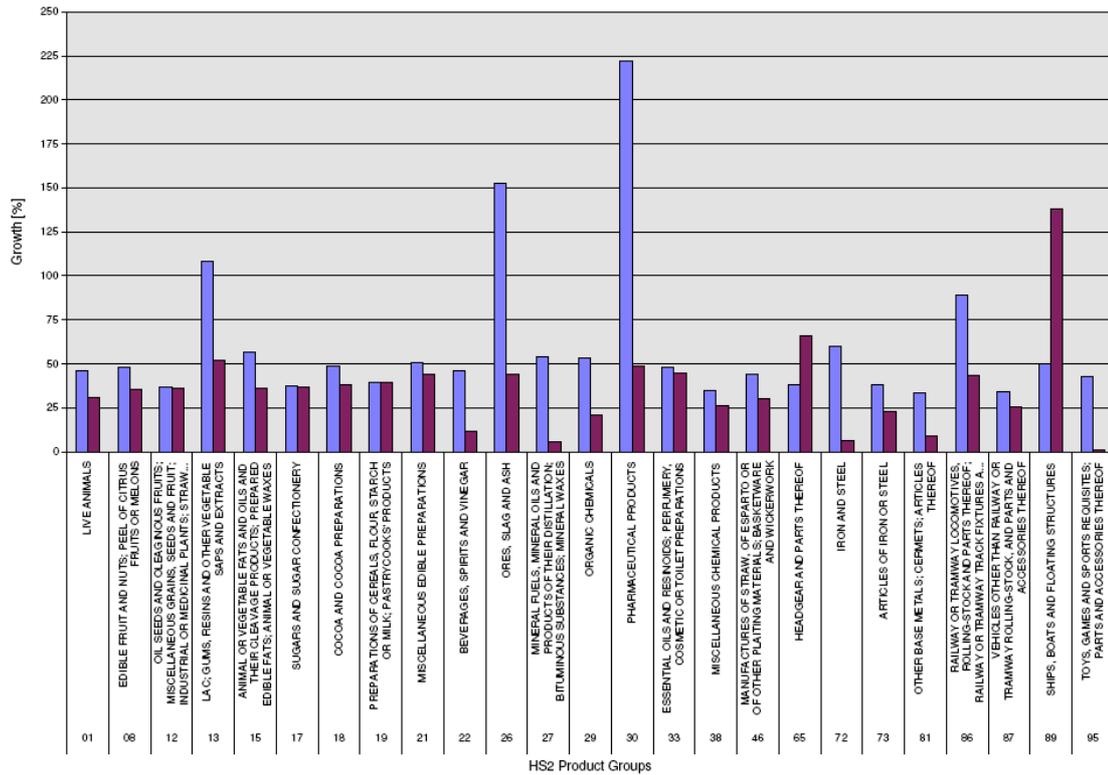
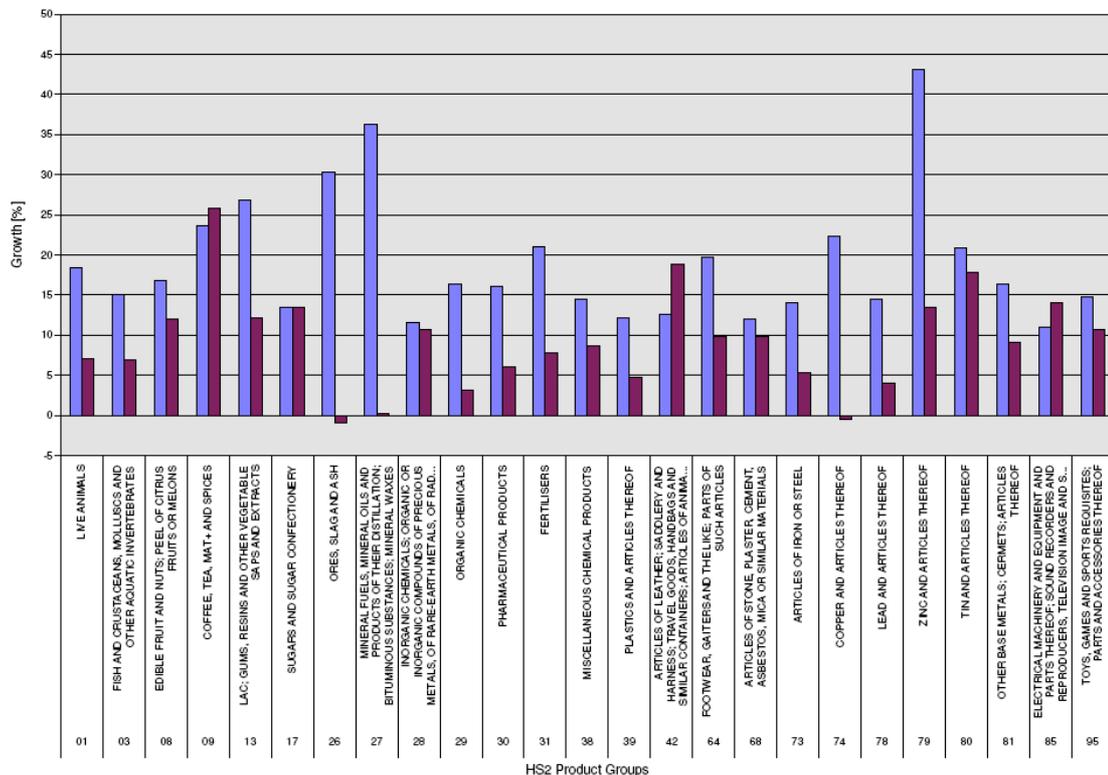


Chart 6-4: Absolute export growth between northern European countries from 2004 to 2005 in € [blue] and tons [red] (25 strongest growing HS2 product groups) (Eurostat 2006)



Most obvious is the strong growth of certain bulk commodities which underlines the importance of the NSR and BSR as a trading ground for such goods. Also, pharmaceutical

goods and chemicals have been growing over the last years and are providing a new area of activity for LSPs as only a few of them are specialized in those goods.

6.4 Port Developments

Ports in the NSR and BSR have experienced a continuous growth over the last decades. Growth rates between 5-15% per year were achieved, especially in the area of container cargo. This puts a lot of pressure on port capacity and infrastructure. Shipping consultants expect a shortage in these areas due to the tremendous growth in container traffic especially in Southeast Asia, Middle East, South America and Eastern Europe.¹⁶⁴ This may halt the flow of global supply chains. However, container traffic growth has slowed and supply is expected to overshoot demand. But the handling of cargo will be difficult because of insufficient capacities.

Despite all the possibilities that differentiated logistical services might offer, the main focus of port development will practically be the expansion of capacity in the years to come.¹⁶⁵ Therefore, it will be a matter of competition if this development is accompanied by individualized logistical services.

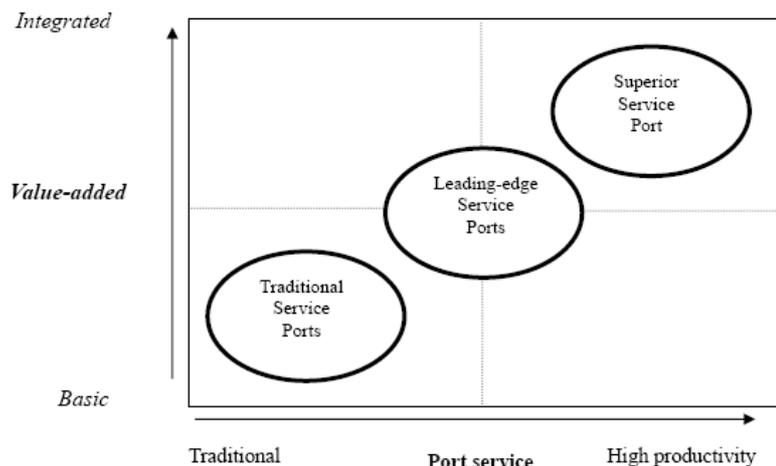
Regional differences can also be identified between NSR and BSR. North Sea ports are dominated by deep-sea transport from overseas and the transshipment of goods via short sea shipping while the Baltic Sea is favoured for short sea shipping of goods. BSR ports also show an internal differentiation in regard to their main focus. As the Russian market has been one of the driving forces for goods turnover of many of the BSR ports especially in the Baltic States, development of Russian seaports will lead to transshipment changes for the Baltic States.

Like with all logistical activities, ports also face a changed perception of logistical services and port activities. As mentioned before, global sourcing and focusing on core competencies has led to diversified approaches of a growing logistical market to offer individualized solutions. Providing VAS is a powerful way for ports to build a sustainable competitive advantage and act according to this development. Shipping companies and port customers are becoming increasingly demanding. Customers now tend to look at VAS as an integral part of their supply chain. As a result, ports must attempt to satisfy these needs by offering differentiated services. This poses a particular challenge for port management. Studies show that the most successful ports are those that not only have a productivity advantage in cargo-handling services, but that also offer value-added services. Thus, there are several available options for ports to choose from, as shown in the simple matrix in Figure 6-6.

¹⁶⁴ Automotive Logistics 01/07, p. 8.

¹⁶⁵ <http://www.logistik-inside.de/newsletter.php?id=477871>

Figure 6-6: Matrix of competitive advantage for ports (United Nations 2002)



The ports providing traditional services in the bottom left hand corner of the matrix are indistinguishable from their competitors. The only option for such ports is to move to the right side of the matrix, towards productivity-advantage leadership, or to move upwards, towards value-added service leadership. There continues to be a need for ports to provide basic, traditional cargo-handling functions, and that there continue to be many customers for such services. Perhaps it is for this reason that many ports in developing countries still concentrate on improving their productivity with regard to traditional port functions. It remains, so to say, the core competency of the port.

However, it is evident that, in the future, there will be fewer ports that prosper only in this area. Rather, we will see the dominance of superior service leaders that possess both a productivity advantage and an advantage through VAS. In between traditional and superior services, ports are the leading-edge service ports. These are the ports that are on their way to becoming superior service ports.

A number of ports have responded to this trend by focusing on VAS as a means of gaining a competitive edge. In this context, VAS refers to the process of developing relationships with customers through the provision of an augmented offer, which may encompass many aspects of added value activities.

Ports can experience synergistic benefits from the logistics centres to provide VAS. It is advantageous for a port to incorporate a specialized distribution centre as well, since the logistics centre can attract cargo that can be shipped through the port. There is a positive correlation between cargo flows at the logistics centre and the number of ships calling at the port. In other words, the cargo attracts the ships, and the ships attract the cargo. The port benefits by generating increased revenue and creating jobs. The port can profit not only from the logistics centre itself, but also from the increased flow of cargo through the port. Thus, an ideal port should provide a diverse range of services that are highly integrated. As such, there is a need to seriously consider the increasing importance of ports in logistics management.

Logistical centres in ports

A logistical centre is a link between different modes of transport. In the BSR, there are a considerable number of activities which are branded as logistical centres. A logistical centre is a link between different modes of transport. It provides VAS and transfers the economies of

scale to the customer of the port or terminal. The advantage of scale results from cooperation. And it leads to the reduction of costs per unit.

However, one should distinguish between a logistical centre, which utilises the port as one element of an overall regional logistical strategy, and the services provided by the port itself. Not all of them are directly linked to ports. The general political aim of regional economic development is often the driving force behind the creation of logistical centres.

Some of the logistical centre initiatives in Finland are the Bothnia Logistical Centre, Oulu Logisforum, Turku Logistics Centre, Ideopolis (Helsinki Vantaa region) and Aviapolis (Airport Vantaa). Initiatives in Sweden include logistical centres in Skåne and Blekinge. Large companies have placed their logistical hubs in Gothenburg/Halmstad, Norrköping/Linköping and the Stockholm/Arlanda/Årsta area. Ports which have invested into the supply of VAS include, among others, the ports of Gothenburg, Trelleborg, Copenhagen-Malmö and Stockholm. The CMP (Copenhagen-Malmö Porto) is currently developing a multi-purpose logistics centre for external transportation and logistical companies.

In Denmark, the creation of transport centres has been more related to road-to-road transshipment and intermodal transport (Danish transport centres). Logistical services are provided in big ports like Aarhus and Copenhagen, but the port of Køge with its Scandinavian Transport Centre is the only one labelling it as a logistical centre.

In Germany, the creation of logistical centres (Güterverkehrszentren GVZ) is closely related to the general political goal of creating a network of inter-linked intermodal terminals. Ports which are integrated with logistical centres include the port of Rostock.

In Poland, a logistical centre in Gdansk is under construction. In Estonia, Lithuania, Latvia and Russia similar activities can also be discerned; for instance, the economic areas previously entitled Free Economic Zones (e.g. in Klaipeda). The development of logistical centres in an integrated way has not proceeded to the same extent as in the Scandinavian countries and Germany. The development activities within the vicinity of ports in Estonia, Lithuania and Latvia are intended more towards the creation of business zones, to attract all kinds of companies to these areas – not only logistical companies.

Distribution centres

The establishment of new hubs and the changed locations of existing hubs, as well as the development of main ports, all result in substantial shifts in transport chains. While European plants and distribution centres have replaced smaller units, which were only installed to serve national markets, the companies enjoy wider choices for potential locations. The large European Distribution Centres handle big volumes of European and overseas goods. For example, in Sweden, companies such as Honda, Nike, Philips have established distribution centres to supply Northern Europe.

Free trade zones also provide means for the development of distribution centres with VAS in port areas as exemptions are given on tax and customs.¹⁶⁶ This allows for increased competitiveness of such port areas compared to others in terms costs.

Port Specialization

¹⁶⁶ UN 2002

Each port serves the market of its adjacent hinterland. To a large extent, these markets determine the nature and types of cargo handled by each port. The development of port specialization is still underway in the Baltic Sea region.

Competition between different ports and terminal operators increases the importance of effective handling routines and specialization in specific commodities. Strategic co-operation or merging into groups has also delivered competitive advantages for small regional ports, making them stronger within a specialised group of ports. This is especially the case for the range of paper and forest product ports in Sweden and Finland.

Examples of ports which are specialised are: the large RoRo ports (e.g. Gothenburg, Trelleborg, Helsinki, Lübeck); the large bulk ports like Frederica, Ventspils, Gdansk; and container ports like Aarhus and Gdynia. However, it is also evident that especially large ports offer extended transshipment possibilities for different kinds of cargoes. Ports often consist of a number of different terminals for different purposes. Despite a trend towards specialization, ports are aiming to cover other market segments as well. Some examples are car transportation (Gothenburg, Malmö), or entry into the container business while being a major bulk port (Gdansk) or being both a major ferry port and a specialised port for paper products (Lübeck).

6.5 Methodology

For the purpose of the following case studies in this study, the following questions are targeted in order to be able to identify VAS for port areas and gain information on potential investors for such services. These questions provide the framework for the subsequent industry case studies.

1. Do the logistical parts of the considered industry provide areas for potential value addition?
2. Which value added services can be identified for the considered industry in relation to location and status in the supply chain?
3. What prerequisites are demanded of locations (i.e. port areas) for such services?
4. Do port areas provide the potential for improved integration into supply chains?
5. What are the criteria of the considered industry in relation to using external LSPs and integrating value added services at certain locations into their production chain?

To answer these questions the logistical demands and prerequisites of an industry needed to be looked at. This is done in a structural fashion to provide the possibility of comparison.

Table 6-1: Industrial Chains Analysis Methodology

Industrial Chains Analysis	
<p>Structural features of the industrial chains</p>	<p><i>Dimension:</i> Dimension of macro-flows related to the most important regions (split by goods categories)</p> <p><i>Complexity level:</i> Complexity of the involved operators and assessment of their added value to the chain, Logistical nodes on which the industrial chain is articulated, Importance of “time” vs. “cost” factors.</p> <p><i>Logistical needs:</i> Logistical and organisational weaknesses, Tendencies of the industrial chain evolution, Possibility to have intermodal integrations.</p>
<p>Selection criteria for the localisation of value added services</p>	<p><i>Logistical supply:</i> Features of logistical services required by operators in terms of infrastructures, connections and other services.</p> <p><i>Area location:</i> Taking into account the origin and destination markets, assessing the importance of the production or distribution of a type of good within the concerning region and the infrastructural and geographic features facilitating the connections with consumption or production markets.</p>
	<p><i>Operators:</i> Presence in the region of operators potentially implementing value added services.</p>

In order to evaluate the industries and their supply chains, the cargo flows looked at in previous chapters were combined with in-depth looks on industry specific logistical issues. Unfortunately broad and detailed data on cargo flows on the micro level could not be identified except for certain cases found in the literature because of competitiveness issues concerning the fact that company specific logistics data is a core asset of their competitiveness.

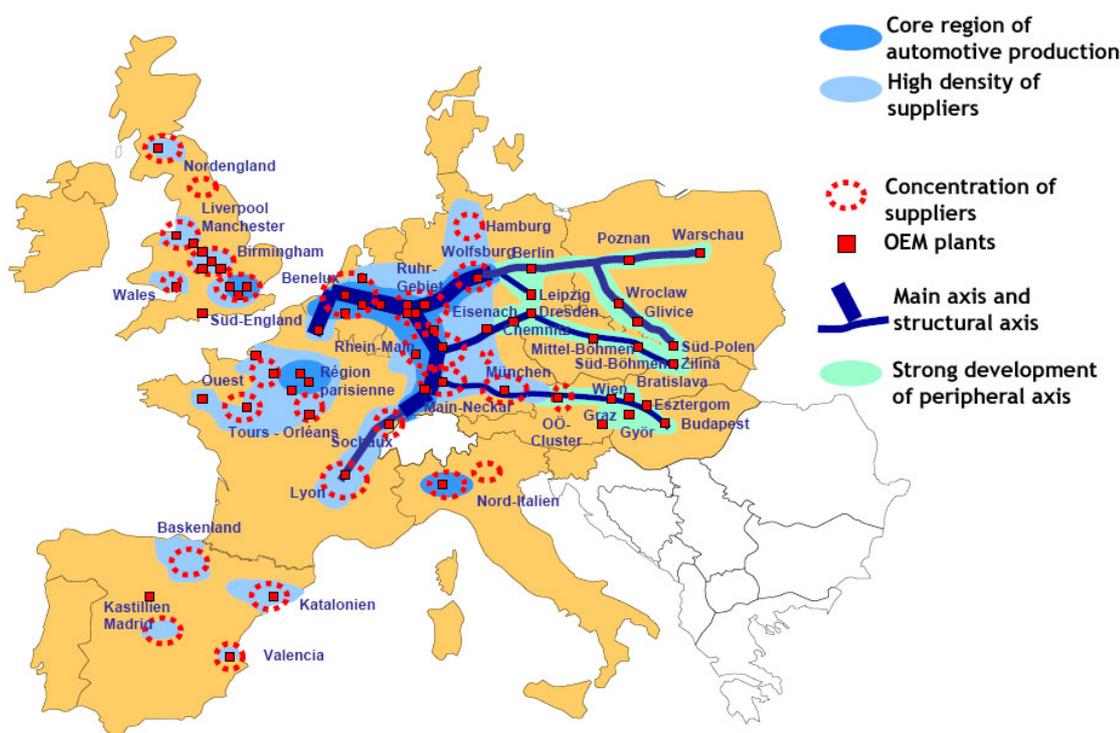
The case studies evaluated in the following chapters are derived from the previous estimates on potential industries and product groups as well as their growth rates in export trade. The following industries will be looked at: Automotive industry, furniture industry, pulp, paper and forest industry, electronics industry, machinery industry and pharmaceutical industry.

7 Automotive Logistics

7.1 Dimension 1 – Industry Analysis

The European automotive sector is one of the most important industries in northern Europe. In 2005, more than 15 million passenger cars were produced in the whole of Western Europe. It is expected that production will reach 16.5 million units by 2009.¹⁶⁷ In comparison, Eastern Europe is growing even faster. Through the opening of several new plants the production of finished vehicles will grow from 3.4 million to 5.0 million in 2010.¹⁶⁸ This development will also change the logistical axis through the whole of Europe. Map 7-1 shows the current regional structure of the automotive industry. The axis relates to the main flow of parts and finished vehicles. In addition to this, the plants in Scandinavia and Russia are growing in importance.

Map 7-1: Main regional economic structures of the automotive industry in Europe excl. the BSR (Podevis 2004)



The major player in this area is Germany with more than 5 million produced cars (5.2 million in 2004). The production is focused on passenger cars that accounts for 90% of all output. And with a turnover of 226 billion € in 2004, it is the third largest vehicle producing country after the United States and Japan.

Table 7-1 shows the imported, exported and soled finished vehicles in the Northern European Countries. The Trade is dominated by exports from Germany and the UK and imports from overseas. The data does not include transshipment of vehicles through other countries as is of growing importance especially for the logistics routes to Russia via Finland or Estonia.

The dominating growth factor not only for Germany but also for most of the other northern European countries has been the export of finished vehicles. In 2004, 70.5% of all produced

¹⁶⁷ European Car Transport Group 2006, p. 27.

¹⁶⁸ *ibid.*

vehicles in Germany were meant for the export market. Growing markets in this regard are Eastern Europe and Asia. And of all produced units in 2004, every tenth vehicle originated in German production.

Table 7-1: Import and Export of Finished Vehicles in Northern Europe in 2004 (European Car Transport Group 2006)

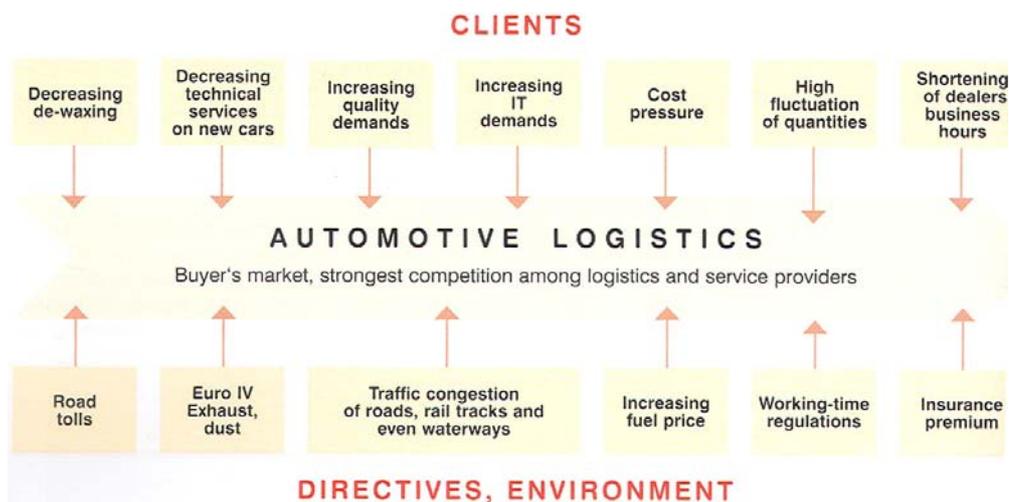
Country	Total Import 2004	Total Export 2004	Total Sales 2004
Belgium	581.065	515.691	590.530
Germany	1.721.574	3.824.491	3.456.944
Denmark	166.044	0	166.044
Estonia	18.802	0	18.802
Finland	160.693	10.510	160.693
Lithuania	11.824	0	11.824
Latvia	12.830	0	12.830
Netherlands	561.930	214.343	570.929
Norway	149.416	0	149.416
Poland	278.198	513.049	355.218
Russia	297.557	112.917	1.489.344
Sweden	233.601	443.850	294.938
UK	2.253.104	1.205.784	2.902.193

Along with these amounts of finished vehicles and the accompanying growth rates goes the importance for the labour market. In 2004, roughly 0.8 million employees worked in the German automotive industry. And including all indirectly employed it accounts for about 5.3 million who work in relation to the automotive sector, which is every seventh employee.

Following the recessional years in 2002 and 2003 the market stabilized until 2005 and has experienced growing dynamics through potential markets in Eastern Europe and Asia.

Vehicle Production is characterised by an under average logistics to total costs ratio. On average only 9% of total costs are spent on logistical services. Therefore logistics service only play a minor role concerning costs and compared to human resource, supply and production costs. But nevertheless it has gain an important position in achieving a competitive market position.¹⁶⁹

Figure 7-1: Influences on Automotive Logistics



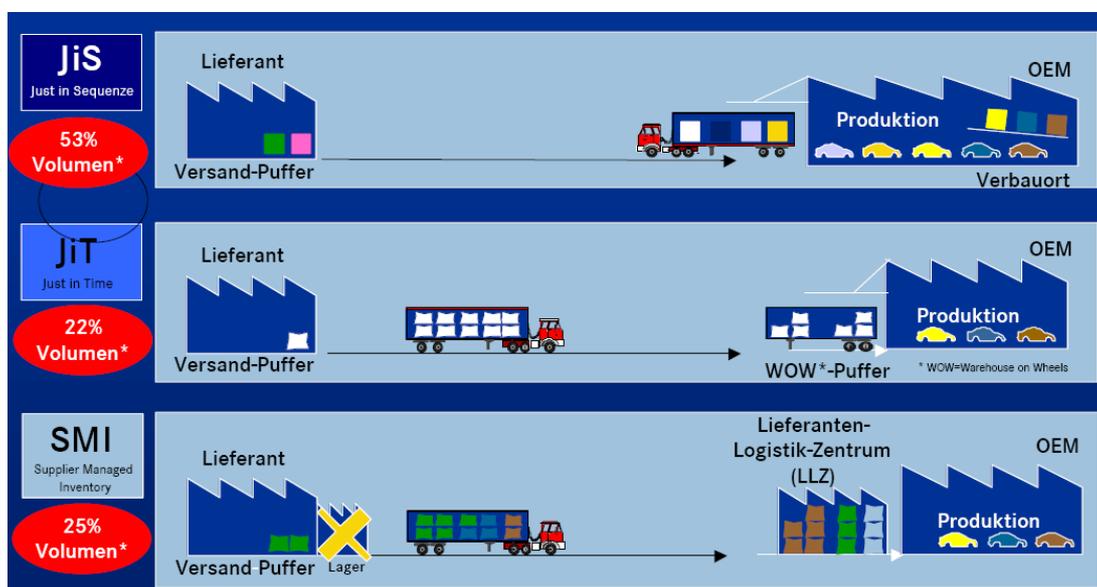
The industry exhibits a high degree of professionalism with logistical services. This is obvious as the OEM companies are in need of integrating a whole range of different aspects into their

¹⁶⁹ Jahns, Langenhan, Walter 2005, pp. 40

supply chains. Not only does an average OEM vehicle producing company exhibit a network of more than 500 supplying companies, it also has to deal with growing individualization in the demand of the customers, growing complexity through diversification of car models, declining product life cycles, increasing relocation of the value addition to suppliers, increasing complexity of the development process of vehicles, continuous globalization and a few more (see Figure 7-1).

Along with these demands, the automotive industry has developed several logistical standards that have first been implemented in this industry. Standards like Just-in-time or Just-in-sequence have significantly improved the industry's efficiency and have proven to be best practice standards for other industries as well. Figure 7-2 shows the three standard delivery options JIS, JIT and SMI.

Figure 7-2: Three standard delivery options within the supply chain of the Daimler-Chrysler plants, % for the production of the model W211 (Graf, 2004)



Due to the pioneering role of the industry, it was estimated that potentials for optimizing logistics have largely been recognized and in many cases developed. The average of German vehicle producing companies has achieved a level of 72% compared to the top 10 companies.¹⁷⁰ Basic logistical strategies are generally known and implemented as well as specialized strategies only automotive logistics details. But compared to other industries automotive companies seem to perform only under average concerning areas like stock management. Frequent loss within the supply chain, labour utilization and design of warehousing do not always comply with future needs.

Automotive producers see themselves with weaknesses in the operational design of logistics processes. This might be due to the fact that the industry has increasingly become time critical. Supply chain potentials however seem to be exhausted and even logistics processes on inter firm level are almost completely integrated. Responsibilities for the different processes are defined and closely related to employers according to survey results. The interfaces between different logistics processes function almost without problems. Even the labour market within automotive logistics has been adapted to achieve flexible employment

¹⁷⁰ ibid.

and working hour programs. And last but not least the sales potential through direct selling to the customer is considered as almost exhausted.

When looking at the potential of own and external logistical services the automotive companies perform well compared to other industries. 57% of possible potentials have been realised on average in the industry.¹⁷¹ Top 10 companies have already obtained 86% of the potential. This leads to the assumption that optimizing potentials determining competitiveness are closely related to performance in logistical services.

Developments in the automotive logistics sector are also determined by trust based relations between automotive producers, suppliers and their LSPs. Common strategies and goals are well established to implement concepts like just-in-time or just-in-sequence. These concepts have also lead to a development of a strong integration of the plant structure. Following that the downtimes of production lines were minimized. Through the services of external LSPs overall costs were minimized as well. The use of express services allowed for the reduction of certain warehouse stock as well as for more flexible in-house logistics.

In the area of outsourcing logistics automotive companies expect the greatest potential compared to other industries. Concerning the make or buy decision 80% of the top 10 automotive companies look at outsourcing as an important asset for competitiveness. The industrial average of 32.3% shows also the largest expectation of growth potential in outsourcing activities compared to other industries. An increase in flexibility within in-house logistics and cost advantages are foreseen as main assets of outsourcing parts of the supply chain logistics. Four areas need to be mentioned that imply optimizing potential in the automotive sector:

- Order fulfilment: distribution and financial management for vehicle delivery to point of sale
- Logistics of the production chain: delivery of parts and modules
- In-house logistics: plant supply and related activities
- Reorganisation of locations for distribution warehouses

In the area of IT integration automotive companies and related LSPs demand high functionality and structured integration of their IT products. These demands outweigh the demands of other industries as the integration of automotive supply chains is by far the most developed.

Concerning the after-sales-market there is hardly any optimizing potential. According to statements of the main automotive companies expectations regarding speed and availability of spare parts are met in most cases.

These survey results and the focus of current automotive logistics literature lead to the conclusion that the automotive industry is at the forefront of supply chain and logistical developments.¹⁷²

In relation to the implementation of logistical services that can be offered by third party LSPs a few logistical tendencies have to be kept in mind:

¹⁷¹ *ibid.*

¹⁷² see Automotive Logistics 2006

- **Supplier parks:** OEM companies are trying to minimize logistical costs by sourcing their supplies from a supplier park close to the OEM plant.
- **Carrier companies:** Deep-sea carrier and road LSPs are developing towards full LSPs and upgrade their services to offer complex individualized logistical solutions.
- **LSP Terminals:** The operation of terminals is now often conducted by specialized LSPs.
- **Long-term contracts:** Contracts of OEM with port service providers are often written for longer periods.
- **Flexibility:** Logistical patterns are changing from traditional established to flexible.
- **Deep-sea shipping:** There is potential for more deep-sea and short-sea shipping but with a tendency to use larger ports for deep-sea shipping and to tranship.
- **Increased amounts:** Amount of finished and used vehicles shipped is increasing.
- **Consolidation:** Plants are being consolidated in many locations.

In addition to the logistical tendencies, a few spatial trends need to be considered:

- **Eastern Europe:** Demand and production capacity in Eastern Europe are rising with high rates.
- **Capacity problems:** Port capacity problems and insufficient hinterland networking put pressure on OEMs and their logistics.

These lines of development describe the current situation of the automotive industry in NSR and BSR.

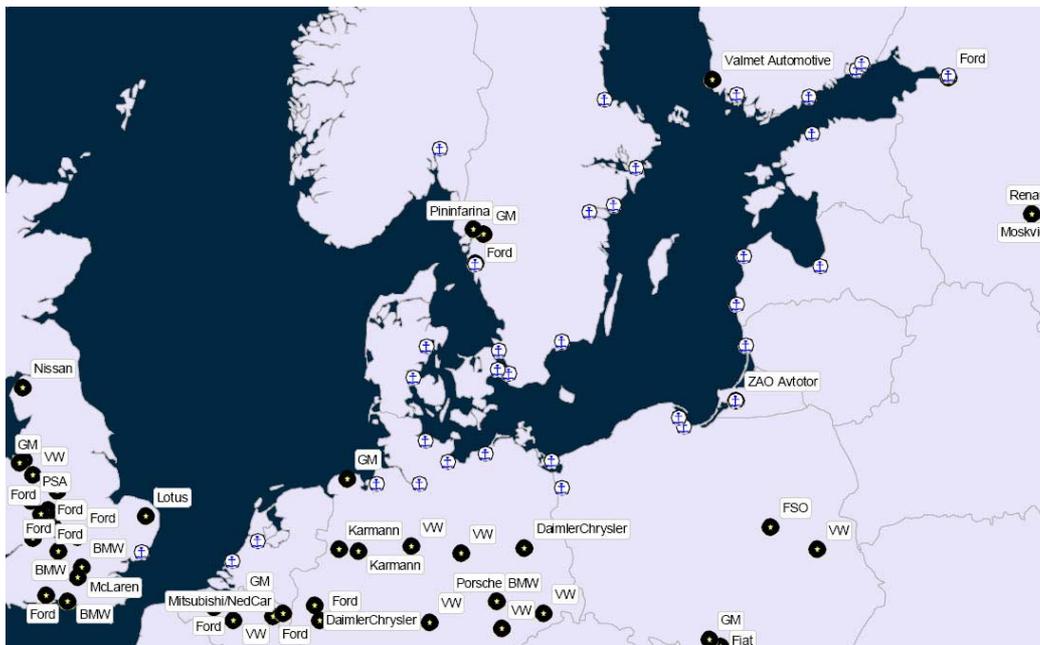
Table 7-2: Industrial Chains Analysis Automotive

Industrial Chains Analysis	
Structural features of the industrial chains	<p><i>Dimension:</i> Plants all over Europe, mainly Germany and UK; large inbound flows from Far East, outbound large amounts between the major European countries, strong growth in exports to Russia and Eastern Europe</p> <p><i>Complexity level:</i> High complexity, many suppliers, effective supply chain management essential</p> <p><i>Logistical needs:</i> Economies of scale with increasing individualization, capacity shortages of ocean carriers have to be met, vehicle specific transportation and individualization</p>
Selection criteria for the localisation of value added services	<p><i>Logistical supply:</i> Space in ports and transshipment locations, specialized transportation vehicles (RoRo, rail wagons, trucks)</p> <p><i>Area location:</i> Cargo flows via specialized ports or special distribution facilities to the destined markets</p>
	<p><i>Operators:</i> Most LSPs have a national, regional or port focus.</p>

7.2 Dimension 2 – Geographic Targets with Major Sources and Major Destinations

The cargo flows of the automotive industry can be identified by the export trade between the countries of the NSR and BSR. Major sources of cargo flows in this industry are the mentioned regions where the major OEMs are located. Map 7-2 visualizes the major plants with their respective geographical location.

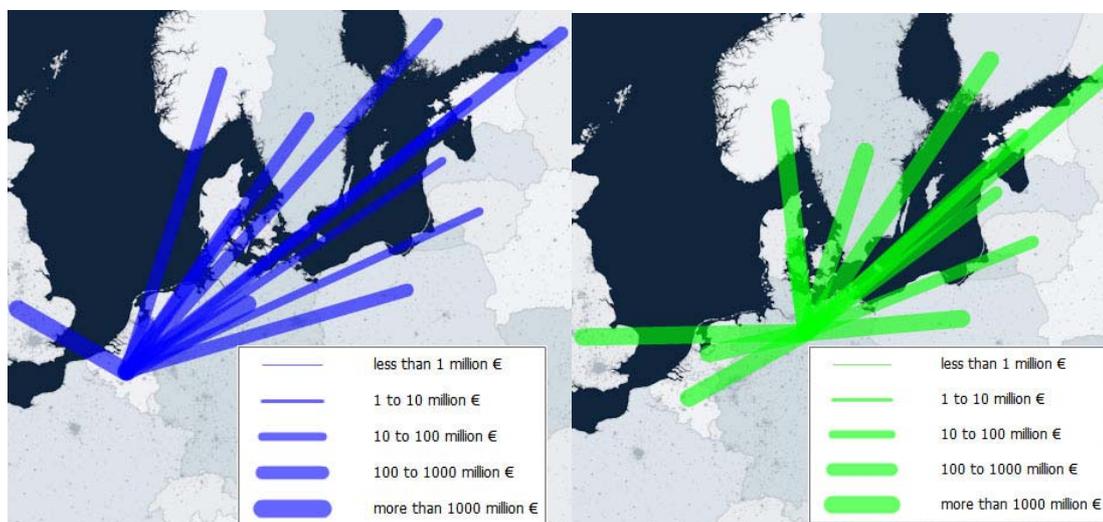
Map 7-2: OEM Production Plants



From these plants the main vehicle flows originate. However, there is no general principle where these flows are going. The shortest way is not always the cheapest way to the next port or distributing facility. And the best available LSP is not always chosen for the relations of concern.

In general, the major vehicle flows relate the plant distribution and the market demand of the respective destination country. From Germany, flow amounts are high in all directions.

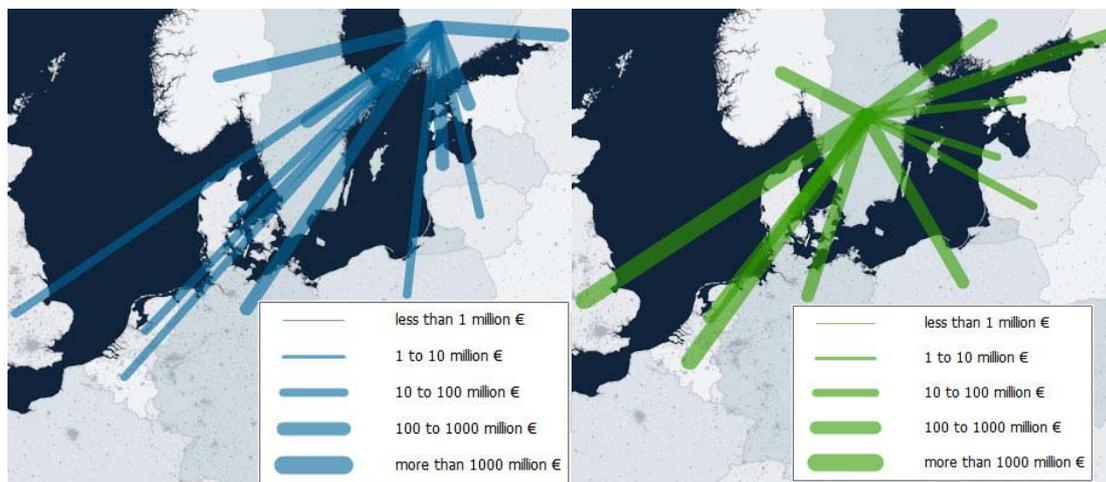
Map 7-3: Goods Flow HS2 Product Group 87 - Vehicles, Exports 2005 from Belgium (l.) and Germany (r.)¹⁷³



¹⁷³ Statistics from Eurostat 2006

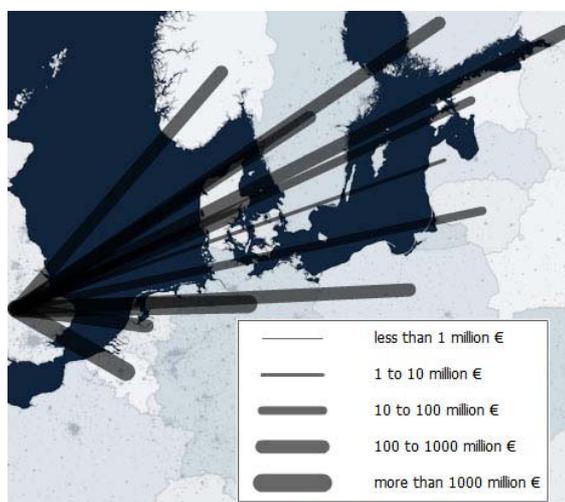
The same is true for Belgium that also functions as a hub for transshipping vehicles. Different scenarios can be found in exports of vehicles from the Scandinavian countries. Finland has only one real automotive producing company which makes only smaller amounts of export possible. Sweden with its two world class vehicles producers on the other hand has rather large exports the western European countries and smaller amounts – related to the countries' smaller markets – to the Baltic States.

Map 7-4: Goods Flow HS2 Product Group 87 - Vehicles, Exports 2005 from Finland (l.) and Sweden (r.)



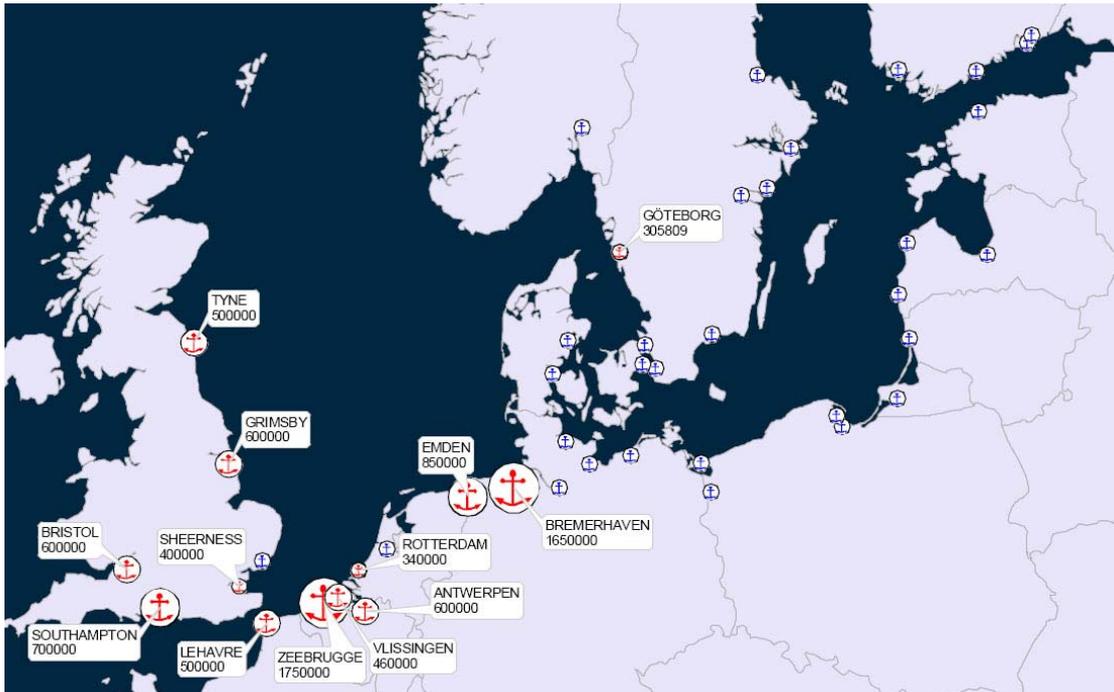
So, market demands in certain categories of vehicles also reflect differences in export structures. This can also be seen for exports from the UK where mostly cars for the UK and overseas market are produced.

Map 7-5: Goods Flow HS2 Product Group 87 - Vehicles, Exports 2005 from the UK



These vehicle flows do not always have to rely on seaborne transport. But in cases of longer distances over the North or Baltic Sea they do. Therefore, a few ports have established related facilities and have focused on the turnover of finished and used vehicles. These are shown in Map 7-6.

Map 7-6: Major Shipping Ports, Size of Port Symbol = Vehicle Turnover 2005 (Coia 2006b)



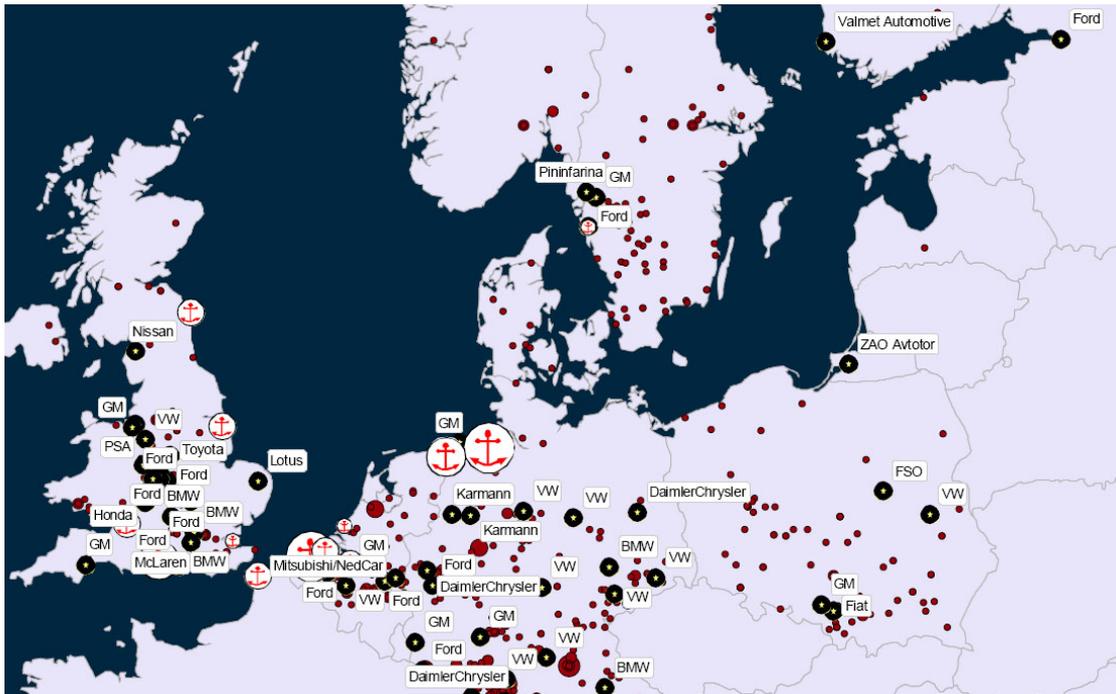
This structure shows the largest vehicle handling ports in the NSR where deep sea RoRo vessels arrive with cargo from overseas, largely from the Far East. The following table shows the largest vehicle handling ports in Europe in figures.

Table 7-3: Major vehicle handling ports in northern Europe 2005 (Port Authorities 2006)

Port	Vehicles
ZEEBRUGGE	1750000
BREMERHAVEN	1650000
TALLINN	939000
EMDEN	850000
SOUTHAMPTON	700000
BRISTOL	600000
ANTWERPEN	600000
GRIMSBY	600000
TYNE	500000
LE HAVRE	500000
VLISSINGEN	460000
SHEERNESS	400000
ROTTERDAM	340000
GÖTEBORG	313667
MALMÖ	261496

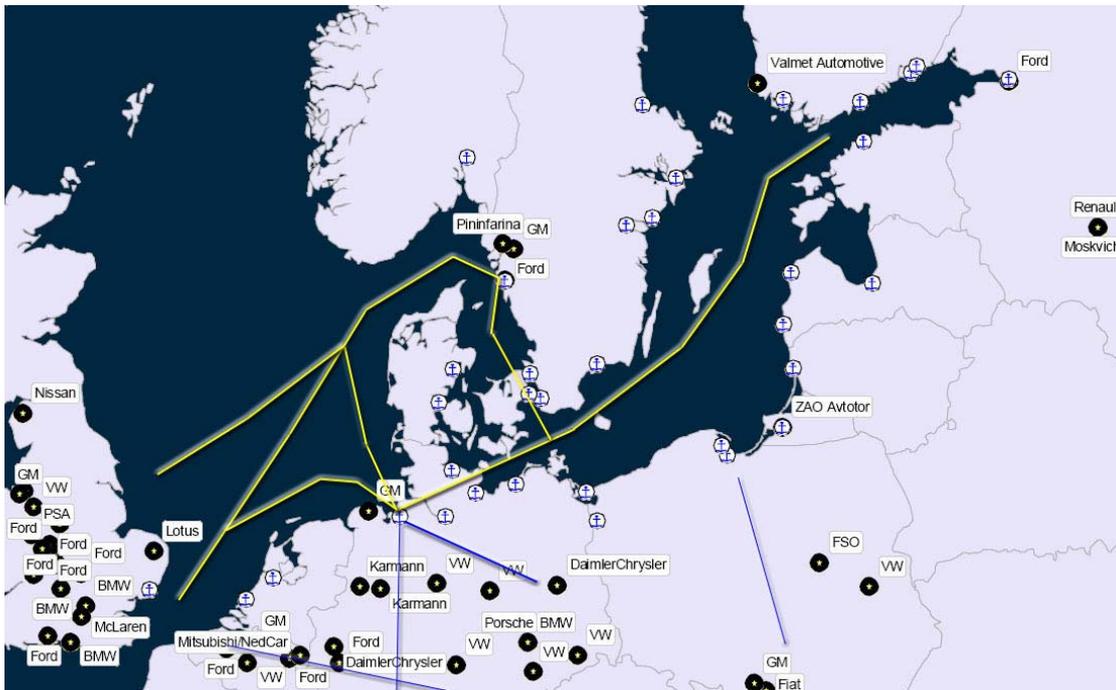
Putting the major OEM plants their suppliers and the major vehicle handling ports in relation, a structure of the major locations of the northern European automotive industry becomes obvious (see Map 7-7).

Map 7-7: Major Vehicle Plants, Shipping Ports (Size = Turnover 2005) and Supplying Companies (Size = Turnover in Euro 2004) (Coia 2006b, Bureau van Dyke 2006)



From this, major transport routes can be derived as shown in Map 7-8.

Map 7-8: Major Transport Routes for Finished Vehicles

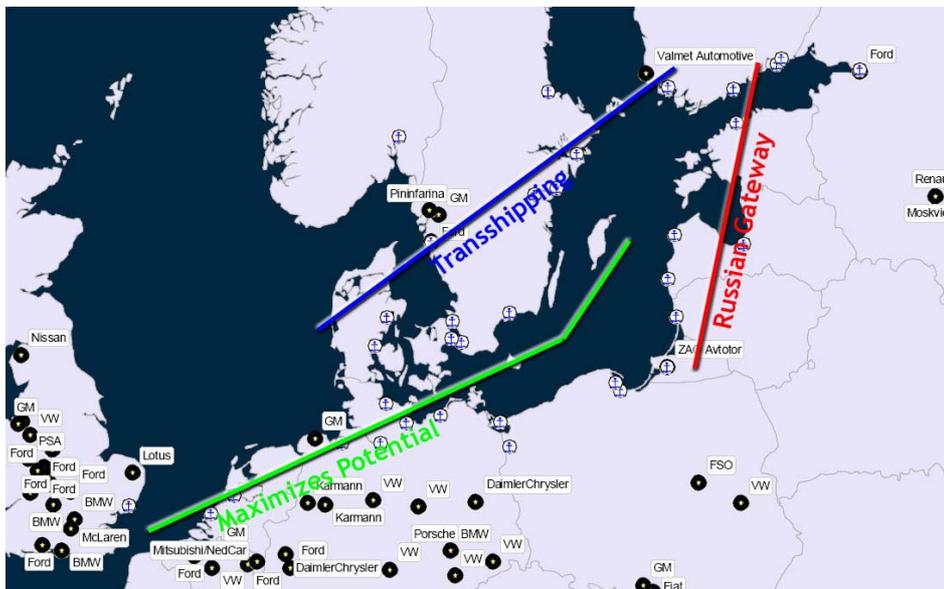


When looking at the current tendencies in logistics and the automotive industry as well as regional market demands, three challenges can be identified for automotive logistics:

1. **Russian Gateway:** The Russian market absorbs in growing number large quantities of new and used vehicles and at the same time is struggling with port and infrastructure capacities. On the one hand, the ports around the Saint Petersburg area are being extended. On the other hand, it will be crucial how the transshipment of vehicles can be handled via the Baltic States or if it is not feasible at all.

2. **Transshipping:** The transshipping of vehicles will become a major concern as deep sea vessels will increasingly call only at large ports. Depending on the mentioned port capacities, transshipping is also needed to handle the growing quantities of cars.
3. **Maximizing Potential:** This includes not only the extension of capacities but also the provision of related services to offer complete logistical processes to the OEM customers.

Map 7-9: Major Challenges for Vehicle Shipping Ports



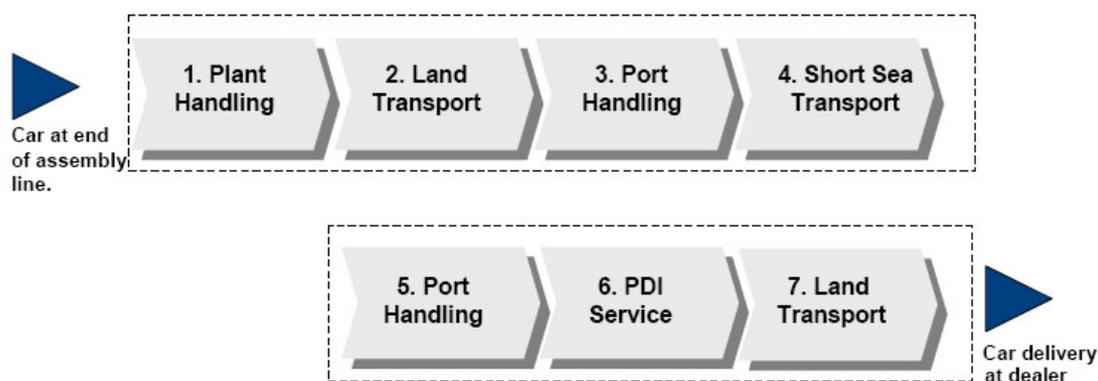
7.3 Dimension 3 – Possible “Value Added Services” for Port Areas

There are three main logistical areas within the automobile industry that can be dealt with differently in the provision of VAS:

- Supply Logistics
- Finished Vehicle Logistics
- Spare Parts Logistics

The question needs to be asked what provides potential for added value within the three major logistical areas and what these value added processes are. Most value addition will be done in the area of finished vehicles. Figure 7-3 shows a general outbound flow for this area.

Figure 7-3: Outbound flow of finished vehicles (Wallenius Wilhelmsen 2002)



Services will most often be offered to the end of the production process and towards the final delivery of the vehicle. For vessel transport this means that pre delivery inspection is only feasible after the unloading in the destination region. But this is no general rule because services can also include for instance the supply of certain products and services to the production line at the OEM plant.

Finished Vehicle Logistics companies offer to their clients a wide range of flexible and continually changing services tailored to the needs of each Client. VAS for clients from the automobile sector include:

- quality control and damage inspection at the end of the production line
- storage in special compounds
- workshop activities:
 - pre-delivery inspection (PDI)
 - de-waxing
 - body and paint repair
 - customising incl. adjustments to national standards (i.e. daytime driving lights for Sweden)
 - refurbishing (former leasing and rental cars)
- other services (i.e. customs clearance, fiscal representation, ...)
- used cars handling (increasingly more services on the basis of the same resources are provided for works on used cars, and specifically young cars which pour into the market after their respective rental and lease period)

7.4 Dimension 4 – Major Shippers

The companies and product groups in the automotive industry are statistically divided into the following NACE and HS2 categories:

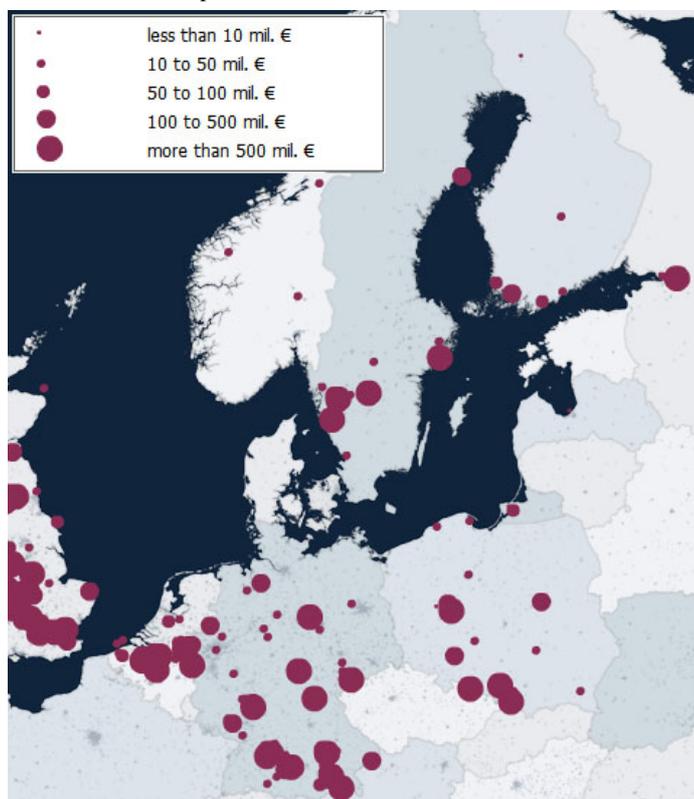
NACE: Manufacture of motor vehicles, trailers and semi-trailers (3400), Manufacture of motor vehicles (3410), Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers (3420), Manufacture of parts and accessories for motor vehicles and their engines (3430), Sale of motor vehicles (5010), Maintenance and repair of motor vehicles (5020), Sale of motor vehicle parts and accessories (5030)

HS: Vehicles other than Railway or Tramway Rolling-Stock, and Parts and Accessories thereof (87)

The major vehicle producing companies are also the largest shippers of vehicles in the northern European region.

Map 7-10 shows the major OEM in northern Europe:

Map 7-10: NACE 3410 - Motor Vehicles, Major Companies, Turnover 2004



Company	Country	City	Turnover million €
BMW AG	DE	MUNICH	180380
DAF TRUCKS N.V.	NL	EINDHOVEN	175000
MANITEX	DE	WOLFSBURG	170000
DAF TRUCKS N.V.	NL	EINDHOVEN	16255
MANITEX	DE	WOLFSBURG	14800
DAF TRUCKS N.V.	NL	EINDHOVEN	12825
MANITEX	DE	WOLFSBURG	10255
DAF TRUCKS N.V.	NL	EINDHOVEN	7497
MANITEX	DE	WOLFSBURG	5300
DAF TRUCKS N.V.	NL	EINDHOVEN	5885
MANITEX	DE	WOLFSBURG	5402
DAF TRUCKS N.V.	NL	EINDHOVEN	5350
MANITEX	DE	WOLFSBURG	5328
DAF TRUCKS N.V.	NL	EINDHOVEN	4662
MANITEX	DE	WOLFSBURG	3338
DAF TRUCKS N.V.	NL	EINDHOVEN	37500
MANITEX	DE	WOLFSBURG	3025
DAF TRUCKS N.V.	NL	EINDHOVEN	33500
MANITEX	DE	WOLFSBURG	2958
DAF TRUCKS N.V.	NL	EINDHOVEN	3338
MANITEX	DE	WOLFSBURG	2881
DAF TRUCKS N.V.	NL	EINDHOVEN	3025
MANITEX	DE	WOLFSBURG	2940
DAF TRUCKS N.V.	NL	EINDHOVEN	2651
MANITEX	DE	WOLFSBURG	2881
DAF TRUCKS N.V.	NL	EINDHOVEN	2746
MANITEX	DE	WOLFSBURG	2651

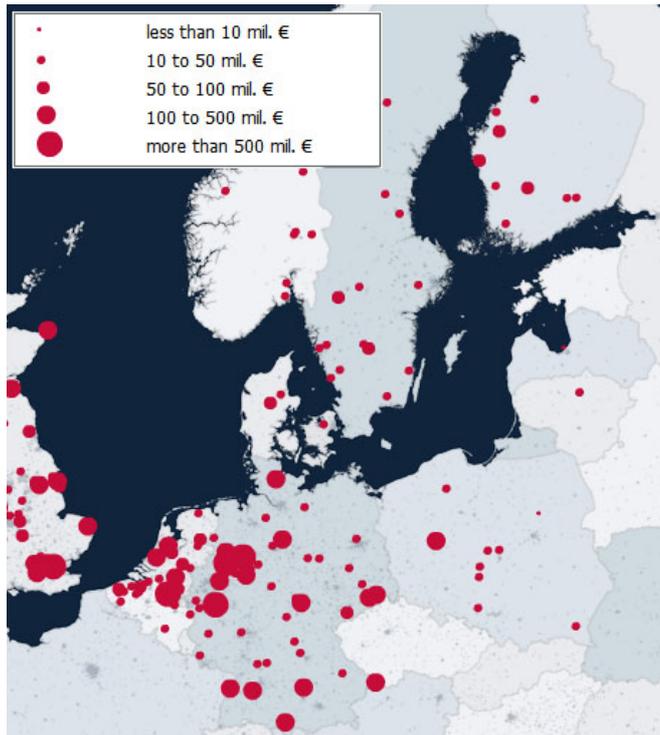
Besides these some other shippers need to be considered. In the area of finished vehicles, cars from the Far East play an important role on the European market. Some of the OEMs from Japan are already producing in Europe as seen in the previous table. But large amounts are shipped via deep sea vessels to the main vehicle transshipment ports of Europe (i.e. Bremerhaven, Zeebrugge, etc.). The most important OEMs are Hyundai, Mitsubishi, Mazda, Suzuki and Kia.¹⁷⁴

Another category of this industry is the production of complex bodies and trailers. The major companies in this area are:

¹⁷⁴ BLG 2006a

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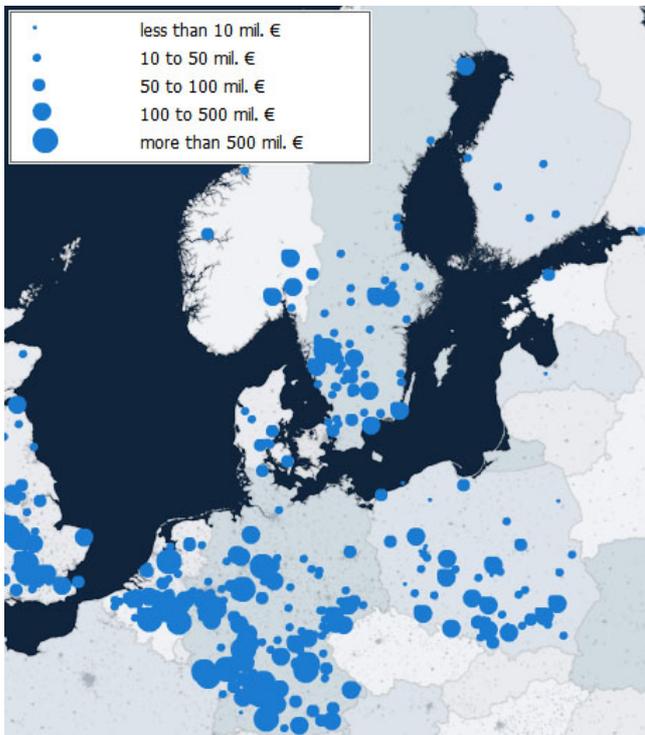
Map 7-11: NACE 3420 - Bodies (Coachwork) for Motor Vehicles, Trailers and Semi-Trailers, Major Companies, Turnover 2004



Company	Country	City	Turnover million €
WILHELM KARMANN GMBH	DE	OSNABRUECK	2781
SCHMITZ CARGOBULL AG	DE	HORSTMAR	1274
THE MAYFLOWER CORPORATION PLC	UK	LONDON	958
DAF TRUCKS VLAANDEREN	BE	OEVEL	906
HBPO GMBH	DE	LIPPSTADT	444
BALLYVESEY HOLDINGS LTD.	UK	DONCASTER	371
JOHNSON CONTROLS OBJEKT BOCHUM GMBH & CO. KG	DE	BOCHUM	355
MAN STAR TRUCKS & BUSES SP. Z O.O.	PL	TARNOWO PODGORNE	265
KNAUS TABBERT GROUP GMBH	DE	JANDELSBRUNN	263
SWINDON PRESSINGS LTD.	UK	BRACKNELL	255
BURG INDUSTRIES B.V.	NE	PIJNACKER	247
BUHOLD B.V.	NE	PIJNACKER	247
BÜRSTNER GMBH	DE	KEHL	245
KARMANN RHEINE GMBH & CO. KG	DE	RHEINE	240
HOBBY WOHNWAGENWERK ING. HARALD STRIEWSKI GMBH	De	FOCKBEK	235
LOTUS GROUP INTERNATIONAL LTD.	UK	NORWICH	235

The supply of parts is the third large category of the industry. It includes the following major companies:

Map 7-12: NACE 3430 - Parts and Accessories for Motor Vehicles and their Engines, Major Companies, Turnover 2004



Company	Country	City	Turnover million €
ROBERT BOSCH GMBH	DE	GERLINGEN	42392
CONTI TEMIC MICROELECTRONIC GMBH	DE	NUERNBERG	13837
AUTOMOTIVE HOLDINGS (UK) LTD.	UK	SOLIHULL	3763
HELLA KGAA HUECK & CO.	DE	LIPPSTADT	3301
BEHR GMBH & CO. KG	DE	STUTTGART	3123
DENSO INTERNATIONAL EUROPE B.V.	NE	WEESP	2761
HERMANN HAGENMEYER GMBH & CIE KG	DE	UNTERGRUPPENBACH	2431
BROSE FAHRZEUGTEILE GMBH & CO. KG	DE	SAARWELLINGEN	2200
ZF-GETRIEBE GMBH	DE	SAARBRUCKEN	1917
UNIPART GROUP LTD.	UK	OXFORD	1614
WEBASTO AG	DE	STOCKDORF	1507
MANN + HUMMEL GMBH	DE	LUDWIGSBURG	1412
FAURECIA AUTOSITZE GMBH & CO. KG	DE	STADTHAGEN	1269
GM POWERTRAIN - GERMANY GMBH	DE	RUESSELSHEIM	1000
LEAR CORPORATION SWEDEN AB	SE	TROLLHAETTAN	890
AW EUROPE	BE	BRAINE-L'ALLEUD	846
EBERSPÄCHER GMBH & CO. KG	DE	NEUNKIRCHEN	815
CONTINENTAL BENELUX	BE	HERSTAL	741
OPEL POWERTRAIN GMBH	DE	KAISERSLAUTERN	635
VISTEON UK LTD.	UK	BASILDON	541
KEIPER GMBH & CO. KG	DE	KAISERSLAUTERN	517

Ford

The Ford Motor Company had difficulty expanding their exports to the Baltic Sea Region and Russia while staying at their major port, Cuxhaven, for the plants in Belgium and Germany. Furthermore because of shorter transit times and a competitive pricing, transports were switched from Cuxhaven to Vlissingen. From there the finished vehicles are shipped to the port of Södertälje that functions as a transshipment hub for the area and Russia (see Map 7-13).

Map 7-13: Major Shipping Routes for Finished Vehicles by Ford (Automotive Logistics 2006)



In addition to the shipments to the Russian market, Ford is also manufacturing vehicles in its plant in the Saint Petersburg area. Due to increasing demands, the output of the plant will grow by 100% up to 150,000 units per year because of the production of the "Focus" model which starts this year. But two fundamental problems are arising. On the one hand, there is not enough expertise in the region to supply the necessary growth in employment. Much more difficult on the other hand, is however the marginal capacity of the port of Saint Petersburg which could jeopardize the supply of parts. A solution could be the opening of the neighbouring container terminal at Ust-Luga for Ford.¹⁷⁵

BMW

BMW traditionally exports their finished vehicles that are destined for the long distance by rail via the port of Zeebrugge. In figures, 60 to 75% of finished vehicles are transported by rail to port. But this connection is currently undergoing capacity shortages due to a lack of efficient infrastructure. Only insufficient rail connectivity can be provided for BMW through the infrastructure in and close to the port of Zeebrugge. So exceeding traffic needs to be routed to other ports or by road. This suggests the importance of sufficient infrastructure for the growing amount of transported vehicles in the ports that are used for export to growth markets like Russia. It should be noted that all ports in the southern Baltic Sea Region that provide frequent connections to Russia and transshipment hubs in Finland are experiencing capacity shortages, not only in rail infrastructure but also in terms of storage space.

¹⁷⁵ <http://wunschauto24.com/news/auto-news.php?action=view&newsid=14091> (18.12.2006)

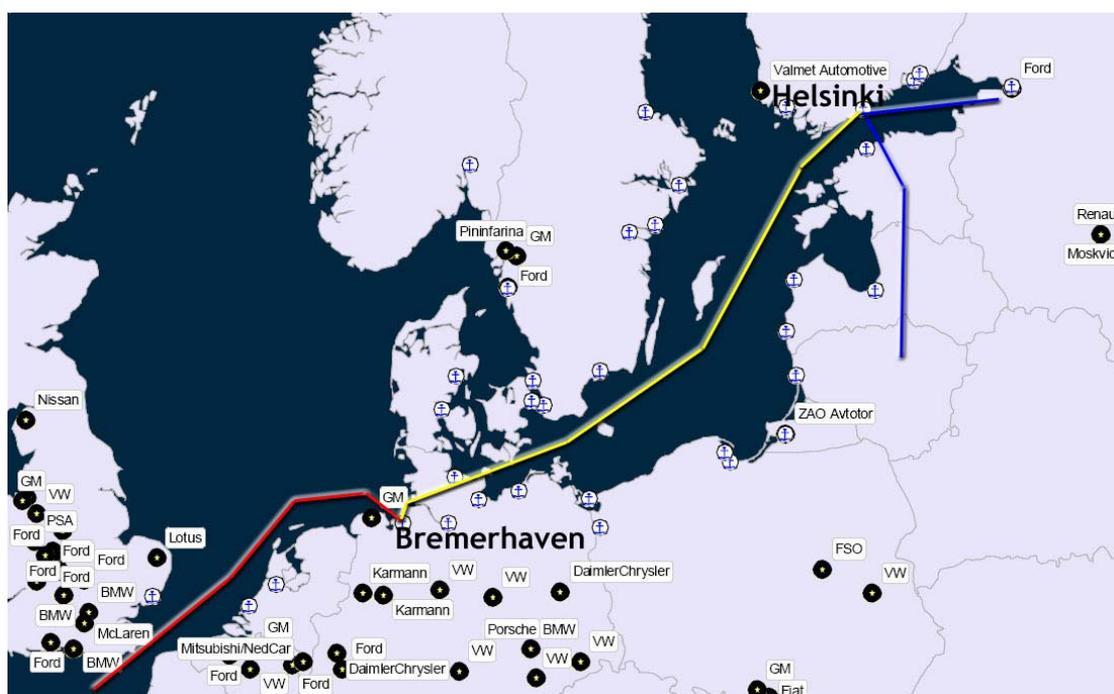
Mazda

The case of Mazda provides a vivid example on how modes of transport can have completely different monetary effects on differing connections. Mazda has decided to transport its finished vehicles from the plant in the Milan area by rail to Rotterdam rather than to Gioia Tauro. This relation was cheaper than Milan to Gioia Tauro and provided a much more efficient and competitive hinterland connection than elsewhere. So not only the appropriate infrastructure is necessary but also its competitiveness in comparison to other connections.

Suzuki and Hyundai

As is the case for many OEM companies from the Far East, deep sea transport is carried out to calls in one of few ports in the south of the North Sea Region. Suzuki and Hyundai have chosen the port of Bremerhaven as their transshipment hub for Europe. From there finished vehicles are distributed to mainland Europe by rail and road while others are carried by feeder vessels into the Baltic Sea Region. Further transshipment is carried out at Helsinki where the cars are collected for further distribution to Russia the Baltic States and Finland (see Map 7-14).

Map 7-14: Major Shipping Routes for Finished Vehicles by Suzuki and Hyundai (Automotive Logistics 2006)



Saab

The Saab logistics network includes 618 suppliers from 30 countries of which the most are supplying the plants in Trollhättan and Nyköping (both Sweden) from Germany and Sweden. Other parts for the assembly are supplied from companies from Spain, France and the UK.

As the production of cars has become a complex process, there is a tendency to supply the final production line just-in-time with complete modules of parts. This is also the case with Saab that supplies for instance the whole engine from its plant in Södertälje to the final assembly line, the seats from Lear at Trollhättan, its bumpers from Plastal at Uddevalla and Simrishamn.

While all supply is geared towards the final assembly at the Trollhättan plant, the after-sales market is managed by the spare parts distribution centre in Nyköping

Volvo

Volvo is the largest industrial company in Sweden and started its business as a car manufacturer in 1927. Today it is a diversified enterprise within the transportation manufacturing industry. The Volvo Group has evolved into several different business areas that also include trucks, buses, construction equipment, marine and industrial engine manufacturing, civilian and military aviation engine equipment and financial services.

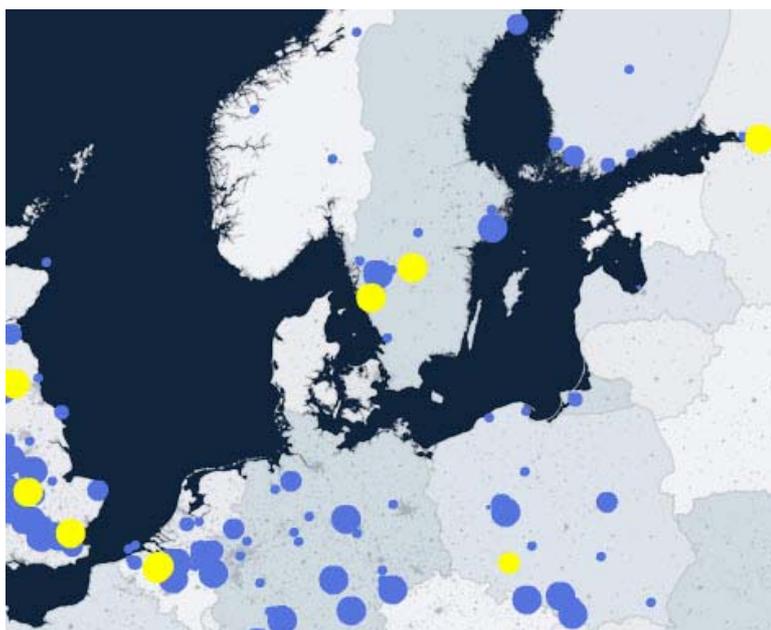
Volvo Logistics is the outsourced LSP of the Volvo Company that handles mainly all of Volvo's logistical needs. In this regard there are close connections between the individual plants of the company. As Volvo has become part of the Ford Motor Company, Volvo Logistics is currently also taking over many of the logistical processes from other Ford plants.

Table 7-4: Ford Motor Company - Largest Plants 2004 (Bureau van Dyke 2006)

Company	Country	City	Employees	Turnover million €	Subsidiaries
FORD - WERKE GMBH	DE	KOELN	30902	14634	9
VOLVO PERSONVAGNAR AB	SE	GOETEBORG	18141	12876	25
FORD MOTOR COMPANY LTD.	UK	BRENTWOOD	13400	10208	16
VOLVO LASTVAGNAR AB	SE	GOETEBORG	6685	5494	27
LAND ROVER	UK	WARWICK	10708	4662	3
VOLVO CARS	BE	GENT	4344	3025	1
JAGUAR CARS LTD.	UK	COVENTRY	9618	2651	9
VOLVO EUROPA TRUCK	BE	OOSTAKKER	2444	1787	1
VOLVO POWERTRAIN AB	SE	SKOEVD	5187	1687	
VOLVO BUSSAR AB	SE	GOETEBORG	847	893	12
FORD MOTORS KAMPANI	RU	SAINT PETERSBURG		643	
VOLVO POLSKA SP.Z O.O.	PL	WROCLAW	1600	362	2
VOLVO TRUCK AND BUS LTD.	UK	WARWICK	302	93	11

Looking at the main transport routes, Volvo uses Gothenburg as its main shipping port. First, it functions as an export port for vehicles manufactured at the Gothenburg plant. Second it is also used as a transshipment port for cars from the Gent plant in Belgium which are going to Russia via the port of Kotka in Finland. Volvo Logistics then uses DFDS Tor Line or Finnlines as the shipping line provider. In 2006, about 6,000 vehicles were transported to Russia via this route.

Map 7-15: NACE 3410 - Major Vehicle Manufacturing Companies, Ford Motor Company Plants (yellow), Cologne Plant missing (NACE 3420) (Bureau van Dyke 2006)



7.5 Dimension 5 – Major Logistical Providers

On the LSP market two different lines of development can be observed. On the one hand, general LSPs are targeting individual industries with specific solutions and so extending their possibilities to specialized markets. On the other hand, there are a few LSPs which are concentrating on their core competency which is handling and servicing of vehicles. The following table provides an overview of the major LSPs according to turnover. In the field profile the differentiation is apparent.

Table 7-5: Major LSPs with a business focus on vehicle logistics with turnover more than 100 million € in 2004

Company	Location	Turnover EU million €2004	Profile
TNT	AMSTERDAM	8777	Mail and express services; TNT Logistics focuses on logistical solutions (e.g. automotive, consumer goods, high-tech, publishing)
Exel (DHL)	BRACKNELL	8776	Largest European contract logistics provider; electronics, consumer goods, chemicals, health care industry and retail; part of DHL since 2005
Schenker (Deutsche Bahn)	KELSTERBACH	8024	Leading provider of network-based and integrated logistics on the German market; landside transport for break bulk, sea/air freight, logistical services
Kuehne + Nagel	HAMBURG	7508	Inter. logistics company, sea/air freight, contract logistics
DHL Logistics (Deutsche Post)	BONN	6786	DHL Solutions: industrial and consumer goods contract logistics; DHL DANZAS AIR and OCEAN: intern. shipping agency; Main customers: automotive, pharmacy/health care, electronics/IT consumer goods, textiles
Panalpina	BASEL	3965	Intern. shipping agency; sea/air freight with contract logistics
Gefco	COURBEVOIE CEDEX	3894	Subsidiary of PSA PEUGEOT CITROEN; automotive, cosmetics, high-tech and other consumer goods
Geodis (SNCF)	CLICHY	3371	Integrated logistical services
Wincanton	WINCANTON	2512	Contract logistics for the consumer goods industry; Other industries: food retail, automotive, other retail
Hellmann	OSNABRUECK	2120	Traditional shipping agency services with road, sea/air freight, messenger services, warehousing, special services
Thiel Logistik	GREVENMACHER	1726	Company group; complete logistics service solutions in all main logistical markets; business areas: fashion and lifestyle, furniture, automotive, food, media, air/ocean, regional logistics
Volkswagen Transport	WOLFSBURG	1682	Logistics for the automotive industry and their suppliers; transport and logistics management for VOLKSWAGEN and their subsidiaries

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Ziegler Group	BRUSSEL	1570	Contract logistics, textiles; intern. sea, air and road transport
CAT Group	BOULOGNE BILLANCOURT	1209	Vehicle Logistics
Salvesen	NORTHAMPTON	1172	Temperature related food logistics, consumer goods contract logistics, transport of textiles
Frans Maas Group	VENLO	1091	Intern. road transports, contract logistics; automotive, packaged chemical goods, high-tech
Chep Europe	ADDLESTONE	1086	Renting of pallets and other packaging materials; add. services in the areas of warehousing, chemical containers, reusable plastics containers; industries: automotive, beverages, food, packaging, petrochemicals
Autologic	LONDON	982	Vehicle Logistics
Rhenus Logistics NV	HOLZWICKEDE	982	Inland water way transport; contract logistics for industrial goods, consumer goods, automotive, chemicals, health care, office/road activities; port logistics: sea/inland port, shipping, intermodal, rail, recycling
Willi Betz	REUTLINGEN	900	Vehicle Logistics
Imperial Logistics	DUISBURG	870	Supply, distribution, production logistics, automotive logistics; IMPERIAL REEDEREI: large inland water way shipping company; J.H. BACHMANN: Intern. shipping agency and LSP, sea/air freight; PANOPA: logistical solutions, VAS, JIS for automotive
Arvato Logistics	GUETERSLOH	770	Contract logistics for consumer goods with customers from finance, telecommunications, It, media, pharmacy and automotive
IHG Logistics	HILDEN	710	Break bulk shipping agency, distribution, automotive, textile, electronics, machinery, consumer goods, chemie/pharmacy, retail, road and rail, overseas services, logistical services
Gebr. Weiss	LAUTERACH	708	Road and air transports, full load transport and industrial contract logistics
Green Cargo	SOLNA	660	Freight subsidiary of the Swedish rail; rail related transport (bulk goods); main customers: wood, steel, chemicals and automotive industry, retail; 80% of Swedish rail cargo
Gruppo Arcese	ARCO	650	Road transports; automotive logistics (e.g. for FIAT, FORD); truck transports
BLG	BREMEN	582	BLG LOGISTICS AUTOMOBILE: 26 locations, network with EH Harms, centre in Bremerhaven; BLG LOGISTICS CONTRACT: customers are e.g. TCHIBO, IKEA, BOSCH; BLG LOGISTICS CONTAINER: holds investment share in EUROGATE
Anker Leschaco	BREMEN	560	Sea and air freight in the areas of aircraft, automotive, bulk, chemicals/pharmaceuticals, project logistics, warehousing
Horst Mosolf GmbH and Co KG	KIRCHHEIM	380	Vehicle Logistics
Ewals Cargo Care	TEGELEN	380	Break bulk transport with own large truck fleet; customers: automotive, electronics, retail
FM Logistic	PHALSBOURG	330	Integrated logistical solutions for consumer goods industry; customers: food producers (e.g. KRAFT FOODS, LORENZ, UNILEVER, MASTERFOODS), supermarket chains, high-tech OEM
D.Logistics	HOFHEIM	312	Holding company; customer and project specific logistical and logistics related services at the customers location, consumer and industry packaging, warehousing (automotive, chemicals, electronics, health care, consumer goods, air freight, machinery)
STVA	PARIS	310	Vehicle Logistics
ATG (Deutsche Bahn with Schenker)	ESCHBORN	293	European vehicle transports on rail incl. logistics, integration into SCHENKER-Automotive
premium logistics (Wincanton)	LA VERPILLIERE	270	Transport services and contract logistics for automotive, consumer goods, high-tech and pharmacy industry as well as retail; part of WINCANTON since 2006
KIESERLING	BREMEN	259	Transport, supply and distribution logistics, special experience with beverages, automotive and security warehousing
Suedkraft (Thiel)	MUENCHEN	180	Subsidiary of THIEL; nat./ europ. consolidated cargo, bin container, tank truck, dump truck, bimodal traffic, warehousing, JIT, inland water way transport, port turnover; automotive, beverages, chemicals, building materials
Thiel Automotive	ASCHAFFENBURG	180	Industry specific solutions for automotive
E.H. Harms & Co KG Automobile-Logistics	BREMEN	173	Vehicle Logistics
Panopa (Imperial)	DUISBURG	125	Subsidiary of the IMPERIAL GROUP, consulting and planning services, warehousing, JIT, JIS, in plant transport, picking and packing, assembly, fleet management, automotive, steel, spare parts logistics
Anterist + Schneider (Deutsche Bahn with Schenker)	SAARBRUECKEN	106	National/international landside transport, beverages, furniture, relocation, automotive contract logistics (e.g. Ford Motor Company, Cologne)
COTRANS (Cooperation)	WOLFSBURG	104	Cooperation company, contract logistics for automotive (e.g. VOLKSWAGEN), food and retail

The geographical operation focus depends. Some are just working for the national market, some are international LSPs, and a few are just stationary terminal operators like the BLG in Bremen. Some are also trying to incorporate the terminal operation into their portfolio of special logistical solutions. This is also the case for the RoRo vessel operators that largely ship cars. The following table shows the major companies operating in the NSR and BSR.

Table 7-6: Major deep sea vehicle shipping companies operating in northern Europe

Company	Location	Web	Turnover EU in million € 2004
Wallenius Wilhelmsen	LYSAKER	www.2wglobal.com	1613
Grimaldi	NAPOLI	www.grimaldi.napoli.it	1350
NYK Line Europe	LONDON	www.nykline.com	631
UECC	LYSAKER	www.uecc.com	

7.6 Automotive Logistics as an Investment Target

As logistics play an important role in the supply and distribution chain of automotive OEM and the automotive industry supplies a currently growing market, automotive logistics in port areas provide substantial potential for opportunities implementing additional logistical services. However, certain questions need to be raised before setting up any kind of service:

- Does the port fit into the supply/distribution chain? How does the spatial location of the port relate to the plant locations or supplier plants?
- Is the pricing of the used relations competitive? Do the relations of locations provide for competitive pricing? And do additional services by private companies and/or by the port authority lead to a competitive advantage for the port area compared to other port areas?

In general several findings need to be considered that frequently determine the debate about automotive logistics in the industry.

- Port must be close to plant or provide efficient hinterland connection. Ports are seen to provide for the last.
- Ports that can transfer vehicles to and from feeder vessels, barge and rail will be most successful.
- Vehicle handling in ports is driven through the commitment of one OEM.
- Space availability and appropriate berths are competitive assets.
- Provision of PDI (and other value added services) depends only on efficiency, space, costs and knowledge about handling vehicles.

For the whole world another problem is currently arising. Due to increasing demands and absorbing capacities of new and used cars from growing economies like Russia and China, ocean carrier companies also have to deal with increasing capacity shortages. On the one hand capacity shortages could be dealt with by incorporating new industrial areas for vehicle handling into port areas. However, this is extremely limited in most ports. On the other hand, port areas also need to handle the increasing turnover in containers and bulk.

8 Logistics of Furniture

8.1 Dimension 1 – Industry Analysis

The EU furniture industry accounts for about half of the world's furniture production with a production value of €82 billion. As a labour-intensive industry it provides employment for around one million people in the EU. Material and service costs make up more than 60% of the production value. The value added represents around 40% of the production, with labour costs accounting for about 78%. The furniture sector is a basic industry, representing in general between 2 and 4% of the production value of the manufacturing sector. And it is an assembling industry, which employs various raw materials to manufacture its products. They range from wooden boards to metal through leather and glass.

The furniture industry in the EU accounts for 8,800 enterprises with over 20 employees, employing 600,000 people, and more than 80,000 enterprises with under 20 employees (employing almost 300,000 people).

Germany is the largest furniture producing country, representing over 27% of total EU production, followed by Italy (21.6%), France (13.5%) and the UK (10.4%).

Upholstered furniture and kitchen furniture are the largest industry sectors representing 14.5% and 13% respectively. Three other significant sub-sectors are office furniture (11.7% of total production), dining room furniture (11.5%) and bedroom furniture (10.3%).¹⁷⁶

Table 8-1: Industrial Chains Analysis Furniture

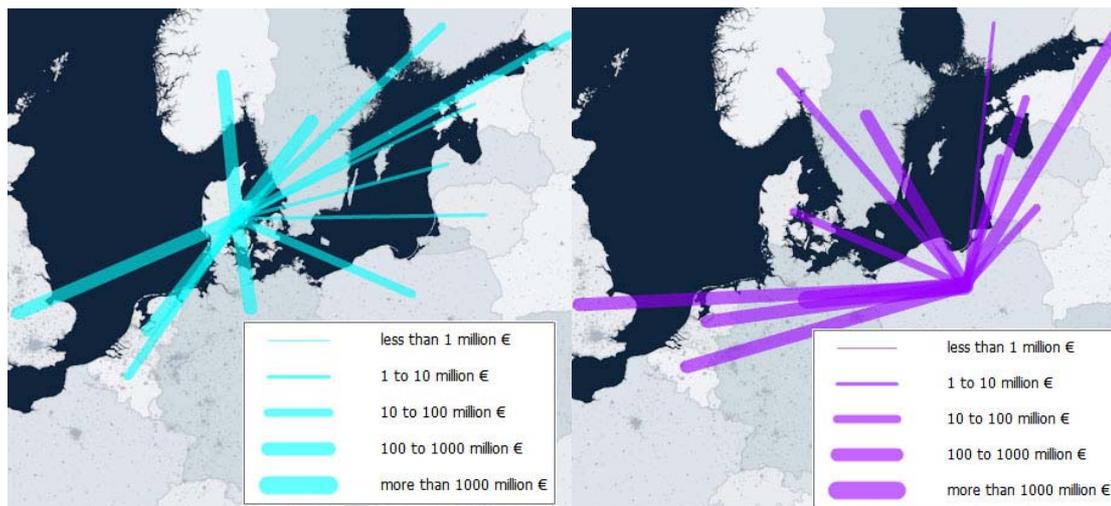
Industrial Chains Analysis	
Structural features of the industrial chains	<p><i>Dimension:</i> to and from Germany the most cargo; Scandinavia second most important centre, growing importance of Poland</p> <p><i>Complexity level:</i> resource based industry; close relations between resource provider and manufacturer; rather few supplier but many different rather small manufacturers</p> <p><i>Logistical needs:</i> high cost concern for supply of parts, resources and distribution of finished products; not as time critical</p>
Selection criteria for the localisation of value added services	<p><i>Logistical supply:</i> cost competitiveness, appropriate packaging</p> <p><i>Area location:</i> efficient distribution becomes increasingly important; production moves towards Eastern Europe.</p>
	<p><i>Operators:</i> specialized furniture LSPs are generally related to several furniture companies by contracts</p>

¹⁷⁶ http://ec.europa.eu/enterprise/furniture/index_en.htm

8.2 Dimension 2 – Geographic Targets with Major Sources and Major Destinations

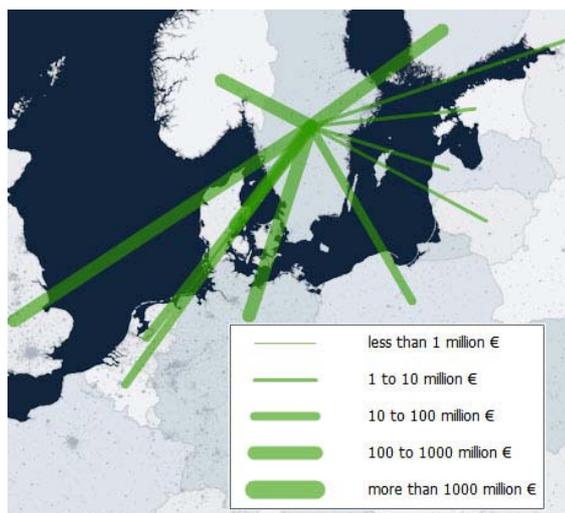
Furniture traditionally serves a regional market. Only some larger companies like IKEA are distributing their products over several countries. However, in times of increasing cost competition, production costs are of major concern for the companies. So, many of products sold in western European countries arrive from low-wage countries. Growing number of products are being produced in Poland and the Far East, especially China. Poland has even outgrown the formerly leading country Denmark in terms of exported furniture.

Map 8-1: Goods Flow HS2 Product Group 94 - Furniture, Exports 2005 from Denmark (l.) and Poland (r.)



Many furniture products are also coming from Sweden while not all that actually sells as an IKEA product comes from Sweden. Most of it is produced somewhere else, for instance in Poland by small manufacturing companies.

Map 8-2: Goods Flow HS2 Product Group 94 - Furniture, Exports 2005 from Sweden



8.3 Dimension 3 – Possible “Value Added Services” for Port Areas

The furniture industry provides only a few possibilities with potential for offering VAS as a LSP. The production process of even the largest furniture product is small compared to the automotive or electronics industry. Even finishing touches through some sort of delivery service are almost always done by the manufacturer itself.

Nevertheless, general accompanying tasks can be offered like:

- quality control and damage inspection
- packaging and labelling
- customs clearance
- exhibition

8.4 Dimension 4 – Major Shippers

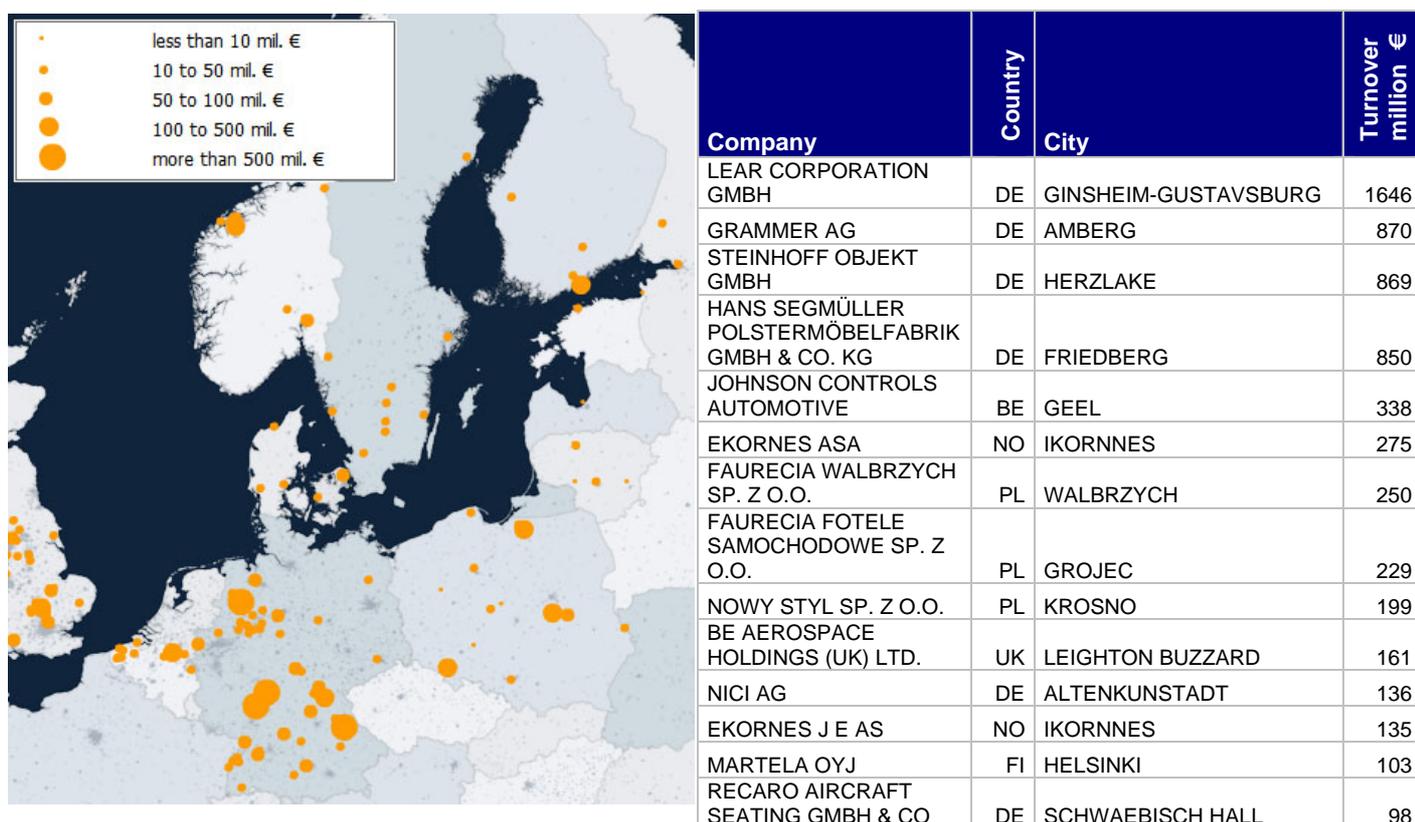
The furniture industry is one of the growing industries in northern Europe and it encompasses the following NACE and product group categories according to HS2:

NACE: Manufacture of furniture; manufacturing (3600), Manufacture of chairs and seats (3611), Manufacture of other office and shop furniture (3612), Manufacture of other kitchen furniture (3613), Manufacture of other furniture (3614), Manufacture of mattresses (3615), Agents involved in the sale of furniture, household goods, hardware and ironmongery (5115), Retail sale of furniture, lighting equipment and household articles (5244)

HS: Furniture; Bedding, Mattresses, Mattress Supports, Cushions and Similar Stuffed Furnishings; Lamps and Lighting fittings, not elsewhere specified or included; Illuminated Sign, Illuminated Name-Plates and the like; Prefabricated Buildings (94)

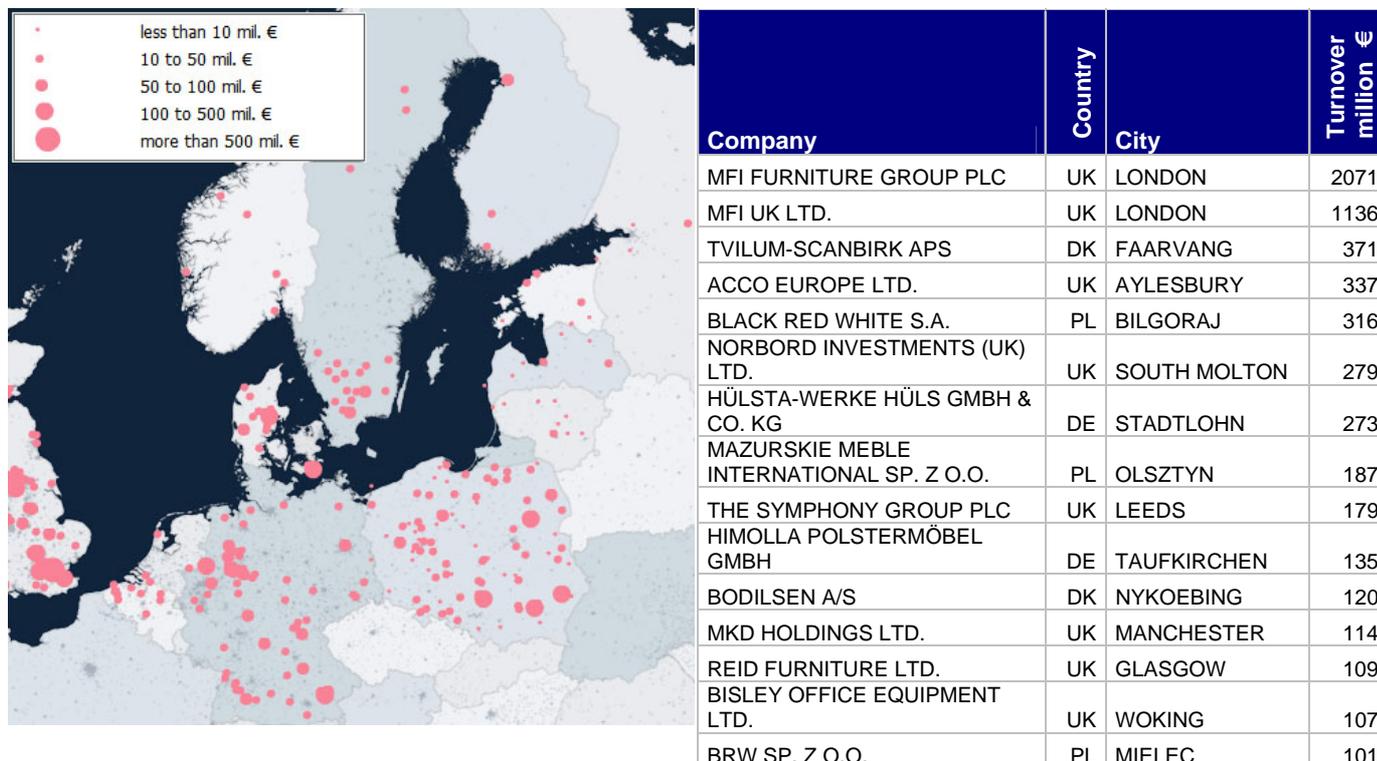
The industry is more or less structured by SMEs that have their special focus on the market. The main categories are shown in the following. The largest companies can be found in the area of manufacturing of chairs and seats. In many cases these also function as automotive supplying companies:

Map 8-3: NACE 3611 - Manufacturing of Chairs and Seats, Major Companies, Turnover 2004



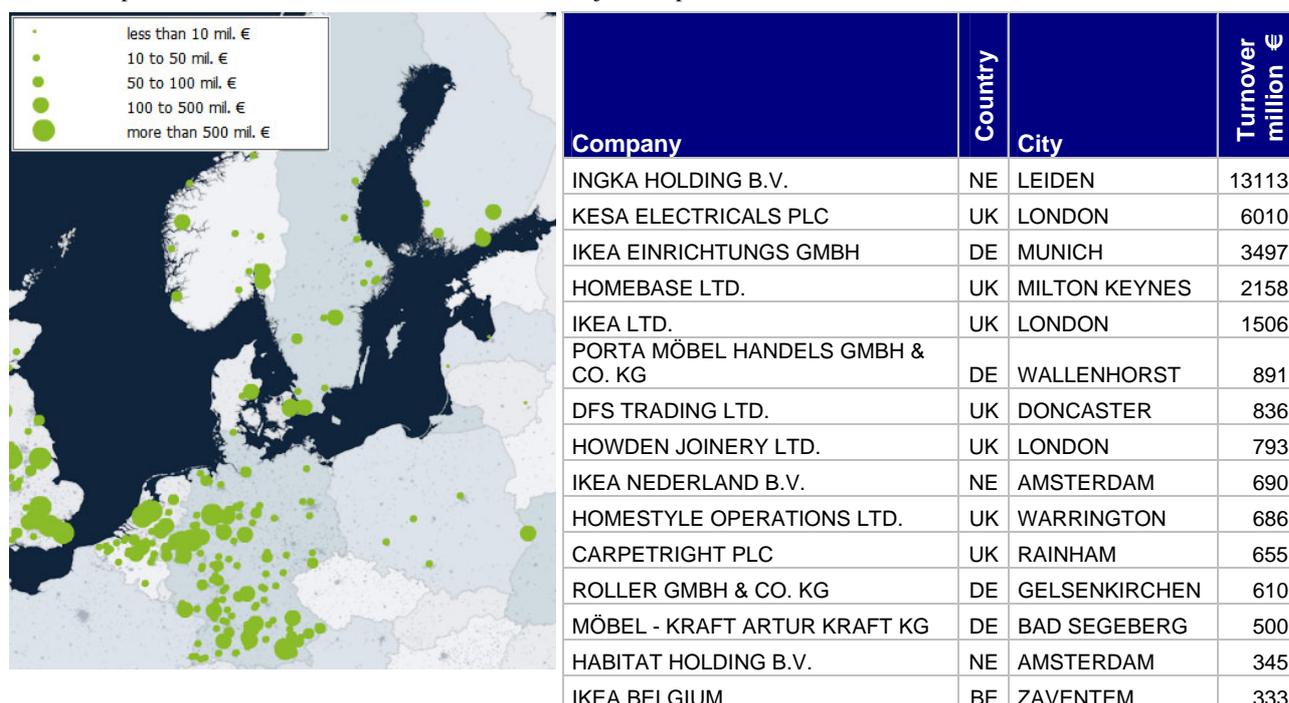
The second major group of companies is the production of general other furniture that falls not into the category of office and kitchen furniture:

Map 8-4: NACE 3614 - Manufacturing of Other General Furniture, Major Companies, Turnover 2004



In this case, the tendency towards production in countries with lower labour costs is observable. The manufacturing of general furniture is already largely done in small enterprises in Poland. This is not the case for specialized furniture. After the production and distribution process of furniture, a major part in the industry is played by retail. The following map shows the locations of the major companies in this field, omitting, however, the franchising concept and the related stores of such chains.

Map 8-5: NACE 5244 - Retail Sale of Furniture, Major Companies, Turnover 2004



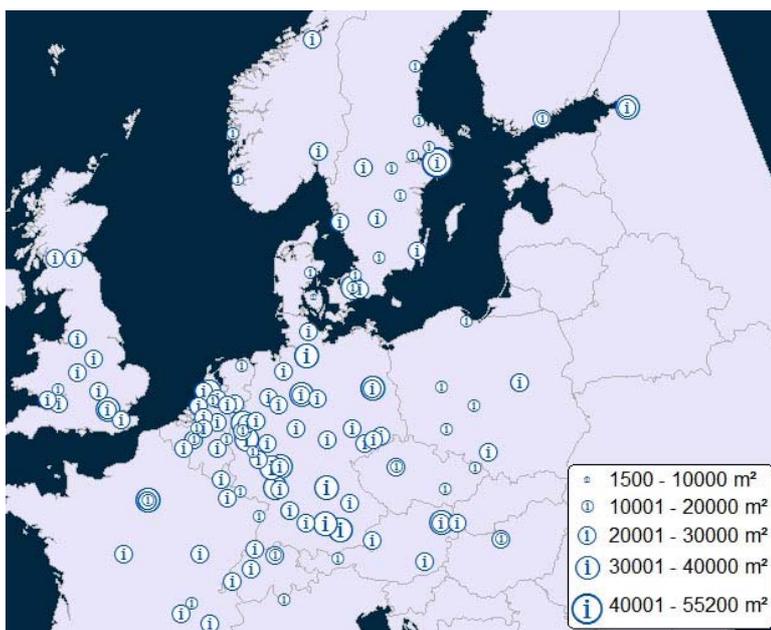
IKEA

As a global player in the market of furniture and one of the most successful companies over the last decades, IKEA provides a vivid example on how to integrate efficient logistics into an overall concept of creating, distributing and selling cost efficient furniture. The aim of the company to provide its products at the lowest price possible has had important effects on the distribution function of the company. The hallmarks of IKEA distribution are:

- A global distribution network with 1,600 suppliers that manufacture approximately 10,000 home furnishing articles.
- Large volumes help to route goods flows together and to keep costs low.
- Flat packages lead to efficient use of transport space and packaging material.
- Low costs lead to competitiveness on the market.

186 IKEA stores around the world are supplied via the network, often via one of the company's 27 central warehouses and distribution centres. This distribution is aimed at the closest route from production location to customer. Here, we see a direct relation between distance and price which shows the high competition on the furniture market by the price of the final product. This is not the case in every industry.

Map 8-6: IKEA Stores mapped according to retail store size¹⁷⁷



Today 60% of all IKEA freight is transported by road, 20% by rail and 20% by sea. Less than one% is air freighted. The aim of the company is to constantly increase the proportion of goods transported by rail. Within the next three years 40% of all IKEA freight within Europe is expected to be moved by rail.

What is exemplary about Ikea's business model is the analysis in minute detail of all costs in the value chain from the tree 'on the root' through sawmilling, plank or chipboard production, component manufacture, packing, storage and transport at every stage in the chain through to the customer's trolley. It is seen as irrelevant whether the materials are in Ikea's ownership or in the hands of their suppliers and sub-suppliers at any particular stage. The supply chain is

¹⁷⁷ <http://franchisor.ikea.com> (04.01.2007)

the entity and all the legal trading entities that participate in the delivery of any particular product do so in a boundary-less way.

In this way IKEA uses the same approach for every supplier. Ikea's suppliers are categorised according to the lead time that they work on. Ikea's policy is to try to shorten lead times gradually. A supplier may start to supply goods on either a long warning fixed time delivery basis or a call-off. Call offs are time based methods and once the supply chain is functioning smoothly the supplier will progress to an order driven method: Order Point Distribution Centre (OPDC) at progressively shorter lead times, from weeks down to days, with the manufacture and delivery of goods being triggered by orders. Once a supplier is able to achieve this they explore the possibilities of cutting the distribution link out of the chain so that retail stores deal directly with factories (Vendor Managed Inventory VMI) perhaps with goods bypassing the distribution centres altogether and going direct to retail stores, or going via distribution centres but only on a transit basis so that there is not time for them to be booked in and out of the warehouse.

This is supply chain management in its purest form. All links in the chain work together to shorten the cycle time and cut out logistical costs so that products reach the customer at the lowest possible price. The progression up the ladder is gradual and reached by agreement with suppliers. The speed imperative has to be balanced against the dependability of supply and the maintenance of high percentage availability of the product in the stores.

8.5 Dimension 5 – Major Logistical Providers

Furniture logistics are not as specialized in their make up in comparison to vehicle logistics. Furniture companies are generally well served by traditional logistical services. However, more and moving companies and other general LSPs are picking up on offering logistical solutions for furniture including services not included in the simple distribution process of furniture products.

Table 8-2: Major LSPs with a business focus on furniture transports and relocation

Company	Location	Turnover EU million €2004	Profile
Schenker (Deutsche Bahn)	KELSTERBACH	8024	Leading provider of network-based and integrated logistics on the German market; landside transport for break bulk, sea/air freight, logistical services
Confern (Cooperation)	MANNHEIM	240	Company for the compensation of free storage space with 60 partners at 50 locations, moving company
Geodis (SNCF)	CLICHY	3371	Integrated logistical services
DMS (Cooperation)	DUESSELDORF	120	Intern. relocation transports within a cooperation network of 90 partners; moving, project transports, container handling
GPL	HAMBURG		Nat. supply and distribution logistics with focus on B2C, supply, warehousing, picking and packing of furniture, white goods, sensitive goods, heavy loads, assembly, installation, mail-order
Hermes	HAMBURG	710	Germany's largest Post-independent LSP for the delivery of households (B2C, C2C), parcel services, furniture and large units services, mail and info services
Optimus Logistics	NUERNBERG	440	Subsidiary of DHL, logistical activities of KARSTADT and QUELLE, B2C of traditional parcel services and large goods, specialised in high value textile logistics
UTS (Cooperation)	MANNHEIM	242	Cooperation of SME furniture shipping agencies
Anterist + Schneider (Deutsche Bahn with Schenker)	SAARBRUECKEN	106	National/international landside transport, beverages, furniture, relocation, automotive contract logistics (e.g. Ford Cologne)

UTS International Europe	WEESP	442	Cooperation company of 450 independent European moving companies
Hansetrans	HAMBURG		Nat./intern. direct transports, messenger services, furniture, automotive, spare parts, hospital logistics
Meyer and Meyer	OSNABRUECK		Textile LSP, warehousing, quality management, consulting, IT-services, services for bicycles, mattresses, furniture, automotive
Rosner	OELDE		Transports with focus on large capacity vehicles; customers from the insulation, automotive, packaging, plastics and furniture industries
Simon Hegele	KARLSRUHE		Contract logistics provider for industry and retail; business areas area moving, health care, IT/Industry

8.6 Furniture Logistics as an Investment Target

As for a company like IKEA, furniture logistics is a constantly changing environment. The company tries to achieve the lowest cost possible for its products and therefore changes its logistical processes regularly to adapt to the market. On the one hand this provides for new LSPs to enter the market but it also lacks some continuity. On the other hand the furniture industry is a rather stable industry with product life cycles that range from 3 to 20 years. Through this the necessary continuity is achieved to develop mutually trusting contracts.

However, the potential for value added services is limited. In general, the products are finished by the time they leave the production plant. So there is only little room for direct value addition depending on the type of product. But services around the product can be offered by the LSP. Depending on the needs of the manufacturing company, this can range from simple packaging and labelling to the appropriate delivery of resources needed for the production process. And there is also growing need for distribution centres which are serving a larger area of retail stores.

9 Logistics of Pulp, Paper and Forest Products

9.1 Dimension 1 – Industry Analysis

Paper is a natural product, manufactured from the natural and renewable raw material wood. Pulp – the basic ingredient for the manufacture of paper and board – is produced from fresh wood, woodchips from sawmills, recovered paper and sometimes even from textiles, agricultural by-products or industrial crops.

Pulp, paper and paperboard is a necessity for almost all forms of activity, such as in communications and advertising (newspapers, magazines, directories), education (books, writing paper), business (security papers, forms, labels, copy paper), commerce (bank notes, cheques, postage stamps), culture (photography, art-work), hygiene (kitchen rolls, napkins, diapers), medicine (dressings, swabs), food and beverage packaging (coffee filters, paper crockery & cutlery, liquid carton board, folding box board), transport and protection (tachographs, bags, sacks, paperboard, packaging). This shows the importance of the industry.

The use of recycled fibre has been growing steadily since 1984 and today stands at a figure of around 50% (the recycling rate is calculated on the basis of recovered paper used in recycling compared to total paper consumption) of the fibre mass used in paper production.

Graphic paper grades make up around 50% of the EU's paper production, packaging paper grades account for 40% and hygiene and specialty papers for around 10%. The European industry consists of more than 1,000 paper mills and 220 pulp mills with Germany leading the field as the largest paper producer in the EU, followed by Finland, Sweden and France. Finland and Sweden are the main pulp-producing countries.¹⁷⁸

In the Scandinavian countries situated in the boreal forest area (Finland, Norway and Sweden), waterpower as a source of energy and forest resources have been the main reasons for the location of industry. In Finland, the mills are situated both on the coast and inland. The south-eastern part of Finland is the most important centre of pulp and paper industry in the Baltic Rim area. In Norway, two separate regions of chemical forest industry can be found, but in Sweden the mills are more spread out along the coastline. In Norway, Sweden and Finland the paper and pulp mills are integrated, in other words the pulp producers typically also have paper machines. The grades produced in Scandinavia are mainly printing papers. In Sweden, there is one giant producer of pulp that does not have its own paper industry.

In the new member states of the EU, the paper industry does not play a significant role, except to some degree in Poland. In these countries, paper consumption per capita is at a low level. During the time of economic transition, a packing industry with liner and craft paper production emerged, because of the new demand in consumer goods markets. Today, multinational firms are interested in investing in the fine paper production in the new member states and in Russia. In Russia, there are also newsprint producers, which have mills near forest resources.

The plants in Germany are located near the raw material resources. About 65% of paper industries' raw material is based on recovered paper, and thus the mills are situated in the

¹⁷⁸ http://ec.europa.eu/enterprise/forest_based/pulp_en.html

densely populated areas. Germany is the biggest producer of paper with 20 million tons annual output, but it is also the biggest user of paper in the area.

In the mechanical forest industry, Sweden and Finland have been the main producers and exporters. Russia has regained its former position as producer and exporter of sawn goods. In addition, Scandinavian companies now invest in the Russian mechanical forest industry.

The Scandinavian forest industry companies are strongly experiencing globalisation, which has resulted in large quantities of raw material transports across the Baltic Sea. For example, Estonia, Latvia and Lithuania export pulpwood to Scandinavia. Russia is also an important raw wood supplier to the forest industry in Scandinavia. The Norwegian forest industry has a good geographical position to exploit fast growing pulp wood resources of the southern hemisphere.

Table 9-1: Production volumes of pulp, paper and paperboard in the BSR (VDP 2006)

Production 2004	Wood Pulp	Paper and Paperboard	Sawn Goods
	million tons		million m ³
Denmark	0	0,4	0,2
Norway	2,5	2,3	2,2
Sweden	12,1	11,6	16,9
Finland	12,6	14,0	13,5
Russia	6,9	6,8	21,5
Estonia	0,1	0,1	2,0
Latvia	0	0	3,9
Lithuania	0	0,1	1,5
Poland	1,0	2,6	3,9
Germany	2,2	20,4	19,1

There have been observed several somewhat changing developments in transport flow and industrial patterns in the last years and the forest industry subsumes it in the following:¹⁷⁹

- Volume output and production capacity are more or less stable.
- Investments in the Far East and South America influence the competitive position in the Baltic.
- The UK market is decreasing while Eastern Europe is increasing.
- There is a tendency towards a higher degree of "unitization".
- There is need to further build up European inland distribution centres, based on rail and trailer transports.

¹⁷⁹ Carlquist 2005

Table 9-2: Industrial Chains Analysis Forest Products

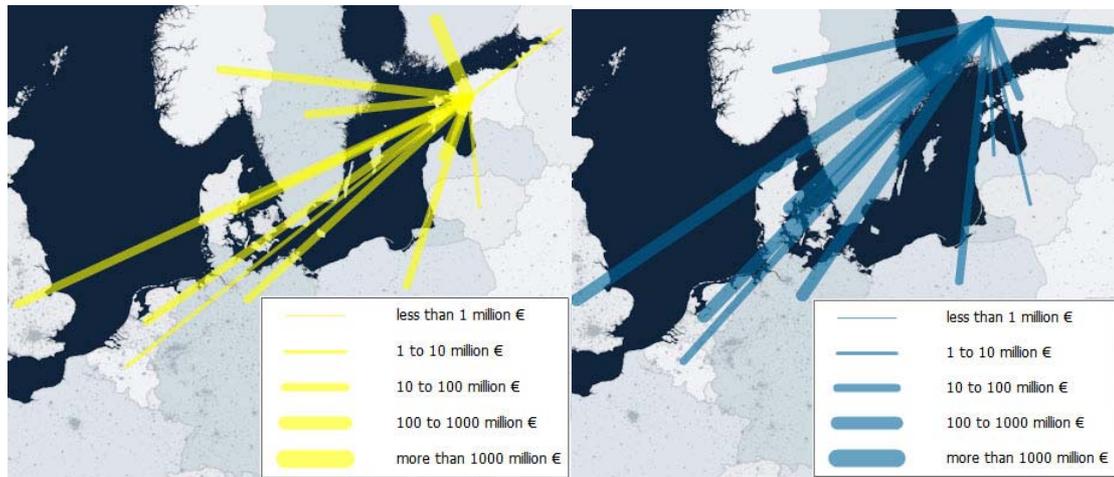
Industrial Chains Analysis	
Structural features of the industrial chains	<p><i>Dimension:</i> large volumes on north to south transport route from Scandinavia to mainland Europe</p> <p><i>Complexity level:</i> preferred seaborne transport due to large volumes; many sawmills, few pulp and paper plants</p> <p><i>Logistical needs:</i> intermodal chain developed; unitization of cargo, improved handling of cargo</p>
Selection criteria for the localisation of value added services	<p><i>Logistical supply:</i> intermodal switches; appropriate storage; EDI handling</p> <p><i>Area location:</i> prior shipping in paper ports or in distribution centres on mainland Europe</p> <hr/> <p><i>Operators:</i> Bulk related LSPs show no geographical clustering; most are port or rail related</p>

9.2 Dimension 2 – Geographic Targets with Major Sources and Major Destinations

Wood

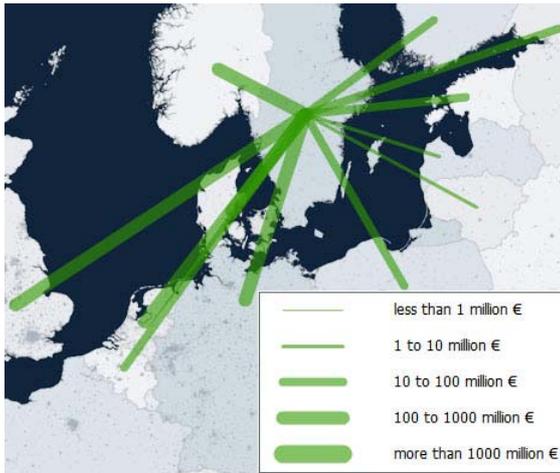
Wood products originate in regions where the resource is available in amounts that exporting is reasonable. The Scandinavian countries as well as the Baltic States and Russia are predestined due to their geographical location for this business. Even a rather small country like Estonia is exporting fairly large amounts of wood products. Finland is the leading competitor in this product group and exports large quantities mainly via the Baltic Sea to mainland Europe.

Map 9-1: Goods Flow HS2 Product Group 44 - Wood, Exports 2005 from Estonia (l.) and Finland (r.)



A similar situation is shown for Sweden. However, much of the wood is directly manufactured to pulp, paper, furniture or building materials in the Nordic countries.

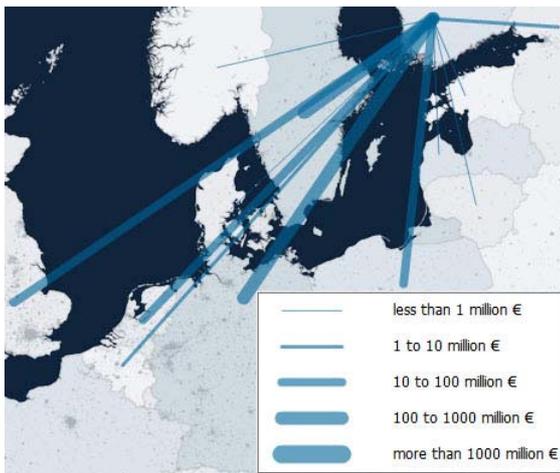
Map 9-2: Goods Flow HS2 Product Group 44 - Wood, Exports 2005 from Sweden



Pulp

For pulp products Finland is also the major supplier. As there are only a few pulp using plants in Europe, many of them in Germany and Sweden, most of the pulp flow is going this way.

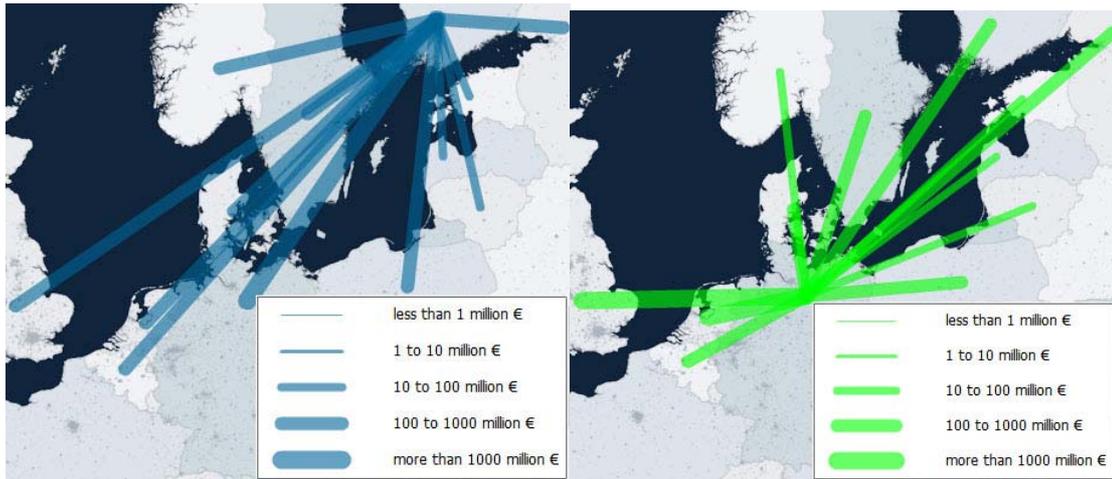
Map 9-3: Goods Flow HS2 Product Group 47 - Pulp, Exports 2005 from Finland



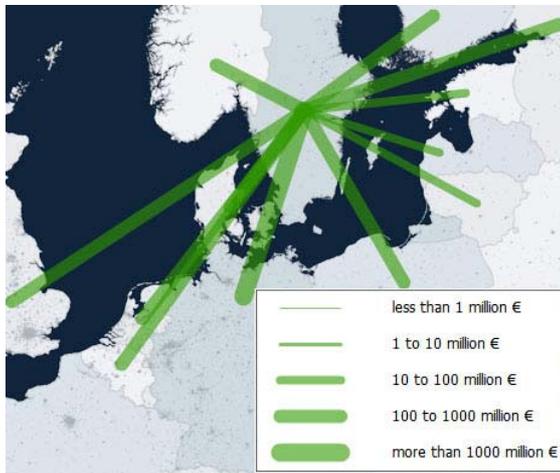
Paper

Paper products show the dominance of the Scandinavian countries. Dominating countries in this product group are Finland, Sweden and also Germany. Related to the paper producing plants in these countries, the goods flows show the major producing regions and the destinations. The latter are show a high need of every company in respect to its economical size which is now surprise evidencing the importance of paper for the whole economy.

Map 9-4: Goods Flow HS2 Product Group 48 - Paper/Paperboard, Exports 2005 from Finland (l.) and Germany (r.)

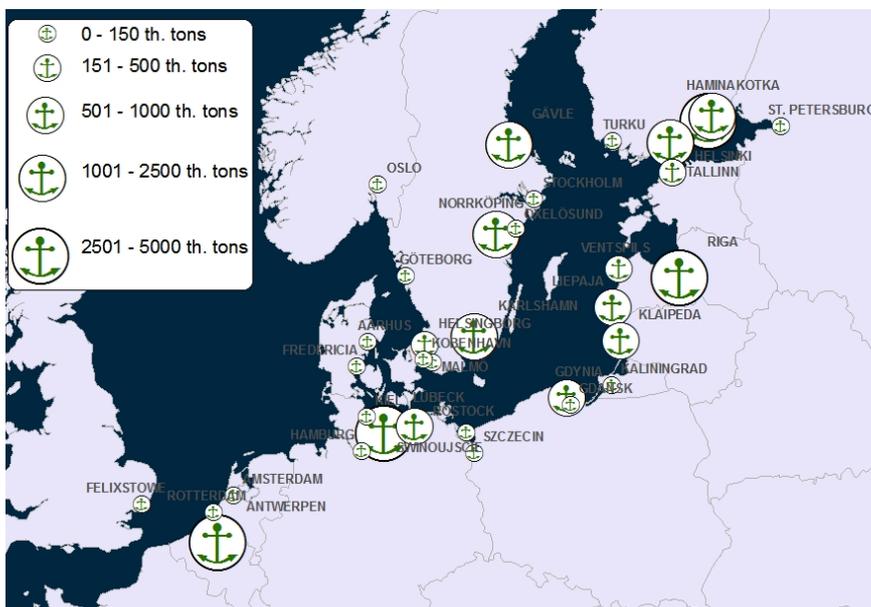


Map 9-5: Goods Flow HS2 Product Group 48 - Paper/Paperboard, Exports 2005 from Sweden



The overall forest product flows relate directly to the structure of ports with a focus on forest products. As the industry is largely using the Baltic Sea for transport, all ports in the north to south relation show high amounts of turnover in this area.

Map 9-6: Total Forest Products Turnover 2005, Size of Port Symbol = Total Turnover (Port Authorities)

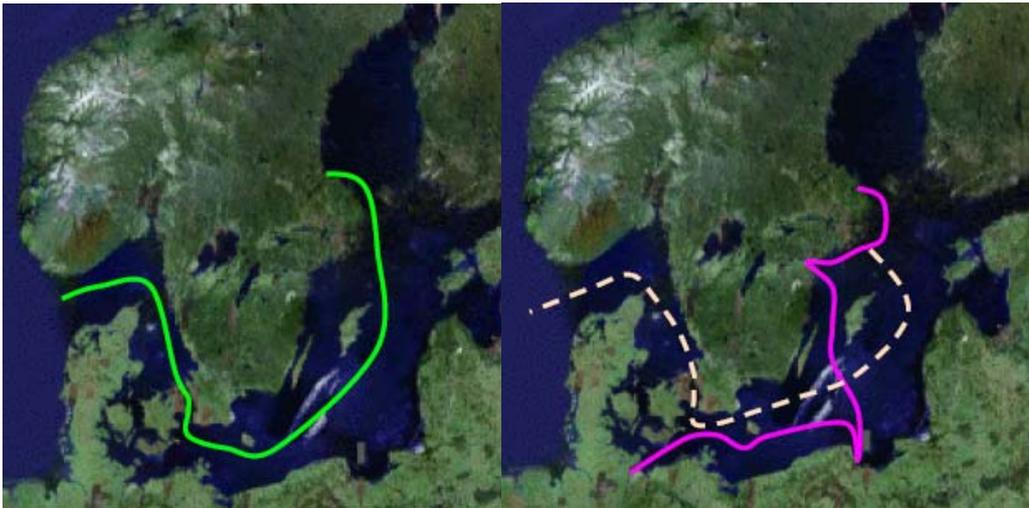


This turnover structure can be underlined by exemplary RoRo liner service relations between ports in the BSR. These services show the main paper transporting routes in the BSR.

Map 9-7: Kappa Packaging (l.) and SCA Transforest, Iggesund, M-Real RoRo Services (r.) (Carlquist 2005)



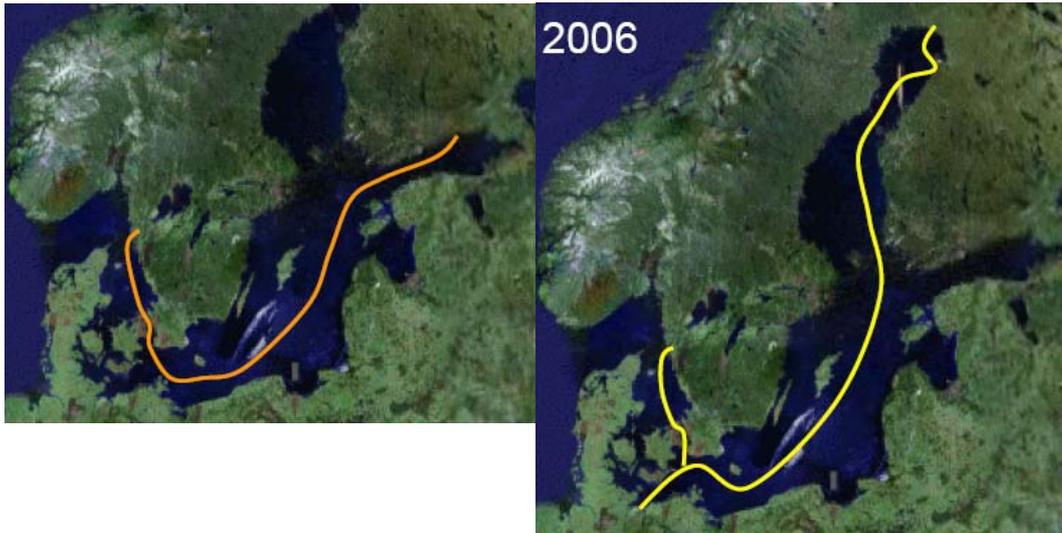
Map 9-8: Korsnäs (l.) and Holmen (r.) RoRo Services in the BSR (Carlquist 2005)



Map 9-9: Transfennica (l.) and UPM Kymmene Seaways (r.) RoRo Services in the BSR (Carlquist 2005)

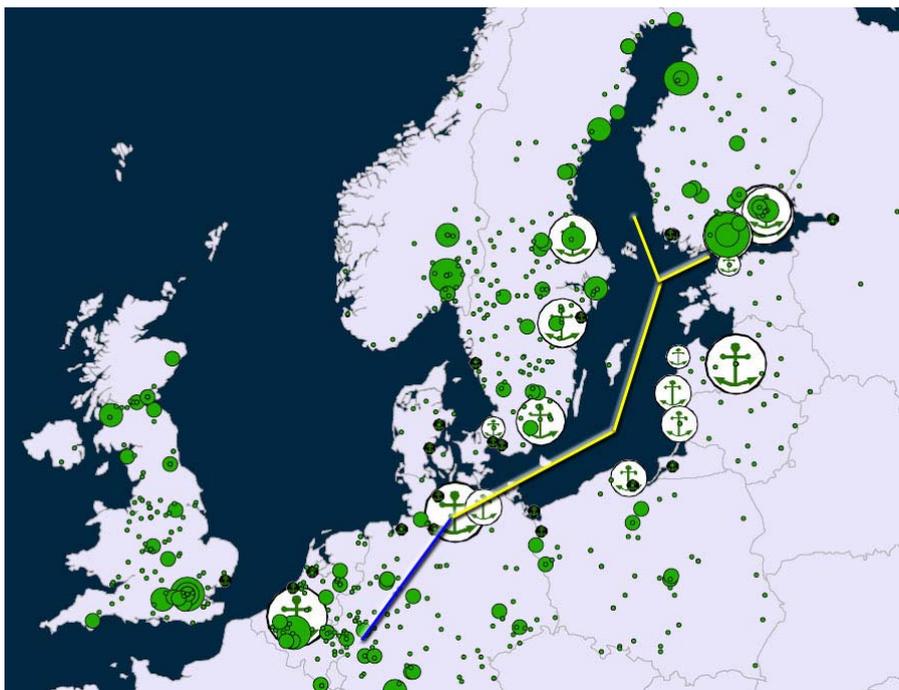


Map 9-10: StoraEnso RoRo Services before 2006 (l.) and starting in 2006 (r.) in the BSR (Carlquist 2005)



In combination a major route can be identified in the BSR that is shown in Map 9-11. All the sawmilling and paper producing companies of the BSR are located within reach of this route.

Map 9-11: Major Shipping Ports and Sawmilling and Paper Producing Companies, Size of Port Symbol = Forest Products Turnover 2005, Size of Company Symbol = Turnover 2004 (Port Authorities 2006, Bureau van Dyke 2006)



9.3 Dimension 3 – Possible “Value Added Services” for Port Areas

In case that the forest industry decides to join forces in a large and long-term RoRo sea transport system which is currently discussed¹⁸⁰, this will have consequences for the development of port areas regarding turnover of forest products. Large RoRo vessel will then only serve a few Baltic ports that function as hubs while smaller RoRo vessels are feeding cargo into hubs from important “outports”. The number of ports of discharge is then reduced. That leads to a limit number of ports that would arrive at amounts of turnover which justify

¹⁸⁰ Carlquist 2005

any sort of value addition. But this development can provide the possibility to build up distribution centres in port areas with a high volume and throughput for inland distribution.

However, the growing "unitization" especially of paper and paperboard makes it almost impossible to add any value directly to a single forest product. But any VAS in relation to these units can be applied. This includes:

- EDI and RFID tagging
- packaging
- consolidation

The handling of the bulk goods wood and pulp is similar in its possibilities for VAS. However, the forestry industry becomes more and more IT conscious. RFID tagging of cut down trees is starting to make the supply chain in the industry more efficient. And this provides new opportunities for LSPs to offer services related to the efficient handling of these wood products.

9.4 Dimension 4 – Major Shippers

According to turnover and employees the forest products industry is one of the most important in northern Europe. It includes companies belonging to the following NACE codes and product groups with the HS codes:

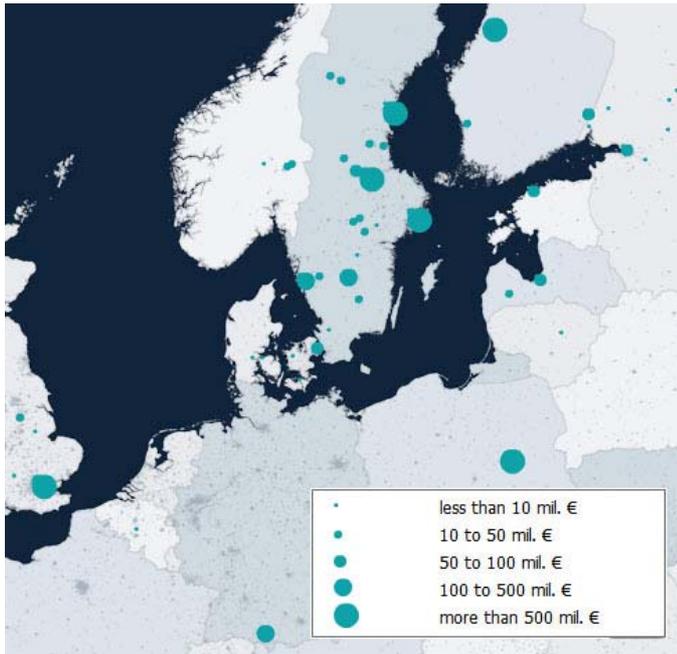
NACE: Sawmilling and planning of wood; impregnation of wood (2010), Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board and other panels and boards (2020), Manufacture of builders' carpentry and joinery (2030), Manufacture of wooden containers (2040), Manufacture of other products of wood (2051), Manufacture of pulp (2111), Manufacture of paper and paperboard (2112), Manufacture of corrugated paper and paperboard and of containers of paper and paperboard (2121), Manufacture of household and sanitary goods and of toilet requisites (2122), Manufacture of paper stationery (2123), Manufacture of wallpaper (2124), Manufacture of other articles of paper and paperboard (2125), Wholesale of wood, construction materials and sanitary equipment (5153)

HS: Wood and Articles of Wood; Wood Charcoal (44); Pulp of Wood or of Other Fibrous Cellulosic Material; Recovered (Waste and Scrap); Paper or Paperboard (47); Paper and Paperboard; Articles of Paper Pulp, of Paper or of Paperboard (48)

These categories show the differentiation of the industry. In general these are connected by a linear supply chain that is accompanied by a linear transport chain which is determined by close distance to cost relations.

The primary category of companies for the whole industry is the forestry and logging companies which are the major players in cutting down the raw wood products.

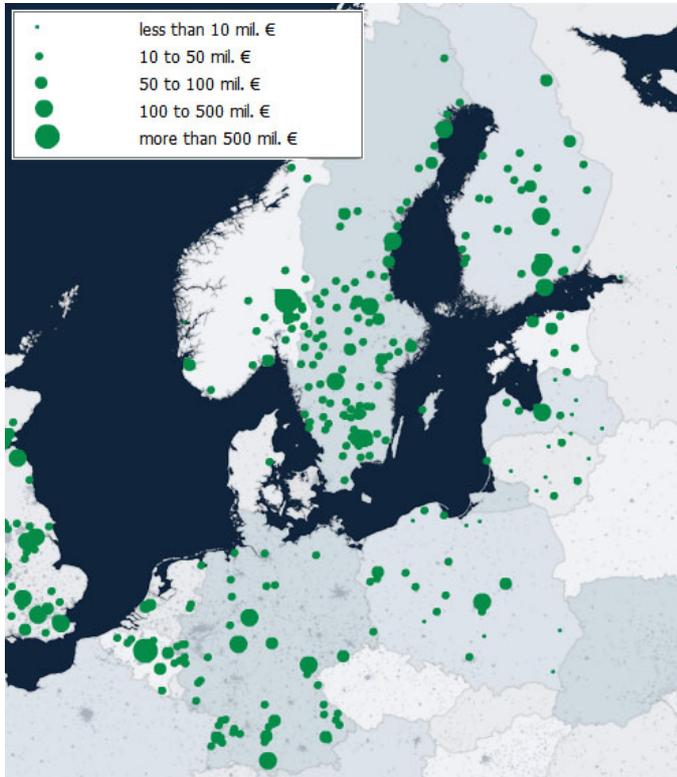
Map 9-12: NACE 201 - Forestry and Logging, Major Companies, Turnover 2004



Company	Country	City	Turnover million €
METSÄLIITTO OSUUSKUNTA	FI	METSÄE	8789
XSTRATA PLC	UK	LONDON	6844
PANSTWOWE GOSPODARSTWO LESNE LASY PANSTWOWE	PL	WARSZAWA	1079
STORA ENSO SKOG AB	SE	FALUN	767
SVEASKOG FÖRVALTNINGS AB	SE	STOCKHOLM	694
SCA SKOG AB	SE	SUNDSVALL	549
SYDVED AB	SE	JOENKÖPING	402
BERGVIK SKOG VÄST AB	SE	FALUN	207
BERGVIK SKOG AB	SE	FALUN	189
SCANINGE HOLDING AB	SE	SUNDSVALL	179
SKÖSSÄLLSKAPETS FÖRVALTNING AB	SE	GOETEBORG	161
TILHILL FORESTRY LTD.	UK	LONDON	106
TTW WALDPFLEGE GMBH & CO. KG	DE	OBERROT	105

The further processing of the raw wood articles is done by sawmilling and planning of wood companies.

Map 9-13: NACE 2010 - Sawmilling and Planning of Wood, Impregnation of Wood, Major Companies, Turnover 2004



Company	Country	City	Turnover million €
INFRABEL	BE	BRUSSEL	6248
MOELVEN INDUSTRIER ASA	NO	MOELV	752
STORA ENSO TIMBER OY LTD	FI	PORVOO	427
MAGNET LTD.	UK	DARLINGTON	406
KLENK HOLZ AG	DE	OBERROT	358
SCA TIMBER AB	SE	SUNDSVALL	332
SETRA TRÄVAROR AB	SE	PITEA	309
SWEDWOOD POLAND SP. Z O.O.	PL	SZCZECIN	267
KRONOFLOORING GMBH	DE	STEINHEIM	242
ISKU-YHTYMÄ OY	FI	LAHTI	225
SÖDRA TIMBER AB	SE	VAEXJOE	212
JAMES WALKER (LEITH) LTD.	UK	BO'NESS	204
JELD-WEN UK LTD.	UK	DONCASTER	200
STORA ENSO TIMBER AB	SE	FALUN	196
VERSOWOOD GROUP OY	FI	VIERUMAEKI	179

Some of these companies are part of larger companies under one holding like StoraEnso or SCA. The next possible step for wood articles is the production of pulp.

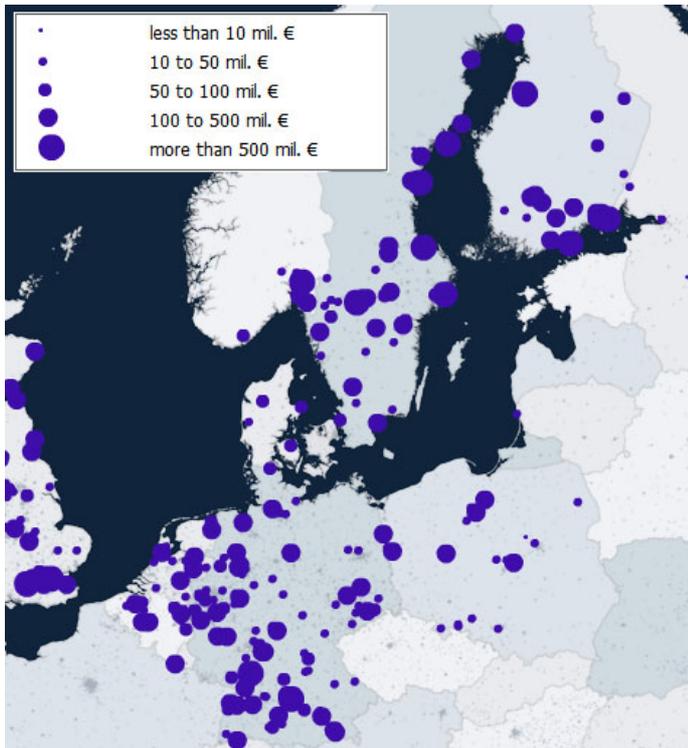
Map 9-14: NACE 2111 - Pulp, Major Companies, Turnover 2004



Company	Country	City	Turnover million €
OY METSÄ-BOTNIA AB	FI	METSÆ	989
SÖDRA CELL AB	SE	VAEXJOE	932
NORDLAND PAPIER GMBH	DE	DOERPEN	873
UPM-KYMMENE PAPIER GMBH & CO. KG	DE	AUGSBURG	771
STORA ENSO PULP AB	SE	SKUTSKAER	374
BORREGAARD INDUSTRIES LTD.	UK	WARRINGTON	273
ENOCELL OY	FI	UIMAHARJU	254
OJSC SVETOGORSK	RU	SVETOGORSK	224
ZELLSTOFF STENDAL GMBH	DE	ARNEBURG	218
DOMSJÖ FABRIKER AB	SE	OERNSKOELDSVIK	179
SØDRA CELL TOFTE AS	NO	TOFTE	160
SUNILA OY	FI	KOTKA	156
VALLVIKS BRUK AB	SE	VALLVIK	92
CELLPACK	BE	SINT-DENIJS-WESTREM	70
ROTTNEROS ROCKHAMMAR AB	SE	ROTTNEROS	69

Pulp can then be further used for producing paper and paperboard by the following major companies.

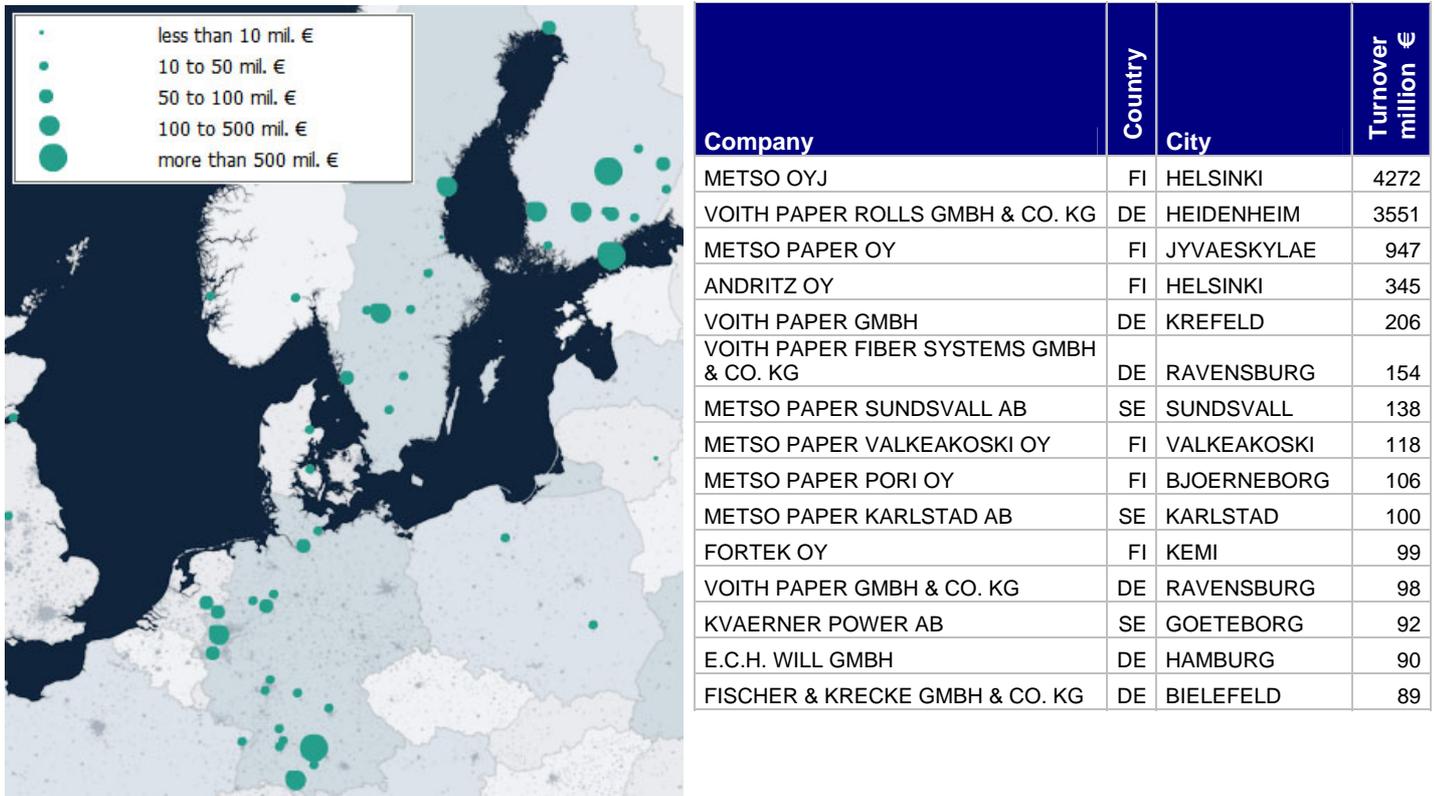
Map 9-15: NACE 2112 - Paper and Paperboard, Major Companies, Turnover 2004



Company	Country	City	Turnover million €
STORA ENSO OYJ	4	HELSINKI	13339
UPM-KYMMENE OYJ	4	HELSINKI	9554
M-REAL OYJ	4	METSÆ	5468
BUNZL PUBLIC LTD. COMPANY	13	LONDON	4268
NORSKE SKOGINDUSTRIER ASA	9	LYSAKER	3221
DS SMITH PLC	13	LONDON	2399
AHLSTROM OYJ	4	HELSINKI	1568
MYLLYKOSKI OYJ	4	ANJALANKOSKI	1486
UPM-KYMMENE (UK) LTD.	13	IRVINE	1085
DE LA RUE PLC	13	BASINGSTOKE	876
BILLERUD AB (PUBL)	12	SOLNA	728
SCA HYGIENE PRODUCTS GMBH	5	MANNHEIM	717
M-REAL SVERIGE AB	12	HUSUM	689
STORA ENSO PUBLICATION PAPERS OY LTD	4	HAMINA	678
PALM PAPIER GMBH & CO. KG	5	AALEN	677
KORSNÄS AB	12	GÆVLE	649
SCA GRAPHIC SUNDSVALL AB	12	SUNDSVALL	597
STORA ENSO SKOGHALL AB	12	SKOGHALL	519

In addition to the producing companies, the industry also needs the appropriate machinery which is supplied by the following major companies.

Map 9-16: NACE 2955 - Machinery for Paper and Paperboard Production, Major Companies, Turnover 2004



StoraEnso

StoraEnso is largest paper and pulp company in the evaluated region and has established a dense network between forestry and sourcing of raw materials on the one side and the paper and pulp mills on the other side. This example shows the tendency in the industry for integrated companies.

Figure 9-1: StoraEnso Traffic Network (Wiklund 2005)

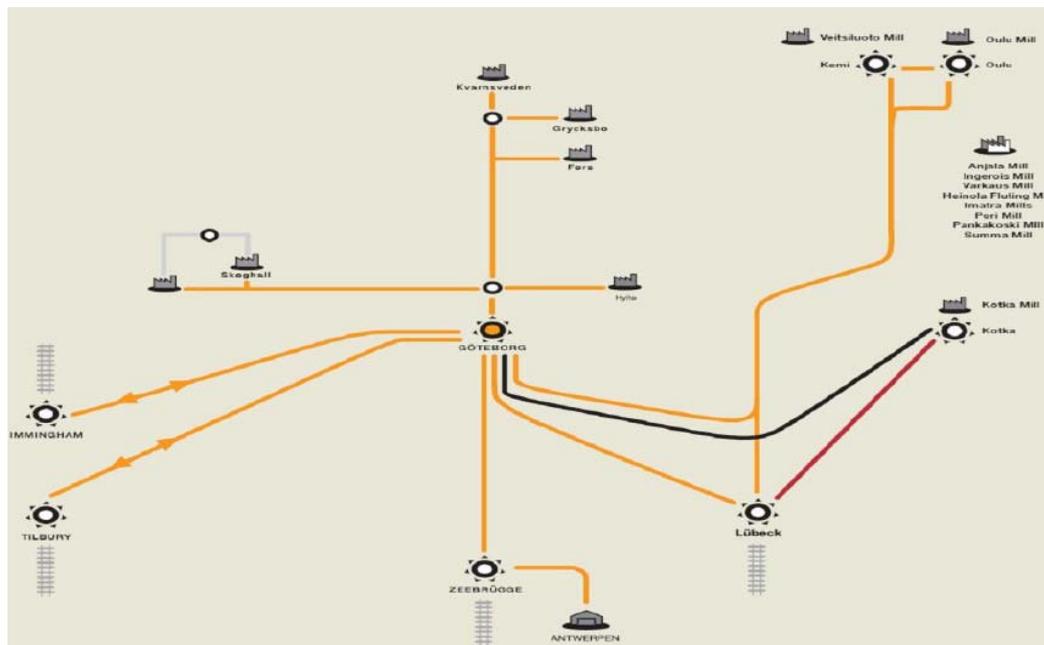


Figure 9-1 shows the logistical network of the StoraEnso company network that spans from Scandinavia to Germany, Belgium and the UK.

9.5 Dimension 5 – Major Logistical Providers

Logistics in the area of raw materials like wood and manufactured goods like pulp as well as paper products are largely done by the manufacturing companies as far as the first stages of the supply chain are concerned. This is due to the integration of the relevant logistical activities into the portfolio of the companies. This is especially the case for the large global players.

In general, there are many LSPs which are capable of dealing with unitized cargo that is mainly transport in paper and paperboard logistics.

Table 9-3: Major LSPs with a business focus on paper and related products

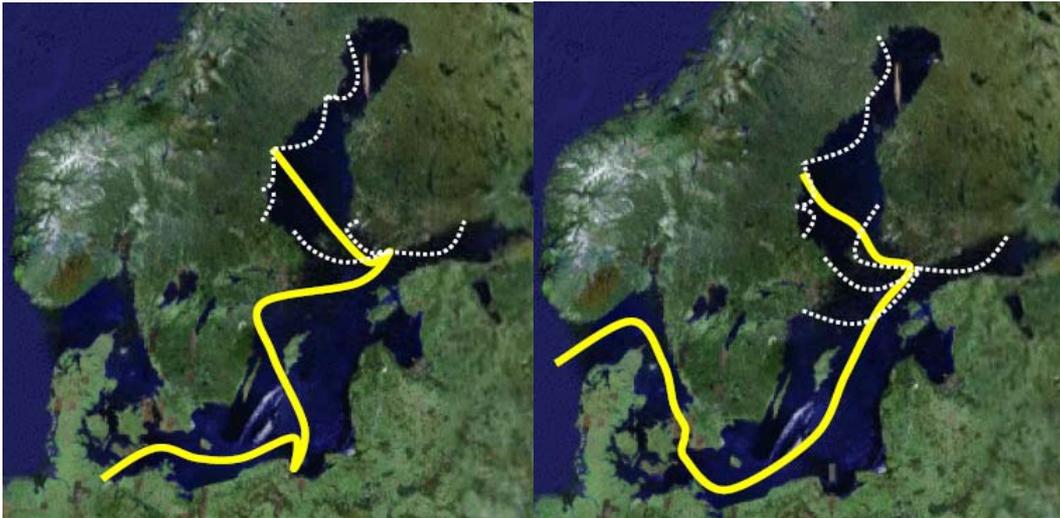
Company	Location	Turnover EU million €2004	Profile
TNT	AMSTERDAM	8777	Mail and express services; TNT Logistics focuses on logistical solutions (e.g. automotive, consumer goods, high-tech, publishing)
Kuehne + Nagel	HAMBURG	7508	Inter. logistics company, sea/air freight, contract logistics
Thiel Logistik	GREVENMACHER	1726	Company group; complete logistics service solutions in all main logistical markets; business areas: fashion and lifestyle, furniture, automotive, food, media, air/ocean, regional logistics
Johann Dettendorf	NUSSDORF		Logistical solutions esp. for paper and scrap
Thiel Media, Overbruck	HAMBURG	114	Industry specific solutions for media
Logista	MADRID	503	Subsidiary of the tobacco company ALTADIS; distribution of tobacco products and media/publishing services; messenger, express and mail services
VR Cargo	HELSINKI	517	Freight subsidiary of the finish rail company; most freight transports of the finish wood, metal and chemicals industries
BWG Reimer	BREMEN		Multimodal nat. and intern. transports, logistics for health care, automotive, food, machinery, paper, wood, media and consumer goods industries
Rosner	OELDE		Transports with focus on large capacity vehicles; customers from the insulation, automotive, packaging, plastics and furniture industries
Seifert Logistics	ULM		Break bulk transports, transport of dangerous goods, bin container traffic, contract logistics, VAS; solutions for the paper, building materials, chemical, automotive and pharmaceutical industry
TNT Logistics	FRANKFURT		Subsidiary of TNT (NL); solutions for the industries automotive, high-tech, media, fashion, pharmacy

9.6 Pulp, Paper and Forest Products Logistics as an Investment Target

The pulp, paper and forest industry is a heavily integrated industry with very much closed supply chains. However, especially ports function as hubs where cargo flows are consolidated and intermodal changes happen. That is why port areas should be the central focus for the implementation of services for the industry. VAS, however, are limited in their extent that they can provide added value to the product.

Additionally, cargo flows of the industry are currently being changed to consolidate flows for the internal BSR and external Europe trade. This will focus especially pulp and paper cargo flows on central hubs which are ports in this case. Map 9-17 shows the proposed consolidated RoRo services.

Map 9-17: Proposed Future Internal (l.) and External (r.) Baltic RoRo Services (Carlquist 2005)



10 Logistics of Electronics and Electrical Equipment

10.1 Dimension 1 – Industry Analysis

In 2005 EU25 engineering companies (electronics and mechanical appliances) manufactured machines and equipment worth €50,428 million, generated a value addition of €12,078 million, invested €9,811 million, gave direct employment to 4.2 million people working in 33,000 manufacturing companies with 20 or more employees and booked a gross operating rate of + 8.5%.¹⁸¹

The industry initiated an upward cycle in year 2000 with a healthy 12% output hike in nominal terms. Then production stagnated unexpectedly in 2001-2003. However, the past two years the upward trend has resumed with a 4% average growth for 2004-2005.¹⁸²

Last year EU25 output of electrical equipment and appliances amounted to €28,394 million (35% of EU engineering production). During the period 1996-2005 the sector has grown by an average annual 3.2% in current terms. This average hides continuous growth until 2001, recession in 2002-2003 and recovery in 2004-2005. EU25 electrical engineering employs directly 1.6 million people. Germany is the largest EU producer in electrical equipment, though less dominant than in machinery. In 2005 it has produced electrical equipment for €7,853 million, or 37% of EU25 electrical engineering output. The following countries are: Italy (14% of EU total), France (12%) and the UK (8%).¹⁸³

Over 60% of the total EU engineering output falls under the three sub-sectors electricity distribution and control equipment (€6,077 million in 2005, 27% of total EU25 output), electric motors, generators and transformers (€10,463 million, 20%), and electric domestic appliances (€3,309 million, 15%). The last category is different to all other electrical engineering sub-sectors in that household appliances are consumer goods.

However, only two electro technical sub-sectors offer expansion opportunities in Europe in the long term: Electric motors, generators and transformers, and other electrical equipment. This will have an effect on specialised logistical activities. In the period 1999-2005 the former grew by 27% in current terms and the latter by 22%. Within the sub-sector electric motors, generators and transformers, the EU has done best in large generators and transformers and electric motors for special purposes, while the European position in small, standard motors is being eroded. At the other extreme the sub-sectors wire and cables (-8%), accumulators and batteries (-5.5%) and lighting equipment (-5%) have performed worst during that period. Production for such rather low-tech sub-sectors is progressively moved to Eastern Europe and Asia due to less labour costs and intensive raw material and energy consumption.¹⁸⁴ The same is true for IT related electronics which is largely being produced overseas.

For the most part the industry is structured with SMEs. Only few large companies exist but they have a leading position on the world market. In Germany roughly 807,000 employees worked for an industry turnover of about €163 billion in 2004. And with exports of €124 billion, it is one of the strongest German shipping industries and dominates the trade with electronics in the region. After a decline for several years from the year 2000 on, the industry

¹⁸¹ Ayala, Spiechowicz, Vidaller 2006

¹⁸² *ibid.*

¹⁸³ *ibid.*

¹⁸⁴ *ibid.*

is booming again with a production surplus of around 5% and an export growth of 9.3% (2004 compared to 2003). But employment opportunities are declining because of outsourcing activities and technical productivity growth.

Logistics costs in this industry are of greater importance compared to the other main industries. On average around 20% of total costs are spent on logistical services and is therefore heavily dealt with. Looking at the average electronics company in comparison with the Top 10 companies it is observed that their logistical performance reaches 73.2% of the performance of Top 10 companies.¹⁸⁵ That means that industry-specific potentials for optimization have been developed for the most part. Basic logistical questions are known by the industry and potential has been made accessible especially in the area of optimization of inventory. The loss rate is considered as fairly low which is only reasonable concerning the high value of electronic components and supplied parts. Furthermore transport times are estimated as low and the dependability of deliveries are high.

In this regard the supply chain within the industry is regarded as optimized and logistical networks between suppliers and customers are almost fully integrated.¹⁸⁶ This leads to fulfilled logistical demands of customers in terms of delivery time, dependability, costs as well as express delivery and after sales services in most cases.

But considering the realized potential of external LSPs the mentioned study revealed that they are underachieving. Through the use of external service providers the need for storage space could only be lowered under average compared to other industries.

Nevertheless the outsourcing of certain logistical elements is seen as of importance. This includes tasks like return- and waste-disposal logistics, IT-logistics as well as production logistics and plant logistics. Another aspect is also regarded as an optimization potential for the future development of port areas: the relocation of distribution centres in cooperation with LSPs.

The Spare Parts Market

The after-market of electronics and related products nowadays puts a lot of pressure on companies as electrical products are offered in a wide range of types and use many different parts. That leads to a growing importance of available spare parts. Not only that, the availability of spare parts, accessories, options and supplies ranging from power cables and memory cards to manuals, toner and paper also has an important impact on brand loyalty. Through a high number of references and a large diversity in source and size, special attention on the handling of after-market services is required. Immediate availability of the necessary parts and repairs at customer locations are only two needs of customers. Environmental and waste management issues are other aspects.

However, special attention to this field has only recently been granted. Even LSPs are just starting to offer certain services in this area. In the context of outsourcing logistical services, it is only another chapter but reveals the importance of on-time and express delivery.

¹⁸⁵ Logistik-Tacho 2010, pp. 44

¹⁸⁶ *ibid.*

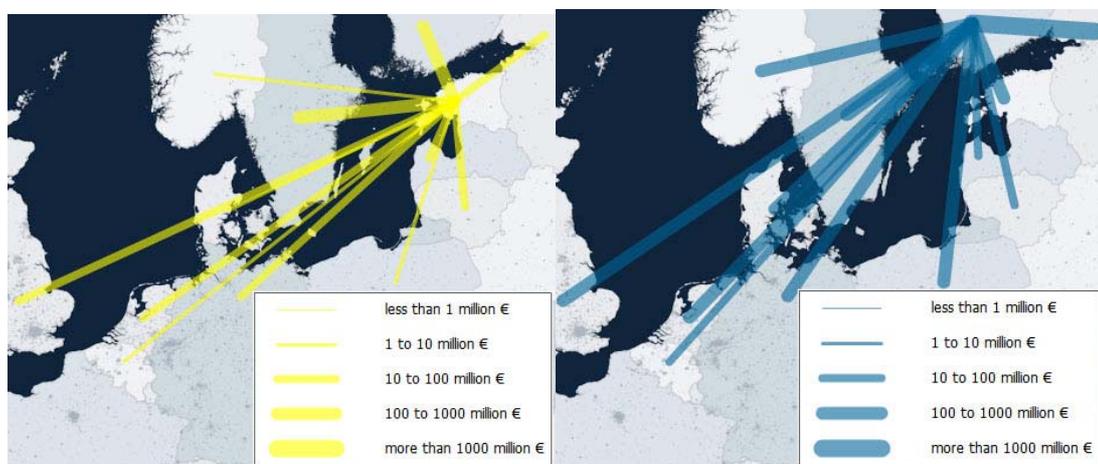
Table 10-1: Industrial Chains Analysis Electronics

Industrial Chains Analysis	
Structural features of the industrial chains	<p><i>Dimension:</i> companies can be found in all countries of the EU, in some clustered to major IT competence cores like in Finland and Estonia; companies supply world markets and supply and distribute over large distances</p> <p><i>Complexity level:</i> complex supply chain with many different suppliers of parts and modules; large variety of products and product variations</p> <p><i>Logistical needs:</i> industry is dependent on strongly coupled production systems that need to be served by JIT, partly long-term close partnerships and partly no cooperative structures at all due to competitive pressure</p>
Selection criteria for the localisation of value added services	<p><i>Logistical supply:</i> on-time delivery; fast, efficient and cost competitive global transport chains</p> <p><i>Area location:</i> due to many different forms of supply chains no preferable location for VAS; many VAS customer related, so they are best implemented close to markets of demand</p>
	<p><i>Operators:</i> Some global LSPs have specialized in high-tech logistics</p>

10.2 Dimension 2 – Geographic Targets with Major Sources and Major Destinations

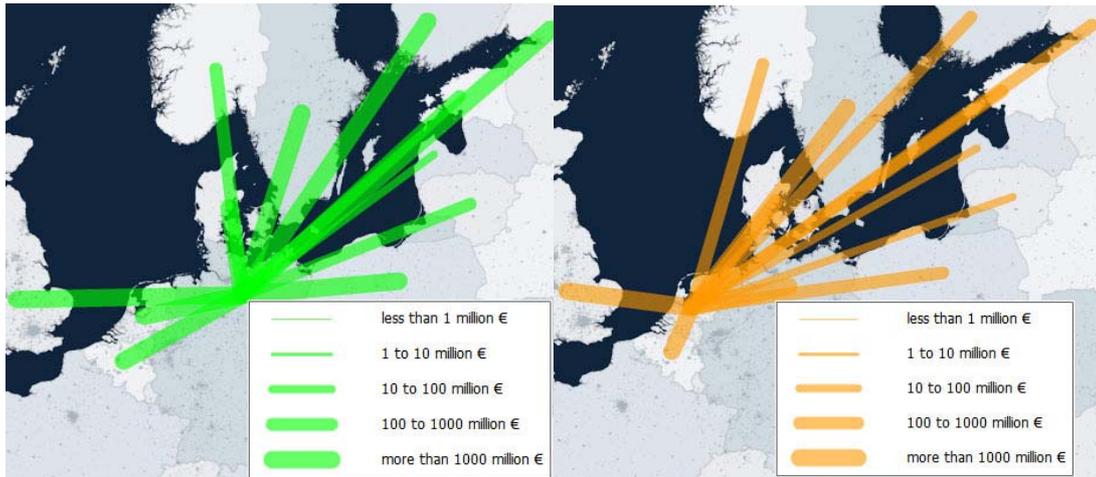
In the EU the industry has developed several IT and electronics cluster where competencies in this area are concentrated. This is especially true for Finland with a network of companies around the global player Nokia and Estonia where an SME network of companies has developed. The stage of development is different and trade relations show the global orientation of Finland and the rather regional focus of Estonia.

Map 10-1: Goods Flow HS2 Product Group 85 - Electronics, Exports 2005 from Estonia (l.) and Finland (r.)

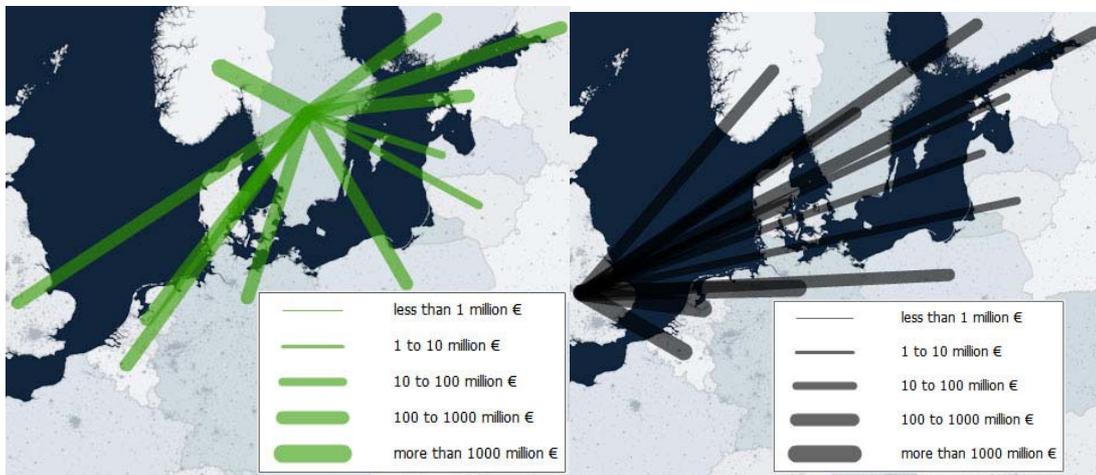


The industry is also of major importance for trade flows from Germany, the Netherlands, Sweden and the UK.

Map 10-2: Goods Flow HS2 Product Group 85 - Electronics, Exports 2005 from Germany (l.) and Netherlands (r.)



Map 10-3: Goods Flow HS2 Product Group 85 - Electronics, Exports 2005 from Sweden (l.) and the UK (r.)



Major markets are, in general, all western European countries that use electronics as an input for further production of goods like the automotive industry and as consumer goods.

10.3 Dimension 3 – Possible “Value Added Services” for Port Areas

As the electronics industry is rather based on the supply of the necessary parts for the finished products, the supply chains of electronic companies depend on specialised services for the supply of parts.

Necessary logistical services could therefore provide the following that relate largely to the handling of the necessary parts for the production process but also relates to the customer individualization:

- Parts procurement support
- Milk-run collection
- Parts stock management
- Picking, packing & labelling operations
- JIT delivery to the factory
- Stock management of finished goods

- Export & import operations
- Non-residential stock operation
- After-market parts logistics
- E-commerce
- Reverse logistics

Specialised value addition is also possible but depends on the product of concern. Services like addition of country specific manuals, individualization through different covers, implementation services and other directly customer related services are possible.

The following VAS could be offered in port areas where electronics parts and finished products are handled:

- Parts procurement centres that consolidate different parts flows to supply electronics manufacturing companies with one goods flow (sequencing)
- Warehousing of finished products as well as supply and spare parts
- Picking, packing and labelling
- Lot & carton management
- Nationalising
- Refurbishing/rejuvenating
- Kitting
- Quality control
- (Sub) assembling
- Re-branding
- Technical configuration & pre-installation of office equipment
- Serial number registration
- Stuffing data, electronic filling, documentation and sharing real-time shipping information via web systems (cargo tracking)
- Installation at site of use

Other individualized services might also be thinkable depending on the needs of the company in need of a VAS. Today's LSPs for electronics and high-tech goods are generally in favour of providing individualized services to their customers.¹⁸⁷

10.4 Dimension 4 – Major Shippers

According to turnover and employees the electronics and electrical equipment industry is one of the largest in northern Europe. It includes companies belonging to the following NACE codes and product groups with the HS codes:

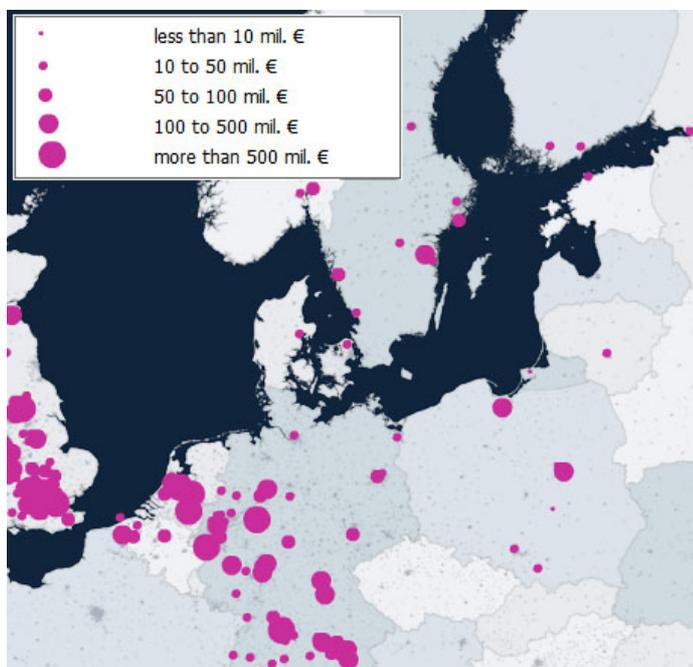
¹⁸⁷ i.e. <http://www.nyklogistics.com>

NACE: Manufacture of electrical machinery and apparatus (3100), Manufacture of electric motors, generators and transformers (3110), Manufacture of electricity distribution and control apparatus (3120), Manufacture of insulated wire and cable (3130), Manufacture of accumulators, primary cells and primary batteries (3140), Manufacture of lighting equipment and electric lamps (3150), Manufacture of electrical equipment for engines and vehicles (3161), Manufacture of other electrical equipment (3162), Manufacture of radio, television and communication equipment and apparatus (3200), Manufacture of electronic valves and tubes and other electronic components (3210), Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy (3220), Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods (3230), Wholesale of electrical household appliances and radio and television goods (5143), Wholesale of computers, computer peripheral equipment and software (5184), Wholesale of other electronic parts and equipment (5186)

HS: Electrical Machinery and Equipment and Parts thereof; Sound Recorders and Reproducers, Television Image and Sound Recorders and Reproducers, and Parts and Accessories of such Articles (85)

A major category of companies in terms of turnover and complexity of the supply chain are the companies manufacturing computers and related equipment. Most of them are subsidiaries of global players and are overseeing the European plants and retail operations of the company. Many of their products are arriving from the Far East and therefore provide potential for services in the area of country specific customization and installation at the site of use.

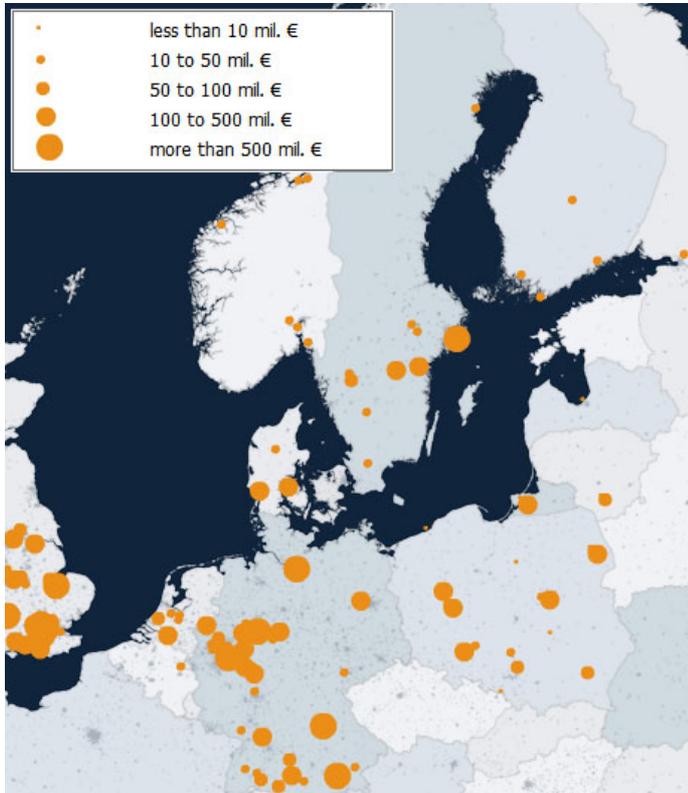
Map 10-4: NACE 3002 – Computers and Other Information Processing Equipment, Major Companies, Turnover 2004



Company	Country	City	Turnover million €
IBM UK LTD.	UK	PORTSMOUTH	5681
HEWLETT - PACKARD LTD.	UK	BRACKNELL	4206
LOGICACMG PLC	UK	LONDON	2677
SUN MICROSYSTEMS INTERNATIONAL B.V.	NE	AMERSFOORT	2375
SIEMENS PUBLIC LTD. COMPANY	UK	BRACKNELL	1929
HEWLETT-PACKARD PRODUCTS C.V.	NE	AMSTELVEEN	1510
ACTEBIS PEACOCK GMBH & CO. KG	DE	SOEST	830
FIC FIRST INTERNATIONAL HOLDING B.V.	NE	'S-HERTOGENBOSCH	750
MAXDATA SYSTEME GMBH	DE	WUERSELEN	700
SANMINA-SCI U.K. LTD.	UK	LONDON	614
MAGIRUS INTERNATIONAL GMBH	DE	STUTTGART	574
INVENTEC (SCOTLAND) CORPORATION LTD.	UK	GLASGOW	561
FUJITSU SIEMENS COMPUTERS LTD.	UK	BRACKNELL	506
BÖWE SYSTEC AG	DE	AUGSBURG	479
EPSON DEUTSCHLAND GMBH	DE	MEERBUSCH	462

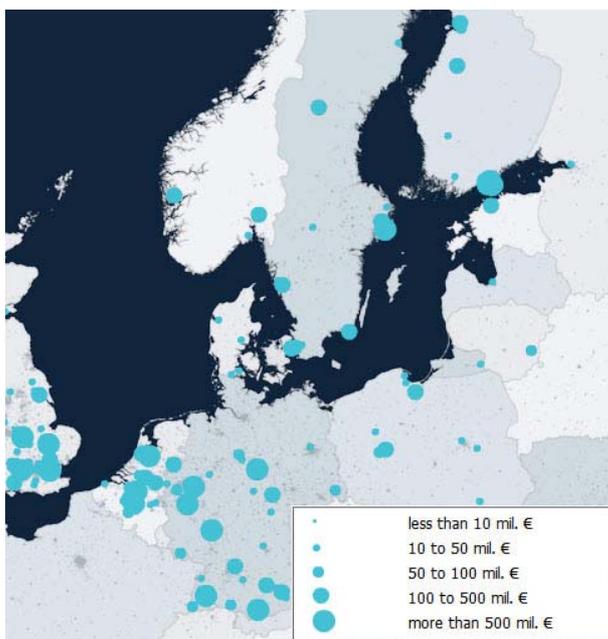
Companies in the category of electrical domestic appliances are generally sourcing from and producing at a regional market. Most of the major companies are locally embedded companies with a long regional historical background but with growing importance on world markets.

Map 10-5: NACE 2971 – Electrical Domestic Appliances, Major Companies, Turnover 2004



Company	Country	City	Turnover million €
AB ELECTROLUX	SE	STOCKHOLM	13401
BSH BOSCH UND SIEMENS HAUSGERÄTE GMBH	DE	MUNICH	4257
SONY UK LTD.	UK	WEYBRIDGE	3873
PHILIPS GMBH	DE	HAMBURG	2075
VAILLANT GMBH	DE	REMSCHEID	1866
MIELE & CIE. KG	DE	GUETERSLOH	1657
AEG HAUSGERÄTE GMBH	DE	NUERNBERG	1233
PHILIPS ELECTRONICS UK LTD.	UK	GUILDFORD	1028
GENERAL DOMESTIC APPLIANCES HOLDINGS LTD.	UK	PETERBOROUGH	942
INDESIT COMPANY UK LTD.	UK	PETERBOROUGH	942
TOSHIBA INFORMATION SYSTEMS (UK) LTD.	UK	ADDLESTONE	834
DYSON JAMES LTD.	UK	MALMESBURY	604
SHARP ELECTRONICS (U.K.) LTD.	UK	UXBRIDGE	497
VORWERK ELEKTROWERKE GMBH & CO. KG	DE	WUPPERTAL	436
LIEBHERR-HAUSGERÄTE OCHSENHAUSEN GMBH	DE	OCHSENHAUSEN	400

Map 10-6: NACE 3220 – Television and Radio Transmitters and Apparatus, Major Companies, Turnover 2004

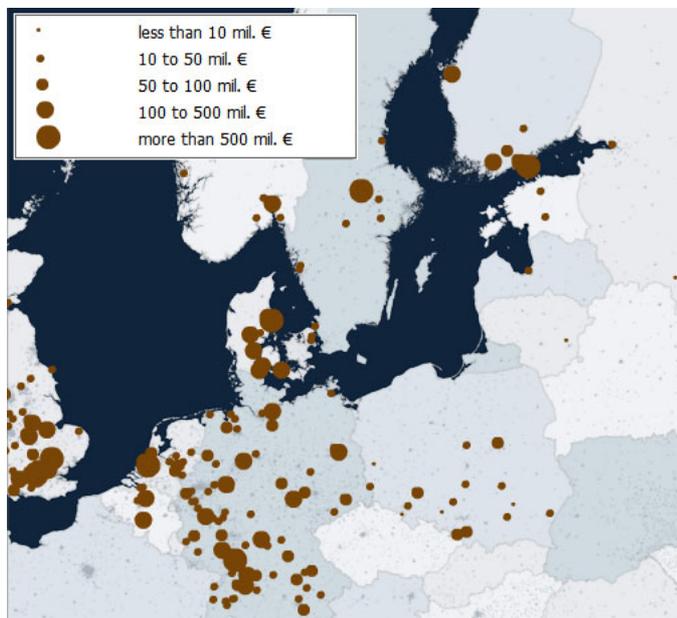


Company	Country	City	Turnover million €
NOKIA OYJ	FI	HELSINKI	34476
ERICSSON AB	SE	STOCKHOLM	8694
MOTOROLA GMBH	DE	TAUNUSSTEIN	4434
ELCOTEQ SE	FI	ESPOO	4164
NOKIA GMBH	DE	BOCHUM	3961
AMSH B.V.	NE	AMSTERDAM	2731
NOKIA UK LTD.	UK	HUNTINGDON	1905
SIEMENS	BE	BRUSSEL	1219
ALBA PLC	UK	BARKING	965
ALCATEL BELL	BE	ANTWERPEN	892
TELENT COMMUNICATIONS LTD.	UK	COVENTRY	805
ROBERT BOSCH ELEKTRONIK GMBH	DE	SALZGITTER	780

A different picture is shown in the category of mobile phones and television apparatus. These companies are all fiercely competing on the world market and are extremely driven by product innovation that has led to complex supply chains.

Companies in the business of electric motors, generators and transformers are one of the strongest company categories in the EU especially in Germany. They supply a wide range of different industries. What has become of growing importance is the increasing development of wind energy related motors. Denmark and Germany have gained major positions on this market.

Map 10-7: NACE 3110 – Electric Motors, Generators and Transformers, Major Companies, Turnover 2004



Company	Country	City	Turnover million €
MEMEC GROUP HOLDINGS LTD.	UK	STEVENAGE	1738
ABB OY	FI	HELSINKI	1604
SIEMENS NEDERLAND N.V.	NE	'S-GRAVENHAGE	1204
VESTAS ASSEMBLY A/S	DK	RANDERS	990
ABB POWER TECHNOLOGIES AB	SE	LUDVIKA	898
MICRON EUROPE LTD.	UK	CROWTHORNE	862
F. G. WILSON (ENGINEERING) LTD.	UK	LARNE	807
ALSTOM POWER GENERATION AG	DE	MANNHEIM	728
ALSTOM POWER LTD	UK	RUGBY	499
ABB UTILITIES GMBH	DE	MANNHEIM	489
ORANGE RETAIL LTD.	UK	BRISTOL	478
VESTAS TOWERS A/S	DK	RANDERS	413
FUTURE ELECTRONICS LTD.	UK	SLOUGH	395
SPIRENT COMMUNICATIONS PLC	UK	CRAWLEY	378
SIEMENS WIND POWER A/S	DE	BRANDE	376

10.5 Dimension 5 – Major Logistical Providers

The electronics industry is largely in need of individualized logistical solutions. This follows in line with the current development of the logistical sector to provide more and more customer specific solutions. The following table shows the major LSPs with a business focus on the handling of high-tech products

Table 10-2: Major LSPs with a business focus on electronics and high-tech

Company	Location	Turnover EU million € 2004	Profile
TNT	AMSTERDAM	8777	Mail and express services; TNT Logistics focuses on logistical solutions (e.g. automotive, consumer goods, high-tech, publishing)
Exel (DHL)	BRACKNELL	8776	Largest European contract logistics provider; electronics, consumer goods, chemicals, health care industry and retail; part of DHL since 2005
Schenker (Deutsche Bahn)	KELSTERBACH	8024	Leading provider of network-based and integrated logistics on the German market; landside transport for break bulk, sea/air freight, logistical services
Kuehne + Nagel	HAMBURG	7508	Inter. logistics company, sea/air freight, contract logistics
DHL Logistics (Deutsche Post)	BONN	6786	DHL Solutions: industrial and consumer goods contract logistics; DHL DANZAS AIR and OCEAN: intern. shipping agency; Main customers: automotive, pharmacy/health care, electronics/IT consumer goods, textiles

Port-Net: “EDI and Cargo Flows in the North and Baltic Sea Region - an Analysis for Potential Logistical Services”

Panalpina	BASEL	3965	Intern. shipping agency; sea/air freight with contract logistics
Gefco	COURBEVOIE CEDEX	3894	Subsidiary of PSA PEUGEOT CITROEN; automotive, cosmetics, high-tech and other consumer goods
Geodis (SNCF)	CLICHY	3371	Integrated logistical services
DMS (Cooperation)	DUESSELDORF	120	Intern. relocation transports within a cooperation network of 90 partners; moving, project transports, container handling
Wincanton	WINCANTON	2512	Contract logistics for the consumer goods industry; Other industries: food retail, automotive, other retail
Geodis	FRANKFURT		Transport (supply, distribution, sea/air freight, bimodal traffic, project logistics, special deliveries), techn. services like repair and after-sales-services (spare-parts, reverse logistics) as well as roll-out (delivery of high-tech goods)
GPL	HAMBURG		Nat. supply and distribution logistics with focus on B2C, supply, warehousing, picking and packing of furniture, white goods, sensitive goods, heavy loads, assembly, installation, mail-order
Frans Maas Group	VENLO	1091	Intern. road transports, contract logistics; automotive, packaged chemical goods, high-tech
Lufthansa Technik Logistik	HAMBURG		Logistical solutions for the aviation industry, parts managements, spare parts services, warehousing, transport, time critical logistics
Willi Betz	REUTLINGEN	900	Vehicle Logistics
Arvato Logistics	GUETERSLOH	770	Contract logistics for consumer goods with customers from finance, telecommunications, It, media, pharmacy and automotive
IHG Logistics	HILDEN	710	Break bulk shipping agency, distribution, automotive, textile, electronics, machinery, consumer goods, chemie/pharmacy, retail, road and rail, overseas services, logistical services
Gebr. Weiss	LAUTERACH	708	Road and air transports, full load transport and industrial contract logistics
NYK Line Europe	LONDON	631	Shipping Company
Stute	BREMEN		Subsidiary of KUEHNE + NAGEL; Europe traffic (truck, rail, barge, pipeline), sea traffic (container, port logistics), air freight (time-critical transports, flight logistics), complete logistical solutions for the industry (e.g. Airbus)
Anker Leschaco	BREMEN	560	Sea and air freight in the areas of aircraft, automotive, bulk, chemicals/pharmaceuticals, project logistics, warehousing
Ewals Cargo Care	TEGELEN	380	Break bulk transport with own large truck fleet; customers: automotive, electronics, retail
trans-o-flex	WEINHEIM	431	Leading European provider of combined transport in B2B; industries: cosmetics, textile, It, radioactive dangerous goods; express delivery
FM Logistic	PHALSBOURG	330	Integrated logistical solutions for consumer goods industry; customers: food producers (e.g. KRAFT FOODS, LORENZ, UNILEVER, MASTERFOODS), supermarket chains, high-tech OEM
D.Logistics	HOFHEIM	312	Holding company; customer and project specific logistical and logistics related services at the customers location, consumer and industry packaging, warehousing (automotive, chemicals, electronics, health care, consumer goods, air freight, machinery)
VIKTORIA-Logistik-Systeme (DFDS Transport)	ASCHAFFENBURG	75	Subsidiary of DFDS TRANSPORT; nat./intern. consolidated cargo; contract logistics (spare parts, electronics, It, textile)
premium logistics (Wincanton)	LA VERPILLIERE	270	Transport services and contract logistics for automotive, consumer goods, high-tech and pharmacy industry as well as retail; part of WINCANTON since 2006
Wincanton midiData	LANGEN		LSP for the high-tech industry
BWG Reimer	BREMEN		Multimodal nat. and intern. transports, logistics for health care, automotive, food, machinery, paper, wood, media and consumer goods industries
Grieshaber	BAD SAECKINGEN		Customer oriented outsourcing concepts, road transports, paper, pharmacy, spare parts, automotive, high-tech
Mueller - die lila Logistik	BESIGHEIM		Supply, distribution, product logistics with focus on automotive and high-tech
Simon Hegele	KARLSRUHE		Contract logistics provider for industry and retail; business areas area moving, health care, IT/Industry
TNT Logistics	FRANKFURT		Subsidiary of TNT (NL); solutions for the industries automotive, high-tech, media, fashion, pharmacy
Tts	HAMBURG		Dry consumer goods contract logistics, industrial contract logistics, pharmacy logistics, IT and consulting

10.6 Electronics Logistics as an Investment Target

Electronics logistics provide much potential for additional services. The supply chain of electronics companies has increased in size over the last years and has developed much like

the automotive supply chain with a variety of suppliers from different parts of the world. To incorporate this variety it is not only necessary to implement an appropriate SCM but also to develop SCC and to improve the competitiveness of the whole supply chain by distributing the value addition process over the whole chain.

The mentioned VAS possibilities are ways in which port areas can participate as well. In general these are not part of the traditional port services. But due to the fact that many parts, modules and finished products are arriving from the Far East where production is much cheaper, the final assembly, configuration, set up or further consolidation and distribution can be done on European premises.

Investments in such areas need to be undertaken in close cooperation to the shipping companies (LSP and OEM) and can not be implemented by themselves as the value addition process along the supply chain is too individualized with each product. The electronics industry is therefore in need of individualized concepts for adding value to and distributing their products.

11 Logistics of Machinery and Mechanical Appliances

11.1 Dimension 1 – Industry Analysis

Europe is more specialised in mechanical than in electrical engineering. Last year the EU output of mechanical equipment amounted to €22,034 million, which accounts for 65% of total engineering. Unlike the old EU countries, the new EU countries are less specialised in mechanical than in electrical engineering. Mechanical engineering represents only 43% of their total engineering production.¹⁸⁸

During the period 1996-2005 the EU25 mechanical engineering has grown by an annual average of 4% in nominal terms. Between 2004 and 2005 the sector's output has increased by 4.6%. The industry is growing much faster in the new EU countries than in the old countries. Germany is the largest producer of mechanical engineering products with an output of €65,571 million in 2005, which accounts for 39% of EU output in this industry. This means that Germany is more specialised in mechanical engineering than in engineering in general. The following countries are: Italy (16%), France (11%) and the UK (8.5%). Among the new member states, the biggest manufacturer is Poland with 1.5% of EU output.¹⁸⁹

Mechanical Engineering is one of the largest industrial sectors in the EU, according to number of enterprises, employment, production and generation of added value; also, it is a very export oriented industry. EU Mechanical Engineering is the world leader in its sector: its competitiveness rests among other things on key know-how, product quality and having the world's largest market for mechanical equipment as home market and excellence in export.¹⁹⁰

This industrial sector is the core of the investment goods industry and is therefore an integral part of other industries that use complex technical products as an asset for industrial competitiveness in northern Europe. The industry relies heavily on a structure of SMEs. For Germany roughly 70% of the 6,000 companies in the sector employ less than 100 employees. On average only 150 employees work for machinery companies. But the industry is one of the largest employers in northern Europe. Furthermore it exports more than two thirds of its produced goods while more than 50% remain in Europe.

The development of the industry follows the general economic development. In 2004 only in Germany a turnover of €42.7 billion was achieved which implies a growth of 6.6% compared to the previous year. Production accounted for €36 billion (5.4%) and exports grew to €7.8 billion (11.0%). As Germany is one of the three major players in the machinery industry (in terms of turnover after the United States and Japan), it is also dominating the trade in northern Europe. For the year 2005 a growth rate of the production of about 3% was achieved. This development is mainly based on product innovation. In this respect it is advantageous for the industry to find customers that are technological leaders in their field as well the relevant suppliers of basic technologies in close proximity in northern Europe, especially in the German federal states Nordrhein-Westfalen und Baden-Württemberg.

The industry has a fairly low logistics costs ratio compared to other industries. Only 11.8% of total costs are spent on logistical services. The situation is similar to the automotive sector as

¹⁸⁸ Ayala, P., Spiechowicz, M., Vidaller, J. (2006): EU Engineering Competitive Update, Brussels.

¹⁸⁹ *ibid.*

¹⁹⁰ http://ec.europa.eu/enterprise/mechan_equipment/index_en.htm

logistics costs are identified as less important than human resource or material costs. But the level of logistical performance is in general quite high. Logistics potential has been identified and targeted by most of the companies so that the average machinery company achieves 74% of the best-practice logistical fitness level of the top 10 companies in the industry.¹⁹¹ But storage space, delivery dependability and transport times are estimated as to be insufficient for current and future needs. Further improvement potentials are expected to be in the area of supply chain management and inter company processes. From this follows that the interfaces between logistical processes provide further potential for optimization.

When looking at the performance of external and own logistical services much of the potential has been targeted at least because of the high number of alternative service providers. The highest optimization potential has been achieved through the cooperation with express-service-providers. Flexibility in logistics is therefore highly attributed to such service providers in the machinery industry.

The question about outsourcing potential is tackled on average in the industry compared to other sectors. Only 29% of the companies see high cost reduction through outsourcing as possible.¹⁹² But the potential through outsourcing of warehousing activities, IT-services as well as the relocation of distribution centres is estimated as above average.

Table 11-1: Industrial Chains Analysis Machinery

Industrial Chains Analysis	
Structural features of the industrial chains	<p><i>Dimension:</i> flows dominated by Germany and the UK; world market demand is served from these countries</p> <p><i>Complexity level:</i> growing complexity; increasing specialization on certain machinery; variety of products, variety of suppliers; SME structure</p> <p><i>Logistical needs:</i> Economies of scope, small scale and discontinuous production, no JIT-concepts necessary, rarely close cooperations between manufacturer and supplier</p>
Selection criteria for the localisation of value added services	<p><i>Logistical supply:</i> flexibility; cost efficiency</p> <p><i>Area location:</i> closeness to production facilities or at customer site; distribution warehousing for large or several smaller OEM located in core markets in central Europe</p>
	<p><i>Operators:</i> highly specialized LSPs needed for large machinery; European wide players</p>

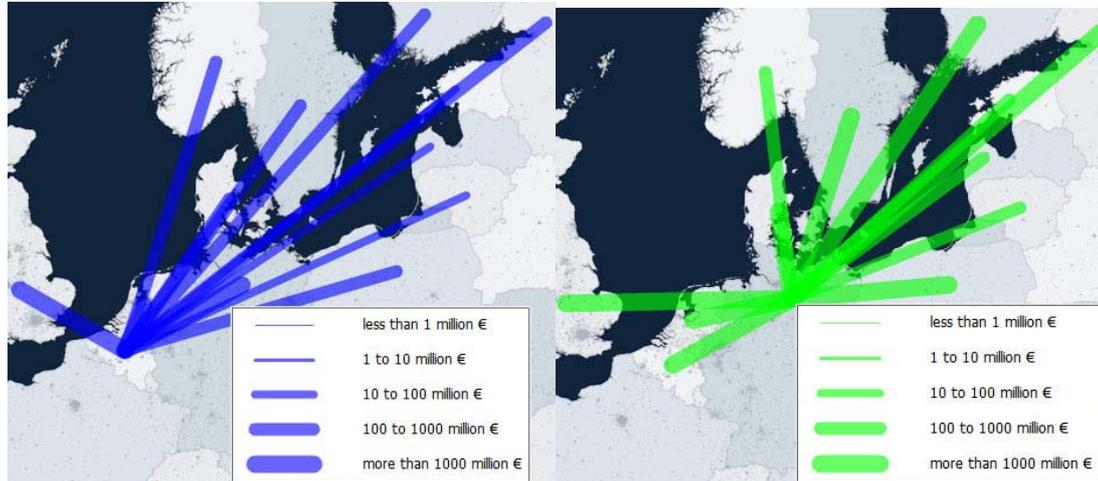
¹⁹¹ Jahns, Langenhan, Walter 2005, pp. 47

¹⁹² *ibid.*

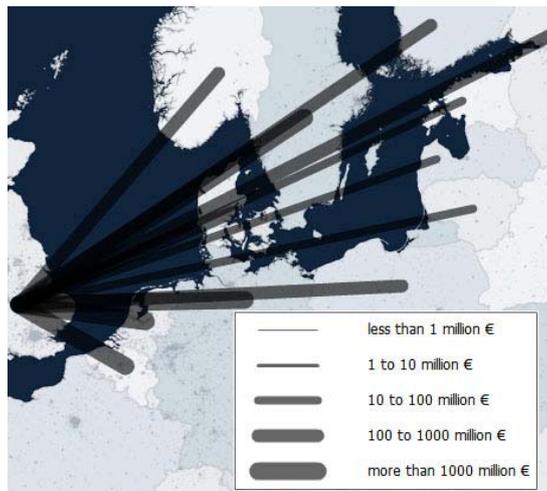
11.2 Dimension 2 – Geographic Targets with Major Sources and Major Destinations

Cargo flows of finished machinery products are dominated by Germany. The largest producer of machinery is also exporting many of its products. Belgium and the UK are also producing large quantities in terms of exported value to basically all northern European countries.

Map 11-1: Goods Flow HS2 Product Group 84 - Machinery, Exports 2005 from Belgium (l.) and Germany (r.)



Map 11-2: Goods Flow HS2 Product Group 84 - Machinery, Exports 2005 from the UK



11.3 Dimension 3 – Possible “Value Added Services” for Port Areas

The optimization potential for interfaces between logistical processes in the industry provides possibilities for port areas as they can offer services that fit into the supply chain of companies whose interfaces need to be improved. In this respect ports can be seen as such interfaces where logistical processes are integrated, combined or further divided. As to provide additional value for the shipping companies certain services can be offered. In accordance with industry estimates the following VAS can be of importance for port areas:

- Warehousing, in order to provide for sufficient and efficient storage space
- Consolidation and distribution, in order to combine several logistical flows and provide the producing company as well the customer with integrated and individualized flows of goods. This could also be combined with IT-services for the supply chain.

Any kind of individualization of the concerned machinery is generally not applicable because manufacturing companies are largely producing in-house according to highly individualized demand. But picking and packing as well as labelling and related services especially for spare parts are possible in this industry as well.

11.4 Dimension 4 – Major Shippers

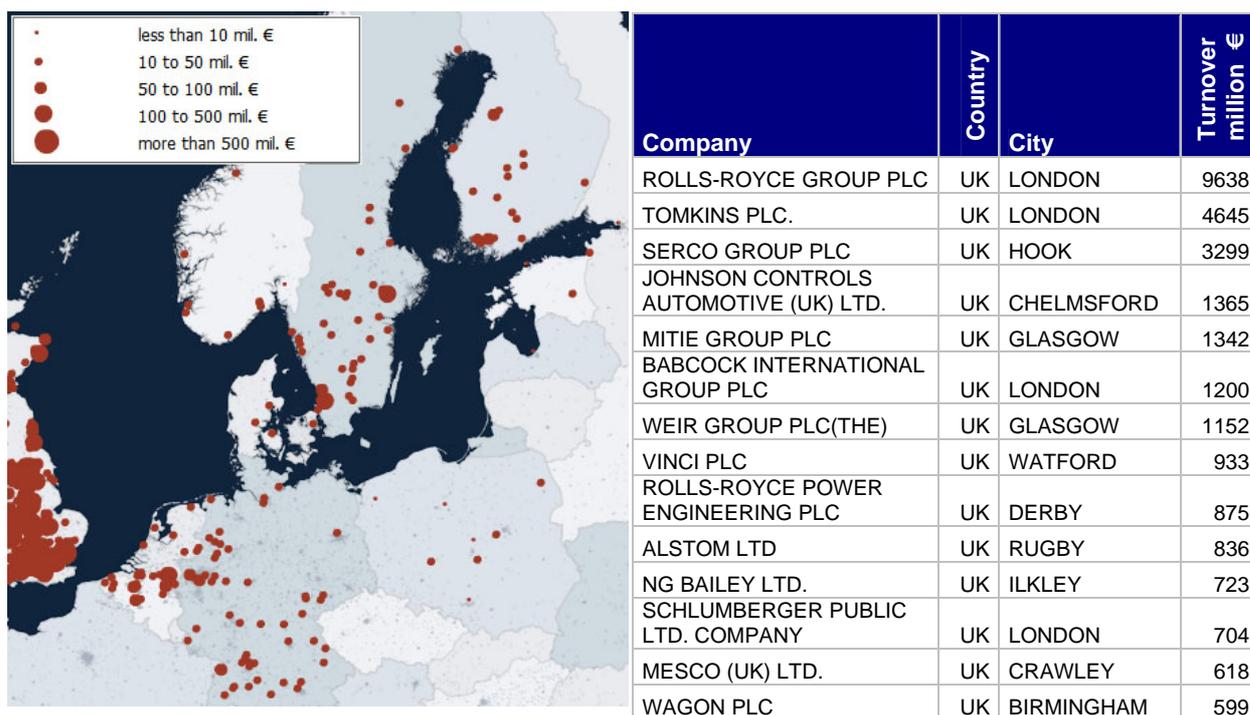
According to turnover and employees the machinery and mechanical appliances industry is also one of the largest in northern Europe. It includes companies belonging to the following NACE codes and product groups with the HS codes:

NACE: Manufacture of central heating radiators and boilers (2822), General Mechanical Engineering (2852), Manufacture of machinery and equipment (2900), Manufacture of engines and turbines except aircraft, vehicle, cycle engines (2911), Manufacture of pumps and compressors (2912), Manufacture of taps and valves (2913), Manufacture of bearings, gearing and driving elements (2914), Manufacture of furnaces and burners (2921), Manufacture of lifting and handling equipment (2922), Manufacture of non-domestic cooling and ventilation equipment (2923), Manufacture of other general purpose machinery (2924), Manufacture of agricultural tractors (2931), Manufacture of other agricultural and forestry machinery (2932), Manufacture of portable hand held power tools (2941), Manufacture of other metalworking machine tools (2942), Manufacture of other machine tools (2943), Manufacture of machinery for metallurgy (2951), Manufacture of machinery for mining, quarrying and construction (2952), Manufacture of machinery for food, beverage and tobacco (2953), Manufacture of machinery for textile, apparel and leather (2954), Manufacture of machinery for paper and paperboard (2955), Manufacture of other special purpose machinery (2956), Wholesale of hardware, plumbing and heating equipment and supplies (5154), Wholesale of mining, construction and civil engineering machinery (5182), Wholesale of machinery for the textile industry and of sewing and knitting machines (5183), Wholesale of machinery for the textile industry and of sewing and knitting machines (5187)

HS: Nuclear Reactors, Machinery and Mechanical Appliances; Parts Thereof (84)

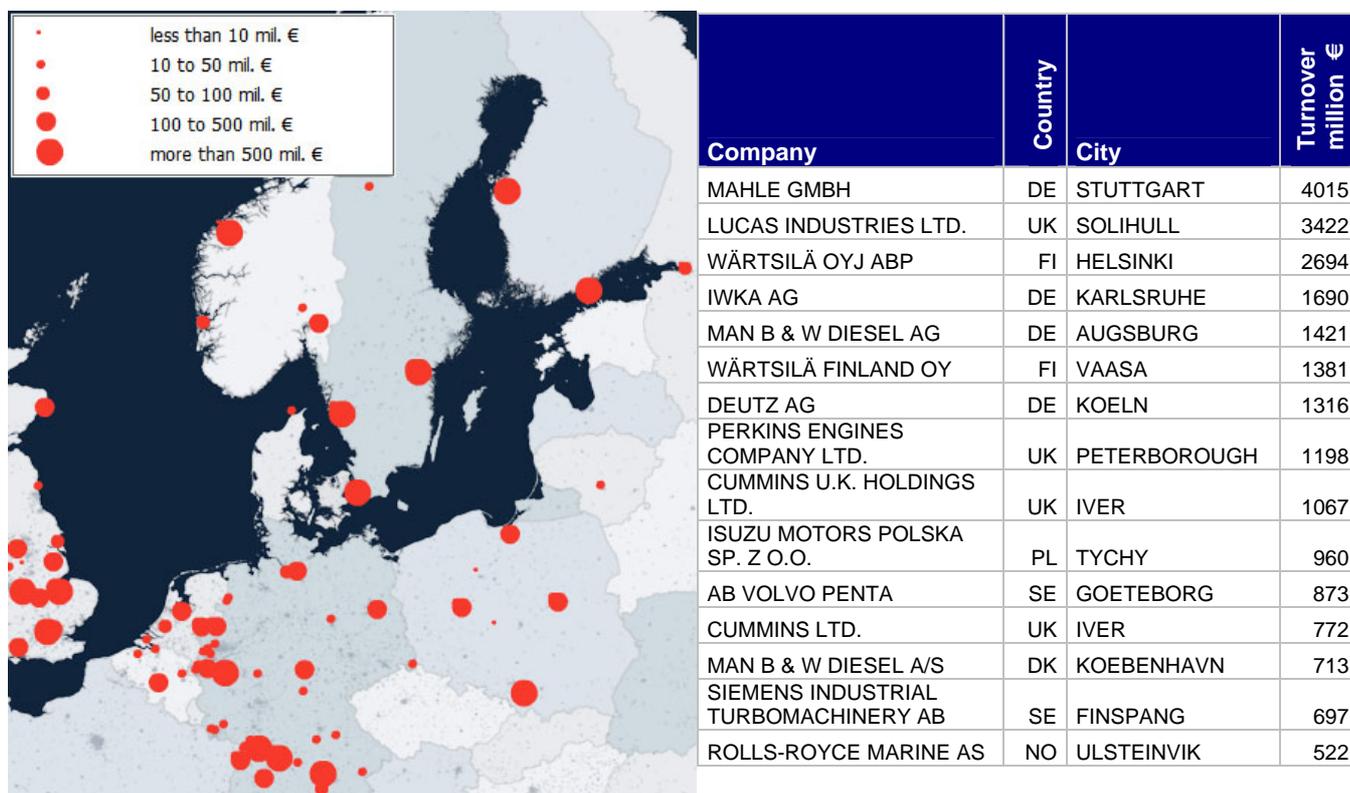
The regional distribution of companies depends on the business category. General engineering companies are mostly concentrated in the UK. This, however, shows the problem of putting the single company into the right category because most of these companies are doing much more specific work than general engineering.

Map 11-3: NACE 2852 – General Mechanical Engineering, Major Companies, Turnover 2004



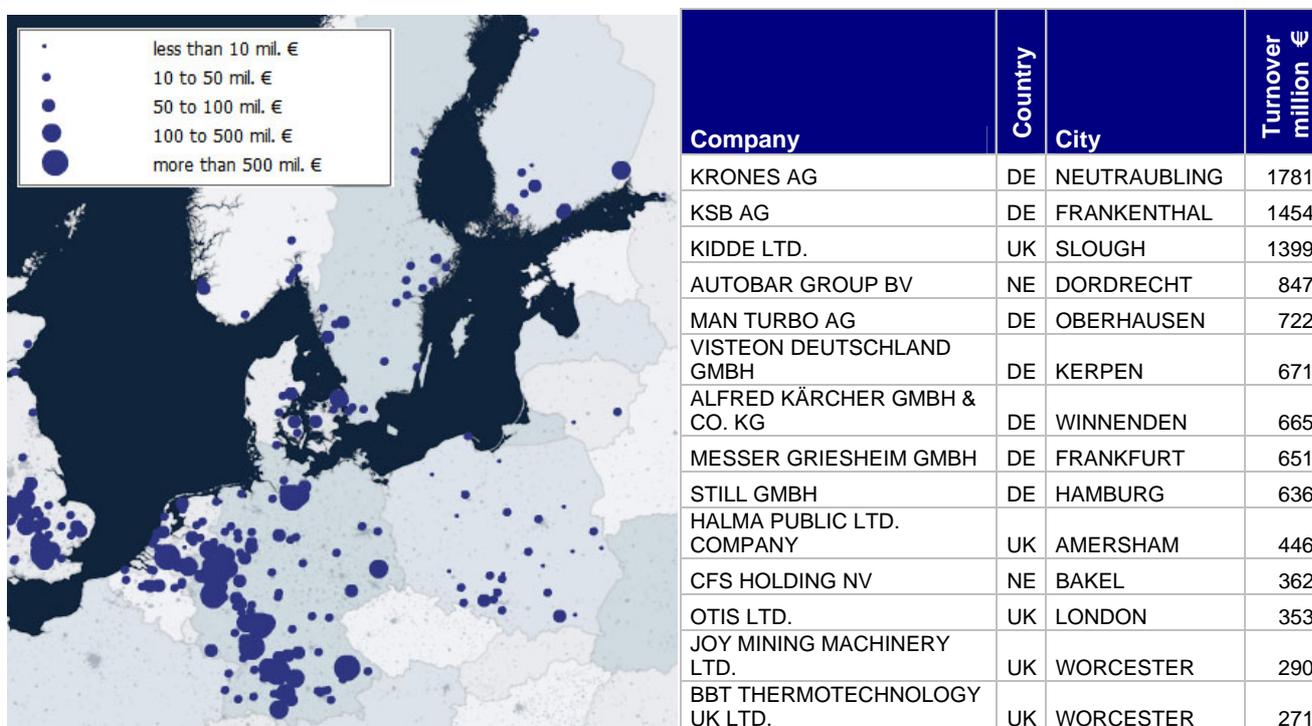
The engines and turbines is a rather small market in comparison to general engineering but many large companies are located all over Europe. The geographical location is not as important in this industry compared to the value that is produced and the global market that is served.

Map 11-4: NACE 2911 – Engines and Turbines, except Aircraft, Vehicle and Cycle Engines, Major Companies, Turnover 2004



Looking at general purpose machinery, the SME structure of the industry becomes evident. Especially Germany exhibits many companies in this area in North-Rhine Westphalia and Baden-Württemberg. Although most of these companies are locally embedded, they have gained world market access and are able to sustain a competitive status. Their central location in Europe provides for rather short spoke relations to all neighbouring countries.

Map 11-5: NACE 2924 – Other General Purpose Machinery, Major Companies, Turnover 2004



11.5 Dimension 5 – Major Logistical Providers

The machinery industry is a largely diversified industry with products ranging large manufacturing engines to small bearings. To provide for appropriate logistical services a range of activities must be offered. Limiting the product to a certain size, many LSPs are capable of dealing these kinds of goods. Heavy load and project cargo, however, is only served by a few LSPs as it is a rather narrow market.

Company	Location	Turnover EU million €2004	Profile
Schenker (Deutsche Bahn)	KELSTERBACH	8024	Leading provider of network-based and integrated logistics on the German market; landside transport for break bulk, sea/air freight, logistical services
Kuehne + Nagel	HAMBURG	7508	Inter. logistics company, sea/air freight, contract logistics
Geodis (SNCF)	CLICHY	3371	Integrated logistical services
Fiege	GREVEN	1503	LSP for contract logistics, integrated logistical systems for consumer goods, machinery and retail
Geodis	FRANKFURT		Transport (supply, distribution, sea/air freight, bimodal traffic, project logistics, special deliveries), techn. services like repair and after-sales-services (spare-parts, reverse logistics) as well as roll-out (delivery of high-tech goods)
GPL	HAMBURG		Nat. supply and distribution logistics with focus on B2C, supply, warehousing, picking and packing of furniture, white goods, sensitive

			goods, heavy loads, assembly, installation, mail-order
J.H. Bachmann (DFDS Transport)	BREMEN	135	Sea/air freight, consolidated cargo for the transport of complete machines
Lufthansa Technik Logistik	HAMBURG		Logistical solutions for the aviation industry, parts managements, spare parts services, warehousing, transport, time critical logistics
Imperial Logistics	DUISBURG	870	Supply, distribution, production logistics, automotive logistics; IMPERIAL REEDEREI: large inland water way shipping company; J.H. BACHMANN: Intern. shipping agency and LSP, sea/air freight; PANOPA: logistical solutions, VAS, JIS for automotive
IHG Logistics	HILDEN	710	Break bulk shipping agency, distribution, automotive, textile, electronics, machinery, consumer goods, chemical/pharmacy, retail, road and rail, overseas services, logistical services
Stute	BREMEN		Subsidiary of KUEHNE + NAGEL; Europe traffic (truck, rail, barge, pipeline), sea traffic (container, port logistics), air freight (time-critical transports, flight logistics), complete logistical solutions for the industry (e.g. Airbus)
D.Logistics	HOFHEIM	312	Holding company; customer and project specific logistical and logistics related services at the customers location, consumer and industry packaging, warehousing (automotive, chemicals, electronics, health care, consumer goods, air freight, machinery)
VIKTORIA-Logistik-Systeme (DFDS Transport)	ASCHAFFENBURG	75	Subsidiary of DFDS TRANSPORT; nat./intern. consolidated cargo; contract logistics (spare parts, electronics, It, textile)
Bachmann (DFDS Transport)	BREMEN	260	Sea and airfreight; consolidated cargo traffic for the transport of complete machines
Panopa (Imperial)	DUISBURG	125	Subsidiary of the IMPERIAL GROUP, consulting and planning services, warehousing, JIT, JIS, in plant transport, picking and packing, assembly, fleet management, automotive, steel, spare parts logistics
BWG Reimer	BREMEN		Multimodal nat. and intern. transports, logistics for health care, automotive, food, machinery, paper, wood, media and consumer goods industries
Grieshaber	BAD SAECKINGEN		Customer oriented outsourcing concepts, road transports, paper, pharmacy, spare parts, automotive, high-tech
Mueller - die lila Logistik	BESIGHEIM		Supply, distribution, product logistics with focus on automotive and high-tech

11.6 Machinery Logistics as an Investment Target

Machinery logistics is a diverse field with many different possible activities due to the differentiated product structure. However, much of the value added process is done by the OEM companies themselves. This leaves only small room for VAS.

Relating to the SME structure, consolidation centres and warehousing facilities are possible for networks of SME companies. But this will only be feasible if the needs of the companies can be combined and the willingness of them to cooperate is at hand. Fierce competition on the market makes this questionable.

12 Logistics of Pharmaceutical Products

12.1 Dimension 1 – Industry Analysis

The European pharmaceutical sector makes a valuable contribution to economy and trade in the EU. It employs about 600,000 people in Europe of whom about 100,000 are in research and development. The output of the pharmaceutical industry was about €160 billion in 2004 and it exported roughly €95 billion. It makes a significant contribution to the Union's trade balance (€24 billion in 2003). However, Europe's role as a centre for pharmaceutical development and production has been declining. In 1992, 6 of the 10 biggest selling medicines in the world originated in Europe with 4 from the USA. In 2002 the situation has reversed with 8 of the top 10 selling medicines coming from the USA and only 2 from Europe.¹⁹³

Nevertheless, amounts of traded pharmaceutical products as well as traded values have constantly been growing over the last few years in Europe, especially as markets like Germany (25% market share of total EU), France (22%), Italy (15%) and the UK (11%) have been growing.¹⁹⁴

The pharmaceutical products industry is undergoing one of the highest growths in northern Europe compared to other industries. It is part of the chemical industry that provides a whole range of intermediate and finalized products from basic organic chemicals to life science products and pharmaceutical goods. Pharmaceutical products are looked at in detail as this area of business has experienced a tremendous growth over the last years in terms of turnover, traded goods and research & development. The industry has one of the highest research and development ratios. Concerning only Germany around €4.1 billion are spent every year in this area and it has become one of the most important exporting industries worldwide with a turnover of €23 billion in 2002.¹⁹⁵

Looking at the logistics of the industry, only 13% of total costs are spent on logistical services. Compared to other industries, this is under average and other areas like material costs, human resource costs and energy costs weigh far higher. However basic logistics tasks are tackled fairly well by most of the companies and potentials have been made accessible at a high rate.¹⁹⁶ This is mainly due to the high standards of the processing industry concerning the intermediate and finalized products as well as the strong regulatory environment. Because of this, relations of producing companies and contracted LSPs are mainly of strategic and trusting nature. Common goals and strategies are in the focus of these connections.

In the area of plant logistics the industry estimates that logistics are well developed and plant connections are optimized. Idle times and plant downtimes are minimized. Concerning the make or buy, the optimization potential is estimated as fairly low because of the specialized production processes and their related logistics.

In the area of return and waste logistics the industry has developed a high standard due to environmental regulatory laws and has implemented it in their processes. Compared to other industries this development is above average.

¹⁹³ http://ec.europa.eu/enterprise/phabiocom/comp_pip_intro.htm (06.11.2006)

¹⁹⁴ *ibid.*

¹⁹⁵ Jahns, Langenhan, Walter 2005, pp. 48

¹⁹⁶ *ibid.*, pp. 49

In delivering pharmaceutical products, a large part of logistical costs is spent on express delivery services. Differing from other areas in the chemical industry that mainly deal with high volumes, pharmaceutical products are distributed in small quantities and at low weights to internationally atomized market structures.

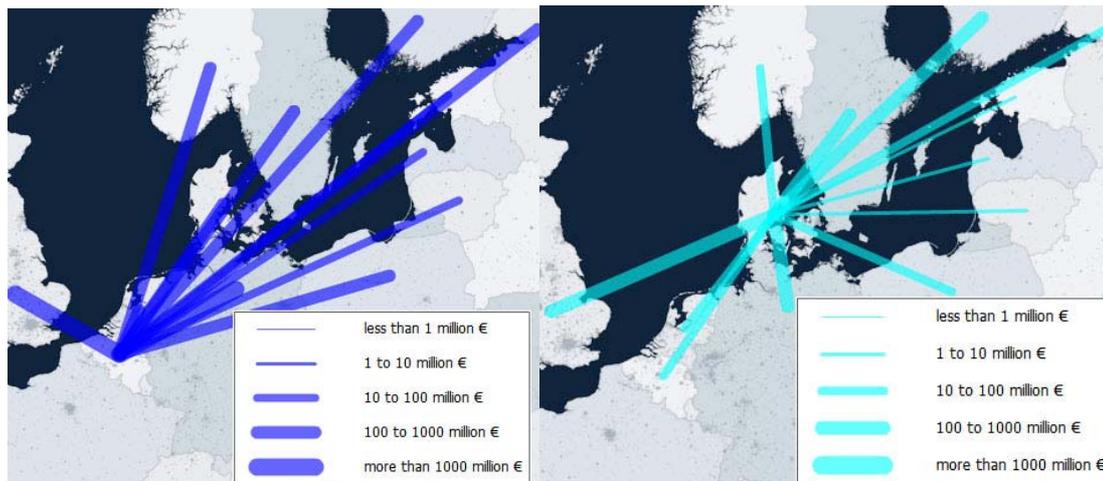
Table 12-1: Industrial Chains Analysis Pharma

Industrial Chains Analysis	
Structural features of the industrial chains	<p><i>Dimension:</i> small, high value quantities originating from the major players in Germany, Belgium, the Netherlands, the UK and the Öresund region</p> <p><i>Complexity level:</i> increasingly diverse assortment, growing supply chain complexity, hospital distribution</p> <p><i>Logistical needs:</i> chemical industry oftentimes located in industrial parks to profit from a common logistical system, through declining vertical integration more specialised logistical services needed, growing cost pressure, JIT-delivery on the last mile, consolidation of products, integrated logistical concepts</p>
Selection criteria for the localisation of value added services	<p><i>Logistical supply:</i> appropriate, temperature related storage and handling; extremely time critical</p> <p><i>Area location:</i> distribution centres in the major markets where major product flows are consolidated</p>
	<p><i>Operators:</i> few European players focus on time critical, temperature related deliveries</p>

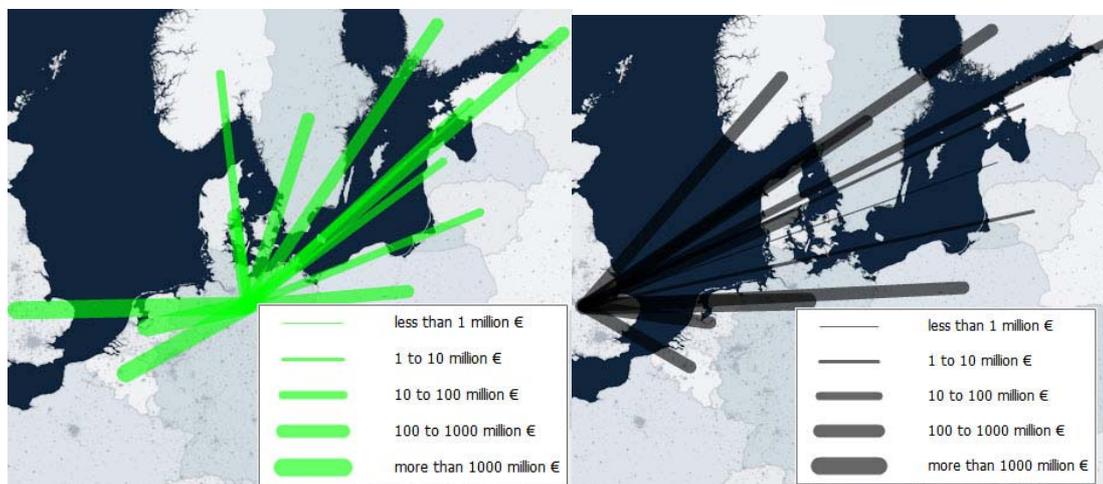
12.2 Dimension 2 – Geographic Targets with Major Sources and Major Destinations

Major flows of pharmaceutical products originate from the global pharmacy players in Germany, Belgium, the Netherlands, the UK and the Öresund region (Denmark and Sweden). However, goods flows do not relate to the economical size of the respective destination country but to the health care perception in the specific country and therefore to the related demand for pharmaceutical products. For instance, the demand of the Russian market for comprehensive health care and pharmaceutical products is still fairly low compared to the demands from western European countries. Nonetheless, it is expected that according to the economical growth and social development of the country, the convenience of these products will increasingly be appreciated over the next years.

Map 12-1: Goods Flow HS2 Product Group 30 - Pharmacy, Exports 2005 from Belgium (l.) and Denmark (r.)



Map 12-2: Goods Flow HS2 Product Group 30 - Pharmacy, Exports 2005 from Germany (l.) and the UK (r.)



12.3 Dimension 3 – Possible “Value Added Services” for Port Areas

Medical and pharmaceutical products manufacturers demand high quality standards of their LSPs. This concerns the storage, transport and safety of their products. Requirements demand adherence to a number factors besides specialized staff training in all aspects of handling and dispatch.

Necessary logistical services should provide the following:

- Dust free and temperature controlled storage environments
- Full training of warehouse and transport employees in all aspects of product handling and distribution to ensure product integrity throughout the supply chain
- Express delivery including even remote regions
- Establishing and fostering of trusted working relations between producing companies and LSPs

The following value added services could therefore be possible for port areas in general:

- Warehousing with appropriate temperature related facilities
- Consolidation and picking & packing of hospital products for regional distribution

- General packing & labelling of finished pharmaceutical products

12.4 Dimension 4 – Major Shippers

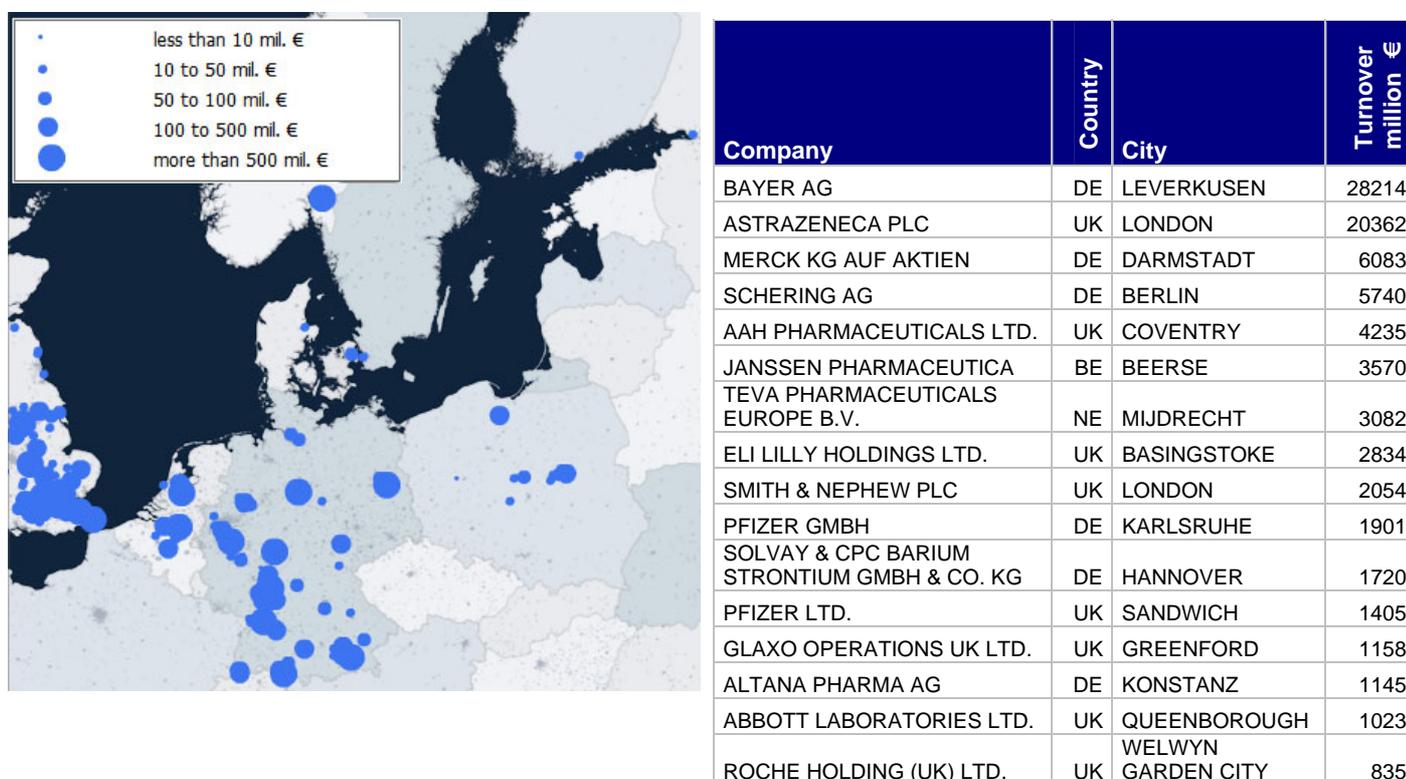
It includes companies belonging to the following NACE codes and product groups with the HS codes.

NACE: Manufacture of basic pharmaceutical products (2441); Manufacture of pharmaceutical preparations (2442); Wholesale of pharmaceutical goods (5146)

HS: Pharmaceutical Products (30)

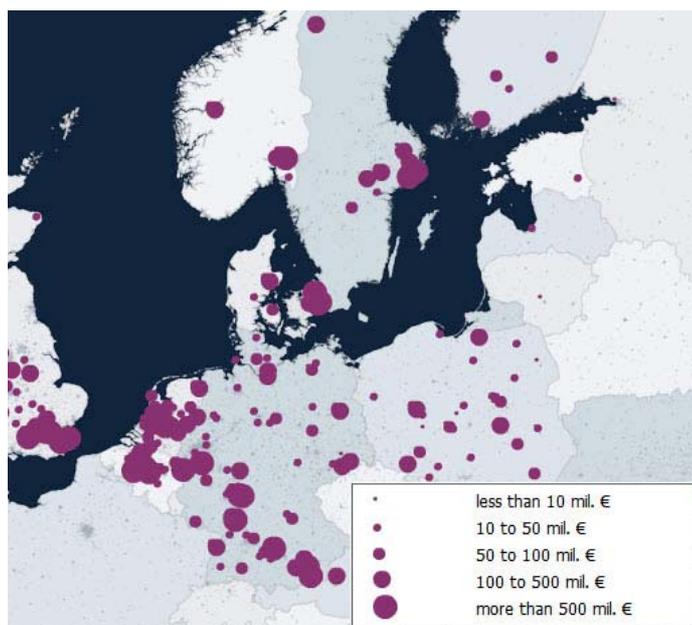
The companies of the industry show a strong concentration of companies in the area of basic pharmaceutical products in the UK and in southern Germany. Companies are mostly large and are operating on global markets with national branches.

Map 12-3: NACE 2441 - Basic Pharmaceutical Products, Major Companies, Turnover 2004



Special pharmaceutical preparations are less dominated by global players but rather show the importance of national corporations as well. In this case, a concentration of companies is seen in the Netherlands.

Map 12-4: NACE 2442 - Pharmaceutical Preparations, Major Companies, Turnover 2004



Company	Country	City	Turnover million €
GLAXOSMITHKLINE PLC	UK	BRENTFORD	31615
FRESENIUS AG	DE	BAD HOMBURG	7889
RECKITT BENCKISER PLC	UK	SLOUGH	6100
ASTRAZENECA AB	SE	SOEDERTAELJE	5462
NOVO NORDISK A/S	DK	BAGSVAERD	4525
GLAXO GROUP LTD.	UK	GREENFORD	4148
UCB	BE	BRUXELLES	3534
MERCK SHARP & DOHME INTERNATIONAL SERVICES B.V.	NE	HOOFDDORP	3525
ROCHE DIAGNOSTICS GMBH	DE	MANNHEIM	2965
AHP HOLDINGS B.V.	NE	HOOFDDORP	2657
OPG GROEP N.V.	NE	UTRECHT	2235
GLAXOSMITHKLINE BIOLOGICALS	BE	RIXENSART	1768
FRESENIUS KABI DEUTSCHLAND GMBH	DE	BAD HOMBURG	1681
HEXAL AG	DE	HOLZKIRCHEN	1433
SHIRE PLC	UK	BASINGSTOKE	1360
JOHNSON & JOHNSON MANAGEMENT LTD.	UK	MAIDENHEAD	1309
PAUL HARTMANN AG	DE	HEIDENHEIM	1273
PFIZER HEALTH AB	SE	STOCKHOLM	1242

12.5 Dimension 5 – Major Logistical Providers

The pharmaceutical industry puts high demands on its LSPs. Prior to contracting a LSP company, it has provide certain prerequisites in the areas of express delivery, storage and security. Only a few LSPs have established specific solutions for the pharmaceutical industry. On the other hand, it has to be kept in mind that the supply chain before the handling of the finished products has to be served. A few companies are also specifically dealing with bulk chemicals that are used for production of pharmaceutical products.

Company	Location	Turnover EU million € 2004	Profile
Exel (DHL)	BRACKNELL	8776	Largest European contract logistics provider; electronics, consumer goods, chemicals, health care industry and retail; part of DHL since 2005
Kuehne + Nagel	HAMBURG	7508	Inter. logistics company, sea/air freight, contract logistics
DHL Logistics (Deutsche Post)	BONN	6786	DHL Solutions: industrial and consumer goods contract logistics; DHL DANZAS AIR and OCEAN: intern. shipping agency; Main customers: automotive, pharmacy/health care, electronics/IT consumer goods, textiles
Buss Holding	HAMBURG		Port logistics (turnover, stevedoring, tie-down, lashing, packaging), warehousing (e.g. chemical and pharmaceutical products)
Panalpina	BASEL	3965	Intern. shipping agency; sea/air freight with contract logistics
Chemion	LEVERKUSEN		Subsidiary of the BAYER AG, contract logistics for the chemical and chemical related industry
Gefco	COURBEVOIE CEDEX	3894	Subsidiary of PSA PEUGEOT CITROEN; automotive, cosmetics, high-tech and other consumer goods
Geodis (SNCF)	CLICHY	3371	Integrated logistical services
Infraserv	FRANKFURT		LSP for the process industry (chemicals, pharmacy, biotech), warehousing for dangerous goods, temperature related warehousing, picking and packing,

			delivery
ITG	SCHWAIG		Intern. shipping agency, textile/fashion, sporting goods, perfumery/cosmetics, supply and distribution for the textile industry, industrial spare parts logistics
Arvato Logistics	GUETERSLOH	770	Contract logistics for consumer goods with customers from finance, telecommunications, It, media, pharmacy and automotive
IHG Logistics	HILDEN	710	Break bulk shipping agency, distribution, automotive, textile, electronics, machinery, consumer goods, chemical/pharmacy, retail, road and rail, overseas services, logistical services
NYK Line Europe	LONDON	631	Shipping Company
Anker Leschaco	BREMEN	560	Sea and air freight in the areas of aircraft, automotive, bulk, chemicals/pharmaceuticals, project logistics, warehousing
transmed	REGENSBURG		LSP of the PHOENIX pharmacy group; nightly delivery of pharmacies etc.; spare parts distribution, books, office materials, health care, home care; special transport
trans-o-flex	WEINHEIM	431	Leading European provider of combined transport in B2B; industries: cosmetics, textile, It, radioactive dangerous goods; express delivery
FM Logistic	PHALSBOURG	330	Integrated logistical solutions for consumer goods industry; customers: food producers (e.g. KRAFT FOODS, LORENZ, UNILEVER, MASTERFOODS), supermarket chains, high-tech OEM
D.Logistics	HOFHEIM	312	Holding company; customer and project specific logistical and logistics related services at the customers location, consumer and industry packaging, warehousing (automotive, chemicals, electronics, health care, consumer goods, air freight, machinery)
premium logistics (Wincanton)	LA VERPILLIERE	270	Transport services and contract logistics for automotive, consumer goods, high-tech and pharmacy industry as well as retail; part of WINCANTON since 2006
Suedkraft (Thiel)	MUENCHEN	180	Subsidiary of THIEL; nat./ europ. consolidated cargo, bin container, tank truck, dump truck, bimodal traffic, warehousing, JIT, inland water way transport, port turnover; automotive, beverages, chemicals, building materials
Planzer Transport	DIETIKON	260	Landside transport; break bulk traffic; industry specific solutions for pharmacy and food industry
BWG Reimer	BREMEN		Multimodal nat. and intern. transports, logistics for health care, automotive, food, machinery, paper, wood, media and consumer goods industries
Grieshaber	BAD SAECKINGEN		Customer oriented outsourcing concepts, road transports, paper, pharmacy, spare parts, automotive, high-tech
Hansetrans	HAMBURG		Nat./intern. direct transports, messenger services, furniture, automotive, spare parts, hospital logistics
Seifert Logistics	ULM		Break bulk transports, transport of dangerous goods, bin container traffic, contract logistics, VAS; solutions for the paper, building materials, chemical, automotive and pharmaceutical industry
Simon Hegele	KARLSRUHE		Contract logistics provider for industry and retail; business areas area moving, health care, IT/Industry
TNT Logistics	FRANKFURT		Subsidiary of TNT (NL); solutions for the industries automotive, high-tech, media, fashion, pharmacy
tts	HAMBURG		Dry consumer goods contract logistics, industrial contract logistics, pharmacy logistics, IT and consulting

12.6 Pharmacy Logistics as an Investment Target

Pharmaceutical products put a lot of demands on LSPs but the demand on the European markets is growing at high rates. Therefore, the industry is in need of handling the increase. In the case of outsourcing of logistical activities in order to focus on core competencies, most pharmaceutical companies have done so or are in the process of doing so. In addition to that, services like the picking & packing, nationalising and customer specific distribution (for hospitals) can be implemented by an LSP.

Port areas however are only predestined for a location of these services if they are located close to a major market to operate efficient express delivery or if the location can compete in costs with other sites.

13 Visualization and Data Management System

After looking at the overall cargo flows in the NSR and BSR as well as current developments in six industries, an IT system is proposed to monitor and analyse the development of cargo flows in the region. This chapter is concerned with the implementation of this data visualization and management system. Due to the fact that cargo flows are constantly changing, the aim was to arrive at a system that would give an understanding of the goods flows in the region and to provide for the possibility to update the underlying data continuously.

13.1 IT-based Cargo Flow Visualization and Data Management

The visualization of cargo flows is dependent on the underlying data. As mentioned in Chapter 3, the statistical data on goods flows is somewhat diverse and in most cases not comparable in a way to break the flows down into detailed regional information. Therefore, data was used that showed comparability for a European wide context. Concerning this, only external trade data for the EU could be used. In comparison with data on the largest companies that was also available on a European scale, one can identify the main shipping companies. These provide no data on current activity in their respective regional ports but on the one hand it is evident that closest ports are used and on the other hand that the visualization of companies in port regions can lead to the identification of potential in logistical services. Comparing this to the current logistical situation in ports – turnover, specialization and liner services – a clearer picture is gained on what areas of activity might be at hand and which other services needed some more development.

This gives a broad overview on the outline of the visualization system and its goal. For the implemented system, its status can only be seen as a prototypical application that can be developed much further. The same is true for the database system that serves the application. The development was based on the basic work of a previous study conducted by the International School of New Media Lübeck (ISNM) called "PortNet Navigator".¹⁹⁷ It has been used as a starting point and provides conceptual strategies for future developments of a system that would eventually offer added value for the participating partners.

13.2 Database System

The database system serves as storage for the statistical data and the accompanying geographical data. For the future implementation as an internet based service, it is recommended to set up the database within a SQL environment implementing it in MySQL, Oracle or similar. In the context of this study it is implemented as a Microsoft Access database that serves better for prototypical and demonstration purposes.

In general, the following features are implemented in the database:

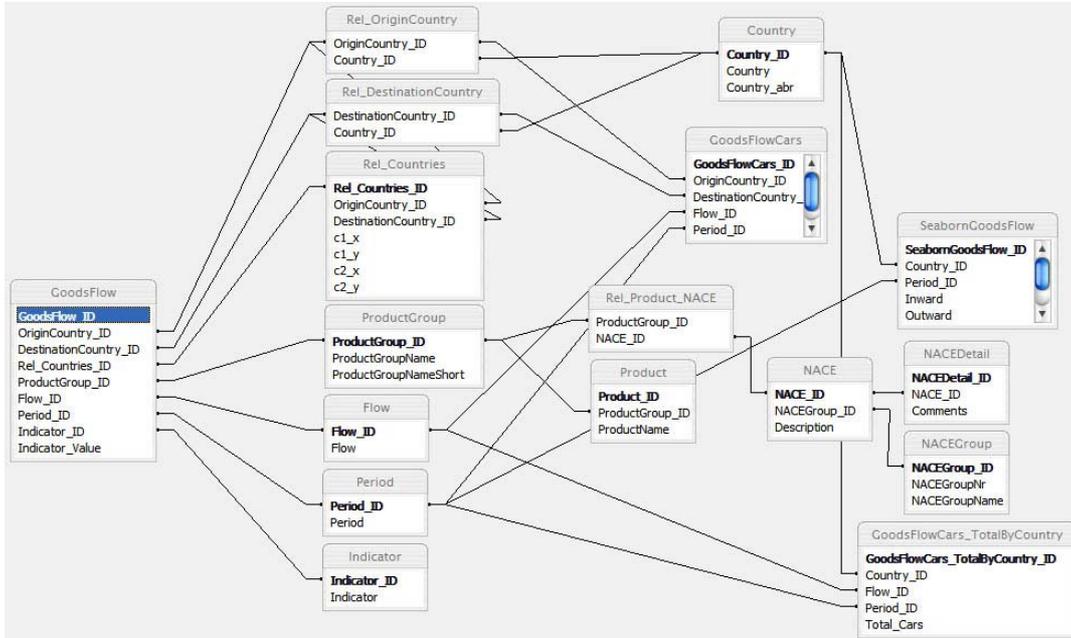
- Statistical data for national trade flows
- Statistical data on port turnover and basic port facts
- Company data including turnover, employment data and number of subsidies

¹⁹⁷ Hasebrook, Schmidts 2006

- LSP data including turnover and specialization
- Port connections through frequent liner services including basic type of cargo

These features are implemented in a fashion of a relational database system. For the basic statistical goods flow data, the table relations are shown in Figure 13-1.

Figure 13-1: Database Relations for Table "GoodsFlow"



A similar outline is applicable for the table relations of ports data, related vessel connections (Figure 13-2) and companies and LSPs (Figure 13-3).

Figure 13-2: Database Relations for Tables "Port" and "VesselConnection"

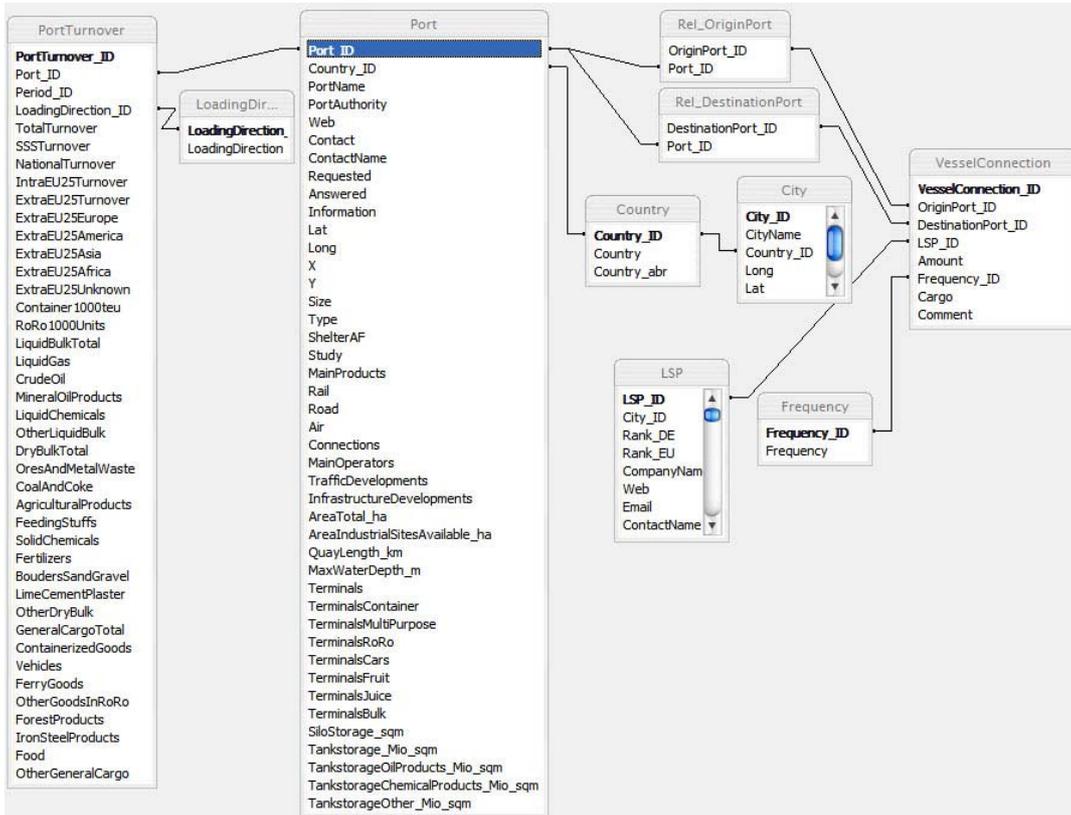
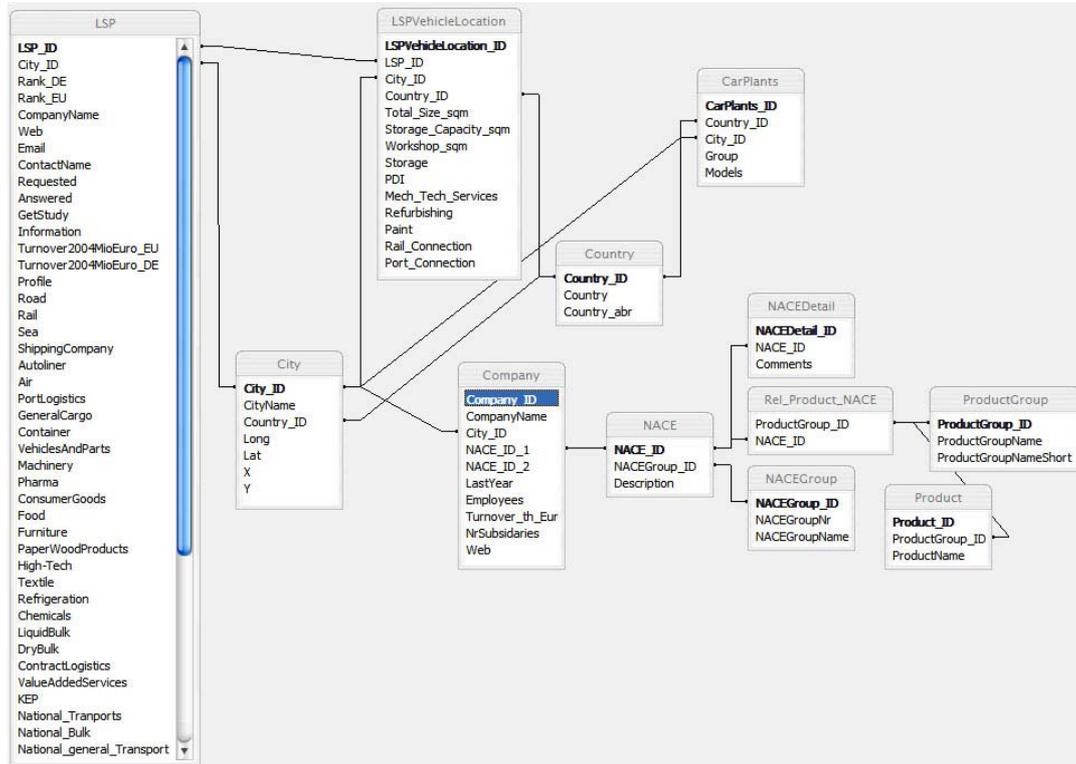


Figure 13-3: Database Relations for Tables "Company" and "LSP"



The database is implemented in Microsoft Access as a very basic system. For further usage of the database in a web based environment and/or for further analysis a migration into an industry standard relational database system is suggested (e.g. MySQL, Oracle).

13.3 Geographical Information System

A visualization of the cargo flows and their respective data flows in the Baltic and North Sea Region combined with the demands of the audience puts certain requirements on an information system:

- Web based visualization
- Visual combination of different types of data
- Interactivity

The implementation of the GIS is done within the FLASH environment as specific Desktop-GIS functionalities are not needed. The main focus lies on the seamless integration and visualization of data on a two dimensional map. As standard mapping applications without the use of AJAX or FLASH technology have the tendency to an interrupting user experience due to the loading of new images from the server, the FLASH technology provides the means for client side interaction with the user's requests.

The foundations for the implementation were constructed in the previous study of the ISNM called "PortNet Navigator".¹⁹⁸ The basic implementation and the basic layout of the client were adopted and customized for this project. The source code is attached to this study (on

¹⁹⁸ Hasebrook, Schmidts 2006

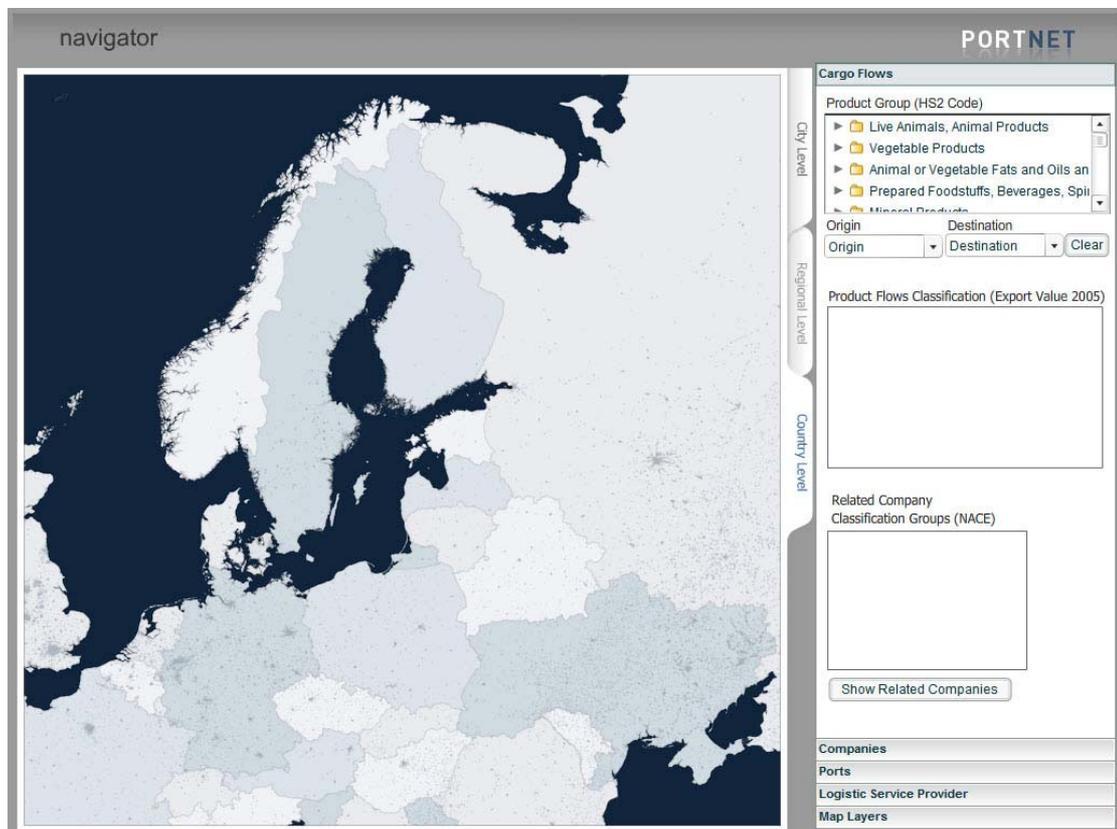
CD-Rom) and can be used for further implementation. For web based use of the Client, it only needs to be inserted into a webpage and slightly changed in size.

The client provides an intuitive interface to the visualization of data (see Figure 13-4). The map presents an overview of northern Europe that can be looked at in three zoom levels via the sliders

- City Level,
- Regional Level and
- Country Level.

It is also possible to navigate on the map by dragging it with the mouse. All other features that are available through the slide bar at the left hand side of the application are basically self-explainable but are described in short in the following.

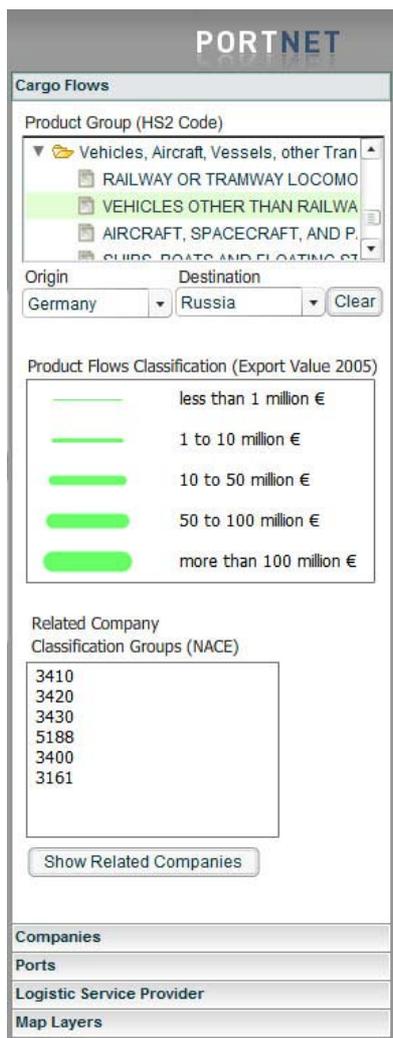
Figure 13-4: Interface of the flash-based GIS-Client (Screenshot)



The menu of the client is divided via a sliding menu into the following categories and sub items:

- Cargo Flows
- Companies
- Ports
- Logistical Service Provider
- Map Layers

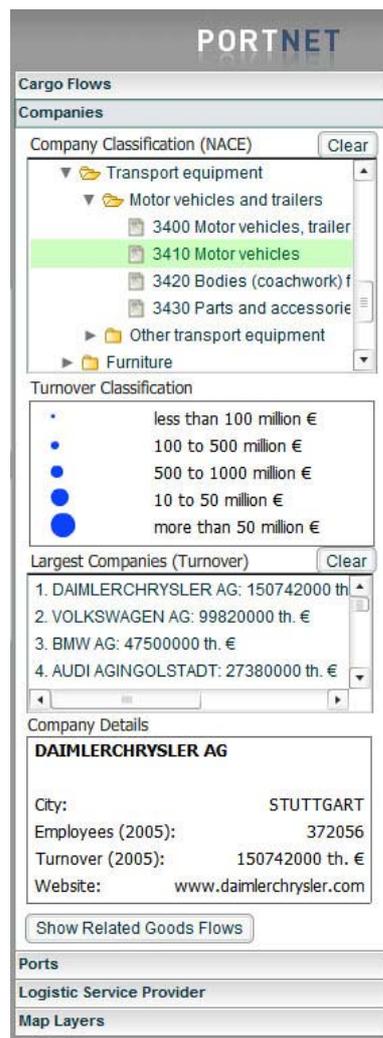
Figure 13-5: GIS-Client - Cargo Flows Information Bar (Screenshot)



Cargo Flows

- Menu of product groups (HS2 codes) with selectable point of origin and point of destination, selected item is shown on map
- Legend for the product flows classification showing the exported value in 2005
- Area showing the related company classification groups according to NACE that relate to the chosen product group

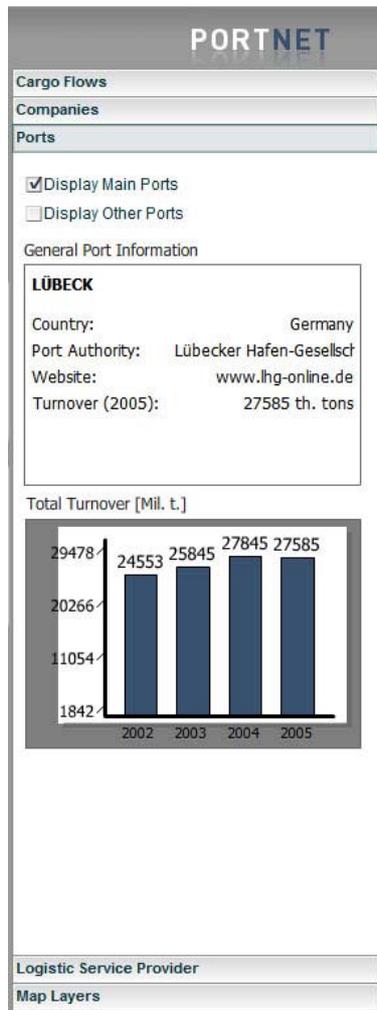
Figure 13-6: GIS-Client - Companies Information Bar (Screenshot)



Companies

- Selectable menu of company classification groups (NACE codes), selected item is shown on map
- Legend for the turnover classification of companies showing the turnover value in 2004 or 2005 (depending on company information)
- Results area showing the largest companies of the selected classification group according to their turnover, selected company is highlighted on map
- Results area for selected company with basic information on the company

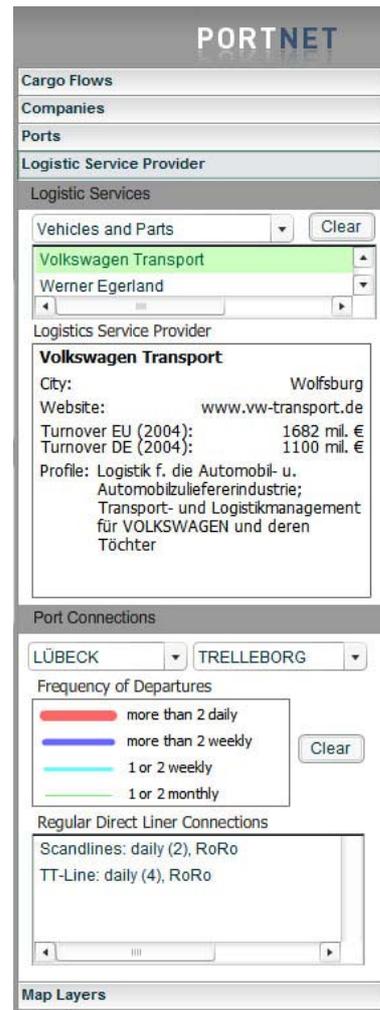
Figure 13-7: GIS-Client - Information Bar Ports (Screenshot)



Ports

- Checkboxes for main ports of the study and other ports in the region
- Result area for clicking ports in the map showing basic information on the selected port incl.
- Chart with figures on the turnover of the selected port

Figure 13-8: GIS-Client - Information Bar Logistical Service Providers (Screenshot)



Logistical Service Provider

- Select field for specialization of LSPs
- Result area for LSP specialization, selected company is highlighted on map
- Result area for selected LSP with information on basic facts (incl. turnover in EU and Germany) and areas of business
- Select fields for port connections, selection of departure (mandatory) and arrival port (optional)
- Legend for the frequency of departures from the selected departure port
- Results area for regular direct liner connections between the selected ports with basic information on liner service provider, frequency of departures and type of cargo

Figure 13-9: GIS-Client - Information Bar Map Layers (Screenshot)



Map Layers

- Checkboxes for the map layers cities, regions, roads, railways.

13.4 Data Maintenance Tool

Continuous monitoring of goods flows to and from ports of the NSR/BSR can only be achieved through the implementation of common data assessment standards. As this study highlights, there are hardly any similar data collection methods nor are there any common detailed statistics that can be utilized to monitor the development of ports in the region on a common level. This problem needs to be addressed before implementing a data maintenance tool. Otherwise comparability through general standardization of data will not be achieved.

To specify the needs for a continuous monitoring system, the following requirements need to be met:

- Bodies keeping statistical data on turnover need to comply on a set of standardized statistical figures that are recorded for every port that takes part in this monitoring system. These statistics need to comply with the following. Otherwise the results of an analysis are not worth the effort.
 - The level of statistical detail should go beyond a recording of broad commodities like “dry bulk” or “liquid bulk”. Port authorities should comply on well-defined commodities.
 - Dead-weights should either be included or left out for all concerned ports.
- The tool should be accessible for all the partnering bodies. They should agree on a web based service that provides analysing functionality like the ones offered in the Port-Net Navigator client prototype.
- The tool should offer added value for the partners. Not much effort should be made to add new figures and information to the system and it should be easy to analyse the data.

Therefore, the following is recommended:

- Identification of a comparable statistical standard on the handling of cargo beyond broad categories by a working group of port authorities and statistical experts on European level

13.5 Further Developments

For further developments, a threefold approach to a combined system of data search, data integration and data visualization is proposed along with the previously mentioned study of the ISNM.¹⁹⁹ This approach would provide a self-sustaining data analysis environment that would incorporate:

- Data warehousing and integration of trade flow data,
- Semantic search²⁰⁰ and ontologies²⁰¹ on corporate and trade related relations and
- Geographic and knowledge visualization of the integrated and searched data.

This approach would allow for continuous automatic updating of the system and a growing accuracy over time as the search engine would incorporate more and more data into the system.

Any other approaches would result in much work to update the data. In relation to the final analysis this would exceed the costs.

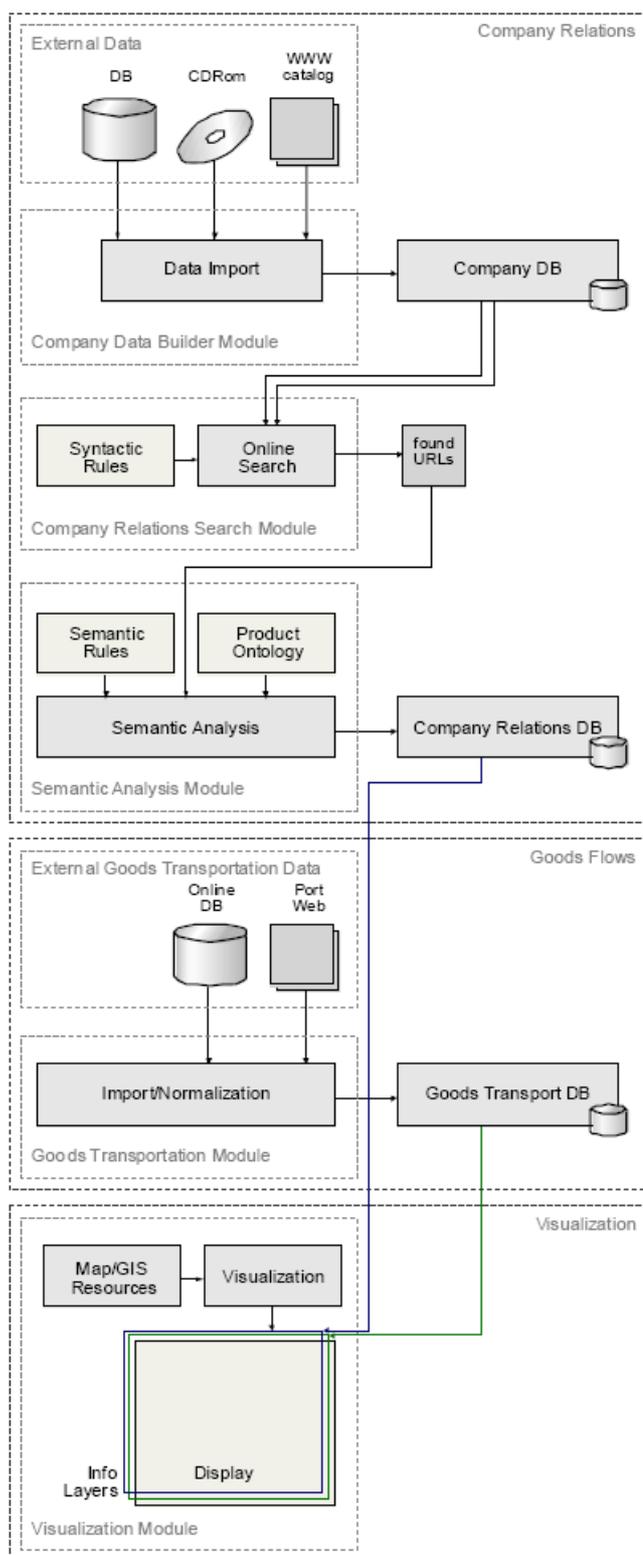
The proposed system, which could be developed from the prototype, would follow along this threefold strategy and would encompass the conceptual parts "company relations", "goods flows" and "visualization". In the following these are described in short.

¹⁹⁹ Hasebrook, Schmidts 2006

²⁰⁰ Semantic search is a webbased approach to the meaningful search of content which is contrasted to syntax search that only pertains to the formal structure.

²⁰¹ Ontology is the product of an attempt to formulate an exhaustive and rigorous conceptual schema about a domain, typically a hierarchical structure containing all the relevant entities and their relationships and rules within that domain.

Figure 13-10: Conceptual modules for a long-term regional goods flow analysis system (Schmidts et al. 2006)



Company Relations

The main goal of the system is the implementation and growth of a database with trade relations between companies. For a start, a foundational company database with locations and traded goods is established to function as an input for a web based mining module. This input company database has been implemented with this study (see attached CD-Rom).

With a semantic web search, entries of companies are searched for in a contextual manner, compared to the ontology build for the system and written in the database (Figure 13-10 upper part).

Goods Flows

With foundational data on port turnover, schedules of liner services and national cargo flows, a basic database for goods flows is established. This input goods flows database has been implemented with this study (see attached CD-Rom).

The prototypical system already presents goods flow relations for northern Europe in differentiated goods categories. It needs to be kept updated by automatic web based searches of the system. An automatic retrieval of such data can be implemented with port authorities and statistical bodies.

Visualization

The visualization shows the retrieved information in a geographical context via a web based/client system.

This can provide different ways of visualization like the ones implemented in the prototype of this study.

14 Conclusion

The globalisation of supply, production and related transport chains as well as a wider geographical sourcing of supplies has led to increased transport. Especially the BSR is experiencing high growth in terms of traded value, traded quantities in tons and higher vessel traffic that evidences not only the growth of western European economies but especially the increasing demands of the markets in Russia, Poland and the Baltic States.

On the other hand average transport distances are increasing and the logistical trends lead to concentration of flows on hubs and nodes which in turn lead to the need of an optimised use of transport resources. Further concentration trends in industries, in trade and in transport operations strengthen the large ports, while many small ports face serious underemployment if they do not focus on their inherent strengths in special business areas that are serving the needs of the surrounding regional industry.

The importance of effective handling routines and specialization in specific commodities has led to strategic co-operation or merging of ports to help handle the growing trade flows and the competitiveness on the ports market.

In general, trade flows in the NSR and BSR exhibit a dominance of certain product groups in terms of transported tons which are mineral oil and dry bulk commodities like building materials and fertilizers. In terms of transported value, vehicles, machinery, electronics and pharmaceutical products show the highest importance overall.

These areas of high value products proved to be industries with different aspects concerning the implementation of logistical processes and services that would lead to added value for the specified product. Even for port areas the potential varies in each industry. While automotive logistics show high potential to offer additional services in areas like pre-delivery inspection or customizing, other industries like machinery do not yet open up their production process in such a way as to let third party service providers cooperate in the process of value addition if it even possible. In general, much seems to be dependent on the individual use of logistical solution for a manufacturing company and if a LSP and a manufacturing company reach a form of contract that is mutually in its business. If a port should be integrated in this process, some additional factors need to be considered:

- Does the port fit into the supply chain of the specific product?
- Can the port provide the appropriate space and facilities?
- Do the hinterland connections and the infrastructure meet the efficiency needs?
- Is the port authority willing to organise a cooperative interaction between the OEM, the LSP and itself?

These questions can not be considered overall as each case provides a different situation and each company – even in the same industry – might have completely different needs.

However, the perception of ports as traditional handling facilities as changed. Simple stevedoring and transporting of cargo does not keep ports in competition nowadays. More and more companies are seeking for complete logistical solutions from one hand. Therefore, port authorities need to raise the question where their port is fitting it.

Two scenarios might be applicable for future activities of ports. The scenarios provide an outlook from the apparent need to offer more than traditional turnover procedures. This can also provide opportunities to attract new cargo flows and to be integrated into chains of collaborative companies that are part of a production chain.

1. Port operators act as integrated service providers with the provision of logistical solutions that meet the needs of companies from different industries. A specialization on specialized services for a few industries can underline its competitiveness. This follows the concept of different levels of logistics service provision:
 - a. 3PLs: Provision of additional logistical services, i.e. value added; the port actually carries out all traditional handling services but combines them with contract logistics, VAS, etc.
 - b. 4PLs: Provision of integrating logistical services; the port oversees logistical activities as a SCM in addition to its traditional handling services

→ Example: BLG at the port of Bremerhaven

2. Port authorities facilitate partnerships with LSPs; build specialized connections to relevant actors within industries and industry specific logistical services in order to expand the functions of the port but without engaging the traditional port operators in logistical activities beyond their scope and rather cooperate with specialized service providers

→ Example: Wallenius Wilhelmsen at the port of Kotka

These scenarios can also be combined as can be seen in some cases. Both scenarios can be found in the BSR. But ports need to clarify their position regarding logistical services and try to bridge the gap between the need for complete logistical solutions and traditional port services. Otherwise cargo flows of companies will simply move another way. A way that is more cost competitive and efficient in use for the companies logistical needs.

It can be concluded from this that new investments highly depend on the supply chain strategies by individual companies. Even though cargo is flowing along a certain path and is moving along the shortest path in most cases, cost competitiveness is the determining factor which leads to transport chains that are not able to use the nearest port because a certain service is not offered.

To build up new partnerships to companies and LSPs, ports also need to build on their inherent, historically given strength. Today, much of the current competitiveness of a port is determined by its specialization in an area that has been the focus of business for a while. This should be developed further. But industries change and new forms of supply chain collaboration need to be considered to attract new cargo to the ports; for example, cargo that has previously not been transported via vessels or cargo from other regions.

This study highlighted the major lines of development in the NSR and BSR and gave an overview of potentials in the strongest growing industries in the region. Potentials for these, it was said, could not be generalized. But the individual port and LSP was seen as in charge of attracting and keeping the relevant cargo flows for the port through the implementation of appropriate services.

Literature and Datasources

- Abelmann, P., Doborjdinidze, G. (2005): Handbuch Logistik Russland, Köln.
- Altekar, R.V. (2005): Supply Chain Management: Concepts and Cases.
- Antola, E., Kivikari, U. (2004): Baltic Sea Region – A Dynamic Third of Europe, Turku.
- Arndt, M., Pauli, A. (2005): Trans-European Transport Networks (TEN-T) in the Baltic Sea Region – Policy Recommendations, Erkner.
- Aström, J. (2005): SCA, Presentation at PPI Transport Symposium September 2005, http://www.ifpta.org/files/ts16/keynote/jan_astrom.pdf (20.12.2006).
- Automotive Logistics (2007a): Buyers' Guide 2007, London.
- Automotive Logistics (2007b): Insufficient Port Capacity Projected by 2011, in: Automotive Logistics, Jan/Feb 2007, p. 8.
- Ayala, P., Spiechowicz, M., Vidaller, J. (2006): EU Engineering Competitive Update, Brussels.
- Baltic 21 (2004a): Sustainable Development of the Industrial Sector in the Baltic Sea Region, <http://www.baltic21.org/?a,188> (17.01.2007).
- Baltic 21 (2004b): Baltic 21 Transport Sector Report, <http://www.baltic21.org/?a,136> (17.01.2007).
- Baumgarten, H. (2003): Logistik-Management – Grundlagen, Trends und Strategien, Presentation at TU Berlin 2003, Berlin.
- Beverkog, P., Edgren, P., Jarlborg, A. (2003): EU enlargement in the Baltic Sea Region – Consequences for the Swedish ship owners, Gothenburg University.
- Bischoff, J., Barthel, H., Beutner, tons (2004): Stand der Logistik und stategische Tendenzen bei Automobilzulieferern, Fraunhofer IPA, Stuttgart.
- BLG (2006a): Import/Export statistics (individualized analysis after enquiry), Bremen.
- BLG (2006b): global... Geschäftsbericht 2005, http://www.blg.de/services/pdf/annual_05/blg_gb2005_de.pdf (23.11.2006).
- BLG (2006c): Automobile Logistics, http://www.blg.de/services/pdf/automobile/automobile_en.pdf (23.11.2006).
- BLG (2006d): Profile 2006, http://www.blg.de/services/pdf/broschure2006/profile_en.pdf (23.11.2006).
- Bowersox, J.W., Closs, D.J., Copper, M.B. (2002): Supply Chain Logistics Management, Mc Graw Hill.
- Brodin, A. (2003): Baltic Sea Ports and Russian Foreign Trade, Gothenburg University.
- Buchholz, tons (2002): Outsourcing-Studie – Schwierige Partnerschaften, in: Logistik Inside, 03/2002, p. 31.
- Buchholz, W., Werner, H. (2001): Supply Chain Solutions – Best Practices in e-Business, Frankfurt.
- Bureau van Dyke (2006): AMADEUS Company Database, <http://amadeus.Bureau van Dyke.com> (05.07.2006).
- Bundesamt für Güterverkehr (2002): Statistische Mitteilungen, Reihe 9.1: Internationaler Güterkraftverkehr.
- Bundesamt für Güterverkehr (2004): Statistische Mitteilungen, Reihe 8: Kraftverkehr.

- Bunz, A. (2004): Logistikprozesse in der Automobilindustrie, Presentation at BVL Regionalforum, <http://logistics.de/logistik/branchen.nsf/ArtikelView> (12.09.2006).
- Carlquist, M. (2005): Baltic Short Sea Ro-Ro – present situation, development and prospects, Presentation at PPI Transport Symposium September 2005, http://www.ifpta.org/files/ts16/panel1/marten_carlquist.pdf (20.12.2006).
- Coia, A. (2003): Streamlining the Automotive Supply Chain, in: Supply Chain Management Review, 32/03, p. 41.
- Coia, A. (2006a): Broadening the niche market potential – Regional Focus Baltic, in: Automotive Logistics, March/April 2006, p. 26-30.
- Coia, A. (2006b): Waves of Change – European Ports, in: Automotive Logistics, May/June 2006, p. 56-68.
- Coia, A. (2007): Ro-ro, increase your boat... - Ocean car carriers, in: Automotive Logistics, Jan/Feb 2007, p. 40-52.
- Coyle, J., Bardi, E., Novack, R. (1999): Transportation, London.
- Department for Transport (2005): Transport Statistics Report – Maritime Statistics 2004, London.
- Deutsche Schifffahrts-Zeitung (2002): Seeverkehrsmarkt Baltic Sea – Deutsche Ostseehäfen, Sonderbeilage Mai 2002.
- Deutsche Schifffahrts-Zeitung (2003): Seeverkehrsmarkt Baltic Sea – Deutsche Ostseehäfen, Sonderbeilage Mai 2003.
- Deutsche Schifffahrts-Zeitung (2004): Seeverkehrsmarkt Baltic Sea – Deutsche Ostseehäfen, Sonderbeilage Mai 2004.
- Deutsche Schifffahrts-Zeitung (2005): Seeverkehrsmarkt Baltic Sea – Deutsche Ostseehäfen, Sonderbeilage Mai 2005.
- Deutsche Schifffahrts-Zeitung (2005): Maritimer Standort Deutschland – Future, Sonderbeilage Januar 2005.
- Deutsche Schifffahrts-Zeitung (2006): Maritime Perspektiven, Sonderbeilage Januar 2006.
- Deutsche Schifffahrts-Zeitung (2006): Maritimer Standort Lübeck, Sonderbeilage Februar 2006.
- Elkin, M. (2006): Gearing up for growth – Volvo Logistics, in: Automotive Logistics, March/April 2006, p. 24-25.
- Ernst, E. (2002): Konsumgüter – Voll im Trend: Cross Docking, in Logistik Inside, 04/2002, p. 24.
- European Commission (2004): European competitiveness report 2004, Brüssel.
- European Commission (2006a): External and intra-European Union trade – Monthly Statistics, Brüssel.
- European Commission (2006b): Statistics on the trading of goods – User guide, Brüssel.
- European Car Transport Group (2006): Survey on Vehicle Logistics, Brüssel.
- ESN – European Shortsea Network (2006): Liner Services Database, <http://www.shortsea.info> (10.01.2007).
- European Union (2003): Verordnung (EG) Nr. 1059/2003 vom 26. Mai 2003 über die Schaffung einer gemeinsamen Klassifikation der Gebietseinheiten für die Statistik (NUTS), Brüssel.
- Eurostat (2005a): Transport by Sea - 2003/2004 Data, Brüssel.
- Eurostat (2005b): Europa in Zahlen – Eurostat Jahrbuch 2005, Luxembourg.

- Eurostat (2006): EU25 Trade Since 1995 By HS2-HS4, <http://fd.comext.eurostat.cec.eu.int/xtweb/> (17.01.2007).
- Eurostat (2006): External Trade by Enterprise Characteristics, Luxembourg.
- Graf, H. (2004): Kundenauftragsorientierte Beschaffungs- und Produktionslogistik bei DaimlerChrysler, Presentation at BVL-Regionalforum, <http://logistics.de/logistik/branchen.nsf/ArtikelView> (12.09.2006).
- Hader, A. (2001): Fährschiffahrt in der Ostsee – Prognosen und Visionen, in: Internationales Verkehrswesen (53), 3/2001.
- Hambuch, P. (2002): Das CPFR-Konzept und seine Bedeutung für die Versorgungskette, <http://logistics.de/logistik/branchen.nsf/ArtikelView> (12.09.2006).
- Hampe, A. (2006): IT-gestützte Prozessoptimierung für Logistikdienstleister im Automotive Umfeld, Presentation at 3. Branchenforum Automobil-Logistik 26.01.2006, <http://logistics.de/logistik/branchen.nsf/ArtikelView> (12.09.2006).
- Hansson, M., Ottosson, P. (2003): The Cost, the Model and the Logistics – A Cost Measurement System at Volvo Logistics Corporation, Gothenburg University.
- Hasebrook, J., Schmidts, U. (2006): PortNet Navigator, Presentation of Study Results at Port-Net Workshop 03-12, 15.06.2006.
- Hänninen, S., Rytönen, J. (2006): Transportation of liquid bulk chemicals by tankers in the Baltic Sea, Helsinki.
- Henningson, E., Lindén, E. (2005): Vendor Managed Inventory – Enlightening Benefits and Negative Effects of VMI for IKEA and its Suppliers, Lulea University of Technology.
- Hoffmann, W. (2004): Linienreedereien als internationale Logistikdienstleister – Darstellung und Bewertung möglicher Supply-Chain-Management-Aktivitäten, Diplomarbeit FH-Kiel, Kiel.
- ICON (2006): Supply Chain Collaboration in der Automobilindustrie, Karlsruhe.
- IKEA (2005): Case Study – IKEA Trading Area Poland, <http://www.ibp.uw.edu.pl/download/2005-2006/ilog-f2005/IKEACase.pdf> (12.12.2006).
- Invest in Germany (2005): Germany – Europe’s Logistics Hub, Berlin.
- Invest in Sweden (2004): Logistics – The quality choice for centralized distribution in Northern Europe, Stockholm.
- Invest in Sweden Agency (2005a): The Automotive Industry – an Integral Part of Innovative Sweden, Stockholm.
- Invest in Sweden Agency (2005b): Invest in Sweden - Report 2005/06, Stockholm.
- Invest in Sweden Agency (2005c): Oil and Petrochemicals Sweden, Stockholm.
- Jahns, C., Langenhan, F., Walter, S. (2005): Logistik-Tacho 2010, Driving Logistics to Excellence.
- Johansson, B., Nilsson, D. (ed) (2001): Trade and Transport Flows in the Baltic Sea Region, Jönköping International Business School.
- Klaus, M. (2006): Optimierung in der Wertschöpfungskette – Bedarfs- und Bestandsmanagement als Basis, Presentation at 3. Branchenforum Automobil-Logistik 26.01.2006, <http://logistics.de/logistik/branchen.nsf/ArtikelView> (12.09.2006).
- Klaus, P., Kille, C. (2006): Die Top 100 der Logistik – Marktgrößen, Marktsegmente und Marktführer in der Logistikdienstleistungswirtschaft, Deutscher Verkehrs-Verlag, Hamburg.

- Krog, E.-H. (2006): Das kundengesteuerte Unternehmen von der Bestellung bis zur Auslieferung, Presentation at 3. Branchenforum Automobil-Logistik 26.01.2006, <http://logistics.de/logistik/branchen.nsf/ArtikelView> (12.09.2006).
- Krüger, G. (2007): Die Russen-Tanker kommen: Lübeck will Ölhafen werden, in: Lübecker Nachrichten, 17.01.2007.
- Langemann, tons (2003): Automobilindustrie - Spielregeln für die Collaboration, in: Logistik Heute, 5/2003, p. 42-43.
- Latvanne, A. (2002): Management of Logistics Service Providers in Nokia Networks, <http://www.ntf-research.org/Konferenz%2027.5.02/Nokia%20presentation%2027%202002.pdf> (23.09.2006).
- Lemper, B. et.al. (2002): Die Wettbewerbsentwicklung und Kooperationsmöglichkeiten der deutschen Seehäfen im Verhältnis zu den Seehäfen der anderen Anliegerstaaten im Verkehrsraum Ostsee, Bundesministerium für Verkehr, Bau- und Wohnungswesen, Bonn.
- MariTerm (2004): The Sea Transport Infrastructure, a Baltic Gateway Report, Work Package I, Gothenburg.
- Matczak, M. et al. (2006): Traffic flows between the Baltic Ports and other major European ports – with focus on the UK ports within Port-Net in preparation for Motorways of the Sea, Port-Net Study 03-2, Gdynia.
- Mullins, G. (2005): Tomorrow's Pulp Markets – A "New World" Perspective, Presentation at PPI Transport Symposium September 2005, http://www.ifpta.org/files/ts16/panell/guillermo_mullins.ppt (20.12.2006).
- Nemeth, J. (2005): Tomorrow's Pulp Markets – Where are they and how will they be supplied?, Presentation at PPI Transport Symposium September 2005, http://www.ifpta.org/files/ts16/panell/joe_nemeth.ppt (20.12.2006).
- Notteboom, TONS, Rodrigue, J.-P. (2003): Port Regionalization – Towards a New Phase in Port Development, in: Maritime Policy & Management, Vol. 32, Nr. 3, p. 297-313.
- Notteboom, TONS, Winkelmann, W. (2005): Factual Report on the European Port Sector, Brussel.
- Nowak, W. (2006): Anlauf- und Lieferantenmanagement am Beispiel der neuen S-Klasse – Mehr Kundenzufriedenheit durch Logistik?, Presentation at 3. Branchenforum Automobil-Logistik 26.01.2006, <http://logistics.de/logistik/branchen.nsf/ArtikelView> (12.09.2006).
- Odenthal, G. (2005): Kollaboration zwischen Verladern und Dienstleistern – Vertrauensbasis oder Konfliktfeld?, Presentation at 6. BVL Logistics Forum, 23.-24.02.2005, <http://logistics.de/logistik/branchen.nsf/ArtikelView> (12.09.2006).
- Ojala, L., Koskinen, M. (2004): Development of Baltic States' Ports, Turku.
- Ojala, L. (2005): Development of Finland's logistics position, http://www.kymichamber.fi/opencms/www/fi/liitetiedostot/Lauri_Ojala.pdf (17.11.2006).
- Panayides, P. (2006): Maritime Logistics and Global Supply Chains – Towards a Research Agenda, in: Maritime Economics & Logistics, Vol. 8, p. 3-18.
- Pawlik, tons (1999): Value Added Services, <http://www.seeverkehrswirtschaft.org> (10.06.2006).
- Personen, J., Teräs, tons (2005): Tomorrow's Pulp Markets, Presentation at PPI Transport Symposium September 2005, http://www.ifpta.org/files/ts16/panell/jarmo_personen_and_timo_teras.ppt (20.12.2006).
- Podevins, O. (2004): OEM und Automobilzuliefererindustrie in den Beitrittsländern – Auf dem Weg zum Netzwerkmanagement, Frankfurt/Main.

- Porter, M. (2001): The Baltic Rim Regional Agenda, Baltic Development Forum Annual Meeting, St. Petersburg (25.09.2001).
- Rao, B., Navoth, Z., Horwitch, M. (1999): Building a World-class Logistics, Distribution and Electronic Commerce Infrastructure, in: Electronic Markets, Vol. 9 (3), p. 174-180.
- Rodrigue, J.-P. (2006): The Geography of Transport Systems, London.
- Rushton, A. (2001): The Handbook of Logistics and Distribution Management.
- Rytkönen, J., Siitonen, L., Riipi, TONS, Sassi, J., Sukselainen, J. (2002): Statistical analysis of the Baltic maritime traffic, VTT Industrial Systems.
- SAI – The Institute of Shipping Analysis (2006): Baltic Maritime Outlook 2006 – Goods flows and maritime infrastructure in the Baltic Sea Region, Gothenburg.
- Seeck, S. (2004): Supply Chain Management und Frische-Logistik – SCM-Potenziale vor dem Hintergrund der Rückverfolgungsverordnung, <http://logistics.de/logistik/branchen.nsf/ArtikelView> (12.09.2006).
- Song, J., Regan, A. (2001): Transition or Transformation? Emerging Freight Transportation Intermediaries, <http://www.octc.net/papers/636.pdf> (13.7.2006).
- Szydarowski, W. (2006): The South Baltic Sea Concept of the Sea Motorways – Contribution from the Baltic Gateway Project, Draft.
- Teichmann, tons (2007): Lübecks Hafen wird zu Europas „Papier-Tor“, in: Lübecker Nachrichten, 05.01.2007.
- TetraPlan (ed) (2005): Scenario Analysis Including SWOT Analysis, a Baltic Gateway Report, Work Package 1, Copenhagen.
- TNT Logistics (2003a): Case Study – Black & Decker, http://www.tntlogistics.de/de/sectors/case_studies/casestudy_black_and_decker_benelux.asp (04.10.2006).
- TNT Logistics (2003b): Spare parts delivery for a North American car manufacturer, http://www.tntlogistics.com/en/images/031112%20Case%20study%20Automotive%20-%20Spares%20Auto%20manufacturer%20North%20America_tcm52-6676.pdf (18.10.2006).
- TNT Logistics (2004): Inbound solutions for the automotive sector, http://www.tntlogistics.com/en/images/040908%20-%20Automotive%20Inbound%20sector%20descriptor_tcm116-135353.pdf (18.10.2006).
- TNT Logistics (2005a): Key player in logistics solutions for electronics, http://www.tntlogistics.com/en/images/050422%20-%20Electronics%20sector%20descriptor_tcm116-135358.pdf (18.10.2006).
- TNT Logistics (2005b): Successful multi-user network for consumer electronics products in Italy, http://www.tntlogistics.com/en/images/051108%20-%20Case%20study%20network%20electronics%20Italy_tcm116-154770.pdf (18.10.2006).
- Transport Intelligence (ed) (2003): Logistical Leaders 2003, Cambridge.
- Transportgruppen (2006): Ports of Sweden – Statistics, <http://www.myn.se/TransportGruppen.asp> (15.05.2006).
- Tritt, W. (2001): Klasse statt Masse – Moderne Ersatzteillogistik, professionelles Management, ein Milliardengeschäft, <http://logistics.de/logistik/branchen.nsf/ArtikelView> (12.09.2006).
- Tulip, S. (2006): Teaching an old dog new tricks – Non-automotive logistics, in: Automotive Logistics, Nov/Dec 2006, p. 34-38.

- United Nations (2002): Commercial Development of Region Ports as Logistics Centres, New York.
- United Nations (2005): Review of Maritime Transport 2005, New York.
- Venables, M. (2006): Contract to fill – Contract Manufacturers, in: Automotive Logistics, Nov/Dec 2006, p. 44-47.
- VDP – Verband Deutscher Papierfabriken (2006): Papier Kompass 2006, Bonn.
- Volvo (2006): Volvo Buses Global – Plant Locations, http://www.volvo.vom/NR/rdonlyres/7829C69C-3D1D-4F9D8DE584D4/0/bus_plant_locations.pdf (17.01.2007).
- Volvo (2006): Company presentation parts, http://www.volvo.com/NR/rdonlyres/3CAA02C2-2766-4B88-BD01-103EF8A4BA7B/0/company_presentation_parts.pdf (17.01.2007).
- Volvo (2006): Volvo Trucks Plant Locations, http://www.volvo.com/NR/rdonlyres/8F96B518-5FE8-4489-86EB-97FC97C62A2A/0/3p_trucks_plant_locations.pdf (17.01.2007).
- Volvo Logistics (2002): True Business Logistics, <http://www.volvo.com/logistics> (23.09.2006).
- Wallenius Wilhelmsen (2002): Supply Chain Analysis, <http://www.2wglob.com/www/productsServices/ConsWalkThorough.pdf> (24.08.2006)
- Walter, S. (2002): Logistik als Erfolgsfaktor für das Management von Dienstleistungsprozessen, Berlin.
- Wiklund, S. (2005): StoraEnso – Sustainable Business Logistics, Presentation at PPI Transport Symposium September 2005, http://www.ifpta.org/files/ts16/panel2/stig_wiklund.pdf (20.12.2006).
- Wildemann, H. (2004a): Collaboration in Wertschöpfungsnetzen, München.
- Wildemann, H. (2004b): Wertorientierte Supply Chain Collaboration, München.
- Windt, K. (2004): Optimierung von Lager- und Distributionsstrukturen in Logistiknetzen am Beispiel eines weltweit agierenden Maschinenbauers, <http://logistics.de/logistik/branchen.nsf/ArtikelView> (12.09.2006).
- Winterflood, B. (2003): Ohne Kratzer nach Safenwil, in: Cargo, 4/03, p. 16.
- Wörnlein, P. (2003): „Baltic Bridge“ macht Fähren Konkurrenz, in: Internationales Verkehrswesen (55) 4/2003.
- Zapp, K. (2005): Ostseereedereien richten sich auf die Zukunft aus, in: Internationales Verkehrswesen (57) 3/2005.

Port Statistics

Basic information and statistics can be found on the respective website. The problem of individual approaches to the calculation of port statistics as been referred to in chapter 3.3.

PortName	Country	PortAuthority	Web
AARHUS	Denmark	Port of Aarhus	www.aarhushavn.dk
AMSTERDAM	Netherlands	Amsterdam Port Authority	www.portofamsterdam.com
ANTWERPEN	Belgium	Antwerp Port Authority	www.portofantwerp.be
BREMERHAVEN	Germany	Bremenports GmbH	www.keyports.de
BRISTOL	UK	Bristol Port Company	www.bristolport.co.uk
EMDEN	Germany	Niedersachsen Ports GmbH & Co. KG	www.emden-port.de
FELIXSTOWE	UK	Hutchinson Ports	www.portoffelixstowe.co.uk
FREDERICIA	Denmark	Associated Danish Ports A/S	www.adp-as.com
GÄVLE	Sweden	Gävle Hamn AB	www.gavle.se/hamn
GDANSK	Poland	Port of Gdansk Authority Co.	www.portgdansk.pl
GDYNIA	Poland	Port of Gdynia Authority	www.port.gdynia.pl
GÖTEBORG	Sweden	Port of Göteborg	www.portgot.se
GRIMSBY	UK	Associated British Ports	www.abports.co.uk/custinfo/ports/grimsby.htm
HAMBURG	Germany	Hamburg Port Authority	www.hafen-hamburg.de
HAMINA	Finland	Port of Hamina Ltd	www.portofhamina.fi
HELSINGBORG	Sweden	Port of Helsingborg	www.port.helsingborg.se
HELSINKI	Finland	Port of Helsinki	www.portofhelsinki.fi
KALININGRAD	Russia	Sea Commercial Port of Kaliningrad	www.russeeds.ru/port/english/index.html
KARLSHAMN	Sweden	Port of Karlshamn	www.karlshamnshamn.se
KIEL	Germany	Port of Kiel	www.port-of-kiel.de
KLAIPEDA	Lithuania	Klaipeda State Seaport Authority	www.portofklaipeda.lt
KOBENHAVN	Denmark	Copenhagen Malmö Port	www.cmport.com
KOTKA	Finland	Port of Kotka Ltd	www.portofkotka.fi
LE HAVRE	France	Port of Le Havre Authority	www.havre-port.net
LIEPAJA	Latvia	Port of Liepaja	www.liepajaport.lv
LONDON	UK	PLA	www.portoflondon.co.uk
LÜBECK	Germany	Lübecker Hafen-Gesellschaft mbH	www.lhg-online.de
MALMÖ	Sweden	Copenhagen Malmö Port	www.cmport.com
NAANTALI	Finland	Port of Naantali Authority	www.naantali.fi/satama/
NORRKÖPING	Sweden	Norrköping Port and Stevedoring	www.norrkoping-port.se
OSLO	Norway	Oslo Port Authority	www.ohv.oslo.no
OXELÖSUND	Sweden	Port of Oxelösund	www.oxhamn.se
PORI	Finland	Porin Satama	www.portofpori.com
RAUMA	Finland	Port of Rauma	www.portofrauma.com
RIGA	Latvia	Freeport of Riga Authority	www.freeportofriga.lv
ROSTOCK	Germany	Hafen-Entwicklungsgesellschaft Rostock mbH	www.rostock-port.de
ROTTERDAM	Netherlands	Port of Rotterdam	www.portofrotterdam.com
SHEERNESS	UK	Medway Ports	www.medwayports.com
SOUTHAMPTON	UK	Associated British Ports	www.abports.co.uk/custinfo/ports/oton.htm

Port-Net: “EDI and Cargo Flows in the North and Baltic Sea Region - an Analysis for Potential Logistical Services”

PortName	Country	PortAuthority	Web
ST. PETERSBURG	Russia	Sea Port of Saint Petersburg	www.seaport.spb.ru
STOCKHOLM	Sweden	Ports of Stockholm	www.portsofstockholm.com
SWINOUJSCIE	Poland	Port Handlowy Swinoujscie	www.phs.com.pl
SZCZECIN	Poland	Authority of Szczecin and Swinoujscie Seaports	www.port.szczecin.pl
TALLINN	Estonia	Port of Tallinn	www.ts.ee
TURKU	Finland	Port of Turku	www.port.turku.fi
TYNE	UK	Port of Tyne Authority	www.portoftyne.co.uk
VENTSPILS	Latvia	Free Port of Ventspils Authority	www.portofventspils.lv
VLISSINGEN	Netherlands	Zeeland Seaports	www.zeeland-seaports.com
WALLHAMN	Sweden	Wallhamn AB	www.wallhamn.se
ZEEBRUGGE	Belgium	Maatschappij van de Brugse Zeevaartinrichtingen N.V. (MBZ)	www.zeebruggeport.be

Appendix

CD-Rom Content:

- GIS-Client Application (implemented in Flash)
- Database (implemented in MS Access)
- PDF and MS Word files of Study

Harmonized System Product Classification (HS2)

#	Product Group	#	Product Group
1	Live Animals	50	Silk
2	Meat	51	Wool
3	Fish etc.	52	Cotton
4	Dairy Produce	53	Other Textile Fibres
5	Products of Animal Origin	54	Filaments
6	Live Trees & Other Plants	55	Staple Fibres
7	Vegetables	56	Wadding, Felt & Nonwovens
8	Fruit & Nuts	57	Carpets
9	Coffee & Tea	58	Special Woven Fabrics
10	Cereals	59	Manufactured Textile Fabrics
11	Milling Products	60	Knitted or Crocheted Fabrics
12	Oil Seeds etc.	61	Apparel (Knitted or Crocheted)
13	Lac, Gums, Resins	62	Apparel (Not Knitted or Crocheted)
14	Vegetable Plaiting Materials	63	Other Textile Articles
15	Fats & Oils	64	Footwear
16	Meat & Fish Products	65	Headgear
17	Sugars & Confectionery	66	Umbrellas etc.
18	Cocoa & Cocoa Products	67	Feathers
19	Cereal Products	68	Building Materials
20	Vegetable, Fruit & Nuts Products	69	Ceramic Products
21	Other Edible Products	70	Glass
22	Beverages	71	Pearls & Precious Articles
23	Residues & Waste	72	Iron & Steel
24	Tobacco	73	Iron & Steel Products
25	Salt, Sulphur, Earths, Stone	74	Copper
26	Ores, Slag, Ash	75	Nickel
27	Mineral Fuels & Oils	76	Aluminium
28	Inorganic Chemicals	78	Lead
29	Organic Chemicals	79	Zinc
30	Pharma Products	80	Tin
31	Fertilisers	81	Other Base Metals
32	Tanning & Dyeing Extracts	82	Tools
33	Essential Oils & Resinoids	83	Other Base Metal Products
34	Soap etc.	84	Mechanical Machinery
35	Albuminoidal Substances	85	Electrical Machinery
36	Explosives	86	Locomotives
37	Photographic Products	87	Vehicles
38	Other Chemical Products	88	Aircraft
39	Plastics	89	Ships & Boats
40	Rubber	90	Precision Instruments
41	Hides & Skins	91	Clocks & Watches
42	Leather	92	Musical Instruments
43	Furskins	93	Arms & Ammunition
44	Wood	94	Furniture
45	Cork	95	Toys
46	Straw Products	96	Other Manufactured Products
47	Pulp	97	Art
48	Paper & Paperboard	98	Total Confidential Data
49	Books, Newspapers etc.	99	Other Products

NACE Groups

Table App-0-1: NACE Groups

#	NACE Grouping	#	NACE Grouping
1	Agriculture, hunting, forestry	40	Electricity, gas, steam, and hot water supply
2	Forestry, logging and related services	41	Collection, purification and distribution of water
5	Fishing	45	Construction
10	Mining of coal and lignite; extraction of peat	50	Sale, maintenance, repair of vehicles; fuel retail
11	Extraction of crude petroleum and natural gas	51	Wholesale trade and commission trade
12	Mining of uranium and thorium ores	52	Retail trade; repair of personal/household goods
13	Mining of metal ores	55	Hotels and restaurants
14	Other mining and quarrying	60	Land transport; transport via pipelines
15	Manufacture of food products and beverages	61	Water transport
16	Manufacture of tobacco products	62	Air transport
17	Manufacture of textiles	63	Supporting and aux. Transport activities
18	Manufacture of wearing apparel	64	Post and telecommunications
19	Manufacture of leather for luggage, handbags, etc.	65	Financial intermediation
20	Manufacture of wood products	66	Insurance and pension funding
21	Manufacture of pulp, paper and paper products	67	Activities auxiliary to financial intermediation
22	Publishing, printing and reproduction of media	70	Real estate activities
23	Manufacture of coke, refined petroleum, etc.	71	Renting of machinery and equipment
24	Manufacture of chemicals and chemical products	72	Computer and related activities
25	Manufacture of rubber and plastic products	73	Research and development
26	Manufacture of other non-metallic mineral products	74	Other business activities
27	Manufacture of basic metals	75	Public administration and defence
28	Manufacture of fabricated metal products	80	Education
29	Manufacture of machinery and equipment	85	Health and social work
30	Manufacture of office machinery and computers	90	Sewage and refuse disposal, sanitation
31	Manufacture of electrical machinery and apparatus	91	Activities of membership organisations
32	Manufacture of radio, tv and communication equipm.	92	Recreational, cultural and sporting activities
33	Manufacture of medical, prec. and opt. Instruments	93	Other service activities
34	Manufacture of motor vehicles and trailers	95	Activities of househ. as employers of dom. Staff
35	Manufacture of other transport equipment	96	Goods of households for own use
36	Manufacture of furniture	97	Services of households for own use
37	Recycling	99	Extra-territorial organisations and bodies

EU-Directives

- COUNCIL DIRECTIVE 95/64/EC of 8 December 1995 on statistical returns in respect of carriage of goods and passengers by sea OJ L320 p25, 30/12/1995
- COMMISSION DECISION 98/385/EC of 13 May 1998 on rules for implementing COUNCIL DIRECTIVE 95/64/EC on statistical returns in respect of carriage of goods and passengers by sea, OJ L174, 18/06/1998
- COMMISSION DECISION 2000/363/EC of 28 April 2000 on rules for implementing COUNCIL DIRECTIVE 95/64/EC on statistical returns in respect of carriage of goods and passengers by sea, OJ L132, 05/06/2000
- COMMISSION DECISION 2001/423/EC of 22 May 2001 on arrangements for publication or dissemination of the statistical data collected pursuant to COUNCIL DIRECTIVE 95/64/EC on statistical returns in respect of carriage of goods and passengers by sea, OJ L151 p41, 07/06/2001
- COMMISSION DECISION 2005/366/EC of 4 March 2005 implementing COUNCIL DIRECTIVE 95/64/EC on statistical returns in respect of carriage of goods and passengers by sea, OJ L123, 17/05/2005