BALTIC MARITIME OUTLOOK 2006

Goods flows and maritime infrastructure in the Baltic Sea Region
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**SUMMARY**

The Baltic Sea Region (BSR) is a little less than half of the area of the EU, the share of its population is 23 percent and the aggregated GDP about 16 percent. Disparities between the countries in the BSR are large. Germany’s GDP alone is more than twice the size of the rest of the countries’ together (excluding Russia).

BSR economies are growing faster than the EU average. In 2005 nine of the ten countries had a higher growth rate than the EU average of 2.1 percent.

Trade within the BSR increases constantly and is one of the main reasons for the fast growth of the economy in the Baltic Sea countries.

The dependence on foreign trade in goods is generally high compared to the EU. The trade integration measured as the value of exports divided by GDP 2003 was 35 percent for the EU 25. For Germany, Denmark, Sweden, Norway, Finland, Poland and Russia the percentages per country varied between 38 and 43 percent, but for Latvia, Lithuania and Estonia the values were much higher with Estonia close to 75 percent.

The new EU economies’ dependence on exports increase much faster than for the other BSR countries. Deregulation and the removal of many customs administrative procedures have lowered transaction costs and increased trade between the new EU member states and between them and other EU member states.

This reflects the ongoing integration process in the region, resulting in higher relative growth rates in intra BSR trade volumes than in extra BSR trade volumes.

While the exports to countries outside the BSR are expected to increase by 46 percent to 2020, and imports by 31 percent, the intra BSR trade volumes are expected to grow faster, by 54 percent.

In 2003 trade to and from the countries in the BSR totalled 1 788 M tonnes; imports 744 and exports 1 044 M tonnes.

The European trade pattern shows significantly larger east-west trade volumes than north-south volumes, and the strongest growth in the intra regional trade is expected to take place between the north eastern and the south western parts of the BSR.

Oil and oil products will dominate the growth. Their share of total exports is expected to increase, while their share of imports is expected to decrease.

For the imports, it can be concluded that vehicles, machinery, electronic goods, electrical equipment and coal are forecast to increase, but oil/oil products, manufactured goods, building materials and chemicals will remain the four most important commodity groups.

Transport by sea is playing an increasingly important role. In the BSR, approximately 50 percent of all foreign trade is transported by sea. Maritime transport to and from destinations outside the BSR accounted 2003 for 76 percent of the total maritime transport, while the intra-BSR transport accounted for 24 percent.

More than 50 percent of total maritime transport are related to the three Scandinavian countries and Finland.

Between 2003 and 2020 maritime transport is expected to grow by 64 percent and road and rail traffic by 27 percent or measured in M tonnes 471 and 272 M respectively.

The maritime transport volume to/from the region is expected to grow by 324 M tonnes and the intra-BSR volume by 147 M tonnes.

Outbound transport by sea is expected to show the strongest growth both in relative and absolute terms, followed by increased intra-BSR transport.
The sea transport corridors connect to a number of important future gateways for trade between the Baltic Sea Region, the European continent and the rest of the world.

These gateways lie both inside and outside the region, for example the deep sea continental ports, which lie close to their main market areas.

The Skagerack/Kattegatt Sea area represents a gateway to the entire Baltic Sea Region, while sub-regional gateways are emerging in for instance Poland and the Gulf of Finland, through which goods find more efficient routes to and from their destination or source areas.

Ports in Germany, Poland and the Gulf of Finland are expected to experience most of the growth in calls.

Russian oil exports are increasingly being channelled through Russian ports in the Gulf of Finland and Kaliningrad, and through emerging new deep sea ports in the Barents Sea area.

The Central and Eastern European part of the BSR is heading for full integration into the European transport network, but substantial investments are required to develop the networks in the east to West European standards.

The road and rail systems are in urgent need of modernisation, but investments in port and hinterland infrastructure need special attention in the BSR, due to the importance of maritime transport for the economic development of the region.

The main obstacle to such a development lies in the transport infrastructure and differences in treatment between transport modes. Deregulation of road transport gained by EU membership underlines the importance of eliminating such differences.

Reduced time for border crossing and transit through Poland in combination with low fuel cost in Russia has led to a shift from sea to road transport in the south Baltic area as evidenced by lower goods volumes in some of its ports.

The ports in the area are organised and financed in a number of different ways, often reflecting historical traditions in a particular country.

Port services are always paid for in full by the user. Infrastructure like fairways, lighthouses etc. is either paid for in relation to usage, in full or in part, typically then running and maintenance, or by the taxpayer. The systems are so diverse, and the negotiable part of port call costs so great, that it is not possible to make a “fair” comparison between different ports of the cost for making a call. Calls at ports in the new EU member states tend, however, to be less costly than the in other countries, although the costs are rising fast.

Ice-breaking capacities and organisations are considered inadequate for future traffic pattern developments at the Baltic Sea and in rivers.
There is a shortage of icebreaker capacity in the Russian part of the Gulf of Finland and in Estonian waters, where problems arise frequently during harsh winter conditions.

Denmark, Norway, Sweden and Finland have a lengthy tradition of cooperation. The "Nordic Treaty" is an agreement between these countries that covers cooperation regarding icebreaking.

Discussions are taking place on route planning for maritime traffic, especially against the background of the increasing oil shipments in the Baltic Sea region.

National transportation networks connected through EU and Baltic Sea cooperation are decisive for the development of the conditions for maritime transport in the BSR.

The initiative taken by the Motorways of the Baltic Sea Task Force to study trade and transport in Baltic Sea Region calls for further initiatives to improve the information on the conditions for maritime transport in the area.
**INTRODUCTION**

By tradition, infrastructure planning is a national responsibility. The challenge today is to introduce a European dimension in national planning, to support increasing trade within the enlarged European Union and with its neighbours. The challenge concerns not only the provision of future infrastructure to cope with trade expansion, but also how to facilitate the internal market mechanisms.

The recent development of maritime transport in the Baltic Sea region has been characterised by an increase in shipping volumes and by the use of larger vessels. In particular, there has been a marked increase in oil traffic in the Baltic Sea.

There are many uncertain elements affecting the geographical structure of demand. One is that new and improved land transport connections will, over time, introduce competition to the maritime corridors. Another is the development of Russian port capacity and related transport corridors, which have the potential to change the present structure of transit flows via the neighbouring countries considerably. A third uncertain element is the extent to which maritime goods operation will be further concentrated. These uncertainties might have a substantial impact on future development. Furthermore, projections of transport demand are particularly difficult and uncertain, because economic and transport statistics, as well as analytical tools, are less well developed for the Baltic Sea region.

The introduction of the trans-European transport network (TEN-T) in the beginning of the 1990s highlighted the European dimension of infrastructure planning. The role of maritime transport in the transport chain was strengthened in 2001, when the seaports were included in TEN-T. The Motorways of the Sea concept, which is now integrated in the revised TEN-T guidelines, will give even more emphasis to the role of maritime infrastructure in delivering an efficient, safe and environmentally friendly transport system.

The Motorways of the Sea concept aims to improve cohesion within the Union, to provide access to peripheral and island regions and to reduce road congestion. One approach is to concentrate flows of freight on sea-based logistical routes, by improving existing maritime links; another is to establish new viable, regular and frequent maritime links for the transport of goods between member states.

The Baltic Sea countries have been active in the forming of a concrete and intelligible idea of the sea motorway concept. The "Baltic Sea Motorway Task Force" has representatives from all Baltic Sea countries (excluding Russia) and the European Commission.

The difference between the four sea motorway areas in Europe should be recognised and considered in the further development of the concept. The Baltic Sea area has many existing maritime links and the focus of the sea motorways here is on the development of transport chains based on these links, rather than on the creation of new links. It must be stressed that although the Motorways of the Sea in the Baltic aim at increasing cohesion and accessibility, an equally important objective for the development of the area is the need to develop the trade corridors with the rest of the world.

The purpose of this report is to contribute to an increased knowledge of the current situation as well as the likely future development of maritime transport in the Baltic Sea Region. It targets both the intra-regional and extra-regional dimensions of trade and transport. Such knowledge is necessary for the further development of transport policies, infrastructure planning, other joint actions in the Baltic Sea region and the development within industry.

The study will serve as an input to the development of the activities within the different fora in the Baltic Sea Region, including the Baltic Sea Motorways Task Force and its sub-groups.

It is also expected that governments, governmental agencies and other stakeholders, public and private, in the transport sector will use the study.

Maritime transport plays an important role in the economic development of the Baltic Sea Region; it is privately financed and operated, but there is an urgent need
for backing public investments in fairways, lighthouses, icebreaking and traffic monitoring services, as well as in hinterland road and rail infrastructure. The report forecasts a strong increase in the demand for transport and a corresponding response from the shipping industry, leading to more and bigger vessels calling in the ports of the Baltic Sea Region. Public and private investments must be coordinated, in order to develop an efficient and sustainable transport system.

The report has been financed by the Swedish Maritime Administration, Ministry of Transport and Communications of Finland, Tallinn Port Authorities, Klaipeda State Seaport Authorities, Ministry of Infrastructure of Poland, Danish Maritime Authority, Norwegian Coastal Administration and the European Community. The study is part of the Master Plan Study for development of the Motorways of the Baltic Sea.

The study is performed by SAI (The Institute of Shipping Analysis) in Göteborg, BMT Transport Solutions GmbH in Hamburg and Center for Maritime Studies in Turku.

METHODOLOGY

Trade and transport data have been compiled from various sources. In order to create a complete picture of total cargo exchange in the Baltic Sea Region, trade data from national statistical bureaus, EUROSTAT and the UN have been used. When inconsistencies between the sources have occurred, national statistic sources have been given highest priorities.

Since transport data is lacking in many of the above mentioned sources, estimates have been made, on the basis of trade data and data collected from ports.

The forecast growth figures have been cross-checked with available forecasts from other organisations and national authorities. This cross-checking lacks some consistency, and only provides rough indications. In general, the forecast GDP growth rates calculated are well in line with figures published by DG TREN.

Other relevant information has been collected and cross-checked with recently published studies and reports and with members of the project advisory group from the BSR countries.

Every chapter begins with a summary of the main findings.

The report presents data on a highly aggregated level. More detailed information is available as a separate annex, which can be acquired from the Commissioner.

GEOGRAPHICAL SCOPE
OF THE REPORT

The geographical coverage of the study is the Baltic Sea countries Estonia, Latvia, Lithuania, Poland, Germany, Denmark, Norway, Sweden, Finland and Russia.

In analysis of socio-economic factors and trade the whole economies are included, while analysis of goods flows and infrastructure are restrained to those parts of the countries that are relevant.

Various parts of the BSR require special attention, for example the Gulf of Finland, which is regarded as particularly vulnerable to disturbances.
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• In the past decade, the BSR has been one of the fastest growing regions in the world and the perspectives are considered to be still positive – but a strong integration of Russia seems mandatory.

• Despite the land area of the Baltic Sea Region (BSR) being a little less than half of the area of the EU, its share of the population in the EU is 22 percent and the aggregated GDP about 16 percent of the EU total.

• BSR is a heterogeneous group of countries and sub-regions in terms of area, natural resources, scale and structure of the economies and population. In recent years however, the BSR countries have started to integrate in several fields of politics and economy.

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

• With a total population of about 103 million, the BSR is witnessing a likely scenario of ageing populations and population decline, like the whole of the EU. The concentration of population in big metropolitan areas and other cities is expected to increase.

• There are differences in the economic structures of the BSR economies: several decades’ structural changes have already resulted in the service sector employing about 3/4 of the personnel in the ”old” market economies, whereas in the new EU member states and Russia services have just started to gain a greater share of employment.

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

• Estonia, Latvia and Lithuania have relatively benefitted most from the foreign direct investment (FDI) per capita in the BSR. In absolute terms, FDI inward to Poland was about 30 times higher than the FDI outward from Poland.

• Between the years 1995 and 2004, the aggregated GDP of the BSR (excluding Russia) grew 42.4 percent to the total of 1 609 598 Meuro. For the coming years, the IMF forecast the highest GDP growth in Russia, Estonia, Latvia and Lithuania.

• Among the BSR economies, there is a substantial growth potential, mostly among the new EU member states and Russia. Some predict that the BSR will be the fastest growing region of Europe in the near future.
THE ENLARGEMENT OF THE EU AND ITS IMPACT ON TRADE AND TRANSPORT – POLITICAL CONTEXT

Since May 2004, eight out of the ten countries in the Baltic Sea Region (BSR) have been EU member states. The two non-member states are EU-associated Norway and the non-associated Russia. The BSR is non-homogenous historically, politically and economically. It is a fragmented region with huge economic and social disparities, both in terms of growth and stability.

A major benefit from an EU membership is that it removes trade barriers and reduces transaction costs for the member states. Some of these potential gains have already been felt in the run-up to membership. One of the most significant results of economic co-operation in the BSR to date is the development of bilateral trade between the countries in the region. EU membership has the capacity to further stimulate economic growth.

The prospect of EU membership has served as a framework for political and economic reforms in Poland, Estonia, Latvia and Lithuania, but the absence of such an external reform driver has been apparent in Russia. Moreover, the focus on the exploitation of natural resources seems to have undermined the necessary diversification and reform of Russian industry. However, Russia’s expanding trade with the EU increasingly uses the Baltic Sea Region.

In the past decade, trade within the BSR has boomed, and the region has been one of the fastest growing regions in the world.

The dependence on foreign trade in goods is generally high in the Baltic Sea Region compared to the EU. The trade integration measured as the average value of exports divided by GDP 2003 was 35 percent for the EU 25.

The prospects for substantial growth in investment and trade are still considered to be high, but, in future, continuing economic development in the region will strongly depend on the success of a stronger integration with Russia.

Following the dissolution of the USSR, Russia retained only 41 of its previous 92 seaports, and for a number of years the remaining ports suffered from lack of investment and modernisation, which made it less costly to use foreign than Russian ports. Major investments are now taking place, and the Russian federal and regional governments show determination to further rebuild the maritime infrastructure and to increase the volume of international trade through Russia’s own ports.

THE BALTIC SEA REGION AS A EUROPEAN MACRO REGION

The Baltic Sea Region (BSR) is positioned at the north-eastern part of the European mainland, spanning both the arctic and the temperate climate zones. The area borders on the Barents Sea, the North Atlantic Ocean and the North Sea and is connected, both historically and currently, by the Baltic Sea itself. Forests and arable land make up most of the land area. Other prominent features include large bodies of fresh water, as well as glaciers and tundra.

According to many observers, the BSR is by no means a homogenous region. Its 103 M inhabitants live in 10 different countries or parts thereof, in which as many major languages are spoken. A majority of the population adheres to either the Catholic, Lutheran or Orthodox faith and the forms of government include three constitutional monarchies, two federal states and five republics. Eight countries - Sweden, Finland, Estonia, Latvia, Lithuania, Poland, Germany and Denmark - are EU Member States, Norway is a member of the EEA and EFTA, while the remaining country, Russia, although co-operating closely with them, is not a member of these organisations.

The land area of the region is approximately 2.3 million km², which is a little less...
than half of the area of the EU. The hundred million people inhabiting the BSR render an average population density of some 46 inhabitants/km². While this is low when compared with the EU, it is significantly more than in the USA, for example. Norway, Denmark, Sweden and Finland constitute nearly half of the region’s entire area and the Russian parts of the BSR more than a fifth. Of the remaining third, Poland is the largest, followed by Germany, whereas the remainder is nearly equally distributed between Estonia, Latvia and Lithuania. More than a third of all people living in the BSR live in Poland and nearly a quarter in Norway, Denmark, Sweden and Finland. A quarter of the population of the Baltic Sea Region live in eight German states, and Russian regions make up for around a tenth of the population. Some 7 percent live in Estonia, Latvia and Lithuania.

The Baltic Sea Region’s share of the aggregated population of the BSR and EU is 22 percent, but only 16 percent for the aggregated GDP (Table 1). This clearly shows that the economic centre of Europe is not in the Baltic Sea Region. However, if we look at the statistics at the regional level, we see that there are great differences, not only in economic status, but also in population densities and in labour statistics between BSR countries as well.

The Baltic Sea Region is entering a new stage of its economic development. With the accession of Poland, Lithuania, Latvia and Estonia to the European Union, all countries except Russia and Norway are now part of one integrated economic area, subject to common rules and regulations in many areas. The new EU members in the Baltic Sea Region are moving out of the transition phase into their next stage of economic development, as young but established market economies. In addition, regional co-operation is shifting, from the provision of support by western countries to their eastern neighbours, to a more balanced give-and-take, where both sides invest to achieve joint economic returns. While this new stage of development offers new opportunities, and in many ways is a confirmation of past achievements, it also requires a review of the existing models and means of regional co-operation.

As the new members have entered the EU co-operation arena, more countries now take part in the decision-making process, in a way that affects the overall European agenda. The increasing economic integration will benefit some parts of the Baltic Sea Region, while others may lose out, as pointed out in the “Nordisk regionalpolitisk samarbeidsprogram 2005-2008” (Nordic Cooperation Program for Regional Policy).

The Baltic Sea Region shares many historical ties, symbolised by the legacy of the Hanseatic league. In the decades preceding the 1990s, however, membership of different political and economic blocks and organisations put the parts of the Region on different courses, both in terms of their economy and their identity. Compared to more central parts of Europe, the Baltic Sea Region also faces a number of other specific challenges in terms of development. The keywords here are their location on the northern periphery, long distances and dispersed habitation, a harsh climate and restricted accessibility. Both history and location are constants that any effort to create an effective strategy for economic collaboration across the Region has to take into account.

### Selected features of the BSR and EU.

<table>
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<tr>
<th>Population (1000)</th>
<th>Land area (1000 km²)</th>
<th>Inhabitants/ km²</th>
<th>GDP at market prices (million €)</th>
<th>Household final consumption expenditure (1000 € / inhabitant)</th>
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From an institutional and organisational point of view the BSR is still a heterogeneous economic area. In spite of the fact that all the countries are now members of the World Bank and IMF systems, many obstacles to free capital flow remain. With regard to trade and trade barriers the picture is also very varied, but for most countries the tendency toward liberalisation is evident.

Large differences in economic performance and growth between countries and regions of the BSR can be attributed to differences in economic structure, degrees of liberalisation and selected economic policies. These differences are likely to encourage labour mobility between or within BSR countries. Economic differences can also be viewed as a significant asset, if the various parties are able to gain mutual benefits from cooperation and thus enhance development. In the long run, increased interaction is likely to even out the differences, leading to the emergence of other forms of cooperation (not based on differences). Following the collapse of the Eastern block, most BSR economies went through a phase of serious economic recession in the early 1990s. This recession affected nearly all the BSR countries, not only the transition ones. However, the Baltic Sea Region is today experiencing a phase of strong economic development and, in the late 1990s, several BSR economies recorded some of the highest growth rates in the world. On the whole, the transition countries, starting from a lower level, are growing faster than most non-transition BSR countries.

In 2004 the aggregated GDP of the BSR economies, excluding Russia and non-BSR regions of Germany, was 1 609 598 million euros. If the whole of Russia is included, the volume was 2 056 742 million. GDP development from the year 1995 to 2004 witnessed huge disparities between the countries. The fastest growing economies were Lithuania with a growth of 366.8 percent, Estonia (309 percent) and Latvia (296 percent) and the slowest Germany (21 percent), Denmark (41 percent) and Sweden (47 percent). The Russian economy grew by 88 percent. The aggregated growth for the BSR between 1995 and 2004, excluding Russia and non-BSR regions of Germany, was 42 percent or a yearly average of 4 percent.

When comparing the sizes of the BSR economies, Germany’s GDP alone is more than twice the rest of the countries’ together (excluding Russia). Despite the rapid growth in Estonia, Latvia and Lithuania, these countries together still account for only 2.35 percent of the aggregated GDP in the area. The GDP volume of the western Russian regions in the BSR is about the same size.

There are indications that nine of the ten BSR economies are growing faster than the EU average, which is 2.1 percent. Although any economic trends in the BSR are difficult to predict, due to relatively high volatility, two types of economic development seem to be emerging in the eastern BSR; Poland, Estonia, Latvia and Lithuania are growing very steadily, whereas Russia is experiencing significant economic turbulence. Nevertheless, disparities in per capita production in the BSR are among the highest in the world and the region includes some of the wealthiest as well as some of the poorest areas of Europe, in many cases bordering directly on each other. The largest economic gap in the BSR is most likely the boundary between Finland/Norway and Russia, and between former West Germany and the new Länder.
TRADE AND FOREIGN DIRECT INVESTMENTS

Proximity promotes trade and distance means expense. That is why companies prefer markets and partners in nearby areas. Most firms are strongest in their home market. An increasing number of firms regard the Baltic Sea Region as their home market.

The modern pattern of international division of labour ties national economies very closely to one another. A major part of foreign trade takes place within production processes. This requires high standards of infrastructure, quality and logistics in all participating countries and companies. Subcontractors, or other partners, have to meet international standards to be able to participate. In particular, these terms have been very severe on firms in former socialist countries. So far, Russia, whose exports consist mainly of energy and metals, has managed to postpone its response to this challenge.

The development of intra-Baltic trade has laid the foundation for an economic region around the Baltic Sea, but commodity trade alone cannot unify a market. Rather, the intensification of integration is reflected in the increased mobility of factors of production. It is foreign direct investment (FDI) that significantly promotes the formation of new networks and leads to a long-term convergence and integration of the national economies.

Foreign direct investment (FDI) can be described as an indicator of more formalised international integration of economic systems. The importance of the FDI for the economies in Estonia, Latvia and Lithuania is evident.

In the new market economies of former socialist countries the role of inward FDI is very important, but the outflow has been very small. The supply of domestic capital for investments is limited and several new EU-Member States in the BSR suffer from large current account deficits. Domestic savings are not likely to increase rapidly.

The fresh capital flows into the region due to the privatisation of former state owned enterprises have waned, as the privatisation process has slowed down. Also, FDI has been boosted in recent years through various Free Economic Zones arrangements; however, these will no longer be allowed since the accession countries became EU-Member States.

Of these countries, Estonia has obviously been the most successful recipient of foreign direct investments, when looking at per capita data. In absolute figures, Poland has been more attractive to foreign investors than Estonia, Latvia and Lithuania, because of its size and natural resources. However, the shares of FDI per capita in Latvia, Lithuania and Poland are equal, while in Estonia the share is almost three times larger.

In Latvia, Lithuania and Estonia, a certain concentration of FDI can be seen in services such as financial services and hotels, in food processing, wood processing and textiles. In Poland, much of the FDI has occurred in manufacturing industry, such as transport equipment.


Data source: UNCTAD (2003)

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Russia contains the greatest natural resources in the world, and has the consumer and labour potential of a population of 145 million, together with limitless investment opportunities, from high technology to agriculture. However, despite rapid economic growth and other positive features in Russia’s economy in recent years, the obstacles to FDI have exerted a stronger influence than any encouraging factor.

Russia’s investment climate still suffers from a number of serious shortcomings. The general problem seems to be the poor – albeit slowly improving - implementation of reforms. In terms of administrative barriers, research results from SITE show that some of the regions in north-western Russia, i.e. the area nearest to the BSR, are among the worst in this aspect.

In Russia, the main areas for investments have been transport and communication, fuel and petrochemicals. In comparison with the new EU-Member States in the BSR, investments in Russia usually aim to satisfy Russian domestic demand, while engagements in the new EU member states are often intended to produce goods and services that are also destined for western Europe. Therefore, FDI in the eastern BSR countries is expected to generate additional international as well as domestic transport volumes.

**ECONOMIC STRUCTURES AND INDUSTRY SECTORS**

Different types of industry sectors are dominant in different parts of the Baltic Sea Region. The northern parts are strong in forest industries, Norway and Russia are big oil producers, while Germany and Poland are strong metal industry countries.

In Sweden, the industrial production is concentrated in sectors that use domestic raw materials, such as timber, iron and other metals. Among the most important production sectors are wood pulp, paper and metal production, car manufacturing, production of machinery, telecommunication and pharmaceutical products. Finland has a highly industrialised economy, and its key economic sector is manufacturing - principally wood, metals, engineering, telecommunications, and electronics industries. Russia has a complete range of mining and extractive industries producing coal, oil, gas, chemicals, and metals; all forms of machine building, consumer durables, textiles, foodstuffs and handicrafts. However, only a few Russian firms are competitive in international markets. Their industrial production is technologically outdated and very energy intensive; it needs modernisation.


The economies of Estonia, Latvia and Lithuania have undergone profound structural changes during the last decade. A prominent feature is the rapid growth of the private service sector which today accounts for over half of total employment. In comparison with its neighbours, Latvia has an undersized industrial sector. During the Soviet era, Latvia had the most diversified industrial base among these countries but much of it was not competitive in the new economic environment in the 1990s.

The Estonian economy benefits from strong electronics and telecommunications sectors, and is greatly influenced by developments in Finland, Sweden, and Germany, three major trading partners. It also has a strong food processing and textile industry. Estonian industry is characterised by small enterprises and diversified production. It is, however, dependent on imports for energy and raw materials. Lithuania’s biggest employers are textiles and food processing industries.

Poland has pursued a policy of economic liberalisation throughout the 1990s and today stands out as a success story among transition economies. The privatisation of small and medium-sized state-owned companies, and a liberal law on establishing new firms, have encouraged the development of the private business sector. Poland has also made massive investments into the production infrastructure, which has caused a rapid growth of industrial production. The three largest industry sectors in the country are food processing and beverage production, vehicle manufacturing and chemical industry.

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

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

Norway, on the other hand, is richly endowed with natural resources like petroleum, hydropower, fish, forests, and minerals, and is highly dependent on its oil production. Norway is also an important shipbuilding country within the offshore sector.

The BSR employment pattern is currently undergoing a rapid structural change. Agriculture is being re-organised and productivity increased, with the result that the previous seemingly innumerable, small farming units are no longer able to sustain the rural population. This is especially true in the new EU member countries but applies, for example, in Finland as well. At the same time, many traditional manufacturing centres, especially in the East, are under substantial pressure to rationalise, while an emerging service sector creates opportunities for new employment. On the whole, the service sector, both public and private, has been the most successful in generating new jobs. This is especially true for the transition countries, which are starting from a substantially lower level than the western BSR countries.

There are large differences in the sectoral composition of both production and employment between the BSR economies. On a national level, the largest differences are found between, on the one hand, Lithuania, Latvia and Poland with high shares of their work force employed in agriculture, and on the other, the rest of the BSR countries, where this share is substantially lower. In 2003, roughly a fifth of all employed persons in Lithuania and Poland were in agriculture and nearly as many in Latvia (13 percent). The corresponding figure for Germany, which is the lowest in the BSR, was only 2 percent. A substantial decrease in primary sector employment has occurred in nearly all BSR regions. The changes have been most dramatic in Estonia, where many agricultural jobs have been lost during the last decade.

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Another aspect of importance is the underdevelopment of the service sector in the transition countries. In Poland and Lithuania the service sector employs only 54 percent of the workforce. In comparison, in the western BSR, the service sector provides three quarters of all jobs. The manufacturing sector is most significant in Estonia, providing over 25 percent of all employment.

GEOGRAPHY OF THE ECONOMIC CONCENTRATIONS

ECONOMIC CONCENTRATIONS BY COUNTRY

Almost every possible product is manufactured within the BSR area. If we take a look at the regional concentration map, we notice that the industry concentrations in terms of value follow the population density of the region. It means that the economy is concentrated in the same places as people or vice versa. There are however a few exceptions.

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

The situation is very similar in Finland, where the rapid growth since the end of the 1990s recession has favoured urbanised areas. Food production is distinctly concentrated in the western parts of the country and forest industry in the central and eastern parts of the country. The sub-regions of south-western Salo and northern Oulu are most strongly oriented around the electrotechnical and telecommunications cluster, and in northern Finland the metal and mechanical engineering sectors are also relatively strongly represented. The Helsinki Metropolitan Area is, however, the biggest economic concentration in Finland.14

Russia has almost all of its industrial centres outside the Baltic Sea Region. One of the richest regions is Tyumen, east of the Ural Mountains, where most of the oil is extracted at present. Only St. Petersburg is in the top ten list of the most important Russian industry areas and ranks as number 715. There is however an important oil industry area in Murmansk and big forest industry concentration in Karelia in the Baltic Sea Region. Other western regions of Russia directly bordering on the Baltic are relatively undeveloped.

Estonia and Latvia have about 1/3 of their inhabitants in their capitals, Tallinn and Riga; the other cities are small. Lithuania’s top three cities are more equal in size, and the capital, Vilnius, is not as dominant in the country as Tallinn and Riga are in their respective countries. The economic importance of these capitals widely out-ranks their population size; Vilnius less so. Economic development outside the big cities is far less vigorous, causing serious social imbalances. There are, however, a number of other cities, which are important in economic terms. Some of them are attractive because the cost of living is much lower there than in the capitals. In Estonia, Tartu is a centre for education and research. In Latvia, the harbour cities of Liepaja and Ventspils are important. In Lithuania, Kaunas is the second most important centre of industry, culture and education. Klaipeda with its harbour and good inland connections is an important centre of economic activity, particularly for transit cargo.16

Poland has a strongly developing economy, with a good position in Central Europe, between east and west, north and south. There are, however, large income imbalances between the cities and the rural areas, and according to Eurostat, Poland has the five poorest regions of the EU25. The largest economic concentration is in Mazowieckie region, around the capital Warsaw.

Industrial output in terms of Gross Value Added in different BSR sub-regions in 2002 (Russia excluded). Regional level NUTS 3, except for Poland NUTS 2, Germany NUTS 1. Data sources: Eurostat and national statistics.
Germany’s affluent and technologically powerful economy has become one of the slowest growing economies in the Euro-zone, and a turnaround is not expected in the foreseeable future. Almost every possible industrial product is manufactured in Germany. The centre of these industries is, however, outside the Baltic Sea Region, in Southern Germany and in the Ruhr area. Hamburg and Bremen are major port and shipbuilding cities which also have substantial machinery production. Berlin, as the federal capital of Germany, is naturally one of the most important economic concentrations in the country.

In Denmark the industrial concentrations differ from the population concentrations. About 2/3 of the industry work force are employed in Jutland and Fyn while the service sector remains concentrated to the Copenhagen region.

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

### German Federal Republic

<table>
<thead>
<tr>
<th>Production Year 2004</th>
<th>Wood Pulp million tonnes</th>
<th>Paper and Paperboard million m³</th>
<th>Sawn Goods million m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>2.2</td>
<td>20.4</td>
<td>19.1</td>
</tr>
<tr>
<td>Norway</td>
<td>2.2</td>
<td>20.4</td>
<td>19.1</td>
</tr>
<tr>
<td>Sweden</td>
<td>12.1</td>
<td>11.6</td>
<td>16.9</td>
</tr>
<tr>
<td>Finland</td>
<td>12.6</td>
<td>14</td>
<td>13.5</td>
</tr>
<tr>
<td>Russia</td>
<td>6.9</td>
<td>6.8</td>
<td>21.5</td>
</tr>
<tr>
<td>Estonia</td>
<td>0.1</td>
<td>0.1</td>
<td>2</td>
</tr>
<tr>
<td>Latvia</td>
<td>0</td>
<td>0</td>
<td>3.9</td>
</tr>
<tr>
<td>Lithuania</td>
<td>0</td>
<td>0.1</td>
<td>1.5</td>
</tr>
<tr>
<td>Poland</td>
<td>1</td>
<td>2.6</td>
<td>3.9</td>
</tr>
<tr>
<td>Germany</td>
<td>2.2</td>
<td>20.4</td>
<td>19.1</td>
</tr>
</tbody>
</table>
and Finland the paper and pulp mills are integrated, in other words the pulp producers typically also have paper machines. The grades produced in Scandinavia are mainly printing papers. In Sweden, there is one giant producer of pulp that does not have its own paper industry.

In the new member states of the EU, the paper industry does not have a significant role, except to some degree in Poland. In these countries, paper consumption per capita is at a low level. During the time of economic transition, a packing industry with liner and craft paper production emerged, because of the new demand in consumer goods markets. Today, multinational firms are interested in investing in the fine paper production in the new member states and in Russia. In Russia, there are also newsprint producers, which have mills near forest resources.

The plants in Germany are located near the raw material resources. About 65 percent of paper industries’ raw material is based on recovered paper, and thus the mills are situated in the densely populated areas. Germany is the biggest producer of paper with 20 M tonnes annual output, but it is also the biggest user of paper in the area.

In the mechanical forest industry, Sweden and Finland have been the main producers and exporters. Russia has regained its former position as producer and exporter of sawn goods. In addition, Scandinavian companies now invest in the Russian mechanical forest industry.

The Scandinavian forest industry companies are undergoing globalisation, which has resulted in raw material transports across the Baltic Sea. For example, Estonia, Latvia and Lithuania export pulpwood to Scandinavia. Russia is also an important raw wood supplier to the chemical forest industry in Scandinavia. The Norwegian chemical forest industry has a good geographical position to exploit fast growing pulp wood resources of the southern hemisphere.
THE OIL INDUSTRY

Norway and Russia are Europe’s biggest oil producers with the shares of 3.9 percent and 11.9 percent. According to British Petroleum’s production statistics, Russia was the world’s second biggest crude oil producer in 2004. The majority of the BSR states do not have their own oil production. North European countries’ shares of world oil refining capacity are generally low, compared to their shares in production. The relatively biggest refining capacities are in Russia and Germany. The majority of the output from Russian crude oil production is exported to Europe.

Numerous oil refineries exist around the BSR. The majority of the refineries are found on the coastline, indicating the importance of sea transport in the business. In the eastern BSR, the refineries are also connected or close to the Russian pipeline network. The situation is the same for the North Sea and the Norwegian coast. The BSR refineries’ demand is mainly supplied by crude oil production from the nearby North Sea and West Siberia in Russia.

The (Metal) Mining Industry

Shares of the BSR countries of the mining production of some metals in the world.

Data sources: European Association of Mining Industries (Euromines) 2005.

* The whole of Russia

<table>
<thead>
<tr>
<th>Metal</th>
<th>Iron</th>
<th>Zinc</th>
<th>Copper</th>
<th>Lead</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poland</td>
<td>0.2</td>
<td>3.3</td>
<td>2.1</td>
<td>1.9</td>
</tr>
<tr>
<td>Russia*</td>
<td>12.4</td>
<td>8.4</td>
<td>2.1</td>
<td>4.9</td>
</tr>
<tr>
<td>Sweden</td>
<td>0.4</td>
<td>3.7</td>
<td>0.2</td>
<td>0.7</td>
</tr>
<tr>
<td>Finland</td>
<td>4.3</td>
<td>3.7</td>
<td>0.4</td>
<td>0.2</td>
</tr>
</tbody>
</table>

THE IRON AND STEEL INDUSTRY

The European steel industry’s (EU25) share of the crude steel production in the world was 18 percent in 2004. In 2004 its output was 193 M tonnes. The corresponding figures in pig iron production were 16 percent and 111 M tonnes. The biggest steel producing countries in Europe were Russia with 66 M tonnes and Germany with 46 million.
In northern parts of the BSR, the production of steel, steel products and iron is mostly concentrated in coastal areas. In Silesia in Poland and in central Sweden, there are also big manufacturing plant concentrations. In the cases of Russia and Germany, the main steel and iron production locations are outside BSR boundaries: in Germany mainly in the Ruhr area and in Russia in the Ural Mountains and Central Russia.

Steel and iron industries have a heavy impact on transport; both raw materials and finished and semi-finished products are transported widely. According to Eurofer (2005), the steel sector generally remains the most important user of rail freight in the European Union, but rail freight has lost market shares to road transport and partly to inland navigation. In some countries, such as Germany, transport on inland waterways represent a substantial share of the transport volume.

Swedish steel industry is very dependent on cost effective transport over long distances. The most important transport modes of steel are rail (40 percent) and short sea shipping (40 percent). In Finland, the respective shares are rail 25.1 percent and water 24 percent. In Germany, the modal split is rail 56 percent, water 25 percent (excluding deep sea) and road 18 percent. Steel related transport totalled 513 M tonnes in the EU in 2003. Of this, intra-EU trade totalled 87 M tonnes. Steel production plants in the area of EU15 exported 78 M tonnes of steel to the EU15 area and 13.5 M tonnes to other parts of Europe (excluding Russia). Russian plants exported 5.7 M tonnes to the EU15 area and 7.5 M to other parts of Europe. Russia ranks number 2 and Germany number 4 in world steel exports.

<table>
<thead>
<tr>
<th></th>
<th>Crude steel production (million metric tonnes)</th>
<th>Pig iron production (million metric tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>6</td>
<td>3.9</td>
</tr>
<tr>
<td>Finland</td>
<td>4.8</td>
<td>3</td>
</tr>
<tr>
<td>Russia</td>
<td>65.6</td>
<td>50.3</td>
</tr>
<tr>
<td>Poland</td>
<td>46.4</td>
<td>6.4</td>
</tr>
<tr>
<td>Germany</td>
<td>46.4</td>
<td>30</td>
</tr>
<tr>
<td>EU25</td>
<td>192.9</td>
<td>110.9</td>
</tr>
<tr>
<td>World total</td>
<td>1,066.7</td>
<td>717.7</td>
</tr>
</tbody>
</table>

Production of crude steel and pig iron in 2004.
Data sources: IISI (2005)
FOREIGN AND INTRA-REGIONAL TRADE

SUMMARY

BALTIC SEA REGION FOREIGN TRADE

TRADE FORECAST 2010/2020

TRADE VOLUMES 2003-2020

COMMODITY STRUCTURE

INTRA EUROPEAN TRADE PATTERNS

INTRA BSR TRADE DYNAMICS AND MAIN CORRIDORS

EXTRA BSR TRADE PATTERNS
• Trade to and from the countries in the BSR in 2003 totalled 1,788 M tonnes; imports 744 and exports 1,044 M tonnes.

• Gross trade between the BSR countries totalled 650 M tonnes, with the rest of Europe 769 M tonnes and the rest of the world 369 M tonnes.

• Oil and other liquid bulk with 847 M tonnes made up 47 percent of total trade volumes. Norway and Russia together accounted for 67 percent of this.

• Dry bulk reached 621 M tonnes, or 35 percent of the total trade volume, other dry cargoes 318 M tonnes or 18 percent of total trade.

• The growth of the international trade volumes of the BSR countries is expected to develop positively but the trade dynamics differ significantly. Until 2020, the total exports of the BSR countries are expected to increase by 48 percent to 1,548 M tonnes, imports by 41 percent to 1,049 M tonnes.

• The intra BSR trade volumes (cross-border) are expected to grow faster than the extra BSR trade: 54 percent versus 40 percent. The relative importance of the BSR as a trade partner for the countries neighbouring the Baltic Sea in terms of volumes is increasing.

• The European trade pattern shows significantly larger east-west trade volumes than north-south volumes – with a tendency towards even higher imbalances in the future.

• Most commodity groups are expected to increase in both export and import volumes until 2020.

• The share of high value and/or time sensitive goods of total international trade volumes such as vehicles, fruit and vegetables, machinery, electronic goods and electrical equipment is forecast to increase until 2020. The import volumes of oil and oil products are expected to decrease.
BSR FOREIGN TRADE

Trade within the Baltic Sea Region has increased constantly and the region has become one of the fastest growing regions in the world.

The relative importance of import and export volumes resulting from BSR trade differs between countries. The high intra BSR export volumes reported for Norway and Russia 2003 are resulting mainly from crude oil and oil product exports.

Germany’s high import volumes from the BSR in 2003 are mainly caused by high oil imports from Russia.

There is a global trend towards more intraregional trade. It is easier and more convenient to trade with partners who are close by, and it is therefore important to focus on the possibilities that exist within regional trade.

The BSR is the nearest and therefore an important market for the exports and imports of the countries neighbouring the BSR.

The significance of the Baltic Sea Region as a market and partner varies from country to country. For small and medium-size countries, the Baltic Sea Region is the most important market, whereas for big and powerful countries it is not so important.

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

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

The economies of Poland, Denmark, Finland, Sweden and Norway are also, to a great extent, dependent on the Baltic Sea Region.

The importance of the Baltic Sea Region also becomes evident from the fact that for all countries, excluding Germany and Sweden, the largest trading partner is from this area.
Measured in tonnes, Germany is the biggest trading partner for the greatest number of countries - Poland, Russia, Norway and Sweden.

Russia is the biggest trading partner not just for Germany, but also for Finland and Lithuania.

Sweden is the biggest trading partner for Denmark and Latvia, and Finland has the leading position in Estonia’s foreign trade statistics.

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

**INTRA-BSR CROSS-TRADE PATTERNS 2003**

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Russia is the biggest trading partner not just for Germany, but also for Finland and Lithuania.

Sweden is the biggest trading partner for Denmark and Latvia, and Finland has the leading position in Estonia’s foreign trade statistics.

**BSR COMMODITY-TRADE STRUCTURE 2003**

The commodity group crude oil and oil products is the most dominating commodity group for both BSR countries’ imports and exports today, and is predicted to remain so in the future. In 2003, about 27 percent of total imports and exports of the BSR countries were oil/oil products.

Other important commodity groups in the BSR are manufactured goods (including paper), building materials and chemicals in both imports and exports - and wood, steel, and coal in exports.
TRADE FORECAST 2010/2020

A description of the used methodology can be found in a separate annex, and a discussion about the methodology and a cross check with forecasts from other sources can be found in the annex.

International trade generates transport. Based on the correlation GDP -> Trade -> Transport, the future trade flows by commodity groups between the relevant European countries has been forecast.

Development of bilateral trade between two countries depends on various determinants in these countries. The development of GDP in each country is by far the most important factor for the development of bilateral trade. For the forecast of trade flows the following expected GDP growth rates - published by PROGNOS – have been used.

TRADE VOLUMES 2003 - 2020

The BSR region is a strongly integrated area. In 2003, the total intra BSR trade accounted for more than 30 percent of total exports and 44 percent of total imports. The respective shares are expected to increase slightly until 2020.

The trade volumes of the BSR countries are expected to develop positively, but the trade dynamics differ significantly. The growth in exports of the BSR countries 2003 to 2020 is expected to be slightly higher than the growth in imports.

Exports of the BSR countries are expected to increase by 48 percent, and imports by 41 percent. In absolute terms trade volumes resulting from imports and exports from/to countries outside the BSR are likely to increase more than volumes within the BSR.

However, the intra-BSR trade volumes are expected to grow faster than the total trade volumes in relative terms: 56 percent versus 54 percent. This reflects the ongoing integration process in the BSR region, resulting in more goods exchange and higher dynamic growth rates of intra-BSR trade volumes, compared with volumes from trade with other trading partner regions outside the BSR.

The total intra-BSR trade is expected to increase from 327 M tonnes to 503 between 2003 and 2020, and the total extra-BSR trade from 1,133 to 1,585 M tonnes.

Since the countries with the highest rate of intra BSR trade are relatively small countries with smaller trade volumes compared to the bigger countries, the overall average figure for intra-BSR trade for the relevant countries is about 31 percent in exports and 44 percent in imports in 2003.

In the longer time perspective until 2020, the intra-BSR shares of total trade are expected to increase slightly: exports to 33 percent and imports to 48 percent. However, the shares of individual countries are expected to still differ substantially. The share of intra-BSR trade of Russia, Estonia, Latvia, Denmark and Sweden are expected to decrease, while it is expected to increase in Germany, Finland, Norway, Poland and Lithuania.

In addition to the total trade volumes per country, the respective volumes expected for intra-BSR trade (volumes resulting from trade between the relevant BSR countries) are presented in the table below.

The driving force behind the growing trade between 2003 and 2020 will be the high trade growth between Russia and Germany as well as between Poland and Germany. In intra-BSR trade Russia, Norway, Latvia and Estonia have a trade surplus, while Germany and the other countries run a deficit.
The trade surplus between Russia and the other BSR-countries is forecast to grow to 2020, partly because of increased exports to Germany, Finland and the new EU-member countries, and partly because Russia and Norway are expected to see the lowest increase in imports measured in tonnes from the BSR, together with Latvia and Estonia.


Germany is the largest importer of goods not just from Russia, but also from Poland and Norway. While its imports from all other BSR countries are expected to grow, imports from Norway are expected to be unchanged.

Next to Germany Sweden, Finland and Poland are the largest importers from other BSR countries. It is also these countries that are expected to see the strongest growth
in imports up to 2020. Finland and Poland will increase their imports from Germany significantly more than Sweden.

Sweden will increase its imports at high rates from all other BSR countries except for Poland. Sweden will be the fastest growing BSR exports market for Denmark, Estonia, Latvia, and the second fastest growing market for Norway and Lithuania.

Finland will be the fastest growing exports market for Sweden, Denmark for Norway, and Latvia for Lithuania.

**COMMODITY STRUCTURE**

The development of the total trade volumes of the BSR countries, based on 19 SITC commodity groups, shows that all commodity groups are expected to increase in both export and import volumes until 2020, with the exception of iron ore imports. In terms of volumes, the four most important commodity groups - oil and oil products, building materials and manufactured goods (including paper) - represented about 50 percent of the export volumes of BSR countries in 2003. Oil/oil products, manufactured goods, building materials and chemicals were the four most important commodity groups, accounting for more than 50 percent of the import volumes of BSR countries. Since both the volumes traded in different commodity group differ and the expected growth rates also differ, the relative importance of each commodity group on total import and export volumes of the BSR countries until 2020 will change.


### Development of trade volumes by commodity group, M tonnes 2003-2020

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 non ferrous ore, scrap</td>
<td>2.9</td>
<td>4.2</td>
<td>3.0</td>
<td>5.1</td>
<td>3.5</td>
<td>6.7</td>
</tr>
<tr>
<td>2 iron, steel</td>
<td>70.2</td>
<td>51.8</td>
<td>80.7</td>
<td>57.8</td>
<td>101.2</td>
<td>70.6</td>
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<tr>
<td>3 non ferrous metal</td>
<td>8.9</td>
<td>8.3</td>
<td>10.4</td>
<td>9.8</td>
<td>13.3</td>
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<td>4 food and beverages</td>
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<td>49.9</td>
<td>46.6</td>
<td>63.3</td>
<td>60.4</td>
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<tr>
<td>5 fresh fruit and vegetables</td>
<td>4.9</td>
<td>15.5</td>
<td>6.3</td>
<td>16.9</td>
<td>8.8</td>
<td>19.8</td>
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<tr>
<td>6 chemicals</td>
<td>61.9</td>
<td>64.6</td>
<td>75.6</td>
<td>77.2</td>
<td>101.3</td>
<td>99.8</td>
</tr>
<tr>
<td>7 vehicles and parts</td>
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<td>16.7</td>
<td>26.6</td>
<td>21.8</td>
<td>37.7</td>
<td>31.8</td>
</tr>
<tr>
<td>8 machinery, electronic goods, electrical equipment</td>
<td>25.9</td>
<td>24.4</td>
<td>32.2</td>
<td>30.2</td>
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<td>8.2</td>
<td>12.3</td>
<td>10.1</td>
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<tr>
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<td>56.6</td>
<td>118.7</td>
<td>68.3</td>
<td>150.7</td>
<td>91.0</td>
</tr>
<tr>
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<td>19.9</td>
<td>11.0</td>
<td>24.2</td>
<td>14.1</td>
</tr>
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<td>47.5</td>
<td>101.7</td>
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<td>78.5</td>
<td>95.7</td>
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<td><strong>Total</strong></td>
<td>1 043.6</td>
<td>744.0</td>
<td>1 214.9</td>
<td>844.2</td>
<td>1 548.4</td>
<td>1 049.1</td>
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</tbody>
</table>

*ex. pipeline exports

33
From top:
Development of trade volumes by commodity group 2003-2020, M tonnes and percent.


ex. pipeline exports

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

For the imports, it can be concluded that vehicles, machinery, electronic goods, electrical equipment and coal are forecast to increase, while oil and oil products are forecast to decrease. Oil/oil products, manufactured goods, building materials and chemicals will remain the four most important commodity groups.

<table>
<thead>
<tr>
<th>No.</th>
<th>commodity group</th>
<th>BSR countries total Exports</th>
<th>BSR countries total Imports</th>
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<tbody>
<tr>
<td>1</td>
<td>non ferrous ore, scrap</td>
<td>2.9</td>
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</tr>
<tr>
<td>2</td>
<td>iron, steel</td>
<td>70.2</td>
<td>101.2</td>
</tr>
<tr>
<td>3</td>
<td>non ferrous metal</td>
<td>8.9</td>
<td>13.3</td>
</tr>
<tr>
<td>4</td>
<td>food and beverages</td>
<td>43.7</td>
<td>63.3</td>
</tr>
<tr>
<td>5</td>
<td>fresh fruit and vegetables</td>
<td>4.9</td>
<td>8.8</td>
</tr>
<tr>
<td>6</td>
<td>chemicals</td>
<td>61.9</td>
<td>101.3</td>
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<tr>
<td>7</td>
<td>vehicles and parts</td>
<td>20.8</td>
<td>37.7</td>
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<tr>
<td>8</td>
<td>machinery, electronic goods, electrical equipment</td>
<td>25.9</td>
<td>43.2</td>
</tr>
<tr>
<td>9</td>
<td>leather and textile goods</td>
<td>7.3</td>
<td>10.1</td>
</tr>
<tr>
<td>10</td>
<td>other manufactured goods</td>
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<td>150.7</td>
</tr>
<tr>
<td>11</td>
<td>pulp and waste paper</td>
<td>17.5</td>
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</tr>
<tr>
<td>12</td>
<td>wood</td>
<td>68.5</td>
<td>101.7</td>
</tr>
<tr>
<td>13</td>
<td>grain and animal feed</td>
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</tr>
<tr>
<td>14</td>
<td>coal</td>
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<td>crude oil and oilproducts</td>
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<td>456.8</td>
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<td>16</td>
<td>iron ore</td>
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<td>32.9</td>
</tr>
<tr>
<td>17</td>
<td>copper ore and bauxite</td>
<td>0.4</td>
<td>0.8</td>
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<tr>
<td>18</td>
<td>building materials</td>
<td>80.6</td>
<td>95.7</td>
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<tr>
<td>19</td>
<td>fertilizer</td>
<td>18.4</td>
<td>27.2</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td><strong>1 043.6</strong></td>
<td><strong>1 548.4</strong></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>No.</th>
<th>commodity group</th>
<th>BSR countries total Exports</th>
<th>BSR countries total Imports</th>
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<td></td>
<td>share 2003</td>
<td>share 2020</td>
<td>Changed share 2003-2020 in %</td>
</tr>
<tr>
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<td>non ferrous ore, scrap</td>
<td>0.3</td>
<td>0.2</td>
</tr>
<tr>
<td>2</td>
<td>iron, steel</td>
<td>6.7</td>
<td>6.5</td>
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<tr>
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<td>non ferrous metal</td>
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<td>4.2</td>
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<tr>
<td>5</td>
<td>fresh fruit and vegetables</td>
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<td>chemicals</td>
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<td>vehicles and parts</td>
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<td>grain and animal feed</td>
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<td>machinery, electronic goods, electrical equipment</td>
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</tr>
<tr>
<td>19</td>
<td>fertilizer</td>
<td>1.8</td>
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</table>
INTRA EUROPEAN TRADE PATTERNS

The trade among all European countries, including relevant parts of Russia, has been constantly growing in the past decade. The trade volumes in 2003 totalled almost two billion tonnes. The European trade pattern is characterised by a number of different trade flows. From a North European perspective, the trade flows along the north-south and on the east-west axis, today and in the future, are of special interest. The east-west trade is expected to grow faster than north-south trade volumes, as a consequence of EU enlargement.

The westbound flows are the driving force behind this development. Nevertheless, the impact of the east-west trade development on the total intra-European trade dynamics is limited. Volumes resulting from trade between west and east European countries as, for example, between Germany and Hungary or between Germany and the Czech Republic are relatively small compared to trade volumes between, for example, Germany and the Netherlands or Belgium and the Netherlands. The overall picture of the total-intra European trade development is dominated by the dynamics in those bilateral trade relations, which generate high trade volumes in terms of tonnes.

The highest dynamics in intra-BSR trade development can be identified in the eastern countries of the BSR. Expected growth rates of up to 105 percent (Lithuania’s imports from the BSR) point to an ongoing rapid integration process in the region. The growth of intra-BSR import volumes of the countries in the western BSR region is, at around 40 percent, significantly lower compared with the eastern BSR countries. Nevertheless, in terms of overall trade volumes, the countries in the western BSR are still dominating the trade pattern.

The above diagrams illustrate the direction of the dynamics, both in terms of import/export growth rates and volumes. For the analyses, the BSR countries have been clustered twice in two groups. North and South BSR countries and East and West BSR countries.

Intra-BSR trade between northern and southern countries is expected to grow with almost the same dynamics, and, as a consequence, trade flows will continue to be imbalanced to the same extent as they are today.
The trade volumes\(^{24}\) will increase by 57 M tonnes in the southern direction and by 17 M tonnes in the northern direction. Southbound transport volumes will be more than three times higher compared to northbound volumes – mainly due to crude oil and coal transport from Norway and Russia to the southern region.

Compared with the expected growth of intra-BSR north/south trade flows, the respective east/west flows show significantly stronger dynamics.

The trade volumes on the East/West corridor\(^{25}\) will increase by 24 M tonnes in the eastern direction and by 68 M tonnes in the western direction consisting mainly of oil and coal. The forecast trade growth rates for eastbound flows are higher compared to westbound flows. Nevertheless, the westbound trade volumes exceed the eastbound volumes by almost a factor of three. The imbalance in volumes points to a strong role of the eastern BSR countries in intra-BSR exports – with a tendency to more balanced trade.

Intra-BSR trade between eastern countries is expected to grow at an even higher rate. The increasing cross-border exchange of goods will additionally boost the freight transport volumes in the eastern BSR region.

**SUB-REGIONAL TRADE CORRIDORS 2003 – 2020**

For the transport sector it can be derived that east/west corridors are likely to show higher transport volumes and to develop more dynamically compared to the north/south corridors.

A further division of the east-west trade growth shows that there will be a significant growth of trade, primarily between Russia and Germany, Poland and Germany, and between Finland/Russia/Estonia/Lithuania/Latvia and Scandinavia. The trade between Scandinavia and Poland is expected to grow strongly, but from a low level, which means the growth in volume will be close to 3 M tonnes.

While the growth in exports from Russia will be dominated by oil, coal, wood, and steel, the growth in exports from Finland will consist mainly of oil products, chemicals, and manufactured goods, and exports from Estonia/Lithuania/Latvia mainly of wood, coal and oil. From Scandinavia the exports of manufactured goods, oil products, chemicals, wood and steel are expected to show the strongest volume growth.

Westbound transport volumes are still significantly higher compared with eastbound flows (mainly due to high export volumes of Russian crude oil to the western countries), but eastern BSR countries are expected to quickly gain importance as import regions particularly for manufactured goods, machinery, chemicals,
and food. In the north-south trade corridors, the highest growth rates in trade are expected between the countries east of the Baltic Sea, while trade growth between countries west of the Baltic Sea will be only modest.

**EXTRA BSR TRADE PATTERNS**

The majority of the extra-BSR trade relations is with Germany and Russia. Since Russia has a large amount of foreign trade with former Soviet Union countries, only Russia’s extra trade relations with European countries outside the BSR are included in the flows, while for Germany trade with the rest of the world is also included.

While intra-BSR trade totalled 327 M tonnes in 2003, trade between BSR and non-BSR countries totalled 1,133 M tonnes, of which 716 M tonnes were exports and 417 M tonnes imports.

Of the total trade between the BSR countries and non-BSR countries 619 M tonnes were with other European countries and 515 M tonnes with countries outside Europe (Russian non-European trade excluded).

Germany dominated the extra-BSR trade with 273 M tonnes of exports and 318 M tonnes imports. Approximately half of the trade was with other European countries.

Norway and Russia were the other large exporters to countries outside the BSR with 186 and 132 M tonnes respectively, while the second largest importer of goods from non-BSR countries Poland accounted for 35 M tonnes.

The trade with countries outside the BSR is expected to grow by close to 450 M tonnes or 40 percent from 2003 to 2020; exports by 324 M tonnes and imports by 124. This increase represents 71 percent of the expected increase in both intra- and extra-BSR trade.

Exports from Germany and Russia are expected to see the largest growth, with 103 and 116 M tonnes respectively; imports to Germany and Poland by 44 and 28 M tonnes. Most of the export growth from Russia and Poland will be within the energy commodity sector, like oil and coal, but also machinery and other manufactured goods from Poland. From Germany the growth consists of manufactured goods, chemicals, food/beverages and steel.

For the new EU-members the growth in extra-BSR trade is expected to be high. For Estonia, Latvia, Lithuania and Poland the growth in exports is expected to be 101, 103, 76 and 58 percent, while growth in imports is expected to be 65, 85, 71 and 80 percent. As the growth starts from a very low level, the nominal growth is low.
The growth in extra BSR exports will be mainly within the dry bulk commodity sector, and growth in imports mainly within the other dry cargo sector (=general cargo).

In the remaining BSR countries Denmark, Sweden, Norway and Finland the correspondent growth figures for exports are expected to be 62, 37, 14 and 44 percent, and for imports 42, 53, 28 and 41 percent. The growth in exports will comprise manufactured goods, chemicals, wood, paper and pulp, and the growth in imports oil, wood, and chemicals.

For most countries the growth in exports outside the BSR is expected to be higher than the growth in imports, except for Poland, Sweden and Norway, where the growth in imports is expected to be higher.

For Poland the difference is very small and for Sweden and Norway it is primarily because the growth in liquid and dry bulk commodity exports is expected to be low.
# Baltic Sea Region Transport Flow Patterns

## Summary

### Maritime Transport

- Maritime Transport by Commodity Group

### Maritime Transport Corridors

- Oil Transport
- Gas Transport
- Trailer Transport
- Container Flows

### Road Transport

### Rail Transport

### Future Freight Flows in the Baltic Sea Region

- Simulation of Future Maritime Freight Flows in the BSR
- Expected Development of Maritime Freight Flows in the BSR
• The growth of the intra-European trade volumes has led to increasing freight transport volumes – and to increased market shares of truck transport in Europe.

• Out of the 327 M tonnes traded between BSR countries in 2003, approximately 178 were transported by sea.

• Extra BSR transport represents 552 M tonnes, or 76 percent of all maritime transports from BSR ports.

• Norway, Germany and Russia dominate extra BSR maritime transports, while Germany, Finland and Sweden together represent 54 percent of the intra BSR maritime transports.

• Out of the intra BSR seaborne trade totalling 178 M tonnes, liquid bulk represents 34 percent, dry bulk and other dry cargoes 43 and 23 percent.

• The oil and container trades are the fastest growing segments in the intra BSR maritime transports.

• The container trade in the BSR is dominated by Germany, followed by Finland, Sweden and Russia.

• It is estimated that 200-220 M tonnes of cargo are transported by road or railway between the BSR countries.

• In most of the countries of the BSR freight transport by road is increasing.

• The international rail transport volumes in tonnes are larger than road transport in the eastern BSR, due to transit goods carried between Russia and its neighbouring countries.

• All BSR countries, except Norway and Finland have experienced falling rail transport volumes in international trade during the last decade. A redirection of trade flows from east to west, poor performance of rail services and increased availability of private hauliers in the transition countries are some explanations.

• The rail market shows great potential for growth over long distances.
MARITIME TRANSPORT

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

The largest maritime transport flows in the Baltic Sea Region are shown in the figure below. Compared to the total trade flow presented earlier, the maritime flow pattern is different.

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

A major part of the extra BSR transport is destined for or originates from other European countries. Although Norway and Germany are the two biggest exporters of goods from the region, Russian cargoes dominate transports through ports on the Baltic Sea east coast.

In 2003, 81 M tonnes of goods originating in or destined to Russia were transited through Finland, Estonia, Latvia, Lithuania and Poland.

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

The biggest intra-BSR flows from Norway were to Sweden, Denmark and Germany, where 21 M tonnes of cargo were exported in 2003.

The biggest intra-BSR flow from Sweden was to Germany, with some 10 M tonnes in 2003. The second biggest flow from Sweden was to Finland, with 8 M tonnes. The largest flow from Sweden outside of the BSR was to the United Kingdom, with 5 M tonnes, and the second largest flow was to the United States, with 4 M tonnes.

From Finland the largest intra-BSR flow was to Germany, with 12 M tonnes. The second largest flow was to Sweden, with 6 M tonnes. The largest flow from Finland outside of the BSR was to the United Kingdom, with 5 M tonnes, and the second largest flow to Belgium, with 3 M tonnes.

Russia exported approximately 26 M tonnes of cargo through its Baltic Sea ports to other BSR countries. Of this, 7 M tonnes were shipped to Sweden and 8 M tonnes to Finland.

Apart from Russian transit cargoes, the biggest flow from Estonia was to Finland, with 4 M tonnes in 2003. The second largest flow from Estonia was to Sweden, with 3 M tonnes. Finland was the biggest source for Estonia’s own imports with 2 M tonnes.

In addition to 20 M tonnes of transit goods, Latvia shipped approximately 9 M tonnes, of which approximately 6 M tonnes went to Sweden.

Lithuania shipped approximately 17 M tonnes of transit cargoes and 8 M tonnes of its own cargo, of which 4 M tonnes were exported to the BSR and 5 M tonnes outside the BSR. The largest intra-BSR flows were to Sweden and Germany with 1 M tonnes each in 2003.

### Table: Maritime Transport in Thousand Tonnes 2003

<table>
<thead>
<tr>
<th>Country</th>
<th>Intra-BSR</th>
<th>Extra-BSR</th>
<th>Intra-BSR</th>
<th>Extra-BSR</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
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<td>13 987</td>
<td>27 362</td>
<td>151 137</td>
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<tr>
<td>Sweden</td>
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<td>28 142</td>
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<td>132 024</td>
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<tr>
<td>Finland</td>
<td>35 365</td>
<td>15 349</td>
<td>22 018</td>
<td>22 756</td>
<td>95 488</td>
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<td>7 881</td>
<td>26 444</td>
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<td>88 676</td>
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<td>13 121</td>
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<td>59 724</td>
<td>23 973</td>
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<tr>
<td>Denmark</td>
<td>25 898</td>
<td>18 555</td>
<td>13 121</td>
<td>18 586</td>
<td>76 159</td>
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<tr>
<td><strong>Gross BSR</strong></td>
<td><strong>178 078</strong></td>
<td><strong>156 842</strong></td>
<td><strong>178 078</strong></td>
<td><strong>395 774</strong></td>
<td><strong>908 772</strong></td>
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<tr>
<td><strong>Net BSR</strong></td>
<td><strong>156 842</strong></td>
<td><strong>178 078</strong></td>
<td><strong>395 774</strong></td>
<td><strong>730 694</strong></td>
<td></td>
</tr>
</tbody>
</table>
The biggest flow from Poland in the BSR was to Germany, with 6 M tonnes in 2003. The second biggest flow from Poland was to Sweden, with 2 M tonnes.

The largest intra-BSR flow from Germany was to Finland with 6 M tonnes in 2003. The second biggest flow was to Sweden, with 6 M tonnes. The largest flow from Germany outside the BSR was to the United States.

The biggest flow from Denmark to the BSR was to Sweden, with 6.1 M tonnes of seaborne cargo. The second biggest export flow was to Finland, with 3 M tonnes in 2003. The two main export destination countries outside the BSR were the Netherlands and the United Kingdom, both with 2 M tonnes.

**MARITIME TRANSPORT BY COMMODITY GROUP**

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

The large shares of the total dry bulk transport for Sweden, Norway and Finland derive from the fact that practically all bulk cargoes are carried in or out of these countries by ship, while the other countries rely more on rail transport.

Germany’s large share of the total BSR dry bulk transport is due to large imports of minerals and forest products from Finland and Sweden. Latvia’s position results from its large exports of wood, and Poland’s and Denmark’s positions from the large coal trade.

Russia’s share of the liquid bulk trade, including transit goods, was approximately 25 percent.

The large general cargo trade explains Germany’s large share of the trade with other dry cargoes.

**MARITIME TRANSPORT CORRIDORS**

Cargo volumes to and from the TEN-A ports in the BSR forms the basis of the transport flows and the maritime corridors. Major volumes are also channelled through private terminals.

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

**OIL TRANSPORT**

In 2005 global oil production is estimated to have reached 4,065 M tonnes. Russian oil production is projected to have reached a total of 467 M tonnes.

In 2003, Russia produced 414 M tonnes of crude oil, or 14 percent of world total production. About 40 percent of the production or 167 M tonnes was exported to the West.

Almost 90 percent of the volume exported was destined for Europe. Although Russian oil companies give high priority to new markets in the United States and in the Far East, Europe will remain the dominant market for Russian oil.

In 2003 the BSR countries imported 64 M tonnes from Russia, and from other European countries 86 M tonnes.

A large part of the oil exported was destined for Germany, Poland, and other countries in Central and Eastern Europe (including Hungary, Slovakia, and the
Czech Republic). Many of these countries are points along Russia’s major export pipeline, Druzhba, and its multiple branches.

51 M tonnes of Russian crude oil were exported in 2003 through the Druzhba pipeline, and approximately 99 M tonnes by tankers to the BSR and other European countries. Another 10 M tonnes of oil were shipped from the Baltic Sea ports to countries outside Europe and 7 M tonnes from Arctic ports.

A total of 109 M tonnes of oil was thus shipped from the Baltic Sea ports in 2003. In 2004, an additional 25 M tonnes were shipped through ports in Russia and Estonia, while shipments from most of the other ports in Finland, Latvia and Lithuania declined.

The crude oil pipelines to Europe are currently near capacity. Upgrading the capacity of existing pipelines and the construction of new pipelines are essential in order to promote a sustained increase in the Russian crude oil production, as well as in crude oil export volumes to Europe.26

Non-pipeline transported exports are poised to increase even more in the coming years. This is particularly the case for exports eastwards to China.

The development of oil and oil product handling in Baltic Sea ports over the time period 1998 to 2004 showed a strong growth in shipments from the Gulf of Finland. Estonia, Latvia, Lithuania and Poland, are major transit countries for oil from Russia. In Estonia, Latvia, Lithuania and Poland were 23, 20, 8 and 10 M tonnes respectively transported through major ports. In addition to this, there were minor transit volumes from Kazakhstan.

As a comparison, 42 M tonnes of oil were shipped through Russian ports in the Baltic Sea and the White Sea in 2003.

Oil transit constitutes the largest segment of transit cargoes in the Baltic States, but from early 2003, after closing down Ventspils crude oil pipeline, the Russian transit volumes through its neighbouring countries, except for Estonia, have been falling, while volumes through Russian ports are increasing.

This trend is expected to continue, due to:

- Redistribution of cargo flows of the Baltic States to Russian ports
- Increasing export-import trade, due to expansion of the Russian economy;
- Rising transit flows, especially through the Trans-Siberian and north-south transport corridors.

There are plans to increase shipping terminal capacities further in the area. The Russian ports of Primorsk, and more recently Vyborg/Vysotsk, will in the next 2-3 years be able to increase their volumes and reduce trans-shipments through the other Baltic Sea ports.

As of end-2003, Russian proven oil reserves were estimated at 69.1 billion barrels (data from BP) and accounted for about 6.6 percent of the world’s proven oil reserves. Oil production and reserves are located mainly in western Siberia between
the Urals and the Central Siberian Plateau and, to a lesser extent, on Sakhalin Island and around the Caspian Sea.

Russian oil production is expected to grow only slightly to 490 M tonnes by 2010 and to 540 M tonnes by 2025, and the export growth is expected to level out. In 2010, export shipments from the Baltic Sea ports are expected to reach 185 M tonnes.

The relatively modest figure is based on a more strict approach by Russian authorities towards using Russian pipeline facilities for transit. This situation is exacerbated by the fact that the Russian refineries (mainly Kirishi and Yaroslav) are approaching their capacity to refine crude oil in the short term and are not able to increase output significantly. The main reasons for these limitations are old-fashioned technology, a low level of investment and growing national demand.

Norway is the other major exporter of oil in the BSR. In 2005 Norwegian oil production is estimated to have reached 153 M tonnes, which is 6 M tonnes below production in 2003. That year 144 M tonnes were exported, of which 19 M went to other BSR countries, 93 to other European countries and 33 M tonnes outside Europe.

The whole North Sea production has peaked and by 2025 it is expected to have fallen by 58 M tonnes below today’s level of 290 M tonnes. With a moderate decline in North Sea production, Western Europe is expected to import increasing amounts from Persian Gulf producers and from OPEC member nations in both northern and western Africa.
GAS TRANSPORT
While the supply of oil is stagnating, the supply of natural gas is increasing.
Norway exports 75 billion cbm natural gas, with Germany, France, Great Britain, Belgium and the Netherlands as its biggest customers. By 2008, Norway plans to export 100 billion cbm, and by 2011 around 120 billion cbm. Statoil plans to double its gas production to 2015, with the intention of increasing LNG shipments, primarily to Great Britain, which will start importing LNG from 2007 to compensate for the loss of its own gas supplies.

TRAILER TRANSPORT
Trailers, with or without trucks, are shipped by ropax-vessels (a vessel that takes both passengers and trailers, with the main focus on freight) and roro vessels. The busiest ropax line in the region is the route across Öresund between Helsingborg in Sweden and Helsingør in Denmark with about 66,000 calls per year.
The second busiest line is across Fehmarn Belt between the two small ports of Rødby in Denmark and Puttgarden in Germany, with about 35,000 calls per year. About 360,000 trailers are transported over the Öresund between Helsingør and Helsingborg every year, while some 260,000 trailers are transported on the Rødby-Puttgarden route. Apart from trailers, passengers, cars and buses are transported. Almost 10 M passengers cross via Helsingborg-Helsingør and 7 M on the Rødby-Puttgarden route every year.
A busy link with its main focus on freight is between Aarhus and Kalundborg in Denmark, where some 160,000 trailers are transported every year, but only 167,000 passengers cross. The above links are all rather short voyages, with crossing times of about one hour or less.
A busy link with a considerably longer crossing time is the Göteborg-Fredrikshavn route, where about 160,000 trailers are transported every year, together with about 2 M passengers. Other busy links are the Trelleborg-Travemünde, Malmö-Travemünde and the Trelleborg-Rostock links, where about 180,000, 185,000 and 100,000 trailers respectively and almost half a M passengers each are transported yearly.
On the route between Göteborg and Kiel, between 35,000 to 40,000 trailers are transported.
The links between Esbjerg and Fanø as well as Spodsbjerg and Taars in Denmark are also busy ferry routes, with more than 10,000 departures per year each, but the capacity of the vessels on these routes is rather low and therefore not so much goods is transported.
The busiest passenger routes are further north, from Stockholm to Finland, and between Finland and Estonia where 7 million passengers are carried annually. The ferries carry mainly passengers. On these routes alone, some 260,000 trailers are transported, of which about 40 percent go on the Naantali-Kapellskär route.
The routes from Sweden to Estonia, Lithuania and Poland have seen a significant increase in both capacity and transportation during the last few years. Between Sweden and Poland, almost 200,000 trailers are transported every year, on four routes by three operators, of which Unity Line is the biggest, with about 100,000 trailers transported yearly. Measured in passengers, Stena Line’s route Karlskrona-Gdynia is more important, with slightly more than 400,000 passengers per year.
CONTAINER FLOWS
The graph above illustrates both the total volume of goods handled in TEN-A and similar size ports of the countries in the
BSR region and the total TEU quantity. The graph indicates the importance of non-containerised cargoes in Norway, Sweden, Finland and Latvia.

The graph at the bottom of page 48 indicates that Germany, with Hamburg and Bremen, handles the largest number of containers or about 9 M containers in 2003.

Finland handled almost 1.2 million TEU 2003 (1.3 million in 2004), with Helsinki as its largest container port. Sweden is the third largest container handling nation, with almost one million TEUs handled in 2003. In 2003, next to Hamburg and Bremen, Göteborg was the largest container port in the region, handling some 666,000 containers, but the rate of growth in St Petersburg is much higher.

St. Petersburg passed Göteborg in container volumes in 2005, and a new terminal is planned at Lomonosov. It is slated for completion by 2008 and contends to be the biggest container terminal in Russia. The overall throughput of cargo – containers, refrigerated cargoes and metals – is expected to be 7 M tonnes per year and will be serviced by two cargo-handling complexes – the roro complex with a throughput of 200,000 tonnes and the container complex to service 6.8 M tonnes, or 570,000 TEU.

Russia is the country in the region with the biggest proportion of its cargo flows originating from and destined for the four deep sea ports, with about 90 percent of the flow originating from this area.

More than 75 percent of all containerised cargoes destined for Russia are transited either via Riga, Tallinn and Klaipeda or via Finland.

As the road network in Russia improves, more and more goods will probably go directly to St Petersburg.

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

About 75 percent of the total number of TEUs arriving in Finland originates from the four deep sea ports on the continent - Rotterdam, Amsterdam, Antwerp and Hamburg.

Helsinki is the main competitor of the port of St. Petersburg with regard to general cargo.

Another port with a high growth rate is the port of Gdansk, which opened its container terminal in 1998. In 2004 it handled almost twice as many containers as in 2003, from almost 25,000 in 2003 to almost 44,000 and, at the moment, it seems as if it will double once again in 2005.

The neighbouring port, Gdynia, has also seen significant growth; the container traffic more than tripled from 2000 to reach 37,000 TEU in 2004.

The growth in container handling in the port of Tallinn is more modest, with some 9 percent in 2005, which is about the same growth as for Göteborg.

Helsinki and Aarhus are also important ports when it comes to container shipments, each handling some 500,000 TEU in 2004.

There are about 10 ports in the region handling from 100,000 to 300,000 containers per year, all evenly spread in the region.
Within the European Union, demand in the road freight transport sector has been growing steadily since the 1970s. The international transport of goods by road has been growing at an average of 2.5 percent a year between 1999 and 2003. In the Baltic Sea Region, the growth was strongest in Norway and Germany. Of the total EU road transport reported in 2003, some 95 percent was international transport between the EU25 Member States.

It is estimated that 70 M tonnes of cargo were transported by road between the BSR countries. The international goods transport volumes on BSR roads in 2003 are shown in the map to the left.

There are large differences between various parts of the BSR with respect to road traffic, with extremely high traffic loads in Denmark, Germany, Poland and a few areas in the Scandinavian countries, and moderate traffic loads in other parts of the BSR.

Traffic loads on major roads in the BSR are highest in and around the urban agglomerations of Berlin and Hamburg in Germany. Furthermore, in Germany the traffic loads on motorways outside the urban areas are much higher than in other countries, even higher than in most urban areas of the BSR. High traffic volumes can be found also on the Danish motorway network and around Copenhagen.

In Norway, Sweden and Finland, the capital city regions show the highest traffic volumes, indicating the interaction between the city centres and the suburbs. However, traffic is much lower there than around German major cities.

The traffic volume on other parts of the network is fairly low, typically about 10 000 vehicles per day, and is as little as 5 000 or even lower on major roads in areas located far north. In Estonia, Latvia and Lithuania, traffic volumes on road are relatively low in general.

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

Four countries - Finland, Estonia, Latvia and Lithuania - stand out as having a different pattern of operation, with around a fifth of their transport with other countries being on road, much of this being cargoes to and from Russia.

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

As a result of growing east west trade, and of increasing seaborne transport volumes, intra-regional road traffic volumes will grow, both between ports and their hinterland, and between BSR and non-BSR countries.
RAIL TRANSPORT
In general, rail transport in the BSR has experienced a large drop in transport volumes during the past decade. The reduction can be observed for both passenger and freight transport, and is spatially concentrated in the new EU countries.

In the 1990s only countries such as Norway and Finland, with rather low volumes, have experienced some growth in rail transport. All other BSR countries, have experienced major losses of rail freight volumes.27

Some explanations for the losses can be found in the poor performance of some rail services and in the rapidly increased availability of private hauliers in those countries, but also in a redirection of trade flows from eastern to western directions.

Russia shows the highest goods transport volumes, and the rail transport volume in tonnes to Estonia, Latvia and Finland is enormous compared to other BSR countries. This is due to the over 80 M tonnes of transit goods which is carried between Russia and its neighbouring countries. Other major rail transport lines are between Poland and Germany and between Sweden and Norway (mainly iron ore in transit to be shipped out of Narvik). Denmark and Lithuania, on the other hand, have lower transport volumes by rail.

However, the railways are still a means of transport with major potential, and renewal of the railways is the key to achieving modal rebalance. The rail market shows great potential for growth over long distances.28

All major inland cities in the south of the BSR have railway connections with the major ports. The railways in this area are closely connected to the continental railway system in Central and Southern Europe.

FUTURE FREIGHT FLOWS IN THE BSR
The BSR transport flows are expected to grow by 47 percent between 2003 and 2020; the extra-BSR flows by 40 percent, and the intra-BSR flows by 56 percent.

Although the total transported volume of goods from source country to destination country is the same as the traded volume, the added volumes from all modes involved in the transports between the countries exceed the total traded volume.

Transiting of goods through other countries, for example Russia’s exports through neighbouring Baltic Sea countries, generally means that the goods are leaving Russia by road or rail, and the transiting country by sea.

Changes in transit volumes between 2003 and 2020 will affect the added transport volumes growth. Less transit goods will mean that the transport growth will be lower than total trade growth in this period.

Since an increasing part of the BSR exports are expected to be transported directly to trading partners and less through transit countries, transport growth between 2003 and 2020 is forecast to be lower than trade growth. The transit of imports is on the other hand expected to increase.
Transport by sea is expected to grow by 64 percent between 2003 and 2020 and the road and rail traffic by 26 percent, or measured in M tonnes 470 and 272 M respectively.

In both modes, the intra-BSR transport volumes will grow faster than the extra-BSR transport but from much lower levels. Measured in tonnes the growth in extra-BSR trade by sea is expected to be 324 M, and by road or rail 134 M tonnes.

BSR transport to countries outside the BSR are expected to grow by 54 percent, or 355 M tonnes, while the transport from those countries are expected to grow by 21 percent, or 95 M tonnes.

Of the total growth in maritime transport to and from the BSR, approximately 270 M tonnes will be exports and 53 M tonnes imports.

In 2020, shipping is expected to become the leading mode of transport in international BSR trade, carrying 54 percent of the total volume of internationally traded goods, compared to 48 percent in 2003. In exports the share will be 65 percent and in imports 37 percent.

BSR exports by sea are expected to grow by 73 percent between 2003 and 2020, and the imports by 43 percent. Measured in tonnes, this growth will be 417 and 200 M.

The land transport modes (road and rail) are expected to grow faster in the intra-BSR trade than in the extra-BSR trade, but from a lower level. By 2020 the share of road/rail transport volumes is expected to be 45 percent.

Extra BSR transport flow changes 2003-2020

The extra-BSR transport volume is expected to grow by approximately 450 M tonnes between 2003 and 2020, of which 170 M tonnes will be exports from the north-eastern part of the BSR (Finland, Russia, Estonia, Latvia, Lithuania), 60 M tonnes from the south-western part (Germany, Denmark), and 30 M tonnes from the north-western part of BSR (Sweden and Norway).

Most of the growth in exports will be transport of oil, iron ore, forest and agricultural products and manufactures.

While transport from the BSR will grow by 360 M tonnes, transport to the BSR will increase by approximately 100 M tonnes, with Russia, Poland, Estonia, Latvia and Lithuania accounting for most of the growth.

A majority of the extra-BSR transport flows to and from these countries will be seaborne. There will be a large flow of extra BSR cargoes from southern Europe to Germany and Poland, which will be land borne.

Intra BSR flow changes 2003-2020

The intra-BSR transport volume is expected to grow by approximately 215 M tonnes between 2003 and 2020. Most of the growth in intra-BSR transport is exports of goods from countries in the northern part of the BSR to countries in the southern part, mainly Germany.

About 147 M tonnes of the total growth in intra-BSR trade is expected to be seaborne, of which nearly half will be exports of oil from Russia and 25-30 M tonnes of oil, iron ore and forest products from Norway and Sweden, mainly destined for Germany.

Trade increase between the sub-regions will result in 93 percent growth of the maritime transport work (tonkm) till 2020, and 83 percent increase in volume. Maritime transport is expected to dominate the growth in trade between countries east of the Baltic Sea and Germany/Denmark and Scandinavia. In comparison the increase in land mode transport work in the BSR is estimated to grow by 40 to 60 percent until 2020 with the strongest increase in the NE sub-region (+ 60 percent).

The remaining 68 M tonnes of the total growth will be landborne, mainly between Poland and Germany, and also between Poland and the north-eastern countries, as a result of the increased integration of the new EU members and Russia.
Within the north-western sub-region, transport between Sweden and Norway is expected to increase by 7 M tonnes, mainly because of increased transports of iron ore from Sweden to Norway. In the north-eastern part of the BSR, the transport between the countries is expected to increase 13 M tonnes.

**SIMULATION OF FUTURE MARITIME FREIGHT FLOWS IN THE BSR**

International freight transport flows result from trade and the distribution of these flows among the infrastructure networks in the BSR has been simulated in the EFM STAN model environment\(^2\).

Modelling means creating a model of the real transport environment, by reducing the existing variety of transport routes and modes to an aggregated level. To simplify the complex and complicated mode and route choice decisions, the model compiles only transport routes, nodes and modes relevant for international freight flows. Base year was 2003. Data used for the calibration of the simulation model include port statistics, vehicle counting, traffic census and available statistics from national authorities. For the forecast horizons 2010 and 2020, a base case and three alternative scenarios have been defined.

The simulation results for the base cases (scenario A) show the expected development of maritime freight flows, if the relative competitiveness of the sea and land transport modes is unchanged. The simulation results for impact scenarios (scenarios B and C) show the expected development of maritime freight flows, if the relative competitiveness of the sea modes is slightly increased compared to land transport modes ("maritime friendly” assumptions). The tested scenarios and the underlying assumptions for the impact scenarios (B and C) are compiled in an annex.

Some results generated in the EFM STAN environment are illustrated below. The maps show examples of maritime freight flows (intra-European volumes) via the Skagen Corridor and the Kiel Canal in 2020.

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

The simulations of how maritime freight flows will develop are presented in this section. The reference situation in 2003 is set equal to 100, allowing for analysis of expected changes in the base cases in 2010 and 2020 by comparing the index values with the reference situation. The scenarios that were tested and the underlying assumptions are described in the annex. The main differences between the tested scenarios are:

2003 **References Situation A Scenario**: reflects the modeled status quo.

2010 Transport demand 2010 + likely changes of transport framework (TEN T until 2010, increasing fuel cost);

2020 Transport demand 2020 + likely changes of transport framework (TEN T until 2020 including fixed Fehmarn Belt, Motorways of the Sea, Baltic Rail; increasing fuel cost);

The simulation results are presented in the following table. The results are shown as index figures.

<table>
<thead>
<tr>
<th></th>
<th>2003 Reference Situation</th>
<th>2010 A Base Case</th>
<th>2020 A Base Case</th>
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</thead>
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<tr>
<td><strong>European level</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Transport work all modes (changes tonkm/year)</td>
<td>100</td>
<td>122</td>
<td>151</td>
</tr>
<tr>
<td>Transport work of sea modes (changes tonkm/year)</td>
<td>100</td>
<td>132</td>
<td>166</td>
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<tr>
<td>Transport work of land modes (changes tonkm/year)</td>
<td>100</td>
<td>114</td>
<td>148</td>
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<tr>
<td><strong>BSR related</strong></td>
<td></td>
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<tr>
<td>Through-put of Baltic Sea ports (changes tonnes/year)</td>
<td>100</td>
<td>132</td>
<td>164</td>
</tr>
<tr>
<td>Volumes by sea modes in/out Baltic Sea via Kiel Canal / Skagen Corridor (changes tonnes/year)</td>
<td>100</td>
<td>120</td>
<td>158</td>
</tr>
<tr>
<td>Transport work of sea modes within Baltic Sea (changes tonkm/year)</td>
<td>100</td>
<td>145</td>
<td>193</td>
</tr>
</tbody>
</table>

**Simulation results 2003-2010**

A comparison of expected developments on the European level (first three parameters) with the development in the BSR (last three parameters) up to 2010 shows the following results:

- Overall trade volumes between all European countries, and between all European countries and the rest of the world, are forecast to increase by about 16 percent until 2010
- Transport work (international, cross-border) within Europe is likely to increase by 22 percent until 2010, transport work of sea modes by 32 percent and transport work of land modes (road and rail) by 14 percent

For the development in the BSR till 2010 the simulation results indicate that:

- International intra-BSR transport by sea mode is expected to increase by 45 percent, which shows a stronger growth rate than the overall European sea transport growth
- Sea transport in/out of the BSR via the Skagen corridor/ Kiel Canal are expected to increase by 20 percent, whereas the BSR port throughput is expected to increase by 32 percent on average.

The following tendencies can be identified:

- The tendencies to more sea transport, observed at European level, are also evident for the BSR, but the effects seem to be stronger, pointing to a more dynamic development in the BSR compared with the European average.
- Sea modes operating within the BSR are attracting a disproportionate share of the growth in European cross-border trade volumes. This seems to result in a tendency to modal shifts from land to sea modes. This could be an effect of expected land mode capacity constraints.
The effects of growth in international trade volumes are affecting the modal split and route choices in the BSR more strongly than for the European average. International Short Sea Shipping in the BSR benefits from the development of trade.

The reasons for the stronger dynamics in the BSR seem to be:

- The BSR includes a high number of national economies with a growth potential that is higher than the EU average.

- Due to geographical conditions (Baltic Sea as natural barrier), sea modes are more important as transport modes for countries in the BSR than for most of the other European countries.

- The share of bulk commodities, which are traditionally transported by sea, is higher for the group of countries in the BSR (i.e. Norwegian and Russian oil exports) compared to most other countries in Europe.

- The relatively strong increases in transport work (tonkm) of sea modes operating within the BSR seem due to the fact that long distance sea links benefit from extra trade volumes, compared to short distance links.

**Simulation results 2010-2020**

The developments from 2010 to 2020 (important TEN-T projects implemented, increased level of international transport demand) are expected to follow the general trend. However, land transport modes seem to benefit most from the transport framework conditions in 2020: the share of land modes of total transport work for cross-border transport increases. Some reasons for that could be more favourable conditions due to implemented important TEN-T projects as, for example, the Fehmarn Belt fixed link and Rail Baltica.

According to the simulation results, the maritime transport volumes in and out of the BSR are expected to increase by 58 percent until 2020. The distribution of the flows between the Skagen Corridor and Kiel Canal will most likely not be substantially affected. Even in 2020, about 71 percent of the international sea transports in and out the BSR is still expected to be shipped via the Skagen corridor.

Simulations of future freight flows show that

- Sea modes operating within the BSR will attract a disproportionate share of the growth in European cross-border trade volumes. This seems to result from a tendency to modal shifts from land to sea modes

- The consequences of growth in international trade volumes have a greater effect on the modal split and route choices in the BSR than is the case elsewhere in Europe. International short sea shipping in the BSR benefits from the development of trade.

Simulations of impacts of alternative framework conditions show that:

- The competition between the sea modes and the land modes seems to become tougher. Land modes are expected to benefit more from changed framework conditions. Despite (assumed) increasing unitised cargo volumes and European-wide road fees, the sea transport within the BSR is not expected to further increase its market share.

- Sea transport volumes in/out of the BSR via the Kiel Canal and around Skagen tend to increase further.
# GENERAL DESCRIPTION OF THE BALTIC SEA REGION TRANSPORT SYSTEM

## SUMMARY

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## TRANSPORT INFRASTRUCTURE

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• Shipping has traditionally been the basis for all transport networks in the Baltic Sea Region.

• Growth in exports of crude oil and increased imports of unitised cargoes to Russia and the new EU-member countries has a strong impact on the transport systems in the area, particularly on the port system.

• Inland waterways are of importance only in Germany and Russia.

• The road network needs to be developed in the region. Good connections between ports and national transport networks are essential for efficient logistics.

• The international railway connections between eastern and western Europe are few and have limited capacities.

• Although there is a need to develop the railway network, deficiencies in the rail network generally refer to qualitative rather than quantitative aspects, including operation and organisation.

• The pipelines in Europe are running close to capacity. Most newbuilding plans concern natural gas.

• The main transport corridors in the BSR run west to east connecting Western Europe with the new EU member states and Russia.
TRANSPORT INFRASTRUCTURE

Within the European Union, the international transport of goods has increased by 50 percent over the last 20 years, with road transport making up the biggest share. Road transport now accounts for about half of the total transport of goods. In contrast, the transport of goods by rail has decreased.31

The transportation network binds the urban centres together and links the cities with the rural hinterland. Shipping has traditionally been the basis for all major transport networks in the Baltic Sea Region. Good connections between ports and national transport networks are essential for efficient logistics. However, even with efficient ports, the benefits will not be fully exploited if connections with the rest of the infrastructure do not work. Port access is often the bottleneck that causes delays in the logistics chain.32

The trade flows cannot only be seen as an indication for transport demand. Lower trade volumes might also point to inadequate transport infrastructure in a country, or between countries.

MARITIME TRANSPORT INFRASTRUCTURE

Ports are essential nodal points in the maritime transport infrastructure. In the BSR, there is a large number of ports, and each country in the area has at least one port among the top ten freight handling ports in the region. The number of ports varies from one country to another depending on the length of the coastline and the intensity of transport flows in each country. The framework of port systems is described in depth later in this report.

The biggest port in Sweden is the Port of Göteborg, where approximately 32.4 M tonnes of cargo was handled in 2003. The second biggest port in Sweden is the Port of Trelleborg, which handled 10.7 M tonnes of cargo in 2003. Brofjorden is a dedicated oil port on the Swedish west coast.

The Swedish port of Malmö is a part of CMP, a joint company between the ports of Copenhagen and Malmö. CMP in Denmark has a cargo turnover of 15 M tonnes. The Port of Fredericia has a cargo turnover of 16.5 M tonnes and the Port of Aarhus 10.0 M tonnes of cargo.

In Norway, sea transport handles practically 95 percent of the transport work of foreign trade and something like 45 percent of domestic transport work. The main ports of Norway are Bergen, Karmsund, Narvik, Tonsberg and Oslo.

In Finland, the biggest port is the Port of Kilpilahti (Sköldvik) which handled 14.1 M tonnes of cargo in 2003. The Port of Kilpilahti is a private oil harbour. The second biggest port was Helsinki, which handled 11.2 M tonnes in 2003.

In Estonia, the biggest port is Port of Tallinn, which consists of five ports: Muuga, Old City Harbour, Paljassaare Port, Paldiski South Harbour and Saaremaa Port. In addition to these ports, ports with significant international cargo transport turnover are the Kunda Port, Paldiski North Port, Pärnu Port, Misduranna and Vene-Balti Ports.

The Russian Federation has six ports situated on the coast of the Baltic Sea – namely Vyborg, Primorsk, St Petersburg, Kronstad, Ust-Luga and Kaliningrad. In 2003, approximately 76 M tonnes of cargo were transported through these ports. The bulk of this was handled in the port of St Petersburg and in the Primorsk oil terminal, where a total of 60 M tonnes of cargo were handled.

In Latvia, Liepaja, Riga and Ventspils in the Baltic Sea Region are mainly involved in processing transit freight, and around 90 percent of transit freight transported through Latvia is handled through these ports. Smaller ports are mainly engaged in the shipment of timber and receipt of fish products.

Except for the oil loading buoy Butinge there is only one seaport in Lithuania – namely Klaipeda State Seaport. The port handles up to 21 M tonnes of cargo.
including metal, grain, feedstuffs, cement, timber, fertilizers, consumer goods in containers, trailers, railway wagons, etc.

The principal ports and harbours of Poland are Gdansk, Gdynia, Szczecin, Świnoujście, Kolobrzeg, Police and Elblag.

Germany’s main seaports are Hamburg, Bremen-Bremerhaven, Wilhelmshaven, Lübeck-Travemünde, and Rostock.

By exceeding the figure of 8 million in 2005, Hamburg climbed to eighth position in the world rankings of container ports. Growth was 15.5 percent. In the container traffic of the three other European deep-sea container ports growth was: Rotterdam 12 percent, Antwerp 7 percent and Bremen 8 percent.

The Port of Hamburg is also the most important transatlantic harbour for the handling of imports and exports for the neighbouring countries of the Czech Republic, Slovakia, Hungary and Austria. With rail traffic of more than 1.5 million TEUs per annum, Hamburg is the biggest railway junction for container business in Europe.

After Hamburg, the Bremen seaports make up the second largest universal port in Germany. In 2004 the Bremen/Bremerhaven port group increased the cargo throughput by 5 per cent to 49 million tonnes. The container handling increased 9 percent to 3.47 million TEU, and automobiles and other vehicles by 7 percent to 1.44 million units.

Inland waterways
The largest system of navigable inland waterways is found in Russia with more than 70,000 kilometres. The second longest system is found in Germany with 7,300 kilometres.

At the moment, 70 percent of European inland waterway traffic operates on the River Rhine, for which a uniform set of rules and regulations is in force. Duisburg, located in northwestern Germany on the Rhine, is the largest inland port in the world.

**Inland waterways**

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<thead>
<tr>
<th>Country</th>
<th>Total length</th>
<th>Main roads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>70 000</td>
<td>1 700</td>
</tr>
<tr>
<td>Sweden</td>
<td>420 000</td>
<td>98 000</td>
</tr>
<tr>
<td>Norway</td>
<td>92 000*</td>
<td>54 000</td>
</tr>
<tr>
<td>Finland</td>
<td>131 000</td>
<td>13 300</td>
</tr>
<tr>
<td>Russia</td>
<td>900 000</td>
<td>50 000</td>
</tr>
<tr>
<td>Estonia</td>
<td>56 000</td>
<td>16 400</td>
</tr>
<tr>
<td>Latvia</td>
<td>70 000</td>
<td>20 300</td>
</tr>
<tr>
<td>Lithuania</td>
<td>45 000</td>
<td>21 100</td>
</tr>
<tr>
<td>Poland</td>
<td>248 000*</td>
<td>n/a</td>
</tr>
<tr>
<td>Germany</td>
<td>230 000*</td>
<td>140 000</td>
</tr>
</tbody>
</table>

* public roads

The road network in the BSR (kilometres)

**Road freight flows (international)/TEN-STAC**

- Most goods traffic is transported by road in the EU, and road’s share of the goods market is growing constantly. Road transport accounts for nearly half of the goods traffic. According to the European Commission’s White Paper, growth in road and also in air traffic must be brought under control, and rail and other environmentally friendly modes given the means to become competitive alternatives.

Road freight flows (international)

<table>
<thead>
<tr>
<th>Base year 2000; international traffic modeled traffic flows. Number of tonnes carried per year (M tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 20</td>
</tr>
<tr>
<td>10 to 20</td>
</tr>
<tr>
<td>5 to 10</td>
</tr>
<tr>
<td>3 to 5</td>
</tr>
<tr>
<td>1 to 3</td>
</tr>
<tr>
<td>&lt; 1</td>
</tr>
</tbody>
</table>

On the other hand, it is still necessary to develop road networks in the regions and countries furthest from the centre of the EU, because outlying areas have inadequate access to central markets. In these areas, road-building has been particularly intense and this is helping their economic development.

In many places, road and rail capacities have been found to be inadequate to serve the ports. The main bottlenecks hindering international transport have been identified and included in the TEN-T priority projects as described later. The High Level Group headed by Ms Loyola de Palacio has also identified transport corridors with the world outside the EU and formulated criteria for selecting priority investment projects.
Densely populated Germany, Denmark and Poland have a correspondingly dense road network, but in spite of lower population densities, the road networks of Norway, Sweden and Finland are well developed, too. While for railways there are a few international trunk lines across the south-eastern part of the BSR, international road traffic has to rely on a road system badly maintained and of a rather regional nature and design standard. Some improvement projects have been started recently, or are under discussion for international financing.  

In Estonia, Latvia and Lithuania, traffic in major road corridors barely exceeds 10 000 vehicles per day, and is even significantly lower for most sections. Traffic volumes in Poland are clearly higher. The major east-west and north-south transport corridors carry between 10 000 and 20 000 vehicles per day.

The road network in Estonia provides a good connection to its neighbouring countries. Tallinn is well connected to St. Petersburg (via Tallinn-Narva road E20) and to Riga via Latvia (via Tallinn-Pärnu-Ikla road E67, the “Via Baltica”) by major roads as part of the overall European road network. Steadily increasing road traffic flows in the Tallinn area contribute to increased transport through Muuga port, 17 kilometers from Tallinn.

**RAIL NETWORK**

The statements above concerning the extension of the road networks are also valid for the railway network. Network capacity is generally sufficient and deficiencies generally refer to quality rather than to quantitative capacity. This is true for both passenger and cargo trains. Significant investments are required to improve quality, but they will not become effective without operational and organisational changes.

All major cities in the south of the BSR have railway connections with the major ports. The railways in this area are closely connected to the continental railway system in Central and Southern Europe.

The Central and East European part of the BSR has only a limited number of important international connections, but Poland is becoming more integrated into the west European network. Germany, Denmark, Norway and Sweden are investing heavily to improve international and regional systems, while Eastern countries still need to develop corresponding railway networks.

Russia is more rail-dependent than any other large country in the world. In Russia, trains carry approximately 90 percent of all land based freight, whereas, in other European countries,
trucks and trailers handle approximately 70 percent of freight carriage. The nodal point of Russian railways is Moscow, from where the railway network radiates around the country. One main regional railway links Moscow with St. Petersburg, and via Vyborg with Finland and her ports. One railway links Kaliningrad with Lithuania, and three lines link the region with Poland.

Sections of three Pan European Transport Corridors pass through the territory of Russia. The total length of railways on the territory of Russia that form part of Pan European transport corridors is about 2,000 km, mainly consisting of well-equipped double-track electrified railway lines.

The Trans-Siberian Trunk Railway is a high-capacity double-track electrified railway line, which is 10,000 kilometres long. The Trans-Siberian railway, together with Moscow–St Petersburg and Moscow–Brest railways, constitute the backbone of the Russian transport system. Annual transport volumes of the Trans-Siberian Trunk Railway are 80–90 M tonnes on the most heavily loaded sections. The capacity of the railway is sufficient at present, as only part of the capacity of about 100 M tonnes is utilised.

In recent years, container transport has increased in fast special trains from the ports of the Far East to Finland, Central Asia and Brest. The transport flow to Finland has the highest volume of all these. Container traffic on the Trans-Siberian railway was nearly 100,000 TEU in 2003.

Although Estonia, Latvia and Lithuania took over tracks, rolling stock and operations from the former Soviet state railways, they technically remain part of the Russian network, as they operate on Russian wide gauge of 1,524 mm, which makes them well equipped for transit traffic between Russia and the Baltic ports, for which the main railway lines were originally constructed.

On the other hand, they need to re-gauge rolling stock or to reload for southbound transport to and from Poland, as the Polish state railways operate on the Central European standard gauge of 1,435 mm.

In Poland there are 344 km of broad gauge of 1,524 mm gauge and 1,135 km of narrow gauge of various dimensions.

The railways in Russia and in Estonia, Latvia and Lithuania all suffer from worn-out tracks, out-dated signalling devices and an ageing rolling stock, due to lack of investment. The same applies for the Polish state railways, which encounter many of the same problems concerning infra- and superstructure quality.

The Estonian rail track density is below the average figure for Western Europe, but roughly equals that of Sweden. The railway network consists of 960 km of railway lines, considered as the public network open for regulated access and serves mainly as port hinterland-links in cargo transit traffic from and to Russia and international and domestic passenger traffic.

The main lines run east-west from the border station Narva, which handles transit traffic from and to St. Petersburg to Tallinn and further to Paldiski and Haapsalu. Another main line branches off the Narva-Tallinn line in Tapa, running south-eastward to Tartu and further to Latvia on the one hand, and to Moscow on the other. Only the Tallinn-Tapa line is equipped with double track, and the Tallinn commuter rail system is electrified.

As in Estonia, the Latvian railways serve as port hinterland links for transit traffic. The network resembles a hub-and-spoke system, with Riga as the hub. The main lines run from east to west, linking the Russian and Belarus border with Riga, Ventspils and Liepaja. Northbound lines run to Tartu and Tallinn in Estonia, while two lines connect with Lithuania. The network density is higher than in Estonia, but the infrastructure facilities are in the same poor condition as in Estonia.

In Lithuania, the public network consists of approximately 2,000 km of lines, of which less than 10 percent is electrified and 30 percent is double track, the latter mainly on the Belarus-Kaliningrad oblast link via Vilnius and Kaunas. The
density figure measured with respect to population is below those of both Baltic neighbouring countries, while, measured per square kilometre, it ranges between those of Latvia and Estonia.

One main line runs in an east-west direction between Vilnius and Klaipeda via Kaunas. Two lines run towards Latvia, while two southbound lines lead towards Belarus and Poland respectively. Because of the gauge difference, border crossing requires re-gauging or reloading.

In Lithuania, there is, in addition to the standard 1 524 mm gauge, also a 22-km European-gauge line from the Polish border to Sestokai railway station. Transit freight transport in the east-west direction from the ports of Klaipeda and Kaliningrad constitute the main share of railway transport in Lithuania. The track network of Germany has been an open transportation system since 1994. Today, any organisation which fulfils the legal requirements can set up a railway company and offer traffic services.

In Denmark, passenger rail operation (but not the tracks) on some rail lines in Central and West Jutland were put out for tender in 2001. A private company, British Arriva, won the contract and began operating these rail lines in 2003. Freight is operated by DB daughter company Railion.

The Norwegian railway system is undergoing a massive modernisation with investments centred around areas where goods transport capacity is a limiting factor. The investments include improved terminal facilities.

In Sweden, railways are divided into main lines and county lines. A main line carries traffic that is of importance to the whole or large parts of the country, whereas a county line has basically local or regional traffic. Major investments have been made in the rail system in Northern Sweden (Bothnia-line), adding transport capacities for both cargo and passenger transports.

AIR TRANSPORT SYSTEM

Air cargo is concentrated at the airports of capital cities. The airports of Helsinki, Stockholm, Oslo and Copenhagen together transport nearly 60 percent of all air freight in the BSR. The airports of Hamburg, Warsaw, Göteborg, Berlin and St. Petersburg follow, but they have on average only 50 percent of Oslo’s freight volume. The airports of Estonia, Latvia and Lithuania have rather low freight volumes, which is much less than freight in some of Denmark’s, Norway’s, Sweden’s and Finland’s regional centres. Of all the different modes, air transport has shown by far the largest increase over the last 20 years. Yet airlines expect air traffic almost to double by 2010. To sustain such growth and to avoid saturation of the skies, air-traffic management will need to be reformed and sufficient airport capacity guaranteed in the European Union.

Denmark’s most important airport is the airport of Kastrup in Copenhagen, which is also the sixth largest airport in Europe. The other international airports are situated in Billund, Alborg, Aarhus, Odense and Rönne.

Besides Oslo international airport Gardemoen, Norway has 5 regional airports, which handle all types of flight operations, 11 medium sized airports and 37 local or privately owned airports. Oslo airport handles over 75 percent of Norway’s air freight.

Airfreight to and from Swedish airports amounted to approximately 190,000 tonnes in 2003. International traffic amounted to 185,700 tonnes, while domestic traffic, which only accounted for two per cent of the total freight volume, amounted to 4,400 tonnes.

In 2003 Finnish airports handled approximately 89 500 tonnes of freight and 10 600 tonnes of mail in international traffic. In domestic traffic 6 300 tonnes of freight and 5 600 tonnes of mail were handled.

Russia has approximately 70 international airports. About 70 percent of flights are handled through the three major airports of Moscow – namely Sheremetjevo, Vnukovo and Domodedovo. In 2004 only 0.9 M tonnes of cargo were transported through Russian airports.
In Estonia there is an international airport at Tallinn.

The largest airport in Latvia is Riga International Airport and there are also three smaller airports located in Liepaja, Ventspils and Daugavpils. In 2003, 13 534 tonnes of cargo was handled at Riga International Airport.

In Lithuania, there are three international airports: Vilnius, Kaunas and Palanga. 3.7 M tonnes of cargo was transported through Lithuanian airports in 2003.

Poland has eight major airports; five of these are important international airports: Warsaw, Cracow, Poznan, Gdansk and Katowice.

In Germany there are 17 international airports. The biggest of these is Frankfurt am Main Airport. In 2003 Frankfurt am Main handled approximately 1 548 000 tonnes of airfreight. Other main airports in Germany are München, Düsseldorf, Hamburg and Berlin-Tegel.

PIPPLES

In 2003 crude oil production in Russia was 421 M tonnes, of which 68 M tonnes was exported by pipelines i.e. approximately 16 percent. Europe is the major importer of Russian crude oil.

Crude oil export pipelines to Europe are currently operating near full capacity, due to an increase in production and export of Russian crude oil over the past three or four years. Upgrading existing capacity and construction of new pipelines are essential in order to promote a sustained increase in the Russian crude oil production, as well as in crude oil export volumes to Europe.

Trunk pipelines of oil and oil products, together with oil terminals, form the Latvian transit corridor of oil and oil products. The trunk pipeline system includes two oil pipelines and one pipeline for oil products. The two oil pipelines are Polotsk – Ventspils, with a capacity of 16 M tonnes per year and the pipeline Polotsk – Birzai - Mazeikiai. In 2003 Polotsk – Birzai - Mazeikiai transported 16.0 M tonnes of oil. The Polotsk – Ventspils pipeline did not transport oil in 2003 at all. Instead the oil pipeline Polotsk –Ventspils transported oil products of 4.6 M tonnes in 2003.

Oil export via the Baltic is important for Russia. In 2004 the throughput was 42 M tonnes, and in 2005 57.5 M tonnes, which is close to the maximum capacity of 60 M tonnes. Transportation through the Baltic Sea cannot be increased indefinitely. The first alternative will be a pipeline towards Murmansk.

The expansion of the Baltic Pipeline System together with the planned terminal in Murmansk would add more than 100 M tonnes to Russian crude oil exporting capacity. From today’s perspective, it is not clear if and when the project will become a reality.

The distances between new sources and the Baltic Sea are long and an increasing proportion of the Russian supplies will in future be shipped from the White Sea and the Barents Sea in the north.

The exploration of new oil findings in Afghanistan, Kazakhstan, and the Caspian Sea could change the oil transportation development of the Baltic Sea area, as these investments may affect the main oil and gas transportation routes to Europe.

An increasing proportion of oil supplies from the southern republics, which presently also use ports in the Baltic Sea region, will be pipelined
through to ports in the Black Sea and Caspian Sea. An oil pipeline from Azerbaijan through Georgia to the Turkish port of Ceyhan is expected to be completed by 2008.

Norway and Russia are the major suppliers of natural gas in Europe. All natural gas consumed in Finland is imported from Russia. The gas enters Finland near the city of Imatra, some 3,500 km from the fields in Western Siberia. The natural gas network in Finland consists of 943 km of high-pressure transmission pipelines and around 1,000 km of distribution pipelines.

The natural gas consumed in Denmark is produced in the Danish North Sea. The gas is piped the 200-250 km to shore at Nybro on the west coast of Jylland, and from there to sites in the north and south of Denmark and Copenhagen. Germany is supplied with natural gas by pipeline from the Norwegian part of the North Sea and via Belarus and Poland from Russia. The natural gas consumed in Sweden is imported from Denmark. The gas enters Sweden south of Malmö and is transported in an approximately 300 km long high-pressure pipeline up the west coast to Göteborg.

Gas exports from Russia are increasing and recently Gazprom, BASF and E.ON signed a contract to build a 1,200 km sub-sea pipeline in the Baltic Sea, from Vyborg to the Greifswald region in Germany, and later to Great Britain. The pipeline will be ready in 2010 and have a capacity of 27.5 billion cbm per year (=12 M tonnes). For Poland this will mean a loss of incomes from transit of Russian gas through Poland.

From the Norwegian sector of the North Sea there are four major pipelines supplying the continent with gas:

**Franpipe** has a capacity of 16 billion m³/year and a length of 840 kms. It runs from the Draupner E field to Dunkerque in France.

**Europipe I** is 620 kms and has a capacity of 13 billion m³/year. It runs from Draupner E to Emden in Germany.

**Europipe II** is 658 kms and has an annual capacity of 21.7 billion m³. It transports gas from Kårstö to Dornum in Germany.

**Norpipe** is 442 kms and has a capacity of 14 billion m³/year. It runs from Ekofisk to Emden in Germany. In the Emden terminal it is connected to the Europipe.

Pipeline transport is a cost efficient means of transportation for large volumes of liquid bulk products. Baltic seaports and oil terminals connected to Russia via pipeline include Primorsk in Russia, Ventspils in Latvia (stopped deliveries 2003), Butinge in Lithuania and Gdansk in Poland.

A lot of the oil from Russia directly to Poland and Germany is transported by pipeline.

Currently, Russia has three main oil export pipelines to the West:

- The Transneft pipeline system to export terminals in the Black Sea
- The Druzhba-pipeline system to Eastern Europe and Germany
- Sea transport through terminals in the Baltic Sea, to which oil is transported either by pipelines or by rail.
Historically, the largest volumes of Russian and CIS oil exports have been shipped through Baltic States’ ports, either via local pipelines connected to the Transneft pipeline system or by rail (Muuga Harbour).

The Druzhba-pipeline has a nominal capacity of 60 M tonnes p.a. On its way to the West it traverses Belarus. The northern line of this pipeline runs through Poland to Germany and the southern line passes through the Ukraine, Hungary and Slovakia, before ending in the Czech Republic. Reportedly, the capacity of the northern pipeline is fully utilised, whereas the southern has some spare capacity.

In comparison to the Druzhba pipeline, the Baltic Pipeline System is a new pipeline, with major impacts on Estonia. The BPS was inaugurated in December 2001, carrying crude oil from Russia’s West Siberian and Timan-Pechora oil provinces westward to the newly completed port of Primorsk in the Russian Gulf of Finland. The pipeline also has connections to Ventspils (Latvia) and Butinge (Lithuania), but not to Estonia.

For oil through terminals in the Baltic Sea, the main destination is Rotterdam. In the Baltic Sea, the port of Primorsk is the main oil-exporting corridor on Russian territory. It relies on the newly constructed Baltic Pipeline System (BPS). In addition, oil is transported via the Russian Ports of St. Petersburg and Kaliningrad.

Throughput capacity at Primorsk has been steadily increased to around 1 M bbl/d by December 2004. Pending government approval, the pipeline will be expanded to 1.2 million bbl/d. The BPS gives Russia a direct outlet to north European markets, allowing the country to reduce its dependence on transit routes through Estonia, Latvia, and Lithuania.
• The transport infrastructure in the BSR region is being developed to cope with growing trade and needs for cohesion, especially to integrate peripheral areas.

• There are several hundred ports in the area, over 50 of them with annual cargo turnover above 1.5 M tonnes.

• The shipping and supporting service companies are numerous and competent.

• Three out of four calls by cargo carrying vessels in the BSR ports are made by tramp vessels (tankers, dry bulkers and multi-purpose vessels) and one out of four calls are made by liner vessels (container and roro.)

• Calls in the Baltic Sea by large vessels (>50,000 gt) are few and consist mainly of tankers, dry bulkers and roro vessels.

• The port systems vary from completely state owned and operated to fully private ports.

• The philosophy of maritime infrastructure and port charges varies between countries and ports and lacks transparency, which makes comparisons between countries and ports very complicated.

• The total icebreaker capacity of the Baltic Sea countries is between 23 and 28 ships.

• There is a shortage of icebreaker capacity in the Russian part of the Gulf of Finland and Estonian waters, where problems arise frequently during harsh winter conditions.

• Increased traffic in the Gulf of Finland will increase the demand for icebreakers.
SUPPLY OF MARITIME TRANSPORT SERVICES

This chapter aims at describing the supply of maritime transport services in the Baltic Sea Region (BSR) and the development trends.

During 2000-2003 tankers, dry bulkers, container vessels, roro vessels, reefer, and other dry cargo vessels (not ferries) made an average of 135,000 port calls per year in the Baltic Sea Region.

Tramp vessels (tankers, dry bulkers, reefer and other dry cargo vessels) are the most frequent visitors to the ports in the area. They accounted for 76 percent of the total number of port calls in the BSR during 2000-2003, compared to 24 percent for the liner traffic (container, roro).

While tramp vessels call at a large number of ports, with only a few regular visits per port, liner vessels call frequently at a smaller number of ports.

Carrying unitised cargoes for multimodal transport solutions along with a high degree of regularity in port calls, liner traffic still plays a much more prominent role in the transport corridors than tramp traffic. A general trend is that the container, tanker and reefer vessel fleets are increasing their share of the market at the expense of dry bulkers and other dry cargo vessels.

Both tramp and liner traffic in the BSR are dominated by small vessels (<10,000 gt). According to ship movement data from Lloyds Maritime Intelligence Unit, an average of 116,000 calls (86 percent of 135,000 calls) were made by vessels in this size segment in 2003. Most calls were actually made by vessels below 5,000 gt.

Calls by cargo carrying vessels above 50,000 gt in the Baltic Sea are very rare, and are made mainly by tankers, dry bulkers and roros.

Due to an increased number of oil shipments, the average size measured in "length over all" (LOA) and beam of vessels calling at ports in the BSR in 2003 exceeded by 5 percent the average sizes of vessels calling at ports in the BSR in 2000.

Among Panamax- and Sub-Panamax container vessels (20-50,000 gt), the average LOA was 224 meters, the average beam 29.2 meters, and the average draught 11.4 meters.

Looking into the future, European shipowners continue to order larger and larger vessels.

For most vessel types, the average size of vessels in the orderbook at the end of 2005 is generally larger than the average size of vessels in the existing fleet.

Another trend is that the share of ice-strengthened vessels owned by Europeans is increasing. Among vessels below 20,000 gt the share is between 50 and 65 percent, with the highest rate of 73 percent among tankers in the size-class 10-20,000 gt.

Tanker-owners are the most frequent buyers of ice-strengthened vessels,
while the number of dry cargo vessels ordered shows the most spectacular decline, despite the large number of vessels operating in the region.

The BSR merchant fleet
The share of vessels registered in BSR countries represents 6.8 percent of the world’s total merchant fleet (in dwt).

Many owners also have vessels registered in other countries, e.g. Bahamas, Liberia, Isle of Man, Bermuda, Cayman Islands and Cyprus; in addition, they operate a large number of chartered vessels, owned by others.

In reality, the tanker, general cargo and container fleets commercially controlled by shipowners in the BSR are much larger than what is presented above.

**RORO CARGO**

An increasing share of the transport of general cargo is performed by roro and container carrying vessels. It is within these types of shipping that the operators of open access liner services show collective strength, by offering services according to a time-table that suits a large number of the transport buyers.

Roro and lolo vessels also offer greater opportunities to carry other kinds of unitised roro cargoes, e.g. cars, trailers and containers. However, these opportunities are restricted by the fact that the destinations for the original cargos of the logistic chains are not optimal for the additional cargoes, neither geographically nor chronologically.

**Roro Liner Services**

In almost all transport chains, cargo is transported by truck for part of its journey, and some goods also go overseas in a trailer. These trailers can be transported on a pure trailer vessel, a so-called roro, or on a ropax, a vessel that takes both passengers and trailers with its main focus on freight, or on a ferry with car decks.

Most roro liner services are offered between countries within the BSR and Northern Europe, but trans-Atlantic services are also offered from Göteborg, Aarhus, Hamburg and Bremerhaven.

In the BSR there are some 100 different lines for the transportation of rolling cargo, not counting all the small lines between islands in the Swedish and Finnish archipelagos or in the Norwegian fjords. Lines can have several calls per day or only a few per week. There can be several operators on the same route or just one.

The biggest operators in the BSR are Stena Line/Scandlines, DFDS Torline/LISCO, TT Line, Finnlines/Norddlink, Transfennica and Tallink. The Swedish part of Scandlines is owned by Stena, and the other two thirds are owned by the Danish and German railways. There are only a few operators supplying railway connections namely, SeaWind (Stockholm-Turku) Unitylines (Ystad-Swinoujscie) Nordö-Link (Malmö-Travemunde) and Scandlines from Trelleborg.

The trend is towards bigger vessels with a focus on cargo. Many roro ports are quite shallow, so the vessels’ draught has to be limited to between seven and eight meters. To maximise speed and minimise fuel consumption, the vessels are rarely wider than 30 meters.

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**BSR merchant fleet**

by flag of registration
(31 December 2003)

Source: Lloyd’s Register

Fairplay

<table>
<thead>
<tr>
<th>Thousand dwt</th>
<th>Oil tankers</th>
<th>Bulk carriers</th>
<th>General Cargo</th>
<th>Container Ships</th>
<th>Other types</th>
<th>Total fleet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norway</td>
<td>13 127</td>
<td>7 514</td>
<td>3 850</td>
<td>88</td>
<td>3 074</td>
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<tr>
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<td>61</td>
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</tr>
<tr>
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<tr>
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<td>6 062</td>
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<tr>
<td>Denmark</td>
<td>3 198</td>
<td>77</td>
<td>413</td>
<td>4 875</td>
<td>610</td>
<td>9 173</td>
</tr>
<tr>
<td>Total BSR</td>
<td>20 356</td>
<td>9 253</td>
<td>10 462</td>
<td>11 356</td>
<td>6 448</td>
<td>57 874</td>
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<tr>
<td>World total</td>
<td>316 759</td>
<td>307 660</td>
<td>94 767</td>
<td>90 461</td>
<td>47 327</td>
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<tr>
<td>BSR share of world total</td>
<td>6.4%</td>
<td>3.0%</td>
<td>11.0%</td>
<td>12.6%</td>
<td>13.6%</td>
<td>6.8%</td>
</tr>
</tbody>
</table>

The Norwegian fleet is by far the largest fleet, measured in deadweight in all categories except containerships. Vessels registered in the Norwegian national and international registers represent 48 percent of the total fleet registered in the BSR ship registers.

Although the number of dry cargo vessels ordered shows the most spectacular decline, despite the large number of vessels operating in the region.
The biggest roro-vessel, measured in lanemeter capacity, are the DFDS Torline RoRos on the routes from Göteborg to either UK or the continent, with about 3,800 lanemeters. Nordö-Link has the two largest ropax vessels, with a capacity of slightly more than 3,000 lanemeters and a passenger capacity of 250. Finnlines have three ropaxes, with a capacity of 2,500 (2,900 with extra deck) lanemeters and 440 passengers. Two of these operate between Sweden and Finland, and one between Malmö and Travemünde together with Nordölink’s 3,000 lanemeter vessels. The Color Fantasy (Oslo-Kiel), Silja Europa, Serenade and Symphony (Stockholm-Finland) are the biggest ferries measured in passenger capacity but they have only room for some 1,000 lanemeters of cargo.

There are a handful of pure paper carriers, normally departing from the northern region of the Bay of Botnia, calling at one port in Northern Germany, UK and then going to the continent. Some shipments go all the way to the North of Spain.

There are also lines with a mix of paper and third party cargoes. One of the first ones is Stora Enso’s line from Göteborg to Zeebrugge; for this service, the paper is transported in big boxes called SECU, and the third party goods are transported from Zeebrugge to Göteborg.

Another "paper line" that is active in the open market is Kappa Packaging, where an empty paper carrier is available for third party cargo on the northbound trip from Cuxhaven to Södertälje. Holmen also seeks to make use of the cargo space on the northbound trips, but on a less commercial basis than Kappa. From time to time, cars are shipped from the continent to Sweden by Kappa.

Transfennica used to be owned by the Finnish paper companies in order to cooperate on the logistics side. Because of this, they are also active in the market for third party cargo. However Transfennica is now owned by the Dutch shipping company Spliethoff. SCA Transforest’s and UPM-Kymmene’s transports are pure paper transports to the continent, normally to France, Spain or Ireland.

**Fleet age**

The average age of the roro fleet is about 15 years, with the oldest vessel built in the beginning of the 1970s. There are about 30 built before 1980 and about as many built after 1999, i.e. two thirds are 6 to 25 years old.

It is comparatively more expensive to build a small vessel than a bigger one and therefore the smaller roros are usually "older" than the bigger ones.

Many shipowners are renewing their fleets operating in the BSR.

- Tallink has one ferry and two plus two ropaxes under construction. The ropaxes are designed for a speed of 25 to 30 knots while the ferry is designed for a more normal service speed of 21-22 knots. Tallink has revealed that the ferry and one ropax are intended for the Helsinki-Tallinn route, but the intended routes for the others have not yet been revealed. The ropaxes will have a capacity of about 2000 lanemeters and almost 2000 passengers.

- Finnlines has five ropaxes under construction with 4,200 lanemeter, 500 passenger capacities and a speed of about 25 knots that will be incorporated in the Finnlines network from Finland to Sweden, Germany or Poland, probably on the longer routes, due to the rather high service speed and because they have four car decks, which makes the turnaround time in ports slightly higher than for a three car deck ropax. When these ropaxes are delivered, they will be the biggest in the region.

- Stena has six ropaxes under construction with 3100 lanemeter, 300 passenger capacities, and a speed of about 23 knots. The first two are destined for Stena Line’s routes between the UK and the continent, but the others are officially not earmarked for any route. Late 2004, Stena Line replaced their ropaxes to Poland.

- Polferries bought a ropax to replace a smaller one. The third operator between Sweden and Poland, Unity Line, also invested in new tonnage

- Other routes to the east coast of the Baltic Sea have no earmarked newbuildings under construction at the moment.
• Color line has one ferry for the Oslo-Kiel route under construction, with a passenger capacity of about 2,800 passengers and 1,300 lane-meters.

• There are three paper carriers under construction in Finland for service from Northern Finland to Göteborg for Stora Enso’s traffic, and another two paper carriers for UPM-Kymmene under construction in Germany for service from Finland to the continent. The owner of Transfennica, Spliethoff, has six 3000 lane-meter roros under construction in Poland but the intended route for these vessels has not been revealed. These vessels are so big they might be for the North America trade.

• DFDS Torline has gone through a major fleet renewal programme.

**CONTAINER**

Most containers arriving in Finland from Sweden, Estonia and the Baltic part of Germany are carried by ferries or roro vessels. Finnlines, for example, has 25 sailings per week between the Baltic Sea ports of Germany and Finland, and 20 from Sweden. Transfennica, the other big operator in Finland, has some 12 sailings per week between Finland and Germany, and about 5 per week with Estonia. Other container carrying vessels are also represented here, such as multipurpose and conventional vessels.

In addition to the 20 sailings between Sweden and Finland, several roro lines call at Göteborg from both the continent and from the UK.

For Poland, only 60 percent of the total number of TEU originates or are destined for the deep sea feeder ports on the continent, so the remaining 40 percent comes partly from Finnlines’ service between Finland and Poland, with seven departures per week and partly from a busy ropax service with Sweden, involving as many as three operators. In addition, Poland has a big fleet of multipurpose vessels calling at Gdynia and Gdansk carrying containers; however, the main flow is still from the four deep sea continental ports.

29 full container liner service companies link Hamburg with ports in Asia on a weekly basis. Approximately 4.3 million TEUs were handled via Hamburg in business with Asia. With China, being the most significant trading partner of Hamburg, 2.2 million TEUs were handled.

Hamburg is the most important North European transhipment hub together with Rotterdam; for Baltic traffic by far the most important. A total of 2.2 million TEUs were handled in 2005 in sea business between Hamburg and the Baltic Sea states. This corresponds to an increase of approximately 350,000 TEUs or 20 percent compared with 2004. The trade with the Russian Federation climbed 50 percent to 422,000 TEU, with Poland 43 percent to 225,000 TEU and with Sweden 14 percent to 383,000 TEU. Norway, Denmark, Lithuania, Latvia and Estonia, all achieved a double-digit growth rate.

In the BSR, container transport is the fastest growing shipping segment, mainly because of a growing market demand for manufactured goods in Russia and in the new EU-member states; another factor is the growing “containerisation” of bulk- and break-bulk export cargoes, for example pulp, paper and sawn wood from Sweden and Finland.

Almost all manufactured or semi-manufactured products go by containers. The container carriers from Asia mainly arrive at Europe’s deep sea ports.
From there the container is transhipped to a feeder vessel if it is to continue by sea to this region, or transported into Europe via the road and railroad network.

Containers can be transhipped in a multipurpose dry cargo or ro-ro vessel, but the dry cargo vessel does not normally have a fixed schedule and is therefore not included here.

In the BSR there are almost 50 container ports with at least one call per week by some of the almost 20 operators.

The container line is like a bus line or a loop with stops along the line. There are also, of course, container lines that act similarly to the airline logistic system, starting from a hub port, heading directly to the destination port, just like a commuter airline.

Many vessels which depart from one of the continental deep sea ports are offloaded along the way to a final destination port, or operate in a loop. However, rules and regulations make it complicated for containers to be shipped from one port to another in such a loop. The restrictions are a matter of the flag of the vessel, since only EU-flag vessels can carry out cabotage in some countries. Therefore the rational shipping of containers between two ports in the same country is not always possible. This is mainly relevant to the repositioning of empty containers.

Although liner traffic usually operates within a given route system, operators continuously adjust their services to the changing market demand and to competition, which means that the tonnage as well as the route planning involved in the operations change during the year.

Most of the pure container carriers operating in BSR have a capacity between 500 and 1,000 TEU. The length of a 500 TEU vessel is slightly below 100 meters and for a 1,000 TEU 160-180 meters.

There are also some post-Panamax carriers calling at Göteborg and Aarhus. They have capacities of more than 6,000 TEU.

Significantly larger vessels are expected to enter the container fleet in the next 10-15 years. The pictures above illustrate the dimensions of such vessels.

If the number of port calls per year is multiplied by the capacity of the vessels calling at the ports, the theoretical capacity of the liner system can be calculated. These calculated capacities for the most important ports are shown in the table to the right. The ranking shows that container carriers calling at Hamburg have the largest total capacity, and that the vessels calling at Bremen represent the second largest capacity.

The problem with the big container carriers is the beam, length or draught of the vessels. A container carrier normally requires more draught than a ferry and therefore the carrier cannot access all ports. Also, the size of the cranes and the quay length can be a problem in some ports. The trend is that as the vessels are getting bigger and bigger, former ocean going carriers become feeder vessels and the ports have to adapt to this new situation. The logistic system is, for the moment, based on vessels in the 500-1000 TEU size range, which restricts the growth of the feeder vessels.

The average age of the container carriers in the region is 9 years, with the oldest built in the late 1970s and the newest just delivered. Fifty percent are between 5 and 15 years old, i.e. built in the 1990s. The age structure of vessels operating in a region vary over time since, many of the vessels are chartered for a short period of time.

Out of 125 feeder vessels on order worldwide between 500 and 1000 TEU only 14 have ice class. Many of the vessels are ordered by European owners, but that does
not mean that they will trade in European waters. Most of the ice classed vessels will probably end up in the region, since there are not many places where ice class is needed.

**DRY BULK**

The dry bulk trade is geared very much towards commodity markets like wood, coal, ores, grain, fertilizers, chemicals and non-ferrous metals, destined for large manufacturing or processing industries.

These industries are normally situated close to the sea, often operating port terminals of their own. Cargoes from inland mines or works are often transported to port terminals on highly specialised trucks or railway wagons with very little ability to carry other types of cargoes.

As a result, the high degree of specialisation offers few opportunities for integration of different flows and transport facilities.

There are some exceptions from that rule; for example, exporters of pulp, paper and sawn woods often share the same transport facilities for their products.

A large share of the dry bulk cargoes transported from Russia are carried by rail, both to transit ports and to final destinations in East and Central Europe. There is a large number of small river-sea carriers of oils and general cargo vessels operating throughout Russia.

Higher specialisation of production means that semi-finished goods are often shipped between factories before being finished. The semi-finished or finished goods are often transported by sea to export markets or by rail or truck to domestic markets.

**OTHER DRY CARGO**

Other dry cargo vessels (multipurpose vessels, other general cargo vessels, reefers etc.) are by far the most common type of vessels on the tramp market in the Baltic Sea, measured both in number of vessels and in tonnes carried. They are generally very small (average 2 600 dwt), and are thus able to call most ports in the region.

Dry cargo vessels are important for inland waterway transports, but due to their small size they make very few visits outside the region. The fleet is ageing and as the replacement rate is low, the fleet growth is actually negative.

**OIL**

Transport of oil in the BSR is growing rapidly, as oil and oil products sourced in the region increase their share of the market both inside and outside the BSR.

In 2005 approximately 160 M tonnes of Russian oil was exported through ports in the Baltic Sea.

Crude oil is not an end customer product, so the crude oil is transported from the source to a refinery; thereafter, it is transported to the end customer. Long distance transportation of oil is normally carried out by ship, train or pipeline.

Refineries in the BSR are large recipients of crude oil mainly from nearby suppliers in the North Sea and Russia.

In the North Sea, the oil is transported by shuttle tankers from the oil fields to the refineries.

Crude oil from Russia is pipe-lined to export terminals, mainly in the Gulf of Finland and Kaliningrad, from where it is shipped to refineries both inside and outside the Baltic Sea. The alternatives to seaborne crude oil transports are few and consist mainly of pipe-lines and rail transports.

Transporting oil through the Baltic Sea is restricted, because the water depth in the Danish Straits limits the maximum tanker size to approximately 120,000 dwt; consequently, a growing proportion of the Russian supplies to oversea destinations will be shipped from the White Sea and the Barents Sea.

Plans to construct a deep-sea terminal in Murmansk for vessels over 300,000 dwt, and to build a privately funded crude oil pipeline, have been disrupted. Furthermore,
it has to be considered that only a few ports in the world can handle vessels of this size.

The expansion of the Baltic Pipeline System, together with the planned terminal in Murmansk, would add more than 100 M tonnes to Russian crude oil exporting capacity. From today’s perspective, it is not clear if and when the project will emerge.

The exploration of new oil discoveries in Afghanistan, Kazakhstan, and the Caspian Sea could change the oil transportation development of the Baltic Sea area, as these investments may affect the main oil and gas transportation routes to Europe too.

An increasing proportion of the oil exported from Russia, which presently uses ports in the Baltic Sea region, will in future be pipelined through to ports in the Black Sea and Caspian Sea. An oil pipeline from Azerbaijan, through Georgia to the Turkish port of Ceyhan, is expected to be completed by 2008.

**Oil port/terminal development trends**

Oil ports vary in size and type as well. Some oil ports are connected to the crude oil source via a pipeline, some are just a storage place for oil coming and leaving by ship, others are just a refinery, while some are a combination of all of these.

In 2004 Mongstad outside Bergen was the biggest oil port in the region handling some 55 M tonnes. Mongstad is also the biggest refinery in Norway refining, some 10 M tonnes.

The biggest oil port in the Baltic Sea is Primorsk outside St Petersburg from which about 45 M tonnes were shipped in 2004. Primorsk has seen a huge increase in oil transport. In 2003, just 18 M tonnes were shipped. The Russian pipeline operator Transneft has expanded the Baltic Pipeline System (BPS) through Primorsk to 60 M tonnes 2005.

St Petersburg is also quite a big oil port, with 11 M tonnes shipped in 2003 and 13 M in 2004. The new Russian oil port Vysotsk was completed late 2004 and, during the first year, 2.5 M tonnes of oil was transported. Vysotsk’s exporting capacity is meant to increase to 4.3 M tonnes and later up to 10.6 M tonnes per year.

There has been much speculation about the port Ust-Luga south west of St Petersburg. It is currently a coal port and there are plans that the port will be involved in the oil and gas business as well; however, these plans are currently on ice.

Favourable railway tariffs for exports of crude and products via Russian ports have made deliveries through Vysotsk and St. Petersburg more attractive than transits through non-Russian Baltic outlets. Crude oil transit has – until the closing down of Ventspils crude oil pipeline in early 2003 – constituted the largest segment of transit cargoes in the Baltic Sea ports.

Muuga Harbour (Tallinn), Riga, Ventspils and Klaipeda / Butinge are main competitors to Russian ports in the transit market of liquid bulk in the Baltic Sea area.

The capacity expansion in Primorsk has come at the expense of other ports in the region, in particular Ventspils and Butinge, through which crude shipments slumped during 2004.

There are several other big oilports in the Gulf of Finland where Tallinn, with 26 M tonnes shipped in 2004 and 24 M in 2003 is the second biggest and Sköldvik, near Turku, thereafter with almost 16 M tonnes in 2004, about 1.5 M tonnes more than in 2003.
Butinge, Klaipeda, and Kaliningrad are quite similar in size and shipped about 7 M tonnes each in 2004.

Ventspils, also in that region, is more than two times bigger shipping 17 M tonnes, and after Tallinn’s 19 M tonnes it is the largest port for oil products.

Gdansk in Poland is quite a busy oilport, with some 12 M tonnes handled in 2004.

In Germany on the Baltic Sea Rostock handled 3 M tonnes in 2004.

There are two big oil ports on the Swedish west coast: Göteborg, with almost 20 M tonnes in 2004, and Brofjorden, a bit further north, with some 20 M tonnes. Both Brofjorden and Göteborg have refineries, so almost everything that is shipped in is also transported out by vessel.

Possibilities to further expand Russian oil exports through the Black Sea are restricted by congestion and traffic limitations in the Bosporus Strait.

**Rail transit**

Rail transit relies solely on the existing railroad network. With the ever increasing volumes, terminal operators have invested heavily in wagon handling equipment. In Muuga Harbour and in the ports of Riga, Liepaja and Klaipeda rail transportation is the only economically possible means of oil transit transportation. Although St. Petersburg is linked to the oil product pipeline, oil exported via this port is mainly carried by rail.

**Tanker transport capacities**

The oil tankers differ from each other in size and type, mostly depending on where in the transport chain they operate, before or after the refinery. A crude oil tanker is transporting oil from the “source” to the refinery, often with a dwt of several hundred thousand tonnes. A chemical tanker is a more sophisticated tanker with several cargo tanks and the possibility to load different types of cargo in the tanks.

The logistic system is based on different size vessels for different kinds of cargo, with the crude oil tankers being the biggest.

The biggest tankers, the VLCCs and the ULCCs, cannot enter the Baltic Sea when loaded due to draught restrictions; the draught is limited to 15.4 meters in the Great Belt. The biggest vessels in the Baltic Sea are not fully loaded Suezmaxes, about 120,000 tonnes of cargo and some 270 meters long. A fully loaded Suezmax is about 150,000 dwt, and therefore it is not so economical to trade Suezmaxes in the Baltic Sea. The largest vessels are thus Aframaxes, about 110,000 dwt and 250 meters long.

As can be seen in the graph to the left, the age profile of the fleet is quite evenly spread. The average age is 15 years, and a lot of vessels are going to be delivered in the coming years, so the age structure will change during the next 3 years, as the older vessels are phased out. The new EU rules ban single hull tankers and tanker older than 25 years from EU waters.

**Tanker fleet additions/replacements**

There are about 1500 tankers under construction worldwide, partly due to the new rules after the Prestige accident in 2002. The new EU rules have led to a newbuilding boom. About half of the 1500 tankers on order are for European owners.

The biggest owner of product tankers in the region is Broström with 80 tankers, both owned and chartered. Broström’s fleet consists of rather small vessels, all of them product or chemical tankers, and the biggest being Bro Stella of almost 70,000 dwt. Other shipowners with a lot of activity in the region are AP Möller and oil companies like BP and Shell. Stena is also a big operator, shipping Russian crude oil from the Gulf of Finland.
Stena Bulk plans to build a wide and shallow Aframax tanker of 116,400 dwt, optimized for trading in the Baltic all year round and designed to navigate in extreme ice conditions with 1 meter thick ice.

**INSTITUTIONAL, FINANCIAL AND REGULATORY FRAMEWORK OF PORT SYSTEMS IN THE BALTIC SEA REGION**

**INSTITUTIONAL FRAMEWORK OF PORTS**
As early as 1997, the European Commission started to focus work on the European ports, their organisation and services. The green paper on port infrastructure recognised that the way European ports are organised and run differs between Member States, as well as inside these countries. There was no transparency in how the ports were financed and to what extent competition was distorted. The Commission initiated the discussion on "a level playing field" for competition in the port sector.

**Denmark**
In Denmark, 23 major ports are owned and operated by a municipal government, 23 owned by a municipal government but operated commercially, 7 are limited liability companies owned by the municipal governments and 7 operated in various other organisational forms.

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

Danish ports bear their own infrastructure costs.

**Sweden**
There are more than 50 commercial ports in Sweden. In addition, there are several industrial ports serving various basic industries. The majority of the commercial ports are limited liability companies, owned by a municipal government. A few ports have mixed public/private ownership. Almost all port companies have incorporated the local stevedoring company and they are now operating as a single entity.

A unique organisational form is the cross-border port operator CMP, Copenhagen Malmö Port AB formed by one Swedish and one Danish port.

Cargo handling is mainly performed by the port companies themselves. In cases where there is a separate stevedoring company, it is normally owned jointly by the port authority or company and some cargo owners.

The so-called "stevedoring monopoly" is strictly adhered to in many Swedish ports.

**Norway**
There are some 60 public ports in Norway. They are owned by the various municipal administrations and run as municipal companies. According to the Norwegian law on ports and fairways, it is up to the local municipal administration to decide the principles on which various dues are determined and whether the port should be divided into different sections with different payment systems. Income may only be used for port purposes.

The local municipality also decides whether to make investments in new port infrastructure and completely new ports. This is part of the municipality’s regular planning process. There is no central government official port policy. The government has, however, nominated ten ports as "ports of national interest".

In addition there are a number of private industrial ports.

**Finland**
In Finland, there are about 50 ports with international traffic. Most of them are
small and the share of the ten largest ports was 73 percent of all cargo handled in Finnish ports in 2003. Most public ports in Finland are owned by a municipality and operate as public utilities, meaning that, in principle, the port makes its necessary investments using its own income. Only two ports, Kotka and Hamina, are municipally owned limited companies.

There are also several privately owned ports, which are usually owned by industrial enterprises and are situated close to their production plants. Examples of owners of private ports are companies in the forest industry, steel industry, chemical industry, oil industry, building industry and power plants. In addition to these industrial ports, the ferry ports in Eckerö and Långnäs in Åland are also privately owned, as well as the private general port of Inkoo.

Private stevedoring companies operate the cargo handling in ports.

**Russia**

After the recent reorganisation of the Russian maritime sector, Rosmorport is the owner of all ports in Russia. Rosmorport in its turn is under the direction of the Federal Agency for Maritime and River Transport, an agency of the Ministry of Transport.

In the Baltic Sea, there are five Russian ports, which are shown in official statistics: Kaliningrad, St. Petersburg, Primorsk, Vysotsk and Vyborg. Port of Ust-Luga is in use, too, but only a part of the planned construction has so far been realised. In addition to these Baltic ports, there are two large ports in the North West, Arkhangelsk and Murmansk, which belong to the Baltic Sea Region in its widest description.

The port of St. Petersburg consists of many different ports, and the expression Greater Port of St. Petersburg is used to cover the entity of all companies handling cargo at port terminals inside the City of St. Petersburg area. The joint stock company Sea Port of St. Petersburg is the biggest of these companies, having a market share of about 55 percent. The Port Authority of St. Petersburg is a state organisation, which among other things leases the state property and controls its effective usage, realises port development and construction of new port facilities and supervises technical operation of port structures and facilities, their reconstruction and repair.

The port of Kaliningrad was opened for foreign vessels in 1991. In 1992 following the market reforms in Russia the port was reorganised into a joint stock company”Sea Commercial Port of Kaliningrad”. The port complex consists of two merchant ports and a state fishing port.

The other ports are also operated by joint stock or limited companies. There are usually several terminal companies handling different cargoes in the ports. The companies carry out the operational port functions. The state organisations, port authorities and sea administrations supervise and manage the state property, and also control safety and security, as well as legal aspects.

**Estonia**

Depending on their form of ownership, there are state-owned, municipal and private ports in Estonia. In total, there are about 30 ports which are involved in merchant shipping, but most of the cargo is concentrated in a few ports. AS Tallinna Sadam (Port of Tallinn Ltd.) is the largest Estonian port enterprise, and all its shares are owned by the Republic of Estonia. The port of Tallinn consists of five ports: Muuga, Old City Harbour, Paljassaare, Paldiski South Harbour and Saaremaa Port. The majority of goods are handled in ports belonging to the Port of Tallinn Ltd. Paldiski North Port and the Port of Pärnu are both controlled by municipal and private capital. Other ports with considerable international cargo turnover are Kunda Port, Miiduranna Port, Vene Balti Port and Sillamäe Port, all with private ownership. There are additional private ports with international traffic.

The small ferry ports of Roomassaare, Virtsu, Kuivastu, Rohuküla, Heltermaa and Sviby, belonging to Saarte Liinid Ltd., are important from the aspect of local traffic (serving connections between the mainland and the islands). In addition to local traffic many small ports also handle a limited volume of export-import shipments.
Latvia
There are three major ports in Latvia – Liepaja, Riga and Ventspils, as well as seven smaller ports with local significance, which are situated along the entire length of the coastline of Latvia. The ports of Riga and Ventspils are operated as free economic zones, and the port of Liepaja is a part of Liepaja’s special economic zone (SEZ). The port of Liepaja only started to operate as a commercial port in 1992.

The ports in Latvia are owned by the state and local government. Only these bodies are entitled to buy land for the port, according to the Latvian law on ports. The land may be let or leased to private companies on the basis of contract agreements. Port superstructure and equipment are privately owned, and private companies take care of cargo handling. Port Authorities are non-profit organisations, and the financial resources may be used only for maintenance and development of the port. They also finance new public investments in ports.

There are separate laws on the freeports of Riga and Ventspils.

Lithuania
There is one large port in Lithuania, Klaipeda, which is owned by the state. Before the restoration of independence of Lithuania in 1991 there were two separate ports: sea commercial port and fishing port. Klaipeda port authority was founded by Decree of the Government of Lithuania and in 1992 Klaipeda port got the status of state seaport. In 1996 the law on Klaipeda State Seaport was passed, which states that the land and water territory, the quay-walls, hydro-technical equipment, navigation routes, canals and other objects of infrastructure belong to the state and cannot be privatised.

The state manages all those objects via the State Enterprise Klaipeda State Seaport Authority, whose main objective is to permanently develop the port, maintain its competitiveness and increase cargo handling volumes. All stevedoring companies are private, and they make land lease contracts with Klaipeda State Seaport Authority.

In addition to the port of Klaipeda, there is the Butinge terminal, which is mainly used for loading Russian crude oil, but can also handle import cargoes. It is owned and operated by the company Mazeikiu Nafta, which is owned by Yukos Finance B.V. (53.7 percent), Lithuanian Ministry of Economics (40.66 percent) and other shareholders (5.64 percent).

Poland
There are three major commercial ports in Poland, Gdansk, Gdynia and Szczecin/Swinoujscie. They handle about 90 percent of all Polish maritime transport. Kolobrzeg, Police and Elblag are other ports of regional significance.

The port sector in Poland has undergone major changes in the last few years to gradually become more like the “standard” EU port with a port authority performing a landlord function and various companies performing services in the ports. Polish ports are established in accordance with a law of December 1966 on Ports and Sea Harbours. The port authorities are organised as shareholding companies, with the State Treasury as a majority shareholder. Re-structuring and re-organisation have taken place in the last few years and privatisation of operational services is nearing completion.

Germany
The port sector in Germany is very diverse, with a number of different legal structures. The two predominant German ports, Hamburg and Bremerhaven, are run completely differently. Hamburg is run by a port authority for the public services of planning and traffic control, with terminal operators responsible for all traffic management and cargo handling. In Bremerhaven port management has been delegated to a private corporation, 100 percent subsidiary of the city and Federal State of Bremen.

Most other German ports are run as landlord ports with port administration integrated in the administration of a region or a state. In some states the ports are run by local authorities, in others by private or limited liability companies.
Cargo handling activities are carried out by private enterprises. These are usually owned, in part or fully, by the state or the local community.

Container volumes are mainly concentrated in the two above-mentioned predominant ports for overseas traffic, namely Hamburg and Bremerhaven. Wilhelmshafen is a major port for liquid bulk. Duisburg is the largest inland waterway port in Europe.

**COMPARISON OF COASTAL AND PORT FEE SYSTEMS**

The systems for charging for port calls vary from the Swedish and Finnish system of user-pays-all, including the costs of the Maritime Administration to the Polish system of charging no more than necessary to keep the ports competitive.

It is not possible to make an accurate and fair comparison of the costs of a port call in various ports in the area.

Below is a short description of the fee systems in the various countries. More details can be found in the annex.

**Denmark**

There are no governmental fairway dues in Denmark. The only fee paid to the government is a charge for ice breaking payable December 15-March 31. The fee is determined annually and is paid by ships calling in ports inside and including Skagen. It is payable a maximum of twice per year.

Pilotage is compulsory for all ships en route to and from Danish ports and waters for certain types of vessels carrying oil, dangerous liquid chemicals covered by the IMO Chemical Code, gas and highly radioactive cargoes. The fee is payable according to a public, published tariff depending on the size of the ship, the waters and the distance etc. If a master sails the same ship in the same waters more than 5 times within a period of 6 months he is exempted form the obligation to use a pilot. English is accepted as a language for the master.

A new pilot act is expected in 2006.

In Danish ports the following dues are paid:

1. Ship’s dues
2. Cargo dues
3. Infrastructure dues
4. Passenger dues
5. Port security fee

Each port establishes its own tariff. There are a number of rebates available. In some ports the port itself offers pilotage and mooring services. The reception of ship’s waste is included in the ship’s dues if delivered in “reasonable” quantities.

The three ports included in this comparison of ports costs all have different systems for charging. They also have different organisational forms. Aarhus is owned by the municipality, but run as an independent entity. Fredericia is part of Associated Danish Ports A/S and a limited liability company. Copenhagen Malmö Port AB is also a limited liability company but owned and operated across the border between Denmark and Sweden.

**Sweden**

The system for charging for ship port calls is divided into two major parts.

1. Fairway and pilotage dues are charged by the Swedish Maritime Administration
2. Port dues and services in ports are charged by the port.

**Fairway dues**

Fairway dues should cover a major part of the total cost of the Swedish Maritime Administration. These Fairway dues are charged on the ship’s gross tonnage and on the cargo loaded/unloaded. Fairway dues based on the ship’s GT are differentiated in relation to bunker sulphur contents and nitrogenous oxide emissions. They also vary according to ship type. Fairway dues based on GT are charged a maximum of 5 times per calendar month for passenger vessels and 2 times per calendar month for other vessels.
Fairway dues based on cargo loaded/unloaded are charged per tonne. No rebates are available for this portion of the fees. The present system of dues was introduced on January 1, 2005.

Pilotage is compulsory for certain vessels. The type of vessel depends on which fairway system the ship uses. There are 21 different sets of local rules to differentiate fairways as to which ships need to take on a pilot.

For masters using the same fairways with the same ship regularly, the possibility of an exemption certificate exists. The knowledge of a Scandinavian language is no longer necessary, and English will suffice.

**Port dues**

Every port sets its own dues. They are calculated to cover the total cost of port operations, including investments and a reasonable return on capital.

Many ports publish tariffs, but it should be pointed out that very few port users pay in accordance with the published tariffs. All regular callers at a port have a negotiated contract with the port company.

Port dues are made up of:

1. Vessel related dues
2. Cargo related dues
3. Environmentally related dues
4. Security fees (ISPS)

There are different systems to charge for services.

**Norway**

In Norway there are central government dues, which are charged by the Coastal Administration, Kystverket, and consist of fairway dues, pilotage fees and safety fees.

Fairway dues should cover 34 percent of the cost of navigational aids in 2005. Up to and including 2004, this figure was 30 percent.

Pilotage should be paid by the user in its entirety, and the safety fees are designed to cover operating costs, including salaries, for the four traffic control centres in Brevik, Fedje, Horten and Kvitsøy.

Fairway dues can be paid according to three different models: single voyage, season (3 months) or an annual fee. In national trade the choice is limited to the two latter models.

Fairway dues are calculated on the basis of a ship’s gross tonnage. The pilot standby fee is charged from all vessels which are required to use a pilot, whether it uses one or not. Pilotage is paid per hour with a minimum of 3 hours and differentiated according to the size of the ship.

Safety dues are different depending on where you go. They are divided into 5 area charges.

All fees except the safety fee are paid twice, once on arrival and once on departure at the same rate. Ships with a master with a pilot exemption certificate, and therefore not using a pilot, pay all dues except for the actual pilotage rate.

**Port dues**

Each port determines its own tariff. They consist of vessel related dues – fairways and the use of berth, cargo related dues and in some ports a security (ISPS) fee.

**Finland**

**Fairway dues and pilotage dues**

There are two main types of governmental dues for vessels arriving at a Finnish port: fairway dues and pilotage dues. The Finnish Maritime Administration (FMA) takes care of the maintenance and improvement of Finland’s waterway network. The costs of icebreaking and maintaining the shipping lanes are covered by fairway dues, which are collected by the Customs Department in connection with the customs declarations and directed to the FMA. The fairway dues are collected as a single
payment when a vessel arrives in Finland from abroad. The amount of the single payment is determined on the basis of the ship’s net tonnage and ice class.

The Finnish State Pilotage Enterprise will charge all piloted vessels a fee based on the set unit price as laid out in the Act on the Finnish State Pilotage Enterprise (938/2003) and provisions issued under it. The amount of the payment is determined on the basis of the ship’s net tonnage and the length of the pilotage. More detailed provisions on the amount of the single payment are issued by Government decree.

There are separate pilotage dues for the Saimaa Canal and Saimaa waterways.

**Port dues**

The different port dues are generally designed to cover the costs of operating and developing the ports. The dues may vary in detail - both in label and tariff - in different ports, but in principle there are the same kind of dues in every commercial port.

The port due on vessel is paid for every vessel that calls at the port. The due is based on the vessel’s net tonnage, which is multiplied with a certain charge. Each port has its own conditions, such as minimum or maximum charges, and there are also different reductions for large customers or regular liner traffic in most ports. Some ports also give a reduction for passenger vessels in regular and in cruise traffic.

The dues on cargo are based on each tonne of cargo loaded or unloaded from the vessel. The cargo dues are usually different depending on what type of cargo is concerned.

In ports with passenger traffic passenger dues are paid for every passenger embarking or disembarking at the port.

There are also fees for mooring and unmooring as well as for waste management. In addition to these the ports charge for different kinds of services like water sales and wastewater, electricity, cranes etc.

**Russia**

The Ministry of Economy of the Russian Federation approved the Port Dues for the Commercial Seaports of the Russian Federation in 1995. The dues are collected by the Port Authorities. The rates of dues were set separately for the Russian coastal trade and foreign-going vessels and foreign vessels. For coastal trade the rates are set in roubles and for international trade in US dollars.

The controlled port dues approved by the ministry include tonnage dues, lighthouse dues, canal dues, berth dues, anchorage dues, environment dues, pilotage dues and navigation dues. There are different rates for different groups of vessels and for different ports. There are also reduced rates. The dues are charged per 1 cubic metre of the vessel’s conventional volume.

At least one port, namely the port of Kaliningrad, has introduced port dues that are based on vessel’s GT instead of cubic meters. In addition to dues mentioned above, towage and mooring dues are charged.

**Estonia**

National maritime dues in Estonia consist of lighthouse dues, navigation dues and pilotage dues. Lighthouse dues are levied for the use of the navigational infrastructure installed on public waterways to ensure maritime safety. Navigation dues are charged for the navigation organisation and use of ice breaking and information services on public waterways.

Lighthouse and navigation dues are calculated according to the Maritime Safety Act and levied by the Estonian Maritime Administration. Pilotage dues are calculated on the basis of the Maritime Safety Act and levied by AS Eesti Loots (Estonian Pilot Ltd) or by the ports. All these dues are based on vessel’s gross tonnage and the pilotage due also on distance.

**Port dues**

Tonnage dues are levied by ports on the basis of gross tonnage of the vessel separately for each entrance and leaving of the vessel. Dues are usually levied from
passenger vessels once a year on their first entering and leaving of the port. There are some differences in tonnage dues for different types of cargo ships. In case the pilotage within the port is performed by the port pilot, the port collects a pilotage due, too.

Other dues include quay charges and mooring charges, which are levied from vessels on the basis of GT. There are different deductions for passenger vessels, cruise vessels and vessels with certain cargoes. Passenger fees are collected according to the number of passengers. Other fees include charges for electricity and communication, water supply and vessel waste disposal, territory rentals and cargo charges.

**Latvia**

Navigation dues in Latvia include lighthouse dues and pilotage dues. The tariff for the lighthouse due is determined by the Minister for Transport based on a proposal of the general meeting of the Latvian Maritime Administration. It is based on vessel’s gross tonnage. The lighthouse due rate for one gross tonne of a ship is 0.03 lats. The due is reduced for passenger ships by 30 percent and for ro-ro ships by 20 percent. For coastal vessels and Latvian fishing vessels it is reduced by 50 percent. The lighthouse due is paid each time when a ship enters a port or port’s road, and it will be collected for the first six times in a calendar year. Starting from the seventh attendance of a port during the same calendar year, the lighthouse due will not be collected.

According to the Latvian law on ports, the following fees may be applied: tonnage fee, canal fee, sanitary fee, small ship fee, anchorage fee, ice fee, quayside fee, freight fee, pilot fee and passenger fee. Port fees and tariffs are determined by the port authority and it may combine the port fees. Most port dues are based on ship’s gross tonnage and some of them also on the vessel type. There are various reductions in port dues in different ports, for example for liner vessels.

**Lithuania**

The Klaipeda State Seaport collects all dues in Lithuania. Regulations on application of Klaipeda State Seaport dues are approved by a decree of the Minister of Transport and Communications. Port dues are calculated in litas.

The following port dues are charged: vessel dues, navigation dues, berth dues, tonnage dues, sanitary dues and passenger dues. Most dues are based on GT and vessel type, and there are several reductions for example for regular visitors. Pilotage services are also charged. Rates depend on vessel type and are based on GT and outside the port also on nautical miles.

**Poland**

There are no governmental charges for calls at Polish ports. The Polish government has a policy of wanting to encourage the use of Polish ports by making them competitive.

Port dues are made up of:

- Tonnage dues, where waste reception is included up to “reasonable” amounts
- Wharfage
- Pilotage
- Mooring services

A few years ago all services were charged at the same rate in all Polish ports. Today, most charges are unique to each port.

**Germany**

There are no federal government charges for the use of general maritime infrastructure. Such investments are considered a government responsibility and maritime transport is seen as having vital importance to the German economy.

In Germany a port does not exist as an independent unit, economically or legally. No separate accounts are drawn up. Transparency is thus limited.

Each port has its own rules for charging for infrastructure use and for services. Infrastructure charges are made up of:
• Port fees
• Quay dues
• Berthing fee (demurrage)

The charges are based on the GT of the ship, cargo tonnage and berthing time.

Stevedoring, pilotage, towing and other services are performed by separate entities and charged individually.

**CHARGES FOR CALLING AT SELECTED PORTS**

Trying to make a simple comparison of charges for calling at selected BSR ports presents many problems. Unfortunately the dues and charges and their grounds vary so much in different countries and even in different ports in one country that it is not possible to make a totally consistent comparison of these charges. The systems are very complicated with various reductions and exceptions. An attempt has been made based on the official tariffs and price lists given by the ports and governmental institutions. The result is presented in Annex A. The figures shown there are not the whole truth, but they have an indicative role for comparison.

One difference between charges is immediately obvious. A port call in a high cost country is more expensive than in a low cost one. This reflects factors such as higher wages and taxes. However, the port charges in the former countries are negotiable to a much greater extent. Most port calls are paid under contractual arrangements, with very little reference to the official tariff. Where stevedoring services are performed by the same entity that levies port dues, these services are often negotiated as one package.

A second obvious difference is created by the fairway dues. Where these are charged to cover the total maritime infrastructure cost, they amount to a large portion of the total cost for 1 call, but where they are charged a maximum number of times per year, they become less important for the frequent caller. These charges are, in principle, not negotiable.

Comparatively high port infrastructure charges can also reflect superior hinterland connections, which cut time and costs on the landside part of the transport chain. Hamburg is considered a good example of this.

Although Copenhagen Malmö Port AB is one company, the charges differ in the two parts, reflecting different port structures and national differences.

**ACCESSIBILITY OF FAIRWAYS IN THE WINTER**

The Baltic Sea Region is partly ice covered during the winter. The ice coverage depends on the harshness of the winter and can be classified as mild, medium or harsh. The figure below shows the ice formation during each of the three season types.

Traffic to Germany, Denmark and Poland is normally not greatly affected by the ice conditions. But during harsh winters, the ice can reach as far as the Danish West Coast and the Oslo Fjord, while in a mild winter only the northernmost part of the Bothnian Sea and the innermost part of the Gulf of Finland are ice covered.

Winter traffic is generally organised from the icebreaker command centres, which primarily have three tools at their disposal:

• **Information** on ice conditions is compiled and conveyed to merchant shipping.

• **Icebreakers**

• **Traffic restrictions** which are used for safety and efficiency reasons. The HELCOM recommendations are for safety and specify required strength of vessels hull, rudder, propeller etc. National requirements concerning engine power are an important factor for efficient winter navigation.
INFORMATION
Daily information on ice movement and ridge formations is collected from satellites, helicopter surveillance and other vessels. The information is compiled and conveyed to merchant shipping in the form of recommended routes to follow. This information is of key importance in reducing delays due to sea ice.

The Finnish and Swedish Maritime Administrations have worked together to develop the IBNet data system, in which information is passed almost in real time between all Finnish and Swedish icebreakers, the icebreaker commands located in Helsinki and Göteborg, and the local Vessel Traffic Service (VTS) centres.

IBNet transmits information on vessels’ estimated times of arrival and departure, their ports of departure and destination, pilotage, their need for assistance, and other necessary information. It provides data on icebreakers’ and merchant vessels’ locations, and the icebreakers can use this to coordinate their work. The icebreakers share their assistance between different ports in order to minimise waiting time and fuel consumption, both for icebreakers and for cargo ships. The icebreakers also collaborate closely with pilot stations and the VTS centres.

ICEBREAKER CAPACITY IN THE BALTIC SEA REGION
One of the fundamental problems facing the icebreaking service in the Baltic Sea is the dimensioning of the icebreaker fleet, as the severity of the winter varies sharply from year to year. An icebreaker is costly to build and maintain, and it is thus important to identify solutions for alternative deployment when the vessel is not required by the icebreaking service.

Denmark has three icebreakers and is studying the conditions for replacing one or more of these with a multipurpose vessel for environmental protection/oil pollution prevention/fire fighting and icebreaking.

Estonia has one line icebreaker to serve all its main ports (Tallinn, Muuga, Pärnu, Sillamäe, Kunda). Additional ice-breakers will be contracted each year. A rebuilt buoy tender, modified to serve as a multipurpose ice-breaker in shallow waters will be taken into service in the second quarter of 2006. The waters around Pärnu are also too shallow for line icebreakers to be able to operate, and the port has a smaller tug available locally.

Finland has a total of nine icebreakers. Three of these, the Fennica, the Nordica and the Botnica, spend the open-water season on time charter, mainly in the North Sea. The ships, together with their Finnish crews, are employed on various jobs in the oil and gas fields. Germany has built two new icebreakers that are also used in coast guard operations, fairway maintenance, emergency towing, environmental protection/oil pollution prevention and fire fighting. However, these are not dimensioned for the considerably harsher ice conditions in the northern areas of the Baltic Sea.
The situation in Latvia is similar to that in Estonia, in that there is one icebreaker available and the system is sensitive to disturbance. The Bay of Riga has a very high probability of being ice covered, even during an average winter, and icebreaker assistance is an important part of securing the wintertime accessibility.

Russia has between three and four line icebreakers in the Baltic Sea, depending on the severity of the ice season and the priority among other regions in Russia.

Lithuania and Poland have no sea-going icebreakers. Ice-breaking in Lithuanian and Polish waters are carried out by tugboats.

The Swedish Maritime Administration operates five icebreakers, one of which is a small icebreaker used on Lake Vänern and to conduct hydrographic surveys during the summer season. As a result of a long-term contract with B&N Viking Icebreaking & Offshore AS, the Swedish Maritime Administration has access to three more icebreaking vessels whenever required during the winter period of January through March. The contract runs through 2015 with an option for a 15 years extension.

Thus, the total icebreaker capacity of the Baltic Sea countries is between 23 and 28 ships. In addition to the capacity mentioned above, many ports around the Gulf of Bothnia have icebreaking tugs available locally. The fleet is considered too large for mild winters, slightly too small for medium winters and definitely too small for harsh winters. In particular, there is a shortage of capacity in the Russian part of the Gulf of Finland and in Estonian waters, where problems arise during harsh winter conditions. This was evident in the winter of 2002-2003, when a large number of vessels were stuck in the Gulf of Finland for many weeks.

Russian law does not allow cabotage with icebreaking vessels. Russia is working on an amendment to the existing law, but it is very hard to predict when that might come into effect.

Increased traffic in the Baltic Sea and particularly in the Gulf of Finland will most likely lead to a commensurate increase in the demand for icebreaking capacity, especially during the harsh winters.

It will be completely uneconomic to have certain ports unreachable during whole months of the year. There is also very little spare capacity to transport goods by land.

Larger tankers need the assistance of more than one icebreaker to navigate in harsh ice conditions. Since traffic involving large tankers is expected to rise, it will mean that the demand for icebreaking capacity will increase faster than traffic volumes.

**DEMANDS ON VESSELS DURING THE WINTER**

Traffic restrictions are used for safety and efficiency reasons. When the winter navigation system begins to slow down as a result of increasingly troublesome ice formation, and icebreaker resources no longer suffice to maintain the pace in maritime traffic, the icebreaker command centres raise traffic restrictions. For vessels that are going to operate in the region, there are a number of ice classification systems. The ice classes of the Swedish-Finnish classification system can be found in the table below. For every class there is a wide range of technical specifications and requirements that a ship has to fulfil, to receive a certain ice class. The ice class generally depends on whether a ship’s hull is strengthened and on its available engine power. These two factors are the main variables when determining whether a ship meets requirements. A table of correspondence of different ice classification was worked out by HELCOM in 2004.

### Classification Society

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**From top:**

- The Swedish-Finnish ice class rules
- Approximate Correspondence between ice classes of the Finnish-Swedish Ice Class Rules (Baltic Ice Classes) and the Ice Classes of other classification societies.
- Source: HELCOM recommendation 25/7.

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<th>Ice Class</th>
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<td>IA Super</td>
<td>For extreme conditions</td>
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<td>IA</td>
<td>For harsh conditions</td>
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<td>IB</td>
<td>For mild conditions</td>
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<tr>
<td>IC</td>
<td>For very mild conditions</td>
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### Ice Class Definitions

- **IA Super**: For high ice conditions
- **IA**: For severe ice conditions
- **IB**: For medium ice conditions
- **IC**: For mild ice conditions
- **IL**: For very mild ice conditions

**ICE-1A**: Class for vessels used in areas with severe ice conditions. These vessels are used for safety and efficiency reasons. When the winter navigation system begins to slow down as a result of increasingly troublesome ice formation, and icebreaker resources no longer suffice to maintain the pace in maritime traffic, the icebreaker command centres raise traffic restrictions. For vessels that are going to operate in the region, there is a number of ice classification systems. The ice classes of the Swedish-Finnish classification system can be found in the table below. For every class there is a wide range of technical specifications and requirements that a ship has to fulfil, to receive a certain ice class. The ice class generally depends on whether a ship’s hull is strengthened and on its available engine power. These two factors are the main variables when determining whether a ship meets requirements. A table of correspondence of different ice classification was worked out by HELCOM in 2004.
**SUPPLY OF ICE-CLASSED VESSELS**

47 percent of the European-owned fleet is ice-strengthened. Among vessels below 20,000 gt the share is between 50 and 65 percent, with the highest rate of 73 percent among tankers in the size-class 10-20,000 gt.

For year round traffic north of Stockholm, as well as in the bay of Riga and Gulf of Finland, ice class is needed. In the Oslo fjord, ice class can be necessary during harsh winters. Vessels serving these regions or further north in the Baltic Sea have ice class 1C or higher. There are about 3500 tankers where the owner is based in Europe and about 1000 of these vessels have ice class, although most of them not having one of the strongest ice classes.

The number of ice classed vessels is dependent on type of tanker; for example, among asphalt tankers, of which 25 are owned by Europeans, 11 have ice class, and out of 6 juice tankers none has ice class. Even though many of the LPG carriers are Italian flagged, more than half have ice class. This might be because the price of a LPG ship is very high so the extra cost of ice class is not so great and the owner wants to have flexibility with the vessel.

About 20 percent of the 800 tankers on order for European owners will have ice class. For owners based in the BSR there are about 250 tankers on order, of which 40 will have ice class.

Of almost 200 vessels for rolling cargo in the region, about 140 have some kind of ice class. Although several of them are operating in the southern Baltic, they have ice class, either in order to be more flexible or because they have previously served on routes where ice class was needed. Some 75 vessels in the region have ice class 1A and 30 even have ice class 1A super. All vessels currently under construction have some kind of ice class. Tanker-owners are the most frequent buyers of ice-strengthened vessels, while the number of dry cargo vessels ordered show the most spectacular decline, despite the large number of vessels operating in the region.

**PRESENT AND FUTURE ACCESSIBILITY: MULTILATERAL AGREEMENTS**

The Scandinavian countries and Finland have a lengthy tradition of cooperation, going back to the ”Nordic Treaty” of 1961, which is an agreement between Denmark, Finland, Norway and Sweden covering cooperation regarding icebreaking, and is still in effect. Germany joined in at an administrative level, during a Baltic Sea Icebreaking Meeting 1999. According to the terms of the treaty, icebreaking capacity is to be used first in the countries’ own coastal waters, but collaboration with other countries is to proceed in accordance with agreements between the icebreaking authorities.

Baltic Icebreaking Management, BIM, is an organisation with members from all Baltic Sea countries. BIM is an extension of the annual icebreaker forums between the Baltic Sea countries that have been held for more than 20 years. These forums offer an opportunity to exchange experience from the past icebreaking season, and to discuss cooperation in icebreaking.

It has been decided that BIM will develop into a joint forum to discuss the development of winter navigation and icebreaker co-operation among the Baltic countries.
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• Globalisation and wider geographical sourcing of supplies means increased transport

• Apart from an increase of the average transport distance the logistic trends lead to concentration of flows on links and nodes and optimisation in use of transport resources.

• Despite the optimisation in use of transport resources, these logistical trends lead to a strong overall growth in transport activity.

• Further concentration trends in industries, in trade and in transport operations strengthen the large ports, while many small ports face serious underemployment.

• The importance of effective handling routines and specialisation in specific commodities has led to strategic co-operation or merging of ports into groups.

• In the BSR a considerable number of activities in ports are branded as logistic centres. The development of logistic centres in the vicinity of ports in Estonia, Lithuania and Latvia are intended more towards the creation of business zones, to attract all kinds of companies to these areas – not only logistic companies.
TENDENCIES IN EUROPEAN LOGISTICS MARKETS

There is a close relationship between freight transport demand and economic growth, but because of the fact that freight is handled a number of times within multi-modal transport chains, freight transport volumes today exceed the volume of goods produced and imported.

The main logistical trends in the last decades are seen in:

• Restructuring of logistical systems
• Realignment of supply chains
• Rescheduling of product flow
• Changes in management of transport resources
• Changes in product configuration/design

The situation in Europe has changed from one in which many plants and distribution centres were working exclusively for one national market. With ongoing economic integration, one European plant or one European distribution centre/hub may cater for the entire EU market.

The logistic centre in a port should be open to external logistic companies. As the primary function of a port is the transhipment of goods, ports must also offer their customers the required combination of facilities, quality and price of services.

LOGISTICAL TRENDS IN THE BALTIC SEA REGION

Decisions concerning logistics can be divided into

A. the structure of the supply chain - the location and size of production/processing plants and storage sites;
B. the alignment of the supply chain - the breakdown of the chain into different processing segments, the number and location of supplies and final destination of the product;
C. the scheduling of the product flow - the frequency of delivery, the mode of ordering and delivery;
D. the management of transport resources – the modal choice, the dimensions of vehicles used and their effectiveness of use;
E. and the product configuration (if concerned with logistics).

The following logistical trends could be observed for the last decades in the BSR.67

Restructuring of logistical systems by spatial concentration of production; through reduction in plant numbers, or increased plant specialisation (‘focused production’); spatial concentration of inventory

Realignment of supply chains by wider geographical sourcing of supplies, wider distribution of finished products and concentration of international trade to hub ports

Rescheduling of product flow by adoption of Quick Response and ECR (Efficient Consumer Response) in retail distribution and concentration of international trade to hub ports

Changes in management of transport resources by improvement in transport’s relative cost/performance, increased use of outside transport / distribution contractors, changes in vehicle size regulations and in handling systems and combination of transport modes towards intermodal transport chains

Changes in product configuration/design by increase in complexity and sophistication of product

The observed logistic trends are assumed to have the following effects on transport:

• increase of the average transport distance
• concentration of flows on links and nodes
• optimisation in use of transport resources.

Despite the optimisation in use of transport resources, these logistical trends lead to a strong overall growth in transport activity.
LOGISTIC CENTRES DEVELOPMENTS

Logistic centres in ports

A logistic centre is a link between different modes of transport. In the BSR there is a considerable number of activities which are branded as logistic centres. The development of logistic centres in the vicinity of ports in Estonia, Lithuania and Latvia are intended more towards the creation of business zones, to attract all kinds of companies to these areas – not only logistic companies.

A logistic centre is a link between different modes of transport. It provides value-added services and transfers the economies of scale to the customer of the port or terminal. The scale advantage results from co-operation, and leads to reductions of costs per unit.

However, one should distinguish between a logistic centre, which utilises the port as one element of an overall regional logistic strategy, and the services provided by the port itself.

In the BSR there is a considerable number of activities which are branded as logistic centres. Not all of them are directly linked to ports. The general political aim of regional economic development is often the driving force behind the creation of logistic centres.

Some of the logistic centre initiatives in Finland are the Bothnia Logistic Centre, Oulu Logisforum, Turku Logististics Centre, Ideopolis (Helsinki Vantaa region) and Aviapolis (airport Vantaa). Initiatives in Sweden include logistic centres in Skåne and Blekinge. Large companies have placed their logistical hubs in Göteborg/Halmstad, Norrköping/Linköping and the Stockholm/Arlanda/Årsta area. Ports which have invested into the supply of value added services include, among others, the ports of Göteborg, Trelleborg, Copenhagen-Malmö and Stockholm. The CMP (Copenhagen-Malmö Port) is currently developing a multi-purpose logistics centre for external transportation and logistic companies.

In Denmark, the creation of transport centres has been more related to road-to-road transhipment and intermodal transport (Danish transport centres). Logistic services are provided in big ports like Aarhus and Copenhagen, but the port of Köge with its Scandinavian Transport Centre is the only one labelling it as a logistic centre.

In Germany, the creation of logistic centres (Güterverkehrszentren GVZ) is closely related to the general political goal of creating a network of inter-linked intermodal terminals. Ports which are integrated with logistic centres include Lübeck and Rostock.

In Poland, a logistic centre in Gdansk is under construction. In Estonia, Lithuania, Latvia and Russia similar activities can also be discerned; for instance, the economic areas previously entitled Free Economic Zones (e.g. in Klaipeda). The development of logistic centres in an integrated way has not proceeded to the same extent as in the Scandinavian countries and Germany. The development activities within the vicinity of ports in Estonia, Lithuania and Latvia are intended more towards the creation of business zones, to attract all kinds of companies to these areas – not only logistic companies.

Distribution centres - the European context

The establishment of new hubs and the changed locations of existing hubs, as well as the development of main ports, all result in substantial shifts in transport chains. While European plants and distribution centres have replaced smaller units, which were only installed to serve national markets, the companies enjoy wider choices for potential locations. The large European Distribution Centres handle big volumes of European and over-sea goods. For example, in Sweden, companies such as Honda, Nike, Philips have established distribution centres to supply Northern Europe.
COMPETITION AND SPECIALISATION

THE COMPETITION ISSUE
There are different levels of competition between the organisations involved in the transport chain.

- The ports compete against each other, to attract the shipping lines for sea-side access, the transport companies (road, rail, inland navigation) for the hinterland access, and the manufacturers and distributors for additional services.

- The shipping lines, as the customers of the ports, compete against each other, to attract shippers/forwarders/hauliers/passengers or other shipping lines as their customers.

- The transport users, as the customers of the shipping lines (shippers/forwarders/hauliers/passengers/other shipping lines), are able to use a large number of alternative transport possibilities, especially in long distance transport (the longer the distance the more route and modal choices exist).

This competition framework becomes even more complex, when all the interdependencies between all the involved participants are taken into account.

The larger the average transport distances, the more route choices, and also the more transport mode combination and services are available. This choice leads to continuous transport chain optimisation and substitutions.

PORT SPECIALISATION
Each port serves the market of its adjacent hinterland. To a large extent, these markets determine the nature and types of cargo handled by each port. The development of port specialisation is still underway in the Baltic Sea region.

Competition between different ports and terminal operators increases the importance of effective handling routines and specialisation in specific commodities. Strategic co-operation or merging into groups has also delivered competitive advantages for small regional ports, making them stronger within a specialised group of ports.

Examples of ports which are specialised are: the large RoRo ports (e.g. Göteborg, Trelleborg, Helsinki, Lübeck); the large bulk ports like Frederica, Ventspils, Gdansk; and container ports like Aarhus and Gdynia. However, it is also evident that especially large ports offer transhipment possibilities for different kinds of cargo. Ports often consist of a number of different terminals for different purposes. Despite a trend towards specialisation, ports are aiming to cover other market segments as well. Some examples are car transportation (Göteborg, Malmö), or entry into the container business while being a major bulk port (Gdansk) or being both a major ferry port and a specialised port for paper products (Lübeck).

THE SMALL PORTS ISSUE
Many large ports have benefited from the increasing integration of the world economies, of the European common market and of the widening of the European hinterland. However, small ports have often been the first ones to suffer from the disadvantages of this development. Many small ports were closely inter-linked with regional structures and a small hinterland area, for the transport of either agricultural products or manufactured goods. The concentration on production has diminished the natural hinterland function of the small ports. Further concentration trends in industries, in trade and in transport operations have led to a decreasing number of ports in total. While the concentration of flows and the economies of scale strengthen the large ports, many small ports face serious underemployment.
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• European Maritime transport policy has enabled seaborne transport to maintain its market share. By more efficient linking up of different transport modes (sea, inland waterways and rail) more transport volumes can be shifted from road to sea (and rail).

• Maritime safety issues have become more important and led to the creation of a European Maritime Safety Agency.

• Protection of water and sea areas in the context of shipping and port operations has become a key issue addressed in the Baltic Sea Region through inter alia the Helsinki Commission (HELCOM).

• Other regional efforts have been launched in the Baltic Sea Region to promote economic and cultural co-operation, as well as increased cross-border trade.

• Within the area of maritime transport, a Baltic Sea Motorways Task Force is established to support and speed up inter-regional co-operation with respect to the development of

This chapter provides a brief description of initiatives and legislation that have an impact on the development of the maritime transport system in the Baltic Sea Region. The chapter gives a short overview of the strategic context, with special emphasis on issues arising from changing framework conditions and international efforts to improve terms and conditions for international transport.
POLICIES FOR MARITIME TRANSPORT
– EU, REGIONAL AND NATIONAL

Overall competition policy has resulted in strong measures aimed at providing a level playing field for activities from different countries and industries. These measures have included directives on competition and transparency, which have become law, and discussions on methods for achieving greater parity/transparency in charging for the use of infrastructure, which have been partly implemented.

EU TRANSPORT POLICY
Transport policy has been high on the European agenda during recent decades. Measures to achieve a more efficient and sustainable transport system include promoting regulated competition, increasing transparency and an efficient linking up of the different transport modes (sea, inland waterways and rail). Sea transport is not, according to the European Commission, just a means of carrying goods from one continent to another, it is a real competitive alternative to land transport within the EU.

Greater competitiveness of maritime transport is an important goal in this context. The state aid guidelines for maritime transport issued in 1997, together with its recent revision, have been instrumental in encouraging the growth of quality fleets flying the flag of an EU country.

Most recently, the European Commission’s communication regarding the Motorways of the Sea, within the policy framework of the TEN-T, underlines the ambition to concentrate freight flows to sea-based logistical routes, thus increasing cohesion and reducing road congestion. The approach is supported by measures to encourage the emergence of integrated services and businesses, by means of promotion centres for short sea and intermodal transport and the standardisation of containers and swap bodies.

The European Commission further aims at a more transparent and competitive port service market, to reinforce quality services in seaports, as a key issue for European transport. Two proposals for a port services Directive have been rejected by the European Parliament.

EMSA – EUROPEAN MARITIME SAFETY AGENCY
In 2002, the European Maritime Safety Agency was created in the aftermath of the Erika disaster. The main aim of the agency is to reduce the risk of maritime accidents, marine pollution from ships and the loss of human life at sea. Some of the key areas where the Agency is active are:

- The strengthening of the Port State Control regime
- Auditing Community-recognised classification societies
- The development of a common methodology for the investigation of maritime accidents
- The establishment of a Community vessel traffic monitoring and information system.

Very substantial packages of EU legislation have been adopted to improve maritime safety and reduce pollution from ships. In this connection EMSA is responsible for organising and structuring the dialogue between 27 European states and the European Commission.

SHORT SEA PROMOTION CENTRES
Maritime clusters in 16 countries have formed Short Sea Promotion Centres. It is the mission of the Promotion Office to encourage sustainable mobility, through a modal shift from road haulage to maritime transport. The centres bring together government departments and private stakeholders to solve transport problems in co-operation.

TRANS-EUROPEAN NETWORK – TRANSPORT (TEN-T) GUIDELINES
The Community guidelines for the development of the trans-European transport network (TEN-T) cover roads, railways, inland waterways and airports, as well as seaports and inland ports. The TEN-T is intended to serve the entire continent, carry
the bulk of the long distance traffic and bring the geographical and economic areas of the EU closer together.

Recent status of TEN-T with special focus on seaports

According to the recent status of the TEN-T, the table on the left shows ongoing and/or new priority projects, covering overland elements, maritime routes and seaports.

According to the latest communication, the EU estimates that the overall financial cost of establishing the TEN-T by 2020 will be some 600 billion EUR. For the next budget period of the EU, the European Commission proposes a contribution to TEN-T projects of 20.35 billion EUR.

Priority projects receive special Community financial support. It is proposed to raise the maximum contribution from 20 to 30 percent of total eligible project costs. Projects that are very important to the European common interest may even receive a 50 percent support contribution in the future.

According to the revised TENT-T guidelines from April 2004, the Motorways of the Sea projects have priority status.

**TEN-T criteria for a seaport**

To be defined as being of international importance, a seaport has to be connected with the overland (road, rail and/or inland waterways) elements of the TEN-T. Furthermore, a seaport of international importance has to meet the following handling volume thresholds as shown in the table to the left:

### REGIONAL EFFORTS

Regional cross border cooperation is an important strategy to realise a truly European market, and to release often unexploited economic potential.

### Interreg III

The trans-European co-operation intended to encourage harmonious and balanced development of the European territory (Interreg III) is a Community Initiative with transport and maritime relevance. Across three strands, Interreg III promotes cooperation and networking across borders, trans-nationally and inter-regionally.

In line with EU regional policy for 2007+, the expenditure of the European Union will be more focussed towards disadvantaged regions, and relevant projects will have to be in line with other major Community objectives. More than 13 billion EUR (about four percent of the total regional policy funds) are planned for Interreg III projects from 2007 to 2013. The new EU financial perspective framework for the period 2007 to 2013 received provisional approval in December 2005.

### Baltic Sea Forum

Another Baltic initiative is the non-profit organisation Baltic Sea Forum, founded in 1992. The BSF has a representative network of members from business, politics and administration, and works closely together with a number of governments, as well as with state-wide, regional and local institutions. Its main objectives are, inter alia, to promote economic and cultural co-operation in the Baltic Sea Region, to

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### Ten-T priority projects in the BSR

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Description</th>
<th>Planned completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Nordic Triangle railway/road axis</td>
<td>Road and railway projects in Sweden&lt;br&gt;Motorway from Helsinki to Turku&lt;br&gt;Railway from Kerava to Lahti&lt;br&gt;Motorway from Helsinki to Vaalimaa&lt;br&gt;Railway from Helsinki to Vainikkala (Russian border)</td>
<td>2010&lt;br&gt;2010&lt;br&gt;2006&lt;br&gt;2015&lt;br&gt;2014</td>
</tr>
<tr>
<td>20</td>
<td>Railway axis of Fehmarn Belt</td>
<td>Fixed rail and road link over the Fehmarn Belt&lt;br&gt;Railway for access in Denmark from Øresund</td>
<td>2014&lt;br&gt;2015</td>
</tr>
<tr>
<td>21</td>
<td>Motorways of the Baltic Sea</td>
<td>Waterborne transport link of the BSR countries with EU Member States in Central/Western Europe, including the route through the North/Baltic Sea Canal&lt;br&gt;Motorways of the sea-projects have to involve two ports from two different Member States and aim at a supra-national transport system of common interest</td>
<td>2010</td>
</tr>
<tr>
<td>23</td>
<td>Railway axis to/from Gdansk</td>
<td>Railway from Gdansk to Warszawa and further to Katowice</td>
<td>2015</td>
</tr>
<tr>
<td>25</td>
<td>Motorway to/from Gdansk</td>
<td>Motorway from Gdansk to Katowice</td>
<td>2010</td>
</tr>
<tr>
<td>27</td>
<td>Rail Baltica</td>
<td>Rail axis Warsaw, Kaunas, Riga, Tallin, Helsinki</td>
<td>2020</td>
</tr>
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</table>
improve the flow of information within the BSR and to consult political institutions on how to reduce obstacles for co-operation in the region.

**Baltic Development Forum**

The Baltic Development Forum is a member-based networking organisation of large companies, major cities, institutional investors and business associations from throughout the BSR. The mission of this forum is to promote the Baltic Sea Region as an integrated, prosperous and internationally competitive growth region, by the provision of a platform for cross-border and cross-sector networking between regional decision-makers from business, politics, academia and media.

**Baltic Icebreaking Management**

Efficient winter navigation in the Baltic Sea and reduction of delays due to sea ice and lack of accessibility, as well as reliable and safe shipping throughout the year, are objectives of the Baltic Icebreaking Management organisation. As an extension of the annual icebreaking forum for the BSR countries, the BIM was set-up in 2004 within the TEN-T framework.

Within the framework of BIM and the Motorways of the Sea concept, an action plan for winter navigation in the Baltic Sea is in progress covering issues like information exchange, agreement preparations to facilitate the joint use of icebreakers as well as a study on the potential of a joint icebreaking service in the Baltic Sea.

**Baltic Sea Motorways Task Force**

Following the introduction of the Motorways of the Sea concept in the TEN-T guidelines, the BSR countries established a task force to support and speed up international and inter-regional co-operation with respect to the changed transport policy environment. The task force consists of representatives from EU countries in the Baltic Sea Region, together with the European Commission and Norway.

**EFFECTS OF EU ENERGY AND ENVIRONMENT DIRECTIVES ON SHIPPING**

**ENVIRONMENT DIRECTIVES**

**Community policy framework**

The European Commission has specified an environmental policy framework for marine operations and efforts to protect the environment. The main directives and their implications are shown in the table to the right:

<table>
<thead>
<tr>
<th>Environment directive</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Policy [i]</td>
<td>Framework for the implementation of measures for the reduction of pollution and the prevention of i.a. coastal waters and rivers</td>
</tr>
<tr>
<td>Habitat [ii]</td>
<td>Laying down the legislative basis for measures to maintain or restore natural habitats and species of wild fauna and flora of Community interest</td>
</tr>
<tr>
<td>Integrated Pollution Prevention and Control (IPPC) [iii]</td>
<td>Achieving integrated prevention and control of pollution through measures designed to prevent/to reduce emissions in the air, water and land, including measures concerning waste, in order to achieve a high level of protection of the environment taken as a whole</td>
</tr>
</tbody>
</table>

[i] See: Directive 2000/60/EC establishing a framework for Community action in the field of water policy

[ii] See: Directive 92/43/EC on the conservation of natural habitats and of wild fauna and flora

[iii] See: Directive 96/61/EC concerning integrated pollution prevention and control

**Baltic Sea as a special area**

At the meeting of IMO’s Marine Environment Protection Committee (MEPC) in July 2005, the Baltic Sea, except Russian waters, was classified as a particular sensitive sea area (PSSA). At the IMO Council meeting in November/December 2005, specific measures following the PSSA decision were decided.

Within MARPOL 73/78, the IMO defines certain sea areas as “special areas” in which - for technical reasons relating to their oceanographical and ecological condition and to their sea traffic - the adoption of special mandatory methods for the
prevention of sea pollution is required. Under the Convention, these special areas are provided with a higher level of protection than other areas of the sea.

In a special area, specific measures are used to control the maritime activities, such as ship routing, strict application of MARPOL discharge and equipment requirements for ships (in particular oil tankers) and installation of Vessel Traffic Services (VTS). According to MARPOL 73/78, these particular measures concerning a special area are:

The International Maritime Organisation has classified the Baltic Sea, except Russian waters, as a Particularly Sensitive Sea Area (PSSA). Within the BSR, Sweden has been assigned to co-ordinate the BSR countries and to promote the final classification of the Baltic Sea as a Particularly Sensitive Sea Area (PSSA) no later than March 2006. The decision has so far been taken in principle.

**Double hulls for oil tankers**

The purpose of this regulation is to reduce the risk of accidental oil pollution in European waters by speeding up the phase-out of single hull tankers of 5000 dwt or above.

In general, no oil tanker carrying heavy grades of oil, irrespective of its flag, may be allowed to enter or leave ports or offshore terminals or to anchor in areas under the jurisdiction of a Member State, unless such a tanker is a double hull oil tanker. The heavy grades of oil concerned are heavy fuel oil, crude oil, used oils, bitumen and tar. Single hull oil tankers of 20,000 dwt may not be older than 23 years, while tankers below 20,000 dwt may not be older than 28 years to operate under the flag of a Member State or to enter ports or offshore terminals under the jurisdiction of a Member State.

**ENERGY AND EMISSION DIRECTIVES**

In 2003 the Commission proposed rules to ensure that all Member States save at least one percent more energy each year. Although transportation is explicitly named as one of the most extensive energy demanding sectors, maritime transport is excluded for measurement reasons – for the moment.

**Marine fuel sulphur directive**

From May 2006 on, all vessels of all flags are only permitted to use fuels whose sulphur content is below 1.5 percent by weight in the BSR. However, each Member State has to support the shipping industry to ensure fuel availability. From January 2010 on, vessels at berth in all Community ports may only use marine fuels with a sulphur content below 0.1 percent by weight. Exemptions are mainly granted to short-stay vessels with less than two hours at berth and to ships which switch off all engines and use shore-side electricity while at berth.

**Clean Air for Europe-Programme**

Recently the Commission received the first results from feasibility and availability studies into measures and technologies to reduce nitrogen oxides ("NOx") emission of ships. The most promising approaches seem to be slide valves, in-engine controls, water injection / humid air motor or selective catalytic reduction. To date, no time-scales have been defined or particular actions planned, but the Commission seems to be determined to introduce a directive on air pollution that includes maritime transport, sooner or later.

**Greenhouse gas emissions**

The Kyoto protocol became operational in February 2005. A system of CO\(_2\) emission trading had already been introduced in the EU in January of the same year. In the first instance, the system will apply only to energy intensive installations, which account for half of the CO\(_2\) emissions. A number of countries outside the EU have expressed their interest in participating in this trading scheme.

In the maritime sector, which is not included in the present scheme, a study has

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**Annex**

<table>
<thead>
<tr>
<th>Description</th>
<th>Measures</th>
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<td>I Prevention of pollution by oil</td>
<td>Strict controls on discharge of oily wastes</td>
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<tr>
<td>II Prevention of pollution by Noxious Liquid substances</td>
<td>Strict controls on tank washing and residue discharge procedures</td>
</tr>
<tr>
<td>V Prevention of pollution by Garbage</td>
<td>Strict controls on disposal of garbage</td>
</tr>
<tr>
<td>VI SOx Emission Control Areas</td>
<td>Strict controls on sulphur emissions from ships</td>
</tr>
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</table>
formulated a proposal for emission trading in SOx and NOx. The proposed system would allow trading between land-based industries and ships.

**HELSINKI COMMISSION (HELCOM)**

Environmental protection has been a key issue for the governments of Norway, Denmark, Sweden and Finland during recent decades. The level of concern for the environment is different in the continental and especially in the East European countries. In general, environmental protection regimes have a direct impact on the kind of and often directly on the costs of maritime traffic.

**Helsinki Convention**

HELCOM is the governing body of the "Convention on the Protection of the Marine Environment of the Baltic Sea Area" - more usually known as the Helsinki Convention. The Helsinki Convention entered into force in January 2000 and was signed by the Governments of Russia and all EU-Member States adjoining the Baltic Sea.

The contracting parties of the Helsinki Convention are obliged to implement legislative, administrative or other appropriate measures to prevent and eliminate pollution of the Baltic Sea Area, covering the water-body and the seabed, including their living resources. Thereby the polluter-pays-principle is to be applied, and preventive state-of-the-art protection practices and technologies should be used to minimise/eliminate the pollution from ships, land-based sources and offshore activities. However, so far as practicable, marine operations (freight and passenger) shall not be impaired.

**CUSTOMS PROCEDURES AND DEVELOPMENT OF CUSTOMS SERVICES**

In recent years, customs services in the EU have undergone massive changes due to:

- Accession of eastern European countries to the EU;
- New EU external borders with countries like Belarus and Russia;
- Security law enforcement and ISPS.

This section will provide a short overview of selected customs procedures and their impact on transport flows. Expected developments and changes of customs services due to new framework conditions will be briefly introduced.

**MEASURES FROM THE EUROPEAN COMMISSION**

The European Union forms a common market for which the Customs Union is an essential foundation. Important elements of customs activities today include traditional customs duties and commercial policy measures. They also cover activities related to security, the environment, anti-dumping, and consumer protection.

To increase the consistency and transparency of customs procedures and administration the European Commission introduced the Customs 2000 programme. The aim was to align the customs operations of the Member States under a single legal act and develop standardised working methods and introduce e-customs procedures. The Customs 2007 programme has recently been launched, with a budget of 133 M EUR. By accelerating the computerisation of customs and improving the customs operations, the Commission wants to reduce the administrative barriers at international borders, ease the flow of goods within the EU and reduce the overall costs of transportation.

A new EU regulation on pre-arrival/ pre-departure declarations is expected to come into force by mid 2006. Traders will be required to supply customs authorities with advance information on goods brought into/ out of the customs territory of the Community. It is anticipated that a 24-hour deadline for prior declaration will apply to goods brought into the customs territory of the EU by sea, where the voyage duration exceeds that period. In most other cases, prior notification will probably need to be given just two hours, if electronic, or four hours if on paper, before the
goods enter/leave the EU customs territory. Further, for goods leaving the EU under a customs procedure the customs declaration itself will be used as the pre-departure advice, so as not to place an additional burden on EU exporters. This pre-notification is in line with the ‘24 hour rule’ on US imports which must be submitted before cargo is loaded aboard the vessel at a foreign port.

**TYPICAL CUSTOMS PROCEDURES**

Since the enlargement of the EU in May 2004, 25 customs administrations now have to act as though they were one. The ten new EU-Member States have adopted the **EU common external tariff**. Consequently, trade with these countries is free from customs duties, provided that the country of origin of the goods is one of the other EU-Member States. Furthermore, the EU guarantees stable customs rates and predictable legislation to its trading partners outside the EU territory.

Russia is a major trading partner for Finland and Sweden as well as an important origin and destination for high volume freight flows transhipped at Baltic seaports like Klaipeda, Riga or Tallinn. But unpredictable customs duties and often complicated and unpredictable customs legislation, as well as a poor level of co-ordination between Russian customs and other Russian authorities responsible for transportation, result in high transport/transfer costs and/or uncertain transport scheduling. However, Russia recently signed a co-operation treaty with the EU to facilitate customs procedures and administrative requirements, which should result in stable customs rates and reliable border checks and customs procedures.

An important factor assisting the free flow of goods related to customs transit is **TIR (Transports Internationaux Routiers)**, which applies to road transport. For intermodal chains, the TIR system will be suspended for the duration of the non-road legs. The TIR procedures enable goods to move under customs control across international borders, without the payment of duties and taxes which would normally be due at importation (or exportation). The movement has to start or to end in a 3rd country, or the goods have to move between two or more Member States via the territory of a 3rd country. Regarding logistics flows to and from Russia, for instance, the TIR procedures are relevant for Finland, Poland, Latvia, Lithuania and Estonia. As a consequence, the customs burdens of road freight transportation at land-based border crossings (waiting and processing time, required documentation etc.) are reduced.

The introduction of the **"Authorised Regular Shipping Service"**, which allows registered shipping lines to carry community goods between two member states with a minimum of customs formalities has made, particularly Short Sea Shipping port-to-port within the Community, more competitive in relation to road and rail transport than it would otherwise be.

Operators of **customs warehousing** are allowed to store imported /exported non-EU goods and choose when they pay the duties or re-export the goods. In a customs warehouse the value added tax rate for export goods is zero. This financially motivated logistics service can be further used to bundle consignment or container full loads to realise economies of scale.

For transport nodes – in particular ports handling international trade and high value goods – it is attractive to install free zones within the EU customs territory. Goods stored in there are free of duties, VAT and export / import charges. No import declaration has to be lodged as long as the goods are stored in the free zone. Free zones allow fewer customs formalities. Therefore, free zones increase the attractiveness of freight transfer points by increasing financial liquidity of users and facilitating transport planning and administrative procedures related to trade. Examples of free zones in the BSR are the Free ports of Riga or special economic zones in the ports of Liepaja and Gdansk.
The BRS region is increasingly involved in the international trade system.

The main drivers behind this development are:

- Political developments that have made the transition from centrally planned economies to market economies possible.
- The globalisation process with a new organisation of production of goods and services.
- The urbanisation process adding dynamics to private and public consumption and investments.
- The development of major mineral resources for many economically important raw materials.
- The development of waterways in and out of the region’s ports and terminals.
- The development of fixed links between economically important zones.

A further strong development of economy and trade in the BSR is dependent on a continued positive development both of these factors and of new ones, like increased cohesion in trade and transport policy making, infrastructure advancement, research and development.

The threats to such a development are political instability, a slowdown of the globalisation process, problems in the exploration, refining and distribution of mineral resources.

As the major growth in trade and transport is expected to take place in the eastern part of the BSR, such problems would more seriously affect the development in this part of the BSR than in others. The transport of minerals and manufactures would suffer the most, and this, in turn, would affect maritime transport more than road and rail transport.

The unique mix of high technology and low cost production within the region adds dynamics to the development. Because of this and the region’s geographical position close to large markets in both east and west, it can be argued that the Baltic Sea Region, despite its socio-economic differences, difficulties and growth obstacles, is a region with unique possibilities in the enlarged Europe.

The economies are already growing above average for the entire EU. GDP growth is expected to be strengthened further for some of them because of the increasing foreign trade.

Trade between the countries within the Baltic Sea Region is forecast to increase significantly. Still 71 percent of the forecast growth in trade between the BSR and countries outside the region will be the main source for the BSR economic development. Exports alone will account for 51 percent of total trade growth.

The significance of the intra-BSR market varies from country to country. It is more important for the smaller economies than for the larger ones. For Germany, Russia
Denmark, trade with countries outside the Baltic Sea Region represents more than 50 percent of their total foreign trade.

Estonia, Latvia and Lithuania have also started their development in this direction by moving from the stage where a major part of the trade takes place within the production processes into a new stage with a more balanced trade relationship with a larger number of trade partners, both inside and outside the BSR.

The EU membership helps them to strengthen their new trade relationships both inside and outside the EU. Still the intra-BSR market will continue to be the most important market for them for the next few years.

The forecast trade growth rates for eastbound flows are higher compared to westbound flows. The imbalance in volumes points to a strong role of the eastern BSR countries in intra-BSR exports – with a tendency to more balanced trade. Intra-BSR trade between eastern countries is expected to grow at an even higher rate. The increasing cross-border exchange of goods will additionally boost the freight transport volumes in the eastern BSR region.

The East-West trade will see the strongest growth with Russia and Poland as the dominant suppliers and Germany as the main recipient of goods.

A concentration of the population to large cities in the southern part of the BSR will increase the sub-region’s share of the imports of manufactured goods, which is the fastest growing commodity group in BSR trade, but cover less than 20 percent of the total imports to the Baltic Sea Region.

The three bulk commodity groups oil/oil products, building materials and chemicals together cover about 50 percent.

Bulk commodities, particularly crude oil, together with unitised cargoes will continue to dominate growth both in extra- and intra-regional trade.

A number of scenarios were simulated as described earlier in this report. The following tendencies were observed at the European level:

- land modes do not seem to be able to sustain the existing modal split, most likely due to growing capacity constraints on land infrastructure networks,
- sea transport modes seem to benefit most from an increased transport demand
(growing trade volumes), indicating a tendency to changes of the modal split in favour of sea transports.

The tendencies are also evident for the Baltic Sea Region, but the effects are supposed to be stronger, pointing at a more dynamic development in the Baltic Sea Region compared to the European average. Short sea shipping in the Baltic Sea Region is expected to benefit more from the development of trade.

Reasons for stronger short sea shipping dynamics in the Baltic Sea Region seem to be:

- The Baltic Sea Region includes a large number of national economies with a growth potential that is higher than the EU average.
- Geographical conditions (the Baltic Sea as a natural barrier), makes sea modes more important as transport modes for countries in the Baltic Sea Region than for most of the other European countries.
- Long distance sea links benefit more from extra trade volumes compared to short distance links.
- The share of bulk commodities, which are traditionally transported by sea, is higher for the group of countries in the Baltic Sea Region (such as Norwegian and Russian oil exports) compared to most other countries in Europe.

The trade development pattern is expected to strengthen existing sea transport corridors for bulk commodities and manufactures.

The growth in maritime transport shows a similar growth pattern as the BSR trade.

Outbound transport by sea from the BSR shows the strongest growth in relative but not absolute terms.

While rail transport in the Baltic Sea Region has experienced a severe drop in transport volume during the past decade, the EU enlargement, with de-regulation of trade and investments in road infrastructure has favoured road transport. As long as investments in new roads exceed investments in rail, rail transport will continue to lose its share of the transport market, both to road and sea transport.

The sea transport corridors connect to a number of important future gateways for trade between the Baltic Sea Region, the European continent and the rest of the world.

These gateways lie both inside and outside the region, for example the deep sea continental ports, which lie close to their main market areas.

The Skagerack/Kattegatt Sea area represents a gateway to the entire Baltic Sea Region, while sub-regional gateways are emerging in for instance Poland and the Gulf of Finland, through which goods find more efficient routes to and from their destination or source areas.

Russian oil exports are increasingly being channelled through Russian ports in the Gulf of Finland and Kaliningrad, and through emerging new deep sea ports in the Barents Sea area.
Growing port capacities, particularly for exports and imports of oil and unitised cargoes.

Increased access to a fleet of modern cargo carriers with capacities well suited for the Baltic Sea Region port system.

The intense work to improve environmental and safety values in the maritime transport chain.

Factors that work against the development of maritime transport in the BSR are:

- The integration, particularly with rail transport modes, is generally low and represents a hindrance for maritime transport development.
- There is a lack of transparency in the methods used to finance fairway and port infrastructure and the methods used vary considerably between countries. This prevents an economically optimal use of resources in the Baltic Sea Region port system.
- Considering the growth in seaborne traffic with oil and “time-sensitive” unitised cargoes ice-breaking capacities and organisations are inadequate for future traffic pattern developments.

The results of de-regulation of road transport gained by EU membership underlines the importance of such improvements also for maritime transport.

Discussions are taking place on route planning for maritime traffic, especially against the background of the increasing oil shipments in the Baltic Sea region.

National transportation networks connected through EU and Baltic Sea cooperation are decisive for the development of the conditions for maritime transport in the BSR. The initiative taken by the Motorways of the Baltic Sea Task Force to study trade and transport in Baltic Sea Region calls for further initiatives to improve the information on the conditions for maritime transport in the area.
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21 The differences in trade volumes for intra BSR imports and exports occur because different methodologies are used by the sources OECD and EUROSTAT and different figures are exported by countries (e.g. the figures reported by Sweden for imports from Poland are different to those reported by Poland as exports to Sweden)
22 The figures for Russia’s total trade include only trade volumes with EU 25.
23 For detailed data tables of BSR countries’ trade volumes 2020 see annex to this report
24 North/South trade corridor: trade flows between Sweden, Finland, Norway, Estonia, Latvia, Lithuania, Russia (North) and Germany, Poland, Denmark (South)
25 East/West trade corridor: trade flows between Finland, Russia, Estonia, Latvia, Lithuania, Poland (East) and Germany, Denmark, Norway, Sweden (West)
27 Hanell et al. op. cit.
29 The EFM STAN simulation tool is described in Annex 2.
30 A simulated index value of 143 in 2020 represents a growth of the respective parameter between 2003 and 2020 by 43 percent.
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