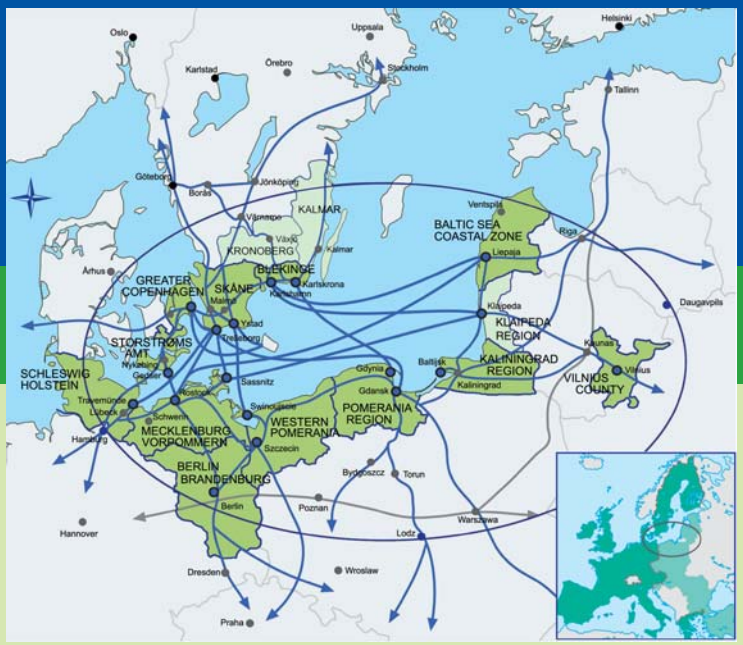
A report produced within the Baltic Gateway project
in close co-operation with SEBTrans-Link



The Sea Transport Infrastructure

A Baltic Gateway report
Work Package 1
October 2004

BALTIC GATEWAY
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MariTerm AB & Lloyd's Register Fairplay Research

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Foreword

This report has been produced for the Interreg IIIb project Baltic Gateway WP 1 that is one of six projects that covers the regional development in the South Baltic Sea Region (SBSR) in various ways.

The report contains the following chapters:

1 Introduction; The outline of the report is described as well as the methodology for producing the future trade flows etc. The chapter also gives a definition of the Baltic Gateway area.

2 General business environment; Gives the conditions for the market and the development from trading, technical and political points of view.

3 Economic growth and trade; Describes the economics, the current trade and the conditions for growth.

4 The Ports in the Baltic Gateway area; The ports are summarised by turnover in the region.

5 The Baltic Shipping market; Ships are presented as by type and typical type of products transported. The development and market conditions for each type are commented. The vessel activity in the BGW region is presented.

6 The Ferry market within the BG; The ferry services and operations are presented.

7 Current transport by cargo type – important trade lanes; The total trade flow is presented and the flow is projected on ship activities.

8 Future demand for sea transportation in the BGWcountries; The trade development is projected on ships activities and the traffic routes predicting the development in tons between countries and in the ports.

9 Summary and suggestion for further analysis; Conclusions of the report are presented and some suggestions for further analyses.

In **Appendix 1** the ports are presented individually.

For a better understanding the report also provides background information around the basics of sea transportation. The report aims to give information that is of value for further analysis of transport routes/corridors and the demand for infrastructure for the future.

The report has been produced by MariTerm AB in close cooperation with Lloyds Register – Fairplay Research, the Institute of Shipping Analysis and Prof A Sakalys, Vilnius Gediminas Technical University.

Göteborg 05/08/2004

Anders Sjöbris

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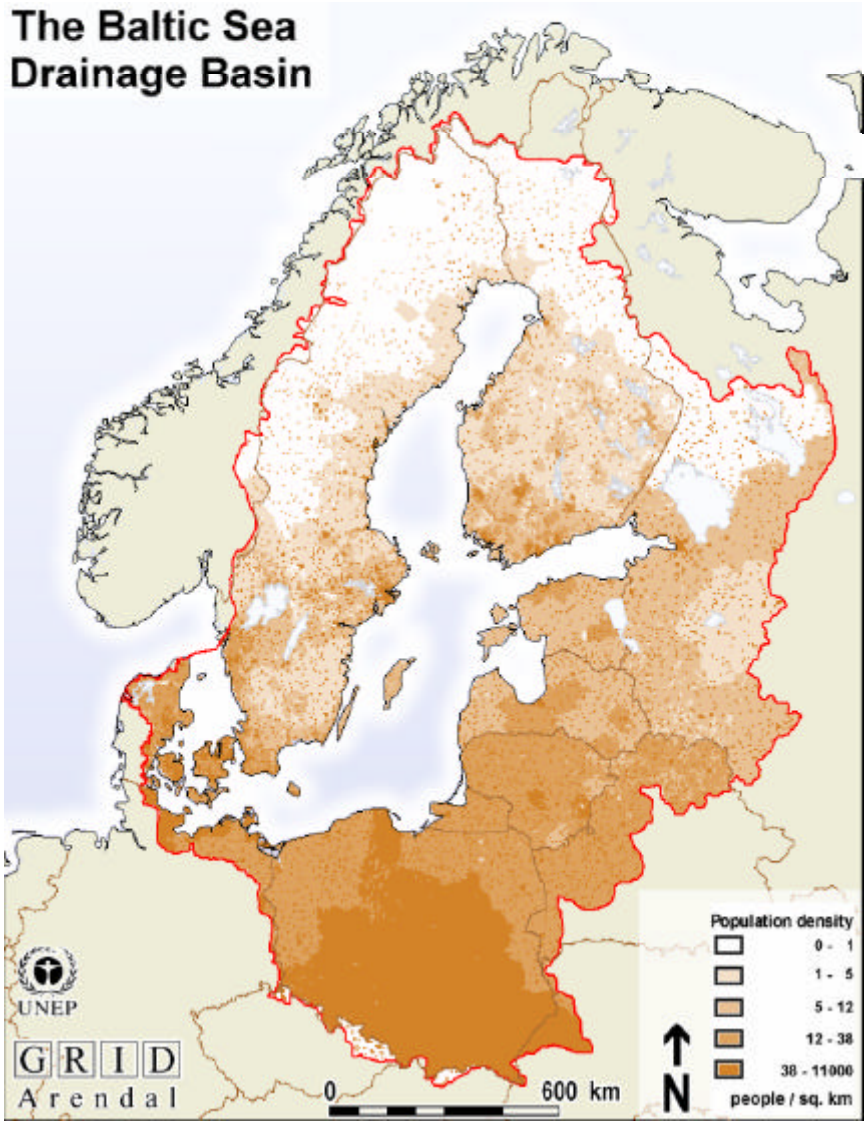
1 Introduction

- **The Baltic Gateway area analysed in the report is determined with geographical location of the involved partners. It encircles the South Baltic Sea, which is a gateway for goods and passenger flows in the north-south and east-west directions, as well as for intercontinental transhipments.**
- **The report analyses the development of sea transports from a total business-environment, demand of transports and a market point of view**
- **Prediction on future demand for seaborne transports in the Baltic Gateway area is based on analyses of the time series and extrapolation of identified trends concerning operation of vessels and traffic routes.**
- **Statistics on ports and vessel operations has been collected from Lloyds Marine Intelligence Unit, processed by the Institute of Shipping Analysis (SAI,) and, in case of ferry traffic - from ShipPax Information. These sources allow for extracting and further processing of data based on ship capacity. Other information has been retrieved from port databases**

The Baltic Gateway project focuses on the southern part of the Baltic Sea and the transport infrastructure in this area. The main topic is the area's function as a gateway for goods and services between east, west and north Europe. The project also handles the flows from east and north Europe to and from rest of the world. This report covers the sea-borne transport part of the project that include the activities of ferry services, liner-shipping operation by Ro-ro systems, container feeder systems, dry and floating bulk and break bulk services in regular and irregular trades.

Figure 1 illustrates the population density and thus the large consumer areas. The population also indicates where the potential future production/consumption will be located. The dense populated areas are also the areas in risk of distortions of traffic thanks to increased use of private cars. This will lead to an increased demand for a more developed infrastructure in the areas.



Source: UNEP/GRID-Arendal

Figure 1: The density of population in the BSR

Sea transports have always operated on commercial conditions but the investments in the land infrastructure, such as the ports themselves and their road and rail connections, which have mostly been built by some form of support from public funding. Competition to transport the cargo is from an historic point of view mainly within the transport mode as regards road and sea borne transports.

The society invested in the infrastructure for the seaborne traffic when heavy goods only could be transported on ships. The important thing was to strengthen industries and facilitate for their development. Today the accessibility is almost an eliminated issue because of the wide expansion of the road- and railway network. A new phase in spatial planning starts now when it comes to control the total flow of cargo and still maintain the mobility in the future.

It therefore becomes necessary to make room for investments in all available means of transport – also the seaborne ones. The means of control will grow in importance and can be affected in many different

ways. Most important is that it should result in a long-term sustainable development. The Baltic Gateway Project and thus this report is a part of developing knowledge to make the right investment decisions for the future.

1.1 Objectives

The objective of the Interreg III B, Baltic Gateway project WP 1 is to cover the Southern Baltic area by knowledge as a shipping area. Information regarding the sea transportation activities is needed to make a SWOT analysis of the area. This will be used for knowing what actions to take in order to guarantee the function of the area as a sustainable sea transport area.

This study displays the sea traffic situation in the area in two major categories; the ferry services in the area and the shipping activities within, to and from the area and their relation to other regions and continents.

The objective is also to identify the development of sea transport activities in the area in order to give information for the spatial planning.

1.2 Methodology

The figure to the right illustrates Lloyd's Register – Fairplay Research standard analytical approach, used in this report. In brief; changes in demand for seaborne transport capacity are a function of economic growth and international trade, which in turn result from changes in the business environment.

The effects of changing demand for seaborne transport capacity depend on how the markets are organised; the market structure (e.g. monopoly, oligopoly etc), strategies used to meet demand and products and services developed to meet demand, as well as the different components of utilisation.

The approach is qualitative and consists of three major parts as illustrated in the figure. Most of the predictions are based on time series analyses. To achieve an understanding of how a market is functioning, analyses of the business environment of that particular market is called for.

Basically, what is affecting demand for transport capacity is;

The business environment

- International, regional, bilateral and nation rules and regulations.
- Political decisions within for instance the International Maritime Organisation (IMO), the World Trade Organisation (WTO) or the European Union (EU) could change the pre-requisites for business in a very short period of time. Recent examples are the accelerated phase out of single hull tankers and the elimination of tax-free sales.
- The political development could have a serious impact, both positive and negative, on stability, business conditions, risk exposure and long term commitments etc. Recent geo-political development in the Middle East, Russia and China/North Korea/South Korea/USA form examples of this.
- Traditional business cycle analysis is largely focused to production, consumption, trade and prices for labour, capital and commodities/products. Different price levels are of importance to business development potentials.
- Technical evolutions often lead to step wise developments. They could for instance affect transport technical solutions, environmental issues and even open up for new trade.
- The environmental issues grow in importance and affect business for the transport industry in many ways; directly via the energy consumption and emission of transport activity; indirectly via environmental effects of the activity such as the phasing out of TBT paint, regulation for the treatment of ballast water, dues that lead to shifts in competitiveness between the transports modes. Environmental issues also affect trade with different products which in turn affect the demand for transport.
- Social issues could affect stability in the same way as political issues do and thereby have an impact on production and trade. Social issues also lead to changes in consumption and travel behaviour.

Economic development and trade

- Changes in the business environment as exemplified above form the platform for economic growth on national, regional, international and global levels. The components of economic growth are, to most countries, highly dependent on the development in other countries. The degree of political openness

of economies, as well as the degree of trade in relation to the size of the economy, decides the magnitude of the impact changes in business cycles in the surrounding world have on a particular country. There are however few, if any, countries of economic significance today that are independent from the development in the outside world.

- The development provides the pre-requisites for trade between countries and regions. Trade with goods leads to a demand for transport capacity. When that trade has been specified by type of product, volume and for which trade link and distance the transport is for, then the demand for transport capacity could be defined.

The transport market

- The structure of the individual transport markets is of importance to how that market actors react to changes in the business environment and in the demand for transport. The development depends on the relation between supply and demand for that mode of transport and if there is any form of concentration to a few dominating actors. Also, the extent of horizontal or vertical integration within that sector affects the way that particular market segment functions.

- The business strategies employed are either one of, or a mix of the following. A market where price is the main competitive factor and having the lowest cost position is of essence. A market where product/service differentiation is the governing strategy or finally, a market where cyclic adaptation of transport capacity is considered the key to success.

- The market function is also affected by the types of products and services that have been developed for each segment. Are the offered services standardised of client specific (differentiated).

- The capacity utilisation is key to the actors actions as regards their capacity adaptation and finally also their earning potential. The combination of capacity utilisation and the development and conditions described above have a clear and direct impact on the actor's dis-/investment decisions. This applies for all actors in the transport industry.

The methodology of this report is to bring out the information as regards the transport activities by using the OECD trade data, organise the commodities into groups having the same type of transport system in

common. The activities are presented as transport flows between the countries in the region and between the region and other regions.

The parallel information regarding the transport activities are produced from databases of ships' activities in the region and in and out of the region. In side the region there are ferry services but also a quite large amount of shipping activities by different ship types. The cargo character can be projected on the ship types giving a fairly accurate view of how much of the trade that is shipped on ships in the region.

There are no valid statistics on transports and the cargo from door to door. By checking the actual trade flows with the knowledge of sea transport systems and the typical cargo in these systems the figures fit quite well in a larger scale.

The development of the trade is an extrapolation of the past development bearing in mind in what state of development the market is found.

In each section that presents calculations, guidance to the methodology used is presented.

1.3 Baltic Gateway Area

The project covers the Southern Baltic Sea area, an area that signifies a lot of shipping activities as it connects the Scandinavian Peninsula to the European Continent. Until year 2000 the connection was based only on ferries and sea transportation. From second half of the year 2000 the Öresund Bridge provided a fixed link for rail and road traffic. This shows clearly in the statistics presented in this report.

The function of this area is by tradition a gateway for the Scandinavian products to the Continent. Forest and steel products are dominating. Special terminals are built up in the Southern Baltic Sea ports to receive these kinds of products and distribute them over Europe. It signifies also a very intensive ferry traffic connecting the road and rail infrastructure on both sides.

The ferry services ship cars, passengers, trailers and rail between the countries. The trailers contain consumer products and industrial commodities. Some of the ferries also carry railway wagons.

The Baltic countries have always been the frontier to the trading having the best port conditions to the Baltic Sea in the region. During the Soviet Union time it was natural to make use of and allocate the transports to the Baltic Sea ports. In the new market situation there is no major change as the ports themselves are the gateway to trading and sea transports.

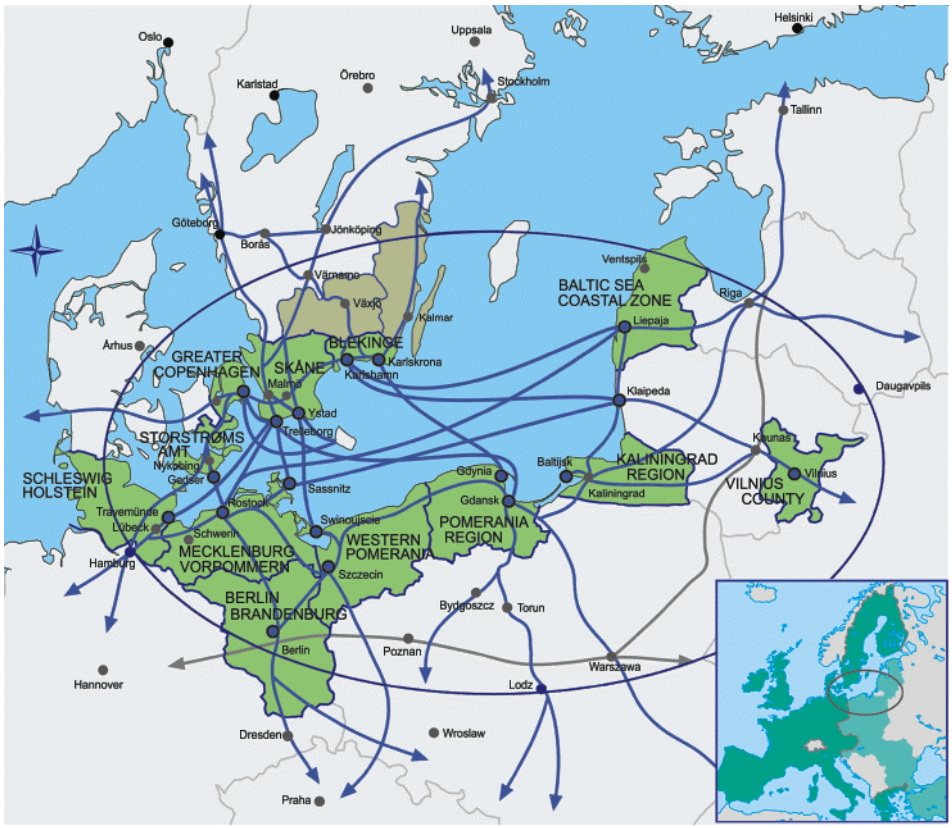


Figure 2: The Baltic Gateway area encircled

The present conditions for trading will also result in a demand from the inner East European countries to find their trading path westwards to the sea. The structures of this have just begun to be built up. It will change the present pattern of transports, as it will give influence on the already heavy occupied transport infrastructure in West Europe. New solutions will be sought for to provide the East Europe with the required port capacity. However, this is a long term project as the major future trading pattern in this respect still is missing both in scale and in statistics.

The Interreg III b project Baltic Gateway partners and associates builds up the geographical area concerned in the project. See Figure 2. The scope of this part of the project covers the sea transport activities that concern the area in one way or another. In the following text the encircled area is named the Baltic Gateway area (BGW). In the report the focus is the function of this area as a Gateway in all dimensions that can be addressed by the word.

2 General business environment

- **The population growth in Europe has stagnated. The major growth will be in Asia. Shipping will develop towards even more rational solutions where unitising the cargo will allow for intermodal transports and will be a key to the global market. Environmentally-friendly and sustainable transport solutions will be the centre of attention**
- **The European Monetary Unions created in Europe will give stabilisation to the EU 15. The economy growth is in general between 1 and 3 %.**
- **The sea transport is characterised as a highly international operation governed by international laws and that receives very little financial support from the society**
- **The containerisation has opened up the world as a market for all scales of trading**
- **There is no harmonisation of the due systems for sea transports and port dues between the EU countries. Finland and Sweden charge national dues on sea transports**
- **The Baltic Sea is phased with ice problems in wintertime. The cost for keeping the sea infrastructure open is covered by the sea transport and in the end mainly by the industry in Finland and Sweden**
- **The European Commission advocates for a considerable and stable growth in maritime transport, aiming at shifting more volumes to short sea shipping and at increasing its market share in order to reduce traffic congestion.**
- **Most of the pro-ecological actions have come from local measures where the industry has agreed to voluntarily take environmentally friendly actions. In these countries the sea transports show better environmental standard.**
- **Ecological safety issues are tackled by the Helsinki Commission (HELCOM), whose aim is to protect the marine environment of the Baltic Sea from all sources of pollution through intergovernmental co-operation between the BSR countries.**

The world population is growing at a pace causing great concern to everyone. According to UN forecasts in 1998, the world population stood at 5.7Bn in 1995 and was projected to be 6.3Bn in 2002 and 7.3Bn in 2013. The average annual growth rate was estimated at a good 1.3 %.

Another billion people will lead to an enormous increase in demand for energy, even if living standards are frozen at current levels.

According to the outlook, the population growth will take place in Asia and the world outside Europe and North America (Figure 3).

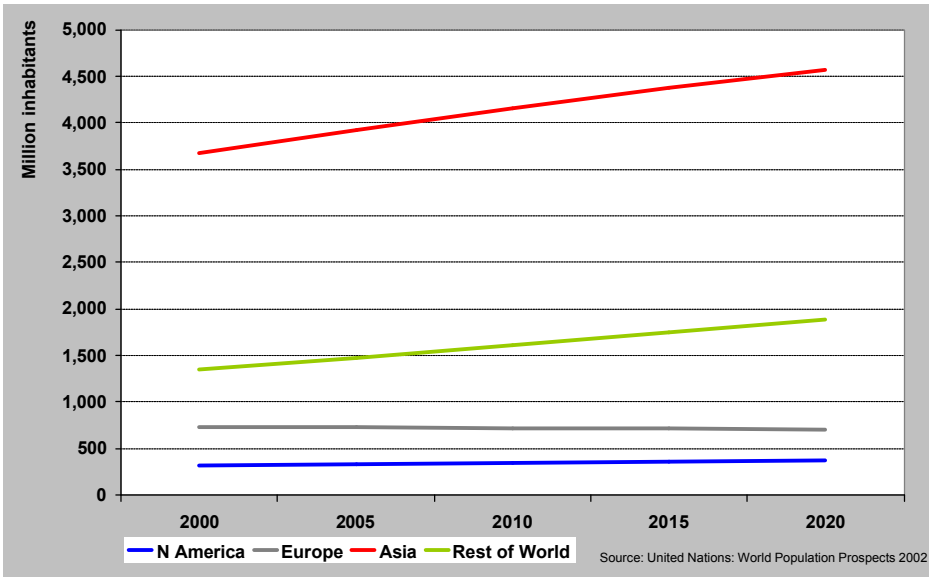


Figure 3: World population outlook

According to the International Monetary Fund (IMF) and the European Central Bank (ECB) changes in total consumer prices in the OECD have been falling slowly for almost ten years; from close to six per cent in 1996 to some 2.5 % by the end of last year. During the same period, energy prices fluctuated dramatically.

Inflation stopped being a problem in the developed world during the 1990s.

2.1 Shipping specific changes and trends

The rapid development of information and communication technologies affects transactions between consumers and producers as well as co-operation between organisations. This takes place by integrating parts of or the entire flow of information. A development of global transport and logistics service providers will be seen based on outsourcing of services and third party logistics.

The shippers' choice of transport solutions and transport service providers depend on a set of criteria of varying importance or value to different shippers. There is therefore a continuous trend towards more sophisticated logistic solutions and higher transport efficiency. In line with increased added value, a rising demand for higher transport quality such as higher time precision and shorter lead times will be seen.

The unitisation of cargo in the form of the worldwide containerisation has opened the world as a market for every producer/buyer that can accept the container as a load carrier. This is probably one of the major

factors for the trade growth over the past decades. Still this is just in a beginning of the development as the containerisation of the world is to continue and the intermodal systems in the already containerised areas demand further rationalisation.

Cargo types are ever changing, causing operators and other transport service providers to adapt, find other solutions and seek ways of increasing productivity as well as quality.

High- and medium-value semi-finished goods are now being traded internationally more than ever, and this development is bound to continue. For shipping in general, this means increasing demand for primarily unitised transport media such as containers and trailers.

Ship operators' clients are increasingly appreciating safe and environmentally-friendly operations. This changing attitude will lead to great challenges, and opportunities, for ship owners and operators.

Competition authorities around the world monitor conference freight rates even more closely, making it difficult for liner operators to make unannounced rate rises. Recent actions in Australia and the EU support this.

At its December meeting 2003, the IMO Marine Environment Protection Committee (MEPC) adopted a revised, accelerated phase-out scheme for single hull tankers. This was decided upon together with other measures including an extended application of the Condition Assessment Scheme (CAS) for tankers and a new regulation banning the carriage of Heavy Grade Oil (HGO) in single-hull tankers. Under a revised regulation 13G of MARPOL Annex I, the final phasing-out date for Category 1 tankers (pre-MARPOL tankers) is set at 2005 instead of 2007. The final phase-out date for category 2 and 3 tankers (MARPOL and smaller tankers) is brought forward from 2015 to 2010.

The action is taken to reduce the risk of oil pollution because of cracks/local damage in the ships hull and to have a higher safety level in case of accidents. The action is a direct consequence of the Erika and Prestige accidents.

2.2 The policies as regard sea transports

In general the sea transport is a very independent business from a political point of view. The ports are operated on a fully commercial basis by the local municipality in some way. The government in the EU has normally very little influence on the ports.

The influence on sea transports from a governmental point comes through the Maritime Administrations that control and regulate the safety and safety standards on the domestic ships and through the "Port state control" on all international ships that calls the country.

However from a business point of view there is very little influence from the governmental level on sea transports. Most of the infrastructure is free and demand no maintenance (the sea) and the major competition is within the transport mode.

One exception that has caused a political action is however the cost for seamen that is regulated by the taxation of seamen sailing on the ships. The taxation is determined of nation of the ship. As we have a free trading in the world almost any ship of any flag may bid for and do the transport. I order to reduce the cost and become more competitive the western ship owners set up ship owning/operating companies in the third world and sailed with a so called “flag of convenience”. In order to stop this type of development the states either opened up international registers allowing special conditions for the employees on the ships or the countries are giving the ship owners special conditions on the taxation in order to reduce the cost of operation.

One common practice is not to allow foreign flag ships to trade domestically. With in the EU the possibility of free transport operation within (cabotage = transporting domestically in another country than carried by the vessel) or between the EU countries is honoured since year 2001.

The investments in infrastructure (fairways to the ports) are of governmental concern in some countries while it is the entire concern of the port in others. In this respect there is no common system within the EU.

Little else has been changed that concern sea-transports since the EU rules started to apply. The general ambition has been to eliminate and take away hindrance for a free trading in and between the EU countries. Free trading without customs clearance and dues. This does not apply to sea transports. In Sweden and Finland the ships have to declare the goods and the transport vehicle (the ship) when coming from another country (if it not concerns ferry traffic) and pay dues. The declaration is costly in itself. Sweden and Finland use the governmental dues as a means of control to achieve certain qualities from the ships. In Finland it is controlled to favour ships of high ice class while the Swedish dues are focused on controlling better environmental performance from ships. See Figure 5.

In traffic systems where there is a competition between the transports modes this has shown to be a direct measure to favour other transport modes that do not have to pay for the infrastructure use, while sea transports are burdened with compulsory dues and service charges.

The circumstance should be weighed against the demand of annual investments to maintain the infrastructure standards for the various transport modes, where sea transport needs are minimal.

2.3 The infrastructure for transports

Today the EU address high hopes that developed sea transports can discharge roads and rail from congestion. An increased use of sea transports for a wider range of products from the industry (i.e. other than bulk cargoes) requires a cargo carrier, rational handling systems and low rates for intermodal transports.

Figure 4: Motorways of the sea

At such conditions sea transports can be a more realistic transport alternative and increase its share of goods transport. This is in line with the EU policy outlined in the White Paper; European transport policy for 2010: time to decide. The infrastructure has become an area of concern for the regional spatial planning in Europe.

To give priority to costly investment in sea infrastructure is normally difficult when they are to be evaluated in competition with other type of needs in the regions. The public (the voters) may not se investments in sea transport infrastructure as obvious as the need for improved road/rail standard and accessibility as this concerns them every day.

Transports and the related infrastructure must be looked upon in a wider international perspective. It demands a prioritised regional infrastructure of increased importance; TEN (Trans European Network, TEN-T Trans European Network-Transport) is today the most spacious approach in this perspective. TEN-T was created within the EU to identify the roads and railways of importance for the development of sustainable move ability in the EU. The status of such assignments is not known but it should give identified infrastructure a prioritised class that allows EU and/or state financing for upgrading and/or extension. The level of financing depends on the type of area concerned and if it classified as an Objective area. EU has so far allocated substantial financing in Objective 1 areas. Examples of this can be found in Ireland, Greece and Portugal.

From the beginning sea transports and the ports were not included in the TEN-T. However, as the major part of the land infrastructure ended in the ports the ports were added in 2001 as nodes in the network. These ports are assigned as TEN-ports and have to fulfil special criteria to earn the assignment. Ports having regular international sea transport activity with an annual turnover of 1.5 million tons or 200,000 passengers and is connected to the TEN-T network is classified as A-class ports. To be a TEN-port, the port must have the A-class standard.

The EU is addressing the enclosure of sea transports in the TEN-T network trough a various initiatives. MOTORWAYS OF THE SEA is a prioritised project program in which the main waterways are to be identified and possible classified. The exact form or feature of the waterway network is presently not known. However it is realistic to believe that it will link to the status that was set up for the ports to be a TEN-T port having more than 1.5 million tons of cargo or 200,000 passengers per year.

Setting up the TEN-T ambition to include also sea transportation it is possible for sea transport services that operate as an intermodal system to get funds for the development by EU.

Dues on sea transports have been set to a level that acts as a means of control to shift transports to another transport mode. The strength of the sea transports are the low ton per kilometre cost and the environmental friendliness in land use/land take, barrier effects, noise, congestion, use of energy, low maintenance etc. Service that is included in dues for a land transport mode, such as traffic control, is an additional cost for sea transports today (pilots).

In Sweden the administration of sea transports infrastructure is run by a commercial administration, and they thus have to take out fairway dues to have a budget. The dues in Sweden favour ships with good environmental performance.

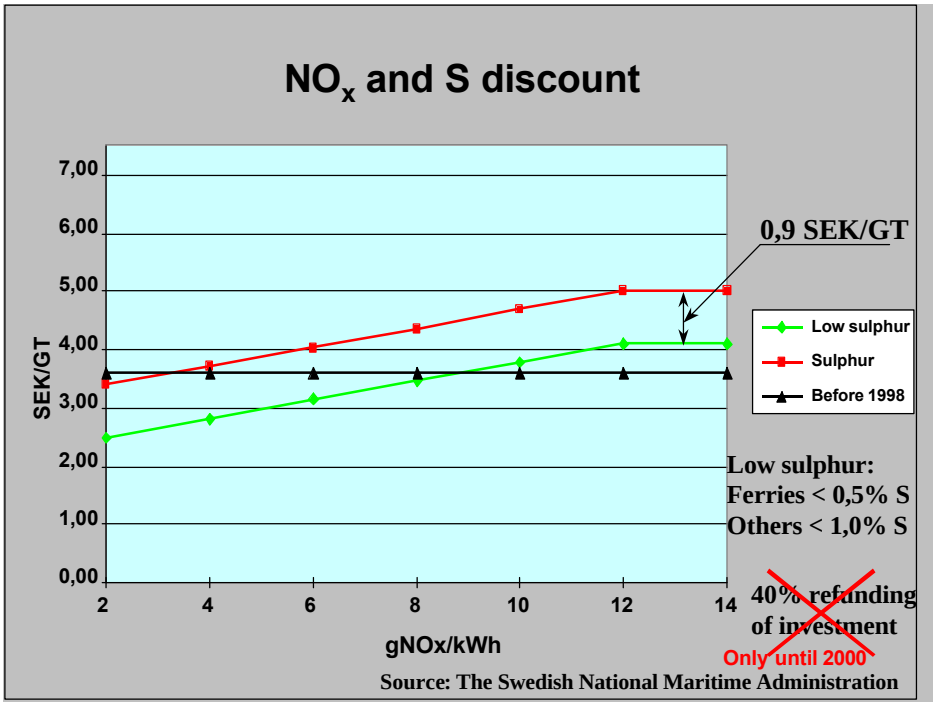


Figure 5: Fairway dues in Sweden from 1998

Sweden and Finland are alone in the EU to have national dues on sea transports in addition to the port dues. According to Vilnius Gediminas Technical University, there is only one major port in Lithuania where port dues apply. The Port dues are; vessel dues, navigation dues, berth dues, tonnage dues, sanitary dues and passenger dues. The Government of Lithuania establishes all dues. In Poland the ports collect the Port dues and in Latvia the ports sets and collect the dues. The same applies in Germany. Denmark has only port dues as the law guarantees that all ships to have free access to ports without Governmental charge.

The normal regulating factor is the Gross Tonnage GT of the ship. Rebates in various forms are normally given to ships calling the port frequently.

Ice conditions

In 1961 a Nordic agreement was closed between Finland, Sweden, Denmark and Norway of co-operation in planning for the icebreaking and how to share the responsibilities in order to uphold sea transports during the winter period. This became the base for a more formal co-operation and plans were made up for how to meet all types of ice conditions using the joint resources. Winter shipping conditions can be considered equal for Finland and Sweden. The cooperation between the Finnish and Swedish icebreakers in the entire area works smoothly. The industries cover the total costs caused by the ice conditions. These costs come in two forms, partly the added cost for higher standard of ships designed for the winter environment and partly the direct cost for the icebreaking service paid in ports. These costs are covered by the shipper as fairway dues and added cost for ships of high standard.

The management of the icebreaking resources have made use of Information Technology to manage the resources in an effective way. An IBNet has been set up, which is a communication system that makes use of AIS and displays on line all activities in the BSR to the Finnish and Swedish icebreaking offices. This is the first step of making use of the AIS system. It will be a powerful tool once it is in full force and installed on all ships.

The Finnish and Swedish Maritime administrations issue restrictions in demand of fulfilling a minimum ice class for vessels calling the ports in the ice regions in the ice season if the ship should count on icebreaker assistance. This is done with consideration to the actual situation and is announced weeks ahead of implementation. The grades of restrictions are continuously followed up over the season. Ships suitable for forcing the ice can expect assistance from icebreakers when entering the ice affected waters and assistance in guidance through to the port of destination and out of the ice area again. Ships not suitable for following the convoy in ice can be declared not suitable for ice conditions and cannot expect assistance from the icebreakers. Sweden and Finland has ratified an amendment to the ice class rules. The amendment is focusing on the ships hull and the parameters that have been found to affect the ships ability to navigate in ice.

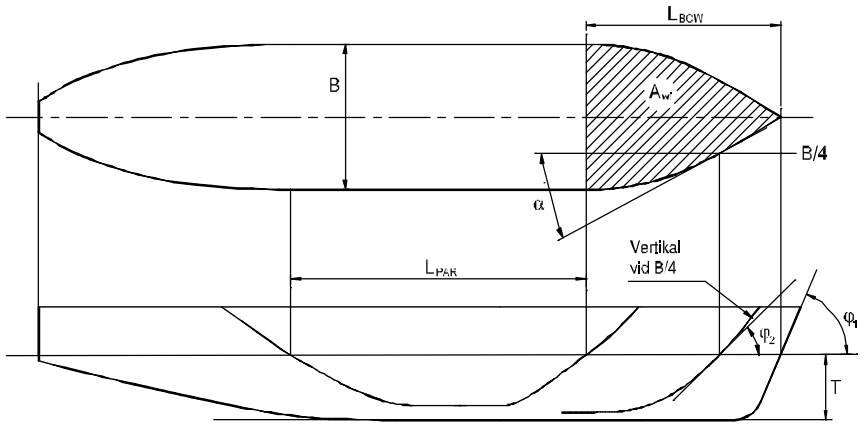


Figure 6: Ships parameters that affect the ability to force ice

The object is to as far as possible try to avoid ships not suitable for ice to operate in the ice affected areas. The new ice class rules the shape and hull form is given functions of angles that will affect the ship's resistance in ice. This gives the demand of power to be installed in the ship to get a certain ice class. Ships can never be left stuck in the ice. If the ice starts moving the ship may be forced aground without any way of saving it. The really dangerous situation is to have moving ice in hard winds. The ice masses represent a huge amount of force that can sink almost any type of ship that cannot head and force it.

The ice class has three major functions;

- the hull itself shall be able to take the ice pressure related to the ice class of the ship
- the propulsion and steering equipment are strong enough to work properly in ice
- the ship has enough power to force the ice and follow the icebreaker.

Most of the times it is not dangerous to navigate in firm thick ice. The dangerous situation is to come from the open sea in hard winds and pass the ice ridge. Tankers waiting to come in to load in the Gulf of Finland will have to find a free area

The dangerous part for the navigation is the moving ice and ships that are locked in moving ice unable to manoeuvre. This risk becomes higher in scale in the South of the Baltic Sea as the ship traffic will continue to increase rapidly especially with regards to tankers. The Primorsk terminal started operation in 2002 and the winter 2002-2003 was the first time when the production of 1 million tons per month started. This turnover will increase to 5 million tons per month. If this amount is shipped in crude oil tankers of 100,000 DWT, as an example, it will result in one to two tankers per day passing the southern Baltic Sea area fully loaded and just as many empty in the other direction.

In the winter season 2002-03 the ice coverage was a bit more than average but the ice situation in some parts of the Baltic was a bit worse than the coverage indicates. Another issue is that the ships calling Russia is of a width that requires two large icebreakers to assist it. It is also well known that the mass of a moving tanker (the energy of 130 –140,000 tons of 1 – 2 m/s cannot be stopped easily) will be a hazard to itself and possibly the icebreakers if they hit a firm mass of ice.

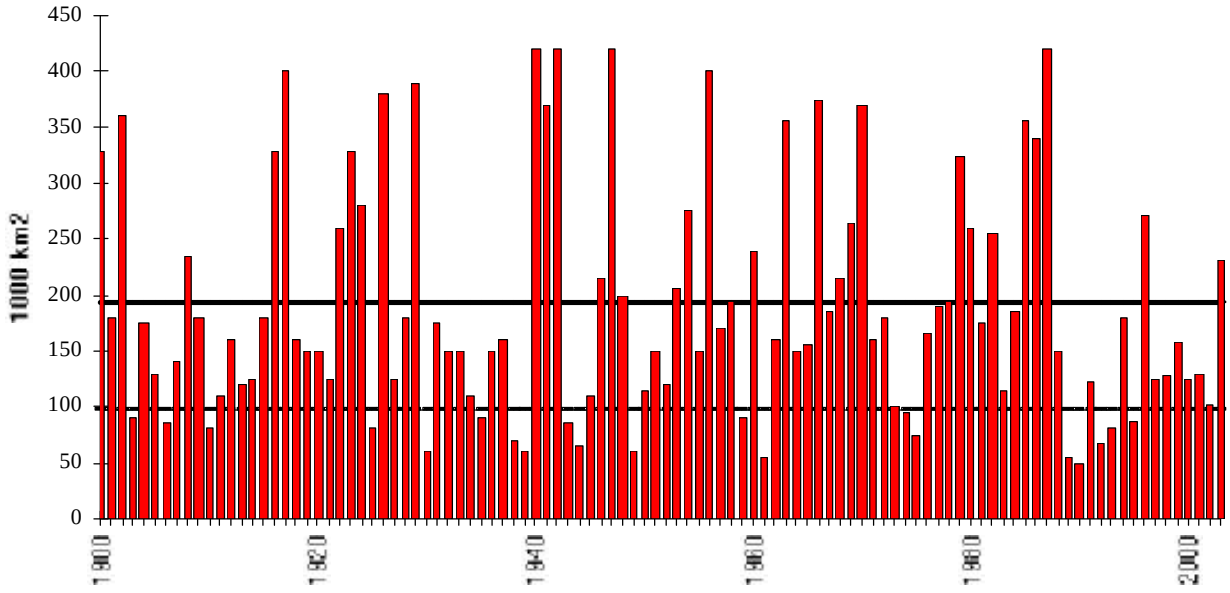


Figure 7: Ice area coverage in the Baltic over the years

The question is how to ensure safe transport in the Baltic in wintertime, as these potentially environmental bombs need assistance from the Skaw to Primorsk. The financial arrangement for such a set up is also to be considered.

Considering the ice situation of 1987 and the state of traffic today, the tankers need efficient assistance through the Belt and in the southern part and the Baltic. The Russian ice directorate has guaranteed service from Russia in case of a hard winter and problems in the Belt.

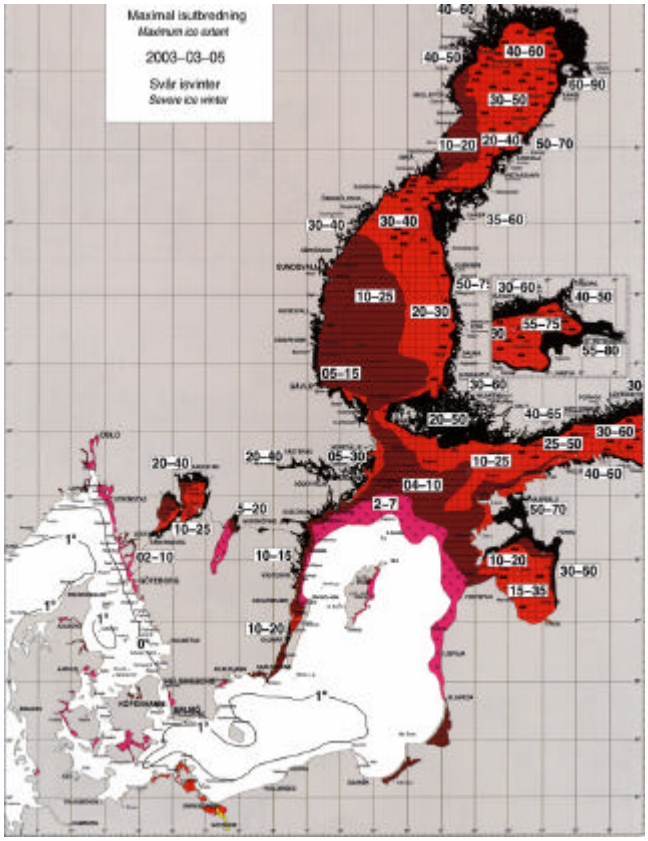


Figure 8: Ice maps from 2002-03

In hard winds and drifting ice the ships need a safe place to anchor or wait if the situation in the Finnish Gulf is causing delay of the traffic. This should preferably be in open water or somewhere sheltered from moving ice. The total picture explains the concern from the Finnish Authority when tanker ships of doubtful strength are navigating in the Finnish Gulf in communication by the IBNet system. From the map the following conclusions can be drawn:

- With the increased traffic on the Baltic countries and Russia there must be resources made available to keep the waters open and safe
- Almost all ships need assistance of icebreakers in the Kategatt, the Sound and the Belt
- The Baltic countries do not have their own icebreakers. However, in the Bay of Riga large icebreakers are needed in normal to hard ice winters
- In hard winters most of the waters are unsafe for the ships to wait in strong winds

- The icebreaker's assistance to ports in the Finnish Gulf and ports north of Gotland is demanding icebreaker service

In short the situation is difficult for sea transports and the costly for the industry and the risk is increasing as the tanker traffic is growing.

During the past decade the trading activities between the EU countries and Russia and the Baltic countries has grown in a healthy way. The winter 2002-03 showed how vulnerable this trading is in wintertime.

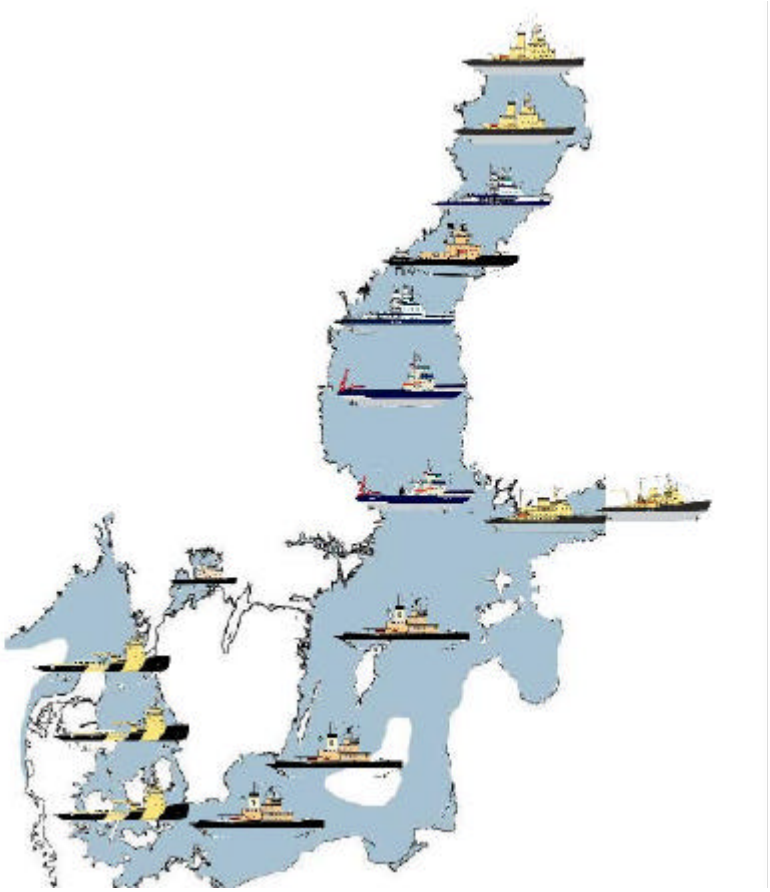


Figure 9: The distribution of icebreakers in the Baltic

There is no formal agreement and understanding between Finland and Russia how the icebreaking resources in the Finnish Gulf shall be managed in future. The only existing agreement is regarding the service through the Belt between Russia and Denmark. However, as the from May 2004 the BSR will become almost a EU sea and in the context of safe navigation and keeping the trade lanes accessible and open within the EU the icebreaking resource in the Baltic has become a EU issue.

Discussions are now going on how to solve the icebreaking resources for the future based on the question if the icebreaking should continue to be a national resource or could it be a common EU resource giving the best service to all countries concerned to ensure the mobility in the region for all countries using the best of the available resources?

2.4 Europe, including Russia

Europe is facing one of the most interesting and evolving challenges since the reconstruction after the Second World War. From having had separate economic systems in Europe the countries will unite in an economic system that aims at free trading and a common monetary system.

One of the major aspects in the future Europe is to plan and construct for the enlarged Europe to guarantee a sustainable mobility and a healthy environment for development. The sea transportation plays here an important role being the sole transport mode to give a large-scale access to the world market as well as ensuring the mobility within the populated central Europe, the contacts between the remote areas and provide for a cost effective transport that allow industries in the remote areas to be on the same play-field as the competitors positioned in the centre.

The enlargement will be costly but it will also give a big new market. In addition the fast developing Russian market is in a world trading perspective so close to Europe that it gives an advantage in the world market competition for Europe to supply this market with it needs.

May 1, 2004, Estonia, Latvia, Lithuania, Poland, Hungary, the Czech Republic, Slovakia and Slovenia as well as Malta and Cyprus became members of the European Union. All except Cyprus have held referendums. A majority in favour of accession has been achieved in all these countries. The next stage on the path towards the introduction of the Euro in these countries will be participation in the EU's Exchange Rate Mechanism (ERM2), which means that each respective national currency will be pegged to the Euro at a fixed exchange rate, known as the central rate. A fluctuation band will also be established. Some time may pass after the beginning of EU membership, but as early as in the summer 2004 the first countries can participate in the ERM2. The establishment of the ERM2 central rate will be an important issue, since in most instances the central rate that has been selected has also become the conversion rate upon a country's transition to the euro.

The timetable for Euro zone enlargement will, according to several market actors, be delayed since several countries will have difficulty meeting the budget and inflation criteria. The Baltic countries are in the best position.

In order to switch from a national currency to the euro, a country must fulfil the convergence criteria according to the Maastricht Treaty.

- The inflation rate may be no higher than 1.5 percentage points above the inflation rate in the three EU member countries that have achieved the best results in terms of inflation
- The public sector deficit may not exceed 3 % of GDP

- The public sector debt may not exceed 60 % of GDP
- Participation in the ERM must last at least two years and no devaluations may have occurred during that period
- The long-term interest rate may be no more than 2 percentage higher than in the three EU countries that have achieved the best results in term of inflation

Some flexibility seems to exist as regards the convergence criteria, especially for the debt and deficit criterion. The actual time for Euro transition will thus vary from one country to another, but EU would most likely work with groups of countries.

Table 1: ERM2 accession and transition to the Euro

Country	ERM2 accession	Euro transition
Czech Republic	2007	2009-2010
Estonia	2004	2008
Hungary	2004	2008-2009
Latvia	2004	2008
Lithuania	2004	2008
Poland	2006	2009-2010
Slovakia	2005	2008-2009
Slovenia	2005	2008

Source: SEB Baltic Outlook - October 2003

The Russian market is and will continue to be especially important for its neighbours Latvia, Lithuania and Poland. In Russia the presidential power is strong but a cooperative Duma has been crucial to the reforms so far in the new century. The Russian president Mr Putin was re-elected with a large margin. Positive to long-term economic and political stability in Russia will be continued efforts in simplifying bureaucracy and reforming the banking and energy sectors as well as the judiciary. The Russian economy is dependent on the oil sector, but the sensitivity to declines in oil and raw material prices is substantially less today than previously.

The banking sector is slowly being reformed and lending has expanded, but capital spending is financed mainly by the major exporting companies, which are bringing home a rising share of their hard currency earnings. They have also taken advantage of the access to loans in the international capital market. Initial progress in improving corporate governance has helped boost foreign direct investments, mainly in the oil industry (sources: SEB, Nordea, LRF Research).

The long-term prospects for increasing direct investments are good, although the arrest at the end of October 2003 of the managing director of the planned merger Yukos-Sibneft – which would have been the fourth biggest oil company in the world – with charges of tax evasion, fraud and embezzlement has been a reminder of the instability of the Russian system. The merger thus was put on hold for the time being that is.

Analysts see stability in recent years as the main contributor to Russia's growth. The action on Yukos highlights the problems that still exist in doing business in Russia, and some ventures are now at stake.

For this project the Kaliningrad area is of special importance. The Vilnius Gediminas Technical University reports that the federal law 'On the special Economic Zone in the Kaliningrad Region' (adopted in 1996) has granted a number of privileges, which considerably facilitate the economic development of the Region.

The aggregate indicator of economic development, the Gross Regional Project (**GRP**), is calculated yearly by the Kaliningrad Regional Statistics Committee (KRSC).

Table 2: GRP of the Kaliningrad Region in 1998-2001:

	1998	1999	2000	2001
GRP of the Kaliningrad Region in current prices, RUR billion	8.7	16.2	24.6	31.5
Changes in real GRP, y-on-y	-9.5	6.8	14.4	4.0
GRP of the Kaliningrad Region per capita, RUR thousand	9.1	17.0	26.0	33.5

(source: Goskomstat, KRSC, 2002)

Table 3: Foreign investments in the Kaliningrad Region, in million USD:

	1999	2000	2001
Total foreign investments	18.3	19.1	24.6
of which:			
Direct investments	4.1	6.6	3.2
Other forms of investments - trade and other credits	14.2	12.5	21.3

(source: Goskomstat, KRSC, 2002)

Since 1991 by 2002, the European Union has made a large financial commitment to Kaliningrad. Kaliningrad has been allocated roughly EURO 40 million directly in Tacis assistance, of which around EURO 25 million has already been spent and EURO 15 million is in the pipeline. The region has also benefited from other TACIS programmes for Russia at a national level and the many regional programmes which the EU finances. The Commission has opened a Tacis support office in Kaliningrad city. EU support has focused on a few key sectors.

Considering the geographic location of Kaliningrad cross border co-operation and trade/transit facilitation is of particular importance. A number of programmes are being implemented which aim at facilitating trade and movement of goods and persons through the development of infrastructure, modernisation of border procedures, and training of enforcement agencies staff to detect unlawful activities and increase their capacity to collect tax revenue.

At present, there are 23 crossing points between Kaliningrad, Poland and Lithuania. In order to ensure the efficient flow of goods across the EU's external border in the future, investment is needed in physical infrastructure and in processing, including through upgraded information systems. Under the Tacis Cross Border Co-operation Programmes, two border crossings in Kaliningrad received priority: Chernyshevskoe /Kybartai-Nesterov (road/rail) and Bagrationovsk/Bezledy (road), on the borders, respectively, with Lithuania and Poland. These crossings, identified after a detailed feasibility study, are the major ones located on the Pan European Transport Network.)

Port development is area of EU focus in cross border cooperation and trade facilitation. *The EU Kaliningrad Port Development project* is aimed to stimulate trade and transit via the region, by strengthening the competitiveness of its port facilities and their management. Ultimately, the port modernisation will contribute to a sustainable economic development of the area and its integration into the Baltic region.

The National Indicative Programme 2004-2006 (NIP) for Russia, adopted by the European Commission on 21 May 2003, has been developed on the basis of the 2002-2006 Country Strategy Paper (CSP)[1], which, within an overall framework of continuing political stability, economic growth and no significant change in direction in the reform programme, remains a valid basis for Community assistance to Russia.

The 2004-2006 NIP is aimed at delivering continuity with respect to assistance in the previous period (2002-2003). It takes as its basis the current "Medium term programme of social and economic development of the Russian Federation for 2002-2004", focussing on those areas with the strongest RF Government's commitment to reform. The National Co-ordination Unit (NCU) played an important role in balancing aid requests from the Russian line ministries and facilitating co-ordination between the EC and Russia at programming and implementation level.

The NIP also takes into account the likely impact of the EU enlargement, reflecting the general objective of making the neighbouring countries aware of the opportunities created by the enlargement, and avoiding any new dividing lines on the European continent. With regard to the legislative/administrative reform and private sector development, the Common European Economic Space (CEES) will also be a progressively more important reference point for Tacis measures

In line with these over-arching objectives, the Kaliningrad Oblast, with its special geographical situation and its significance to the overall development of the wider Baltic region, will receive special attention in

[1] http://europa.eu.int/comm/external_relations/russia/csp/index.htm

the implementation of the NIP. The NIP therefore foresees allocating EURO 25 million to support the economic and social development of Kaliningrad, in line with Russia's plans for the region. Where relevant, this will be pursued in co-operation with other donors, including the IFIs. The present Indicative Programme for the period 2004-2006 covers three areas of co-operation, in continuity with the previous period 2002-2003:

1. Support for institutional, legal and administrative reform,
2. Support to the private sector and assistance for economic development
3. Support to the integration of Russia into the international economy.

Shipping specific policies

In the aftermath of the Erika and Prestige accidents, the EU has formed its own shipping governmental body; the European Maritime Safety Agency (EMSA). EMSA's role should not be regulatory, but rather to ensure that maritime safety legislation is applied properly across the EU. Some players however speculate that the Commission intends that EMSA eventually replace national bodies, describing it as "the thin end of the wedge towards uniform European standards".

A recent example of this is the European MPs vote at the beginning of June 2003 for a faster phase-out scheme of single hull tankers in EU waters and for a ban on such vessels carrying heavy grades of oil as from September 1 last year.

The proposal by the European Commission to tighten pollution regulations has met strong opposition by the industry and to some extent by European transport ministers. This is yet another step by the Commission to go beyond rules agreed in the International Maritime Organisation (IMO). The IMO is seriously concerned with the EC activities that might undermine its position.

Meanwhile, the EC has an ambition to become a "full" member of the IMO. The EU currently enjoys observer status since only states can be members under the present convention.

Another effect of the EU enlargement is that the manning issue has become a delicate problem for the EU-member states. With the applicant countries entering the EU, this matter will be revisited since the manning costs are significantly lower in these registers.

2.5 The Baltic S BSR countries

The general business environment in the three current EU-member states Germany, Sweden and Denmark is rather similar. The two Baltic states Latvia and Lithuania have systems and a standard which is quite similar

and Poland shows more resemblance to them than the old EU countries.

	Area [km^2]	Coastline [km]	Population (2003)	GDP per capita [US $] (2002)
Denmark	43,094	7,314	5,384,384	28,900
Germany	357,021	2,389	82,398,326	26,200
Latvia	64,589	531	2,348,784	8,900
Lithuania	65,200	99	3,592,561	8,400
Poland	312,685	491	38,622,660	9,700
Sweden	449,964	3,218	8,878,085	26,000
Russia	17,075,200	37,653	144,526,278	9,700

Source: CIA - The World Factbook

Figure 10: Basic facts, Baltic Gateway countries plus Russia

The "old" EU countries in the region

Germany's economy is the worlds third-biggest. Considered the economic heart of Europe, its performance has far-reaching effects outside Germany, particularly in other EU countries and in Central and Eastern Europe.

Chancellor Gerhard Schröder pushed through a tax reform in his first term, but taxes remain high and complicated. The labour market is rigid but with large long-term unemployment this will change slowly. Low returns on investment, a legacy of state-owned banks and their artificially low cost of capital are also hindering growth. A second reform package, "Agenda 2010", launched by Mr Schröder in early 2003, made labour-market reform a top priority, and a modified version passed (with opposition support) late in the year. With the government's popularity low at the beginning of 2004, the prospects for further economic reforms are dim.

Germany's other options are circumscribed. The independent European Central Bank controls monetary policy, and the EU's "Stability Pact" still in theory constrains its fiscal policy, though the pact's enforcement measures have been suspended. The ECB claims that Germany's economic problems are structural rather than cyclical and an interest rate cut could not help Germany's labour market or finance its health system

Denmark is currently run by a right-of-centre coalition government, consisting of the Liberal Party and the Conservative People's Party. The government continues its slide in the polls but its co-operation with its main support party, the Danish People's Party, has to be considered as solid. Thus they will remain in power at least until the next general election, which must be held no later than November 2005.

The government has announced a programme of income tax cuts to be implemented in June 2004, designed to boost consumption and generate new jobs. However, the cost of maintaining Denmark's welfare state means that fiscal policy is likely to be tightened again after the next

general election. Denmark's current administrative division into municipalities and counties will be reformed during 2004, in preparation for the next local elections in November 2005.

Most of the income tax cuts are ones previously intended to be implemented over the three-year period to 2007. The income tax cuts are likely to give a boost to private consumption in 2004-05.

The risk of inflation is small as the labour market is weak and still is not foreseen to be stronger as the growth is very low. The oil price is expected to fall and this will keep down inflation.

In *Sweden* the official target of a public sector budget surplus totalling 2 % of GDP currently appears distant. The government seems to be forced to borrow more than SEK 40Bn in 2004. Budget policy is subject to the alliance between the Social Democratic Party, the Left Party and Green Party. This grouping will effectively postpone structurally changes in the tax system, and only minor adjustments are expected.

Unemployment has risen over the last few years and necessary structural changes on the labour market are hard to come by with the current parliamentary situation. In addition, sick leave has increased drastically. The number of people actually working fell by 0.7 % during 2002 and has continued to fall at the same pace during 2003 (sources: ECB, Nordea).

The "new" EU countries in the region

The *Polish* economy is recovering faster than expected and the main cause is the exports. The GDP growth was 3.5 % in 2003 and we expect it to be a good 4 per cent in 2004 (based on reports from SEB, IMF, Nordea, ECB, RBS, The Economist). The inflation has been modest due to the account deficit and is expected to be so because of the high debts and deficits.

The public sector debt is climbing and exposes the economy to a risk of having to tightening the budget.

The good thing is that the export is doing well and coming into the EU this may be one of the positive parts for the economy looking in a short-term perspective. There is a political uncertainty of what is expected to be the Polish role in the EU and how far the Commission is letting Poland come especially on the agriculture side where there are a number of different opinions on EU supports, price setting and free market. This makes an uncertainty in the effect of the accession.

Government changes in *Latvia* have been frequent over the recent years. Repse was the tenth prime minister since 1990 and new parties can emerge rapidly and unexpectedly. Latvian politics is more focused on individual politicians rather than on political parties and regardless who comes instead it will continue to be rocky.

Speculations have it that a government without Repse could mark the end to the fight against corruption and the clean-up of the state civil service. The EU-membership should make a halt on those kinds of speculations though. The Latvian Lats is pegged in a narrow fluctuation band to the IMF Special Drawing Rights (SDR) currency basket, in which the US dollar weighs heavily. According to plans, on January 1, 2005, Latvia will peg its currency to the Euro as a preparation for transition to euro.

Putting a lid on inflation will be a high-priority issue for economic policy over the next few years, since Latvia will be working to qualify for zone accession by 2008 and must show low inflation in the preceding years, according to the Maastricht criteria. Unemployment will probably remain above 10 %. There are structural problems on the labour market in the forms of educational gaps between urban and rural areas. Thus more attention is needed on basic and higher education.

The rising current account deficit is perhaps more serious, should it become unsustainable. Credit growth is rapid, especially to households. Real wage and salary growth, at a historically high 8 % rate during the first half of 2003 and low interest rates for the next year at least point towards continued rapid growth in borrowing.

In *Lithuania* after gaining independence (1990) the transitional period in the political structure of the state was aggravated by choosing the proper way for economic development. The right winged politicians in power consulted by foreign experts speeded up privatization process but lack of legal basis for it was the first difficulty to overcome. Nevertheless the economy in 1994 showed some evident progress after the first years of severe depression. This considerably favorable period was cut by Russian economic crisis in 1998. Although the industrial production has taken downturn due to the foreign trade with Russia and interior difficulties in privatization process the service sector became the pioneer in the economy. Soon another important weakness in economic growth was revealed: the ageing infrastructure and its dependence on raw materials. The need for improvements in the business environment also became evident. As a result of privatization the share of the private sector in the GDP in 2003 exceeded more than 60 per cent

Comparing the GDP growth in last years: 6.8 per cent in 2002, 8.9 per cent in 2003 and the further growth in the first quarter of 2004 the tendency of Lithuanian economy towards constant growth is visible. According to the Ministry of Finance of Lithuania forecasting Lithuanian's economy will reach 7.3 per cent in 2004. In accordance with official statistical records surplus value in 2003 the most rapidly was increasing in the industry of energy (24.8 per cent), construction sector (17.1 per cent), processing industry (14.1 per cent), trade (11.1 per cent) and transport and communications sector (6.8 per cent).

The economy growth of 2003 was mostly dependent on these market processes: rapid growth of the foreign and domestic direct investments and growth of the private consumption stimulated by favorable crediting.

Foreign direct investments in Lithuania increased nearly 1.5 times during the three last years and in 2003 reached more than 3.8 milliards EUR.

The final consumption expenditure in 2003 increased 9.8 per cent (for household –11.1 per cent, for State sector –5.7 per cent).

The tendency of the positive economic growth had impact on the employment rate and decrease of the unemployment. Generally unemployment during 2003 reduced by 1.4 per cent and reached 12.4 per cent level.

Thanks to rapid economic development growth Lithuania will be ready to introduce EUR already in 2007 and become the member of European Monetary Union.

Shipping and Ecology

The choice of system and transport mode for the shipment of products in the BSR is very much dependent on the type of products, the available infrastructure and the cost for the shipment. As regards the major products, raw materials and energy products, there is no option but to transport them by sea. The choice is here obvious as most of these shipments are in strong competition and the lowest price for the required standard of service wins the shipment. As economy here is very important the ships will be quite large, just as large as the infrastructure, ports and terminals allow.

This kind of shipments has a good environmental performance in most aspects.

The Baltic Sea is considered to be one of the major growth sectors of sea transports in the world this decade. The reason is the liberalisation of the trade between the East European countries and the Western world. The growth will give new demands on the Baltic Sea. The narrow passages in The Belt and The Sound stress the issues of environmental protection and safety that is a joint ambition of the countries. The Baltic Sea has been assigned a Particular Sensitive Sea Area (PSSA) by IMO, April 2 2004. The assignment gives no direct effect but it allows taking special measures to prevent from environmental hazards for the future and address special regulation to ship and transports that trade in the area.

Even if this today excludes the Russian territorial waters it will give possibilities to enforce environmental friendly conditions in order to protect the area from misuse in way of pollution or emission of hazardous substances.

By nature the Scandinavian area is biologically sensitive as it has very small amounts of limestone in the soil. This makes it sensitive to acidic fallout, which is one of the major problems of the modern society. Sulphur oxides and nitrogen oxides results in acid rain that dissolves the metals in the soil causing damages on the forest.

The Baltic Sea is a type of fjord as it has a relatively shallow entrance to the salt sea. In the southern part the brackish water has created a good environment for life in the sea. However, it causes a limited shift of water in the area and the pollution from the rivers tends to stay in the sea that slowly loose its quality. This makes the Baltic Sea a very sensitive area that can not take more damage and has very limited buffer capacity left for more nourishment, acidic pollutions or other disturbances.

The present conditions are shown very clear in the fishing industry. The supply of the famous Baltic cod has decreased strongly over the past few years and there are signs of decreasing supply of other fish as well.

All development in the area must be in view of protecting the sea from further damage. The initiation of a process to protect the sea came in the mid 1980-ties when the ports in Germany and Sweden demanded the ships to discharge all black water in the ports. Some ports in Sweden demanded the ferry operators to reduce the sulphur content in their fleet to be maximum 0.5 % on average. The Swedish Maritime Administration tried to reach bilateral agreements in the region as concerns demand on emissions from ferry operations in the Baltic area but failed. The Administration then used the National Dues on ships to stimulate active measures to reduce the Sulphur and Nitro oxide emissions by raising the level of dues and give credit to ships that took measures. See Figure 5.

Most of the work and progress as regards safety and environment is today in the hand of HELCOM[2] an organisation comprising all states around the Baltic Sea. The organisation monitors the environment in the region and makes proposals for measurements to protect the environment. The sea transport comes naturally in focus but the organisation covers all activities that give effect on the environment in the Baltic Sea.

Sea transports can be very environmental friendly if the ships are run on low sulphur fuel at moderate speed and use its deadweight as much as possible to move cargo. The emissions from ships are relatively simple to clean but it increases the running cost of the ships. For this reason only ships chartered by a shipper that explicitly demand exhaust gas cleaning equipment are using cleaning equipment. Those are mainly ships in charter for the Swedish forest industry and some ferries that trade on Sweden.

[2] www.helcom.fi

The cost of cleaning 1 kg NO_x on a ship is below EURO 0.5 while the taxation level is discussed to be in the range of EURO 1 – 4 per kg. In this perspective it is very cost effective to clean the ships in order to reduce the emissions. The Governments take measures to order reduction of sulphur in the fuel and demand catalytic reductions of emissions in land-based vehicles. The effect is that the share of air pollution (SO_x and NO_x) from sea transports increase. International measures have to be taken to reduce this and the effects of the emissions.

Table 4: Comparison of emissions from different transport modes

Examples of a 500 kilometres transport:

FUEL		CO2	NOx	CO	HC/VOC	PM	SOx	
TRUCK 1 semitrailer								
175	litres	455	4	0,4	0,2	0,1	0,000001	kg
RORO-SHIPPING 1 semitrailer								
271	kg	868	15	2	0,7	0,3	11	kg
LOLO-SHIPPING (Pulp transport with exhaust gas cleaning) **30 ton**								
72	kg	232	0,4	0,2	0,2	0,2	1,4	kg
ULCC-SHIPPING (350 000 dwt) **30 ton cargo**								
10	kg	33	0,9	0,1	0,03	0,04	0,5	kg

In Table 4 a transport of 30 tons is compared on different transport systems. A semitrailer on the road, a semitrailer on a Ro-ro ship full by lanemeters, the comparable amount of cargo on low sulphur (1 %) General Cargo ship equipped with exhaust cleaning and finally 30 ton on a ULCC tanker.

The handicap of sea transports is the international operation environment that limits the possibility to take action in certain areas. In the table this is clearly demonstrated by the sulphur emission from a semitrailer vehicle where the maximum sulphur content in the fuel is very low by law.

Sea transports have however many environmentally friendly characters that should be highlighted. It is silent, it gives a positive environment[3], it causes no congestion and the infrastructure is free and extremely low at cost if it is treated with respect.

It should be noted that it is very cost effective to clean the ships' exhaust.

[3] The highest costs of living are often found in the vicinity of canals, port entrances etc.

3 Economic growth and trade

This chapter show and analyse the trade in the countries of concern in the BGW area. All figures used relates to the whole countries although the BGW ports and transport system only concern parts of some of the countries. The figures are of special interest for the trade between the countries concerned in the BGW area, as it is obvious that the transports between the countries primarily will be using the established routes and ports at least in one end.

- **Economic growth in the new Member States is higher in terms of GDP than in the old EU 15, whose trade volumes and absolute GDP figures are in turn much bigger.**
- **The GDP per capita is at least three times as high in the "old" EU countries as in the 2004 affiliated countries**
- **The overall trade is growing. The dry cargo non-bulk trade is the fastest growing. Oil trade is growing in the region while the other bulk trade is not**
- **Even though the percentage growth is markedly lower for Germany's trade, the actual growth in volume is substantial**
- **Exports and imports are imbalanced between the BGW countries**
- **Commodity structure in the new Member States and Russia is changing towards higher value goods in westbound trade flows**
- **Large parts of the trade with other continents are transited via ports on the North Sea coast**
- **In some cases, such as oil between Russia and central Europe including Germany, the mode of transport is land based, such as pipelines and trains**

For this reason it should be noticed that the study presents the trade from the whole of Russia, Sweden, Denmark and Germany even if these countries have most of the port capacity in other areas than those positioned in the BGW area.

Kaliningrad has a special situation in this respect. It is not realistic to use the figures for Russia to represent this area that is geographically separated from the rest of Russia.

As for the statistics and the economic status, which in some respect is related to Russia in total, the EU gives following status of Kaliningrad;

"As elsewhere in Russia, unemployment and poverty in Kaliningrad have increased dramatically since 1990, but the standard of living is lower

than the Russian average: GDP is 35 % lower than the Russian average and 30 % of the population is estimated to live below subsistence level. There is a growing, evident, wealth gap between the region and Poland and Lithuania. Industrial production dropped by 60 % since 1990, with drastic changes in the regional economy. Kaliningrad has a significant formal external trade deficit (with the EU, the deficit in 2001 was $313 million). However, much activity is now informal, with the black economy accounting for more than 60 % of GDP and over 90 % of mined amber is smuggled out of the region."[4]

Of course it is difficult to consider the special conditions in Kaliningrad when assessing the economic situation in the region. In the following the Russia as a whole is considered and the above related situation should be carried in mind.

3.1 Growth

World economic growth is in a fragile situation where the gloomy 2001-2002 years should be replaced by a healthy market upturn. The upturn is there and the International Monetary Fund (IMF) expects a business cycle peak in 2004 with a global GDP growth of 3.1 % (revised down from four per cent).

The US economy has been the growth engine in the world for a long time. Long-term interest rates are very low in the US now, but investments are not yet materialising. The main reason for this is the surplus capacity in the American industry built up during the long growth period.

There are significant differences in growth rates in different parts of the world. It is important to keep in mind that even if growth rates are higher in many countries/regions in the developing world, North America, Western Europe and Japan will continue to account for almost two-thirds of world trade in the next five years.

Growth and welfare depend on a functioning transport system. The production system, from raw material to end-user product, is increasingly fragmented geographically.

The trade flows between countries of comparable size, per-capita income and culture, to a large extent consist of differentiated but similar products being traded in both directions (e.g. cars & electronics). For many of these products, branding and marketing are important.

[4] European Union, Delegation of the European Commission in Russia, Memo issued in Brussels. 18 Sept 2002, Kaliningrad and the EU – Facts and Figures

For dissimilar countries, trade is mostly one way; low- to medium-value goods in one direction and finished goods the other.

The future negotiations within the framework of the World Trade Organisation's (WTO) are important to global growth and development. According to estimates by the World Bank and the IMF, elimination of barriers to trade in both industrialised and developing countries could result in gains amounting to as much as $620Bn annually, of which a significant part would be to the benefit of developing countries.

The US economy holds the key to the momentum of growth in the rest of the world. In order to secure consumer demand and overall growth, employment has to increase. In addition, increased employment levels would send positive signals across the board that would probably increase confidence enough to trigger further investment and recruitment decisions. Businesses are still cautious, though.

Unemployment levels in Europe and Japan seem to have stabilised, but at a much higher level in the Euro zone than in the other areas. In Germany the labour market situation still is worrisome and in France there are few signs of relief. Southern Europe is providing the Euro zone with crutches, however rickety.

Long-term GDP forecasts (2001-2025) put US growth at an average annual rate of 3 %, Western Europe at 2.3 % and Japan at 1.8 % (source: The United States Energy Information Agency EIA consensus assessment).

Germany's large undertakings in building up the east part results in a GDP growth of just 0.2 % in 2002, perhaps nil in 2003, and unemployment around 10 % at an average. Per capita GDP is now below the EU average.

Denmark as well as other countries in the region suffers from the weak USD that gives problems for their exports. Germany being the major market with a 20 % share of the exports does not help up the situation even if there are signs of a slight in crease of exports from Denmark.

Denmark has had a couple rough years following the global economic downturn. Households are as in larger parts of the western world considered to be the key to sustainable growth. The industry output in Denmark has not developed considerably in the last years and there is no reason to believe that this will change in the near future. Productive rises will continue to be modest. Still the Danish economy has a character of steadiness and endurance. They had a GDP rise of 1.1 % in 2003 and an anticipation of 1.7 % in 2004, which more than the average in the Euro countries.

In *Sweden* the engine of the cyclical upturn is private consumption. In short term the outlook is favourable with low inflation and modest wage

increases. In the long run, however the increasing long-term sick leave and disability retirements will cut the growth potential.

Robust balance sheets will give households room to cut back on their high savings. Despite a tighter fiscal policy, the growth in private consumption can accelerate. Exports will rise relatively fast despite a stronger Krona. Sweden will probably have a faster growth than the Euro zone both this year and in 2004. Overall, exports will grow by some five per cent in 2004.

Poland is right now experiencing export-led recovery at a higher level than the EU. A highly expansive fiscal policy is fuelling domestic demand, but as always there is chance that this kind of policy leads to budget crisis.

The export growth could seem somewhat strange since EU, which is the largest market for the Polish goods, has had a bad couple of years. This is made possible thanks to moderate to low salary increases and a lot of streamlining in the industry.

Poland is the country of the new EU-members that have most developed industrial structures and thus will assimilate to the rest of the union fastest.

Of the three Baltic countries *Latvia* was the one least affected by the Russian financial crisis in the late 1990s. Latvia has enjoyed high growth coupled with low inflation since 2000. Growth prospects for the next couple of years remain good. The growth will remain broad with positive contributions from both domestic demand and foreign trade. Capital spending will be an increasingly powerful driving force. In the short and medium term import growth will lead to a high (and expanding) current account deficit.

The country is located in a politically and economically active region, formed by the manufacturing- and trade-centres in Western Europe. The presence of two big markets – the Russian Federation and the European Union also contributes to the favourable location of Latvia. There are also three important ports in the region; Ventspils, Riga and Liepaja.

The most essential physical structures of the Latvian transit network are the railway, pipelines and ports. Although many different kinds of products transit Latvia, the most important is the outbound transit of crude oil and oil products.

Other important components of the Latvian transit systems are the natural gas pipelines, the high-voltage electric network and the highways crossing the territory in East –West and North – South directions.

Noticeable improvements in the procedure for transit between the three Baltic States have been achieved since the signing of the Baltic Common Transit Processing Agreement on January 1, 2001. However, the border

crossing to Russia is still the slowest and least effective and all changes in relations with Russia and Russian transit policies can strongly affect the whole transit industry in Latvia. The rail tariffs currently used by the Russian side make the transport, and thereby transit, of fertilisers through Latvia some 300 % more expensive than to a comparative destination in Russia, while the transport of metals becomes 200 % more expensive.

The Economist reports that Latvia is interested in signing a number of different agreements with Russia on air traffic, in the field of customs handling, railway transport and cross-border co-operation. Seven agreements have been prepared for ratification, but none of these agreements had been signed by the end 2002. It must be admitted however that, generally, the relations between Latvia and Russia in the transport sphere, as in most other spheres, are getting better and better.

Transit trade has been developing into a major contributor to the Latvian GDP over the last few years. Transit volumes could be expected to increase in value, but maybe not in volume. Transit trade will inevitably remain an important part of the Latvian economy even in the future, but the forecasts are very much dependent of future developments in Russia and other CIS countries. It also depends on the Latvian political and economical relations with this group of countries.

Traditionally the most important categories in the Latvian transit volumes are crude oil and oil products, which cover 60 % of all the transit shipments through the country. The growing EU energy dependence, which will reach import dependence of about 70 % of natural gas and 90 % of oil around the year 2020, is creating a strong long-term demand for energy.

Exports will probably grow more than 15 % this year (LRF assessment). Despite the economic slowdown of the past few years in the West, Latvia's exports have risen by 11-12 % annually in recent years.

Imports will also grow by more than 15 % this and next year, thanks to the ever developing economy with huge domestic demand growth. A large proportion of imports are investment-related goods, which is positive for economic growth viewed in a longer perspective.

Lithuania's tight fiscal policy has laid the ground for accelerating economic growth, with private consumption contributing more and more via rising real wages. 1999 was an exception year with the Russian crisis affecting Lithuania. Exports have shown good growth figures despite a stronger currency and the current deflation will most probably turn into mild inflation this year.

During the recent years about 4 – 6 % of Lithuania's GDP was generated by the transport sector and a significant part of the transport sector is concerned with foreign cargo transit. About 20 – 25,000 people in Lithuania are directly dependent on the ports and shipping business for

their daily living and 60 – 70 % of the value-add in this line of business is related to transit trade. The Klaipeda Seaport is the outstanding transport hub in Lithuania.

There are three main transit corridors in Lithuania; The East-West corridor from the eastern border of Lithuania to Lithuanian ports. This is the most important transit cargo flow, to and from Russia. There is also a flow of Russian transit cargoes from the eastern border of Lithuania to the exclave of Kaliningrad Oblast and its ports. The third of the possible corridors is North-South by the Via Baltica motorway that crosses Estonia, Latvia and Lithuania and on to Poland.

There are no direct borders between Lithuania and Russia, apart from Kaliningrad. Therefore Russian cargoes must transit a third country, i.e. Belarus or Latvia, when travelling to Lithuania.

Butinge oil-loading platform terminal came into operation in 1999. The terminal is connected by a 93 km purpose built 55 cm diameter pipeline from the Mazeikiai refinery. The annual capacity of the terminal is 8 million tons of oil, which can be both export and import.

The two terminals – Klaipeda Seaport and Butinge handles the whole cargo flow that crosses the western sea border of Lithuania, i.e. all sea-borne trade.

Since 1999 *Russia's* GDP has doubled in dollar terms to more than $400Bn, about the same as Sweden and Finland combined. Growth exceeded six per cent in 2003, with the high world market oil prices as a good engine.

Private consumption is driven by continued high real pay increases. Capital spending rose significantly in 2003, reflecting an improved business climate and greater faith in economic and political stability.

The enlargement of the European Union will boost trade within the union, but could put a lid on trade to and from it. The net effect on trade of incorporating the applicant countries into the EU is expected to be positive. Even if short-sea shipping and inland navigation are supposedly to benefit more than deep-sea shipping, it will open up business opportunities elsewhere.

Europe needs a growing US economy to ignite its growth engine. The current euro/$ exchange rate is not helping. Export growth is being held back by the stronger euro. Euro zone GDP will grow by 0.5 % this year, 1.7 % in 2004 and 2.4 % in 2005 according to ECB.

Next year, the main engine of growth will be private consumption, while in 2005 growth will be more broadly based, with larger contributions from exports and capital spending.

According to SEB Baltic outlook in September 2003 the three Baltic countries remain Europe's fastest-growing region. They anticipate that

the annual GDP growth will be in the 5.5-7.0 % range over 2004 - 2005. The growth so far has been driven by strong domestic demand, but will broaden as demand in Western Europe gradually strengthens.

The abolition of tax-free sales onboard ferries in the Baltic Sea region will also change the demand structure, favouring cargo in cost of passenger.

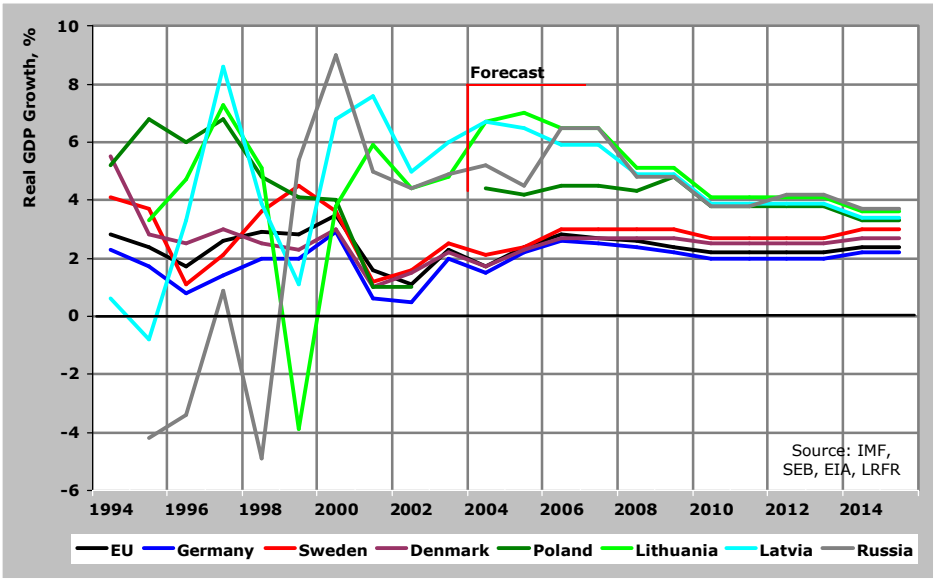


Figure 11: GDP growth; EU, Baltic Gateway countries and Russia

With the exception of Russia, the Baltic Sea is to become in effect an inland waterway of the European Union. Shipments of goods to and from the Baltic states are bound to increase, yet transit to and from Russia via the three states might fall further.

3.2 Trade

The following figures are based on trade statistics derived from official national statistics and published by the Organisation for Economic Co-operation and Development (OECD) in the "International Trade by Commodities Statistics" database. The trade data is only available as aggregates for whole countries. Thus regional breakdowns are not feasible.

It should also be underlined that this trade data does not reflect the mode of transport. However it forms a very important part of the overall demand for transport regardless of mode. The switchover to demand for seaborne transport services is made later on in this document (chapter 7).

The intra-Baltic Gateway (BGW) trade, i.e. the trade between Sweden, Denmark, Germany, Poland, Lithuania, Latvia and Russia, amounted to 158M tonnes in 2001.

In rough terms; the bulk type of cargoes account for 80 % of this volume whereof crude oil and oil products are half of the volume (Figure 12).

Non-bulk types of dry cargo form the remaining 20 %. This cargo category is either unitised (containers, trailers or vehicles), palletised or break bulk. Goods types that are predominantly transported by air are excluded (such as jewellery and other valuables).

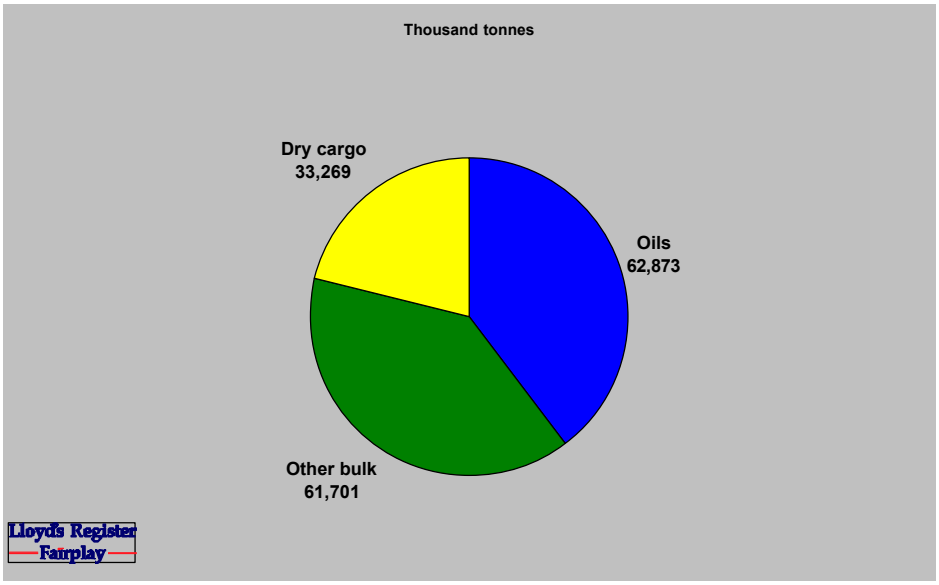


Figure 12: Intra-BGW trade 2001, thousand tonnes

The *intra-BGW trade with dry cargo* as defined above is presented in Figure 13. This figure illustrates broadly the relative volumes in the different trade relations as well as the balance between exports and imports.

Out of the total dry cargo trade of 33M tonnes, 29 % is between Germany and Poland, 17 % between Germany and Denmark, 15 % between Germany and Sweden, and 10 % between Germany and Russia. Thus Germany is by far the dominant player in the region.

This is not surprising since Germany is the largest economy with a PPP[5] adjusted GDP amounting to $2,160 billion, equally much as the other six countries together. In addition, the value of Germany's total trade is about twice as high as the combined trade of the other six countries.

[5] PPP = Purchasing Power Parity.

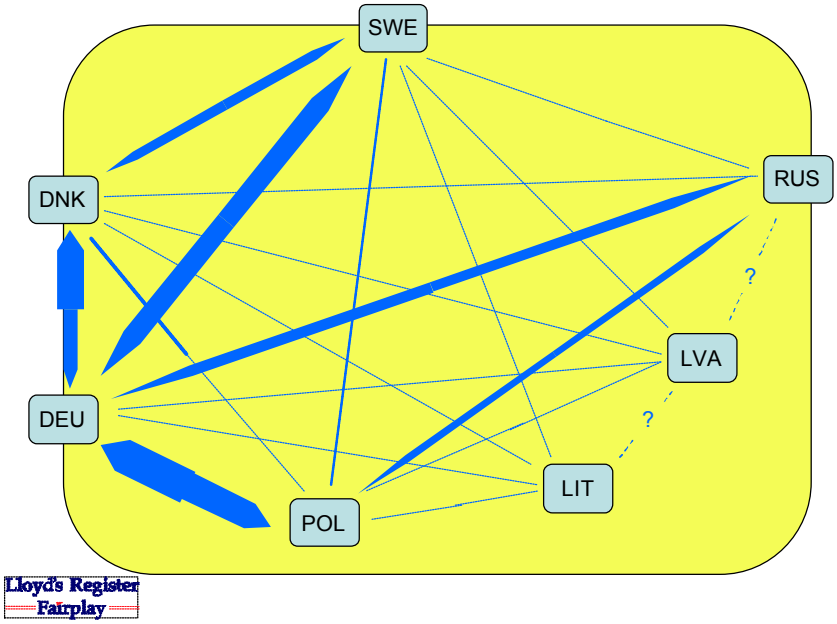


Figure 13: Intra-BGW dry cargo direction of trade 2001 based on tonnes

The growth has on average been seven per cent per year since 1995, but the spread is substantial for the different relations. Trade with Latvia and Lithuania have increased markedly over the period – Denmark-Latvia for example grew by an annual average of 28 % and Poland-Lithuania by 33 % while Denmark-Poland only grew by one per cent annually.

The accumulated growth over the 1995-2001 period was 11M tonnes. The *trade within the BGW region with bulk types of cargoes* amounted to 125M tonnes in 2001. The absolute largest share of this volume was exports from Russia to Germany as illustrated by Figure 14 below.

Poland's exports to Germany and imports from Russia also represent a substantial share of the total intra-BGW bulk cargo trade. On average, the annual growth since 1995 was three per cent, but as above the differences are significant.

The Sweden-Lithuania trade score the highest average annual growth with 42 %, but from a very low level though. Still, at 2001 this trade represented a mere one per cent of the total BGW bulk trade. When trade is leaving the start up phase, the per cent growth figures usually are very high. The accumulated growth over the 1995-2001 period was 20M tonnes.

A decade ago trade between Sweden and Latvia were close to non-existent. Since then the development has been strong and up to 2001, trade had increased by 646 % to reach 133 thousand tons. Despite this strong development this bilateral trade only accounted for two per cent of the total Baltic Palette volumes in 2001. Sweden's imports from Latvia are to a very large extent dominated by veneers, plywood and other wood manufactures. Imports of furniture are catching up. Paper products and feeding stuff for animals are being shipped in the other direction.

Sweden's trade with Russia reached about 274 thousand tons in 2001. Fertilizers form the largest imported commodity to Sweden from Russia followed by veneers and plywood. Exports used to be dominated by margarine, but margarine has been surpassed by cereal preparations, paper and paperboard.

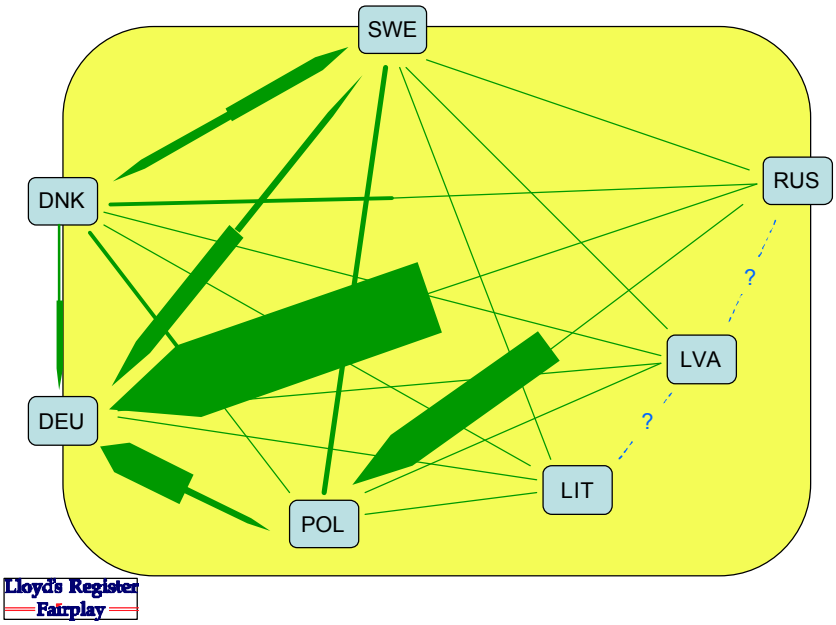


Figure 14: Intra-BGW bulk cargo direction of trade 2001 based on tonnes

Petroleum products (crude oil and refined oil products) accounted for approximately half of the bulk cargo trade. The trade pattern is similar to the one described above, but a major difference is the by comparison small trade between Germany and Poland (Figure 15).

Russian exports to Germany and Poland dominate completely. The only other relations amounting to significant volumes are Sweden's trade with Denmark and Germany.

The total volumes have grown by an average of six per cent per year since 1995. In percentage terms growth has been strongest between Sweden-Lithuania and Germany-Lithuania, but in volume terms Russian trade with Germany and Poland completely dominate.

Total growth since 1995 amounted to 19M tonnes.

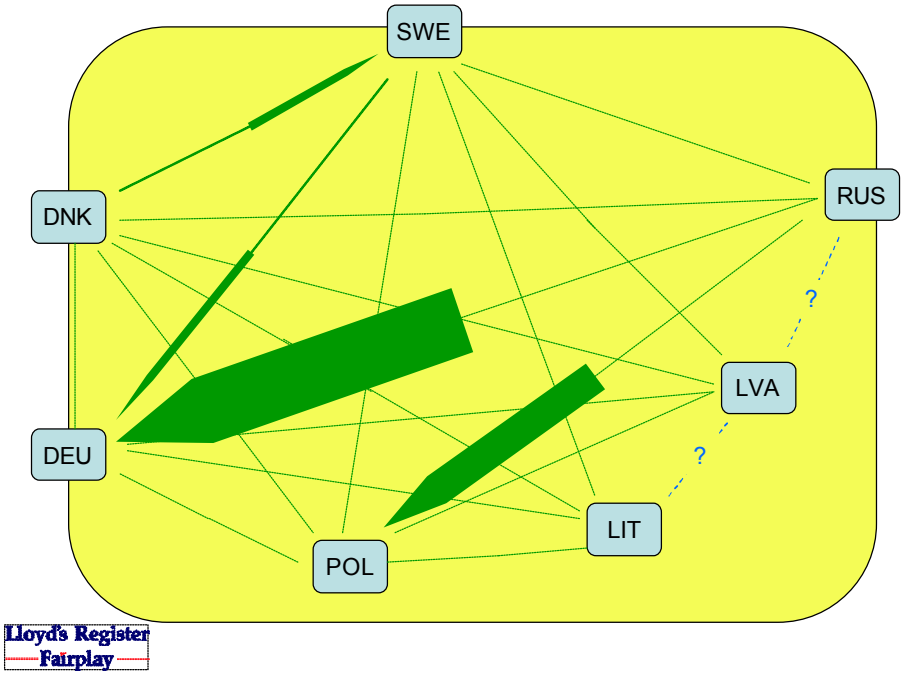


Figure 15: Intra-BGW oil cargo direction of trade 2001 based on tonnes

The BGW region's external dry cargo trade relations are in volume terms heavily dominated by the volumes to other continents. Figure 16 illustrates the total trade volumes (imports + exports) with dry cargo to other countries and groups of countries in the world.

The external trade of the BGW region amounted to 527M tonnes of dry cargo in 2001, whereof 292M tonnes were with non-European countries.

Trade with inland Europe (as well as with Estonia) has grown the most though in percentage terms over the past six year period. In tonnes, growth has been higher with southern Europe.

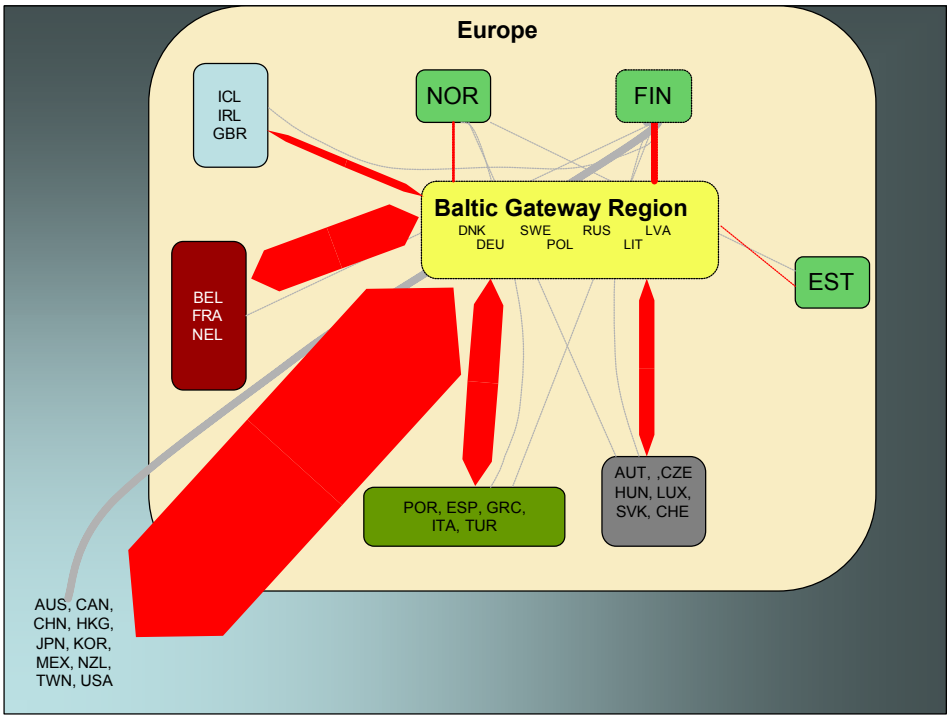


Figure 16: Extra-BGW direction of dry cargo trade in tonnes 2001

As for the bulk cargo trade the overall trade growth has been sizeable and volumes have increased from 471M tonnes in 1995 to 699M tonnes in 2001. Growth has been highest in the smallest volumes, but volume wise the most significant increase has been with the countries outside of Europe (Figure 17).

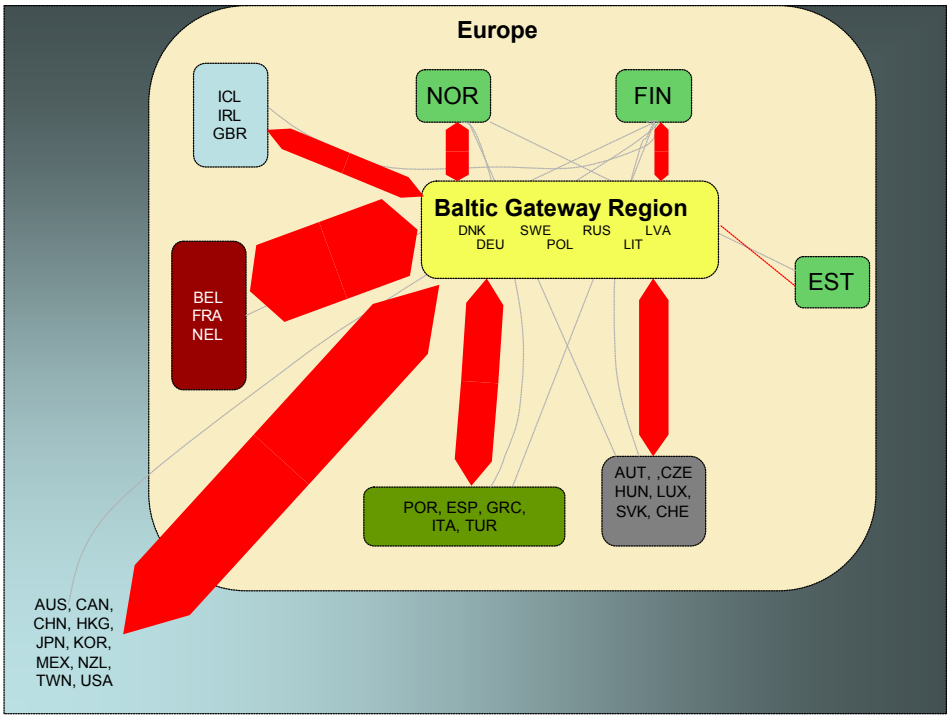


Figure 17: Extra-BGW direction of bulk trade in tonnes 2001

To a certain extent *Norway*'s trade relations with Latvia, Estonia and Russia make use of transport links from Sweden and is therefore of interest to this study. The trade volumes with Russia account for a large part, but the Estonia trade has built up strongly over recent years.

Two thirds of what is exported from Norway to Russia is fish and one fifth is chemicals. Imports from Russia consist up to two thirds of fertilizers and to one fifth of fish.

From Estonia Norway imports trailers (on the decline though), prefabricated buildings, furniture and wood manufactures and exports primarily fish. Fertilizers and prefabricated buildings have been the backbone on the import side but lately wood manufactures and floating structures have popped up.

Trade imbalances are substantial on most trades if measured in tons. Sweden's trade with Russia is also largely imbalanced. It is also worth noting that some of the imbalances would diminish if the trade were to be measured in cubic metres instead of tons. Thus from a road hauler's perspective the imbalance might be less of a problem.

Trade growth in 2002 was slightly negative with a few exceptions, but in 2003 recovery was strong. The general outlook for 2004 to 2006 is positive following the expected continued upturn in the business cycle. The EU enlargement came into effect on May 2004 and will likely provide some additional fuel for the intra-BGW trade growth.

4 Ports in the Baltic Gateway area

- **61 ports in the BGW area have been extensively described with regard to their operations in year 2002**
- **The overall number of calls reached 30 514, with an average DWT size per vessel is about 6 750**
- **The total port turnover in the region is about 260 million tons**
- **Total container throughput in the BGW was 883 000 TEU**
- **Total trailer throughput in the BGW ports amounted to 3.25 million**
- **The total number of passengers transported in the BGW area is about 50,8 millions per year**
- **The largest port by number of calls of freight ships is Swinoujscie/Szczecin with about 2 900 calls**
- **Helsingør/Helsingborg had the largest number of ferry calls with 44 760 registered calls**
- **The largest port by number of trailers is Travemünde having about 485 000 calls**
- **The largest port by number of containers is Gdynia handling about 308 600 TEU**
- **The Helsingør/Helsingborg is the most frequented ferry connection in the BGW area servicing about 11.7 millions passengers**
- **Ventspils is the largest port in goods turnover having 28.7 million tons whereof 20.5 million tons in wet bulk about**

Table 5 shows the recorded ship calls by ***Lloyd's Marine Intelligence Unit (LMIU)*** in the Baltic Gateway Area in the year 2002. The record shows an extensive port activity during a year. In order to condense the information all of these are not presented in the report. Some of the ports are presented as a group as they work in close cooperation and they share the fairway to the port terminals.

The information presented is based on LMIU statistics, (port calls), vessel characteristics and port information from Lloyds Register Fairplay. In some cases, additional information has been supplied directly by the ports themselves. Supplementary data has also been collected from the ports' Internet sites.

PORT	Country	Calls	DWT Sum	DWT/CALL	FROM \ TO	Country	Calls	DWT Sum	DWT/CALL
Holtenau	DEU	1	2,800	2,800	Copenhagen	DNK	2,334	12,013,941	5,147
Lauterbach	DEU	3	5,333	1,778	Butinge Term.	LTU	9	943,220	104,802
Kappeln	DEU	5	7,422	1,484	Klaipeda	LTU	2,793	26,734,831	9,572
Ueckermunde	DEU	5	6,601	1,320	Liepaja	LVA	1,117	4,426,032	3,962
Heiligenhafen	DEU	7	10,665	1,524	Ventspils	LVA	1,169	34,198,843	29,255
Eckernforde	DEU	8	11,109	1,389	Wladyslawowo	POL	3	3,100	1,033
Hochdonn	DEU	13	12,640	972	Darlowo	POL	6	7,879	1,313
Flensburg	DEU	28	40,899	1,461	Ustka	POL	14	10,156	725
Sassnitz/Mukran	DEU	31	169,069	5,454	Kolobrzeg	POL	130	152,830	1,176
Vierow	DEU	42	74,038	1,763	Gdansk	POL	1,907	23,771,404	12,465
Greifswald/Neustadt	DEU	127	214,111	1,686	Gdynia	POL	2,309	14,903,623	6,455
Wolgast	DEU	218	489,421	2,245	Szczecin/Swinoujscie	POL	2,901	17,025,598	5,869
Stralsund	DEU	415	1,019,585	2,457	Svetlyy	RUS	11	130,490	11,863
Kiel/Rendsburg	DEU	794	3,405,800	4,289	Baltiysk	RUS	72	432,820	6,011
Wismar	DEU	1,251	3,230,927	2,583	Kaliningrad	RUS	2,219	12,704,975	5,726
Lubeck	DEU	1,963	12,489,920	6,363	Västervik	SWE	4	7,108	1,777
Rostock/Warnemünde	DEU	2,282	14,472,673	6,342	Degerhamn	SWE	12	35,841	2,987
Tuborg Havn	DNK	2	4,664	2,332	Karlskrona	SWE	19	57,514	3,027
Frederikssund	DNK	3	2,235	745	Bergkvara	SWE	20	79,571	3,979
Nykobing	DNK	11	20,958	1,905	Simrishamn	SWE	20	23,797	1,190
Masnedo/Orehoved	DNK	15	18,678	1,245	Ystad	SWE	76	157,409	2,071
Stubbekobing	DNK	20	25,974	1,299	Hoganas	SWE	99	430,357	4,347
Rodbyhavn	DNK	43	64,605	1,502	Trelleborg	SWE	125	402,699	3,222
Stevns Pier	DNK	59	147,234	2,495	Solvesborg	SWE	153	354,930	2,320
Bandholm	DNK	107	172,144	1,609	Landskrona	SWE	257	652,375	2,538
Hundested	DNK	109	187,365	1,719	Kalmar	SWE	309	879,960	2,848
Fakse Ladeplads	DNK	115	141,454	1,230	Oskarshamn	SWE	314	1,548,560	4,932
Naestved	DNK	181	299,074	1,652	Ahus	SWE	437	1,315,715	3,011
Nykobing(Falster)	DNK	186	356,087	1,914	Malmo	SWE	817	5,278,178	6,460
Nakskov	DNK	222	439,854	1,981	Karlshamn	SWE	839	2,887,547	3,442
Koge	DNK	313	594,674	1,900	Helsingborg	SWE	1,083	5,564,244	5,138
Frederiksvaerk	DNK	357	472,192	1,323	TOTAL		30,514	205,745,752	6,744

Source: SAI

Table 5: Port calls of freight ships in the Baltic Gateway area (2002) Source SAI

Note 1. The statistics in Table 6 are from 2002 and are collected from a number of different sources. The statistics considering Calls, Total DWT and DWT/call are from Lloyds Marine Intelligence Unit, (LMIU) 2002, processed by SAI (The Institute of Shipping Analysis), 2002. The ferry traffic statistics are based on ShipPax Information and covers the year 2003.

Table 6: Port statistics in the Baltic Gateway area (2002)

Port	Calls SAI	Ferry calls[4]	Trailer [units][4]	Pax [No][4]	Total DWT SAI	DWT/call	TEU	Wet Bulk [000 tons]	Dry Bulk [000 tons]	Total Cargo [000 tons]	Rail connection
Gedser		2,976	64,578	1,297,307						**1,033**	Yes
Helsingør		44,062	362,185	11,645,520						**5,795**	Yes
Rødby	43	17,226	278,482	6,421,490	64,605	1,502				**4,456**	Yes
Bandholm	107				153,678	1,436					n/a
Køge	313	312	1,689		584,826	1,868		27	1,052	**1,456**	Yes
Naestved	181				299,074	1,652					Yes
Nakskov	222				439,854	1,981	400	43	455	**498**	n/a
Nykøbing[1]	212				395,723	1,867					Yes
Rønne		1,526	6,918	1,261,653						**111**	No
Copenhagen[2]	2,334	255	5,817	1,604,059	12,013,941	5,147	135,000	6,600	3,100	**14,800**	Yes
Malmö[2]	817	964	185,048	136,298	5,278,178	6,460	25,694	3,440	480	**7,500**	Yes
Karlshamn	839	461	32,035	50,955	2,887,547	3,442		900	1,980	**4,660**	Yes
Karlskrona	19	612	46,608	385,437	57,514	3,027			5	**690**	Yes
Helsingborg	1,083	44,761	362,185	11,645,520	5,564,244	5,138	86,109	940	860	**6,960**	Yes
Solvesborg	153				354,930	2,320		37	145	**630**	Yes
Trelleborg	125	6,179	471,370	2,062,351	402,699	3,222		79	53	**10,690**	Yes
Ystad	76	2,960	119,219	1,430,408	157,409	2,071		1	130	**2,150**	Yes
Åhus	437				1,315,715	3,011	25,511				n/a
Liepaja	1,117	279	26,474	15,119	4,426,032	3,962	2,798	888	799	**4,318**	Yes
Ventspils	1,169				34,198,843	29,255	1,044	20,539	7,606	**28,704**	n/a
Klaipeda	2,793	847	89,863	116,039	26,734,831	9,572	118,000	6,738	3,957	**19,396**	Yes
Butinge	9				943,220	104,802		11,550[4]		**11,550**	No
Gdansk	1,907	162	6,380	113,008	23,771,404	12,465	22,500	9,900	8,700	**18,702**	Yes
Gdynia	2,309	617	68,000	500,524	18,752,160	8,121	308,619	632	3,700	**9,700**	Yes
Kolobrzeg	130				152,830	1,176					Yes
Swinoujscie/ Szczecin[3]	2,901	1,890	102,490	417,711	17,025,598	5,869		499	12,090	**17,366**	Yes
Kiel	794	1,093	139,664	1,129,784	3,405,800	4,289	27,454			**2,235**	Yes
Lübeck	1,963	-	38,125	620,000	12,489,920	6,363	85,000		4,500	**25,400**	Yes
Rostock	2,282	11,504	43,093	2,015,094	14,472,673	6,342	397	1,750	6,404	**21,163**	Yes
Sassnitz	31	2,041	37,955	928,953	169,069	5,454			280	**5,271**	Yes
Travemünde		3,347	485,020	618,407						**16,800**	Yes
Puttgarden		17,226	278,482	6,421,490						**4,456**	Yes
Stralsund	415			13,409	1,019,585	2,457			1,212	**1,329**	Yes
Wismar	1,294				3,230,927	2,497			2,962	**2,962**	Yes
Greifswald	127				214,111	1,686					No
Wolgast	218				489,421	2,245					No
Kaliningrad	2,219				12,704,975	5,726	44,000	4,874	1,629	**9,510**	Yes
TOTAL	**28,639**	**161,300**	**3,251,680**	**50,850,536**			**882,526**	**69,437**	**62,099**	**260,290**	

[1] The statistics for the port of Nykøbing are numbers from both Nykøbing Falster and Nykøbing Orehoved.

[2] Please pay attention to these numbers because of the merge of Copenhagen and Malmö ports into one. The statistics can sometimes consider both ports and sometimes only one of them.

[3] Cover the two ports Swinoujscie and Szczecin due to practical reasons have the same statistics in some columns, i.e. due to LMIU report structure, but it is only Swinoujscie that has a ferry port.

[4] Year 2003

On account of applied methodology the table presents figures, some of which differ from the data on port operations published by individual port authorities

4.1 Description of the ports

In Appendix 1 to the report the interested reader will find a more detailed description of the following ports, which all is important to the Baltic Gateway area on their own merits.

In Denmark ten ports are described being: Copenhagen, Rønne, Bandholm, Koge, Naestved, Helsingør, Nakskov, Nykøbing, Rødby and Gedser.

In Germany the following eight ports are described: Kiel, Lübeck, Travemünde, Rostock, Saßnitz, Stralsund, Puttgarden and Wismar

In Russia only Kaliningrad is described.

In Latvia the description covers Liepaja and Ventspils and In Lithuania Klaipeda and Butinge Marine Terminal.

In Poland there are five ports described; Gdansk, Gdynia, Kolobrzeg, Swinoujscie and Szczecin.

At last but not least the eight relevant ports in Sweden are described: Helsingborg, Karlshamn, Karlskrona, Malmö, Sölvesborg, Trelleborg, Ystad and Åhus.

4.2 The trade routes over the ports

The traffic over the ports indicates the trade flows using the ports to receive/export/distribute the products.

Almost all ports have a rail connection, see Table 6. The exemptions are the pure industrial terminals and some minor ports. In the Appendix 1: "Ports in the Baltic Gateway area" the traffic in the ports is presented. It can be found that the only ports that run a rail ferry service in operation are Trelleborg, Travemünde, Ystad and Swinoujscie.

In general terms the trade pattern over the ports relates to the type of traffic that calls the ports. The trade and routes used depends on the specific conditions in each port and of the industries serviced by the port. This level of information can only be obtained through a thorough study of each port.

Some indications can however be obtained from Table 6. The main type of commodities that can be related to a transport mode is presented in the following Table 7.

Table 7: Relation between commodity and inland transport mode

Activity	Product description	Inland destination/source	Main transport mode
Ferry service Trailers	General cargo, high value cargo	All routes, all distances	Road. Some terminals provide combined rail service
Ferry service rail	Industrial cargo	Long routes	Rail traffic
Ferry service passengers	Passengers	All routes	Mainly road. Some rail service
Container service TEU	General cargo, high value cargo	All routes, all distances	Mainly road. Some terminals provide combined rail service
Wet bulk	Industrial products	Direct to/from industry	Local pipeline to industry, possible rail service
Dry bulk	Industrial products	Direct to/from industry	Road/rail transports, it is common that some shipments start/ends in the vicinity of the

How the cargo flows are specifically distributed to/from the port is not registered information. This has to be studied for each port.

5 The Baltic Gateway shipping market

- ***This chapter excludes the ferry traffic (presented in chapter six)***
- **The vast majority of port calls & shipments in tons in the BGW ports are in relation with ports in North West Europe**
- **The majority of calls are made by ships of the smallest type of General Cargo vessels with an average size of 3 100 DWT**
- **The General Cargo vessels represent the largest number of calls and the highest total transport capacity in DWT in the region**
- **The dominating country of benefit from the ships' operation (country of actual ship owner) is Germany controlling about 20 % of the No of ships, mainly General cargo vessels. Norway, Russia, Greece and Netherlands follow thereafter**
- **Ships in service in the BGW area have less than 25 years with a concentration around 20 years and 10 years**
- **The oil tankers will in future become larger and much more frequent. Special types will be developed for the Baltic Sea**
- **Chem tankers will increase in number**
- **Bulk carriers will keep the volumes and only increase slightly**
- **Container traffic will increase in the BGW area. A concentration of the traffic is expected in the area**
- **Reefers will be phased out step wise**
- **General cargo vessels are a true workhorse of the Baltic Sea. They are expected to keep their market share in serving smaller ports and make them connected to the container-shipping network**
- **The Ro-Ro shipments comprise both industrial and high value shipments. The services will dominate intra Baltic shipments between Finland/North Sweden and the Continental ports in the South Baltic Area**
- **30 % of all shipments are within the BGW area**
  50 % are in relation with NW Europe
  About 20 % are in relation with other Baltic Sea ports
  A small fraction of shipments is bound to the rest of Europe and even a smaller quantity has an overseas destination
- **Sea transports are of specific importance to industries that import raw materials and/or exports products in bulk. To**

them, it is of essence to minimise handling and transport costs. For this type of bulk cargo industries that have a high turnover of materials, transport costs can be decisive for where the industry is located.

Bulk cargo varies substantially by character. Break bulk can normally be carried in containers or as break stowage on Ro-ro-ships. The ships are more or less designed for one or a few types of products. However, the ports are expected to give service to all types of ships using suitable handling equipment, relevant competence and terminal capacity to give the sea transport the service that is demanded in an efficient and productive way. If there are no commodities to ship from the port, the port will not exist. The claim of being too many ports in Scandinavia may be true at an administrative level. But as the ports operate on commercial terms, the market justifies the number of available ports.

Table 8: Number of ports and Port calls in Northern Europe

		2000		2002		Calls/Port		Change 02/00		
	Country	Calls	Ports	Calls	Ports	2000	2002	Calls	Ports	Calls/Port
UK/Eire	Great Britain	83 839	298	82 428	301	281	274	-1,7%	1,0%	-2,7%
	Isle of Man	421	4	407	4	105	102	-3,3%	0,0%	-3,3%
	Ireland	9 068	28	7 777	25	324	311	-14,2%	-10,7%	-3,9%
	Total UKE	93 328	330	90 612	330	283	275	-2,9%	0,0%	-2,9%
N Cont Europe	Belgium	26 416	29	26 658	20	911	1333	0,9%	-31,0%	46,3%
	Germany NEU	29 963	60	29 269	47	499	623	-2,3%	-21,7%	24,7%
	Netherlands	44 504	69	41 863	63	645	664	-5,9%	-8,7%	3,0%
	Total NEU	100 883	158	97 790	130	639	752	-3,1%	-17,7%	17,8%
Scandinavia/Baltic	Denmark	21 567	81	18 325	85	266	216	-15,0%	4,9%	-19,0%
	Estonia	5 913	16	5 416	17	370	319	-8,4%	6,3%	-13,8%
	Finland	16 213	49	16 662	49	331	340	2,8%	0,0%	2,8%
	Germany SCN	8 474	26	7 949	25	326	318	-6,2%	-3,8%	-2,4%
	Latvia	6 268	7	6 647	6	895	1108	6,0%	-14,3%	23,7%
	Lithuania	3 183	3	3 125	3	1061	1042	-1,8%	0,0%	-1,8%
	Norway	38 272	209	40 018	210	183	191	4,6%	0,5%	4,1%
	Poland	8 716	11	8 304	10	792	830	-4,7%	-9,1%	4,8%
	Russia	9 725	33	10 884	34	295	320	11,9%	3,0%	8,6%
	Sweden	28 914	89	24 764	90	325	275	-14,4%	1,1%	-15,3%
	Total SCN	147 245	524	142 094	529	281	269	-3,5%	1,0%	-4,4%

Source: The Institute of Shipping Analysis

Table 8 show the number of calls in the three regions The Baltic Sea, The Northern Continent and UK/Ireland. The statistics for the whole area show that 993 ports received 430.848 calls in 2001. Scandinavia/Baltic shows 544 ports and 164.691 calls. However, the statistics include all ports around Scandinavia, incl. Norwegian and Russian ports on the Atlantic/Arctic side.

Ports are built where there is demand for sea transports. Sweden and Denmark have relatively many ports, which forms a valuable infrastructure resource. It can also be noted in from the table that Latvia has the highest number of calls per port.

The Baltic Gateway area had about 30,000 calls in 2002.

5.1 Ship types, development and their typical cargo

In the BGW area in 2002 there was over 30,000 port calls made by 3,736 ships. More than 50 % or 1,904 of them were made by dry cargo (general cargo) ships, most of them being less than 10,000 DWT. They accounted for 18,850 calls.

Table 9: Ship calls in the Baltic Gateway Area in 2002

LRFR-types	Size	No ships	Average age	No calls	Total DWT	Average DWT
Oil Tanker	200 000 dwt +	2	7.0	2	597,462	298,731
	120' - 199 999 dwt	24	9.6	37	5,084,348	137,415
	80' - 119 999 dwt	59	9.5	159	16,201,393	101,896
	60' - 79 999 dwt	18	18.2	26	1,725,796	66,377
	10' - 59 999 dwt	142	18.6	425	10,969,795	25,811
	- 9 999 dwt	88	19.9	1,267	4,332,750	3,420
	< 500 gt	10	40.2	175	101,084	578
Oil Tanker Total		343	17.3	2,091	39,012,628	18,657
Chemical Tanker	60 000 dwt +	1	22.0	1	67,031	67,031
	10' - 59 999 dwt	166	10.4	728	14,769,986	20,288
	- 9 999 dwt	161	15.8	1,675	8,042,315	4,801
Chemical Tanker Total		328	13.1	2,404	22,879,332	9,517
LPG	- 49 999 cbm	64	14.6	243	1,714,724	7,056
LPG Total		64	14.6	243	1,714,724	7,056
Bulker	80 000 dwt +	14	17.6	14	1,768,394	126,314
	55' - 79 999 dwt	125	10.4	215	15,502,007	72,102
	35' - 54 999 dwt	129	14.8	185	8,063,490	43,586
	10' - 34 999 dwt	267	19.4	593	13,660,847	23,037
	- 9 999 dwt	72	24.2	888	3,401,079	3,830
	< 500 gt	2	49.0	10	1,334	133
Bulker Total		609	17.2	1,905	42,397,151	22,256
Combination	60 000 dwt +	33	18.0	82	6,467,485	78,872
	10' - 59 999 dwt	3	19.7	4	218,000	54,500
	- 9 999 dwt	1	8.0	29	107,590	3,710
Combination Total		37	17.9	115	6,793,075	59,070
Container	3' - 4 999 teu	1	0.0	1	41,850	41,850
	1' - 2 999 teu	13	7.8	30	610,738	20,358
	- 999 teu	46	9.7	719	5,094,734	7,086
Container Total		60	9.1	750	5,747,322	7,663
Reefer	7 100 cbm +	157	16.7	285	2,317,671	8,132
	- 7 099 cbm	50	19.3	348	903,484	2,596
Reefer Total		207	17.3	633	3,221,155	5,089
Dry cargo n.e.s.	10 000 dwt +	173	16.9	424	7,997,504	18,862
	- 9 999 dwt	1,692	17.7	17,459	49,929,406	2,860
	< 500 gt	39	43.3	967	562,312	582
Dry cargo n.e.s. Total		1,904	18.1	18,850	58,489,222	3,103
Vehicle Ro-Ro	4 000 ceu +	17	9.6	18	301,905	16,773
	- 3 999 ceu	34	18.1	306	936,279	3,060
Vehicle Ro-Ro Total		51	15.3	324	1,238,184	3,822
Ro-Ro n.e.s.	2 200 lm +	13	14.1	213	2,375,962	11,155
	- 2 199 lm	120	17.3	2,958	20,439,009	6,910
Ro-Ro n.e.s. Total		133	17.0	3,171	22,814,971	7,195
Total		**3,736**	**17.1**	**30,486**	**204,307,764**	**6,702**

The second largest category in number of ships was the bulkers, which in some respect carry the same type of cargo. Measured in number of calls the Ro-ro segment was the second largest with over 3,000 calls.

Seen in the total DWT the General cargo ships was the largest followed by the Bulkers and Oil tankers. Considering the fact that a fair share of the chemical carriers also carries oil products the importance of oil as a

commodity in the region is apparent, since those segments together have the largest DWT capacity.

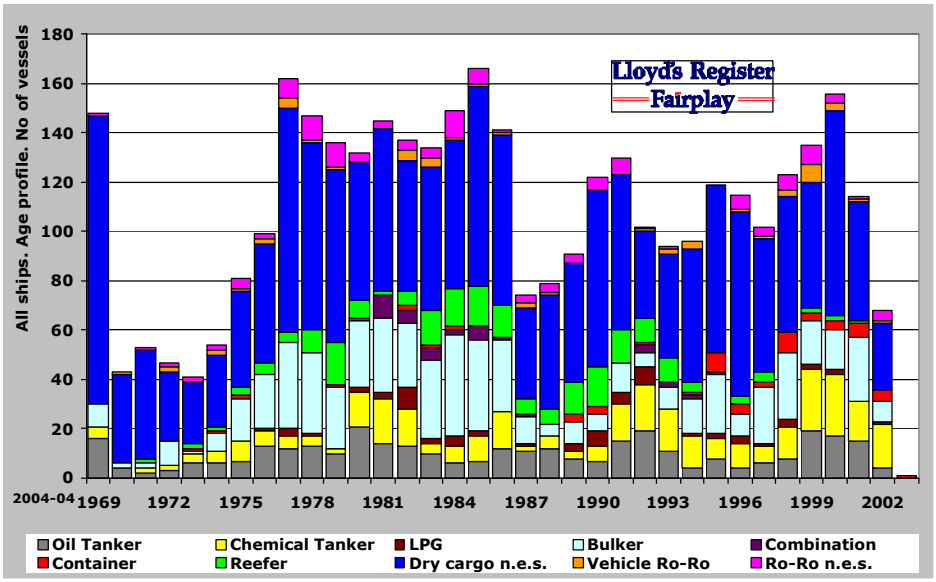


Figure 18: Age profile on ships calling the BGW area in 2002

The age distribution among the ships calling the BGW area is rather evenly spread around the average of 17 years. The largest oil carriers are by far the youngest.

Table 10: Flag on ships that called the area in 2002

	Flag \ Ship type	Oil Tanker	Chemical Tanker	LPG	Bulker	Com-bination	Con-tainer	Reefer	Dry cargo n.e.s.	Vehicle Ro-Ro	Ro-Ro n.e.s.	Total
1	ANTIGUA & BARBUDA		3		11		6	2	286		7	315
2	RUSSIA	28	3		24		1	2	255			313
3	MALTA	45	19		97	1	1	26	86	2	10	287
4	NETHERLANDS	6	10	5			9	10	239		2	281
5	PANAMA	26	22	1	103	5		34	38	13	7	249
6	CYPRUS	21	11		77			6	92	1		208
7	NORWAY (NIS)	19	58	7	5	5	2	3	73	10	17	199
8	BAHAMAS	20	11	7	20	10	2	30	72	1	1	174
9	LIBERIA	40	19	6	31	7		16	11		2	132
10	SWEDEN	20	37		10				33	8	11	119
11	SAINT VINCENT & THE GRENADINES	4		1	11	1	1	14	77		4	113
12	GERMANY	8	7				16		78		3	112
13	DENMARK (DIS)	6	20	3	3		1	2	72			107
14	ISLE OF MAN	4	15	17	3		2	4	26	2	7	80
15	UNITED KINGDOM	6	5	4	1		7	12	29		13	77
16	GIBRALTAR	2	6		1				59		3	71
17	NETHERLANDS ANTILLES			3	1		1	4	55		1	65
18	GREECE	14	4		30	1			9		2	60
19	FINLAND	7	2		3				28		19	59
20	ITALY		22	3	7				5	1		38
	Other	67	54	7	171	7	11	42	281	13	24	677
	Total	**343**	**328**	**64**	**609**	**37**	**60**	**207**	**1,904**	**51**	**133**	**3,736**

When it comes to what flag the ships in the region are registered to, the Antigua & Barbuda flag is the largest followed by Russia, Malta and the Netherlands. Different registers are specialised in different segments examples being Panama in Bulkers and Norway/Sweden in the Chemical tanker market.

When it comes to which country that has the economic benefit there is no doubt that Germany are the largest country in the region. Norwegian, Russian and Greek interests are the runner ups.

Table 11: Ships, by country of economic benefit

	Country of ec. benefit \ Ship type	Oil Tanker	Chemical Tanker	LPG	Bulker	Com-bination	Con-tainer	Reefer	Dry cargo n.e.s.	Vehicle Ro-Ro	Ro-Ro n.e.s.	Total
1	GERMANY	15	42	4	30		40	14	526	3	23	697
2	NORWAY	30	63	10	30	5	4	29	174	10	25	380
3	RUSSIA	42	7		30	4	1	4	287			375
4	GREECE	59	23	1	154	12		41	44		5	339
5	NETHERLANDS	3	17	7	2		3	19	256	2	2	311
6	DENMARK	20	28	5	4		2	5	113		2	179
7	SWEDEN	26	43		10			6	55	1	11	152
8	UNITED KINGDOM	8	1	3	11		1	17	45		11	97
9	POLAND	6	6		56				18		5	91
10	JAPAN	2	5		29			17	6	22		81
11	FINLAND	9	5		3			3	29		22	71
12	LATVIA	21	5					18	16			60
13	CHINA, PEOPLE'S REPUBLIC OF				37	3	1		18		1	60
14	ESTONIA							3	48		4	55
15	TURKEY	3	4		16	2			26			51
16	ITALY	2	23	2	9		1		13	1		51
17	CYPRUS	4	7	4	13			1	13	1		43
18	LITHUANIA				9			1	25		1	36
19	UNITED STATES OF AMERICA	5	9		8	1		3	8		1	35
20	SINGAPORE	8	2		5	8			5	3		31
	Other	80	38	28	153	2	7	26	179	8	20	541
	Total	**343**	**328**	**64**	**609**	**37**	**60**	**207**	**1,904**	**51**	**133**	**3,736**

Oil tankers

Put simply, oil tanker market basics are about the transport of crude oil to refineries (Crude Oil Tankers) and of refined products to storage or other refineries (Product or Chemical Tankers).

The tanker market has gone through a consolidation process on both the demand and the supply side. The charterers are a handful oil companies and some traders. Examples could be Exxon/Mobil, Total/Fina/Elf, Chevron/Texaco and BP/Amoco.

To match this, players on the supply side have formed larger operating entities such as Frontline, World-Wide and Teekay. Some “smaller” operators have started pooling their capacities by the creation of Tankers International VLCC (Very Large Crude Carriers), the Alliance pool (Suezmax) and the Torm pool (Product tankers).

Crude transport is carried out by VLCCs (200,000 DWT-plus) mainly on long-haul trades, Suezmaxes (120-200,000 DWT) mainly on medium-haul trades and Aframax tankers (80-120,000 DWT) mainly on short- to medium-haul trades. The latter trades are covered by the smaller Panamax (60-80,000 DWT) segment as well. Products are mainly carried by vessels smaller than Aframax size. The different products range from “light” products such as MTBE, naphtha, jet fuel, kerosene, gasoline, diesel/gasoil to the “heavy” ones like heavy fuel oils and bitumen.

The smallest oil tankers are also the oldest. Quite a few of these ships are bunker tankers that serve the all other ships. The vast majority of the bunker ships are rarely double hulled, and a regulation that prohibits them from trading will concern all shipping markets in the world.

Oil tankers smaller than 10,000 DWT made most of the calls 2002 in the Baltic Gateway region. Here we find all the bunker ships among others.

The products were carried by a fleet of 144 ships in the 10-60,000 DWT size range and crude carried in ships in sizes above.

The oil tanker fleet in the world has grown from 6,164 ships in 1985 to 7,099 in July 2003. At the same time, fleet capacity has increased from 236M DWT to 285M DWT. The current IMO Marpol 13G and MEPC working group rule 49/16/1 that rules the phasing out single hull tankers from the market affect close to 2,000 oil tankers up to 2015. New buildings during this period are forecasted at 1,404 ships and scrapping at 1,315. This results in an oil tanker fleet growth of 89 vessels (37M DWT).

Chemical tankers

The chemical tanker market as categorised in this report is in effect two separate ones that occasionally trade in the same market. Firstly it is a rather closed market for the transport of "sophisticated" chemicals (special products like corrosive or specially heated products) where actors like Stolt-Nielsen, Odfjell Seachem, Jo Tankers and MOL run their IMO I- or II-graded vessels that demands special steel in the tanks and special tank/pump arrangement. Secondly it is one for the less sophisticated cargoes (lubrication oils, MTBE etc) for which coated tanks are sufficient. The number of ship operators on this end of the market is fairly high. Vessels in the latter category often compete with the product tankers in the sophisticated end of their market.

Operators in the former segment have admitted to a certain degree of co-operation in violation of US price-fixing regulations. Some of them are in financial difficulties. They will have to set their hopes on the growth in China.

In the BGW region traded almost as many chemical tankers as oil tankers, 338 compared to 357. This is due to the fact that a lot of chemical tankers today carry oil products.

The world chemical tanker fleet has shown an impressive growth of 679 ships between 1995, when the fleet stood in 2,078 ships (19.8M DWT), and July 2003, when it reached 34.6M DWT. Based on DWT, this is an average growth of more than 7 per cent per annum.

As a consequence, much of the chemical tanker fleet is young, with few candidates for demolition. The intense contracting activity over the last years is partially due to a number of combined chem/oil tankers replacing product tankers, both for increased flexibility.

Capacity utilisation on the market last year and in early 2003 has been high, with freight rates following suit. All these factors have resulted in a sharp increase in the number of new chemical tanker orders, maybe more than called for.

The substantial number of deliveries over 2003-2004 will cool the market. New ordering is expected to slump next year, but to recover somewhat in 2005. The fleet will grow with 453 vessels. This equals more than 6 per cent annually based on DWT, i.e. less than before but still high.

LPG tankers

The LPG tankers always call special terminals that look as oil piers and can be a combined oil and gas terminal. The products are pumped in pipes.

LPG ships are used for the carriage of petrochemical and hydrocarbon gases such as ethylene, ethane and polypropylene as well as LPG (butane, propane or blends thereof). Demand for LPG itself generally benefits when the price of natural gas is high. Japan and countries in Europe are the dominant importers, but Chinese imports are growing fast. The LPG production or supply side is expected to grow over the coming years.

New LPG projects in the Atlantic Basin are projected and Middle East exports are expected to grow.

In the LPG segment we had 306 port calls in the Baltic Gateway region by 75 ships in the year of 2002.

Bulker carriers

The bulk carrier is the least sophisticated dry cargo ship that normally carries low value products in bulk that is just filled in the ship's large free open holds. The simplest ships demand some type of crane of discharging equipment on the quay to discharge the products.

Loading of the bulkers always demand some kind of loading device that pours in the free flowing bulk into the ship's hold. Some bulkers are equipped with own gear enabling them to discharge the cargo. This can be cranes or in some sophisticated cases discharging system that delivers the bulk on the quay with high productivity and in a continuous flow.

Some bulkers are equipped with container fittings in hold and on the hatches to be able to ship containers in bulk.

The very numerous bulk carrier fleet in the world currently amounts to 6,316 vessels of all sizes. The majority is highly dependent on shifts in business cycles since a large proportion of the cargoes are commodities catering to the energy and construction industries. Changes in business cycles are of particular significance to trade in developing countries where infrastructural investments are intense and thus bulk commodity dependent.

The fleet of 631 Capesize bulkers (80,000 DWT and upwards) carry about 75 % of global deep-sea iron ore volumes. Iron ore is to some extent also carried by the fleet of 1,099 Panamax vessels, where ship sizes are 55,000-79,999 DWT. Coal shipments, however, are the main occupation for Panamax bulkers. Other important cargoes for these vessels are grain, bauxite/alumina and phosphate rock.

Grain helps keep the Panamax sector somewhat less exposed than the Capesize segment to changes in business cycles.

Handy bulkers are below 55,000 DWT and are often sub-grouped into Handymax (35-55,000 DWT) and Handysize (10-34,999 DWT). There are currently 1,525 Handymax and 2,011 Handysize bulkers in the fleet.

These ships carry mainly minor bulks such as non-ferrous ores, iron and steel scrap, steel products, cement and forest products on all routes, but are also involved in grain and coal trade on short- to medium-hauls.

The 1,050 bulkers smaller than 10,000 DWT are with very few exceptions purely involved in regional trade. A substantial part of the transport work these vessels perform is related to the redistribution (feedering) of medium- to long-haul bulk cargoes from other continents. The reception facilities for these cargoes are often located near industries and heating plants.

Development in China 2003 went far beyond all plans and expectations, and China's demand for iron ore and coal sent the large bulker (Cape and Panamax) freight rates through the roof. Net capacity change in the Capesize fleet was close to five per cent 2003, while Panamax fleet growth remained below two – thus a modest supply growth. The intense traffic jammed ports at both ends, tying up tonnage waiting for weeks, which in effect reduced trading capacity markedly. The combined effect was that the capacity utilisation rate increased sharply with consequent effects on freight rates.

Market conditions for the Handymax and Handysize segments are somewhat different. In part they have enjoyed the effects of the Chinese upturn, but trade patterns have changed and this has called for repositioning of tonnage in many cases – to the better for many, to the worse for some.

Looking at the age profile of the bulk carrier fleet, it is quite obvious that if the market remains strong over the period 2004-2005 the replacement need for 1983-1985-built handies should result in substantial new ordering in the years to come. The market for these ships is however decreasing. This is because the rapidly growing fleet of container vessels will ensure cheap container freight rates several years ahead. The attraction of this logistic network on bulk cargoes increases by the day, and we will see even more bulk-type cargoes being shipped in containers

in the future. Even so, the market affected is marginal in comparison to the big bulk quantities transported.

Another factor that will adversely affect the handy market over the years to come is increased Chinese steel production capacity. As of today, China is already self-sufficient in long steel products and is on its way there with plates. The average age of ships in the larger bulk carrier and Handymax segments is under 13 years, while that in the Handysize segment is close to 19 years. The replacement needs for Handysize vessels are increasing by the day and scrapping will increase over the years to come.

All the above gives a forecast of a Handysize fleet decreasing by some 232 ships up to 2007. Meanwhile the Handymax fleet will grow by about 132 vessels.

In the Baltic Gateway region 132 Panamax ships traded in 2002, were they were doing 231 calls. There were 146 handymax ships doing 235 calls. The most numerous size category was the handysize ships at 291 and 749 calls. Only 15 Capesize ships entered into the region.

Combination carriers

The combination carrier was developed from a trading pattern of oil (crude oil) in one direction and bulk cargo (ore or coal) in the other. The idea is to minimise the empty trips for the ship. Typical combination carriers are OBO (oil Bulk Ore) and OB (Oil Bulk) carriers.

The combination carrier fleet has been shrinking since 1992. Dry bulk shipments by combination carriers have almost ceased to exist over the past decade, while their presence in the crude sector has been shifting over the years. The exceptional development of the dry bulk market has led combination carriers back to dry trading again.

The combination fleet has fallen since 1992 at an average 7.7 per cent per annum, based on DWT. The outlook to 2007 is a continuing fleet reduction of 31 ships or 3.2M DWT (-5.8 per cent p.a.). The fleet will thus be below 10M DWT in 2007.

Scrapping of tonnage is projected at 37 ships until 2007, and five deliveries are expected. Six new contracts are forecasted, all of them to replace existing combination carriers in designated industrial systems.

Container ships

Container handling can be done in all normal ports and at any general cargo quays. I the Baltic numerous containers are handled by Ro-ro ships over the ramp standing on roll-trailers or lifted from weather deck by mobile cranes. A container is a relatively heavy unit and it demands special gear, a spreader, to be lifted by crane or by truck. Ports that handle containers are developed from conventional general cargo ports to

dedicated container quays when the turnover comes up to about 10,000 annual TEUs. At this stage the port normally invests in a mobile crane heavy enough to reach out over the ship and lift up to 40 tons in the hook.

Figure 19: Mobile port container crane

At a turnover of 50 – 75,000 annual TEU the port invest in a port gantry dedicated container crane to increase the handling capacity from 15 units/hr to about 20 units per hour. At this stage there is a port area and at least two berths dedicated for container operation only.

Figure 20: Port gantry container crane

The unitised and dry cargo sector of the world shipping scene has been dominated by the enormous influx of containers into the system the last decade. This grand-scale containerisation of the global logistical chain is the result of the exploration of economies of scale in the deep-sea

container vessel fleet. Prices have dropped over the last decade attracting cargo from competing segments such as dry cargo, reefer and minor bulk.

This development has affected the formation of strategies as well as the development of products and services.

The last ten-year period has been a roller-coaster ride for the container operators, with profits going up and down. Fleet expansion has been especially rapid in capacity terms. For every added year, the TEU[6] capacity per vessel is increased. The newest and largest vessels are being deployed on the Asia-Europe and Asia-US trades, sending the existing ships cascading into other trades. Such a development is finite, and there are size restrictions (length, beam, draught, height, port handling capacities) interrupting the cascade potential.

All the large global operators want to take part in this development, and this is reflected in new ordering activities. Most of them have substantial orderbook/ fleet ratios.

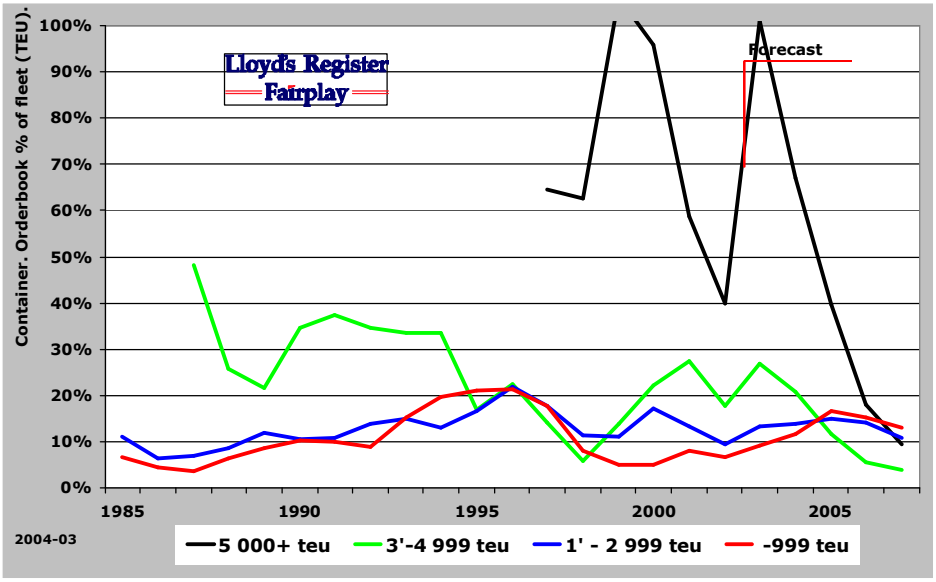


Figure 21: The orderbook/fleet ratio in different container segments

Figure 21 illustrates the orderbook/fleet ratios. Without doubt more of the cargo being offered to the transport market will be carried by container ships, even if we foresee a decline in the orderbook relative to the fleet over the next years.

[6] TEU "Twenty-foot Equivalent Unit" Containers are counted in 20' units a 40' container counts as 2 TEU

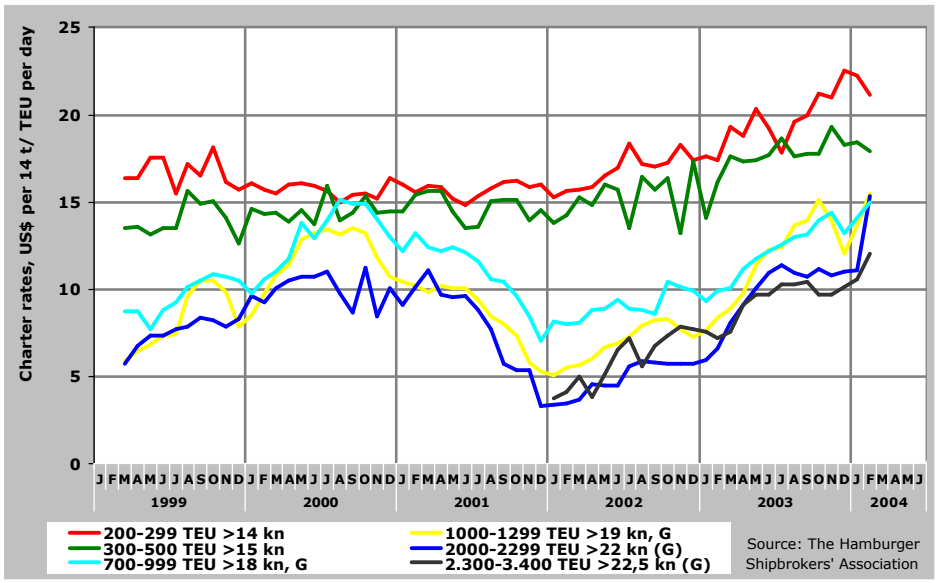


Figure 22: Container ship charter rates

Charter rates have increased (Figure 22) which is an interesting development when comparing with freight rates (Figure 23).

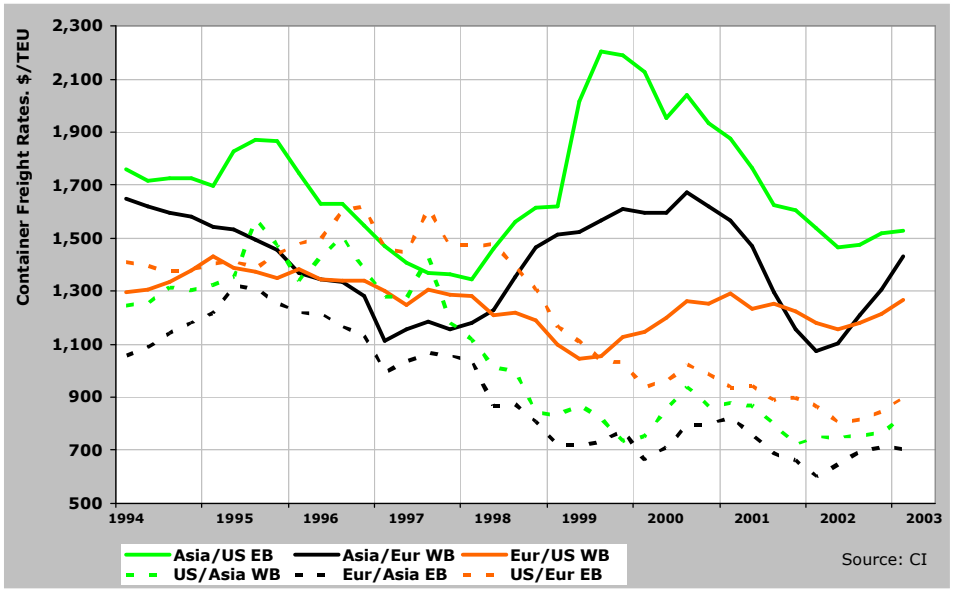


Figure 23: Container freight rates

Container freight rates have been under pressure for a long time, and even if the post-Asian crisis recovery was substantial, the trend has been pointing downwards for decades.

Today we face a situation where ship operators are chartering tonnage at increasing rates to secure operation at decreasing rates. Lower freight rates increase the attractiveness of the container as such. Goods are now being shipped in boxes that were previously earmarked for bulk or break-bulk, such as timber and sawn wood. Reversals when rates bounce upwards seem to be lagging somewhat, but the competition from break-bulk is there.

The rates from Asia to Europe have risen by more than 30 per cent over the last quarters, but are still at the same level as in 2000. The increase is due to the strong development in China lately. For European shippers the rates have "only" risen by ten per cent as a result of the euro/$ exchange rate development.

We expect the rates to provide container ship operators with a positive cash flow throughout the year, but rate increases as seen in the bulker market will not materialise. However, increasing box rates make reefer and dry cargo fleet operators smile.

A lot of new container vessel tonnage will reach the market over the years to come, and shippers will see their negotiating power strengthen.

About 30 companies provide most of the trans-oceanic containership trade. Even if 30 are not that many, there is no assurance that the market can handle more than ten. Recent vessel charters in the smaller size segments have been closed on rather high rate levels – levels that might not be manageable over a freight rate downturn.

Lower rates will ensure the continuation of consolidation via take-overs or mergers. For the shipper, the transport cost will continue to decrease and the cargo will thus eventually end up in a container.

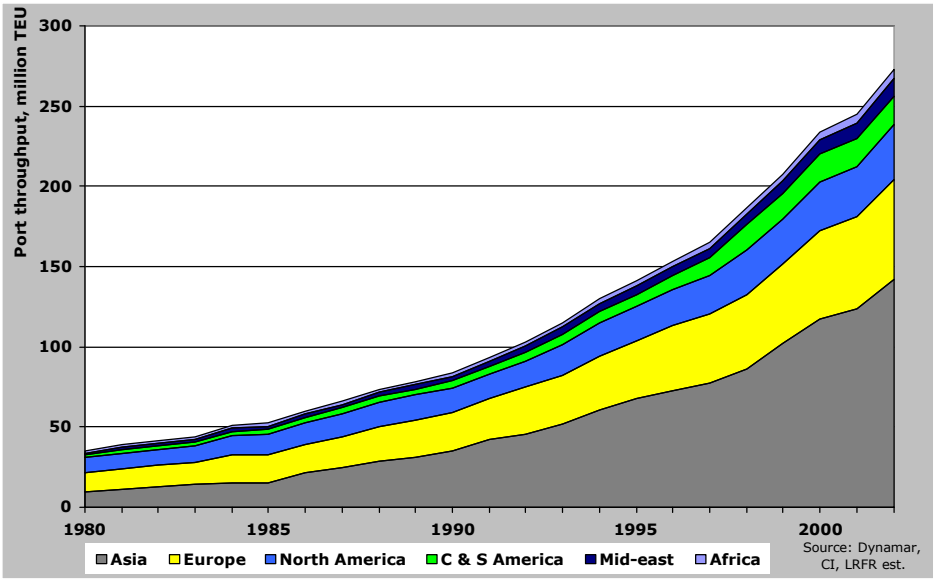


Figure 24: World container port throughput

The container-shipping sector is facing some major challenges ahead, and coping with over-supply of tonnage is one of them. Being able to offer the lowest cost per unit on the major trades has been and will continue to be an important incentive for the ordering of new and larger vessels.

The multi-national industrial conglomerates have got used to transport costs decreasing over time. Should the transport sector be able to continue offering services at these terms, then the empty container issue

has to be addressed. Increased efficiency in container handling ashore is another target area.

Recent data suggests that the imbalance has actually increased – particularly on the trans-Pacific trades. Slot utilisation on the eastbound trans-Pacific trades is currently some 90 per cent, while it is about 40 per cent in the other direction. The Europe/Asia trade is better off, but the Asia to Europe direction outnumbers the opposite stretch by two to one.

The container vessel fleet has grown at a high rate ever since 1995. Average annual growth has been a tremendous 9.7 % and the fleet is now standing at a 6,291,408 TEU. In the forecast this growth rate will slowly deteriorate to eight per cent p.a.

The tremendous supply of container shipping capacity on the market will probably result in a search for more cargo and introduction of the containers on new markets. In other words the containerisation of the world will increase. This implies a still growing container market that opens up more markets in the world. There are clear signs showing the Baltic Sea Region to be one of these markets.

Reefer

The reefer ships are a general cargo ship normally built for handling pallets. The ship's holds are refrigerated and the ships carry all types of products that need to be cold or heated. Typical examples are fruit and meat. The reefer call ports equipped with cold stores.

The forecast show the tendencies for more consolidation in the reefer market. Star Reefer and NYK Reefers set up the NYK Star pool in 2001, but NYK made use of a break-up clause the summer of 2003. Instead NYK will collaborate with LauritzenCool in a vessel sharing partnership starting in January 2004. The agreement also sees NYK Reefers taking half the shares in LauritzenCool Logistics.

In the meantime several bids have been made for Star, but so far all of them have been rejected. One of them was from the Greek Lavinia group, which itself controls 70 reefers.

Container ships are the cause of the turmoil. Reefers are comparatively small for the deep-sea trade. A large reefer ship is about 15,000 DWT with some 20,000 m^3 cargo-carrying capacity. The refrigerated TEU capacity on modern large container ships is about 50 % more than that. With the heavy ordering of large container ships seen over the past years, the reefer market will now have an even larger competitor than it did six months ago. Speaking in favour of reefer operation is the sheer size of the newest container vessels. They are simply too large to trade on a number of the current reefer routes.

On the other hand, container operators have to deploy the older, smaller, vessels elsewhere (cascade effect), which could lead to new lines being opened in parallel with existing reefer trades.

Demand for the transport of refrigerated products has been positive over the last decade, in line with reduced trade barriers. The fruit trade, for example, has grown from 42Bn tonne-miles in 1990 to 60Bn in 2002, where bananas account for 33Bn tonne-miles.

The development of reefer capacity in the container fleet has of course had a negative impact on the reefer ship market. Some loading ports for reefer cargo have not been, and some are still not, geared for container handling, which has protected the reefer branch somewhat. This protection, however, will not last forever.

The existence of smaller geared container vessels with reefer slots as well as reefers with container-carrying capacity ensures a continued gradual penetration of the container even into the smaller reefer ports.

The reefer fleet has not grown over the last five years, and operators have experienced severe problems with earnings. Earnings have improved the past six months though, which comes as no surprise. The container market has been reasonably good and operators have not been offering additional cargo at low prices to the same extent.

Heavy container vessel deliveries over the forecast period will probably increase the interest in offering slot capacity for refrigerated cargo. Reefer fleet capacity is forecast to fall by ten per cent up to 2007.

General cargo vessels

The market for the General Cargo fleet is diversified with a lot of different players, mainly in local/regional markets. This fleet is one of the three shipping fleets beside the container fleet that have substantial container-handling capacity. The larger ship segment is in decline since these vessels compete directly with the container ships, while many of the smaller ones supplement the container feeder system. These smaller ships often carry a combination of break-bulk and containers. The combination makes the future for these smaller ships more robust than that for the larger dry cargo ships.

There are still a lot of places where the total cargo volume cannot justify a dedicated feeder service, but in combination with other cargo, these ships can allow even smaller ports/cities to enjoy the advantages of being connected to the container-shipping network.

The negative impact of containerisation on the reefer segment affects the General Cargo fleet in the same way. The fleet of ships of 10,000 DWT and above is predicted to decrease by ten per cent up to 2007, whereas the smaller segments will remain unchanged. This is explained by the use of dry cargo vessels to carry containers.

The world fleet consists of 16,541 ships, of which 11,430 are larger than 500 GT.

The General Cargo ship is a very common type in the Baltic Sea Area. The type is of a multipurpose type that can carry anything from bulk products to containers or pallets or special cargo. The ship type is mostly used for all the shipment of pulpwood and bio fuels in the area. There are numerous supplies of low value and small shipments of bulk products to the steel and forest industries that are handled by the General Cargo tonnage. A typical example is all the pulpwood shipped from the Baltic States and Russia to the Finnish and Swedish forest industries.

Vehicle Ro-ro carriers

Vehicle carriers are large "car parks" that distribute the new built cars all over the world. The vehicle carriers call ports that have import sites for cars. In these sites the cars will be prepared for the market and fitted according to the local regulations. In the Baltic Gateway area we have such terminals in Malmö for importing cars and Lübeck for the export of German cars to the Scandinavian market.

The vehicle Ro-ro market has a structure with rather few operators and high barriers to entry. A few Japanese owners and the Swedish/Norwegian Wallenius Wilhelmsen are among the big players. However, Japanese interests have a massive showing in the current orderbook. China is the fastest-growing car manufacturing country in the world at present, calling for a restructuring of the car transport logistics network.

Cars are high-value goods and even though container operators do not currently pose a threat to the vehicle Ro-ro market, they definitely form a potential one. Container operators already take care of transporting exclusive cars to distant places, i.e. when the volumes are low. The recent development on the container shipping market as described above further underlines this statement.

The capacity of the vehicle Ro-ro fleet has been growing since 1985 at an average 3 per cent p.a. The fleet has grown in steps, which partially finds an explanation in the relatively few operators and vessels involved in deep-sea trading, resulting in a marked impact of any fleet renewal programme. Several new orders for large vehicle carriers have been placed by Japanese interests over the past six months to be delivered in 2004-2006.

In addition, Wallenius Wilhelmsen is converting five of its older vessels to increase car-carrying capacity. The vessels are said to be intended for the expanding Far East – Mid East trade.

Despite the strong development of the container carrier sector, the automotive industry does not yet seem prepared to make a move towards large-scale containerisation for the transport of new vehicles.

Should we see the introduction of a logistical innovation aimed at improving the efficiency of container use for new vehicle shipments, then the switch away from PCC/PCTCs could be very quick.

The fleet at 1,978,518 CEU (car equivalent units) today will grow by three per cent p.a., corresponding to a total growth of 304,210 CEU to 2007.

Ro-ro excluding ferry

The Ro-ro ships need a quayside with a ramp to meet the ships ramp. The ship type is relatively large for its carrying capacity in tons. The concept of Ro-ro aims at increasing the port efficiency by carrying rolling cargo carriers that speeds up the productivity in the port and increase the flexibility in carrying different kinds of cargo. The ferry is the solution for ships carrying vehicles between ports and the Ro-ro ship carry the same vehicles plus containers and break bulk on trailers between ports at a longer distance.

The forest industry in the Baltic area and the majority of the Finnish communication system with the rest of the Europe are based on the Ro-ro concept.

The short sea Ro-ro operation is loosing volumes to the container services. The fast containerisation of the market gives new opportunities and higher productivity for smaller volumes that the market finds more interesting than using the Ro-ro ferries. Ro-ro cargo that was transferred and containerised in the central European container terminal are now containerised closer to the shipper or stripped by the consignee. The container depots are increasing in the BSR as the container services are growing. The use of containers gives in some relations and for some products better cost-efficiency and less handling of the cargo than some other shipping solutions.

The Ro-ro ships were introduced in deep sea trading during the 80:ties but several services did not give the economy that was anticipated. Some majors services cross Atlantic are still running and are trusting in the flexibility. So are some services Cross Pacific, Australia-US.

The car carriers haves covered for the demand of flexibility in the market as the modern car carriers are equipped with a full height deck for carrying special cargo.

The market share for the **Ro-ro ships** in transoceanic trades has thus decreased following the rapid development of containerisation. However, when using the Ro-ro technique in short sea shipping the flexibility in carrying goods and the fast load and unloading makes up for the

disadvantages of the rather expensive trailer units (high capital, maintenance costs and port dues). This is especially recognised in ferry relations where the drivers are travelling along with the trailer during the ferry trip (runners).

The load carriers, roll-trailers, cassettes and semi-trailers are suitable for both carrying forest products in outbound shipments and consumables on the return trip. The trailers are mainly transported as single units on the ship (drops). These units are picked up in the other end by local trucks that deliver the cargo or deliver the trailers to the hucke-pack (piggy-back) terminal.

For this reason we see more and more lines that add or increase the Ro-ro capacity by adding a Ro-ro ship to the ferry two-port service for flexibility and for the economy. In the shipping services from the Baltic area to the continent the share of containers on the Ro-ro ships increases. These containers are using the cargo ferry service for the trans-shipment between Scandinavia and the container hubs. The operation is very common in Finland and by the Finnish operators. In Sweden the services are more focused on pure industrial shipments of forest products but some services has started integrated operation by shipping empty containers to the North Baltic area to be stuffed and brought down to the Continental hub by a conventional Lo-lo ship.

This part of the Ro-ro fleet is engaged on long term contracts with large industries on defined trades. These are typically industrial shipping services where the Ro-ro operation forms a link in a supply chain management that use the flexibility of the system for late bookings, to carry any type of products and to offer return cargo capacity for own and third parties to keep the operation as cost efficient as possible.

The Ro-ro fleet is thus fighting for cargo with container vessels on one hand and cargo ferries on the other. While the combined ferry traffic has the advantage (and the cost) of carrying passengers as a feature the Ro-ro fleet cover its costs by transporting dangerous cargo and other types of cargoes that is not suitable to combine with passengers.

The Ro-ro fleet is relatively fragmented with a lot of smaller operators all over the world.

Today there are several Ro-ro ships in order varying from 13,000 DWT up to 18,000 DWT. Several are ordered especially for the Baltic Sea Region market. The market for some of them is not disclosed but it can be assumed that they will add in to the cross Atlantic service between Scandinavia and US-Canada.

5.2 General traffic pattern by ship type (excl. Ferry)

To determine the shipping function in the BGW area the ships' movements within the region and between the BGW region and other

areas/regions have been analysed. The ships' movements will together with the ship type mirror the trading pattern in the and in relation on the area. The local trade pattern in way of ferry operations will be handled in Chapter 5.5.

In order to follow information given in the following tables a key to the abbreviations are needed.

Table 12: Key to area abbreviations

Local level	**Baltic Gateway (BGW)**	
BGW	Ports	
European level		
BGW	Regions	
	BLK	Black Sea
	MED	Mediterranean
	NEU	Belgium, Germany, Netherlands and France
	FIN	Finland
	RUS	Russian ports in the Baltic Sea
	SBN	East coast of Sweden North of BGW
	OBS	Estonia and Riga bay
	ONE	West coast of Sweden, Denmark and Norway
	UKE	United Kingdom and Ireland
World level		
BGW	Continents	
	AFR	Africa
	AME	America
	ASI	Asia
	AUS	Australia

Local ship movements within the BGW area dominate the shipping activities.

The trade with ONE and NEU are next to the local one clearly in a dominating position with UK and Finland following.

The total traffic on the ports in the region to/from a port outside Northern Europe is very limited. Ships having a previous destination outside the Northern Europe made only 466 calls out of 30,522 in the BGW region. 304 of 30,515 ships were heading to a port outside of the Northern Europe. This shows that the shipping activities are very regional. However, it can be said that the activities studied are limited and do not show the final destination for products like break bulk, containers and general cargo, as these commodities are often transited in a North European port to/from ocean going tonnage..

Total traffic volumes between ports in the BGW-region or with ports outside the BGW-region amounted to 30,522 calls in 2002. Direct traffic between ports in the BGW region amounted to 8,781 or 29 % of the total number of calls. Direct traffic between ports in the BGW region and

ports outside the region amounted to 21,741or 71% of the total number of calls.

Table 13: Number of port calls in the BGW region from various previous regions

		Previous Region																		
Type	Size	BGW	ONE	NEU	UKE	S	FIN	OBS	SBN	RUS	S	IBE	AME	MED	ASI	BLK	AFR	AUS	S	Total
01 Oil Tanker	60' dwt+	**6**	24	99	63	**186**	14	0	4	1	**19**	5	10	1	0	0	0	0	**16**	**227**
01 Oil Tanker	<60' dwt	**525**	567	374	112	**1 053**	45	148	60	16	**269**	14	7	0	0	0	1	0	**22**	**1 869**
02 Chemical Tanker		**597**	504	578	137	**1 219**	276	179	96	18	**569**	12	12	0	2	0	0	0	**26**	**2 411**
04 LPG		**25**	94	42	35	**171**	11	0	29	0	**40**	1	1	1	0	0	1	0	**4**	**240**
05 Bulker	35' dwt+	**43**	52	180	74	**306**	7	3	24	16	**50**	15	9	3	0	0	1	1	**29**	**428**
05 Bulker	<35' dwt	**297**	404	359	186	**949**	41	34	87	16	**178**	60	13	3	1	0	1	0	**78**	**1 502**
06 Combination		**16**	2	57	24	**83**	0	9	2	0	**11**	0	6	1	0	0	0	0	**7**	**117**
07 Container		**220**	76	295	54	**425**	11	25	1	67	**104**	0	1	0	2	0	0	0	**3**	**752**
08 Reefer		**131**	139	68	122	**329**	0	14	0	81	**95**	35	42	0	0	1	1	0	**79**	**634**
09 Dry Cargo		**6 203**	4 232	4 338	866	**9 436**	568	887	927	638	**3 020**	142	23	12	2	8	0	0	**187**	**18 846**
10 Vehicle RoRo		**40**	72	142	44	**258**	21	0	0	0	**21**	5	0	0	0	0	0	0	**5**	**324**
11 RoRo		**678**	689	119	105	**913**	1 074	153	210	134	**1 571**	9	0	1	0	0	0	0	**10**	**3 172**
Total		**8 781**	**6 855**	**6 651**	**1 822**	**15 328**	**2 068**	**1 452**	**1 440**	**987**	**5 947**	**298**	**124**	**22**	**7**	**9**	**5**	**1**	**466**	**30 522**

Table 13 shows the region from where the ships originated before calling the BGW region.

Table 14: Number of calls in the BGW region with destination in other regions

		Next Region																		
Type	Size	BGW	ONE	NEU	UKE	S	FIN	OBS	SBN	RUS	S	IBE	AME	MED	ASI	BLK	AFR	AUS	S	Total
01 Oil Tanker	60' dwt+	**5**	18	96	87	**201**	7	4	0	2	**13**	2	7	1	1	0	0	0	**11**	**230**
01 Oil Tanker	<60' dwt	**523**	580	357	139	**1 076**	39	162	41	11	**253**	3	4	2	1	1	0	0	**11**	**1 863**
02 Chemical Tanker		**597**	501	642	211	**1 354**	228	135	58	18	**439**	6	6	1	3	0	0	0	**16**	**2 406**
04 LPG		**25**	95	50	34	**179**	8	0	28	0	**36**	1	0	1	0	0	0	0	**2**	**242**
05 Bulker	35' dwt+	**41**	18	88	202	**308**	4	10	6	11	**31**	20	17	2	1	0	1	0	**41**	**421**
05 Bulker	<35' dwt	**295**	338	266	311	**915**	57	37	89	36	**219**	43	26	1	1	0	1	0	**72**	**1 501**
06 Combination		**16**	7	28	43	**78**	1	8	0	2	**11**	1	9	0	0	0	0	0	**10**	**115**
07 Container		**217**	105	251	59	**415**	92	8	1	15	**116**	1	2	1	1	0	0	0	**5**	**753**
08 Reefer		**136**	176	53	148	**377**	1	14	3	82	**100**	8	12	1	0	1	0	0	**22**	**635**
09 Dry Cargo		**6 217**	3 584	4 007	1 324	**8 915**	715	1 293	995	605	**3 608**	77	15	10	2	6	2	0	**112**	**18 852**
10 Vehicle RoRo		**40**	64	81	53	**198**	85	0	1	0	**86**	0	0	0	0	0	0	0	**0**	**324**
11 RoRo		**686**	738	91	52	**881**	1 129	108	231	136	**1 604**	0	0	1	0	1	0	0	**2**	**3 173**
Total		**8 798**	**6 224**	**6 010**	**2 663**	**14 897**	**2 366**	**1 779**	**1 453**	**918**	**6 516**	**162**	**98**	**21**	**10**	**9**	**4**	**0**	**304**	**30 515**

The figures in the above tables gives that roughly:

- 30 % of all calls are within the BGW region.
- 50 % of all calls are in relation with the Northern Europe.
- 20 % is communication with the rest of the Baltic Sea.
- 1 % of the calls are in relation with the rest of the Europe.
- less than 0.5 % is overseas calls.

General cargo ships dominate the traffic and alone accounted for 62 % of the total number of calls. Tankers account for 15 % of total calls, Ro-ro vessels for a little over 10 %, bulkers for 7 %, and container and reefer vessels for 2.5 % each.

The traffic within the BGW region accounts for 29 % of total traffic. Here the dry cargo share is 71 % of the total, while oil tankers account for 6 %, Ro-ro vessels for 8 %, bulkers for 4 %, container carriers for 2.5 % and car carriers for just 0.5 %.

The traffic to North Western Europe accounts for 50 % of the total traffic. For crude oil tankers, LPG carriers, bulkers and car carriers the percentages are even higher.

The traffic to North Eastern Europe accounts for 20 % of total traffic. For Ro-ro traffic the proportion is as high as 50 %.

As previously mentioned the traffic to UKE from the BGW region does not balance the traffic from UKE to the BGW region.

Traffic with dry cargo and bulk vessels to UKE exceed traffic in the opposite direction by the same ship type by a wide margin. For Ro-ro and LPG the situation is the opposite, which as pointed out earlier, is because traffic back to the UK goes via other regions.

In traffic to the rest of North Western Europe the situation is similar with chemical tanker, container and reefer calls exceeding the number of calls in the opposite direction while the reverse is true for dry cargo calls.

In traffic between the BGW region and North Eastern Europe traffic to Estonia, Latvia, Lithuania and Finland exceeds flows in the opposite direction while the opposite is true of traffic with Russia, which is insignificant in comparison to the other countries (about 15 %).

General cargo traffic to North Eastern Europe by far exceeds traffic in the opposite direction (by 588 calls), while chemical tanker movements are fewer out of the region than into it.

The average ship size varies between different ship types. The largest average size ship is a crude oil tanker, which explains the large difference in average DWT per port call for Gdansk, Rostock/Warnemünde, Ventspils, Klaipeda and Butinge Terminal.

Table 15: Average deadweight per port call

Average Deadweight per Port Call

FROM \ TO	BGW	ONE	NEU	UKE	S	FIN	OBS	SBN	RUS	S	IBE	AME	MED	ASI	BLK	AFR	S	Total
Szczecin/Swinoujscie	**4 041**	3 048	8 557	12 312	**6 796**	8 026	3 933	4 349	5 990	**5 086**	7 530	21 553	13 916	3 153	5 595	-	**22 491**	**5 869**
Klaipeda	**5 189**	7 007	11 409	18 176	**12 016**	3 920	8 353	4 843	9 841	**6 582**	19 181	43 258	4 665	14 026	4 849	-	**55 318**	**9 572**
Copenhagen	**4 883**	4 469	6 866	5 111	**5 011**	7 038	5 279	3 562	4 097	**5 891**	3 454	8 398	111 587	-	-	-	**47 400**	**5 147**
Gdynia	**4 832**	4 905	6 502	8 782	**6 808**	8 102	5 059	5 848	8 806	**7 347**	34 518	13 269	-	33 154	7 480	-	**28 033**	**6 455**
Rostock/Warnemünde	**5 132**	5 811	4 445	22 224	**6 727**	7 045	7 232	3 031	5 908	**6 595**	16 778	58 427	-	-	-	-	**102 050**	**6 342**
Kaliningrad	**4 565**	3 826	5 692	8 056	**5 773**	9 888	4 177	4 851	5 197	**6 865**	7 911	13 524	3 521	7 106	2 687	18 955	**18 839**	**5 726**
Lubeck	**2 708**	6 031	3 647	6 051	**5 630**	8 565	4 302	7 994	3 504	**7 937**	5 837	1 196	7 460	-	-	-	**10 165**	**6 363**
Gdansk	**5 177**	7 451	19 792	25 675	**17 651**	7 860	3 901	9 980	11 532	**7 683**	55 066	34 928	48 708	-	-	22 218	**181 333**	**12 465**
Wismar	**2 149**	2 172	3 806	3 388	**2 666**	3 704	3 033	2 030	3 250	**2 912**	3 420	4 866	-	-	-	-	**11 705**	**2 583**
Ventspils	**7 826**	23 674	34 205	47 573	**39 064**	26 219	8 723	4 259	22 379	**9 358**	46 303	61 048	47 163	27 259	3 210	65 449	**79 057**	**29 255**
Liepaja	**4 008**	2 241	4 395	5 009	**3 695**	3 910	3 307	3 028	13 802	**4 094**	8 758	15 033	-	-	-	-	**52 987**	**3 962**
Helsingborg	**4 963**	4 100	5 586	6 899	**4 762**	4 738	4 948	9 019	5 322	**6 516**	8 883	33 640	19 748	3 794	-	-	**23 674**	**5 138**
Karlshamn/Elleholm	**2 635**	3 807	3 510	6 845	**4 260**	4 708	3 563	2 038	5 950	**3 923**	2 662	-	-	-	2 893	-	**8 216**	**3 442**
Malmo	**5 101**	4 101	5 121	26 554	**7 756**	3 359	6 662	4 603	10 823	**5 264**	34 291	48 158	8 379	-	-	-	**47 061**	**6 460**
Kiel/Rendsburg	**3 348**	4 093	5 272	3 206	**4 798**	5 140	4 655	3 419	4 343	**4 453**	11 478	-	-	-	-	-	-	**4 289**
Ahus	**2 321**	2 108	4 169	3 640	**3 819**	3 855	2 973	1 974	2 867	**2 749**	-	-	-	-	-	-	-	**3 011**
Stralsund	**2 139**	2 800	2 403	4 252	**2 812**	3 451	2 297	2 030	2 487	**2 610**	5 711	-	-	-	-	-	-	**2 457**
Frederiksvaerk	**1 484**	1 156	1 178	1 578	**1 211**	3 087	1 519	1 486	3 080	**1 904**	2 723	-	-	-	-	-	-	**1 323**
Oskarshamn	**3 995**	5 605	4 361	4 744	**4 738**	5 290	3 548	12 563	3 932	**5 562**	4 156	-	-	-	-	-	-	**4 932**
Koge	**1 732**	1 920	1 820	2 769	**1 931**	2 680	2 277	2 686	2 300	**2 601**	3 035	-	-	-	-	-	-	**1 900**
Kalmar	**1 777**	4 808	2 145	2 623	**3 022**	6 033	2 956	2 186	6 532	**3 850**	3 280	-	-	-	-	-	-	**2 848**
Landskrona	**2 215**	2 798	2 069	3 067	**2 645**	5 145	2 460	2 788	2 358	**3 075**	-	10 452	-	-	-	-	**10 452**	**2 538**
Nakskov	**1 659**	2 155	1 481	2 583	**1 987**	2 966	2 446	2 531	4 037	**2 987**	-	-	-	-	-	-	-	**1 981**
Wolgast	**1 832**	1 527	2 248	3 439	**2 272**	3 135	2 531	2 753	1 630	**2 862**	3 790	-	-	-	-	-	-	**2 245**
Nykobing(Falster)	**1 761**	2 098	1 616	3 030	**2 006**	2 063	1 654	1 134	-	**1 716**	3 100	-	-	-	-	-	-	**1 914**
Naestved	**1 641**	1 604	1 693	1 590	**1 618**	3 030	-	3 204	2 499	**2 808**	-	-	-	-	-	1 220	**1 220**	**1 652**
Solvesborg	**1 946**	1 899	3 587	2 201	**2 526**	3 263	3 338	2 343	-	**3 029**	-	-	-	-	-	-	-	**2 320**
Kolobrzeg	**1 193**	998	1 350	-	**1 128**	1 570	1 420	1 299	988	**1 304**	-	-	-	-	-	-	-	**1 176**
Greifswald/Neustadt	**1 149**	2 006	1 996	2 766	**2 109**	3 201	3 850	3 038	-	**3 390**	-	-	-	-	-	-	-	**1 686**
Trelleborg	**3 586**	3 764	2 473	2 211	**2 817**	5 698	1 499	1 540	4 137	**2 846**	-	-	-	-	-	-	-	**3 222**
Fakse Ladeplads	**1 261**	1 231	1 135	1 500	**1 210**	1 372	-	1 130	-	**1 251**	-	-	-	-	-	-	-	**1 230**
Hundested	**2 511**	1 610	1 158	1 170	**1 584**	-	2 620	1 171	-	**2 040**	1 006	-	-	-	-	-	-	**1 719**
Bandholm	**1 381**	1 294	1 597	2 750	**1 566**	2 268	3 340	2 300	3 105	**2 825**	-	-	-	-	-	-	-	**1 609**
Hoganas	**4 253**	4 381	3 870	3 714	**4 243**	5 688	5 695	2 172	6 385	**4 718**	-	-	-	-	-	-	-	**4 347**
Ystad	**2 085**	2 093	1 753	2 470	**1 974**	1 384	2 122	1 556	2 658	**1 948**	3 776	-	-	-	-	-	-	**2 071**
Baltiysk	**3 131**	3 749	16 593	-	**11 700**	8 631	3 325	-	3 062	**5 873**	-	-	-	-	-	-	-	**6 011**
Stevns Pier	**2 170**	1 693	1 423	3 295	**1 997**	3 944	-	1 489	-	**3 094**	-	-	-	-	-	-	-	**2 495**
Rodbyhavn	**1 305**	2 371	864	-	**1 570**	-	-	-	-	-	-	-	-	-	-	-	-	**1 502**
Vierow	**1 703**	1 276	1 846	-	**1 748**	-	2 907	-	-	**2 907**	-	-	-	-	-	-	-	**1 763**
Sassnitz/Mukran	**1 682**	2 946	4 368	8 025	**5 617**	-	-	-	-	-	12 359	-	-	-	-	-	-	**5 454**
Flensburg	**1 464**	2 113	1 125	-	**1 454**	-	-	-	-	-	-	-	-	-	-	-	-	**1 461**
Bergkvara	**3 873**	4 525	-	-	**4 525**	-	3 162	5 845	3 970	**3 931**	-	-	-	-	-	-	-	**3 979**
Simrishamn	**819**	1 835	-	-	**1 835**	-	635	1 042	4 137	**1 938**	-	-	-	-	-	-	-	**1 190**
Stubbekobing	**981**	646	1 430	-	**1 195**	3 030	-	-	3 149	**3 090**	-	-	-	-	-	-	-	**1 299**
Karlskrona	**3 397**	2 222	2 560	-	**2 335**	-	-	-	1 160	**1 160**	4 031	-	-	-	-	-	-	**3 027**
Masnedo/Orehoved	**1 409**	1 028	730	-	**829**	1 664	1 664	-	-	**1 664**	-	-	-	-	-	-	-	**1 245**
Ustka	**751**	584	564	-	**574**	-	-	-	-	-	-	-	-	-	-	-	-	**725**
Hochdonn	-	-	775	3 346	**972**	-	-	-	-	-	-	-	-	-	-	-	-	**972**
Degerhamn	**2 215**	3 277	3 142	-	**3 187**	-	-	3 358	-	**3 358**	-	-	-	-	-	-	-	**2 987**
Nykobing	**280**	1 747	-	2 586	**2 026**	-	-	-	-	-	-	-	2 440	-	-	-	**2 440**	**1 905**
Svetlyy	**9 719**	-	14 332	14 848	**14 435**	-	-	-	-	-	-	-	-	-	-	-	-	**11 863**
Butinge Term.	**96 687**	106 506	105 626	85 766	**99 104**	-	-	-	-	-	-	-	-	-	-	-	-	**98 862**
Eckernforde	**1 389**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1 389**
Heiligenhafen	**1 558**	2 907	1 028	-	**1 498**	-	-	-	-	-	-	-	-	-	-	-	-	**1 524**
Darlowo	**1 217**	1 506	-	-	**1 506**	-	-	-	-	-	-	-	-	-	-	-	-	**1 313**
Kappeln	**1 577**	1 115	-	-	**1 115**	-	-	-	-	-	-	-	-	-	-	-	-	**1 484**
Ueckermunde	**1 320**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1 320**
Västervik	**1 400**	-	-	-	-	-	1 050	1 115	3 543	**1 903**	-	-	-	-	-	-	-	**1 777**
Frederikssund	-	745	-	-	**745**	-	-	-	-	-	-	-	-	-	-	-	-	**745**
Lauterbach	**1 400**	-	1 967	-	**1 967**	-	-	-	-	-	-	-	-	-	-	-	-	**1 778**
Wladyslawowo	-	1 050	-	-	**1 050**	-	1 000	-	-	**1 000**	-	-	-	-	-	-	-	**1 033**
Tuborg Havn	-	2 332	-	-	**2 332**	-	-	-	-	-	-	-	-	-	-	-	-	**2 332**
Holtenau	-	-	-	-	-	-	2 800	-	-	**2 800**	-	-	-	-	-	-	-	**2 800**
Total	**3 985**	**4 382**	**8 505**	**16 980**	**8 297**	**7 469**	**4 930**	**4 807**	**6 520**	**6 049**	**20 054**	**37 134**	**22 064**	**20 932**	**4 510**	**26 961**	**54 289**	**6 744**

5.3 The traffic pattern related to ports

The table below shows ports in order of number of port calls and the next destination of the ship.

The following 8 ports dominate both in terms of traffic within the region and traffic with other regions:

Szczecin/Swinoujscie, Klaipeda, Copenhagen, Gdynia, Rostock/Warnemünde, Kaliningrad, Lübeck and Gdansk.

These 8 ports together receive 61 % of the calls in the BGW region.

Table 16: Traffic pattern related to ports (number of calls)

Number of Calls

FROM \ TO	BGW	ONE	NEU	UKE	S	FIN	OBS	SBN	RUS	S	IBE	AME	MED	ASI	BLK	AFR	S	Total
Szczecin/Swinoujscie	**796**	685	681	248	**1 614**	77	191	103	77	**448**	18	15	6	1	3		**25**	**2 901**
Klaipeda	**703**	397	742	396	**1 535**	106	169	158	79	**512**	20	20	1	1	1		**23**	**2 793**
Copenhagen	**622**	948	268	158	**1 374**	171	95	40	25	**331**	4	2	1				**3**	**2 334**
Gdynia	**696**	202	539	278	**1 019**	332	96	84	65	**577**	4	9		3	1		**13**	**2 309**
Rostock/Warnemünde	**761**	342	637	114	**1 093**	156	155	35	64	**410**	13	5					**5**	**2 282**
Kaliningrad	**540**	242	754	233	**1 229**	181	137	40	59	**417**	18	7	4	1	2	1	**15**	**2 219**
Lubeck	**337**	464	96	11	**571**	738	95	189	29	**1 051**	2	1	1				**2**	**1 963**
Gdansk	**538**	300	335	292	**927**	174	114	52	73	**413**	21	5	2			1	**8**	**1 907**
Wismar	**417**	265	92	36	**393**	83	108	133	114	**438**	2	1					**1**	**1 251**
Ventspils	**169**	81	316	327	**724**	20	82	107	20	**229**	16	24	2	3	1	1	**31**	**1 169**
Liepaja	**238**	215	210	126	**551**	82	83	125	22	**312**	13	3					**3**	**1 117**
Helsingborg	**273**	420	148	73	**641**	54	28	64	17	**163**	2	1	2	1			**4**	**1 083**
Karlshamn/Elleholm	**391**	146	105	56	**307**	6	60	33	39	**138**	2				1		**1**	**839**
Malmo	**329**	235	45	52	**332**	28	53	65	4	**150**	1	4	1				**5**	**817**
Kiel/Rendsburg	**238**	108	204	13	**325**	18	82	16	112	**228**	3						**0**	**794**
Ahus	**163**	23	125	24	**172**	11	54	32	5	**102**							**0**	**437**
Stralsund	**233**	82	54	16	**152**	9	3	11	2	**25**	5						**0**	**415**
Frederiksvaerk	**78**	178	49	31	**258**	2	9	3	2	**16**	5						**0**	**357**
Oskarshamn	**56**	24	56	52	**132**	5	49	25	46	**125**	1						**0**	**314**
Koge	**135**	103	43	7	**153**	4	4	15	1	**24**	1						**0**	**313**
Kalmar	**94**	39	63	36	**138**	7	22	28	19	**76**	1						**0**	**309**
Landskrona	**128**	58	19	5	**82**	8	12	22	4	**46**		1					**1**	**257**
Nakskov	**71**	92	34	3	**129**	10	4	4	4	**22**							**0**	**222**
Wolgast	**48**	33	93	23	**149**	11	5	1	1	**18**	3						**0**	**218**
Nykobing(Falster)	**42**	88	26	2	**116**	13	7	7		**27**	1						**0**	**186**
Naestved	**82**	76	15	3	**94**	1		1	2	**4**						1	**1**	**181**
Solvesborg	**90**	13	8	1	**22**	10	19	12		**41**							**0**	**153**
Kolobrzeg	**60**	36	21		**57**	1	6	3	3	**13**							**0**	**130**
Greifswald/Neustadt	**64**	28	21	8	**57**	3	2	1		**6**							**0**	**127**
Trelleborg	**65**	11	25	3	**39**	6	3	11	1	**21**							**0**	**125**
Fakse Ladeplads	**42**	50	18	1	**69**	2		2		**4**							**0**	**115**
Hundested	**14**	84	4	1	**89**		3	2		**5**	1						**0**	**109**
Bandholm	**50**	20	22	4	**46**	3	1	1	6	**11**							**0**	**107**
Hoganas	**29**	37	8	4	**49**	8	6	6	1	**21**							**0**	**99**
Ystad	**23**	14	12	2	**28**	2	10	7	3	**22**	3						**0**	**76**
Baltiysk	**41**	8	13		**21**	5	1		4	**10**							**0**	**72**
Stevns Pier	**5**	18	4	6	**28**	17		9		**26**							**0**	**59**
Rodbyhavn	**11**	15	17		**32**					**0**							**0**	**43**
Vierow	**12**	5	24		**29**		1			**1**							**0**	**42**
Sassnitz/Mukran	**3**	2	15	10	**27**					**0**	1						**0**	**31**
Flensburg	**19**	3	6		**9**					**0**							**0**	**28**
Bergkvara	**4**	2			**2**		3	1	10	**14**							**0**	**20**
Simrishamn	**13**	4			**4**		1	1	1	**3**							**0**	**20**
Stubbekobing	**8**	3	7		**10**	1			1	**2**							**0**	**20**
Karlskrona	**13**	2	1		**3**				2	**2**	1						**0**	**19**
Masnedo/Orehoved	**5**	2	4		**6**	1	3			**4**							**0**	**15**
Ustka	**12**	1	1		**2**					**0**							**0**	**14**
Hochdonn			12	1	**13**					**0**							**0**	**13**
Degerhamn	**3**	2	4		**6**			3		**3**							**0**	**12**
Nykobing	**1**	6		3	**9**					**0**			1				**1**	**11**
Svetlyy	**6**		4	1	**5**					**0**							**0**	**11**
Butinge Term.	**1**	1	5	3	**9**					**0**							**0**	**10**
Eckernforde	**8**				**0**					**0**							**0**	**8**
Heiligenhafen	**3**	1	3		**4**					**0**							**0**	**7**
Darlowo	**4**	2			**2**					**0**							**0**	**6**
Kappeln	**4**	1			**1**					**0**							**0**	**5**
Ueckermunde	**5**				**0**					**0**							**0**	**5**
Västervik	**1**				**0**		1	1	1	**3**							**0**	**4**
Frederikssund		3			**3**					**0**							**0**	**3**
Lauterbach	**1**		2		**2**					**0**							**0**	**3**
Wladyslawowo		2			**2**		1			**1**							**0**	**3**
Tuborg Havn		2			**2**					**0**							**0**	**2**
Holtenau					**0**		1			**1**							**0**	**1**
Total	**8 798**	**6 224**	**6 010**	**2 663**	**14 897**	**2 366**	**1 779**	**1 453**	**918**	**6 516**	**162**	**98**	**21**	**10**	**9**	**4**	**142**	**30 515**

The main part of the traffic from these ports is bound for North Western Europe. For all ports except Lübeck between 40 and 60 % of the traffic is bound for this region. Szczecin/Swinoujscie is the most important port for traffic with North Western Europe.

From Lübeck the traffic is more frequently bound for the Baltic Sea. In the group next in size 7 ports are found: *Wismar*, *Ventspils*, *Liepaja*, *Helsingborg*, *Karlshamn*, *Malmö and Kiel/Rendsburg*. These ports account for 23 % of total traffic. Ventspils and Klaipeda play the most

important roles in trans-ocean traffic. Thus the 15 largest ports account for 84 % of the calls made in the BGW region.

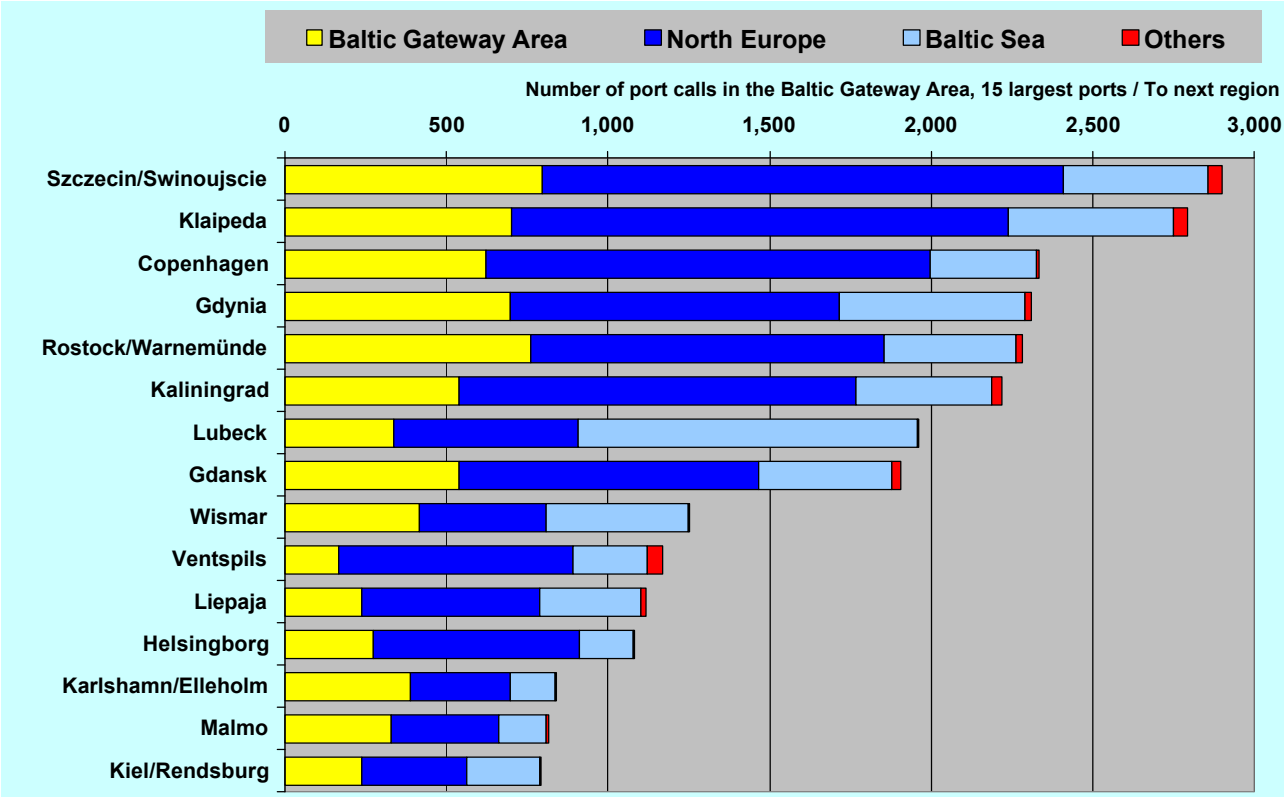


Figure 25: Geographic traffic pattern in "Top 15" ports (number of calls)

The largest number of the port calls is found in Poland, Szczecin-/Swinoujscie and Klaipeda, while the biggest ships call Ventspils.

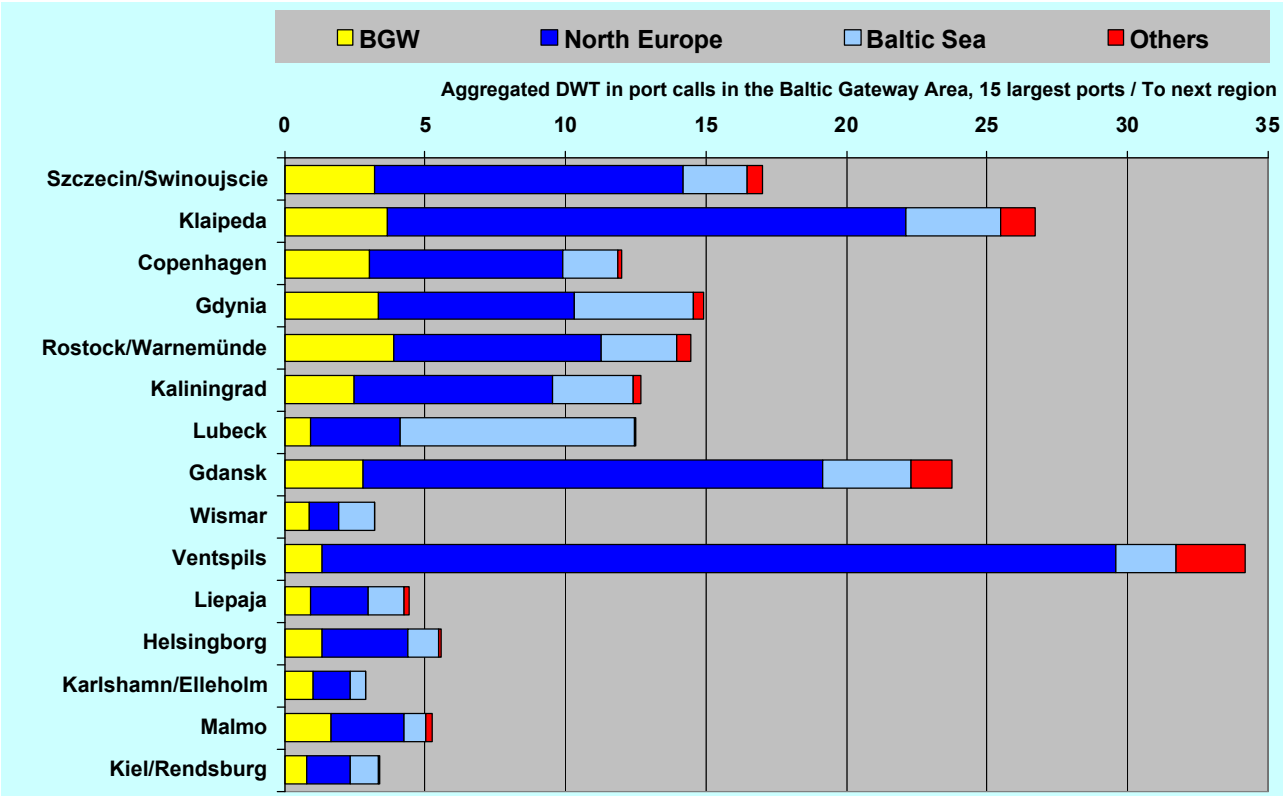


Figure 26: Geographic traffic pattern in "Top 15" ports (total DWT)

Table 17: Traffic pattern related to ports (deadweight tonnes)

	Total Deadweight																	
FROM \ TO	**BGW**	**ONE**	**NEU**	**UKE**	**S**	**FIN**	**OBS**	**SBN**	**RUS**	**S**	**IBE**	**AME**	**MED**	**ASI**	**BLK**	**AFR**	**S**	**Total**
Szczecin/Swinoujscie	**3 216 415**	2 087 691	5 827 425	3 053 456	**10 968 572**	617 991	751 180	447 919	461 246	**2 278 336**	135 537	323 302	83 497	3 153	16 786		**562 275**	**17 025 598**
Klaipeda	**3 647 844**	2 781 764	8 465 348	7 197 751	**18 444 863**	415 554	1 411 677	765 152	777 418	**3 369 801**	383 620	865 163	4 665	14 026	4 849		**1 272 323**	**26 734 831**
Copenhagen	**3 037 325**	4 236 949	1 840 192	807 463	**6 884 604**	1 203 418	501 489	142 475	102 431	**1 949 813**	13 817	16 795	111 587				**142 199**	**12 013 941**
Gdynia	**3 362 948**	990 902	3 504 677	2 441 513	**6 937 092**	2 689 818	485 671	491 253	572 410	**4 239 152**	138 072	119 417		99 462	7 480		**364 431**	**14 903 623**
Rostock/Warnemünde	**3 905 796**	1 987 311	2 831 670	2 533 565	**7 352 546**	1 098 972	1 120 923	106 093	378 095	**2 704 083**	218 115	292 133					**510 248**	**14 472 673**
Kaliningrad	**2 465 066**	925 939	4 291 576	1 877 114	**7 094 629**	1 789 770	572 227	194 048	306 652	**2 862 697**	142 397	94 668	14 083	7 106	5 374	18 955	**282 583**	**12 704 975**
Lubeck	**912 466**	2 798 262	350 111	66 565	**3 214 938**	6 320 991	408 685	1 510 898	101 612	**8 342 186**	11 674	1 196	7 460				**20 330**	**12 489 920**
Gdansk	**2 785 069**	2 235 219	6 630 346	7 497 047	**16 362 612**	1 367 601	444 661	518 980	841 816	**3 173 058**	1 156 393	174 638	97 416			22 218	**1 450 665**	**23 771 404**
Wismar	**896 063**	575 557	350 131	121 970	**1 047 658**	307 467	327 588	269 928	370 518	**1 275 501**	6 839	4 866					**11 705**	**3 230 927**
Ventspils	**1 322 510**	1 917 579	10 808 731	15 556 287	**28 282 597**	524 386	715 286	455 725	447 586	**2 142 983**	740 843	1 465 148	94 325	81 778	3 210	65 449	**2 450 753**	**34 198 843**
Liepaja	**953 859**	481 895	923 030	631 080	**2 036 005**	320 631	274 485	378 441	303 651	**1 277 208**	113 860	45 100					**158 960**	**4 426 032**
Helsingborg	**1 354 927**	1 722 152	826 770	503 628	**3 052 550**	255 857	138 552	577 192	90 471	**1 062 072**	17 766	33 640	39 495	3 794			**94 695**	**5 564 244**
Karlshamn/Elleholm	**1 030 314**	555 834	368 550	383 303	**1 307 687**	28 245	213 804	67 240	232 041	**541 330**	5 323				2 893		**8 216**	**2 887 547**
Malmo	**1 678 373**	963 618	230 439	1 380 790	**2 574 847**	94 063	353 094	299 207	43 291	**789 655**	34 291	192 633	8 379				**235 303**	**5 278 178**
Kiel/Rendsburg	**796 785**	442 095	1 075 463	41 683	**1 559 241**	92 520	381 711	54 700	486 408	**1 015 339**	34 435						**34 435**	**3 405 800**
Ahus	**378 343**	48 473	521 096	87 356	**656 925**	42 402	160 548	63 160	14 337	**280 447**							**0**	**1 315 715**
Stralsund	**498 361**	229 630	129 759	68 026	**427 415**	31 059	6 891	22 331	4 973	**65 254**	28 555						**28 555**	**1 019 585**
Frederiksvaerk	**115 758**	205 730	57 710	48 916	**312 356**	6 174	13 671	4 458	6 160	**30 463**	13 615						**13 615**	**472 192**
Oskarshamn	**223 740**	134 516	244 188	246 708	**625 412**	26 448	173 836	314 079	180 889	**695 252**	4 156						**4 156**	**1 548 560**
Koge	**233 754**	197 802	78 281	19 384	**295 467**	10 718	9 107	40 293	2 300	**62 418**	3 035						**3 035**	**594 674**
Kalmar	**167 015**	187 507	135 159	94 412	**417 078**	42 233	65 029	61 211	124 114	**292 587**	3 280						**3 280**	**879 960**
Landskrona	**283 564**	162 267	39 307	15 333	**216 907**	41 161	29 518	61 343	9 430	**141 452**		10 452					**10 452**	**652 375**
Nakskov	**117 775**	198 254	50 363	7 748	**256 365**	29 657	9 785	10 123	16 149	**65 714**							**0**	**439 854**
Wolgast	**87 957**	50 405	209 073	79 091	**338 569**	34 486	12 655	2 753	1 630	**51 524**	11 371						**11 371**	**489 421**
Nykobing(Falster)	**73 951**	184 627	42 016	6 060	**232 703**	26 816	11 581	7 936		**46 333**	3 100						**3 100**	**356 087**
Naestved	**134 532**	121 925	25 396	4 770	**152 091**	3 030		3 204	4 997	**11 231**						1 220	**1 220**	**299 074**
Solvesborg	**175 166**	24 683	28 696	2 201	**55 580**	32 633	63 431	28 120		**124 184**							**0**	**354 930**
Kolobrzeg	**71 576**	35 943	28 359		**64 302**	1 570	8 520	3 897	2 965	**16 952**							**0**	**152 830**
Greifswald/Neustadt	**73 555**	56 165	41 923	22 127	**120 215**	9 603	7 700	3 038		**20 341**							**0**	**214 111**
Trelleborg	**233 059**	41 405	61 837	6 634	**109 876**	34 190	4 498	16 939	4 137	**59 764**							**0**	**402 699**
Fakse Ladeplads	**52 981**	61 533	20 438	1 500	**83 471**	2 743		2 259		**5 002**							**0**	**141 454**
Hundested	**35 157**	135 199	4 631	1 170	**141 000**		7 860	2 342		**10 202**	1 006						**1 006**	**187 365**
Bandholm	**69 058**	25 885	35 130	10 999	**72 014**	6 804	3 340	2 300	18 628	**31 072**							**0**	**172 144**
Hoganas	**123 350**	162 102	30 962	14 855	**207 919**	45 501	34 172	13 030	6 385	**99 088**							**0**	**430 357**
Ystad	**47 955**	29 302	21 030	4 939	**55 271**	2 768	21 222	10 892	7 973	**42 855**	11 328						**11 328**	**157 409**
Baltiysk	**128 384**	29 991	215 715		**245 706**	43 157	3 325		12 248	**58 730**							**0**	**432 820**
Stevns Pier	**10 851**	30 467	5 693	19 767	**55 927**	67 053		13 403		**80 456**							**0**	**147 234**
Rodbyhavn	**14 353**	35 559	14 693		**50 252**					**0**							**0**	**64 605**
Vierow	**20 439**	6 381	44 311		**50 692**		2 907			**2 907**							**0**	**74 038**
Sassnitz/Mukran	**5 045**	5 891	65 522	80 252	**151 665**					**0**	12 359						**12 359**	**169 069**
Flensburg	**27 809**	6 340	6 750		**13 090**					**0**							**0**	**40 899**
Bergkvara	**15 490**	9 050			**9 050**		9 487	5 845	39 699	**55 031**							**0**	**79 571**
Simrishamn	**10 645**	7 338			**7 338**		635	1 042	4 137	**5 814**							**0**	**23 797**
Stubbekobing	**7 848**	1 939	10 008		**11 947**	3 030			3 149	**6 179**							**0**	**25 974**
Karlskrona	**44 160**	4 444	2 560		**7 004**				2 319	**2 319**	4 031						**4 031**	**57 514**
Masnedo/Orehoved	**7 047**	2 055	2 920		**4 975**	1 664	4 992			**6 656**							**0**	**18 678**
Ustka	**9 008**	584	564		**1 148**					**0**							**0**	**10 156**
Hochdonn			9 294	3 346	**12 640**					**0**							**0**	**12 640**
Degerhamn	**6 646**	6 554	12 566		**19 120**			10 075		**10 075**							**0**	**35 841**
Nykobing	**280**	10 481		7 757	**18 238**					**0**			2 440				**2 440**	**20 958**
Svetlyy	**58 314**		57 328	14 848	**72 176**					**0**							**0**	**130 490**
Butinge Term.	**96 687**	106 506	528 130	211 897	**846 533**					**0**							**0**	**943 220**
Eckernforde	**11 109**				**0**					**0**							**0**	**11 109**
Heiligenhafen	**4 673**	2 907	3 085		**5 992**					**0**							**0**	**10 665**
Darlowo	**4 868**	3 011			**3 011**					**0**							**0**	**7 879**
Kappeln	**6 307**	1 115			**1 115**					**0**							**0**	**7 422**
Ueckermunde	**6 601**				**0**					**0**							**0**	**6 601**
Västervik	**1 400**				**0**		1 050	1 115	3 543	**5 708**							**0**	**7 108**
Frederikssund		2 235			**2 235**					**0**							**0**	**2 235**
Lauterbach	**1 400**		3 933		**3 933**					**0**							**0**	**5 333**
Wladyslawowo		2 100			**2 100**		1 000			**1 000**							**0**	**3 100**
Tuborg Havn		4 664			**4 664**					**0**							**0**	**4 664**
Holtenau					**0**		2 800			**2 800**							**0**	**2 800**
Lithuania				45 400	**45 400**					**0**							**0**	**45 400**
Total	**35 061 731**	**27 275 732**	**51 112 885**	**45 218 711**	**123 607 328**	**17 672 184**	**8 770 593**	**6 984 439**	**5 985 808**	**39 413 024**	**3 248 818**	**3 639 151**	**463 347**	**209 319**	**40 592**	**107 842**	**7 709 069**	**205 791 152**

5.4 The traffic pattern by ship type and ports

The character of the ports varies with regard to type of ships. In this chapter the traffic pattern for the different types of ships operating in the BGW region is presented. Only the traffic to/from the 15 largest ports is described.

Table 18: Traffic to/from the 15 largest ports by type of vessel and No of calls, total traffic

All Traffic

Port	**01 Oil Tanker**	**02 Chemical Tanker**	**04 LPG**	**05 Bulker**	**06 Combination**	**07 Container**	**08 Reefer**	**09 Dry cargo**	**10 Vehicle Ro-Ro**	**11 Ro-Ro**	**Total**
Szczecin/Swinoujscie	125	133	7	261	3	10	75	2 149	3	116	**2 882**
Klaipeda	235	180	3	217	14	36	191	1 770		153	**2 799**
Copenhagen	166	180	2	103	10	194	103	1 060	65	452	**2 335**
Gdynia	90	165	24	121		160	57	1 236	99	354	**2 306**
Rostock/Warnemünde	184	161	39	353	5	6		1 329		198	**2 275**
Kaliningrad	155	505		139	12	4	93	1 230		76	**2 214**
Lubeck	97	1		25		1		642		1 197	**1 963**
Gdansk	156	229	95	191	5	94	62	974	48	51	**1 905**
Wismar	27	17		11		1		1 189		5	**1 250**
Ventspils	266	267	48	170	60	2	2	348			**1 163**
Liepaja	79	51	1	47	1	4	19	913		3	**1 118**
Helsingborg	130	107	1	25		82	14	602		121	**1 082**
Karlshamn/Elleholm	31	33	13	25				738		1	**841**
Malmo	158	123	10	40	3	72	2	345	54	11	**818**
Kiel/Rendsburg	39	16		16		51	2	334	2	334	**794**
Total	**1 938**	**2 168**	**243**	**1 744**	**113**	**717**	**620**	**14 859**	**271**	**3 072**	**25 745**

The ports' character depends also on the type of sea transport service demanded, whether it is regional[7] and/or to other regions.

As the service is built up in shipping lines cargo/products of the same character and type are normally attracting each other. The old device that cargo attracts cargo is a fact. If a port is built for a special type of product/service it is natural that the port will grow in this service sector(s). The port can in a competition with other ports supply a more cost efficient service as it has better utilisation on the equipment and better knowledge of how to handle the products. In this way you find Ro-ro terminals, container terminals, LPG terminals etc.

Within the intra-regional BGW traffic the share of Ro-ro, container and dry cargo traffic is larger. The Ro-ro service is a typical ferry operation calling a few ports in a regular service in a typical intra-regional service.

The container traffic can appear as an intra-regional service but the flow of containers is not intra-regional it is very much inter-regional as the container ship is a feeder vessel that transport the containers between the container hubs and a number of ports in the Baltic.

Table 19: Traffic to/from the 15 largest ports by type and No of calls, Intra-regional

Intra-Regional

Hamn	01 Oil Tanker	02 Chemical Tanker	04 LPG	05 Bulker	06 Combination	07 Container	08 Reefer	09 Dry cargo	10 Vehicle Ro-Ro	11 Ro-Ro	Total
Szczecin/Swinoujscie	24	37	2	37	2	1	30	591		69	**793**
Klaipeda	25	22		31	1	8	43	508		63	**701**
Copenhagen	32	46		17	4	60	23	308	4	127	**621**
Gdynia	50	71		21		12	9	403	4	123	**693**
Rostock/Warnemünde	67	25	10	84	3	1		502		68	**760**
Kaliningrad	38	129		18	3		15	299		37	**539**
Lubeck	64			6		1		232		33	**336**
Gdansk	22	100	3	19	2	19	6	331	4	31	**537**
Wismar	10	2		5		1		397		1	**416**
Ventspils	50	40	7	6	1			65			**169**
Liepaja	29	13	1	10			3	181		1	**238**
Helsingborg	14	14		4		44	2	180		13	**271**
Karlshamn/Elleholm	5	4	1	6				374		1	**391**
Malmo	50	28	1	7		66	1	170	3	3	**329**
Kiel/Rendsburg	14	1		2			1	152		68	**238**
Total	**494**	**532**	**25**	**273**	**16**	**213**	**133**	**4 693**	**15**	**638**	**7 032**

E.g. Szczecin/Swinoujscie is not only the largest port in terms of the number of calls. It is also the largest port in intra-regional traffic, above all dry cargo traffic. The reason is that the port is a very diversified port where we find both ferry services (a lot of calls) and bulk in both dry and liquid (a lot of tons). The same goes in a way for Klaipeda where the lower ferry activity gives fewer intra-regional calls but more inter-regional calls than Szczecin/Swinoujscie.

Specialisation in Ro-ro traffic makes the Lübeck terminals an important and dominating actor in intra-regional traffic and especially in the intra – Baltic traffic.

The shares of Copenhagen and Helsingborg in inter-regional traffic are above average due to larger shares of container traffic.

[7] In this respect the BGW area is considered as an intra-regional area.

Transport of crude and oil products

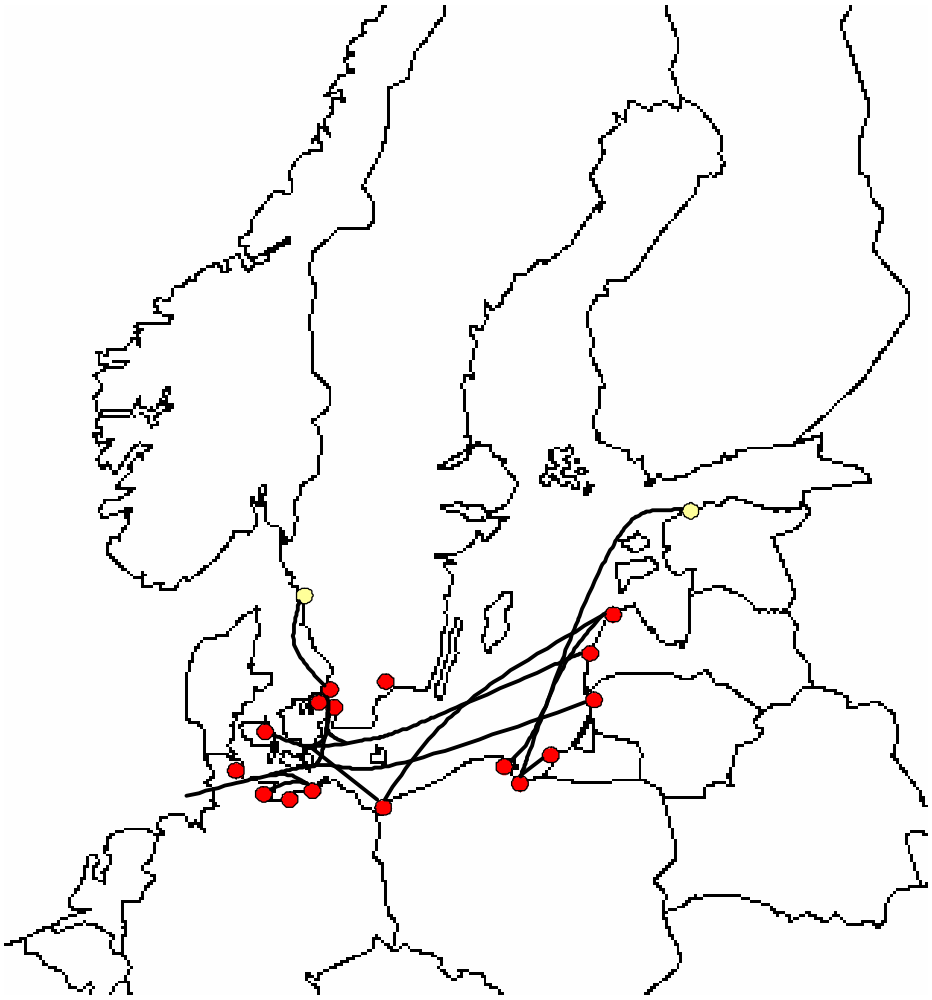


Figure 27: Trades in the region in oil tankers

The above Figure 27 describes the regular oil trades between ports in the region in 2002. All trades involving at least 12 interrelated port calls between two ports are defined as a “regular trade”.

The traffic pattern is characterised by the fact that a large share of crude oil and oil products go from the eastern to the western parts of the BGW region and further on to other regions.

Transportation within the BGW region by large oil tankers (>60,000 DWT) is negligible, while traffic by smaller oil tankers (<60,000 DWT) and chemical tankers is substantial.

Although the Baltic States are not important energy consumers or producers, together they have a key transit location for Russian oil exports. The Russian crude oil pipeline system is connected to three ports on the Baltic Sea: Latvia's port of Ventspils (completed in 1961); Lithuania's port of Butinge (completed in 1999); and the Russian port of Primorsk (completed in 2002). These three ports transited about 25M tons of crude oil in 2002, or 10 % of Russia's net exports.

In the Baltic Gateway region the two large crude terminals thus are Ventspils and Butinge. There is however also a pipeline to Gdansk

having smaller capacity. Smaller quantities of crude oil are also distributed to other Baltic ports via rail together with significant quantities of petroleum products.

With the completion and upgrades at Butinge and Primorsk, export capacity in the Baltic region has nearly doubled since 1999. Because virtually all of the oil exported through these ports comes from the Russian pipeline system, the competition has been fierce, and the distribution of market share has changed dramatically in recent years. As a result, Latvia and Lithuania have been compelled to compete with Russia's own export route at Primorsk.

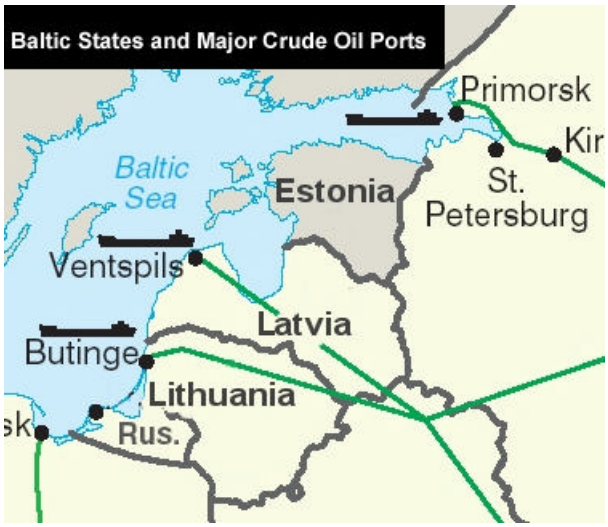


Figure 28: Pipeline ports in the Baltic

The crude oil export from Russia over the Baltic Sea was 21 M tons 2003 and is estimated to reach 172 M tons in 2006 when the new port structures and the pipelines in Russia have been built. The question is if that results in a reduced transiting over the Baltic States or not.

Before the recent expansion of export capacity in the Baltic region led by the construction of Russia's Primorsk facility Ventspils was the largest port in the Baltic and the second largest oil export terminal for Russian crude after the Black Sea port of Novorossiysk. In late 2002, the Russian pipeline monopoly, Transneft, stopped deliveries of crude oil to Ventspils following the completion of its own port of Primorsk. Having been left starved for oil, authorities at Ventspils undertook an effort to increase shipments of crude oil and petroleum products delivered by rail. Over the course of 2003, this effort has reportedly served to mitigate some of the losses owing to the absence of Russian crude oil, and in 2003 the port exported roughly 10.7M Tons, compared to about 14-15M tons in the pre-embargo times. Ventspils has, however, lost significant market share, and has exposed its balance sheet to greater risk as petroleum products and rail-borne crude oil are more expensive than crude delivered via pipeline and carry slimmer profit margins.

Table 20: Transports capacity of Crude Oil tankers in DWT 2002

Hamn	NEU	UKE	ONE	BGW	OBS	FIN	AME	RUS	IBE	Total
Ventspils	4,754,448	3,771,268	881,216	197,317		410,509	61,341	96,136		10,245,061
Klaipeda	2,490,379	2,046,767	484,032	211,850	328,358		309,022			5,870,408
Gdansk	1,955,309	1,618,546	765,838			182,526		154,970	270,633	4,947,822
Rostock/Warnemünde	697,956	287,813	107,261			91,263	209,312			1,393,605
Butinge Term.	528,130	211,897	106,506	96,687						943,220
Total	**10,426,222**	**7,936,291**	**2,344,853**	**505,854**	**328,358**	**684,298**	**579,675**	**251,106**	**270,633**	**23,400,116**

The future of Ventspils is still uncertain. The two primary owners are the Latvian government and a private concern, Latvijas Naftas Tranzits. Several firms from around the world have expressed interest in acquiring a stake in the port's management, including Russia's Transneft and Rosneft, the Russian-UK joint venture TNK-BP, Kazakhstan's Kaztransoil, and the U.S. investment company BroadStreet Group. The ability of the Ventspils shareholders to secure a reasonable selling price and award a tender will be largely determined by the future of Russian pipeline deliveries to the port.

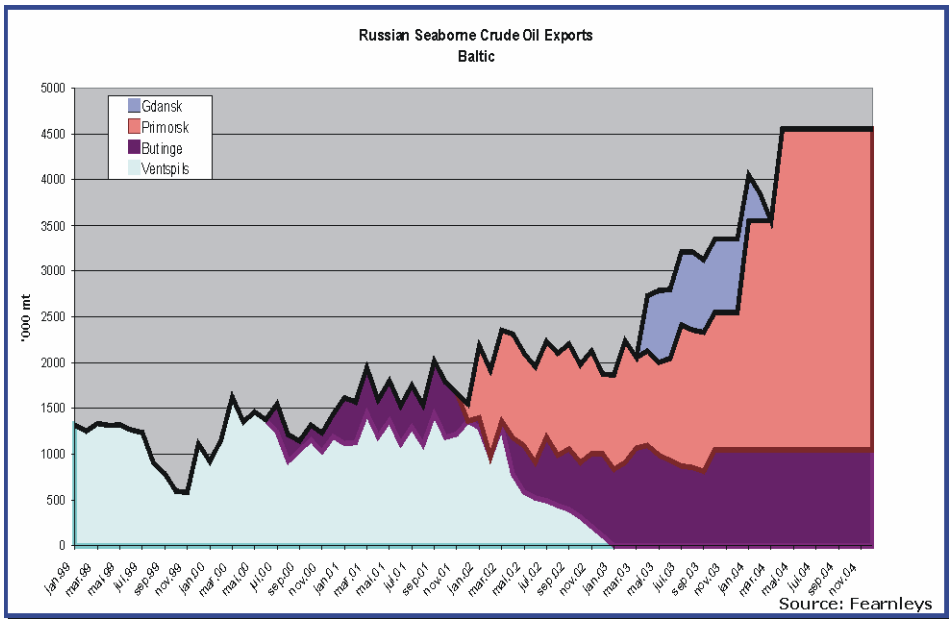


Figure 29: Crude oil from the Baltic

Although considerably smaller in terms of capacity (around 1/5), Lithuania's port of Butinge exported slightly more oil in 2003 than the port of Ventspils. This is because Butinge has enjoyed considerably better relations with its Russian suppliers than has Ventspils since 2002 when Russian oil major Yukos became the port's largest shareholder. In 2003, Butinge underwent significant expansion and exported about 11.5M tons of crude oil. Port authorities plan to increase throughput to 13M tons next year while also increasing storage capacity, thereby ensuring a stable supply of crude oil during inclement weather.

Table 21: Transport in DWT of oil products – from the area in tons

FROM \ TO	NEU	UKE	ONE	FIN	OBS	SBN	Total
Ventspils	3,606,981	3,883,464	367,307	74,870	394,645	17,080	8,851,467
Klaipeda	3,302,544	2,300,398	419,928	14,796	303,709	156,516	6,807,277
Kaliningrad	1,954,187	271,291	451,458	1,697,392	229,518	49,804	4,662,217
Gdansk	844,807	230,767	505,809	75,788	104,757	253,043	2,062,809
Copenhagen	356,559	205,754	835,472	75,681	306,293	15,948	1,795,707
Rostock/Warnemünde	477,424	128,173	449,733	122,198	469,753	10,628	1,695,233
Gdynia	264,422	108,491	108,375	25,306	94,870	17,519	732,285
Liepaja	137,339	12,000	77,069	102,122	18,306	0	346,836
Baltiysk	128,850	0	29,991	36,882	3,325	0	202,201
TOTAL	11,073,113	7,140,338	3,245,142	2,225,035	1,925,176	520,538	27,156,032

Kaliningrad together with Gdansk plays an important role in intra-regional transportation of chemicals and Rostock/Warnemünde and Lübeck are large discharging ports for oil.

The transportation of oil from the BGW region is primarily from Ventspils and Klaipeda to the Continent and UK, and from Liepaja to Malmö where the oil is transferred to larger vessels.

From Kaliningrad there are also substantial oil quantities for the Continent and Finland.

Kaliningrad is by far the largest port of departure for oil products to other ports within the BGW region, but almost all is destined for nearby Gdansk.

Oil products to the BGW region come mainly from the Continent via the Kiel Canal to Rostock/Warnemünde and Lübeck but also from Estonia (Muuga) and Sweden (Göteborg).

Table 22: Transport in DWT of oil products – to the area

TO \ FROM	ONE	NEU	UKE	OBS	SBN	FIN	RUS	IBE	AME	AFR	Total
Copenhagen	332,134	242,717	667,623	153,985	10,517	11,538	0	45,692	45,692	0	**1,509,898**
Lubeck	301,993	329,517	525,684	173,595	30,675	0	0	55,289	64,035	0	**1,480,788**
Helsingborg	449,180	208,270	26,548	30,835	53,949	74,871	49,846	0	0	0	**893,499**
Gdynia	131,507	226,760	65,462	108,663	33,593	67,223	11,199	0	44,803	0	**689,210**
Szczecin/Swinoujscie	267,422	230,696	25,377	80,094	59,701	6,679	0	0	0	0	**669,969**
Malmo	252,665	151,088	75,993	83,618	45,680	13,498	16,755	0	0	0	**639,297**
Hundested	171,110	10,328	102,474	1,163	23,050	0	33,216	46,700	0	0	**388,041**
Karlshamn/Elleholm	236,538	84,755	5,400	6,151	16,376	608	17,617	0	0	0	**367,445**
Hoganas	98,440	46,443	11,995	0	0	76,998	0	0	0	0	**233,876**
Oskarshamn	101,982	0	0	76,322	25,401	0	6,600	0	0	0	**210,305**
Koge	83,351	71,110	0	0	6,620	38,500	0	0	0	5,500	**205,081**
Wismar	97,239	24,104	0	0	6,639	33,294	0	0	0	0	**161,276**
Kalmar	83,833	6,464	0	0	0	11,620	32,965	0	0	0	**134,882**
Nykobing(Falster)	134,618	0	0	0	0	0	0	0	0	0	**134,618**
Trelleborg	2,437	65,932	6,783	0	0	20,062	0	0	0	0	**95,214**
Kiel/Rendsburg	38,642	9,024	3,659	0	11,538	0	0	8,150	0	0	**71,013**
Landskrona	37,316	30,687	0	0	0	0	0	0	0	0	**68,003**
Karlskrona	21,103	3,659	0	0	29,994	0	0	0	0	0	**54,756**
Nakskov	19,731	2,009	4,018	2,009	3,659	0	0	0	0	0	**31,426**
Greifswald/Neustadt	27,993	0	0	0	0	0	0	0	0	0	**27,993**
Rodbyhavn	26,950	0	0	0	0	0	0	0	0	0	**26,950**
Stralsund	0	11,524	0	0	0	0	0	0	0	0	**11,524**
Nykobing	10,886	0	0	0	0	0	0	0	0	0	**10,886**
TOTAL	2,927,070	1,755,087	1,521,016	717,435	357,392	354,891	168,198	155,831	154,530	5,500	7,883,074

The largest oil transporters in the region are Swedish and Danish operators. Russian, Polish, Norwegian and German operators are much less frequent.

The inter-regional chemical trades are heavily weighed towards continental Europe and Finland, while the Kaliningrad, Gdynia and Gdansk dominate in the intra-regional trade.

Figure 30: Trades in the region in chemical tankers

Within the region oil products that are carried by both oil and chemical carriers are the most featured liquid cargo. There are exceptions though, one being crude oil from Ventspils to the refinery in Klaipeda (Butinge). Altogether the two fleets made 1,131 calls and they was carrying cargo in about 500 of these, giving transport of about 3.6M tons.

Table 23 show the extensive network of oil product transports.

Table 23: Oil/Product tanker transports in DWT within the BGW area

TO \ FROM	Ventspils	Klaipeda	Liepaja	Kaliningrad	Gdynia	Rostock/ Warnemünde	Gdansk	Baltiysk	Svetlyy	Total
Gdansk	29 110	13 924	14 851	588 591	27 421	29 305				**703 202**
Ventspils		229 783	8 091	5 741	114 684	41 689	60 571			**460 559**
Copenhagen	9 394	178 306	5 085	48 508	8 761	7 030	132 484	6 474		**396 042**
Gdynia	157 097			86 407			71 004	51 259		**365 767**
Klaipeda	231 320		3 085	28 231	18 603	18 696	40 401			**340 336**
Kaliningrad		22 156	28 822		115 008	51 174	3 000	31 795	52 064	**304 019**
Malmo	16 956	29 690	189 949	3 794	3 046		5 781			**249 216**
Rostock	39 030	30 443	10 506	83 363	13 619		51 448			**228 409**
Baltiysk				149 208	35 011	10 628	3 460			**198 307**
Szczecin	53 280		1 295	19 209	18 582	7 970		13 673		**114 009**
Liepaja	4 300			21 880	7 030	8 377	14 355			**55 942**
Lubeck						41 441				**41 441**
Svetlyy				14 796		14 848				**29 644**
Swinoujscie	3 153			8 020		3 325	7 665	2 000		**24 163**
Kiel						14 290				**14 290**
Kalmar				1 061	5 122		4 000			**10 183**
Karlshamn	9 927									**9 927**
Helsingborg							6 592			**6 592**
Wismar						5 272				**5 272**
Ystad		1 316		3 296						**4 612**
Karlskrona				3 889						**3 889**
Hundested		3 296								**3 296**
Stralsund						655				**655**
TOTAL	**553 567**	**508 914**	**261 684**	**1 065 994**	**366 887**	**254 700**	**400 761**	**105 201**	**52 064**	**3 569 772**

LPG trades

LPG transports are very scarce in the region. The most frequented port exporting the LPG is Gdansk.

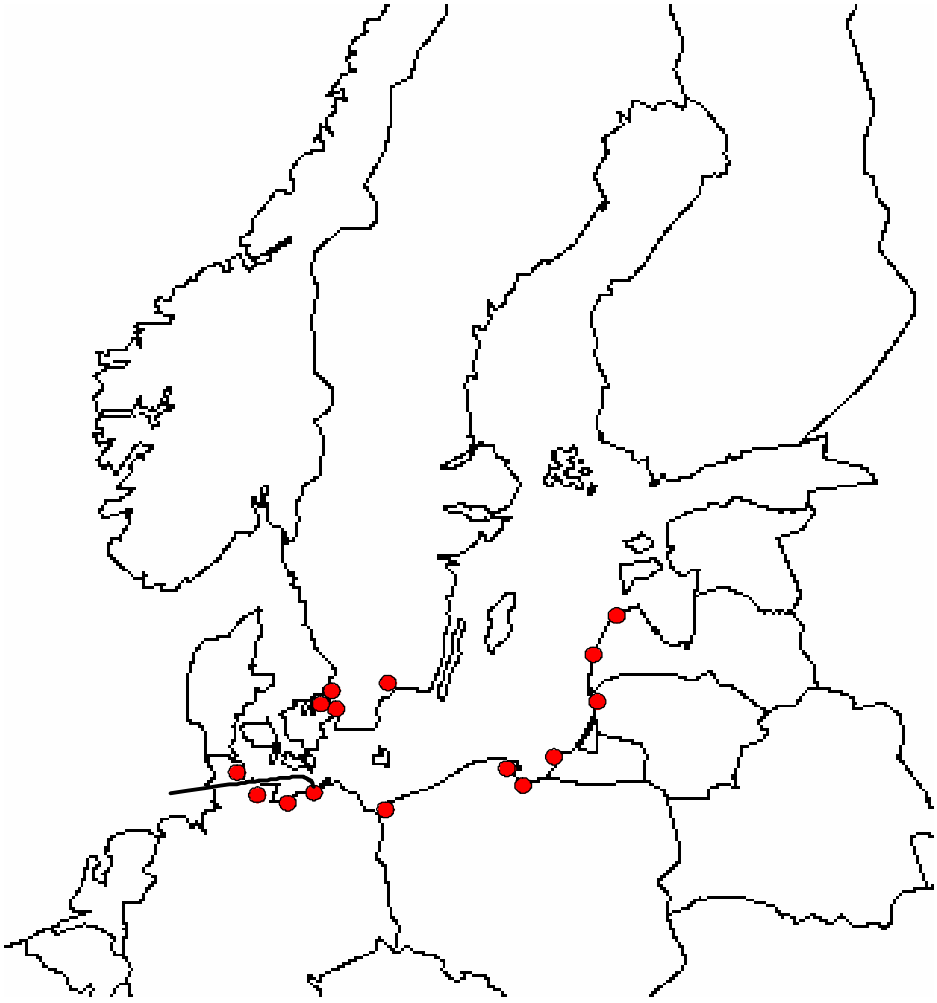


Figure 31: Main regional LPG ports

Transports to the North West Europe dominate the LPG transports. In addition this some traffic finds its way within the BGW region. See Table 24.

Table 24: Number of LPG shipments from the region

FROM \ TO	ONE	NEU	UKE	SBN	BGW	FIN	Total
Gdansk	54	13	20		3	3	94
Ventspils	5	6	3	25	7	2	48
Rostock/Warnemünde		27		2	10		39
Gdynia	20		4			1	25
Karlshamn/Elleholm	3	2	4		1	2	12
Malmo	8	1			1		10
Szczecin/Swinoujscie	2	1	1	1	2		7
TOTAL	**95**	**50**	**34**	**28**	**25**	**8**	**242**

Bulker trades

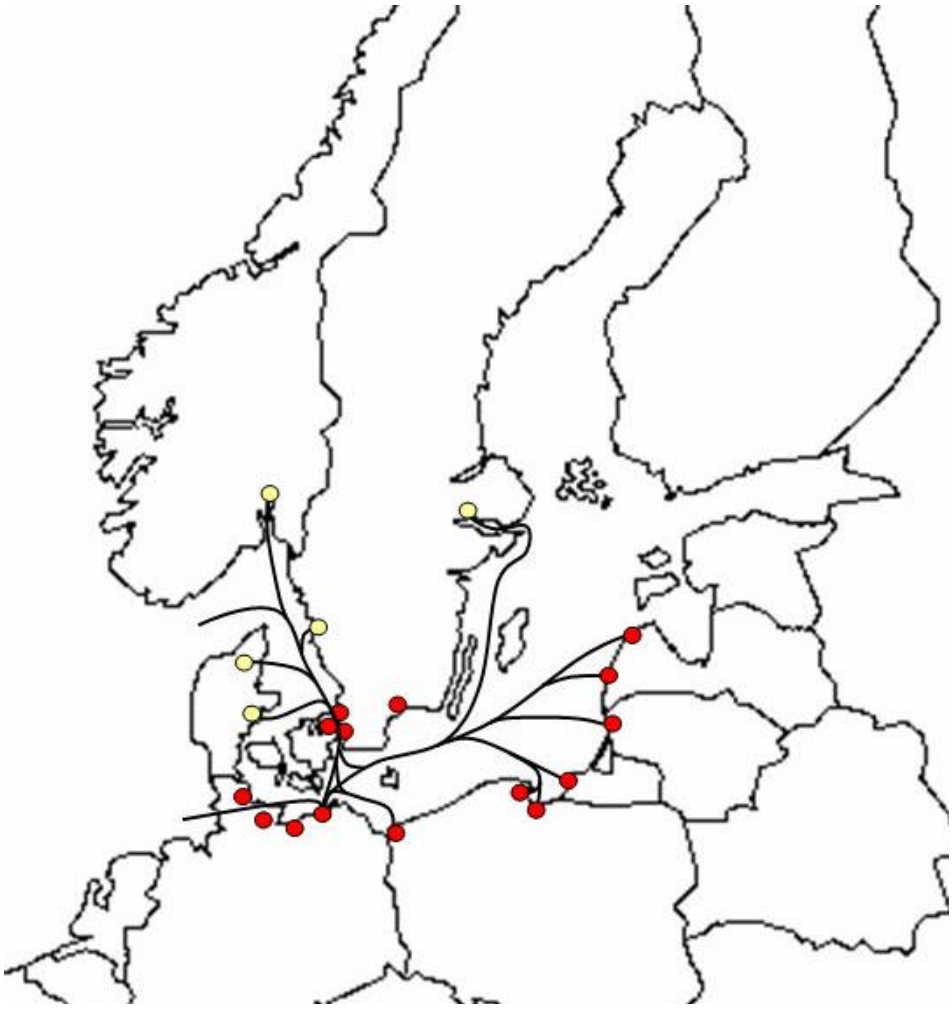


Figure 32: Main regional bulk trades

There is no obvious pattern within the BGW region when dry bulk transportation is concerned. On the other hand, the trade pattern is clearer on other regions. One of the main commodities is coal to the energy plants and the steel industry from the Baltic States and Poland to the Continent, Denmark and Sweden.

The bulk shipping is one of the major commodities transported it the

Table 25: Transport capacity in DWT Bulk Ships from the BGW area

FROM \ TO	UKE	NEU	ONE	AME	IBE	RUS	FIN	OBS	SBN	Total
Ventspils	7,686,336	2,125,010	505,108	1,358,962	600,984	59,782	0	166,783	0	**12,568,414**
Gdansk	4,664,185	2,455,063	322,487	132,741	836,857	163,349	213,137	108,856	132,657	**9,126,748**
Szczecin/Swinoujscie	2,184,220	3,513,033	541,398	200,544	73,702	182,617	340,230	118,092	70,294	**7,270,630**
Klaipeda	1,748,982	454,229	575,708	396,959	208,896	313,101	99,043	292,727	60,213	**4,149,858**
Rostock/Warnemünde	1,587,028	471,119	708,679	27,652	175,639	170,803	21,323	229,934	29,304	**3,421,481**
Gdynia	986,884	340,463	103,976	0	122,292	118,873	584,235	181,260	102,310	**2,594,952**
Kaliningrad	910,131	539,864	7,743	66,968	73,812	0	0	35,871	0	**1,653,344**
Liepaja	216,894	226,096	8,996	28,460	59,462	199,819	0	24,523	4,378	**768,628**
TOTAL	**19,984,660**	**10,124,877**	**2,774,095**	**2,212,286**	**2,151,644**	**1,208,344**	**1,257,968**	**1,158,046**	**399,156**	**41,554,055**

The most frequented port without comparison is Ventspils for exporting dry bulk cargoes. The Polish ports come in following numbers in size.

An estimate of the bulk shipped to the ports in the area is made and presented in Table 26. The figures are identified by determine if the port is a typical export or import port.

Table 26: Transport capacity in DWT Bulk Ships to the BGW area

TO \ FROM	ONE	UKE	NEU	SBN	RUS	AME	OBS	IBE	Total
Copenhagen	491,429	11,942	52,934		131,005			23,796	**711,106**
Malmo	269,749	167,559		69,545		46,436			**553,289**
Helsingborg	142,645	38,660	84,000	112,948		70,047	64,040		**512,340**
Kiel/Rendsburg	16,073	131,004	168,378					19,590	**335,045**
Lubeck	104,642	39,675	19,084						**163,401**
Stralsund	57,666		11,858					5,753	**75,277**
Landskrona	16,564			51,732					**68,296**
Sassnitz/Mukran	5,753	6,460	34,267						**46,480**
Wismar	30,907		13,008						**43,915**
Karlshamn/Elleholm	27,489			14,484					**41,973**
Hoganas	24,706			4,319					**29,025**
Degerhamn	12,566			6,564					**19,130**
Oskarshamn				0			18,764		**18,764**
Koge	10,111	6,461	736	0					**17,308**
Ystad	10,945			2,189					**13,134**
Nakskov	10,869			0					**10,869**
Wolgast		6,329		0					**6,329**
TOTAL	**1,232,114**	**408,090**	**384,265**	**261,781**	**131,005**	**116,483**	**82,804**	**49,139**	**2,665,681**

Table 27: Transport capacity in DWT Bulk Ships within the BGW area

FROM \ TO	Szczecin/ Swinoujsci	Rostock/ Warnemünd	Gdynia	Klaipeda	Gdansk	Kaliningrad	Liepaja	Copenhagen	Landskrona	Stralsund	TOTAL
Rostock/Warnemünde	190,434	0	31,850	34,039	47,442	0	0	47,442	24,721	0	375,928
Szczecin/Swinoujscie	0	142,992	0	0	0	0	0	0	0	6,341	150,683
Gdansk	32,541	47,442	31,850	16,653	0	0	0	0	0	0	128,486
Kaliningrad	0	0	0	22,782	6,258	0	51,518	0	0	0	80,558
Liepaja	0	0	0	0	11,635	45,644	0	0	0	0	57,279
Landskrona	0	53,387	0	3,048	0	0	0	0	0	0	56,435
Copenhagen	47,442	0	0	0	0	0	0	0	0	4,119	51,561
Klaipeda	0	0	42,838	0	0	6,085	0	0	0	0	48,923
Gdynia	41,100	0	0	0	0	0	0	0	0	0	41,100
Ventspils	0	39,475	0	0	0	0	0	0	0	0	39,475
TOTAL	**312,867**	**286,578**	**106,538**	**76,522**	**65,335**	**51,729**	**51,518**	**48,367**	**24,721**	**10,460**	**1,052,604**

Container transports

In parallel to the ferry service there are container feeder services in the Baltic Sea that connect the ports. The main function of these services is to transport containers between the continental hubs and the Baltic ports. As yet a very limited number of containers are employed in an intra European service.

Transport flows primarily connect ports in the region with ports outside the region, the Continent, England, other Northern Europe and Russia.

The large container nodes in the region are Copenhagen/Malmö/ Helsingborg and Gdynia/Gdansk. German vessels dominate traffic to/from the largest ports.

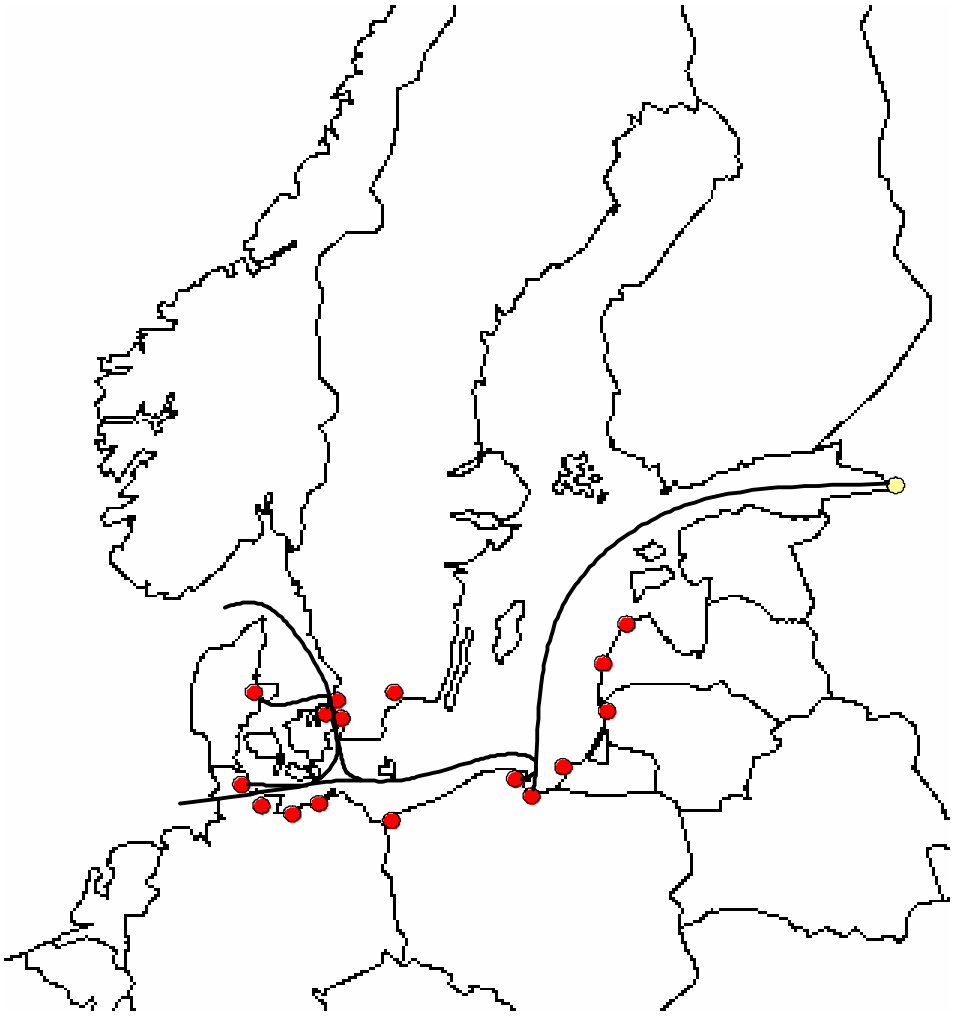


Figure 33: Main regional container trades

Table 28: Container ships calling ports in BGW area

TO \ FROM	NEU	BGW	ONE	RUS	UKE	OBS	FIN	ASI	AME	SBN	Total
Gdynia	97	4	1	5	51	1	1				**160**
Copenhagen	96	59	36	2		1					**194**
Gdansk	59	2	1	31	1						**94**
Kiel/Rendsburg	4	18		22			7				**51**
Klaipeda	9	3	1	2		21					**36**
Malmo	7	52	13								**72**
Helsingborg	9	63	9				1				**82**
Ahus	5	9	1	5		2	2				**24**
Szczecin/Swinoujscie	6	2	1		1			1	1		**12**
Hoganas			3								**3**
Liepaja	1	1	2								**4**
Rostock/Warnemünde		3	2		1						**6**
Kaliningrad	2	2									**4**
Nakskov			2								**2**
Ventspils			1					1			**2**
Oskarshamn										1	**1**
Stralsund		1	1								**2**
Wismar			1								**1**
Wolgast			1								**1**
Lubeck		1									**1**
TOTAL	**295**	**220**	**76**	**67**	**54**	**25**	**11**	**2**	**1**	**1**	**752**

Table 29: An example of Container services in the Baltic Sea provided by the MSC.

1.1 1.19a - Baltic Feeder Service - Loop1 - Russia-Poland

	Antwerp	St. Petersburg	Gdynia	Aarhus	Antwerp
MSC HINA 14A	-	20/21.01	23/24.01	25/26.01	27.01
MSC LIESELOTTE 13A	21/23.01	27/28.01	30/31.01	01/02.02	03.02
MSC HINA 15A	28/30.01	03/04.02	06/07.02	08/09.02	10.02
MSC LIESELOTTE 14A	04/06.02	10/11.02	13/14.02	15/16.02	17.02
MSC HINA 16A	11/13.02	17/18.02	20/21.02	22/23.02	24.02
MSC LIESELOTTE 15A	18/20.02	24/25.02	27/28.02	29.02/01.03	02.03
MSC HINA 18A	25/27.02	02/03.03	05/06.03	07/08.03	09.03
MSC LIESELOTTE 16A	03/05.03	09/10.03	12/13.03	14/15.03	16.03

1.2 1.19b - Baltic Feeder Service - Loop 2 - Denmark / Lithuania / Finland

	Antwerp	Aarhus	Klaipeda	Helsinki	Bauma	Antwerp
MSC PATRICIA 34A	-	-	20/21.01	22/23.01	24/25.01	29.01
MSC GRACE 49A	22/23.01	25.01	27/28.01	29/30.01	31.01/01.02	05.02
MSC PATRICIA 35A	29/30.01	01.02	03/04.02	05/06.02	07/08.02	12.02
MSC GRACE 50A	05/06.02	08.02	10/11.02	12/13.02	14/15.02	19.02
MSC PATRICIA 36A	12/13.02	15.02	17/18.02	19/20.02	21/22.02	26.02
MSC GRACE 51A	19/20.02	22.02	24/25.02	26/27.02	28/29.02	04.03
MSC PATRICIA 37A	26/27.02	29.02	02/03.03	04/05.03	06/07.03	11.03
MSC GRACE 52A	04/05.03	07.03	09/10.03	11/12.03	13/14.03	18.03

1.3 1.20a - Baltic Feeder Service - Loop3 - Latvia / Estonia / Finland / Denmark

	Antwerp	Riga	Kotka	Tallinn	Antwerp
MSC BALTIC 87A	-	19/20.01	21.01	22/23.01	27.01
MSC POLAND 82A	22/23.01	26/27.01	28.01	29/30.01	03.02
MSC BALTIC 88A	29/30.01	02/03.02	04.02	05/06.02	10.02
MSC POLAND 83A	05/06.02	09/10.02	11.02	12/13.02	17.02
MSC BALTIC 89A	12/13.02	16/17.02	18.02	19/20.02	24.02
MSC POLAND 84A	19/20.02	23/24.02	25.02	26/27.02	02.03
MSC BALTIC 90A	26/27.02	01/02.03	03.03	04/05.03	09.03
MSC POLAND 85A	04/05.03	08/09.03	10.03	11/12.03	16.03

Reefer trades

When it comes to calls Klaipeda is by far the largest one with 157 registered calls. Traffic with reefer vessels is distributed between many ports and no single port can be said to have a hub function with a further distribution by sea. Danish and Norwegian ships are among the most frequent callers in the BGW region.

Table 30: Reefer trade to the region

TO \ FROM	ONE	UKE	RUS	NEU	AME	IBE	OBS	Total
Klaipeda	55	36	12	27	12	12	3	**157**
Kaliningrad	11	31	7		6	15	2	**73**
Copenhagen	28	7	30			2	4	**71**
Szczecin/Swinoujscie	39	1	6	7			3	**56**
Gdansk	1	24	9	8	9	3	1	**55**
Gdynia		14	6	17	14	1		**53**
Liepaja			6	5	1	1	1	**14**
Helsingborg	1	8		3		1		**13**
TOTAL	**139**	**122**	**81**	**68**	**42**	**35**	**14**	**503**

The total reefer traffic inside the Baltic gateway area amounted to 132 calls by reefers with a medium size of about 3,300 DWT, approximately 4,000 cubic metres. If full ships make half of the trips, this means transport of about 250 thousand m^3 refrigerated cargo within the region. That approximately equals the transport of 5,000 trailers. 34 calls where made in Klaipeda, Kaliningrad and Copenhagen.

General cargo trades

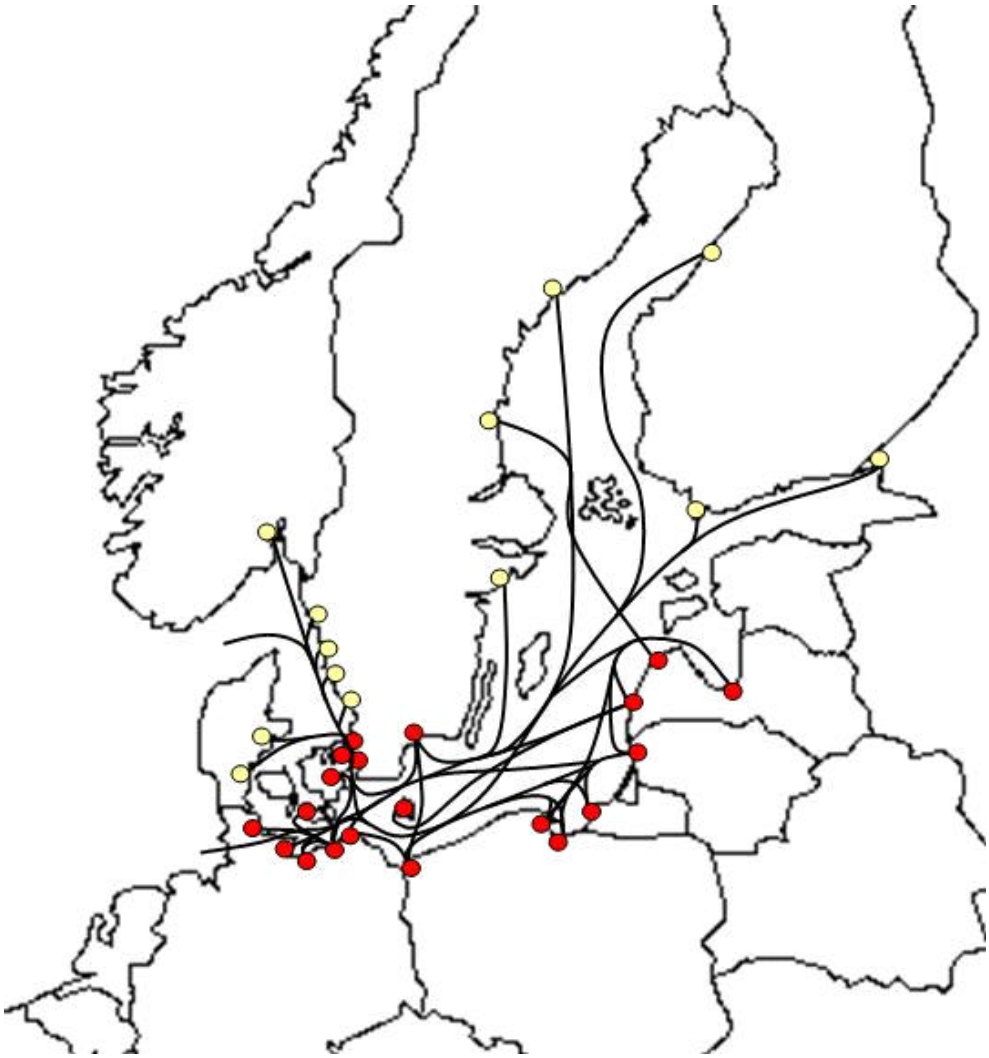


Figure 34: Main regional dry cargo trades

Top 15 ports have more calls and transport relations with dry cargo vessels within the BGW region than any other type of vessel traffic. This also applies to traffic in relation with other regions.

Karlshamn has a substantial traffic with Stralsund and Rostock/Warnemünde. The same pattern applies between Szczecin/Swinoujscie with Karlshamn and Gdynia. Gdynia in its turn has a large traffic on Klaipeda. The largest traffic flows, however, goes to other regions in North West Europe and Scandinavia.
German operators dominate the dry cargo market in the southern part of the Baltic Sea together with Dutch, Swedish and Russian operators.

Table 31: General cargo ships to the region, No of calls

TO \ FROM	NEU	ONE	SBN	OBS	UKE	RUS	FIN	IBE	AME	MED	BLK	Total
Szczecin/Swinoujscie	625	496	54	55	104	65	64	24	4	2	4	1497
Klaipeda	402	249	106	217	109	28	46	11	2	1		1172
Gdynia	563	91	31	37	105	26	62	10	4		1	930
Rostock/Warnemünde	348	321	19	64	42	39	58	13	2	1		907
Wismar	120	305	93	98	25	187	18	6			1	853
Copenhagen	230	360	23	21	58	16	67	9				784
Kaliningrad	331	188	66	31	60	14	21	10	2	5	1	729
Gdansk	336	171	26	18	82	12	29	13	4			691
Liepaja	165	185	98	76	54	21	25	8	1	1	1	635
Lubeck	87	182	65	57	10	21	68	1				491
Helsingborg	128	153	17	3	18	29	22	8		1		379
Karlshamn/Elleholm	63	124	32	28	23	51	7	5				333
Ahus	133	37	11	43	38	4	10	3				279
Frederiksvaerk	37	196	2		10	5		1	1			252
Ventspils	40	55	70	37	24	6	8	2	1			243
Oskarshamn	38	16	59	43	6	51	5					218
Malmo	50	113	10	4	22		9	9				217
Kiel/Rendsburg	101	49	2	6	4	17	12	2				193
Stralsund	46	96	30	2	11	2	3					190
Kalmar	67	39	27	5	8	23	1					170
Nakskov	26	103	11		3		3					146
Landskrona	43	53	16	3	5	2	6	1				130
Wolgast	64	40	4	1	16	3	1					129
Koge	33	75	3	1	8	1	4		1			126
Naestved	34	85			1		1					121
Nykobing(Falster)	28	44	8	4	4		3					91
Kolobrzeg	12	50	4	11	2		11					90
Solvesborg	42	26	2	6		2						78
Bandholm	16	53	2	2	2				1			76
Fakse Ladeplads	12	49	2	1	3							67
Hundested	3	48	7									58
Greifswald/Neustadt	25	22	2	2	1							52
Stevns Pier	9	26		1	3		1	2		1		43
Hoganas	10	13	14									37
Ystad	10	14	6	1	1		1	3				36
Rodbyhavn	5	16										21
Vierow	4	17										21
Trelleborg	3	9	1	5	1							19
Bergkvara			1	2		13						16
Flensburg	6	10										16
Masnedo/Orehoved	3	12										15
Sassnitz/Mukran	8	3		1	1		1	1				15
Stubbekobing	3	10										13
Hochdonn	12											12
Simrishamn	3	7	1									11
TOTAL	**4338**	**4232**	**927**	**887**	**866**	**638**	**568**	**142**	**23**	**12**	**8**	**12643**
												Average ship size 3.100 DWT

The average size of the General Cargo ships trading in and out of the region is 3,100 DWT (about 200 trailers capacity).

The information of how the ships are loads/discharge in the routes from port to port is not known. In the following table both the previous and next destination are disclosed to give the trading frequency and pattern.

Table 32: General cargo ships from the region, No of calls

FROM \ TO	NEU	ONE	UKE	OBS	SBN	FIN	RUS	IBE	AME	MED	BLK	AFR	ASI	Total
Szczecin/Swinoujscie	542	469	155	160	82	64	69	10	6	3	3			1 563
Klaipeda	505	192	168	134	137	80	35	6	1	1			1	1 260
Kaliningrad	500	144	118	87	27	20	17	11	2	4	1		1	932
Gdynia	375	115	113	55	56	59	52	3	2					830
Rostock/Warnemünde	357	200	54	113	21	22	52	4	1					824
Wismar	80	241	32	108	132	82	114	2						791
Copenhagen	162	372	90	35	29	49	11	4	1					753
Liepaja	168	172	105	76	123	65	16	6	1					732
Gdansk	154	153	114	72	25	90	30	3				1		642
Helsingborg	85	230	36	24	16	12	16	1		1				421
Lubeck	58	173	8	73	36	30	28	2	1					409
Karlshamn/Elleholm	92	106	45	55	27	2	33	2			1			363
Ventspils	65	31	39	51	80	7	8	1			1			283
Frederiksvaerk	49	178	31	9	3	2	2	5						279
Ahus	102	22	24	53	27	11	4							243
Oskarshamn	52	16	45	45	18	5	45	1						227
Kiel/Rendsburg	99	35	11	9	8	9	10	1						182
Malmo	21	72	12	22	26	19	2			1				175
Kalmar	61	14	34	21	24	2	16	1						173
Wolgast	93	32	22	5	1	11	1	3						168
Stralsund	53	60	13	3	11	9	2	3						154
Koge	42	71	5	4	8	4	1	1						136
Nakskov	34	74	3	4	4	10	4							133
Landskrona	18	42	5	11	16	2	4							98
Naestved	15	75	3		1	1	2					1		98
Nykobing(Falster)	25	36	2	7	5	13		1						89
Fakse Ladeplads	18	50	1		2	2								73
Kolobrzeg	21	29		6	3	1	3							63
Bandholm	22	20	4	1	1	3	6							57
Greifswald/Neustadt	21	22	8	1	1	3								56
Hundested	4	45	1	3	2			1						56
Stevns Pier	4	17	6		9	17								53
Solvesborg	7	11	1	19	11	3								52
Ystad	12	9	2	10	5	2	3	3						46
Vierow	24	5		1										30
Hoganas	1	13	1	4	6		1							26
Rodbyhavn	17	5												22
Trelleborg	3		3	3	9	1	1							20
Sassnitz/Mukran	10	2	6					1						19
Bergkvara		2		3	1		10							16
Hochdonn	12		1											13
Stubbekobing	7	3				1	1							12
Masnedo/Orehoved	4	2		3		1								10
TOTAL	4 007	3 584	1 324	1 293	995	715	605	77	15	10	6	2	2	12 635
														Average ship size 3.100 DWT

The general cargo traffic is really the most important shipping segment in the region when it comes to tons carried. There were 6,300 calls within the region made by ships of an average size of 2,600 DWT. The transported cargo onboard one of those ships is equal to about 160 trailers (8 000 DWT Ro-ro). As comparison the yearly traffic on the ferries between Sweden and Poland in the region amounted to 159,268 trailers, which equals 900 dry cargo ships calls.

There are 35 ports in the region that has 20 or more calls of the General Cargo ships from within the region.

As shown in the table Klaipeda, Szczecin/Swinoujscie and Kaliningrad has almost two calls a day.

Table 33: General cargo ships within the region

From/To	Szczecin/Swinoujscie	Klaipeda	Kaliningrad	Rostock/Warnemunde	Karlshamn/Elleholm	Wismar	Gdynia	Liepaja	Gdansk	Copenhagen	Helsingborg	Stralsund	Lubeck	Koge	Kiel/Rendsburg	Malmo	Ventspils	Frederiksvaerk	Ahus	Kalmar	Wolgast	Greifswald/Neustadt	Solvesborg	Nakskov	Landskrona	Naestved	Total
Szczecin et. al.	45	75	72	18	36	32	48	25	42	16	12	7	11	21	10	4	9	7	2	10	22	4		6	7	3	**597**
Klaipeda	78		66	33	4	21	57	28	43	14	28	7	10	3	2	3	10	5	39	6	3	21	1	4	1	1	**508**
Rostock/Warnemünde	58	43	33		53	39	24	13	13	10	7	34	19	17	18	1	7	13	7	2	11	5	12	11	4	8	**502**
Gdynia	77	81	39	13	9	8		11	63	17	2	9		21	2		3	8	2	14	2		11			3	**403**
Wismar	34	42	21	43	21		10	19	6	18	6	12	10	31	3	12	5		18	8	4	3	13	3	14	13	**397**
Karlshamn/Elleholm	57	9	42	50	4	9	10	53	1	7	3	70	9	4	2	3	1		2	2	6	6	1	4	2	1	**379**
Gdansk	52	63	42	11	6	6	51	23		10		4	5		5	1	13	13	2	3	2			1	1	5	**331**
Copenhagen	31	14	10	4	13	20	5	8	8		117	6	9	6	3	15	3	3	2	1	1			3	15	1	**308**
Kaliningrad	51	66		24	6	11	8	13	9	13	2	6	7	1	39	1	3	8	1	6	4	5	1				**299**
Lubeck	19	25	17	18	10	22	6	10	4	3	1	4		5	5	12	13	4	6	11	3	2	7	3		3	**232**
Stralsund	31	18	8	18	80	6	10	1	7	3			10		8	2	1	9		1	3	2	1	1		3	**229**
Liepaja	15	32	11	9	47	3	1		9	4	7	4	3		4	5	8		3		3						**181**
Helsingborg	8	16	11	6	8	7		9	2	68			1	2	2	28	3	3								1	**180**
Malmo	8	4	6	6	2	22	1	9	3	57	12		1	2	4		5	11	1	2	1		1	2	5	1	**170**
Kiel/Rendsburg	18	5	43	15	4	6	8	3	2		1	4	6	6		3		2	6	1	3	1	1	4		1	**152**
Ahus	22	14	3	8	14	16	5	6	11	1	2		3	4	1	2	4	3		3	4	1		2	1		**141**
Koge	8	3	2	13	3	31	10	2	6	4		1	16		1	8			1	1	3	2		2	1	2	**131**
Landskrona	12	3	4	4	8	8	3	2	8	12	4		3	2	1	6			1	1	1			1			**87**
Kalmar	10	11	6	3	9	10	7	3	1	1			2	3	1		5	2	2				2	1		1	**86**
Solvesborg	9		12	4	1	12	10	3	6			3	4	1	3	3	2	3		2	1			1			**86**
Swinoujscie	34	4	7	2	4	2	5	5	1	2	1		1	1	3	1		1			2					1	**82**
Naestved	16	1	6	7	3	9	2	1	1	3	3	3	4	1	5	3		1				3	1				**80**
Frederiksvaerk	4	13	10	11		2	6		5	1		8	4		1	6				1		1	3				**77**
Nakskov	8	3	1	26	3	7	2	1	1			1		2	3		2	2	2		1						**71**
Ventspils	3	14	6	5		6	3	9	4	1	5		4		1								1				**65**
Greifswald/Neustadt	2	20	5	4	12			2	2		1	1		1	1				2							1	**59**
Kolobrzeg	13	11	3	1	3		6	1	10				2	2		1				3							**57**
Bandholm	9	2	1	19		1	1			2	1	2		1										3	2	2	**48**
Oskarshamn	3	3	1	2	10	2	1	15		3			2			1	3			1	1						**48**
Wolgast	8		3	5	11	1	1	1	1		1		3	2	3					3						1	**48**
Fakse Ladeplads	1			5	4	3	1		1				4		4						2	4					**42**
Nykobing(Falster)	7	2	2	4		1	6		2	2	2		2		2			2				1		1		1	**39**
Ystad	1	1	3	4	1	3	1		1		3						2										**20**
Flensburg	1	1		9				2				2			1	1											**18**
Hoganas	2	1		2	2				1		1				1	2	1	1	1		1						**16**
Hundested	1		1	1				6		2	1							1							1		**14**
Simrishamn		1	10			1																					**13**
Ustka	6	1		1						1														2			**12**
Vierow				3	7														1								**12**
Karlskrona					2		4	1	1	1							1										**10**
	765	**602**	**510**	**428**	**405**	**331**	**313**	**286**	**283**	**278**	**223**	**189**	**156**	**141**	**139**	**125**	**106**	**102**	**101**	**85**	**84**	**61**	**56**	**55**	**54**	**54**	**6 300**

Ro-ro trades

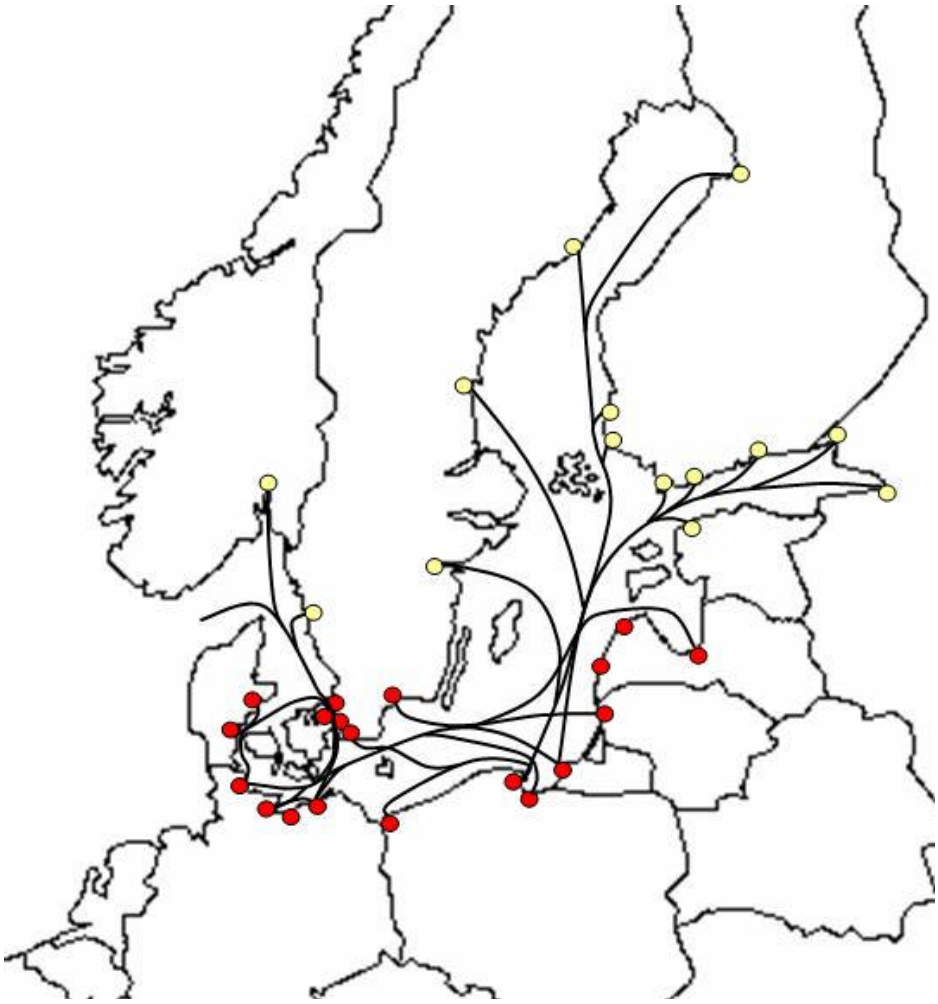


Figure 35: Main regional Ro-ro trades

Ro-ro traffic within the BGW region is not very extensive, but Ro-ro traffic between the BGW region and ports in the northern Baltic Sea is. Traffic to Lübeck is the dominant pattern, above all because of the large traffic from Finland. Kiel is another Ro-ro node as are Klaipeda and Copenhagen.

Finnish operators play a prominent role in Ro-ro traffic, followed by Swedish, Norwegian, Lithuanian and Polish operators. German and Swedish operators control the main ferry cargo traffic in the BGW region, with increasing participation from Latvian and Lithuanian operators.

The industrial products from the Scandinavian countries are at large shipped over the Southern Baltic area for transhipment. It is also common to use a Baltic Gateway port in the region as a terminal function in the South Baltic area for delivery directly to the consignee. Several indicators determine if the products will be shipped through, passing or handled in a terminal in the region. The main indicator is the cost for the distribution.

Products from Sweden are using the three transport modes in competition. In broad lines the products in need of a quick transport, where the cost is of minor importance, are shipped directly from factory to the consignee. Products that have a destination to the east part of Germany, Austria and/or Italy will have a preference of railway. Products to the North Sea coast, Iberian Peninsula, UK and combinations to these countries are preferably shipped by sea. To the latter countries it is more or less exclusively by sea if there are larger volumes.

There are no transports on Ro-ro ships to destinations outside Europe from the BGW area registered.

Table 34: Ro-ro ships to the region

TO \ FROM	FIN	ONE	SBN	OBS	RUS	NEU	UKE	IBE	Total
Lubeck	631	259	141	39		17	1		**1088**
Copenhagen	93	188	10	18	3	5	38	1	**356**
Gdynia	204	5	41		1	15	40	5	**311**
Kiel/Rendsburg	8	60	2	89	101	19	1		**280**
Rostock/Warnemünde	120	10		4		2			**136**
Helsingborg	10	41	1			37			**89**
Klaipeda		53			2	2	1		**58**
Szczecin/Swinoujscie	3	39			1	4	4	2	**53**
Hundested		24					8		**32**
Kaliningrad			4	1	24		1	1	**31**
Gdansk	3	2		1	1	7	8		**22**
TOTAL	**1074**	**689**	**210**	**153**	**134**	**119**	**105**	**9**	**2494**

Larger volumes give an economy of scale that gives preferences for sea transports. Economy of scale is most significant for sea transports. To keep down the total cost for all break-bulk volumes as much as possible is shipped by sea. That results in a preference to ship the larger volumes with sea transports and to set up joint sea transport systems between industries to get the proper volume and shipping frequency to achieve the best service level.

To some extent the same effect can be achieved by rail operation. In this way sea transports and rail transports theoretically is competing for the same products. If actual cost for each transport is known detailed information of the zone of competition can be drawn on a map. To make the situation more complex the situation of competition also depends on the cost to reach the shipping terminal from the factory/mill and how rational/cost effective the handling of the products can be from the shipping site.

Another factor that sea transports and rail has in common is the low rate of return cargo. Because of structural reasons of rail operation the trains shipping volumes to the continent are almost exclusively empty on the return trip. Most sea transport systems have also been sailing in ballast in return (with the exemption of the traffic between the continent and South of Finland) but there has been a change in these systems in the last few years.

Sea transports, ferry services and liner service on South Finland up to Rauma, have always been a major link for Finland to communicate with the Continent. As long as there is no transit possibility by land on the east side of the Baltic Sea, Finland is directed to use ferry service via Sweden (from where rail traffic, combined traffic or direct road traffic is optional to the Continent) or directly to a Continental port in the Baltic Sea.

The ferry services and the links between Scandinavia and Germany have increased considerably during the past few years. Increased activities can be seen in the ports of Lüebeck and in Rostock while the activities in Kiel have decreased. It is anticipated that the major increase will come in the southeast part of the Baltic Sea. This depends very much on the development of the infrastructure in central Europe, the development of the traffic situation in Germany and the development of trading.

From the history we can see how the traffic formed itself and found its way through the Continent guided by the cost. In the 80:ties, before the reunited Germany, most of the rail transports to the south of the Continent found its way through East Germany as the cost for rail transport was about ? from passing through Germany. This traffic stopped when the reunited Germany equalised the cost of transports. If the infrastructure and the cost of operation in the east part of Europe prove to be efficient and cost effective we may see an increased railway service to southern Europe from Poland via the east European states in the future.

Liner services with industrial shipping using a gateway function to Europe is listed in the following Table 35.

Table 35: Liner services that use the South Baltic area as a Gateway to the Continent

From	To	Service level
Norrköping, Sweden	Lübeck, Germany	Weekly, Lo-lo
	Gdynia, Poland	2/week, Lo-lo
	Gdynia, Poland	2/week, Cont.
Södertälje, Sweden	Lübeck, Germany	Weekly, Lo-lo
Stockholm, Sweden	Gdynia, Poland	2/week, Cont.
Gothenburg, Sweden	Gdynia, Poland	3/week, Cont.
Gävle, Sweden	Gdynia, Poland	2/week, Cont.
Iggesund, Sweden	Lübeck, Germany	2/week, Ro-ro
Sundsvall, Sweden	Lübeck, Germany	2/week, Ro-ro
Örnsköldsvik, Sweden	Lübeck, Germany	2/week, Ro-ro
Umeå, Sweden	Lübeck, Germany	2/week, Ro-ro
Åhus, Sweden	Gdynia, Poland	2/week, Cont.
Raahe, Finland	Gdansk, Poland	Weekly, Lo-lo
Kemi, Finland	Lübeck, Germany	Weekly, Ro-ro
	Copenhagen, Denmark	Weekly, Ro-ro
Oulu, Finland	Lübeck, Germany	Weekly, Ro-ro
	Copenhagen, Denmark	Weekly, Ro-ro
Rauma, Finland	Lübeck, Germany	3/week, Ro-ro
	Gdynia, Poland	Weekly, Ro-ro
Turku, Finland	Travemünde, Germany	4/week, Ro-ro
Hanko, Finland	Lübeck, Germany	9/week, Ro-ro
	Gdansk, Polen	2/week, Ro-ro
	Travemünde, Germany	Weekly, Ro-ro
	Malmö, Sweden	Weekly, Ro-ro
	Rostock, Germany	6/week, Ropax service
Helsinki, Finland	Copenhagen, Denmark	2/week, Ro-ro
	Lübeck/Travemünde, Germany	12/week, Ro-ro
	Rostock, Germany	4/week, Ro-ro
	Klaipeda, Lithuania	Weekly, Ro-ro
	Gdansk, Poland	Weekly, Cont
	Gdynia, Poland	5/week, Ro-ro
	Szczecin, Poland	Weekly, Ro-ro
	Helsingborg, Sweden	Weekly, Ro-ro
Kotka, Finland	Lübeck, Germany	3/week, Ro-ro
	Rostock, Germany	Weekly, Ro-ro
	Gdynia, Poland	Weekly, Ro-ro
Hamina, Finland	Lübeck, Germany	3/week, Ro-ro
	Gdansk, Poland	Weekly, Cont

Vehicle Ro-ro trades

There is no intra-regional vehicle Ro-ro trade in the BGW region, only traffic with other regions west and north of the BGW region.

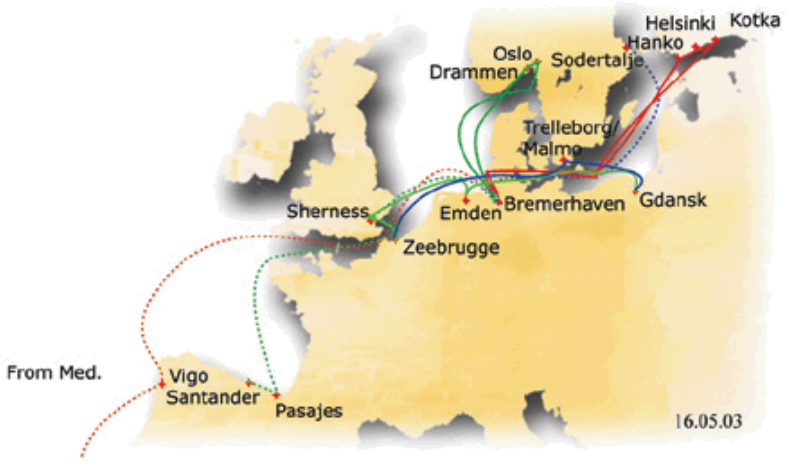


Figure 36: UECC trade

Inside the BGW area UECC (Ugland European Car Carriers) has a service going from Zeebrügge to Trelleborg and than on to Gdynia (Gdansk in their map). In 2002 Trelleborg had 25 calls, thus once every second week.

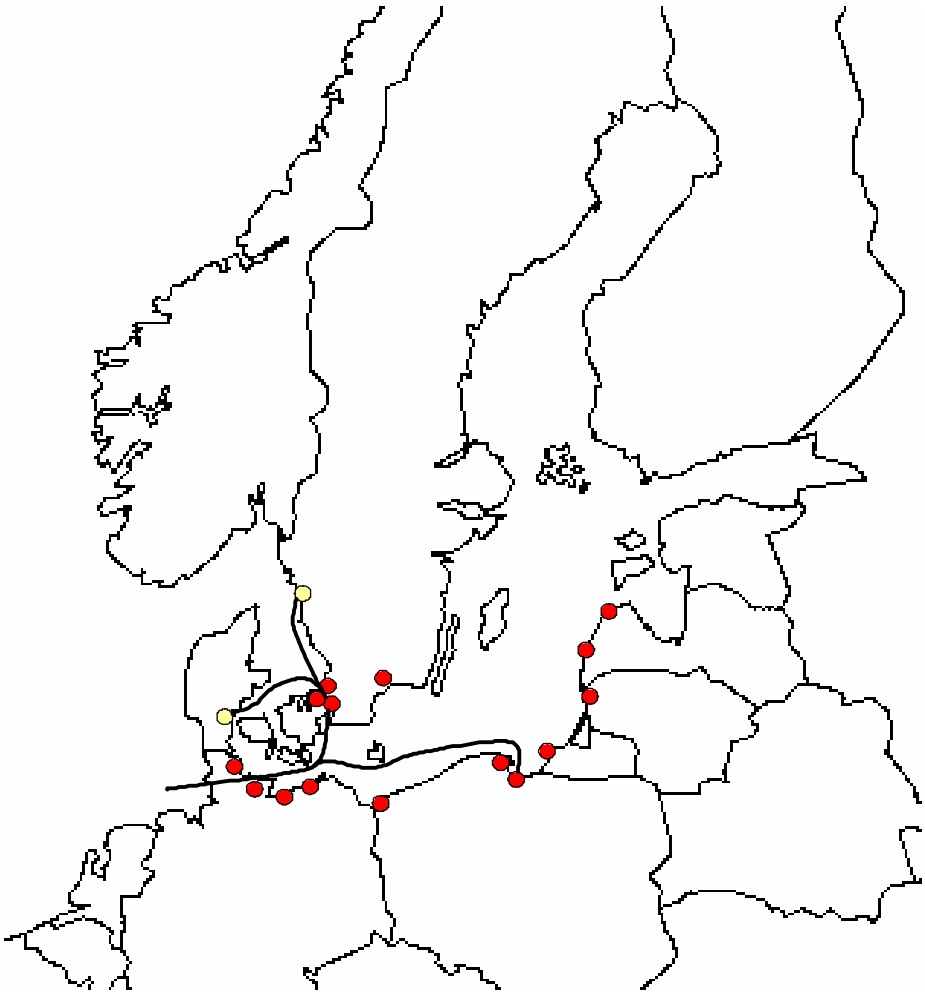


Figure 37: Vehicle trade

Car terminals are normally located in ports/terminal with a PDI service, in wich the car is equipped for the country to be sold in. The cars will be distributed from these terminals by rail or road. Each car manufacturer decided the location and there can be a number of ports that host a PDI function in each country.

Table 36: Car carriers to the region

TO \ FROM	NEU	ONE	UKE	FIN	IBE	Total
Gdynia	54		8	8	5	75
Copenhagen	12	30	15	1		58
Malmo	18	33		1		52
Trelleborg	48	2				50
Gdansk	7	6	21	10		44
Kiel/Rendsburg	1			1		2
Szczecin/Swinoujscie	2					2
Landskrona		1				1
TOTAL	**142**	**72**	**44**	**21**	**5**	**284**

5.5 Ships that pass the Baltic Gateway area

The total number of vessel passages was over 16,000 in 2002. General cargo vessels represented the largest share (6,300 passages or almost 40 %).

Tankers and bulkers passed through the region with almost the same frequency (2,800 and 2,900 passages respectively or over 17 %).

The table below shows the number of passages east bound through the BGW region to ports in the following countries:

Table 37: Number of passages eastwards through the BGW-region

	Vessel Type						
Country	Bulker	Combination	Container	Dry Cargo	Roro	Tanker	Total
EST	439	42	135	654	75	686	**2,031**
FIN	431	5	657	2,414	1,201	769	**5,477**
LVA	500	3	134	779	13	369	**1,798**
RUS	902	6	466	1,102	57	433	**2,966**
SWE	560	6	281	1,457	401	655	**3,360**
Total	**2,832**	**62**	**1,673**	**6,406**	**1,747**	**2,912**	**15,632**

The absolutely major part of the traffic goes to Finland.

A notable number of Ro-ro ships pass the BGW region bound for Finland, 1,201 or 69 % of all Ro-ro traffic through the region. A relatively small portion of the Ro-ro traffic is bound for Russia. The Russian traffic has an unusual high representation of reefers.

The table below shows the number of westward passages through the BGW region made by ships on their way from ports in the following countries:

Table 38: Number of passages westwards through the BGW-region

	Vessel Type							
Country	Bulker	Combination	Container	Dry Cargo	Reefer	Roro	Tanker	Total
EST	535	45	230	784	29	18	755	**2,396**
FIN	517	6	854	2,832		1,418	670	**6,297**
LVA	620	3	64	812	20	9	361	**1,889**
RUS	936	7	338	1,063	515	51	462	**3,372**
SWE	471	2	177	1,301	9	370	493	**2,823**
Total	**3,079**	**63**	**1,663**	**6,792**	**573**	**1,866**	**2,741**	**16,777**

The distribution of ship types is roughly the same as for eastward passages with a somewhat lower proportion of tankers (16 %).
The difference between the number of passages east bound and west bound is explained by the fact that about 600 port calls in North Eastern Europe are made by ships that have made calls in the BGW region.

6 The Ferry market within the BGW

- **Ferry services are often using different vessels for their market segments: Roro/Ropax ferries for the freight market and fast ferries for the passenger/car traffic**
- **Since the abolition of the tax-free system in result of the EU enlargement the economical focus has shifted from passengers to cargo in the ferry operation, which has significant implications for the Baltic Gateway area**
- **The enlarged market in the Baltic is opens up to new trade and ferry service opportunities in the BGW area**
- **A number of conditions guides the development of the traffic such as; the rules and regulations for drivers' resting, the cost of using alternative routes, the service level of the ferry, the type of shipment (runners/drops), the development of the high value cargo traffic etc.**
- **The demand for trailer shipment in ferry operations has increased during the years in the north-south direction. Upon rather stable figures for the overall passenger flows, growth in cargo determines a set-up for a future network of TEN ports in the Baltic Gateway area.**
- **While an overall development of ferry cargo traffic shows a doubling of the volumes in the period of 1993-2003, there is a strong variation on individual lines**
- **Growth in trailer operation (about 8%) is the main factor of increasing shipments of goods.**
- **Compared with well-established ferry operations in the western part of the Baltic Gateway area, its eastern part demonstrates low figures. Some of the lines there have already proved their stability.**

There are several different ship concepts named ferries. The definition of a ferry is that the ship has the capacity to carry passengers in a regular pendulum service. New ferry concepts have been developed over the last few years to meet the new market after the tax-free abolition in Europe. The concept has been to reduce the service capacity for passengers (as this is a costly function onboard, and to increase the cargo/vehicle carrying capacity. This type of ferry is called ro-pax that is short for the Ro-ro-ship having passenger capacity. The previous North European-/Scandinavian ferry concept was more focused to passengers as the main source of income. As a consequence this was giving the combined ferry

or a cruise ferry as the most common tonnage. Figure 38 illustrates the different type of ferries.

	Ro-ro	Ferry; cargo			Ferry; non cargo	
		RoPax		High speed		High speed
						
	Open Liner		Cruise		Ferry	
						
Cargo	Yes	Yes	Yes	Rarely	No	No
Trailers	Yes	Yes	Yes	Rarely	No	No
Passenger	12 drivers	200 - 600	500 - 2000	200 - 600	500 -	100-1000
Train	Occasionally	Occasionally	No	No	No	No
Cars	Limited	Yes	Yes	Yes	No	No
Day cruise	No	Occasionally	Yes	Rarely	Yes	Occasionally
Conference	No	Yes	Yes	No	Yes	Rarely
Entertainment	No	Occasionally	Yes	Occasionally	Yes	Occasionally

Figure 38: The different kinds of ferries

The **ferry; non cargo** market (i.e. passenger only vessels) is to a large extent characterised by a transport need between islands, across rivers or bays. The basic demand is generally from residents, topped off with seasonal tourist traffic.

A lot of the traffic is in domestic trade, but there are exceptions. In the ferry; non cargo segment 669 out of 2,784 ships are high-speed (30+ knots), which could be regarded as a market within a market. Out of these 50 % are multi-hulled.

Standard ferries (combined ferries) or ro-pax mainly do the passenger service in international traffic.

The **ferry; cargo** market is a combined cargo and passenger service and predominantly short sea shipments of Ro-ro cargo. These cargo services normally come in two port liner services where you also find a large share of runners (trailers with trucks and drivers). The drivers prefer the passenger ferries from a social point of view and for the higher level of passenger service. This can be a problem for the ferry operators in the summertime when the ferries are full of passengers and the operator would prefer to have the trucks on the Ro-ro service departures, if a choice would have been given.

The time for rests is also a crucial part of how much runners the service can attract. The driver needs the rest to be able to do a full day driving

behind the wheel. If the service is too short the driver do not get his required rest period and can not continue driving when the ferry had arrived. He may need stop and take his full rest before continuing. If the rules and regulations were followed in this respect the ideal time of passage would be 11 hours to have a full rest. However all ferry services of four hour and up are of interest to make the time as productive a possible. Today the control is not all that strict but it will be when the new EU trip recorder comes into force. Never the less the possibility to rest on the ferry will be of importance also in the future. The shorter sea routes have a high percentage of drivers that accompanies the trailer as presented in Figure 39.

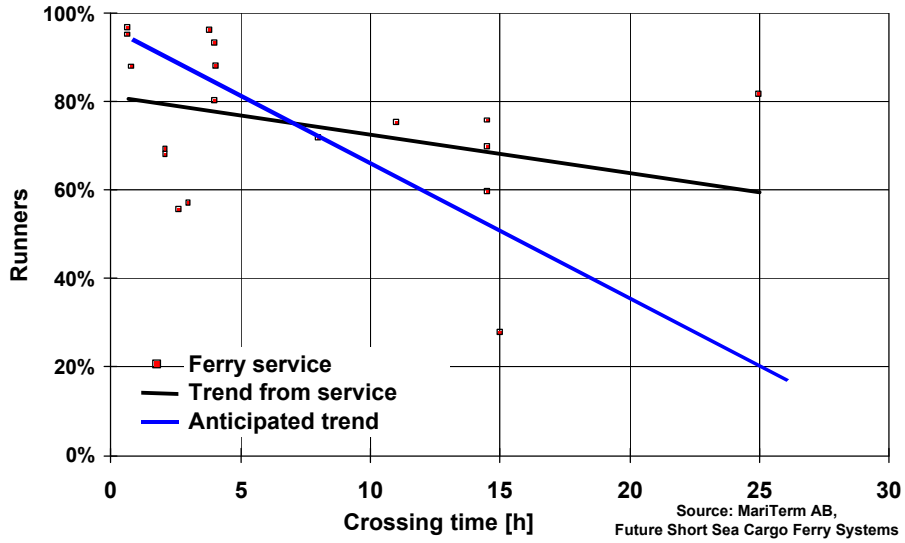


Figure 39: Percentage of runners as function of crossing time.

These drivers are very important as they have a certain option to choose which service they will use and which route to take. In some services the result has been that the driver preferred the service from the larger ferry where there is a better passenger service onboard, entertainment and a more options of food and company.

In Scandinavia the ferry operators in this market segment have faced a consolidation process over the last five years. This has come as a result of the number of fixed links (bridges & tunnels) that has been being constructed and the abolition of tax-free. As a result, the ferry operators have changed from a passenger to a trailer/cargo focus.

However, we find a number of exceptions where the passenger compartment of the ferries to a large extent is designed for cruise service. These ferries are normally trading in a “city-to-city” concept offering short cruise travels.

The high-speed segment within the cargo ferry market is relatively small. Merely 123 of the 3,015 ships in world fleet have a speed of 30 knots or more. 70 % of these are multi-hull vessels.

The short sea shipping **Ro-ro** ferry operation typically transports trailers or semi-trailers. The service can be regarded as an extension of the road network. The service is operating in semi- to long-distance relations and in some cases as added capacity to a combined cargo/passenger ferry operation.

As many other industries the shipping industry is in transition. This change looks like the structural change within other industries, with a concentration by merging with or purchase of competitors. However, the ferry business is characterised by a slow development or a direct reluctance for such a process. One cannot disregard that the ferry industry and its transport pattern is a multifaceted business that demands experience. That means that potential buyers of a ferry service often are established and growing ferry companies, while it is extremely rare that other established shipping companies, within for example bulk, tank or container shipping, involve themselves in the ferry industry. It is therefore very likely to find the big owners of ferries today as the big actors on the ferry market in the future.

One strong reason for the concentration process is the cease of the tax-free sales on board ferries within the European Union. The loss of income from the tax-free sales has forced ferry companies to consolidate the operation and to secure the economy in the ferry industry by expanding into new regions.

The politicians in Europe have helped the industry through tax reduction schemes. The shipping companies can, depending on flag state, be compensated in various extents. It also gives the ship owner the freedom to engage the ships in various services so that the use of the fleet can be more optimised.

6.1 The Baltic

Historically the ferry traffic in Northern Europe has grown by transporting passengers and to offer entertainment. Since the abolition of the tax-free system the economical focus has shifted from passengers to cargo. A large part of the ferry industry has adapted the tonnage to the new situation. In addition the ferry traffic between Sweden and Denmark are since July 2000 competing with the Öresund bridge, a fixed-link between the two countries.

The ferry service is to a large extent a link in the land transport infrastructure where the rail and/or road are connected to waterways that cannot be bridged by a permanent road connection. This type of ferry operation is in way of business a shipping service but as infrastructure it is a part of the road /rail land transport system.

The ferry tonnage in Europe can be divided into three segments; long distance, medium distance and short distance services.

Long distance ferries operate on a service that has over-night service. It means that the passenger capacity is related to the number of cabins/berths.

The medium distance means ferries operating on services where as a minimum one trip per day (at least in peak season) is a night trip that gives a demand for cabin capacity.

Short distance concerns ferries that operate on lines that are that short or that the time table do not demand cabins or overnight service.

The crossing time for a long distance ferry is at least 9 hours, a medium distance between 5 and 9 hours and for the short distance ferry the crossing time is 5 hours or shorter.

The second hand market for the moment is limited and every shipping company that seeks unique characteristics for a certain line will realise that the possibility to find competitive suitable tonnage are small.

The different market segments can roughly be divided in distance and if they are related to goods- and passengers markets. Each market is built up from different motives that give the demand for capacity, service type, service level and the willingness to pay for services. The demand depends also on the development of the market and the hinterland of the service.

As previously explained the market strategy was heavily focused on passengers and their shopping onboard the ferries until the abolition of tax-free. The onboard sales were the major income of the service.

In the long run it is anticipated that the effect following the change of taxation system eventually will give very little effects on the ferry systems. The result will be a reduction of cruising for pleasure and purchase onboard but will be substituted by tourism for the purchase of products in the other end of the travel.

The looser is the ferry operator who will profit only on the sales for consumption onboard and from the tickets. To compensate for the loss the ferry operator must increase the cost of the tickets and the profit from the onboard sales. The cargo transport will also be of higher interest than shipping passengers. However, it should be clearly stated that all sales for consumption onboard of any kind on a ship in international trade still is tax-free and gives added income to the operator.

It is essential to understand the situation for the ferry operators to produce the service and how they plan for the future.

In a tax-free service the operator buy the duty free products and add on a charge that gives a competitive price in comparison to the price in the connecting countries. As an example a bottle of whiskey cost around EUR 5 and the tax is about EUR 20 in Sweden. At the ferry the price is about EUR 17, which will give about EUR 12 per bottle to the operator.

The passenger can buy 1 bottle. While travelling from an EU country he may buy 10 litres of spirits. The tax differs between EUR 12 – 15 between the Denmark/Germany and Sweden on one bottle. This is the reason for a substantial increase in the ferry traffic on Germany and Denmark from Sweden.

The major difference with the new regulations is that the ship owner does not make the money onboard the ferry. If it is less expensive to buy the products in the other country the passenger will do that. Today it is of minor interest to buy tax-free onboard the ship and only bring home one bottle than to buy it in a less expensive EU country and bring 10 times as much home.

As a conclusion the result of the enlargement of EU will not result in better incomes from tax-free sales that give benefits to the ship owner in direct terms. However, the alcohol tourism will increase but the ship operators will mainly be credited by an increased number of passengers from this development. The increase cannot be compared to the income from tax-free sales onboard the ferries. The result will be increased ticket prices and freight cost on the ferries. A development that already has started.

6.2 Ferry passenger traffic

Passenger traffic demands better service the longer the trip but the minimum demand is the possibility to eat and shop onboard. Travellers are divided into a number of categories:

- Business
- Tourism
- Pleasure
- Shopping
- Tax-free
- Conference
- Cruises
- Visits

The business category is sensitive for the design of time tables

The visiting travellers are a price sensitive category that adapts the number of travels to the cost, but also other adjustments like travelling route and crossing time are made.

Tourists chooses and prioritise the ferry traffic if the same is so unique that it itself is a tourist attraction.

Pleasure trips are of the category one-day-on-the-sea like a short vacation and/or travelling experience.

Tax-free trips are when the main motive for the trip is the tax-free purchases made onboard. Otherwise the passenger falls into the same category as the pleasure traveller.

Conference trips aims to attract the business conference parties that are very service demanding but also willing to pay for good service.

Cruises should not differ in respect of the time before tax-free sales.

Shopping tourism. The activity is split in two characters,

a) The modern pleasure is to shop. There is however a number of conditions for the shopping except for the special prices on the products. One is that some kind of entertainment is offered to create added value of the trip.

b) The newly developed market for shopping taxed alcoholic products from a country that has lower taxes on alcohols.

Before the abolition of tax-free in the EU, a number of polls and "stated preference" studies where made. The studies show that the passengers have strong consciousness of prise. It was clearly demonstrated by the response which is much higher if the ticket price is doubled than if it is halved. The crossing time and the trip frequency are not as important for the travellers. The travelling is however season related mainly due to the tourist summer season. However, the new tourism of shopping alcoholics is merely related to occasions and other seasons.

The passengers value the service onboard and find this an important factor. It is important to have access to both shops and restaurants. The business and visiting travellers that only uses the connection for transportation cannot see the need for service onboard but gives priority the ticket price. This means that they would travel more frequently if the price of the ticket were reduced.

6.3 Cargo transports on ferries

Operators in Scandinavia and primarily in Finland developed the Ro-ro concept. Since the 1960s it became common to unitise the cargo on rolling units in the service between Finland and Germany. The benefit of the operation was a fast ferry handling in the port having rolling ready units aboard the ship to be exchanged with similar ready units in the terminal. The efficiency of the ships operation increased and the operation was very flexible as the units could carry anything that was not rolling itself.

From Scandinavia peninsula the road and rail traffic had no other option but to use a ferry service connecting to Denmark or the Continent until the Öresund Bridge was operational in July 2000. For the railway the Öresund Bridge presented a shortcut as the link from Sjaelland (Zeeland) to the mainland Jylland (Jutland) was there a few years before.

The road and rail traffic had still the option to use the ferry service between Sweden and Germany or Poland, between Helsingborg – Helsingør and the ferry link over Rødby – Puttgarten to arrive at the Continent. Another option is the ferry service between Gothenburg – Kiel/Travemünde. The Bridge resulted in very few changes as regards the ferry service in these waters.

The difference between the services, for the exemption of the driving distance, is that drivers need a full rest after 9 hrs driving (the distance from mid of Sweden or Oslo region to South of Sweden. The rest should be at least 9 hrs if he likes to continue to drive on the Continental Europe for another 9 hrs. It implies that he favours services that can offer more than 8 or 9 hrs rest. This is favourable for the truck drivers that travel between Scandinavia and the Continent. Services can be found from Gothenburg to Germany, Trelleborg – Travemünde and South East of Sweden to Lithuania and Poland. Increased taxes on the German motorways will assumingly increase the popularity for these services. After a rest of 8 or 9 hrs[8] the drivers can take a full driving shift (9 hrs or 20 hrs if two drivers) to reach the destination.

The runners on the ferries seem to increase in number over the last years. The new EU members from predominantly Lithuania, Poland, Hungary and Romania are seen on the roads and ferries today. They are expected to increase the competition in road services all over Europe. We will probably see a continuing increase of trucks from the east European countries offering transports in Europe, as the salaries of their drivers are lower and the price is the most important factor for the choice of trailer operation. This will increase the number of runners on the ferries and probably strengthen the use of trailers in the intra-European operation.

Some factor that determines the choice of transport system are:

- Destination
- Transit time
- Batch size
- Costs
- Character of consignee (end user or agent)
- Schedule and frequency of the service
- Type of cargo carrier
- Cargo handling equipment

The cost of the transport can be as important as the cargo value for some shippers. Hence, the design of the transport systems is as important for the shipper as for the consignee. The integration of storage and logistic functions between manufacturer and the consignee increases. When a industry accepts the responsibility to supply products to the client it is quite common that the he also includes the responsibility to guarantee enough of supplies and components in stock to enable the client to fulfil his deliveries. The higher the goods value the stronger the integration. The logistic system is more and more considered to be an active means of competition and is presented as a sales argument for the customers.

The ferry service becomes a part in a transportation chain that is governed by short lead-time and customer controlled production. The just-in-time delivery systems reduce handling and storage, which justifies the added cost of more frequent transportation. The result is a door-to-door service that reduces handling and storage which justifies the higher

[8] Depending on the operating system, one or two drivers etc.

frequency of shipping and more expensive way of distribution. In this context truck, trailer and Ro-ro based traffic has the advantages of short lead times, high time precision (due to door to door transportation) and lower risk of damage (the driver can supervise the loading and unloading and is personally responsible for the cargo all the way on road between the ends).

Most of the cargo owners use shipping agents to arrange their shipments, but it is also common for shippers to outsource the transport to one or a few and larger forwarders with the capacity to cover a wider market and give supplementary types of transport services. Another way is to use a third or fourth party logistic services, which become more common. Shippers contract a logistic centre with high capacity to take the responsibility for the entire transport chain. The advantage is to cut down on administration costs for bookings, damage control etc. by outsourcing the logistic function.

A number of factors, where importance can vary between services, guides when selecting port or ferry line. Some factors are the same for most actors. The faactors can be split in categories (most of them are pretty obvious):

The geographical position: The position of the port in relation to the location of the cargo is of course important, but the infrastructure to and from and around the port also is. This may influence the total transit time as much as the distance.

The service of the operator: High frequency and/or good service is a prerequisite for the customer to choose the ferry. A quick and comfortable crossing is demanded as well as to arrive on the scheduled time. Trailer drivers demand good food and comfort at a reasonable price. Ferry operators focusing on a high service level on board will naturally be the first choice when the drivers have an opportunity to influence the choice of port/crossing.

Time: Time and day of departure as well as day and time of arrival are very important factors especially at long distance transports. The timetable must be suitable to the demand of the main target group's and it can differ widely between cargo- and passenger categories.

Price: is always an important factor, a good contract can overcome many other factors. The price of the ferry service is primarily calculated to get a cost coverage and reasonable profit from the service. In many relations the competition decides the price of the ticket. In a start up of a ferry operation the price of the ticket is mainly related to the cost of introducing the service.

An evaluation of the total cost is what rules the choice of route. "Stated preference" studies done show a direct priority to the transport route that gives the lowest cost for freight transports. When there is a choice

between alternatives, the one with the lowest cost is almost always awarded the contract. Changes in service that act favourable on the cost will directly give chances of increase in traffic over the connection. Long waiting times implies a cost increase that reduces the attraction. Over night departures are therefore of interest. The crossing time has no significant meaning if no faster alternative exists.

From the cargo point of view the service should have a timetable that satisfies the demand of the industry. The service should at the same time give the passengers a transport service.

The combination of the terminals location, the speed of the ship and the timetable gives the prerequisites for a high success factor when operators choose the ferry service.

6.4 North – South bound ferry operations in the BGWregion

The ferry operation in the Southern Baltic has a long tradition and is a well-established transport system. Most trips are between Denmark and Sweden where the traffic across the Sound is dominating due to high frequency and smaller ships. From mid 2000 the new Öresund Bridge opened and the ferry traffic stopped in the southern part of the Sound. Over a couple of years all ferry services in the Malmö – Copenhagen region ceased.

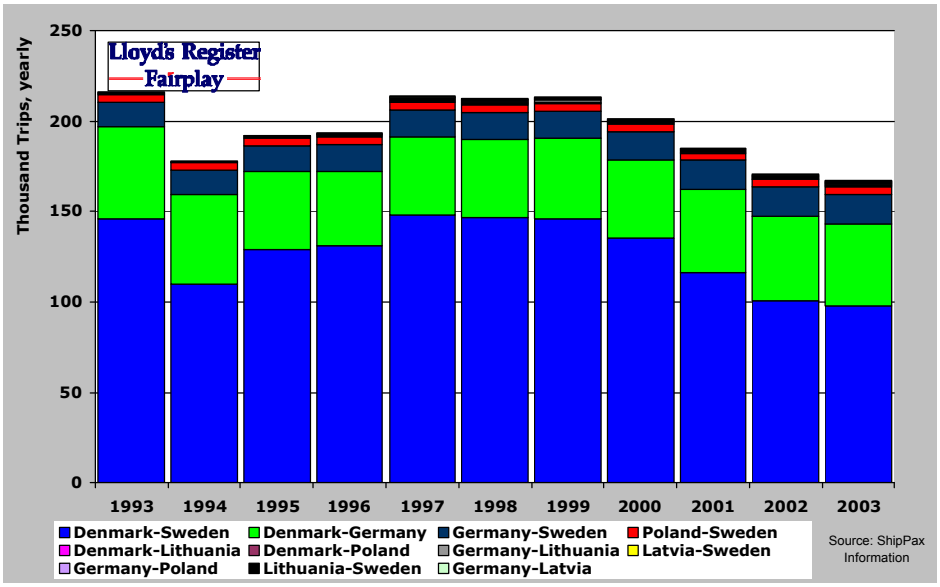


Figure 40: The total ferry traffic in the South Baltic Sea, No of trips[9]

Figure 40 shows a decrease in number of trips, due to the fixed-link. In most other relations we will later in this chapter show that the number of trips has increased the last ten years.

[9] Observe no domestic traffic included

The bridge came in operation mid year 2000. The volumes are still growing but it is estimated that half of the cargo passing the bridge is new local traffic due to the new fixed-link between Copenhagen and Malmö regions.

The statistics given in number of trips is not representative for the actual activity as the ferry operation over the Sound (Helsingborg – Helsingør) has a commuter character being a waterborne bridge with small ferries and regular high frequent sailings.

The demand for trailer shipment capacity has increased tremendously during the years. See Figure 41. The traffic shows a very steady growth representing an increase of 8 % over the 10 year period.

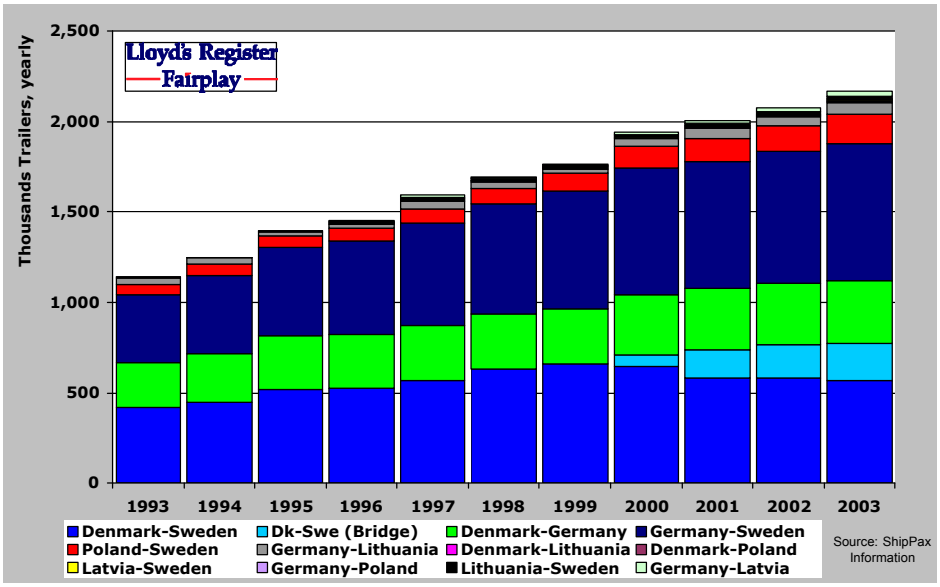


Figure 41: Trailer crossings in Baltic Gateway area incl. the Öresund Bridge

Looking at the monthly figures in Figure 42 it will give an idea of the activities over the year. It shall be noted the figures up to 1996 can be considered affected by the Estonia accident. The figures after 1996 would be more representative and it shows a fluctuation of about ±15 % over the year with a peak in the summer tourist traffic and the down period around the New Year. The difference in sailing frequency over the year varies for the different relations.

In general the gap between the summer months and that rest of the year in number of trips has decreased since the abolition of tax-free sales at end June 1999 and the inauguration of the Öresund Bridge at 1st of July 2000.

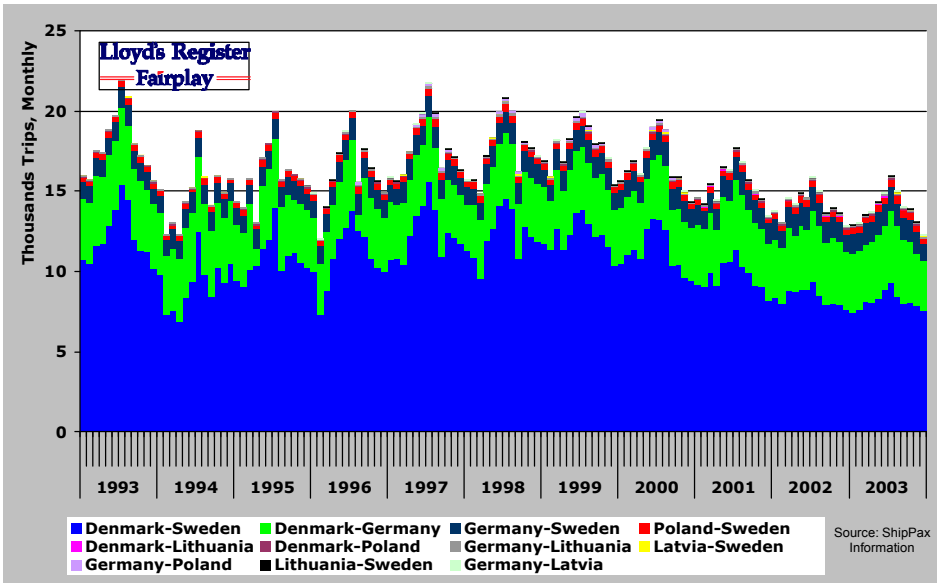


Figure 42: Monthly variations in ferry services over the years

The ones that still rely on passenger traffic are the ones that will increase their traffic over the summertime. Some of the operators do also increase the capacity for passenger by opening up space onboard that is closed in wintertime.

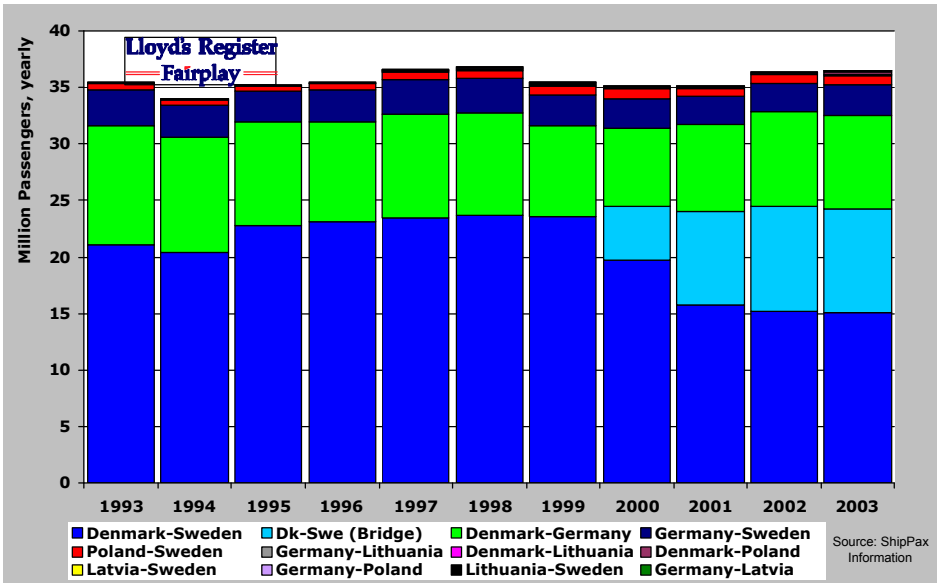


Figure 43: Passenger service in the Baltic Gateway region

Figure 43 shows a steady flow of passengers over all. The variation is approximately ± 2 million passengers per year with a slight increase over the past years. The loss of passengers in 1999 when the tax-free sales ceased was by now means anything near the substantial loss of passengers to the bridge in 2000 and onwards. In this case it is the ferry service in the relation between Malmö and Copenhagen that shifted to train transports when the ferry service was closed down. This can be compared to the development of freight cargo that merely shifted from ferry service to the bridge without loosing volumes on the other services.

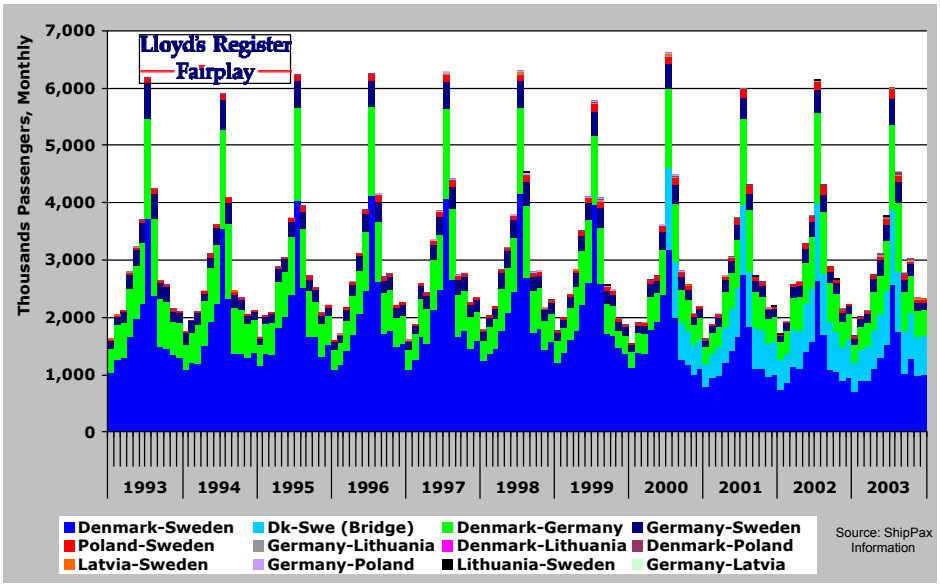


Figure 44: The monthly variations of passenger transport in the BGWarea

The extreme variations of passenger traffic over the year is visualised in Figure 44. The difference is up to 4 times in the summertime in relation to the down period in the middle of the winter. The tourist traffic in the summertime results in a situation where the ferries are fully booked both as regards lane meters and in passenger capacity.

In the following we focus more specific on the ferry operations in the regions of the Baltic Gateway area and start with the services between Sweden and Denmark.

Sweden – Denmark

The traffic intensity between Sweden and Denmark is known to be closely related to the cost difference of consumer products in the countries. Figure 45 illustrates that the passenger transport increased to a new level after the bridge opened but fell back to a normal level in the year after. This can be related to the novelty factor of “trying the bridge”. The simplified and increased railway service and the possibility to drive between the regions gave an expected and natural increase in passengers. A certain continuous growth is expected as the commuters increase in numbers. The statistics gives the impression of a step down of passengers in the north ferry services when the bridge came in operation. See Figure 46. It may the fact but it certainly also was an effect of the abolishment of tax-free that took place a year before. The traffic between Sweden and Denmark was the one most affected in Sweden apart for the traffic over Kvarken in the northern part of the country. One explanation can also be related to the temporary stable situation on the price levels between the two countries that did not give the incitement to travel. From the autumn 2003 this incitement came back in way of trips for the purchase of alcoholics, a tendency that can be observed in Figure 45.

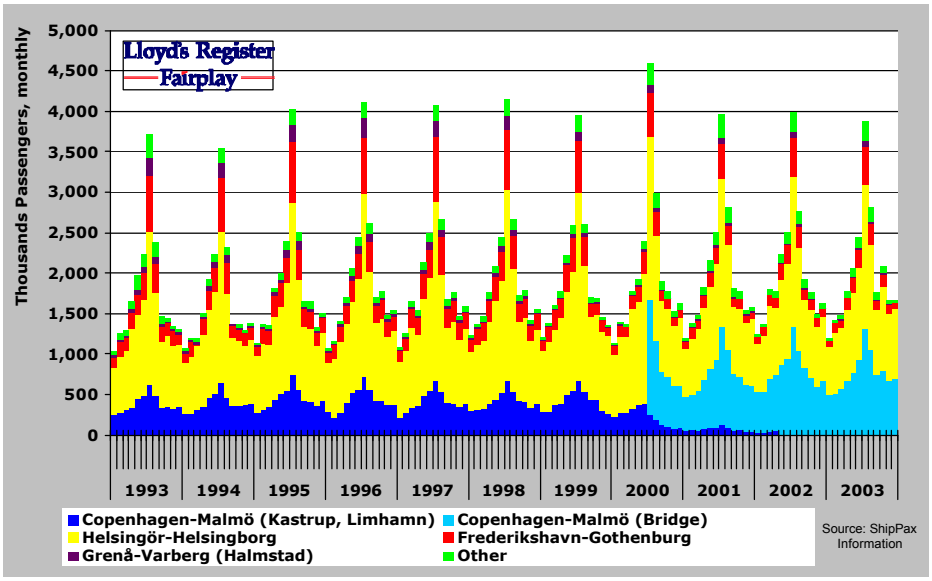


Figure 45: Passenger traffic Denmark and Sweden, monthly statistics

The great variation over the year is clearly visible in Figure 45. The variation may vary between 2 – 10 times depending of the character of the service.

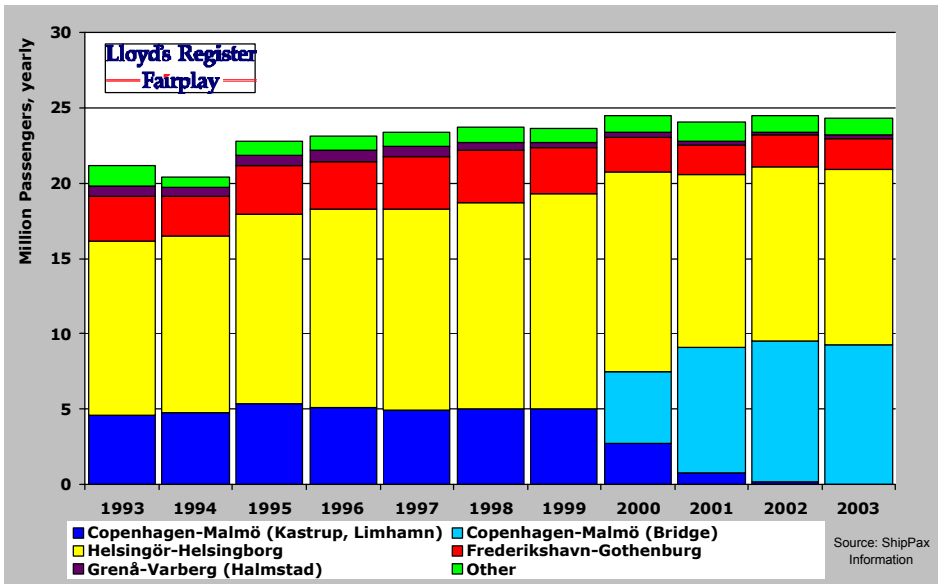


Figure 46: Passenger traffic Denmark and Sweden, annual statistics

For the ferry traffic the demand for trailer transports very much sets the demand of capacity. The operator can choose in either increasing the frequency or increasing the size of the ships. Looking at the Figures presenting the different services it is striking that the smaller operators and services tend to increase the sailings as the demand increases while the big operators starts to use larger ferries.

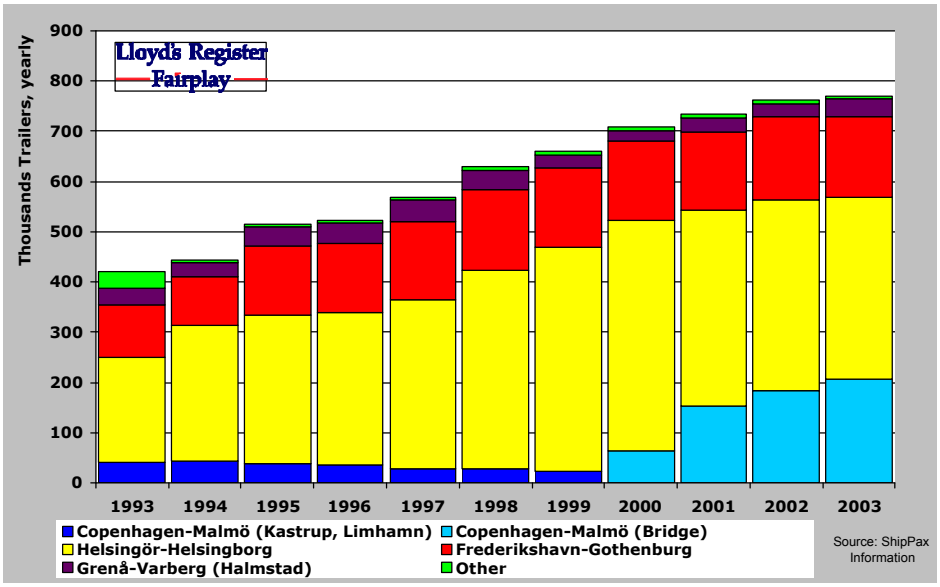


Figure 47: The trailer transports between Sweden and Denmark

The main traffic direction in the relation Denmark – Sweden is in the North – South direction. Studies in the 1980s showed that 50 % of the trailer traffic was in relation with Denmark, 25 % were in relation with Germany and the final 25 % had other relations. A later estimate says a split of 50 % on Denmark and 30 % on Germany, which confirms that the split is of approximately the same level. There is no statistics to confirm these figures. The estimate comes from the port of Helsingborg in the north of the Öresund region.

Sweden – Germany

The traffic over Öresund by ferry and also to some extent via the bridge is competing with the direct North – South ferry connections between Sweden and Germany. See Figure 48.

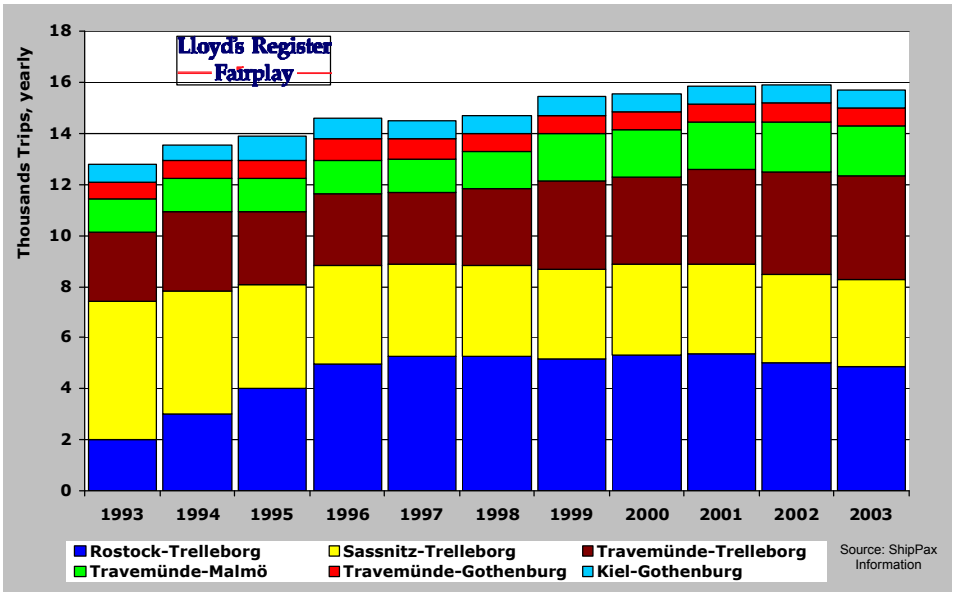


Figure 48: Ferry trips between Germany and Sweden

The service between Sweden and Germany is known to be a major and heavy fairway for the trailer and trains. 70 % of the southbound rail operation is forest products. At the railway only about 30 % of the transport capacity is used in the northbound service.

The demand in freight service gives a traffic growth historically of about 7 % per year. The tonnage has increased in size over the years to meet this. The Öresund Bridge meant a minor cut of railway traffic in the area. This affected mainly the connection Trelleborg – Sassnitz ferry service. Coming from a level of about 4 million tons in the overall rail ferry traffic the service in Trelleborg is still having about 3 million tons of goods.

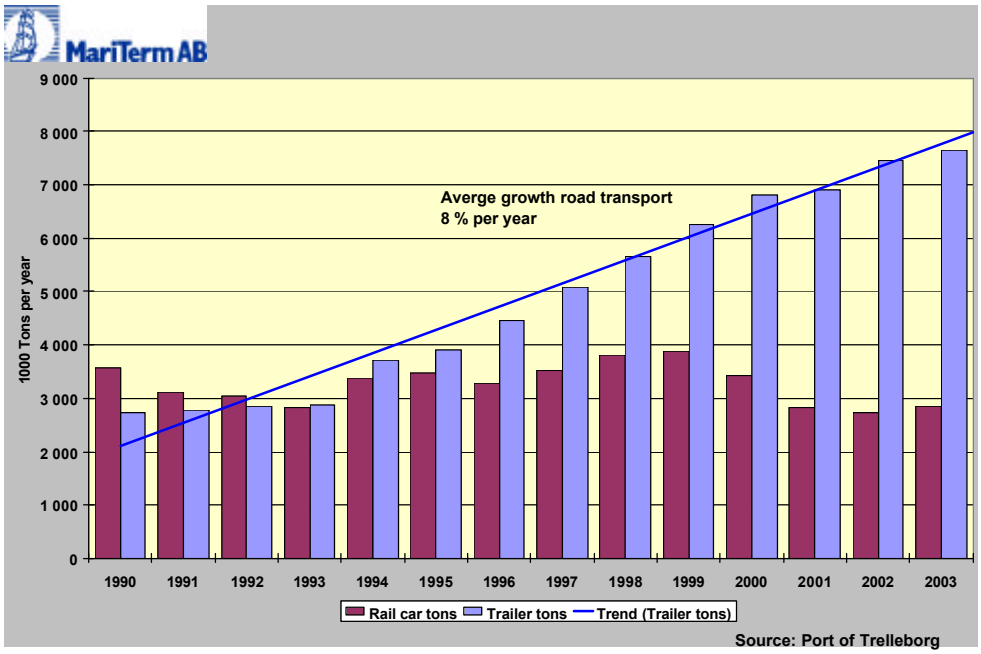


Figure 49: The trailer and railway traffic between Trelleborg and Germany

The sailing time to Sassnitz is about 3.5 hrs and to Travemünde 8.0 hrs, the latter is favourable as it gives the driver enough time to rest for further driving.

It can be noted that the Sassnitz ferry link lost volumes as Germany was reunited. This was probably because of the increase in cost for rail freight that followed the integration of the railway in East and West Germany.

The trailer volume growth in Trelleborg has been on both the Rostock and the Travemünde trade.

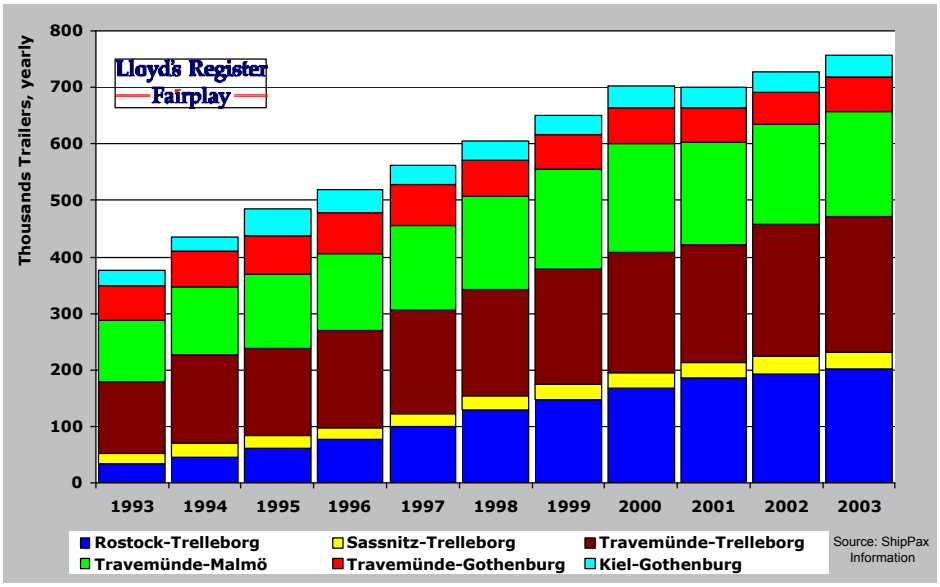


Figure 50: The trailer traffic between Sweden and Germany

The North – South traffic flow includes not only Swedish traffic but also Norwegian transit trailers to the continent. Traffic to Sweden outside the Baltic Gateway region has been at a very consistent level over the years, a fact that may change in summer 2004 where Stena is to operate larger more modern Ro-ro capacity at the Travemünde to Gothenburg line.

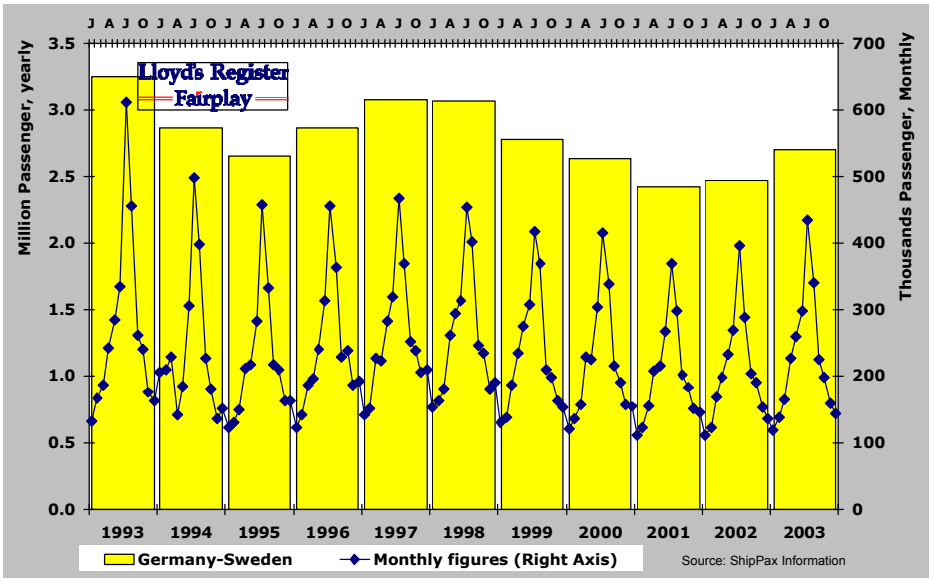


Figure 51: Passenger transports between Sweden and Germany

The traffic is affected by the tourist traffic in the summertime. As this is a low period for freight transports it suites the service and the tourist traffic is the one that designs the passenger transport capacity of the services.

Denmark – Germany

The route between Denmark and Germany is mainly by the fixed road passing the border between Jylland and Nordfriesland. Several minor ferry services connect the two countries. Important transport links are the high capacity service between Rødby –Puttgarden (the second largest in

the BGW area) and also the Gedser – Rostock connection. As these are the services that relates to the trading and trade development they are the only ones considered in this statistics.

This service is very stable and mature which shows in the number of trips that are produced every year.

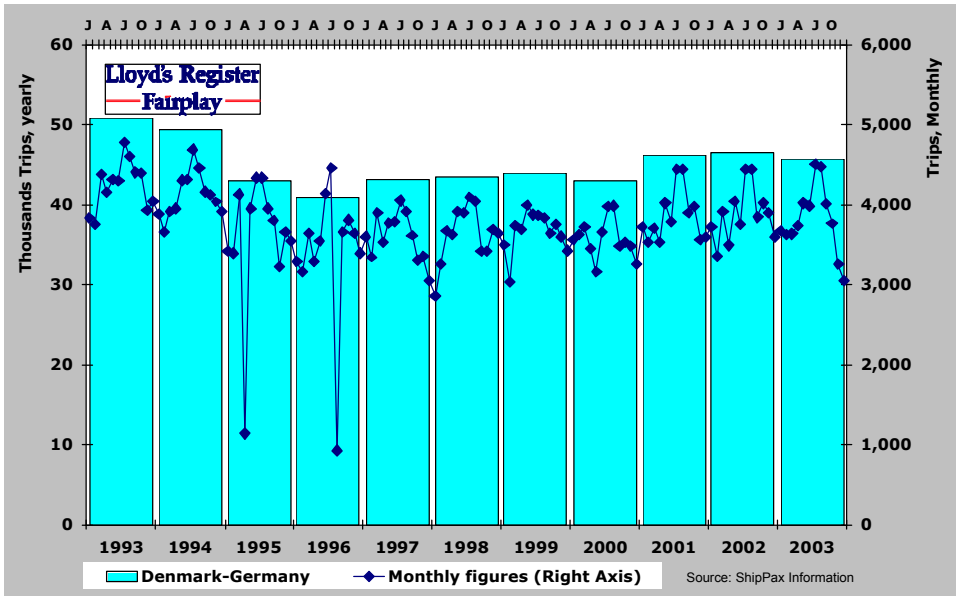


Figure 52: Ferry trips between Denmark and Germany

The number of trailers on the service shows a steady growth of about 3 % while the No of passengers shows a slight declining trend.

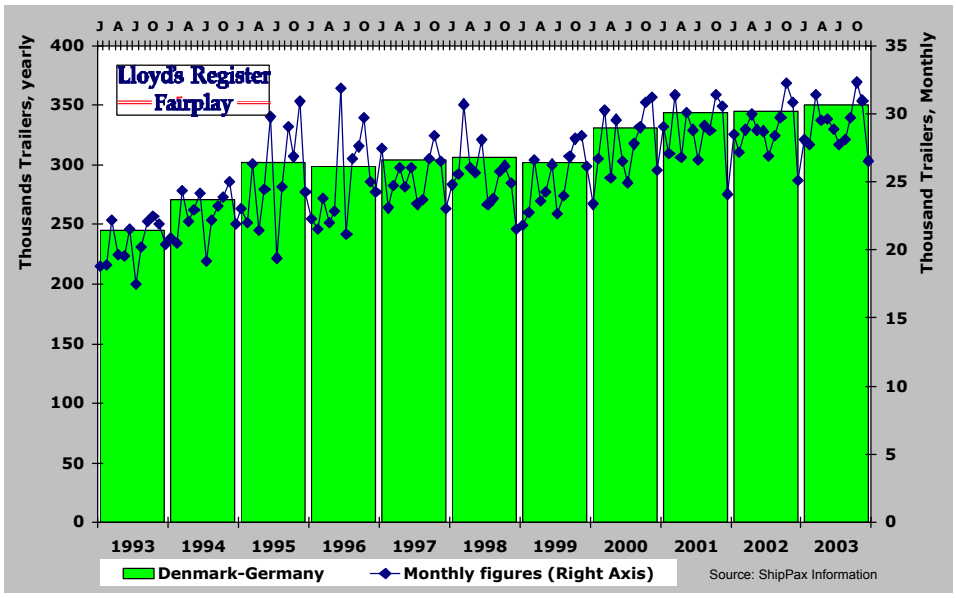
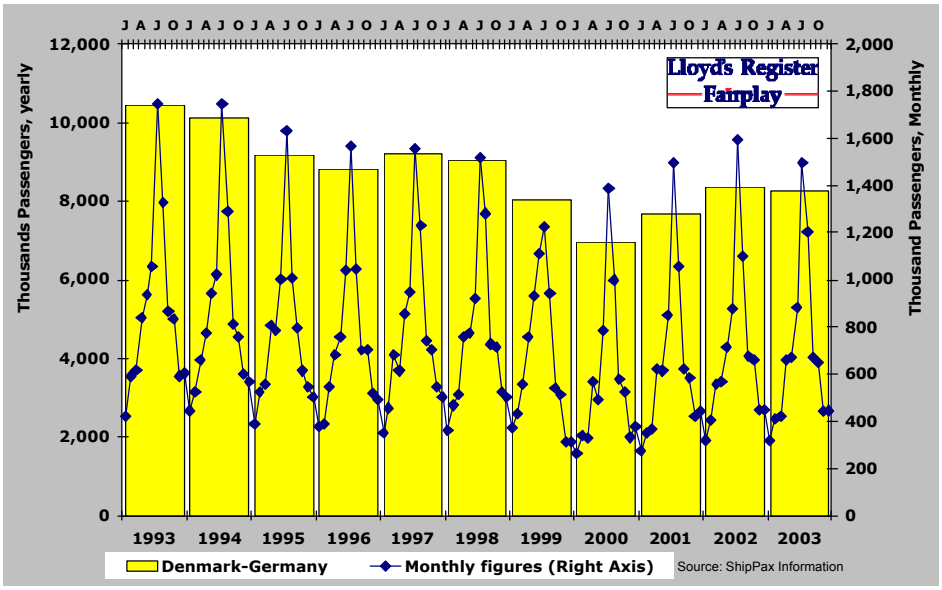


Figure 53: The trailer shipments between Germany and Denmark



Sweden – Poland

The new market from many perspectives comes in the services between Scandinavia and the east European countries. Here we find the highest percentage growth in service as well.

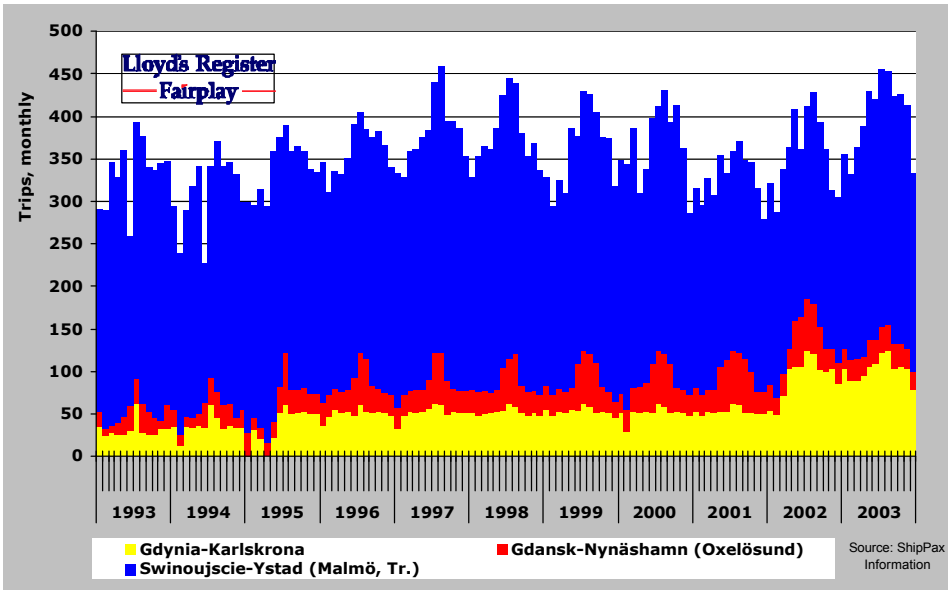


Figure 54: Ferry services between Poland and Sweden

The ferry service between Poland and Sweden increased slowly until year 2000 but it has taken up speed since then.

The rail traffic increased when the German countries were united, see Figure 55, but has decreased since then. The rail traffic has not been affected by the opening of the bridge. This may indicate that the bridge is no alternative for the cargo that uses the link. The major growth of cargo is in the trailer traffic.

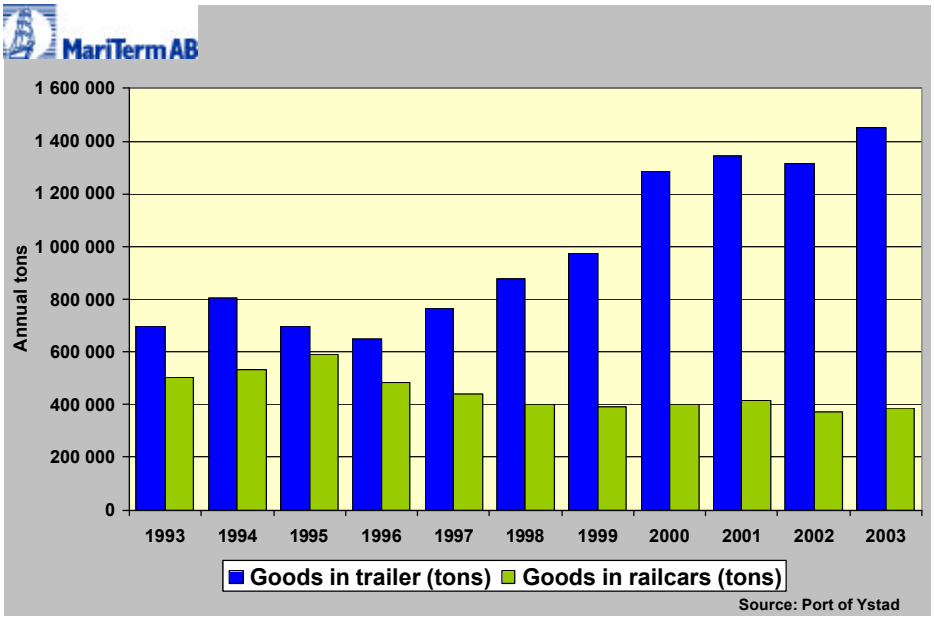


Figure 55: The development of rail and trailer cargo Ystad-Poland

The tendency is the same as for the Trelleborg traffic, a fast increase of trailer cargo and a quite stable rail cargo volume. The sailing time is 6.5 hrs, which is a comparatively short time for crossing in the direction.

The growth of trailer cargo has an average of 12.5 % since 1996, which is extra ordinary. Still it can be expected to increase even more if the service and cost can be met by Poland in comparison to Germany for the North-South bound transit trailer and rail cargo.

The planned taxes on trucks in Germany can make this link look very positive if you want to avoid the taxes. This could be the way to avoid the German road and enter into Germany from Poland at a position that gives as short way as possible in Germany.

The potential should be looked upon in the view of the traffic situation in Germany and the cost of transporting in Germany versus Poland. Then again the infrastructure and the rail/road service must be available at good standard in Poland in order to be a competitor.

The actual number of trailers on the ferries to Poland from Sweden today is about one fifth of the Sweden – Germany traffic.

There is a recent large growth on the Karlskrona – Gdynia service where the number of trips doubled over the past two years. The service is responding to a demand that comes from the trailer operation. See Figure 56.

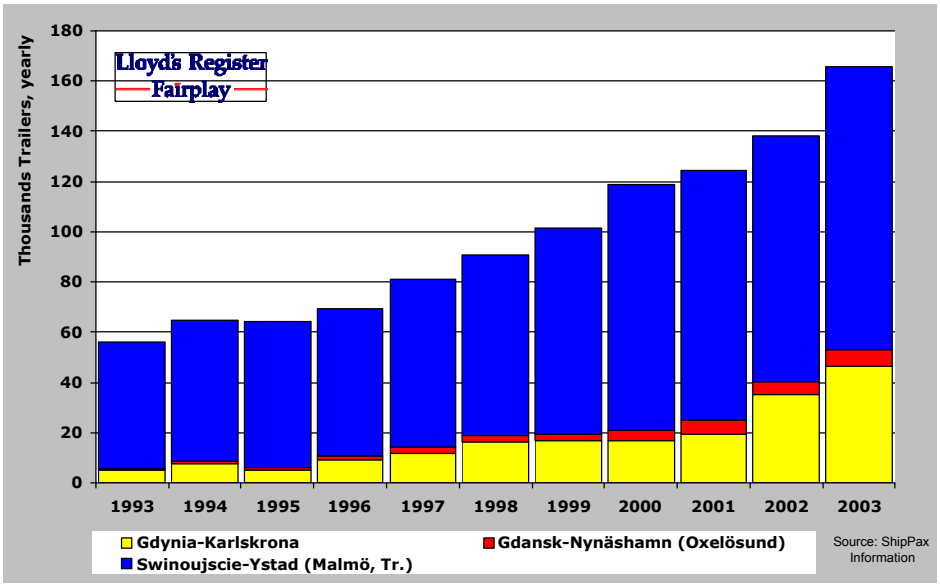


Figure 56: The increase of trailer traffic is huge between Poland and Sweden

The enlarged EU will probably give extra fuel to the demand for transport capacity and the service, especially on Poland, must be considered as well positioned both as regards road and rail transport capacity. The question is; how fast will the development come?

6.5 East – West bound ferry operations in the BGWregion

The east – west ferry services are a new market that has a potential for the future. Already during the time of the Soviet Union there were connections between the Baltic States and East Germany. The east – west bound services is expected to grow in importance and volume as it gives a service to the regions that has more shipping activities and represents a shortcut between markets.

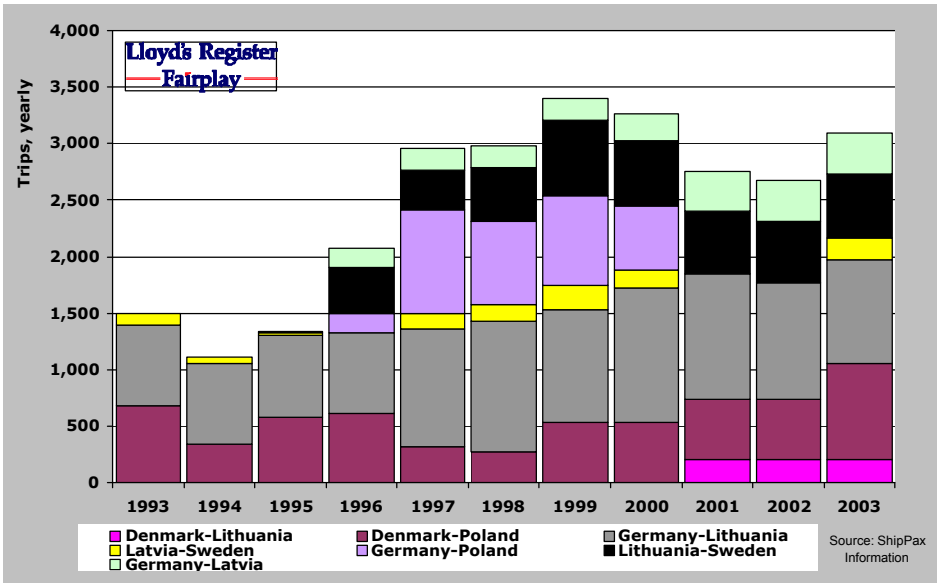


Figure 57: The services East - West ferry relations

The statistics illustrates that a lot of operators has been trying the market for some years with various result. Services have opened, closed and

shifted between ports. As the market and the demand for services between west and east Europe grows the market will become more stable. The number of trips for the entire east – west traffic is about one fifth of the number between Sweden and Germany and about 2/3 of the one between Sweden and Poland.

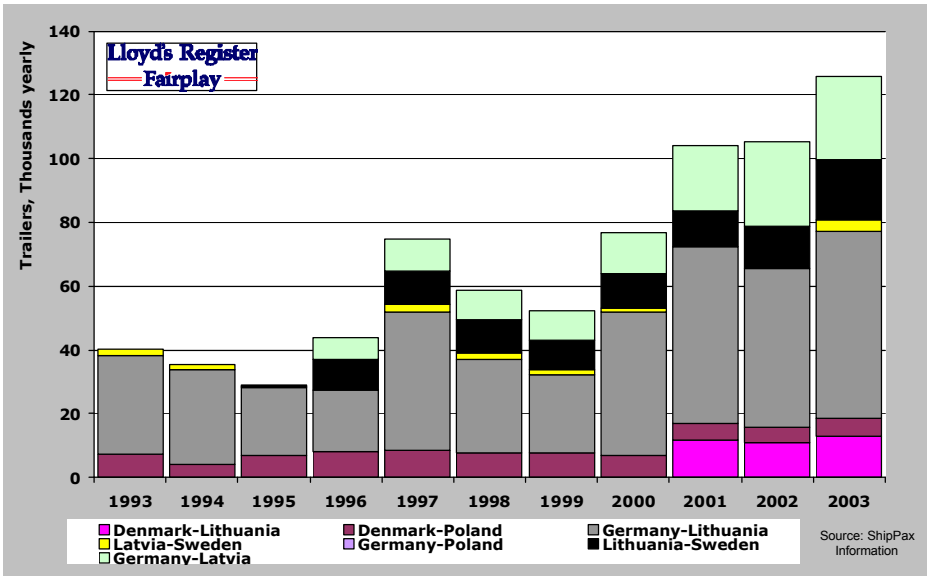


Figure 58: East – West trailer transports

The ferry service between Germany and Lithuania is dominating as regards number of sailings and trailers. We find also a new service between Denmark and Lithuania for trailers.

Figure 59: The ferry between Denmark Lithuania docking in Klaipeda

The passenger service is clearly dominated by the service between Denmark and Poland.

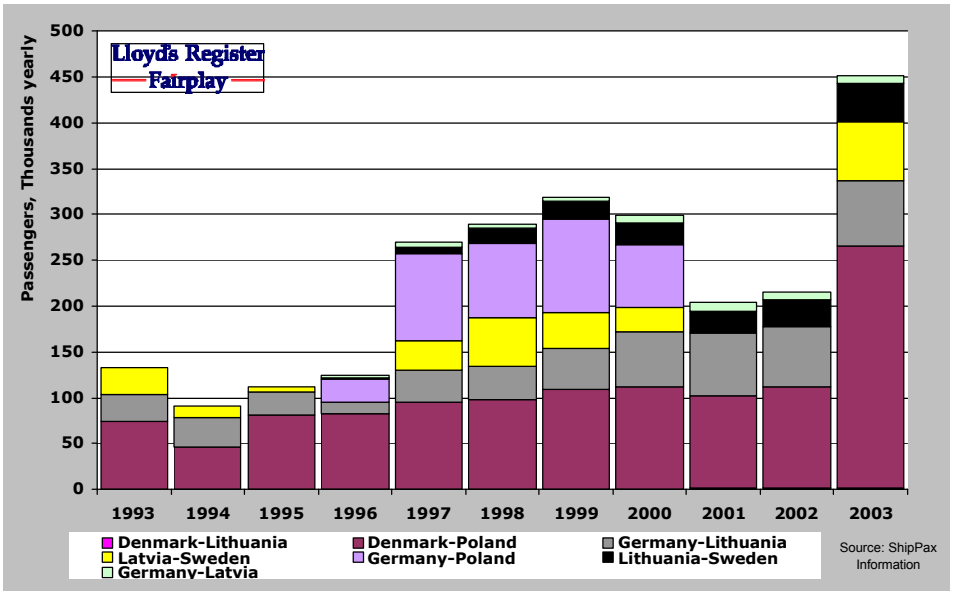


Figure 60: East – West passenger transports

Poland – Denmark

The traffic between Denmark and Poland is mainly a connection from Copenhagen to Swinoujscie (5 sailings/week). In 2003 a service between Copenhagen and Gdansk was added, but it was closed later in the year due to lack of profitability. Since the new service was essentially a cruise ferry operation, the passenger numbers showed a sharp increase during the time of this operation.

The figures increased remarkably for the passenger transport in 2003, which could indicate the increased cruising/tourism demand that has been fulfilled by the new ferry service. See Figure 62.

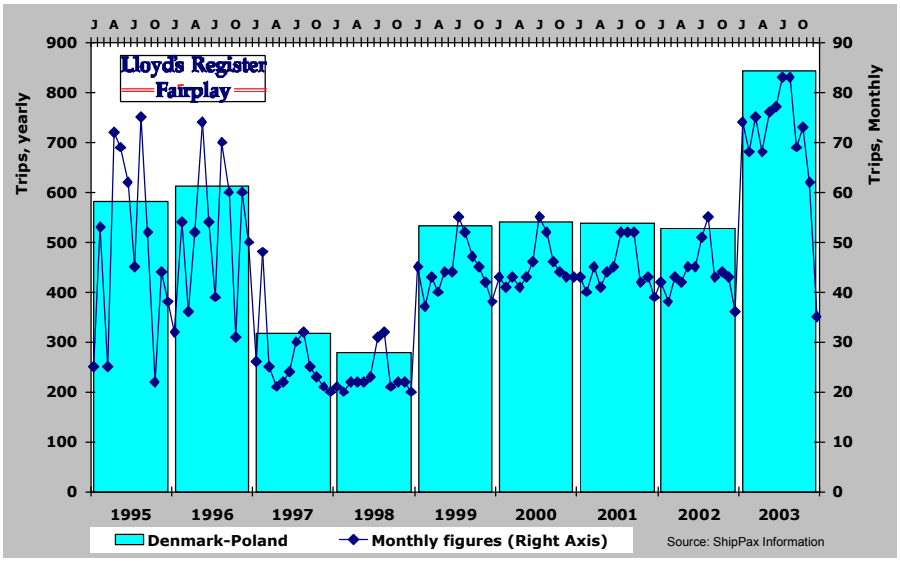


Figure 61: Ferry services between Denmark and Poland

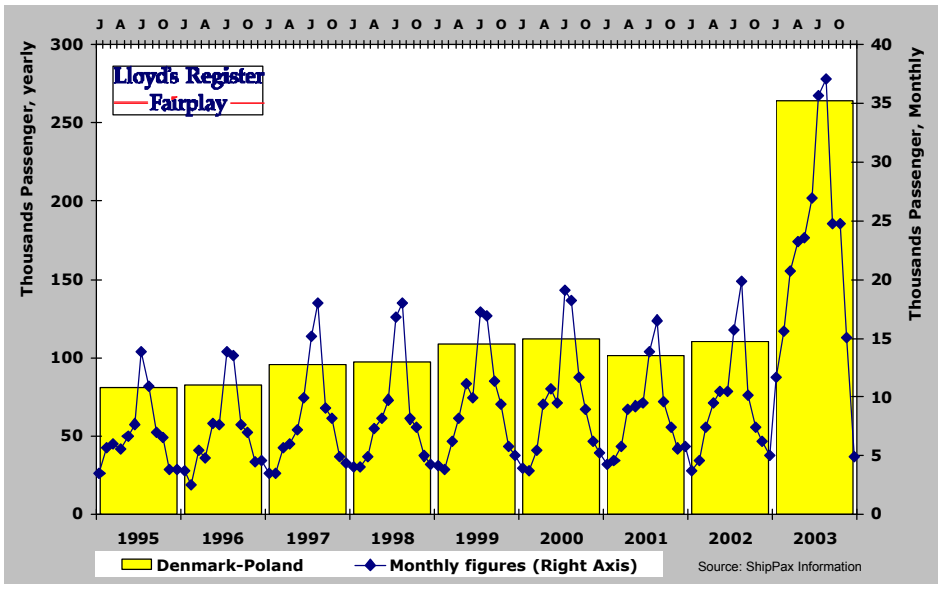


Figure 62: Passenger service between Denmark and Poland

Lithuania – Germany

In the end of 1980:ties a giant project for the time was invested in as a rail-ferry service between Klaipeda and Mukran south of Sassnitz. Some of these vessels are still in operation from Lithuania.

Figure 63: LISCO Lines ship for transports between Klaipeda and Mukran

The service between Germany and Lithuania is very stable since 1997 but the turnover of goods and passengers are increasing in total. There is one traditional service between Klaipeda and Sassnitz (3 calls/week) that is slowly decreasing, and one new between Klaipeda and Kiel (8 calls/week) that increases.

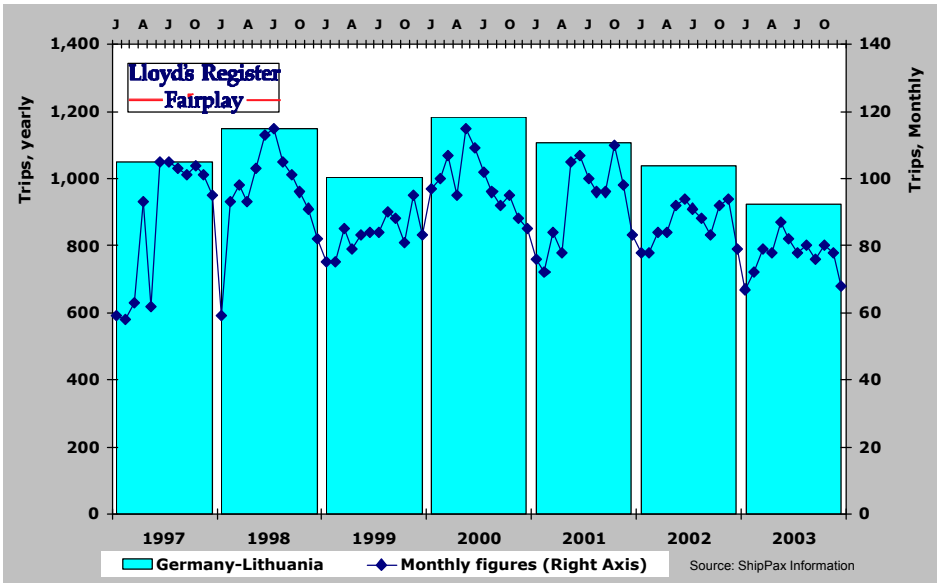


Figure 64: Ferry service between Germany and Lithuania

The total figures shows a growing demand primarily for passenger service, see Figure 66, but from 1999 an on also for trailer/cargo service. See Figure 65. The railcar service ceased in year 2001on the ferries.

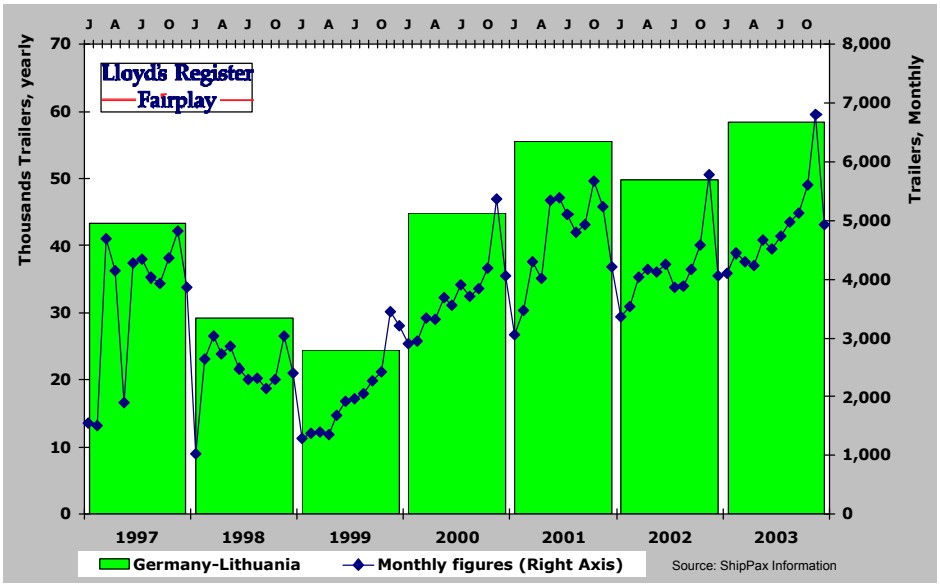


Figure 65: Trailer service between Germany and Lithuania

Both the passenger and the trailer service between Lithuania and Germany show increasing volumes although the total volume is small as a ferry service.

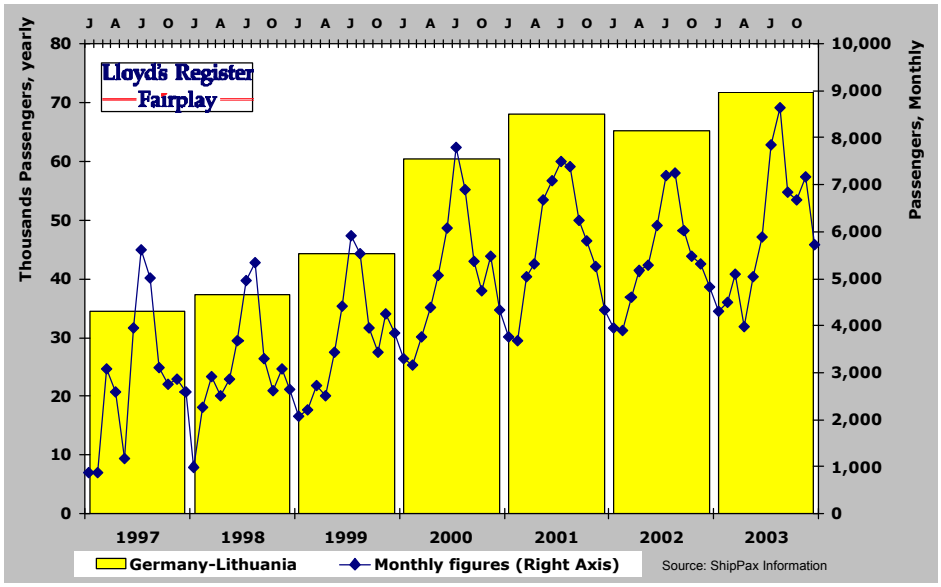


Figure 66: Passenger service between Germany and Lithuania

Lithuania – Sweden

A new fast growing service has begun to mature between Karlshamn and Klaipeda. The service has tested several relations from Klaipeda to Sweden, Åhus, Malmö and Stockholm to finally settle down in Karlshamn. The length of the service is 14 hrs, which is a comparatively long time for passengers to have patience to travel for leisure and cruise trips. It can be seen from Figure 69 that the turnover of passengers on the service is quite modest.

The service is today 4 sailings per week.

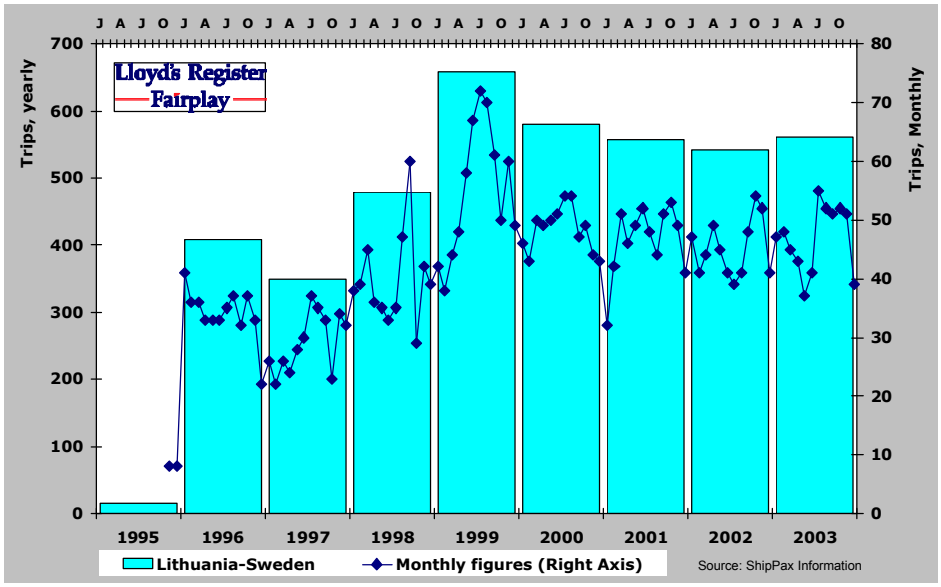


Figure 67: Service between Lithuania and Sweden

The market for the service is most probably trailer traffic between Lithuania and Sweden/Norway.

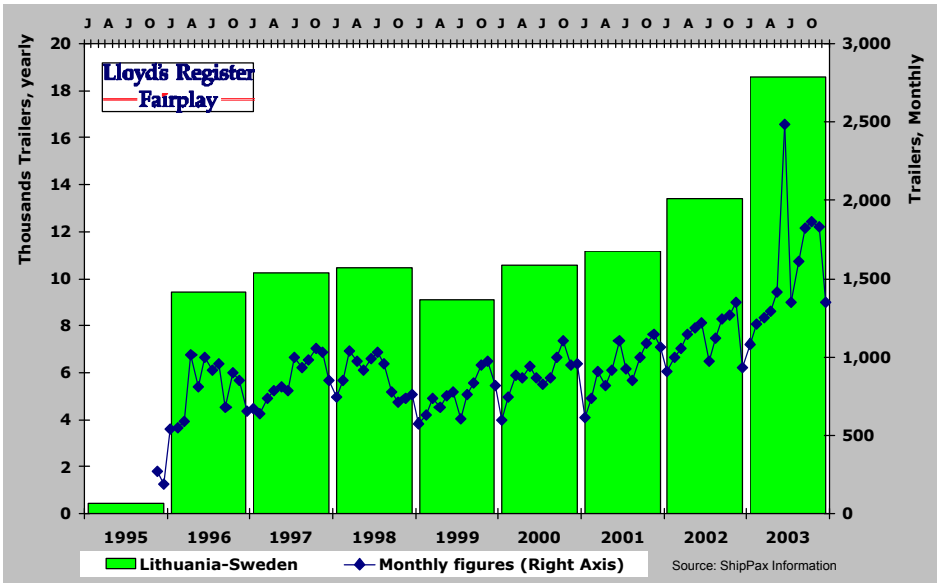


Figure 68: Trailer turnover on the service between Sweden and Lithuania

There is a relatively low monthly variation of trailers over the year. There is a firm tendency over the last years of an increase in trailers on the ferry.

Figure 69 show that tourists very marginally choose the service but in 2003 we find a large increase of tourists (high number of passengers in the summertime) and also the fact that the monthly volumes are steadily increasing over the last few years. The ports claim that the major part of tourists comes from Germany and Denmark while the Swedes are slower in finding pleasure in exploring new areas.

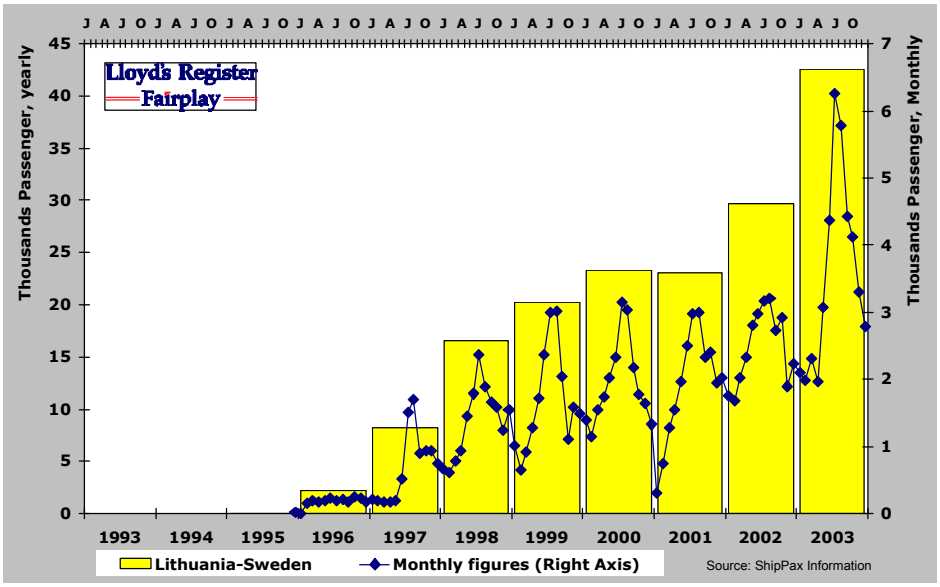


Figure 69: Passengers on the service Lithuania-Sweden

Latvia – Sweden

Another service that has a history in trying to find its port in Sweden is the service on Latvia. Today there are two services that are calling Latvia from Sweden. One service call Liepaja and Karlshamn and there is a new

service between Stockholm (Nynäshamn) and Riga. The latter service has been a bit on and off but seems to be gaining volumes after the last restart.

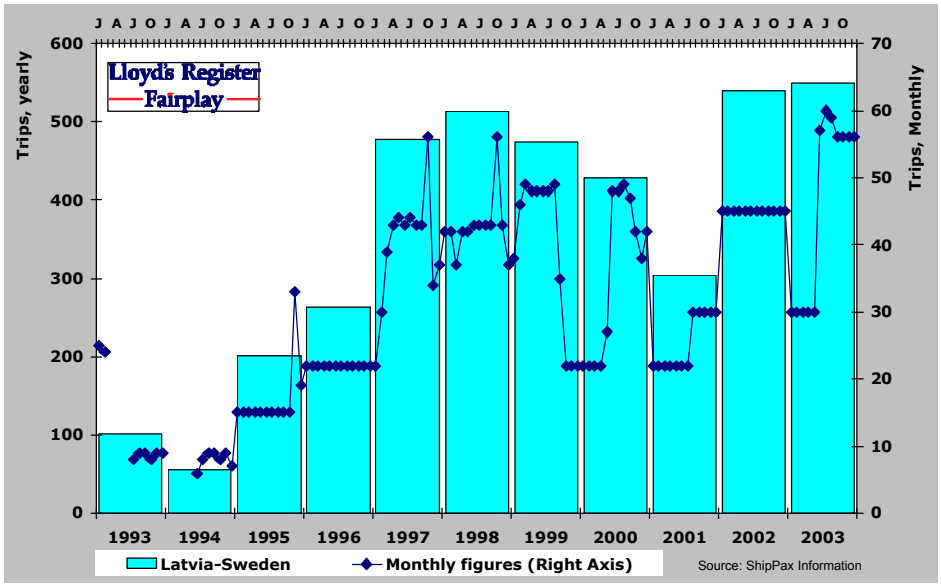


Figure 70: Ferry trips between Sweden and Latvia

In Figure 70, the number of trips per month is indicated and the major variations come from services that start and stop over the year.

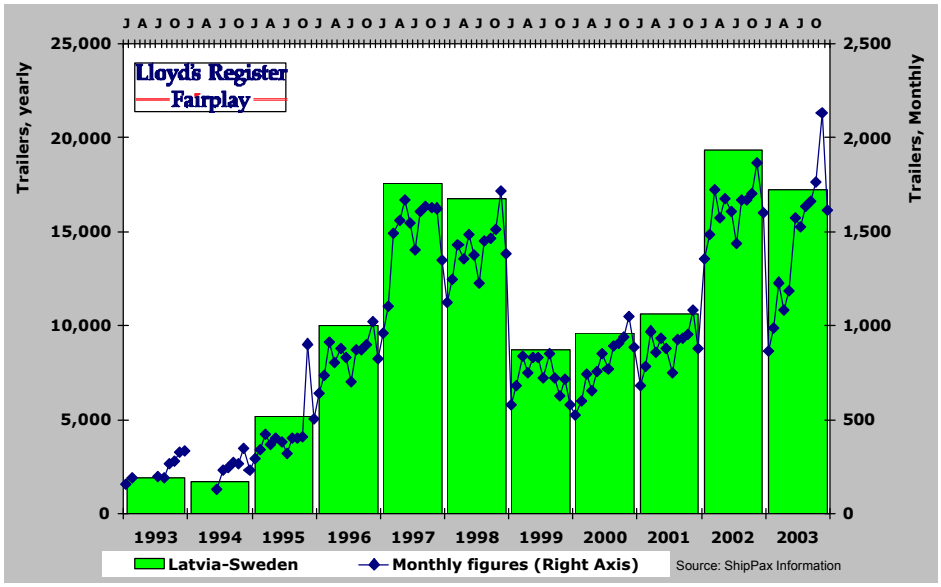


Figure 71: Trailer (goods) volumes transported on Latvia-Sweden services

Figure 71 indicate the monthly variation of trailers and it can be noted that the new service in 2003 did not cause a drop in the other service why these trailers came as additional cargo volume between the countries. It implies a demand for transport services in this direction that now has been initiated.

7 Current transport by cargo type – important trade lanes

- **The dominating trade lanes are the links to the North East Continental Europe and IRL/UK**
- **Oil products and Dry Bulk are the major commodities in volume, having an equal share of about 40 million tons annually**
- **In the high value segment the Ro-Ro traffic on Finland dominates the trades**
- **The General Cargo shipments are important and highly diversified; leaving no trade pattern to show. Operations are in a total network**

7.1 Trade, cargo flows and transport modes

In the approach used in this report the total trade is organised, aggregated and presented on general levels like “wet bulk”, “dry bulk, “general cargo”, etc.

The “wet bulk” category consists mainly of crude oil and refined petroleum products, but liquefied natural gas (LNG), liquefied petroleum gas (LPG), some chemicals and some vegetable oils and fats are also included here.

The “dry bulk” category is mainly including products such as ores, minerals, metals, other energy commodities than above and some basic wooden products such as lumber.

In the “general cargo” category, most of the remaining product types are included. Products not included here are the ones not drawing upon a physical transport as described in Figure 72, such as electric current.

There are no overall statistics available that present the relation between the types of products being traded and the way they are transported on a country-by-country level. Therefore an approach to arrive at the modal split is called for.

On a country-by-country basis, the modal split for the trade between the two countries has been estimated for the three major cargo groups (general, liquid bulk & dry bulk). In several cases, this estimation has been done on much more detailed cargo level than the basic three categories.

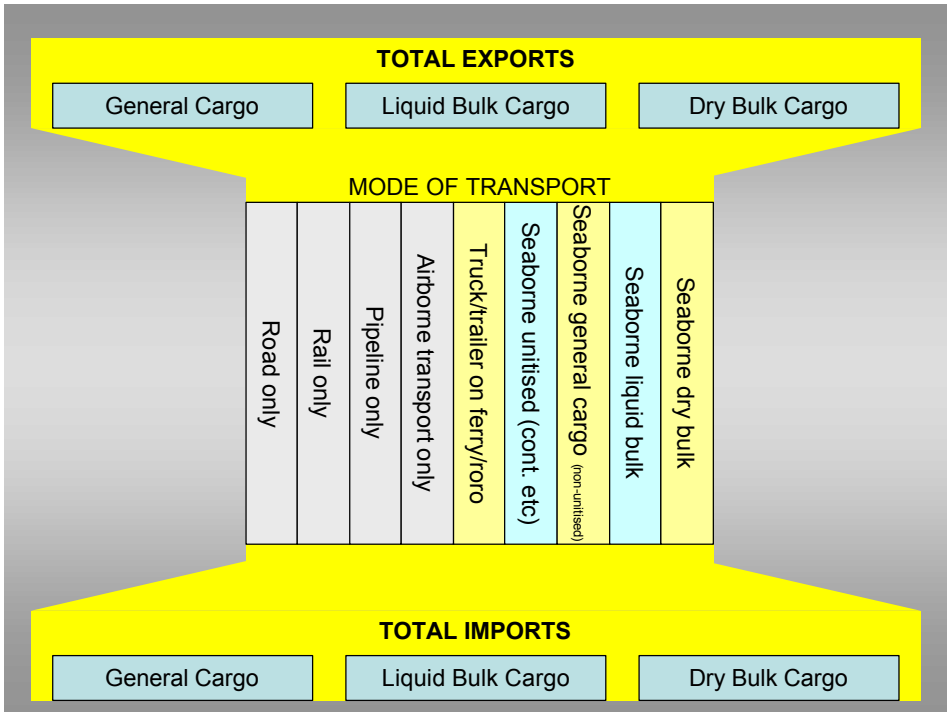


Figure 72: Trade product flow illustration

References used for the qualitative assessment have been the very limited data available on modal split, port data aggregated to country level and the aggregated cargo carrying capacity of the vessels trading between the countries.

For trade between countries outside of the BGW area, (but that could be assumed to be utilising the transport capacities within the area, such as for instance trade between Finland and France,) the same approach has been used.

The information in this report is to be regarded as a projection of the sea transports on to land transport modes. That is:

Ferry service, trailers; Road transports on average 15 tons per trailer[10]

Ferry service, trains; Railway

Ferry service, passengers; Roads, train and bus service

Industries active on the market for wet and dry bulk products are in many cases located nearby the sea or a river with a direct connection to a port. Often this port is owned and operated by the industry itself.

Those bulk product industries that are located inland usually have their distribution to the port furnished by rail or pipeline. Some industries, utilise cableways, but most of these have been replaced by trucks today.

[10] Based on a number of ferry services where the total weight and the number of trailers are registered

The transport mode delivering products to the ports is and will be specific for the conditions of each individual port. This report indicates the possible growth/decline in volumes on a macro level.

From a spatial development and planning point of view the information must be handled on a micro level. Specific information of this kind must be obtained from each port. The information given in this report can be used in general terms as a guideline to the anticipated development of traffic over the ports and by type of cargo.

The figures presented are the historic cargo volumes in each port in tons by category, passengers in each port in number, trailers in each ferry service in No of units, containers in container terminals and the rail operation in tons per year. The projected figures are on a country-by-country level with an indication of the individual port's possible position in this development.

7.2 Total cargo flows 2002

The South Baltic Sea area has been described as an area having high sea transport activity and that acts as a "gateway" for the communication between the Continent and Scandinavia/Finland and Russia to North Europe.

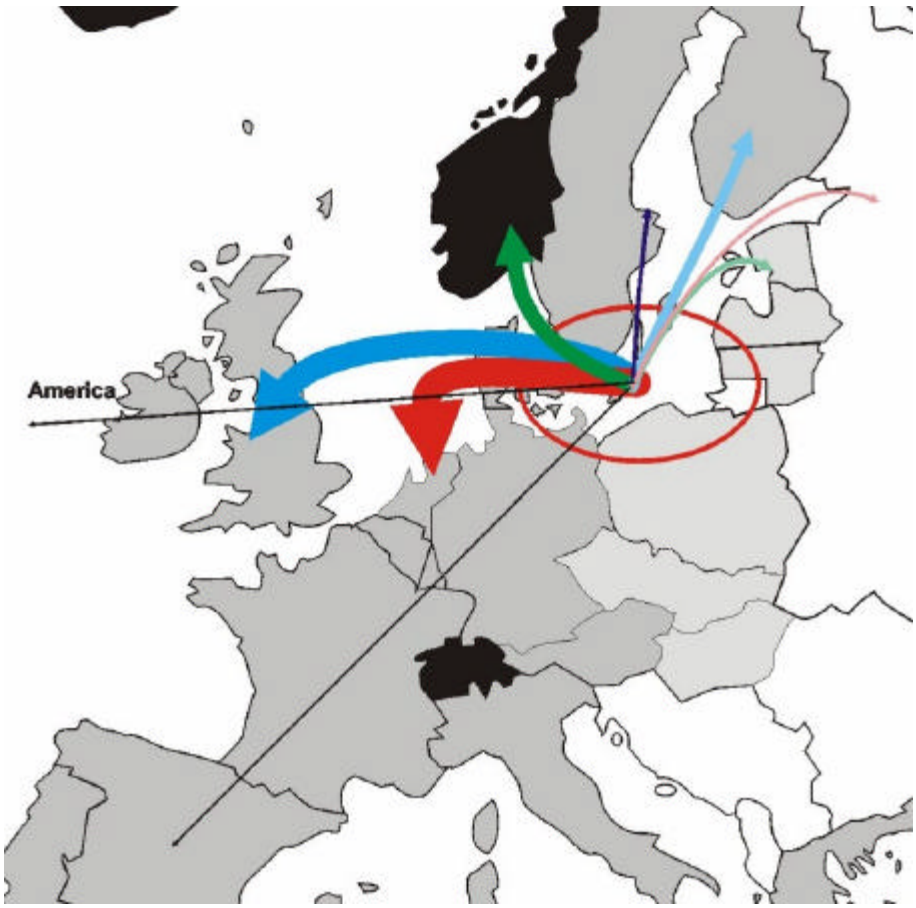


Figure 73: The most important trade lanes in proportion

As Figure 73 illustrates almost all the large volumes to/from the region ends up/come from North Europe.

Further on in this chapter the trade lanes for different cargo types are presented.

In broad views the southbound cargoes are forest products and steel products in industrial shipping systems to the port terminals in Germany. These products are distributed to consignees in Europe by road or rail from the terminals. In return many of the shipping systems carry consumables from the continent to Finland.

The ferry systems between Germany and Denmark/Sweden work in the same way but due to the short distance there is a high number of private cars and passengers as well as direct road and rail cargo traffic on the ferries. The traffic between Sweden and Germany including the links over Denmark are without comparison the largest routes. This traffic can be considered to be within the BGW area even if there are supporting services that come into the region from ports north of the region, such as Gothenburg to Kiel/Travemünde.

Table 39: Seaborne volumes between the countries in the BGW area

2001	General cargo - **seaborne volumes**		Crude oil & oil products - **seaborne volumes**		Other bulk - **seaborne volumes**	
Trade relation (exp+imp)	1000 tonnes	Avg annual growth 95-01	1000 tonnes	Avg annual growth 95-01	1000 tonnes	Avg annual growth 95-01
Denmark - Germany	1,356	3%	37	-7%	854	-5%
Denmark - Russia	492	4%	800	-15%	2,222	8%
Denmark - Latvia	123	28%	179	12%	183	13%
Denmark - Lithuania	198	11%	93	7%	96	8%
Denmark - Poland	159	2%	373	12%	2,148	-5%
Denmark - Sweden	2,602	5%	4,691	3%	4,130	1%
Germany - Russia	2,773	5%	4,989	7%	3,435	10%
Germany - Latvia	61	17%	26	-36%	124	4%
Germany - Lithuania	158	11%	76	37%	118	6%
Germany - Poland	0	0%	0	0%	0	0%
Germany - Sweden	4,775	5%	2,176	-1%	9,986	-1%
Poland - Russia	213	5%	5,977	13%	1,678	-5%
Poland - Latvia	9	24%	0	-20%	5	11%
Poland - Lithuania	33	33%	309	24%	29	34%
Poland - Sweden	817	12%	636	11%	1,611	-3%
Sweden - Russia	266	6%	1,572	36%	719	50%
Sweden - Latvia	133	17%	685	-13%	877	58%
Sweden - Lithuania	108	8%	436	61%	569	34%
Intra - Baltic Gateway	14,273	5%	23,054	4%	28,783	1%

7.3 Wet cargo flows in 2002

Crude oil

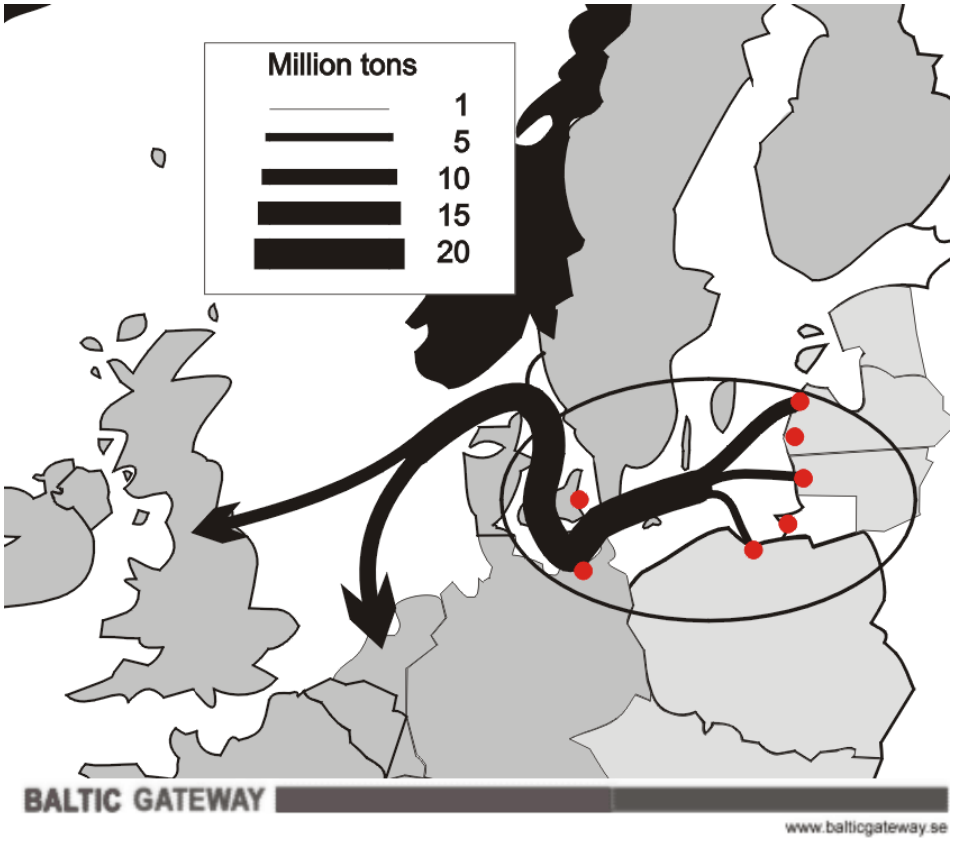


Figure 74: The crude oil trades

A few hands control the Russian crude oil production. Russian interests have decided that the major oil export flow in the years ahead should be via the ports in the Gulf of Finland.

The existing export capacity in the ports in Latvia, Lithuania and Kaliningrad will for several reasons continue to be utilised, but the entire expected oil export growth will be distributed via the outlets in the Gulf of Finland – primarily Primorsk.

Most of the Russian crude oil exports from the BGW area are shipped to refineries in North Western Europe as illustrated above. Some smaller volumes are shipped to crude terminals within the BGW area to be re-exported on larger vessels.

Oil products

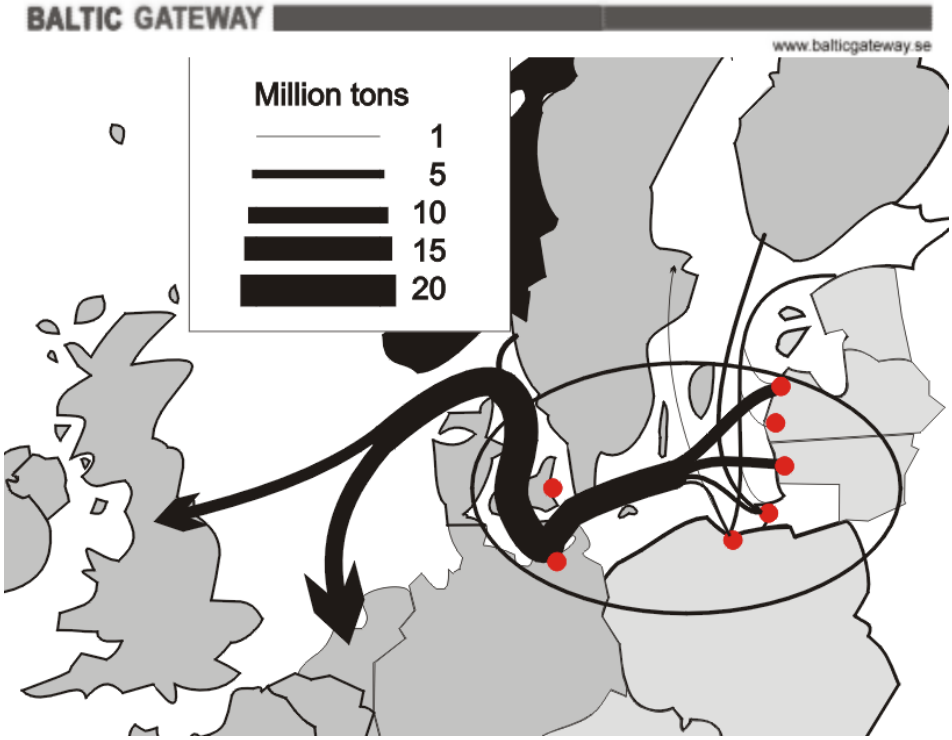


Figure 75: The oil product cargo flows in/out of the region

Large parts of the seaborne oil product trade within the BGW area derives from Russian production. The qualities are many and diverse calling for a flexible transport function being able to handle both large and small batch sizes.

The network of oil product shipments in the area is relatively extensive but the cut off volume for the illustration above has been one million tonnes which excludes many of them.

7.4 Dry cargo flows in 2002

Dry bulk

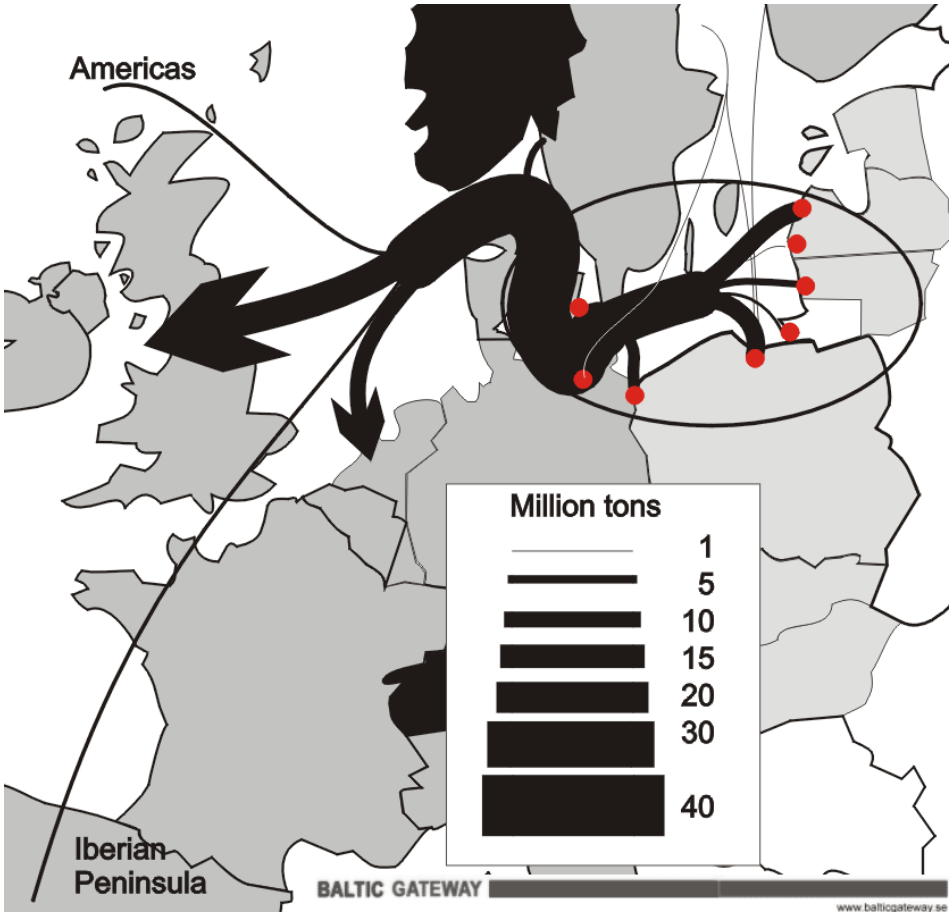


Figure 76: Bulk commodities flow on sea transports

Different types of bulk products (excluding oils) dominate shipments from the BGW area. A small fraction is traded with the Americas and the Iberian Peninsula but the rest of the raw material volumes end up in North Western Europe. For example, stone, sand and gravel are shipped in significant volumes from Germany to the Netherlands.

General cargo

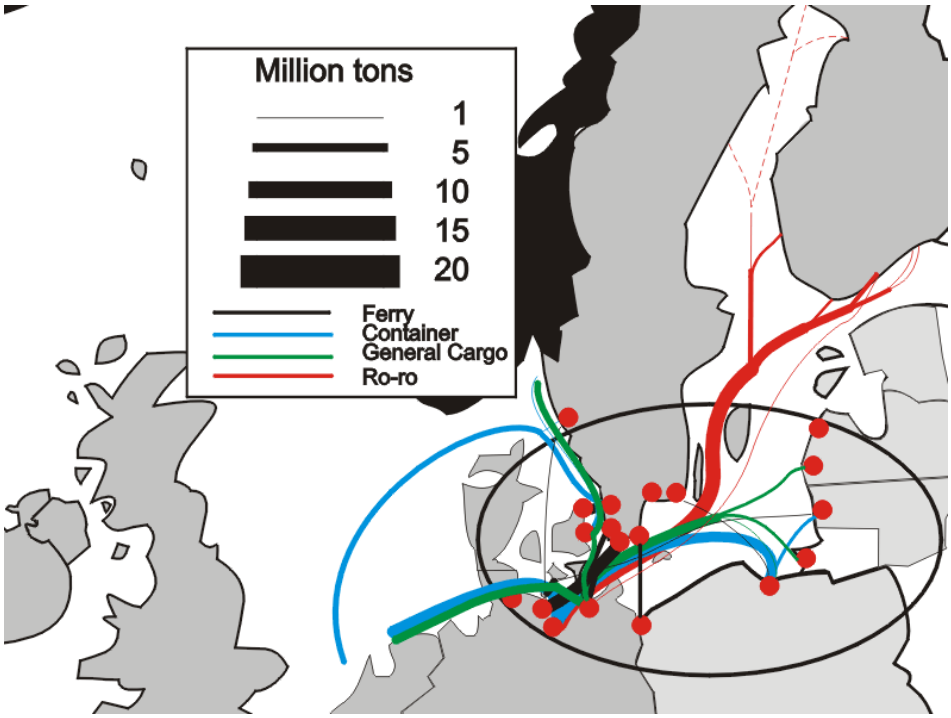


Figure 77: Cargo flows of general cargo in Container, Ro-ro, Ferries and General Cargo ships

The general cargo products comprise all types of break bulk products, pallets and containerised cargo. All of which represents products of high value to more general semi manufactured products.

The trade pattern is much diversified and the major cargo flows consist of staple products and other industry products to be distributed from the ports. A majority of these products are handled in multi-modal transport systems.

The large ro-ro volumes from Finland to Germany consist to the predominant part of the industrial shipments of forest products. The major ferry routes are between southern Sweden and Germany while the containerised trade is dominated by the feedering between Poland (Gdynia/Gdansk) and the North West European hubs.

8 Future demand for sea borne transportation in the Baltic Gateway countries

- **The Baltic Sea is considered to be one of the fastest growing trading areas in the World**
- **The trade growth has exceeded 100 % 1993 – 2001 and will continue**
- **The development of the trade will follow the economic, cultural and political development that envelops a trade link**
- **The enlargement of the EU is expected facilitate a faster development**
- **The annual growth since 1990 has been, 3 % for oil, 1 % for Dry Bulk, and 6 % for General Cargo and is expected to continue to grow**
- **Over the coming 10 years this will give a more than doubling of the trade volumes**
- **Today there is a demand for a more suitable standardised transport unit for intra EU transports than the semi-trailer**
- **The container will take a larger share of the intra-European transports**
- **The newly built ferries tend to have higher speed and purpose built for the freight market. Revenues from passengers have become a secondary issue**
- **The major growth in the oil and Dry Bulk sector will come in the East Baltic terminals that today act as export ports**
- **The development of General Cargo shipments is considered to be very marginal**
- **The development of container traffic is expected to grow in the range of 7 – 10 % over the coming years as a consequence of increased global trading**
- **The ferry freight traffic will continue to grow at high pace. The new services will take a larger share of the traffic as the mobility is expected to be higher in the east part of Europe**
- **The ferry passenger traffic will show stability in west and grow at high pace on the east side. The number of passengers on the east services will however be marginal in comparison**
- **The type of ship operation reflects the land transport mode used for transporting the trade products on land infrastructure**
- **The used distribution system is unique for each port**

The Baltic Sea area is together with some areas in Asia one of those in the world that have most potential to increase the amount of sea borne trade, in both short and medium time. The trade growth in the area has exceeded 100 % over the 1993 – 2001 period, a development that is expected to continue.

The shift of political agenda in the early 1990s lead to a liberalisation of the trade between East and West Europe and it really shifted the supply of especially raw material in the region surrounding the Baltic Sea. The reasons for this development was of-course that the Baltic states and Poland could offer raw material at competitive prices, but also a very strong intention and will from them as sellers to get less dependent on Russia as a trading partner. From the mid 1990s especially Poland but also the Baltic countries have been large subcontractors and beneficiaries when western companies outsourced their production. This is due to their relatively low labour costs.

This is an ongoing revolution and it will probably not be that much affected by the new status the exporting countries will have as EU members, although it will be easier to establish branch offices in those countries.

For the actual sea-borne transports from the Baltic ports it stands clear that the most important commodity is oil that is transited from Russia. This will continue to be of importance in the future.

Ahead is a period when the industry and the private citizens in the new EU-member states will increase their demand for more products. These are preferably, but not necessarily, produced in other EU countries. This explains why the main perspective in this chapter is focused on semi manufactured or finished products.

Over time this will change the composition and structure of the trade, but it is a process that will take time.

In every country or part of the market the development has been and will continue to be unique; still a general development and a possible future can be outlined as in Figure 78.

Figure 78: The development of trading structure in the Baltic Sea

After growing from 6 to 15 members in a period of 20 years, the European Union has now prepared for its biggest enlargement ever in terms of volume and diversity in just a few years. 13 new countries have applied to become new members: 10 of these countries - Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, the Slovak Republic, and Slovenia joined on May 1st, 2004.

Bulgaria and Romania hope to do so by 2007, while Turkey is currently not negotiating its membership.

Most of these countries were enrolled in the Comecon trading area that was dissolved and split in 1990. By joining the EU these countries comes into a new toll free market that will stimulate the growth and the trading. EU gets a new market for their products and maybe most important a lot cheaper work force that could help to sustain the European welfare in the decades to come.

For the future the EU allocates EURO 300 Billion for projects and support for the regional development and upgrading of the infrastructure.

This money will not only come handy for the accession countries but will also be beneficial for the present EU countries in different ways. Among the most urgent is to solve the traffic situation in central Europe.

The present investors will not turn to something new without a fight. The marginal cost of increased road and rail traffic and decreasing mobility in central Europe is today not on their account.

The solution pointed out by the Commission to this problem is closely connected to sea transports and general cargo shipments. To use the sea transport as a major feeder system is an operation that will continue to function in its simple way for many more years to come since the infrastructure is there and the transports is working on pure commercial basis. The general cargo type of vessels performs a basic transport work that will continue to be of importance even if most of the growth will be in the other systems.

In this respect the Baltic area is well furnished in having lots of ports thereby reducing land transport distances.

8.1 Seaborne cargo volumes

As pointed out earlier (Table 39) the trade, and thus the seaborne one, between the countries in the BGW area has shown good growth measured in tonnes since the early 90s. Oil has averaged at 4 % p.a., which is higher than global oil consumption that grew about 1.5-2 % over the same period. The dry bulks grow by 1 % in average and the general cargo by 5 %. All figures are based on tonnes.

The figures arrived at for the years 1995 to 2001, in accordance with the approach described in section 7.1, have formed the starting point for the expected development over the period up to 2015.

The average annual growth figures have been very high for several trade relations. Still it is important to remember that growth figures generally are very high in the early stages of any new trade relation that is expanding. The closer you get to the maturity stage, as illustrated by Figure 79, the per cent growth figures will be lower while the actual volumes are higher.

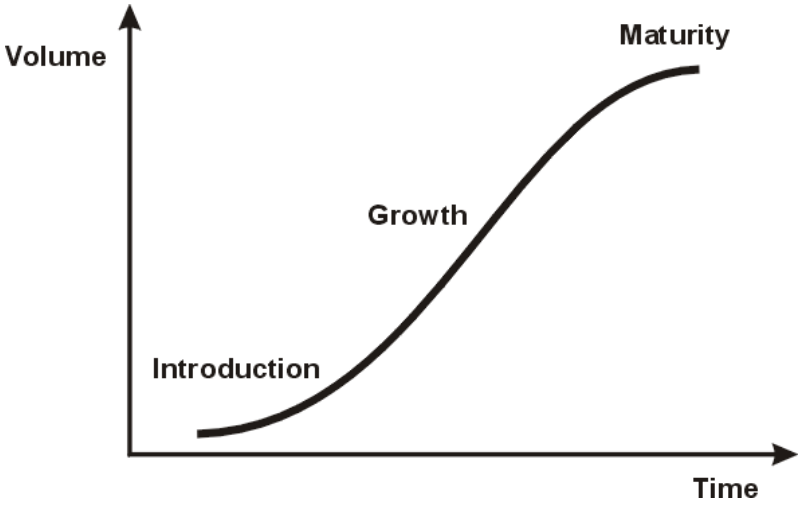


Figure 79: Basic product, industry or business life cycle

Many new enterprises never leave the introduction phase though, but it is within this phase the new and fast growing opportunities lie.

The following three tables display the foreseen development of overall seaborne trade with the basic three cargo categories between the countries in the BGW region.

One could say that the promising new opportunities lie in the trade relations with both a high average per cent growth and a fairly high growth volume. It should however be underlined that continued growth in the established relations could result in just as good an outcome – or even better.

Table 40: Growth in seaborne trade with crude oil & oil products

	Oil products - **seaborne volumes**			
Trade relation (exp+imp)	Avg annual growth 95-01	Avg annual growth 02-15	Growth 02-15 1000 tonnes	Volume 2015 1000 tonnes
Denmark - Germany	-7%	0%	0	37
Denmark - Russia	-15%	1%	60	864
Denmark - Latvia	12%	8%	331	524
Denmark - Lithuania	7%	7%	154	253
Denmark - Poland	12%	7%	566	964
Denmark - Sweden	3%	1%	478	5,203
Germany - Russia	7%	2%	1,111	6,175
Germany - Latvia	-36%	0%	0	26
Germany - Lithuania	37%	14%	383	469
Germany - Poland	0%	0%	0	0
Germany - Sweden	-1%	0%	58	2,238
Poland - Russia	13%	1%	1,295	7,362
Poland - Latvia	-20%	0%	0	0
Poland - Lithuania	24%	8%	527	857
Poland - Sweden	11%	3%	339	996
Sweden - Russia	36%	9%	3,239	4,945
Sweden - Latvia	-13%	0%	46	735
Sweden - Lithuania	61%	1%	61	500
Intra - Baltic Gateway	4%	2%	8,649	32,150

Table 41: Growth in seaborne trade with other bulk cargo

Trade relation (exp+imp)	Other bulk - **seaborne volumes**			
	Avg annual growth 95-01	Avg annual growth 02-15	Growth 02-15 1000 tonnes	Volume 2015 1000 tonnes
Denmark - Germany	-5%	-5%	-398	411
Denmark - Russia	8%	4%	1,618	3,921
Denmark - Latvia	13%	8%	326	524
Denmark - Lithuania	8%	14%	450	555
Denmark - Poland	-5%	1%	309	2,462
Denmark - Sweden	1%	1%	651	4,802
Germany - Russia	10%	2%	979	4,479
Germany - Latvia	4%	5%	110	239
Germany - Lithuania	6%	11%	339	464
Germany - Poland	0%	0%	0	0
Germany - Sweden	-1%	0%	-612	9,323
Poland - Russia	-5%	-2%	-447	1,190
Poland - Latvia	11%	13%	21	27
Poland - Lithuania	34%	29%	1,021	1,058
Poland - Sweden	-3%	1%	222	1,847
Sweden - Russia	50%	9%	1,536	2,318
Sweden - Latvia	58%	10%	2,312	3,270
Sweden - Lithuania	34%	12%	1,973	2,605
Intra - Baltic Gateway	1%	2%	10,410	39,495

Table 42: Growth in seaborne trade with general cargo

Trade relation (exp+imp)	General cargo - **seaborne volumes**			
	Avg annual growth 95-01	Avg annual growth 02-15	Growth 02-15 1000 tonnes	Volume 2015 1000 tonnes
Denmark - Germany	3%	4%	848	2,251
Denmark - Russia	4%	5%	437	949
Denmark - Latvia	28%	17%	906	1,049
Denmark - Lithuania	11%	11%	644	864
Denmark - Poland	2%	2%	39	201
Denmark - Sweden	5%	5%	2,414	5,145
Germany - Russia	5%	6%	3,071	5,993
Germany - Latvia	17%	17%	453	524
Germany - Lithuania	11%	13%	685	861
Germany - Poland	0%	0%	0	0
Germany - Sweden	5%	5%	4,426	9,424
Poland - Russia	5%	16%	1,360	1,593
Poland - Latvia	24%	19%	89	99
Poland - Lithuania	33%	35%	2,088	2,131
Poland - Sweden	12%	11%	2,499	3,403
Sweden - Russia	6%	7%	417	700
Sweden - Latvia	17%	16%	961	1,115
Sweden - Lithuania	8%	9%	233	350
Intra - Baltic Gateway	5%	7%	21,570	36,650

8.2 The transport corridors in the SBSR

The transport corridors in the area will follow the sea transport activities. In this respect the corridors can be divided into road/passenger transports and pure cargo transports.

The main rail/road/passengers corridors are identified in the west part of the area as the North-South traffic, including and excluding Denmark. This is the strongest road/passenger corridor in terms of utilisation. The

corridor is based on ferry services but for the road/rail-link over the Öresund Bridge.

In the North – South East direction as well as in the East – West direction new transport links are growing.

The corridors can only be studied as individual links when considering spatial planning. The information of the links is obtained by figures in Chapter 6 and as illustrations in Figure 90 and Figure 91.

The predicted development of the services is presented in Table 47 and Table 48.

The services are to be regarded as a part of the land transport infrastructure and demand capacity in the terminals and a suitable infrastructure inland.

The cargo freight corridors are based on a number of identified freight flows. The corridors are identified in Chapter 7.3 and 7.4. The prediction of the future cargo flows are presented in Chapter 8.5. Many of the transport activities, especially inside of the BGW area are very scattered over the area. The main flows are illustrated in the figures of Chapter 7.3 and Chapter 7.4 where the main product flow leaves the area.

8.3 Ro-ro (ferry) versus container and general cargo

The trend towards smaller shipments in size has increased land transports and thus ferries at the expense of general cargo ships. Transports where the transport must start and/or end with a substantial land transport will suffer from the handling cost in ports on a general cargo ship. These shipments will continue by land transport (ferries) if nothing is done. This is a threat to society, as a shift from general cargo ship operation to land transports will increase the road traffic. Such a development is not in favour of the wanted development of the European transports and the sustainable mobility.

In this situation the container may become a solution for intra European shipments. However, the container, as it is today, designed to be stacked nine high in sea and allow to be showered by green water, it is too heavy for trucking and does not offer enough capacity for road transport. New better units for intermodal shipments are wanted. They should be less expensive (in operation) and more suitable for sea transports than the trailer, but having better capacity than the container. The deficit of the container is thus that its tare weight on road will not allow for the same transport capacity as the trailer can offer.

The European infrastructure is not built up for container handling. The consequence of this is that in Europe the container is primarily a port-to-port unit that is stuffed and stripped in the port and moved to the container depot. The depot is the base or home of the container from where it is deployed by its operator. Thus the container operation as of

today in Europe is more related to feeder services. The ports in the feeder system function as depots for the containers of the deep-water container operators that contract the feeder line service (or operate the feeder line themselves).

The infrastructure for trailers in Europe is very good. Most countries have forwarding systems where the trailers are employed and handled by the local hauler in a routing service between the terminals. The trailer is also more suited for the handling structure in Europe where pallets normally is handled over the side of the trailer by forklifts. To enable this the normal type of trailer are the so-called tilt trailers, a trailer that is covered by a tarpaulin that allows access from the side by lifting or folding away the tarpaulin. A disadvantage of this type of trailers is that the tarpaulin is the only cover safeguarding the cargo. The cover is good enough for a TIR classification but it does not require much violence to force the trailer. In this aspect cargo protection is much higher in a container.

Figure 80: A typical tilt trailer with tarpaulin cover

The Port of Rotterdam expects the ro-ro operation to decline and the container operation to take an even larger share of the general cargo.

Should this prove to be a trend, the switchover will probably not be as quick in the Baltic Sea as on the North Sea.

8.4 Ferry & Ro/Ro vessel characteristics

The conceptual and technical development of the ships servicing the Baltic Sea is today fairly limited. During the 1990-ties the Finnish operator Transfennica invested in a new fleet of fast Ro-ro ships that could uphold a fixed weekly schedule on the North Sea, the continent and the UK.

Figure 81: Transgard a modern Finnish Ro-ro ship

The ships are powerful and equipped to force ice and run at 20 knots in open sea. They feature a STORO type of stowage on the main deck and lower holds and containers on weather deck. The DWT capacity is about 8,000 tons.

The latest ships employed in the Baltic Sea area are the Stena Ro-ro Forerunner series. These vessels have a carrying capacity of about 13,000 tons and can do 22,5 kn. The Forerunner type has about 3,000 lane meter trailer capacity on three decks.

Figure 82: The Stena Forerunner type of modern fast Ro-ro ship

Another more passenger adapted ferry type is a fast Ropax ferry that is operated by Superfast between Hanko and Rostock. These ships are two in a series of ships built by a Greek ship owner that found the ferry concept to be useful for a number of services in Europe.

Figure 83: Superfast Ferries two ships in operation between Hanko and Rostock

The trend is a fast large ferry having lots of capacity to ship trailers, runners and drops, between the ports. In the Baltic the containers are often carried on the ferries, especially in Finland.

The route of a service is carefully planned to give a fixed schedule and utilising the ferries as much as possible. Figure 84 shows a diagram in number of ships where the options and speed of ships can be identified for a given shipping system.

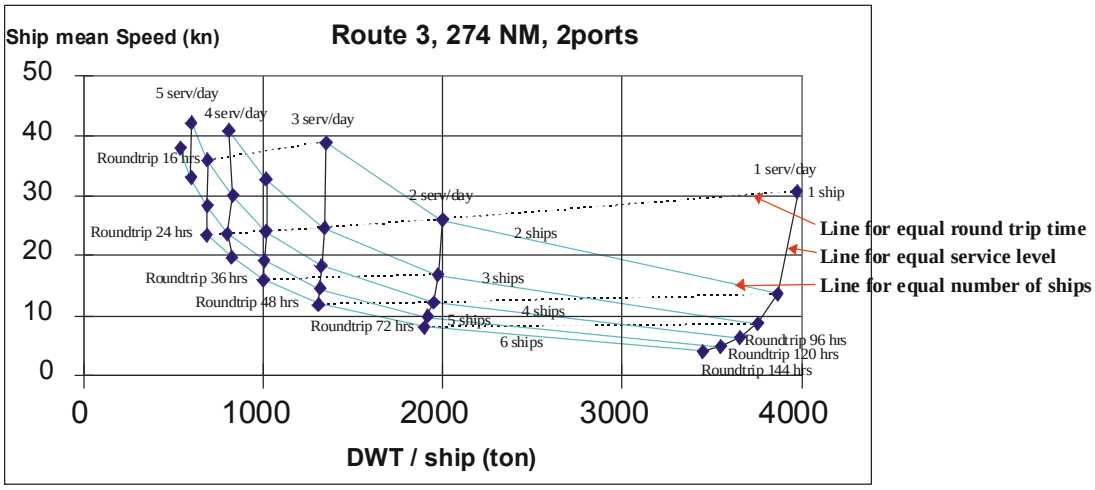


Figure 84: Typical layout of service options between two ports in a ferry system

The possible combinations of the major parameters for the logistics of a ferry service are shown. For a fixed demand of shipping capacity the options in number of ships (blue line between the service levels) and the number of calls per day (vertical lines), determines the demand for ship speed and carrying capacity for a fixed distance.

The speed is a bit controversial as it also affects the fuel consumption and by this the CO_2 and other emissions. Fuel consumption increases drastically when a ship's speed passes 15 – 16 knots. In this respect two different approaches in the Baltic Sea are found, the environmental approach taken by the forest industries SCA and StoraEnso having exhaust cleaned slow running ro-ro ships. This is a matter of designing the service to the length of the roundtrip and the service level as well as to the cost for the operation.

Today a crossroad can be identified where there is a choice between the "fast and costly" and the "slow and clean" service. As regards passengers

the choice is still obvious. The passengers demand speed and are reluctant to think in terms of better environment.

The situation after the abolishment of the tax-free system in the EU has caused a halt in the production and ordering of new ferries. The only ones that are ordering new ferries today are ship owners that control their own services and are confident in the operation. The return on investment is low and the prospect of financing new ferries of a standard the north Europeans have got accustomed to, seems difficult. This has resulted in a shortage of tonnage for upscale or new services in the Baltic Sea. This is especially the case for new ferries of high ice class. The smaller ones built in the 60s and 70s are nowadays outdated performance and safety wise and have to be replaced.

The incidents in the 90s and 2000 caused the IMO to implement new rules and regulations and since then the market for elderly tonnage is very limited. Thereby it is difficult to find tonnage that limits the financial risk for services in the starting up phase or for testing the market.

After having abolished the tax-free system income from the ferry services must be more focused on cargo freight. Ro-pax ferries are suitable for this concept. The ro-pax type is a freight ro-ro with passenger capacity. It has no or limited accommodation capacity and is equipped for the freight and transporting passengers on a ferry link.

Figure 85: Saga Star a typical Ropax, 108 pax berths capacity, previously on the Trelleborg-Rostock link.

In the future a continued polarisation of ships and ship types in the Baltic will probably be seen.

The cruising in the Baltic is growing for many reasons. It is anticipated that this service will be supplied by suitable cruising vessels that only accommodates cruise passengers and all the necessary facilities create a pleasant stay on board while at sea, cruising between the attractive locations/cities in the Baltic Sea area.

Figure 86: Silja Opera a "new" cruising service designed for the Baltic Sea

8.5 Seaborne Traffic development

The road traffic situation in the west European Continental region is a major problem today where road congestions are daily and the authorities are trying to reduce the traffic by introducing road taxes and road tolls.

The same north continental area is today the gateway for the overseas shipping services of manufactured goods mostly transported in containers.

From the EU perspective, the solution is not to build more infrastructure in the congested areas, as this will hamper the environment and is too costly in relation to the effect given in those areas. The railways are needed for transport of passengers and there is not capacity enough to give full service on the railways for both passengers and cargo due to the differences in speed on the rail.

At the same time as the market and trading grows the EU enlargement will give new options for routes and mobility in the EU and here the area in south Baltic has an important role to fulfil. The Baltic Sea area may be the alternative to the big ports on the Continental North Sea coast and the solution to the demand for port capacity from the east European countries. The assessment of the transport activities shows the substantial amount of products that is shipped from the ports in the South East Baltic Sea.

Oil shipments

Today the average size of an oil tanker in the BGW area is about 50,000 DWT and the maximum size is almost 300,000 DWT. The average size

will increase in near future, as new special designed tonnage is of more than 200,000 DWT and exports out of Russia will increase in the Baltic.

The Baltic area functions as a distribution channel for refined oil products (gasoline, diesel, fuel oils etc). In several countries, major distribution centres are built by the coast from where the products are trucked or in some cares distributed by rail to the customers.

Investments that could be interesting in the future are refinery capacity, when environmental concerns call for even better fuels, especially at sea. Locating and financially justifying such an investment would be truly challenging though.

Based on trade and GDP growth and other assumptions described earlier in this report we expect the overall development to be around the 2 % mark in the long term.

The ports in the eastern part of the Baltic Sea will continue to play an important role as distributor of oil.

Table 43: The forecast of oil trading in the major ports

Wet bulk, oil	2003	2005		2010		2015	
Port	[000 tons]	% growht pa	[000 tons]	% growht pa	[000 tons]	% growht pa	[000 tons]
Copenhagen	6 600	2%	6 900	1%	7 300	0%	7 300
Malmö	3 500	5%	3 900	2%	4 400	0%	4 400
Karlshamn	900	5%	1 000	1%	1 100	0%	1 100
Helsingborg	1 000	2%	1 100	0%	1 100	0%	1 100
Liepaja	900	3%	1 000	3%	1 200	5%	1 600
Ventspils	20 600	3%	21 900	0%	21 900	0%	21 900
Klaipeda	6 800	5%	7 500	5%	9 600	5%	12 300
Butinge	11 600	5%	12 800	2%	14 200	4%	17 300
Gdansk	9 900	5%	11 000	2%	12 200	2%	13 500
Gdynia	700	5%	800	2%	900	2%	1 000
Swin./Szczecin	500	2%	600	2%	700	2%	800
Rostock	1 800	2%	1 900	1%	2 000	1%	2 200
Kaliningrad	4 900	2%	5 100	2%	5 700	2%	6 300
TOTAL	70 000	4%	75 500	2%	82 300	2%	90 800

Dry Bulk shipments

Coal is one of the major bulk commodities that are shipped in the Baltic. The major importers are the steel industries and power plants (heating and energy generation). The average size of the bulk carriers is about 50,000 DWT and this is not expected to change since it would require heavy investments in the infrastructure to handle larger ships – investments not regarded as justifiable. These bulk vessels are the vessel type that carry most of the cargo tons in the region.

Some specific bulk commodities are stored in central ports, for trading and for distribution purposes. In Europe, the Port of Rotterdam is the central port for bulk commodities. Rotterdam functions as a central distribution terminal for major commodities and strategic storage of commodities traded in the market.

Based on assumptions above and the trade and GDP growth earlier described we expect the development for total dry bulk shipments to be around 2 % p.a.

The ports in the South East Baltic Sea will handle the majority of the bulk in the future as well.

Table 44: The development of the bulk commodity trades

Dry bulk	2003	2005		2010		2015	
Port	[000 tons]	% growht pa	[000 tons]	% growht pa	[000 tons]	% growht pa	[000 tons]
Copenhagen	3 100	0%	3 100	0%	3 100	0%	3 100
Køge	1 100	2%	1 200	1%	1 300	0%	1 300
Nakskov	500	2%	600	1%	700	0%	700
Malmö	500	5%	600	2%	700	0%	700
Karlshamn	2 000	5%	2 300	1%	2 500	0%	2 500
Helsingborg	900	2%	1 000	0%	1 000	0%	1 000
Liepaja	800	3%	900	3%	1 100	5%	1 500
Ventspils	7 700	3%	8 200	2%	9 100	2%	10 100
Klaipeda	4 000	5%	4 500	5%	5 800	5%	7 500
Gdansk	8 700	5%	9 600	2%	10 600	2%	11 800
Gdynia	3 700	5%	4 100	2%	4 600	2%	5 100
Swin./Szczecin	12 100	2%	12 600	3%	14 700	3%	17 100
Lübeck	4 500	2%	4 700	1%	5 000	1%	5 300
Rostock	6 500	2%	6 800	1%	7 200	1%	7 600
Stralsund	700	2%	800	1%	900	1%	1 000
Wismar	2 700	2%	2 900	1%	3 100	1%	3 300
Kaliningrad	1 700	2%	1 800	2%	2 000	2%	2 300
TOTAL	62 000	3%	65 700	2%	73 400	2%	81 900

Dry, general cargo shipments

The workhorse of the Baltic Sea is the dry cargo ship. The ship type is a true multipurpose vessel that moves anything from dry bulk to containers. Project cargoes, special deliveries and liner services of mixed container shipments, palletised cargo and other break bulk cargo is being handled. The majority of the vessels are of about 3,500 DWT and are represented in the vast majority of all port calls in the BGW area.

The base load is often formed of regular shipments for the heavy industry between the factories or the port close to the factory and to the special terminals in Europe.

These shipments partially compete with ferry services and their function as a link in the door-to-door trailer transports. The weakness of the

general cargo vessel is the handling costs in port and the strength is the low cost of shipments. As long as the labour cost is low and the port costs are reasonable it is expected that this type of shipping will continue.

The 61 ports in the area having one or more calls of a general cargo ship in year 2002 will continue to have this in the period until 2015. There is no reason to believe that the current traffic will be altered in any significant way. The trade between the countries will grow but container and Ferries/Ro-ro ships will cover for this increase. There is a good possibility that the average size of the general cargo vessels will increase over the period, but this a slow process and it will not make any substantial marks in the system.

The dry cargo ship as such will also continue to act as a container feeder for the growing volume of containers.

Container shipments

The ever-increasing cargo volumes in Europe call for increased transport capacity. The container opens the door to the world market. Once the container is fed into the shipping system it could reach almost any place in the world. The container is thus not only a unit. It is a complete transport system that makes global trading possible even for smaller quantities of goods. This increases global traffic and will also raise demands on port services.

The primary option is to look for ports and or terminals as close to the market as possible. The feeder ship will grow in size. Today the average feeder ship has a capacity of about 500 TEU but by 2015 the common size may be 2,000 TEU to enable feedering of four times as much cargo at the same timetable from the larger ports in the Baltic Sea to the continental container hubs.

The closest transoceanic hub with two or more services is found in Gothenburg having two services calling, one cross Atlantic and one Far East service. Two of the largest container ports in Europe are close, Port of Hamburg and Rotterdam and in between them Bremerhaven.

Table 45: Examples of container services that call some ports in North Europe

Hamburg		Rotterdam		Bremerhaven		Felixtowe		Gothenburg	
Grand Alliance	Far East	Grand Alliance	Far East	Grand Alliance	Far East				
CKHY Alliance	Far East Pacific North Pacific South	CKHY Alliance	Far East Pacific North Pacific South	CKHY Alliance	Far East	CKHY Alliance	Far East Pacific North Pacific South		
New World Alliance	Far East	New World Alliance	Far East	New World Alliance	Far East				
Maersk Sealand	Far East	Maersk Sealand	Far East	Maersk Sealand	Far East	Maersk Sealand	Far East	Maersk Sealand	Far East
ACL	US East Coast	ACL	US East Coast	ACL	US East Coast			ACL	US East Coast

The transoceanic operators are mainly operating their own fleet of feeder ships. In some areas where the turnover does not justify a call (more than 30 units per call) the operators use a joint service from one of the few independent operators to carry their containers. More cargo turnover in the area will provide incitement for investments in ports as soon as the economy is in place (or at least in sight).

In the future, more of the smaller ports will handle containers in conjunction with other general cargo traffic. A few ports will develop into central (national) container ports with the necessary infrastructure in place to provide re-distribution by rail, road or sea to other terminals or directly to the consignee.

The development of the container shipments is expected to be within the range of 7-10 % per annum over the years to come.

Table 46: The development of containerised trade in the Baltic Sea

Number of TEU	2003	Approximate	2005		2010		2015	
Port	Number	Tonnes	% growht pa	Number	% growht pa	Number	% growht pa	Number
Copenhagen	135 000	1 890 000	5%	149 000	5%	190 000	5%	240 000
Malmö	26 000	360 000	5%	28 700	5%	36 700	5%	46 800
Helsingborg	87 000	1 206 000	8%	101 500	6%	135 900	5%	173 400
Åhus	26 000	358 000	5%	28 700	4%	35 000	3%	40 500
Liepaja	3 000	40 000	20%	5 000	20%	12 500	20%	31 100
Ventspils	2 000	15 000	20%	3 000	20%	7 500	20%	18 600
Klaipeda	118 000	1 652 000	15%	156 100	12%	275 200	8%	400 000
Gdansk	23 000	315 000	10%	27 900	8%	41 000	8%	60 000
Gdynia	309 000	4 321 000	15%	409 000	8%	601 000	8%	880 000
Kiel	28 000	385 000	5%	30 900	5%	39 500	5%	50 000
Lübeck	85 000	1 190 000	5%	93 800	5%	119 800	5%	150 000
Kaliningrad	44 000	616 000	10%	53 300	10%	85 900	10%	138 300
TOTAL	883 000	12 348 000	11%	1 086 900	8%	1 580 000	7%	2 228 700

Ferry services

The harmonisation of taxes in the EU resulted in a substantial change for ferry operations in the Nordic countries after July 1, 1999 as was presented in the ferry chapter. The focus for the operators has since then shifted towards the cargo flows. Based on the trade flows presented earlier and anticipation of mode of transports and destinations for the different commodities, Table 47 presents the actual number of trailers in 2003 and our estimated growth in the years to come. We have estimated the trade at country-to-country level.

The expected development follows the reasoning described in previous chapters. It opens up for both new trades as well as the closure of others as has been seen in the past. Some of the existing routes will enjoy a strong growth while others will grow at a lower pace.

Table 47: Forecast of the trailer volumes on ferries within the BGW area

Trailer Connection	2003 Number	2005 % growht pa	2005 Number	2010 % growht pa	2010 Number	2015 % growht pa	2015 Number
Sweden - Germany	**756,000**	**3%**	**803,000**	**3%**	**930,000**	**3%**	**1,070,000**
Rostock-Trelleborg	27%						
Sassnitz-Trelleborg	4%						
Travemünde-Trelleborg	32%						
Travemünde-Malmö	24%						
Travemünde-Gothenburg	8%						
Kiel-Gothenburg	5%						
Sweden - Denmark	**764,000**	**5%**	**843,000**	**4%**	**1,030,000**	**3%**	**1,190,000**
Copenhagen-Malmö (Bridge)	27%						
Helsingör-Helsingborg	47%						
Frederikshavn-Gothenburg	21%						
Grenå-Varberg	5%						
Denmark - Germany	**344,000**	**4%**	**373,000**	**3%**	**430,000**	**3%**	**498,000**
Rödby-Puttgarden	81%						
Gedser-Rostock	19%						
Sweden - Poland	**166,000**	**15%**	**219,000**	**10%**	**352,000**	**9%**	**542,000**
Swinoujscie-Ystad	68%						
Gdynia-Karlskrona	28%						
Gdansk-Nynäshamn	4%						
Gdansk-Gothenburg	0%						
Sweden - Latvia	**17,000**	**15%**	**23,000**	**12%**	**41,000**	**10%**	**67,000**
Liepaja-Karlshamn	79%						
Riga-Stockholm	22%						
Sweden - Lithuania	**19,000**	**10%**	**23,000**	**8%**	**34,000**	**8%**	**50,000**
Klaipeda-Karlshamn	100%						
Germany-Lithuania	**407,000**	**12%**	**511,000**	**10%**	**823,000**	**8%**	**1,210,000**
Kiel-Klaipeda	56%						
Sassnitz-Klaipeda	44%						
Germany-Latvia	**122,000**	**20%**	**176,000**	**12%**	**311,000**	**10%**	**501,000**
Rostock-Liepaja	69%						
Kiel-Riga	31%						
Denmark-Poland	**73,000**	**10%**	**89,000**	**8%**	**131,000**	**7%**	**184,000**
Copenhagen-Swinoujscie	100%						
Denmark-Lithuania	**13,000**	**15%**	**18,000**	**10%**	**29,000**	**10%**	**47,000**
Århus/Aabenraa-Klaipeda	100%						

The trade between Denmark and Germany is not growing as much, but the cargo volumes on ferries between the two are increasing. This follows Sweden's growing trade volumes with the continent that generate volumes on the Denmark-Germany trades.

As could be seen in the historic graphs the typical ferry operation has a high summer peak. Travelling between countries will increase by the standard of living. In comparison to overseas flight and flights to warmer places the ferry service offers a short relaxing weekend trip with entertainment of a high-class restaurant/hotel but at a lower cost. In the west to east direction the motive would be low prices for onboard consumption, the entertainment and the attraction of the destination.

After accession of the Baltic States in the EU the differences in taxes on alcohol at the same time as it is free to bring in alcohol that is purchased in another EU country for personal use, gives an incitement to travel to an adjacent EU country. This can be combined with a pleasure trip with the purchase of alcohol as an added value to the trip.

The ferry operation needs a firm all year market to cover for the cost of having passenger capacity onboard. The size of crew, for safety reasons, and the service onboard is costly. Therefore some operators have started to have the vessels classed differently following seasonally changes. By closing down parts of the ship and reduce the passenger capacity it is possible to cut cost in periods of lower demand.

In the east-west direction, the tourism has increased. As the tourism practically was zero historically it is not surprising.

As of today it's mainly wealthy people in the Baltic States and Kaliningrad who can afford to travel. To them a ferry trip is no alternative to flying to large cities for shopping and entertainment.

The cruising passengers are assumingly:

- From a large city
- Of middle class west European level
- Those that enjoys dancing, eating and a good show
- Those that valuate the opportunity to shop in another large city
- Those that can assimilate and function in an international environment

The mobility and supply of service will create new transport demands and increase the travelling. Many of the west – east crossings are a bit too long in time to be an option for a comfortable weekend trip. The alternative is to travel a bit longer by car and to take a shorter trip to a nearby country.

The BGW region lacks also spectacular larger cities like major capital cities with the exemption of Copenhagen. However, today Hamburg, and Berlin can be comfortably reached via ferry services in the Baltic and this will give new regular passenger volumes travelling for business or vacation.

All of the above gives the conclusion that it is the trailer traffic and thus the trade that sets the boundaries for the development for the passenger traffic in the region as illustrated in Table 48.

Table 48: Forecast of passengers on ferries within the Baltic Gateway area

Passenger Connection	2003 Number	2005 % growht pa	2005 Number	2010 % growht pa	2010 Number	2015 % growht pa	2015 Number
Sweden - Germany	**2,700,000**	**0%**	**2,700,000**	**0%**	**2,700,000**	**0%**	**2,700,000**
Rostock-Trelleborg	29%						
Sassnitz-Trelleborg	29%						
Travemünde-Trelleborg	18%						
Travemünde-Malmö	5%						
Kiel-Gothenburg	18%						
Sweden - Denmark	**23,000,000**	**1%**	**23,500,000**	**1%**	**24,700,000**	**1%**	**26,000,000**
Copenhagen-Malmö (Bridge)	40%						
Helsingör-Helsingborg	51%						
Frederikshavn-Gothenburg	9%						
Grenå-Varberg	1%						
Denmark - Germany	**7,700,000**	**1%**	**7,900,000**	**1%**	**8,400,000**	**1%**	**8,900,000**
Rödby-Puttgarden	83%						
Gedser-Rostock	17%						
Sweden - Poland	**800,000**	**5%**	**890,000**	**4%**	**1,090,000**	**3%**	**1,270,000**
Swinoujscie-Ystad	37%						
Gdynia-Karlskrona	48%						
Gdansk-Nynäshamn	14%						
Sweden - Latvia	**72,000**	**20%**	**110,000**	**10%**	**180,000**	**5%**	**230,000**
Liepaja-Karlshamn	12%						
Riga-Stockholm	88%						
Sweden - Lithuania	**43,000**	**15%**	**57,000**	**10%**	**92,000**	**5%**	**118,000**
Klaipeda-Karlshamn	100%						
Germany-Lithuania	**72,000**	**12%**	**91,000**	**10%**	**147,000**	**8%**	**216,000**
Kiel-Klaipeda	84%						
Sassnitz-Klaipeda	16%						
Germany-Latvia	**9,000**	**20%**	**13,000**	**12%**	**23,000**	**10%**	**38,000**
Rostock-Liepaja	74%						
Kiel-Riga	17%						
Denmark-Poland	**91,000**	**10%**	**111,000**	**8%**	**164,000**	**7%**	**231,000**
Copenhagen-Swinoujscie	100%						
Denmark-Lithuania	**2,000**	**15%**	**3,000**	**10%**	**5,000**	**10%**	**9,000**
Århus/Aabenraa-Klaipeda	100%						

9 Summary and suggestion for further analyses

- **The oil volumes will grow fast in the Baltic Sea**
- **Russia aims to provide own ports for the exports**
- **The transiting over the Baltic States and Kaliningrad will continue to be of interest**
- **The oil from Russia is stored in Baltic Sea ports as strategic storage**
- **The oil tonnage from Russia will grow fast and new purpose built ships will provide for some of the service**
- **The dry cargo segment is serviced by a number of ship types where the unitisation (containerisation) breaks in as an option for many types of products. The type of ship used depends on many factors**
- **The overseas dry bulk shipments are not expected to grow**
- **The General Cargo shipments will continue to play an important role as a distributor of products in the Northern Europe**
- **The containerisation will affect the market and increase the globalisation of trading**
- **Ferry service is important for the mobility giving a frequent service in the region**
- **The ferries are the major means of public transports in the region between the countries separated by sea**

The Baltic Gateway Area functions as a *gateway* between the Continental Europe and Scandinavia, East Europe and Northern Europe as well as a trading area itself. The transports and trading is substantial within the region. The traffic from ports within the area to ports outside Europe is very scarce.

Trends and tendencies in the world decide the future for the area regarding trade with other regions. The port capacity and the infrastructure make the BGW area a viable partner for the communication with the Northern Europe having all modes of transport and transport capacity available for transport of the trade.

There is really no reason to believe that the trade from the region to or from other continents will give any big impact on facilities such as ports or fairways or for the hinterland for that matter.

The important factor for the Baltic Gateway area is how the trade with the other North European countries develops. As they have to be supplied by raw material (bulk cargo) and energy (oil) to produce their goods, they will continue to buy bulk commodities. Some day the supplying countries will produce the finished high value manufactured products within their own country and the trade will decrease. That day is well beyond our forecast period.

A rather large share of the traffic in the eastern part of the Baltic Gateway area is transit traffic, mostly from Russia. It is very apparent that Russia is determined to stay independent as far as possible in port operation and to use its own port capacity for the export of crude oil.

Still, it will be room for more transit traffic both over the Baltic States and the Russian enclave of Kaliningrad especially when it comes to transports of different kinds of dry cargo – preferably bulk that is delivered to other countries in North Europe.

The ferries are important in the western part of the region since they act as bridges between Finland, Sweden and Norway and the Continent. The ferries are suitable in the short sea transport relations. For the rather long distances in the southern/south-eastern parts of the region the Ro-Ro/Ropax services will be more suitable especially when it comes to the shipping of trailers.

9.1 Wet cargo - Oil transports

The strategies for transport of oil are set. Russia will increase its port capacity to handle most of the crude over own terminals. Just a few of these are not connected to a pipeline system that supplies the oil to the terminal. There is however refinery in the Baltic States that will continue to increase their volumes over time.

The export of crude oil over the Gulf of Finland will increase from 21 million tons 2003 to about 175 million tons in 2006[11]. Suitable ships are being projected for the service of a special design that fits the Baltic Sea. The ships will be of more than 200,000 tons capacity in size. Some of the new ports will receive the crude oil by rail.

Part of the oil goes directly into store in other ports in the Baltic to be traded on the open market. It will be positioned strategically in ports for transiting when the market shows an increase in the oil price. This is a business opportunity for ports in the region. Lots of storage capacity and good ports are available in the region for intermediate strategic storage.

[11] Interview in DI (Swedish economic Newspaper) with MD Vladimir Kananuchin, Baltnefteprovod

As previously shown the distribution of oil and chemicals within the area is done by smaller tankers < 60,000 DWT. This is not expected to change. While the export to major Continental North Sea ports and overseas will go in tankers of ever increasing size.

9.2 Dry cargo

The dry cargo sector in the region has been and will continue to be affected by the same fundamentals as any other region in the world. In short – the dry cargo sector covers a wide span of different goods types – several of which are vastly dissimilar in their characters. To cater for the dry cargo transport requirements the shipping operators have developed various concepts based on different products/services and strategies. Typical factors that rules the type of ship used are:

- The port condition
- The service demands
- The cost of handling
- The products sensitivity of handling
- The regularity of shipments
- The options and demands for return cargo
- etc.

These concepts are changing over time and large structural changes in the past decade have been witnessed. The vessel types and their overlapping in the fight for market shares are illustrated in Figure 87.

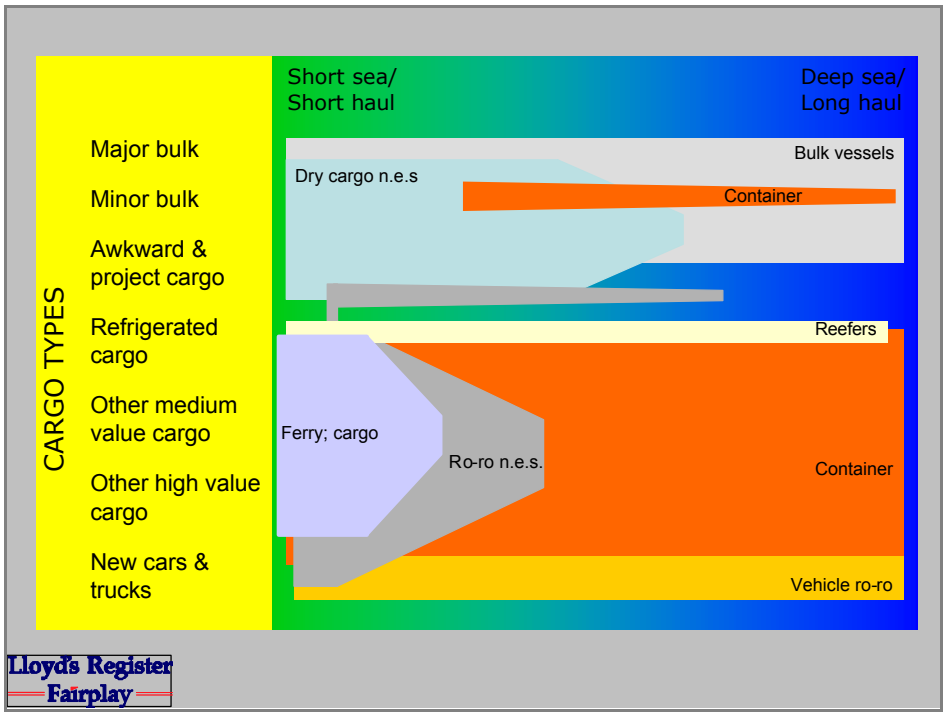


Figure 87: Dry cargo types and shipping segments

The container has penetrated most other segments excluding the major dry bulks and some of the minor bulks. To confuse the picture further, the same cargo type could be handled in different ways in separate logistic

systems. Steel products for instance could be handled either as break bulk or as bulk cargo. Forest products, which are a widely spread category, could be handled in bulk, break bulk or unitised fashion.

Ro-ro and ferries vessels are primarily being utilised in the short sea liner network for the shipment of trucks and trailers, but the same (or at least fairly similar) type of vessels are being employed in industrial shipping – sometimes over long distances. Following the reasoning above about how the shipping markets have developed different concepts for meeting the transport demand, Figure 88 presents the development of the trans-oceanic seaborne dry cargo trade.

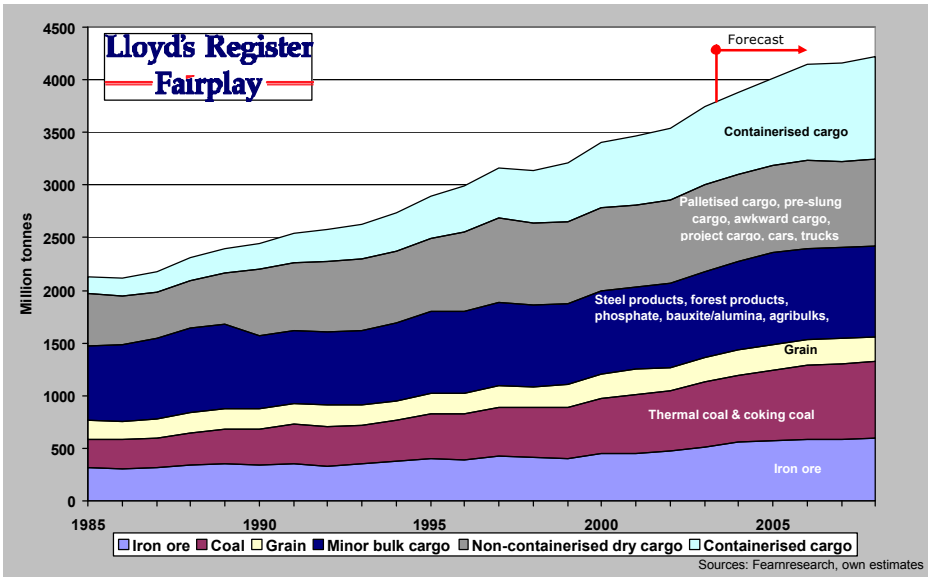


Figure 88: Trans-ocean dry cargo seaborne trade, million tonnes

The illustration is divided into the major dry bulks (iron ore, coal & grain), the minor bulks, the containerised and the non-containerised dry cargo.

Over the 1985-2003 period, the total dry cargo seaborne trade grew at an annual average rate of 3.2 % (based on tonnage). The containerised cargo segment of this trade grew by 8.7 % while the minor bulks averaged a mere 1.0 %. The other dry cargo that is neither bulk nor containerised reached 2.9 % over the same period.

The 2004-2008 period is predicted to continue to show growth but at a somewhat lower pace than previously. Average annual growth is predicted at 2.1 %.

Growth rates will fall for most cargo types, but only the non-containerised non-bulk dry cargo is expected to actually decrease in volumes, i.e. show negative growth. This follows the expected continued heavy penetration of containers in this cargo segment.

Figure 89 presents the dry cargo fleet that performs the services outlined above. This is an interesting comparison. The DWT growth of the fleet over the period 1985-2003 averaged an annual rate of 1.8 % that is noticeably below the average growth in the seaborne tonnes.

In the years ahead the situation is quite the opposite; seaborne tonnes are moderately predicted to average 2.1 % per year while the fleet is expected to grow by 2.8 % annually.

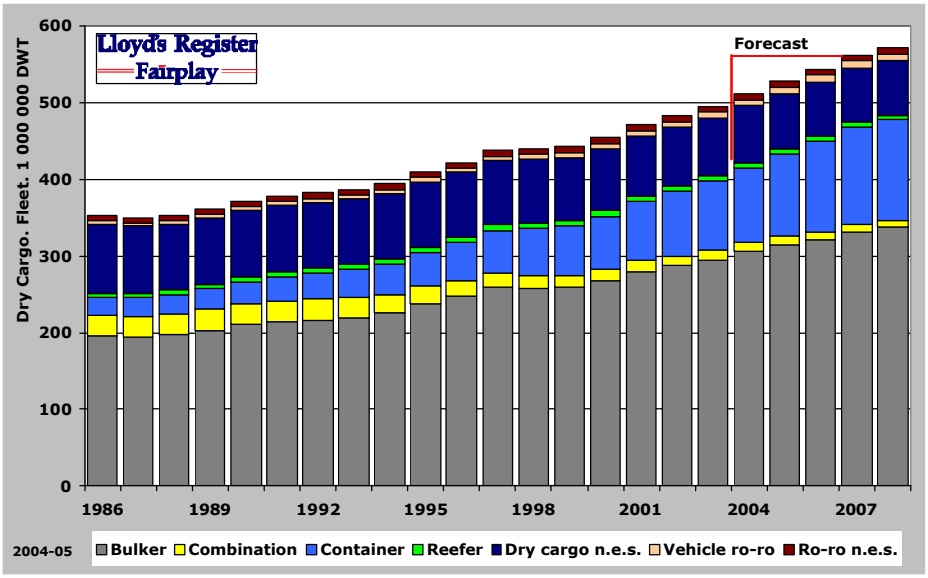


Figure 89: Dry cargo fleet, million DWT

The switch is worth noting, but of course trading patterns/distances, fleet performance and other factors should be taken into account before any major conclusions are drawn.

The Dry Bulk shipping

The major dry bulk shipping in the Baltic is energy transports and shipments of supplies to the metal and forest industries in the Baltic Sea region. The shipment of bulk products from Russia is expected to increase but this is a matter of finding suitable terminals. Bulk terminals are today constructed in Tallinn. The coal terminal there will be very competitive in the future and these volumes will therefore to a large extent stay out of the ports within the Baltic Gateway region.

If the bulk shipments shall increase it demands larger ports and better handling capacity. There is no obvious long-term strategy in the dry bulk sector but it can be assumed that the shipments will increase from Russia/Belarus/Poland and Ukraine in the future. This is to be handled somewhere.

Dry, General cargo shipping

As shown in chapter seven this is not a transport system where the trade lines are clear and can be shown. Still it attracts a lot of tonnes. The

General Cargo vessels are used for the smaller quantities in distribution of products.

The service is important for regions and their local industry in distribution of raw material and semi fabricated products to all types of industries. In effect it is often a transport to "the" industry in the region. If this industry didn't get their raw material or could deliver their goods to various destinations at a competitive price they would cease to exist and thus disturb the order in the region.

The container operation

The container operation is a balance act of filling larger ships in intercontinental services with as many containers as possible in order to stay competitive in the market.

In the Baltic the only positions that shows surplus of containers are in the Baltic States and St. Petersburg. In all other places a demand for containers is found. The products are imported to the region in containers and exported as bulk. Looking at it from a positive side, there is a potential for the increase use of container at a good price, as they have to be repositioned for the market. In Finland and in North of Sweden these containers are filled with forest products for the Asian or US market. Containers in the Baltic States are transferred to Finland to be used in outbound trading.

At first the strategy for the future is to increase the frequency of port calls of container vessels, to build pure container terminals and to establish container depots in the ports that have crane capacity for efficient operation and an infrastructure to service the containers. This development has started in Klaipeda, Gdansk, Gdynia, Ventspils and Rostock. In the west part there are many larger terminals like Copenhagen/Malmö, Helsingborg that is well established in its function. The German terminals Kiel, Lübeck/Travemünde have land-bridges on rail to Hamburg and other Continental terminals.

	Starting at turnover per year	
Container feeder ships in regular service	10 - 25000	TEU
Container operator calling the port	25 - 50 000	TEU
Port gantries in the terminal	50 - 100 000	TEU
Dedicated berths and zones for operators	100 - 500 000	TEU
Container hubs having direct transocean calls	500 - 1 million	TEU

Secondly the strategy will be to increase the ship size in feeder operation and shift from independent operators to have the liner services calling the terminals with their own ships to own depots and terminals. Such service is common in the terminals of an ordinary size.

In the region Gdynia is the port with greatest potential, but the chance of transoceanic container calls before 2010 seem very low.

The ferry operation

The ferry operation in the BGW area is old and well established.

As the area represents a potential and natural demand to bridge over the Baltic Sea new investments comes natural. These investments come partly in increased service capacity for existing ferry lines and partly in new services that test the market. At the short distances the ferries fulfil the demand that can be posed on a bridge. On longer distances this is hard to achieve though, since it demands very high volumes.

The crucial item for the ferry traffic is to have good road access to the terminals and to care for the drivers in the terminals as well as aboard the ferry. A pleased and happy driver will use the service again.

The strategy of the ferry services today is to find and give service to cargo flows, i.e. road transports. The base of the service may be single or a number of contracts. The service will then give the best service available from the income of the operation. The service is built up on a fully commercial base, but it is quite common that the ports in the service take the investments on its own account for the start up of the service. This is natural as the long-term income form the terminal will be profitable for the port.

Figure 90 illustrates the trailer transported at ferries in the region in 2003. It is very clear that the ones in north-south direction are within the level of fulfilling the TEN turnover of port in tons/passenger volume calculating 16 tons per trailer shipped. The ones on the longer distances in east – west direction can't fulfil this level however.

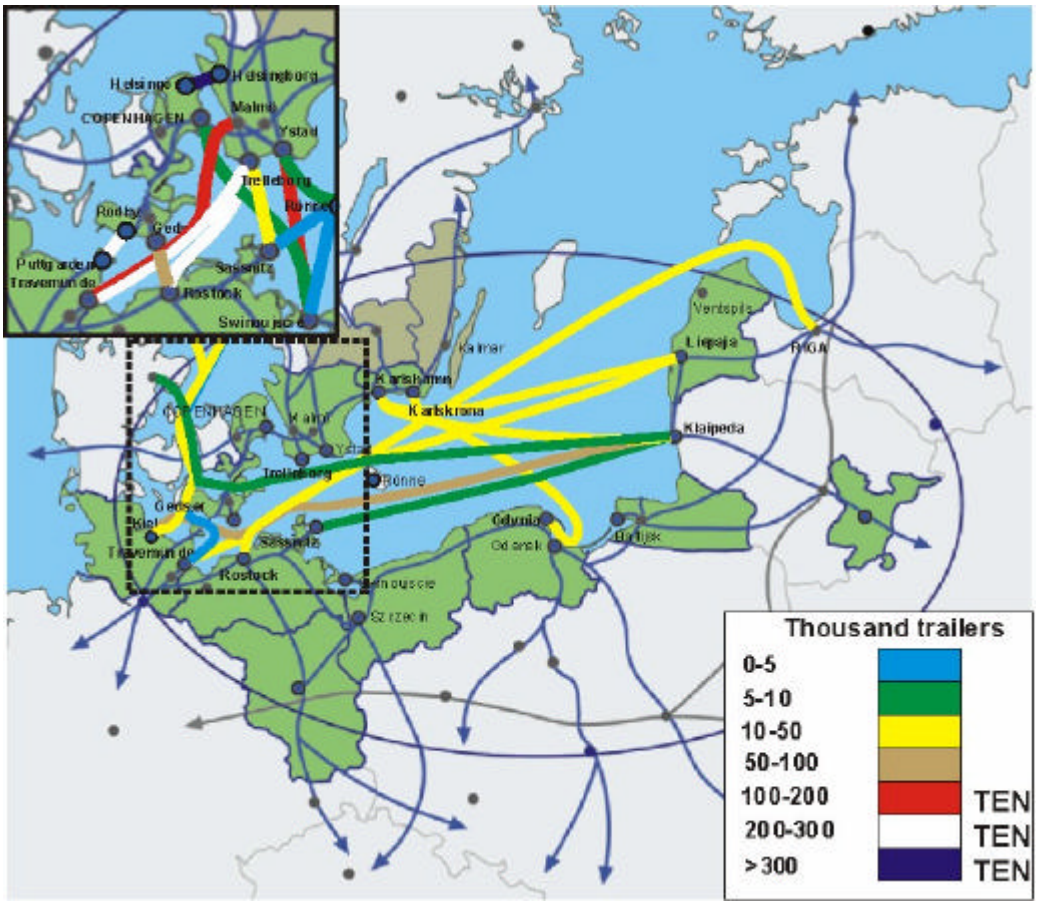


Figure 90: Trailer traffic in the Baltic Gateway area

Today there is a shortage of suitable ferry tonnage because of the new rules and regulations as well as the decrease in profit after the abolition of the tax-free system. The major operators control the ferries of good standard in service. They can move around their ships and have them where they fit best. If the service demand increased capacity the operator can build a new ferry for that service and use the old one to test the market or increase the capacity on another route.

The result of this is a very limited number of operators, most of the newcomers will have substandard tonnage and ports may loose on scattered investments. The upside is that the larger operators looking for a new market will have capital enough to sustain a start up, better tonnage and full service from the start.

Lots of money has been wasted in the Baltic Sea on ferry service trials so far. The money is lost both by investors who believed in the service and by the ports that tempted an investment to fit the ferry to the port terminal.

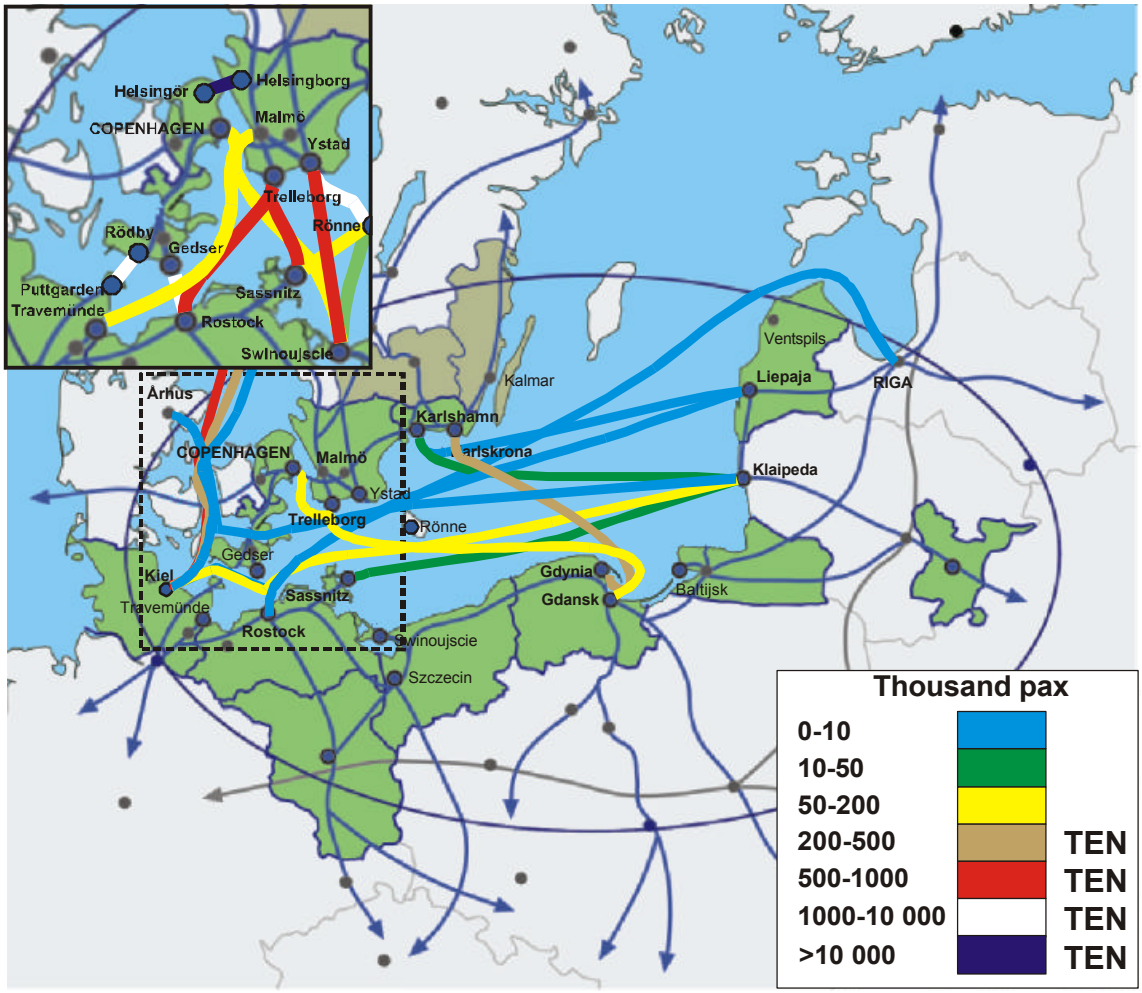


Figure 91: Passenger traffic in the Baltic Gateway area

9.3 Further analysis/Scenarios

In the project Baltic Gateway – Stage II – it is proposed to make further studies of the development of sea transports in the area. Four different further questions/scenarios are proposed:

Scenario No 1 The development of container transports

The container handling capacity in the ports is a direct function of the demand for transport and the turnover in the ports. Hence is the service by the operators also a function of the demand of the turnover of containers.

By studying the container volumes in the ports and its development the service levels from the operators can be predicted in a scenario where the growth of container handling is set. By varying the growth in the scenario it can be estimated when the demand reaches a level that implies upgrading of services and centralised operation.

The enormous ordering of container ships, an ordering that breaks all anticipations and market analysis, must result in an even faster containerisation of the world.

The effect of this in the Baltic Gateway area is to be analysed from port capacity and the expansion point of view.

The scenario will consider the potential development of the container transports in the region and discuss different potential actions from the market actors to employ the tonnage in the market.

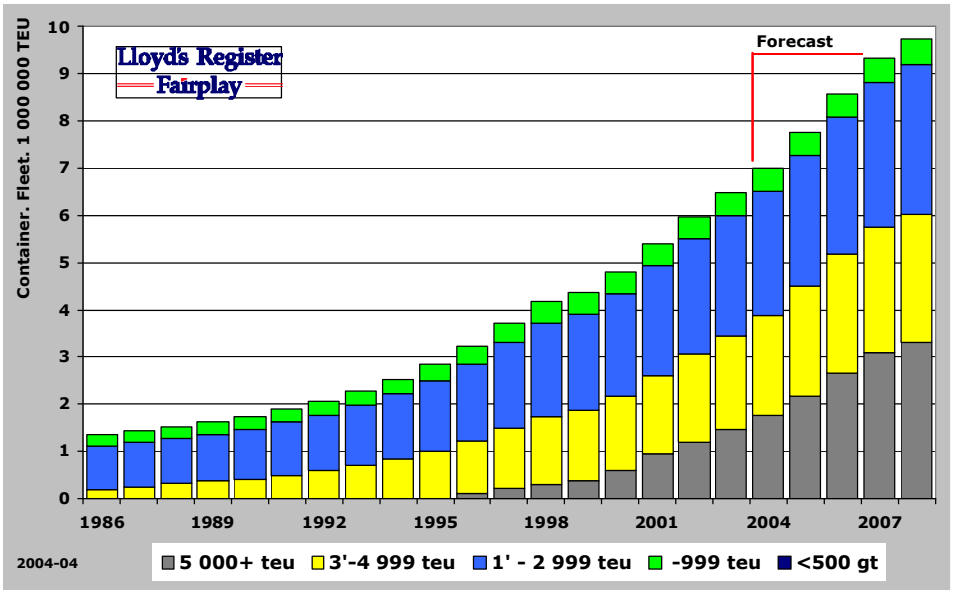


Figure 92: Container vessel fleet, million TEU

A crucial question is the how to be positioned as an operator to attract the shippers, where to position the container depots and the central ports, the hubs.

In different scenarios will the possible options be described and calculated on to find the restrictions/possibilities for the future development of container transports and structures in the Baltic.

Scenario No 2 Ecology

The ferry services are the sea transport operation that stands for the largest part of the emissions as it has a very high frequency and often powerful ships.

In an ecology scenario the total sea transport emissions are calculated for the traffic that that is trading within the BGW area. This is shown in relation to the total emissions given by sea transports in the Baltic Sea.

Scenarios are produced to show the result if the ships use better fuel (lower sulphur fuel) and/or are equipped with exhaust cleaning equipment.

Different ship types that can be used for the service are tested and compared from an environmental (emissions/energy) perspective to show the difference in performance.

Scenario No 3 Passing oil tankers

The oil transports from the Baltic Sea is increasing. Most of the ships will pass through the BGW area.

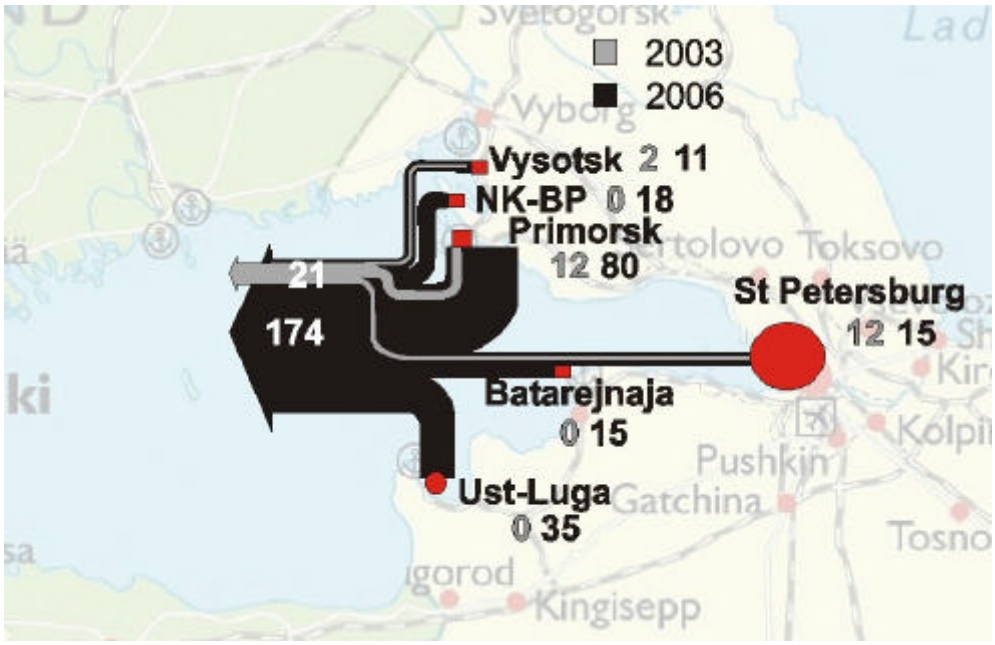


Figure 93: The anticipated development of oil transports from the Gulf of Finland

The present tanker traffic capacity passing the area could be presented in DWT and in number of ships. In Stage II the 2003 years figures will be used.

In a scenario the estimated produced and shipped volumes year 2006, 174 million tons from the Gulf of Finland. These volumes will be projected on the ships in order to show the change of ships traffic in the area.

The scenario will also deal with the consequences for the BGW area of the increased traffic, consequences of a heavy ice-situation and ports as place of refugee for the new expected tonnage.

Scenario No 4 The TEN – corridors in the BGW area

In the report the shipping activities are outlined for the ferry traffic and the cargo traffic in the Baltic Gateway area. The scenario will continue of the Chapter 7 outlined TEN routes.

The Scenario will draw up the resulting sea transport corridors in the Southern Baltic Sea area.

The fairway corridors will be drawn up form a number of perspectives:

- The traffic volume in the corridor
- The transport capacity in the corridor
- The future demanded capacity of the corridor
- The link to other relevant corridors using the link
- The connection to the main land transport corridors

The resulting information will be presented in pictures that can be merged with the land transport charts of TEN transport activities to illustrate a complete picture of the future TEN system.

References and Sources

This project is based on information that is purely assessed for the project. The main database sources are:

LMIU (Lloyds Maritime Intelligence Unit) ship movement database. The information is processed and delivered by SAI.

OECD trading database processed and delivered by Lloyds Register Fairplay Research.

ShipPax Statistics of Ferry services; processed and delivered by Lloyds Register Fairplay Research.

Lloyds Register World Ships database processed and delivered by Lloyds Register Fairplay Research.

Port information is assessed from Lloyds Register Fairplay Port Information and various sources from the Internet. If possible and available information from each individual port has been used.

References can also be given to the Interreg III b project Baltic Palette and the Action Group II report Infrastructure Connecting Urban Systems, Sea Transport Corridors. www.balticpalette.com. The information from this project shows affect on the Baltic Gateway area mainly in the way of the highly increased oil tanker activity in the South Baltic Sea and the competition in ferry service to the Baltic States.

The Interreg IIIa Project, Partnerskap Nordkalotten, has looked into the bulk trading in the Baltic Sea Area and the bulk cargo flows between the South Baltic Sea Area and the North. This is presented in a report "Sjöfartssamarbete in Bottenviken" that also elaborates with the political conditions for sea transports in the BSR. The report is available in Swedish and Finnish. www.logistik-nordkalotten.nu

In the business environment section of the report a numerous sources has been use including regular reports from International Monetary Fund (IMF), The Economic Co-operation and Development organisation (OECD), The European Central Bank (ECB), The Royal Bank of Scotland (RBS), The Economist, Foreningssparbanken, Nordea and SEB.

Abbreviations

AIS	Automatic Identification System (electronic sea charts displaying all ships in the vicinity and the details of the ships for a safe navigation)
BGW	Baltic GateWay
BSR	Baltic Sea Region
CAS	Condition Assessment Scheme
CEU	Car Equivalent Unit
DWT	Dead Weight Tons a figure of ships' approximate carrying capacity of cargo stores and bunker
ECB	European Central Bank
EMSA	European Maritime Safety Agency
ERM	Exchange Rate Mechanism, EU
EU	European Union
FSU	Federal Soviet Union
GDP	Gross Domestic Product
GRP	Gross Regional Product
HELCOM	Helsinki Committee
HGO	Heavy Grade Oil
IFI	International Financing Institutes
IMO	International Maritime Organization
IMF	International Monetary Fund
LPG	Liquefied Petrol Gas
MARPOL	Convention for the Prevention of Pollution from Ships, IMO
MEPC	Marine Environment Protection Committee, IMO
MTBE	Methyl Tertiary Butyl Ether, an additive to petrol
NIP	National Indicative Program, EU fund for Russia
PCC	Personal Car Carrier
PCTC	Personal Car Truck Carrier
PDI	Pre Delivery Inspection (workshop where imported cars will be outfitted and inspected for the domestic market)
PSSA	Particular Sensitive Sea Area, IMO code
RF	Russian Federation
SEB	Skandinaviska Enskilda Banken
SBSR	South Baltic Sea Region
Tacis	European fund for regional development in Russia
TEN	Trans European Network
TEN-T	TEN Transport
TEU	Twentyfoot Equivalent Unit (a standardised measurement for all containers, one 20' container is one TEU, One 40' container is 2 TEU)
UN	United Nations
VLCC	Very Large Crude Carriers

Passenger ships types; see Figure 38

MariTerm AB

Lloyd's Register

Fairplay

WWW.BALTICGATEWAY.SE