

INLAND NAVIGATION IN EUROPE

Marketobservation

2011

2



Market Observation No. 14

**Analysis of the Economic Situation
as of mid-2011 and Outlook for 2012**

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FOREWORD

In the course of this market observation, it has been possible to complete examination of inland shipping within each individual geographical area by including articles dealing with the periphery of Europe's main network of waterways, specifically with the UK, Poland and Italy. While the Scandinavian countries are also quite familiar with inland shipping, this mode of transport is nonetheless so closely linked to marine shipping within these countries that a separate examination would not appear warranted. Poland's system of inland navigation is connected to the main network of waterways, while a significant volume of transport flows between Poland and Germany.

A second report focuses on the subject of providing access to another shipping area of national importance: the Seine-Nord Europe Canal. On completion, this project, of exceptional strategic significance for inland shipping, will result in a new link between a region of Europe having a superior level of economic activity and the major North Sea ports. Providing access to this canal system will give new impetus to international waterway transport for two reasons: due to the high level of demand already existing along this axis; and as a result of the unique logistic context, specifically because supplying goods to France's economic heartland will face inland shipping with special challenges. Yet, important decisions are still pending. The funding decision, on which further planning and implementation depend, will be taken only in the course of 2012.

The business cycle developments in the freight and passenger transport sectors usually represent the major portion of the report. Passenger shipping, while seemingly unaffected by the overall economic situation, is nonetheless experiencing independent growth as a result of demographic changes, and thus the prospects for this sector are good. Freight transport, in contrast, continues to be affected by business cycle volatility in general. As a result of the economic situation in Europe and of current uncertainty, the general tendency would appear to indicate a downward trend. Whereas in 2010 there was talk of optimism in the face of the speedy recovery from the 2008-2009 crisis, the prospects for 2012 are no longer as favourable, while prospects in the longer term are fraught with such great uncertainty that reliable predictions are hardly possible.

Special Report 1:

**Inland Water Transport
in particular
European countries**

► a) United Kingdom

Because the United Kingdom is an island, there are a few peculiarities about inland shipping there. The large number of rivers in the country form wide bays (estuaries) where they flow into the North Sea, allowing sea-going vessels to navigate the rivers a certain distance inland, too.

These wide estuaries were even used by the Vikings, who sailed up the English rivers in their longboats. A combination of maritime and inland shipping continues to be a typical characteristic of shipping in the United Kingdom to the present day.

Definition of inland waterway traffic in the United Kingdom

Pure inland waterway transport on British rivers (with inland ports as the starting point and destination of the shipment) is not very significant, at about 3.5 million tons per annum. Marine shipping which also uses inland waterways, and is therefore included in the total figure for inland waterway traffic, is far more significant. This includes coastal shipping, insofar as the ships cross the boundary between maritime waters and inland waterways. There are two concepts used for the demarcation between inland waterways and maritime waters:

Inland waterways boundary = all water areas available for navigation that lie inland of a boundary defined as the most seaward point of any estuary which might reasonably be bridged or tunnelled - this is taken to be where the width of water surface area is both less than 3 km at low water and less than 5 km at high water on spring tides.

Smooth water line = marks the boundary in tidal rivers and estuaries where significant wave height could not be expected to exceed 2 metres at any time.

Below is a summary that provides an overview of the various individual components of inland waterway traffic in the United Kingdom:¹

¹ Source: British Department for Transport

Internal (or pure) inland waterway traffic: all non-seagoing traffic between ports and wharves which remains wholly within the smooth water line

- + Coastwise traffic: Inwards seagoing traffic coming from UK seaports and unloaded at ports and wharves upstream of the inland waterways boundary; and outwards seagoing traffic loaded at ports and wharves upstream of the inland waterways boundary and going to UK seaports

- + Foreign traffic: Inwards seagoing traffic coming from foreign countries and unloaded at ports and wharves upstream of the inland waterways boundary; and outwards seagoing traffic loaded at ports and wharves upstream of the inland waterways boundary and going to foreign countries

- + One-port traffic: Inwards seagoing traffic coming from offshore installations or sea dredged aggregates unloaded at ports and wharves upstream of the inland waterways boundary; and outwards seagoing traffic loaded at ports and wharves upstream of the inland waterways boundary and going to offshore installations or being dumped at sea

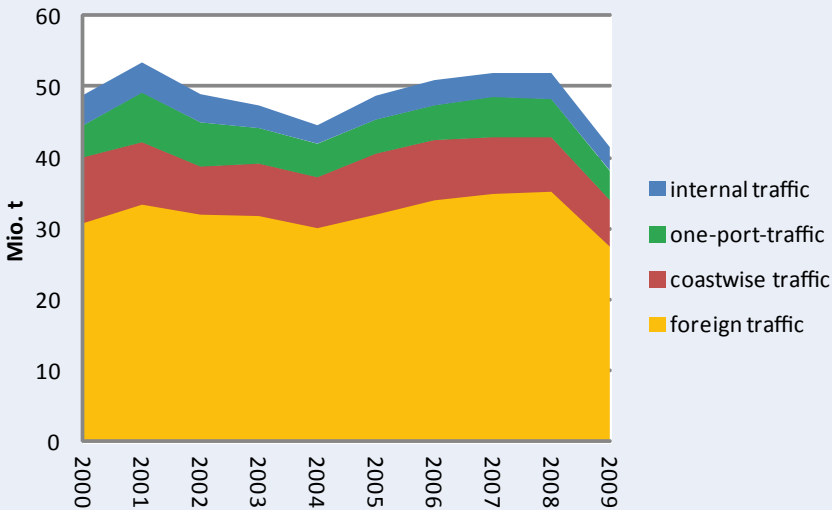
= Total amount transported on inland waterways in the United Kingdom

Structure and development of the transportation

The graph below clearly shows that the foreign traffic accounts for the largest proportion of the total inland waterway traffic in the United Kingdom. The data that these graphs are based on was collected by the British Department for Transport by surveying shipping companies and ship brokers as well as using port statistics.

It should be added that voyages made by seagoing vessels on inland waterways solely for the purpose of refuelling of the seagoing vessels, not for the purposes of river transport, are not included in this figure.

Figure 1: Transportation on inland waterways in the United Kingdom by type of traffic



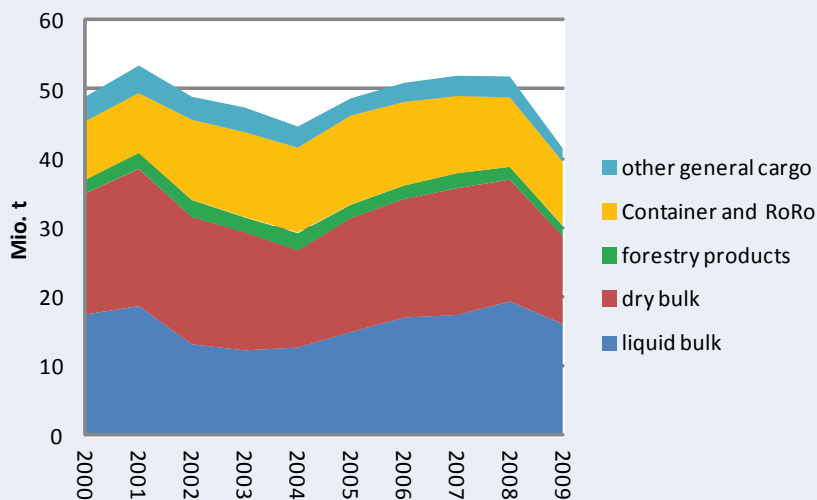
Source: British Department for Transport

The most important branch of inland waterway traffic, in terms of quantity, is foreign traffic. This involves goods from abroad being transported on sea-river vessels to an inland port in the United Kingdom, or vice versa.

If the total amount transported is sorted by product category, it becomes evident that, at around 38%, liquid bulk cargo accounted for the lion's share of the volume transported. This segment grew by 10% in the period 2000-2008. As a result of the economic crisis, 2009 saw a 17% drop compared to the previous year.

Dry bulk cargo accounted for about a third of the volume transported. The volume transported stagnated in the period 2000-2008, which was followed by a 28% drop relative to 2008 in 2009. Transportation of dry bulk cargo thus dropped more markedly than the transportation of liquid bulk cargo in the United Kingdom, too, reflecting the situation in Germany, France and the Netherlands.

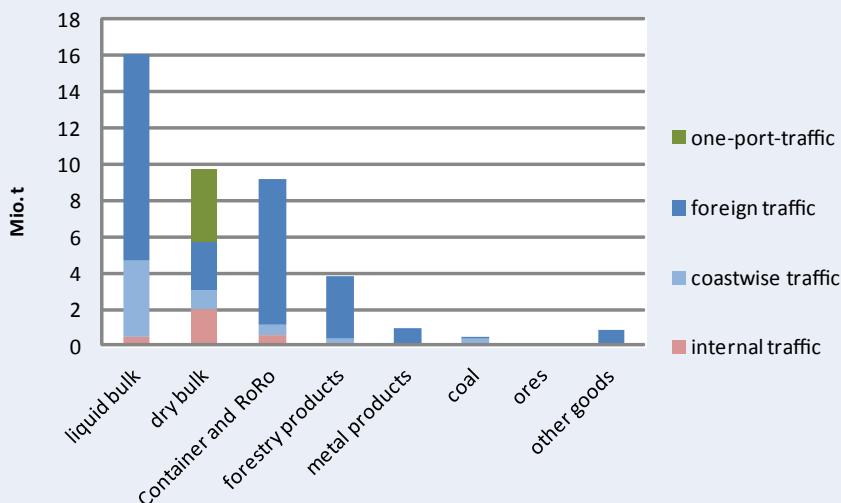
Figure 2: Transportation on inland waterways in the United Kingdom by product category



Source: British Department for Transport

The most important segment of foreign traffic, in terms of quantity, is accounted for primarily by container transportation and liquid bulk cargo (mainly crude oil and mineral oil products).

Figure 3: Transportation on inland waterways in the United Kingdom by product category and type of traffic



Source: British Department for Transport

Internal inland waterway transport

Within this segment of internal inland waterway transport (shipments transported only on inland waterways) sand, earth and building materials account for the majority of freight transported, at around 2.0 m tons. In second place comes the transportation of household waste, which amounts to approx. 700,000 t.²

These shipments are primarily in the Greater London area. The waste is sealed in containers and transported on the Thames to waste collection sites by the recycling and waste management company Cory Environmental, which uses more than 6 tugs, 47 pushed barges and over 1,000 containers.³

Pure inland waterway transport has seen modest growth since 2004, although the amount transported dropped in 2009, logically, due to the economic crisis.

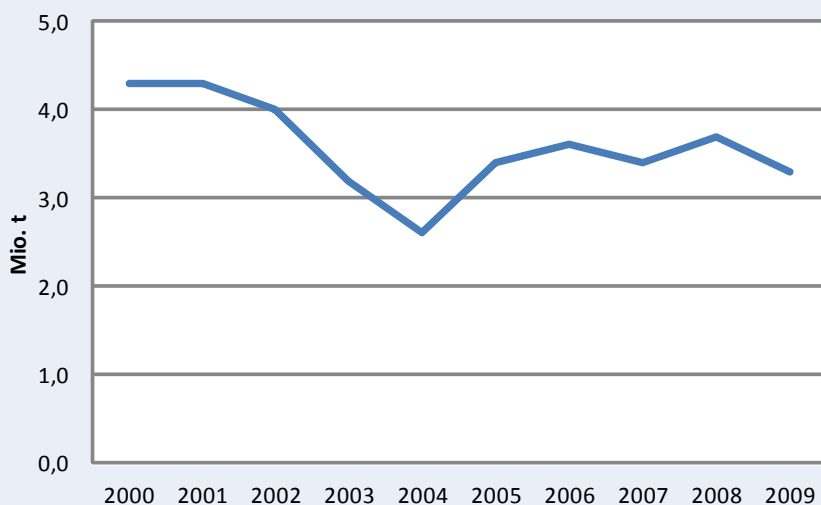
² Source: Navigation, Ports & Intermodalité No. 07/08; mid-2011.

³ Source: Cory Environmental

The mean transport distance for pure inland waterway transport is currently 41 km. The most common transport distance is a journey of 10 km at most, with about 37% of the total quantity of freight transported via inland shipping being transported no more than 10 km. These short distances are also related to the fact that sand, earth and building materials are the most important segment of inland waterway traffic, in terms of quantity, and because these cargos are low-value cargos, they are usually only transported short distances.

The mean distance for waste transportation is above average, at 56 km. The mean distance for general dry cargo is exactly the average distance (41 km), and the mean distance for liquid cargoes is below average, at 22 km.

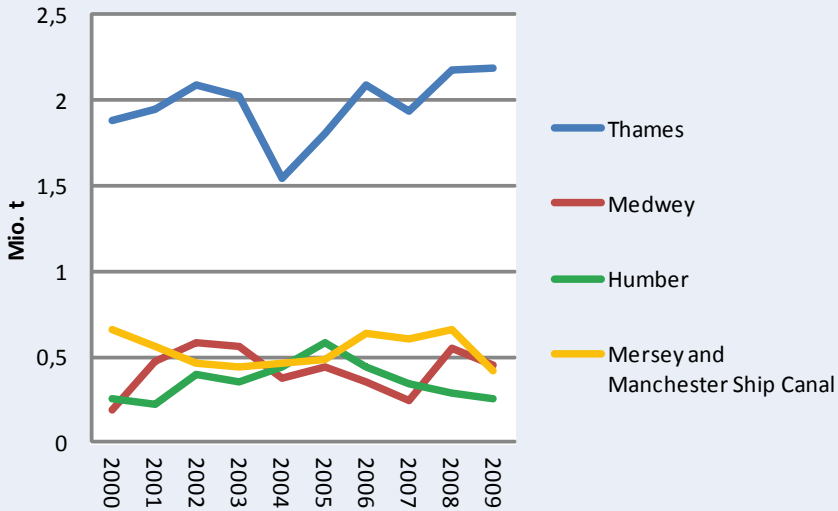
Figure 4: Development of internal inland waterway transport on waterways in the United Kingdom



Source: British Department for Transport

The increase in pure inland waterway transport can primarily be put down to shipping on the Thames. This is evident from the graph below, which shows the development of internal inland waterway transport on the five most important waterways in the United Kingdom.

Figure 5: Development of internal inland waterway transport on the five most important waterways in the United Kingdom



Source: British Department for Transport

The river Mersey, with Liverpool in its estuary, together with the Manchester Ship Canal, was an important artery for British trade in the past. The canal was built between 1887 and 1894. It fell into decline in the 1970s, as it was unable to accommodate the ever-larger seagoing container ships.

A few years ago, the ports of Liverpool and Manchester were bought by the company Peel Ports, of which Deutsche Bank holds a 50% stake, and in 2011 it also bought the Manchester Ship Canal, which connects the two, and it now hopes to develop the ports in the form of a synergy relationship. In Liverpool it plans to build a deepwater container terminal and in Salford, near Manchester, there are proposals for an inland container terminal. Container traffic on the canal is expected to rise to 300,000 TEU in the coming years.⁴

⁴ Source: Navigation, Ports & Intermodalité No. 07/08; mid-2011

Figure 6: Map of the main inland waterways and ports in the United Kingdom



Source: UK Department for Transport / Creaprint / CCNR Secretariat

► Fleets

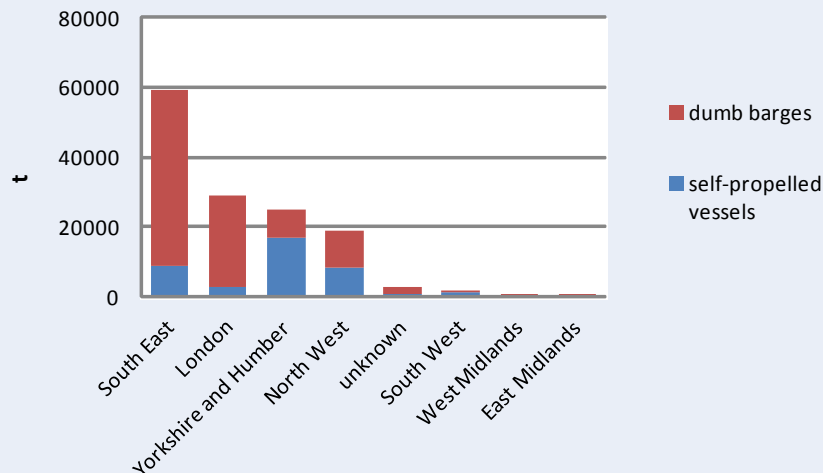
The British Department for Transport conducts statistical surveys of the inland shipping fleet every few years, with the last one having been conducted in 2007. The resulting register of ships based on this survey lists all of the commercially operated inland vessels in the UK, although it only counts ships that operate exclusively on inland waterways. Coasters and sea-river vessels, which are capable of navigating both inland waterway and sea routes, are thus not included in this figure, although the “narrow boats”, which are capable of navigating very narrow canals, are.

According to this list, there are 445 inland vessels in the United Kingdom, 158 of which are motor cargo vessels and 287 are pushed barges. The total tonnage of motor cargo vessels is approx. 40,000 t, the tonnage of pushed barges is approx. 98,000 t, amounting to a total tonnage of almost 138,000 t for the inland shipping fleet. The inland vessels in the United Kingdom are considerably smaller than the inland vessels in continental Europe. The mean tonnage of a motor cargo vessel is approx. 252 tons.

This low average tonnage can probably be attributed to the differences in the waterways network. For instance, the UK has a relatively dense network of canals, some of which can be used for passenger ships and some of which can also be used for freight navigation, but are unable to accommodate any large vessels due to the way they were built.

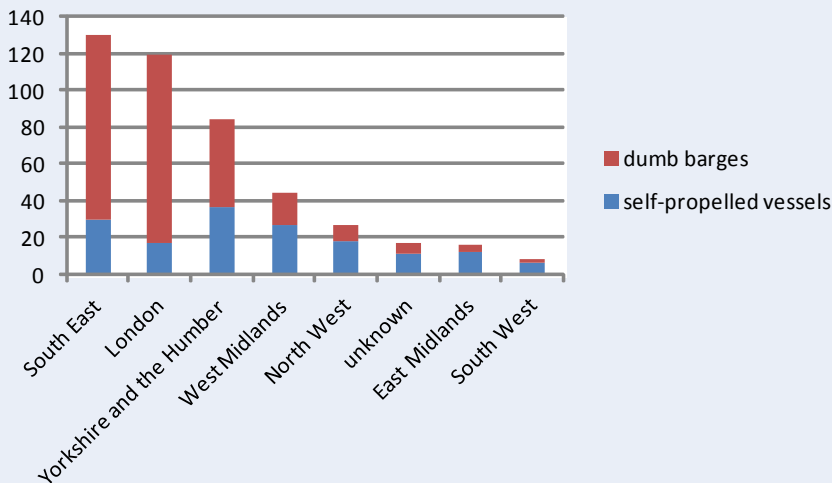
The graphs below show the fleet, expressed in terms of the tonnage and the number of vessels, by area.

Figure 7: Shipping fleet in the United Kingdom (tonnage) by area*



Source: UK Department for Transport *Vessels used exclusively on inland waterways

Figure 8: Shipping fleet in the United Kingdom (number of vessels) by area*



Source: UK Department for Transport *Vessels used exclusively on inland waterways

It is apparent from these graphs that the lion's share of the fleet is located in the South East, i.e. primarily on the Thames. London is a separate waterway region and the vessels there are smaller, on average, than in other waterway regions, as is revealed by comparison of the number of vessels vs. the tonnage.

The proportion of pushed barges is higher in the South of England than in the Midlands or the North. Tugboat and pushed barge traffic is thus evidently very important on the Thames.

Modal Split

Inland shipping in the United Kingdom currently accounts for a modal split of approx. 6% of freight transport, although this figure includes all inland shipping, including inland-seagoing traffic and one-port traffic.

There have been a number of modal shift projects in the core segment of internal inland waterway traffic in the UK, the transportation of sand, earth and building materials in recent years.⁵

Below is a prime example of such a project:

In 2005 the company Cemex, a global manufacturer of building materials, introduced barge transport on the river Severn, the longest river in the United Kingdom. About 200,000 t – 300,000 t of stone, sand and gravel for use in concrete production are transported on the river each year. If the barges make four trips per day, this saves 116 lorry trips each day, or 30,000 trips per annum. A government funding programme was also used to purchase the transshipment machinery needed at the docks.⁶

In general, transport on inland waterways is also advantageous for the building industry because it allows the storage capacity to be increased, especially where space is at a premium (as is often the case in urban areas). Inland vessels can easily be used as floating storage facilities for sand and gravel. Delivery on the water is easier to plan and more reliable than by road as the risk of traffic jams is avoided. There are also modal shift projects in other market segments, as well as in the sand, earth and building materials segment, in particular for container traffic.

⁵ Source: British Department for Transport

⁶ Figures derived from the capacity of the barges (180 t each), the capacity of the lorries (25 t each) and the number of barges available (2).

The supermarket chain Tesco imports wine from overseas (Australia, New Zealand, California, Chile and Argentina), all of which arrives in the UK via the seaport of Liverpool. For a long time, lorries were then used to distribute it throughout the UK. A few years ago, however, a container line set up business on the river Mersey and the Manchester Ship Canal, which is used to transport the imported wine from Liverpool to a container terminal near Manchester – a distance of about 40 miles (approx. 64 km) – up to three times a week.

The economic viability of this project is also improved by the fact that the container ships are used to carry goods for export, on the one hand, and urgently needed empty containers, on the other, on their return trip to Liverpool. This is the first waterway project for Tesco in the United Kingdom.

The growth potential of inland shipping in the United Kingdom derives primarily from the ever-increasing density of traffic on the roads, resulting in traffic jams and the additional costs incurred by this for freight transport. The waterways can thus be seen as a means of transport with plenty of spare capacity.

However, a modal shift on a large scale is less likely for bulk goods, than it is for container transport. This is because, on the one hand it is necessary to take into consideration that the UK's economic structure is now essentially dominated by the service sector and the iron and steel industry, which used to be very important, is now no longer very significant. The iron and steel industry is thus a major customer that inland shipping in the United Kingdom lacks.

A study commissioned by British Waterways and the East Midlands Development Agency is investigating the opportunities for shipping on the river Trent.⁷ This study draws a number of comparisons between the cost of transportation by lorry and by ship. These comparisons show that the waterways can be more cost-effective than transportation by lorry, in particular if the ships make several trips per day and carry sufficient payload. However, the cost advantage is rapidly undermined if the recipient of the goods is not located in the immediate vicinity of a waterway, as the pre- and post-river haulage by lorry and the reloading of the goods soon erode the cost advantage of inland shipping.

⁷ British Waterways and East Midlands Development Agency (2009): River Trent Waterway Feasibility Study

► b) Poland

Poland has very conducive natural conditions for inland shipping, with 3,660 km of inland waterways in total, of which 3,351 km are navigable by cargo and passenger ships. The density of the network of waterways (the length of the waterways relative to the surface area of the country) is 11.6 km per 1,000 km² and is thus on a par with France.

About 80% of inland shipping in Poland is along the Oder, with the remaining 20% on the Vistula. Both of these rivers flow into the Baltic, where the most important Polish seaports, Gdansk (Vistula) and Szczecin (Oder) are located.

In 2009 some 5.6 million t of goods were transported on Poland's waterways, a decrease of 2.4 million t relative to the previous year. The total amount transported was just 9.8 million t in 2007, and dropped by 17% to 8.1 million t in 2008. The global economic crisis, which only made its full impact felt in 2009, resulted in a further 30% drop, to just 5.6 million t.

Modal split and infrastructure

The market share of the waterways is very low in Poland. In 2010 it was just 0.3%, and thus far lower than pipelines (3%), the railways (12%) and road transport (84%). The modal split share is just as low if you look at the amount transported.

The main problem appears to be that inland shipping itself is at a disadvantage when it comes to the classical bulk goods in comparison to road and rail transport. Ore and scrap metal, which are actually the domain of inland shipping, are transported far more by lorry than on the inland waterways.

Apart from the other factors, it is primarily the infrastructure that is responsible for the uncompetitive position of inland shipping. Even the most important river in the country, the Oder, flows freely for a long distance, meaning that the draught falls below the 1 metre mark in the summer months, making the river unnavigable. The section of the Oder where it remains in its natural course is between Brzeg Dolny (36 km north-west of Wrocław) and the confluence of the Warta and the Oder (near Küstrin/Kostrzyn on the German border).⁸

⁸ Cf. the report "Analysis of inland waterway networks in the SoNorA project area", published by the European Union – European Regional Development Fund, 2010.

Due to the undeveloped state of the Oder along this stretch, shipping on the Oder is divided in two: The upper Oder up until just downstream of Wrocław, and the lower Oder from Küstrin to the Baltic. These two relatively navigable parts of the Oder are connected by a poorly developed middle section, which makes uninterrupted passage, in particular the export of coal from the Silesian Coal Basin via the seaport of Szczecin, impossible, especially in the summer months.

Figure 9: Map of Poland

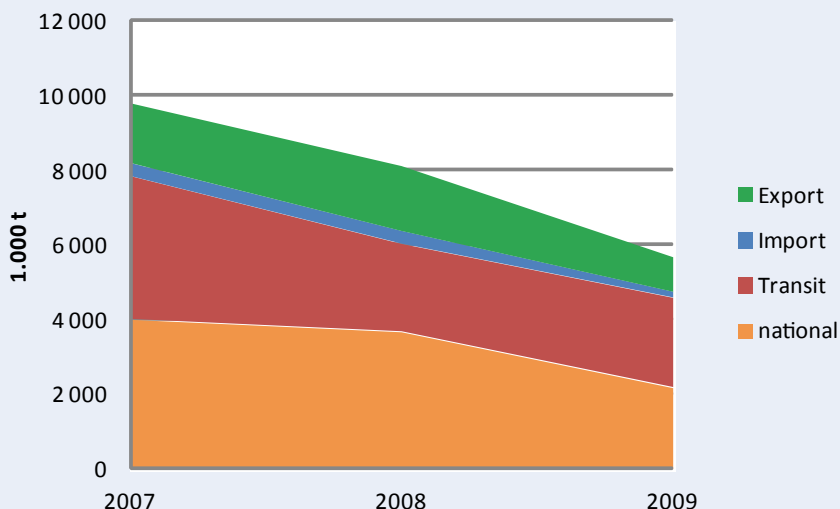


Source: CCNR Secretariat / Creaprint

Transportation by type of traffic

Due to the size of the country, national transport plays a relatively important role.

Figure 10: Transportation on inland waterways in Poland by type of traffic



Source: Polish Office of Statistics

The proportion of the total traffic accounted for by international traffic is on the increase, as expressed by the steady increase in the mean transportation distance. Both of these factors reflect the fact that Polish shipping companies are increasingly active on west European rivers and canals.

There are close ties with Germany in terms of international transport. For instance, 98% of exports from or imports to Poland transported via the waterways are to Germany or are from there. Some 67%, or precisely two thirds of the exports transported via the waterways are of hard coal, almost all of which goes to Germany. Apart from coal, a limited amount of chemicals are also exported.

Shipping companies and employment

Most of the Polish ports are owned by shipping companies. The ports of Wrocław and Opole are both owned by 'Odratrans', for example. In Wrocław there is a coal port which is capable of handling up to 800,000

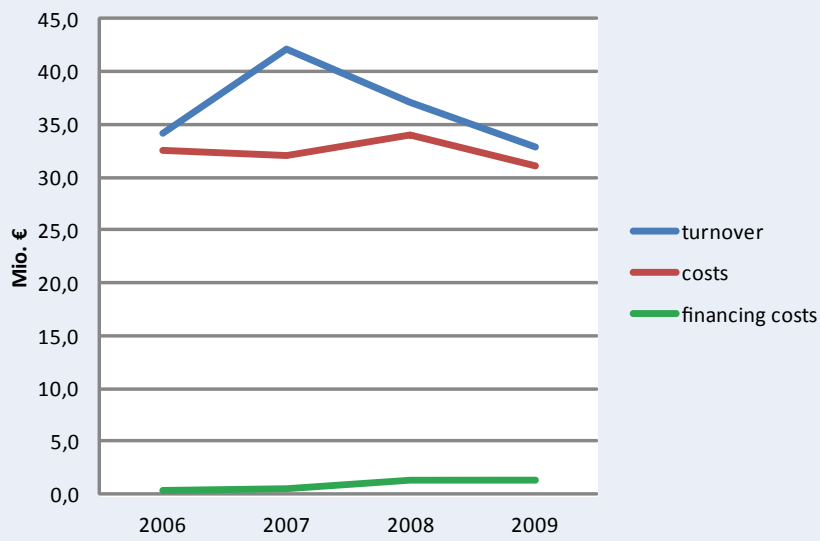
The most modern inland port in Poland is the port of Gliwice, which has a potential transshipment capacity of 2.5 million t per annum. The port primarily handles raw materials and products for and from the steel industry, with coal, coke, ore, gravel and steel products being the main goods handled.

Before the fall of the Iron Curtain there were seven state-run shipping companies. Today's private company 'Odratrans' was one of the two largest state-run companies at that time. After the state-run companies were dissolved in the course of privatisation a large number of shipping companies and small-scale independent ship-owners came into existence. There are thus now about 200 companies of various legal forms active in the field of inland shipping in Poland. Some of these companies also perform port services and repair work as well as offering transport services.

The fluctuation in the demand for transport services since 2006 has had a severe impact on the economic viability of the shipping companies. For instance, for the shipping companies for which data is available (companies with more than 9 employees) the cost/turnover ratio worsened in 2008 and 2009 relative to 2007. This can primarily be put down to the slump in demand in 2008 and 2009.

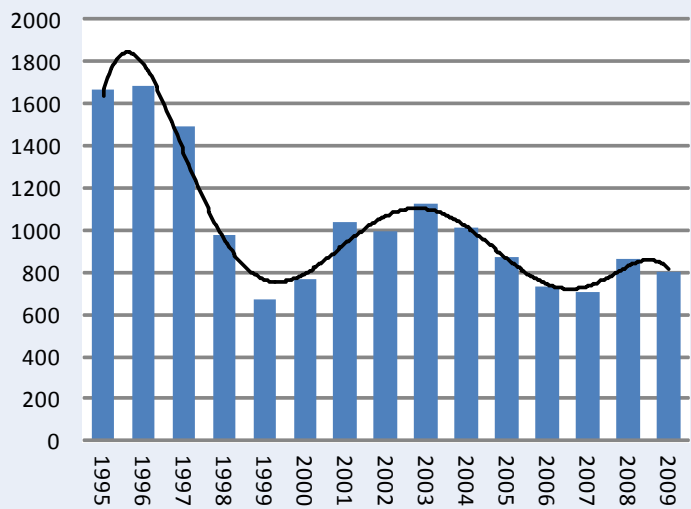
Costs rose slightly in 2008 and dropped again in 2009. This can presumably be put down to effects such as the rise in fuel prices in 2008 and the drop in prices in 2009. The financing costs only make a small contribution to the total costs, although this cost component rose significantly from 2008 onwards.

Figure 11: Revenue and cost development in the Polish inland shipping industry*



Source: Calculation performed by the CCNR (conversion of data on turnover in Polish zloty to euro applying the mean annual exchange rates for 2006, 2007, 2008, 2009); Original data: Polish Office of Statistics. * For companies with more than 9 employees

Figure 12: Employees of Polish inland shipping companies



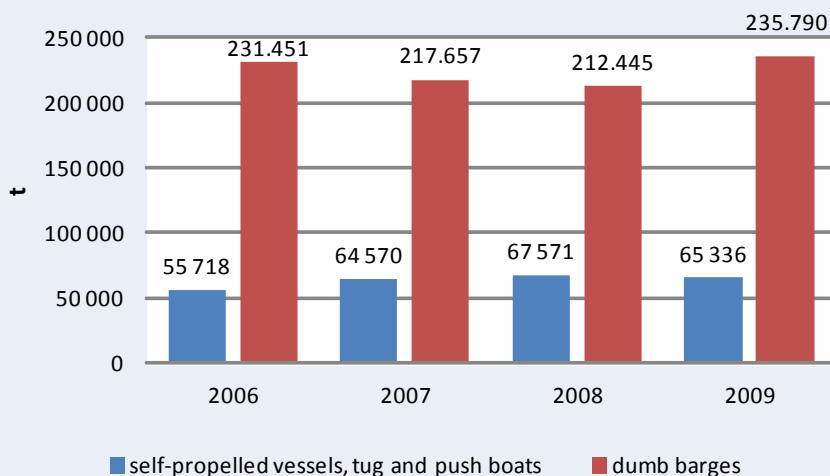
Source: Eurostat

► Fleet

There are currently about 600 inland vessels used for freight transportation, about 20% of which are motor cargo vessels as well as tugs and pushers. The remaining 80% are pushed barges.

Pushed barge traffic is a very major factor in Poland. Both the number and the total capacity of motor cargo vessels, tugs and pushers rose slightly between 2006 and 2008 (see graph). The number and capacity of pushed barges also saw a net increase up until 2009.

Figure 13: Development of the tonnage of the Polish freight shipping fleet



Source: Polish Office of Statistics

Most of the motor cargo vessels date from the 1950s and 1960s. The age profile of the tugs and pushers as well as the pushed barges is a bit better. Overall, the age profile of the entire Polish fleet is as follows:

Table 1: Age distribution of the Polish inland shipping fleet

Year of construction	Proportion of the fleet in %
Up to 1949	2,2
1950 - 1969	22,5
1970 - 1979	41,0
1980 - 1989	30,6
1990 - 2009	2,4

Source: Polish Office of Statistics

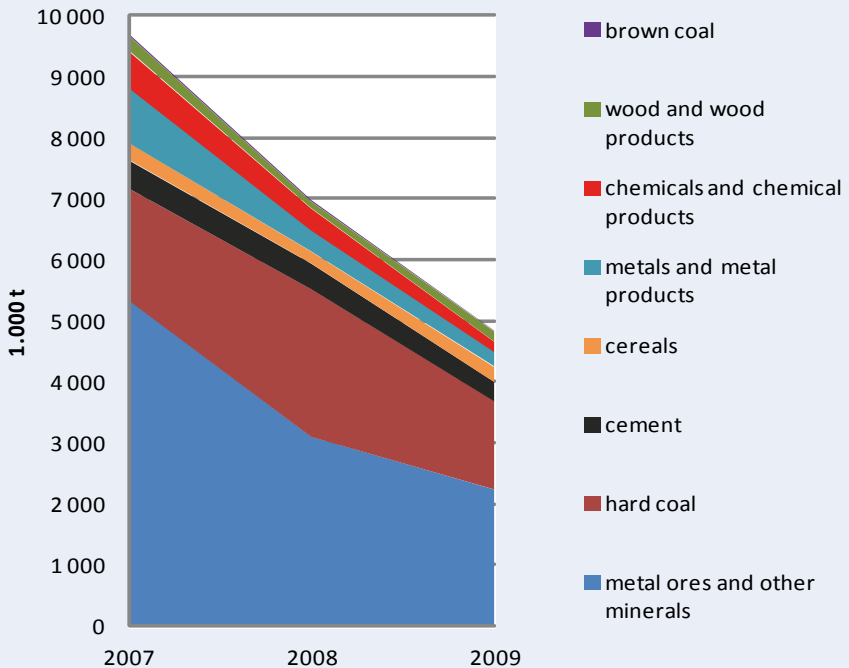
There are also slightly over 100 passenger ships with a total capacity of approx. 8,600 passenger seats. The mean age of these ships is relatively high. For instance, about half of the passenger ships were built between 1950 and 1969, whereas slightly less than a quarter were built in the year 2000 or since then. In 2008 and 2009 about 1.1 million passengers travelled on the Polish inland waterways each year.

Goods segments

Inland shipping in Poland is strongly dominated by the steel industry. Ore and scrap metal as well as hard coal, altogether, account for about two thirds of the total amount transported (65% in 2009; 68% in 2008). Building materials, at just 5%, play a far less significant role than in Western Europe.

Tanker shipping is very underdeveloped. Almost no mineral oil products are transported and chemicals and chemical products also only account for a very small proportion of the total.

Figure 14: Transportation on inland waterways in Poland by product category



Source: Polish Office of Statistics

Although Poland is traditionally a major agricultural country, agricultural products do not play a major role. This also applies to the Vistula, on which large amounts of agricultural products used to be transported from the Polish hinterland to the seaport of Gdansk.

Because hard coal is very significant for the Polish economy, the next section will take a closer look at the potential that coal offers for inland shipping in Poland.

Furthermore, it should be pointed out that there is also potential for growth in the container segment, primarily on the Vistula in the hinterland of the port of Gdansk, which was the container port with the strongest growth in the Baltic in the period 2005-2009 (+244%).⁹

⁹ Cf.: Hamburg Sparkasse (2011): Gut gerüstet für die Zukunft? Der Hafen als Impulsgeber für den Logistikmarkt Hamburg. (Well prepared for the future? The port as a source of stimulus for the logistics market in Hamburg.)

There are plans to quadruple the port's transshipment capacity, from approx. 500,000 TEU to approx. 2 million TEU, in the next few years. Since 2010 there has been a direct connection between China and the port of Gdansk.

Prior to this, the port was served primarily by feeder services and by rail services from Hamburg and the ARA ports. Shipping on the Vistula could, given the right political support and a waterway-friendly port policy, play a significant role in container distribution in the hinterland of the Port of Gdansk.

Hard coal – a goods category with potential for inland shipping in Poland

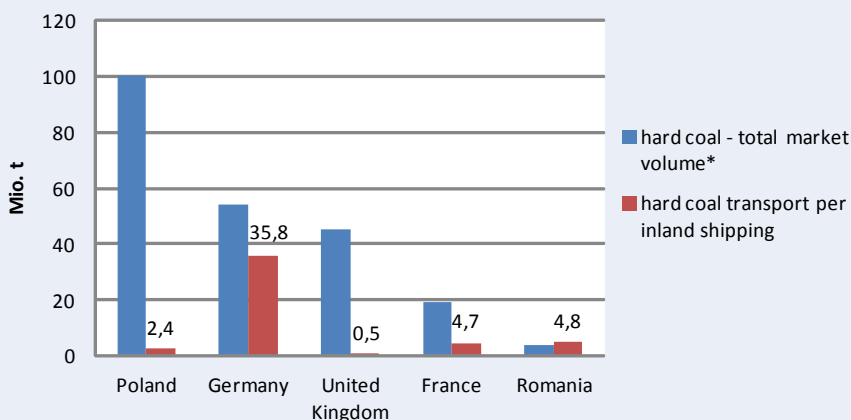
The centre of the Polish coal mining industry is in Upper Silesia. The largest coal mines in the country are located in Gliwice and Katowice. The Upper Silesia coalfield accounts for 93% of Poland's entire coal production. Gliwice is connected to the Oder via a canal and Katowice lies approx. 34 km east of Gliwice.

Poland is the largest producer of hard coal in Europe, with a production volume of almost 77 million t (2010) just ahead of the Ukraine.¹⁰ It is also ahead of the Ukraine when it comes to exports, exporting 14 million. t. It is only with respect to imports that Poland lags behind several other European countries, including Germany, France and the United Kingdom. The total amount of hard coal (production, exports and imports) is very high in Poland, at around 100 million t (cf. Germany: 54 million t).

In comparison to these figures, the amount of hard coal transported on the inland waterways in Poland can be described as being very low (see graph below). Of course, it is safe to assume that some of the coal mined in Poland is used in-situ for power stations and by the steel industry, and is therefore not transported to any significant degree. Nevertheless – irrespective of the amount of domestic production – a trading volume of 23.5 million t that needs to be transported in full, in any case, but the amount of coal transported on the waterways is only 2.4 million t.

¹⁰ Not including Russia

Figure 15: Total amount of hard coal and amount of hard coal transported



Source: VDKI. Figures for 2010. *Total amount = sum total of hard coal mined, exported and imported

The table below shows the trading volume of hard coal for the countries in the graph above. Poland is now a net importer of hard coal, as is the case for most other European countries. The reason for this is that the amount of hard coal mined in Poland is dropping. Imports of hard coal are therefore likely to increase in future, which should be especially beneficial for the largest ports in the country, Gdansk and Szczecin. There is thus also great potential for inland shipping on the Oder and the Vistula.

Table 2: Imports and exports of hard coal for a number of European countries (2010)

Country	Hard coal imports	Hard coal exports	Sum total of exports and imports (trading volume)
Poland	13,5	10	23,5
Germany	40	0	40
United Kingdom	26	1	27
France	19,3	0	19,3
Romania	1,4	0	1,4

Source: VDKI

Of the hard coal exported in 2010 63% was exported by sea and 37% on land. The seaports used to export coal are primarily the ports of Gdansk and Szczecin. The largest customers of coal exported by sea from Poland are Germany and the United Kingdom. The hard coal exported on land is mostly transported by rail to Poland's neighbours.

The amount of coal transported by rail thus exceeds the amount transported by inland waterway by a long way. In 2009 about 1.5 million t of hard coal were transported on Poland's waterways, in comparison to approx. 100 million t by rail.

There are several coal-fired power stations that, despite the fact that they lie directly on the Oder, are not supplied with coal via the inland waterways, but by rail. As far as coal is concerned, it is very apparent that the waterways in Poland are used far less than would be possible.

► c) Italy

It has to be stated quite categorically that inland shipping currently plays a very marginal role in freight transport in Italy. The modal split share is about 0.1% of the total volume of freight transport in Italy.

Inland shipping played a much more significant role in Italy up until the late 1970s, before then seeing a steady decline in the following years.

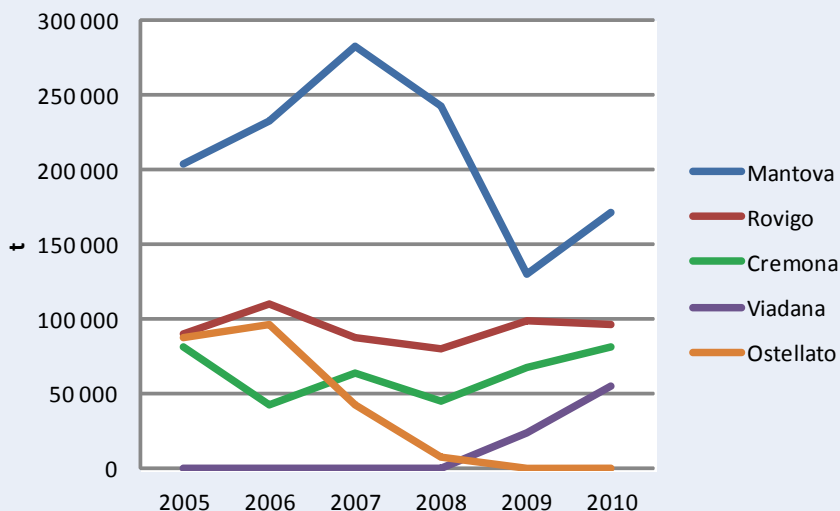
The total length of the inland waterway network in Italy is 957 km, 564 km of which is economically navigable. The Po, as the main axis of inland shipping in Italy, is not navigable along its entire length. For instance, it follows its natural course for the first 250 km (out of its total length of 650 km), not artificially contained in any way. The subsequent 400 km have been subjected to hydraulic engineering measures in order to make the Po navigable.¹¹

The Po flows into the Adriatic Sea, forming a delta where several ports that are suitable for combined river and sea traffic (e.g. Chioggia, Porto Garibaldi and Porto Levante) are located. Pure inland traffic accounts for about 80% of the total, with the remaining 20% being accounted for by river-sea traffic.

¹¹ Source: Region Emilia-Romagna (2011), Directorate-General for Infrastructure Networks, Logistics and Mobility: Annual report on the monitoring of mobility and traffic in the region of Emilia-Romagna.

As far as the fleet is concerned, there are almost only pushed convoys on the Po and the canal system Fissero-Tartaro-Canal Bianco, each with between 6 and 8 ships each. On the Ferrara waterway, which lies in the south of the Po delta, there are primarily sea-river vessels with a mean carrying capacity of 1,300 t. There are 35 to 40 motor cargo vessels available for transporting sand from the Po.

Figure 16: Waterside freight transport at Italian inland ports

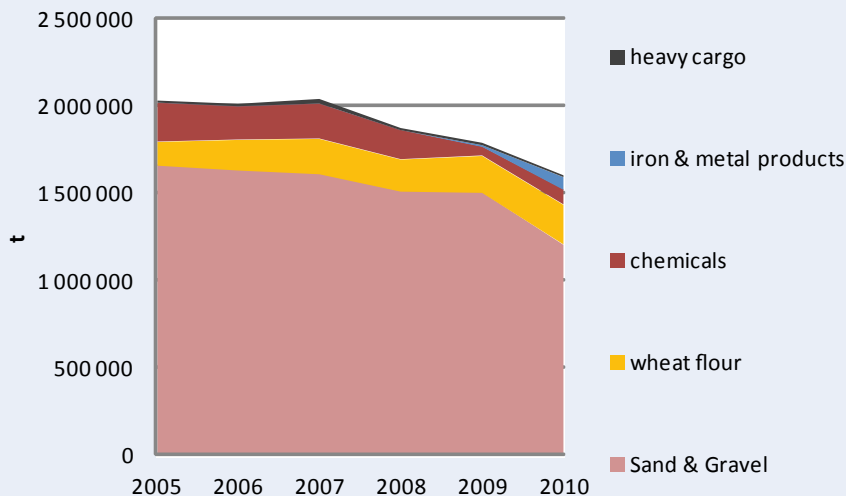


Source: Agenzia interregionale per il fiume Po (AiPo)

Categories of goods

At present, a large proportion of the freight transported consists of sand and gravel that is dredged from the river bed of the Po and supplied to the building industry. Another important segment is flour. In Mantova, Italy's largest inland port, the main freight handled, other than flour, is chemicals, as there are a number of major chemical plants located in Mantova. Raw materials for the steel industry do not play a significant role for inland shipping in Italy, despite the fact that Italy is a major producer of steel.

Figure 17: Freight traffic on inland waterways in Italy by product category



Source: Agenzia interregionale per il fiume Po (AiPo)

The demand for transportation dropped from approx. 2 million t in 2005 to approx. 1.6 million t in 2010. This is primarily due to a reduction in the quantity of chemicals transported and in the important segment of sand transportation.

The very low volume of transportation of heavy goods is accounted for by large, bulky and heavy items such as components for nuclear power plants, which are exported from Italy to America and Asia. Only a minute amount of mineral oil is transported, mainly for use in thermal power stations on the Po.

Figure 18: Map of main inland waterways and ports in Italy



Source: VNF / Creaprint

Containers

The logistics companies Fluviomar and Venezia Logistics have traditionally run river transport between the ports of Venice, Mantova and Cremona, primarily transporting flour, steel products and heavy goods. In early 2011 they, both subsidiary companies of Venice Port Authority, started the first regular container service on the Po.¹² The inland navigation line consists of 5 container barges, each with a capacity of 60 TEU, and one pusher boat. This convoy provides a regular service between Venice and Mantova.

Alongside this container service, Venezia Logistics has also set up a terminal covering 8,500 m² in the river port of Mantova for the handling and storage of containers and goods.

Passenger shipping

There are about 15 river tourism operators with over 50 ships, which carry about 150,000 passengers each year, on the Po.¹³ They offer one-week river cruises from Cremona to Venice and back as well as shorter cruises lasting one or more days.

¹² Source: www.venezialogistics.com

¹³ Source: AiPo

Outlook

In the light of the rich industrial network in the north of Italy, inland shipping stands a genuine chance of playing a much greater role in freight transportation in Italy in the future than is currently the case. In addition to this, the north of Italy (the provinces of Lombardy and Venice) are the industrial and economic heart of the country, accounting for some 31% of the Italian GDP. The prospects for the future of passenger shipping are also good.

For inland shipping to attract a greater share of the market, however, it will require greater flexibility and better orientation by the carriers to the needs of the industrial customers. Also, it will require higher reliability of the Po as a waterway.

Special Report 2:

Seine-Nord-Europe Canal

The connection between the Seine-Oise basin around Paris and the Benelux region is currently ensured by three waterways: the Canal du Nord, the Canal de Saint-Quentin and the Sambre-Oise Canal. Together with the rail and road links, these canals form the North-South axis between the Benelux region and Paris.

The economically important and densely populated Parisian agglomeration area is located at the end of this axis. In addition to the Ile-de-France, there are another three regions in the canal's direct catchment area: the Nord-Pas de Calais, Picardy and Upper Normandy. The total regional GDP of these four regions accounts for 39% of France's overall gross domestic product.

At present, only vessels with a maximum carrying capacity of 600 tonnes are permitted to travel on the North-South axis. This situation restricts water-based North-South traffic. Consequently, the construction of a canal which can hold large, modern freight vessels with a carrying capacity of several thousand tonnes could significantly increase the volume of inland shipping in the North of France and its bordering regions. The Seine-Nord Europe canal represents the priority project Nr. 30 within the transeuropean network (TEN).

Due to the fact that the canal links the northern French waterways of the Seine and the Oise with the dense networks in Belgium and the Netherlands, it will save the waterway network in the North of France from its isolated situation.

At the same time, it joins the inland ports and seaports of Northern France (Le Havre, Dunkirk, Rouen, Paris) and the seaports of Belgium and the Netherlands into a single network. It must be remembered that the canal is located in the hinterland of several important seaports (Rotterdam, Antwerp, Gent, Zeebrugge, Dunkirk, Calais).

The chances of the project being realised in the near future have improved since the French President, Nicolas Sarkozy, gave the project his backing in the spring of 2011. It should be decided in 2012 what company is granted the license for operating the canal. According to the current schedule, the canal is set to commence operations either in 2016 or 2017.

Costs and financing

The Seine-Nord Europe project will cost a total of €4.2 billion. Public bodies shall provide 50% of the construction costs as initial financing before construction starts. The remaining 50% will be financed during construction, with €1.67 billion coming from private investors. Several organizations are involved in the initial financing.

In addition to the French State, these include the immediately affected regions, Nord-Pas de Calais, Picardy, and Ile-de-France as well as the relevant departments. The European Union is making a significant contribution. Lastly, the seaports of Le Havre, Rouen and Dunkirk and the inland port of Paris are also participating in the financing.

The question of usage charges has not yet been fully clarified. Choosing a too high value for the usage charge implies the risk of a loss of market shares for inland shipping.

Technical characteristics and navigability

The Seine-Nord Europe canal has the following technical characteristics:

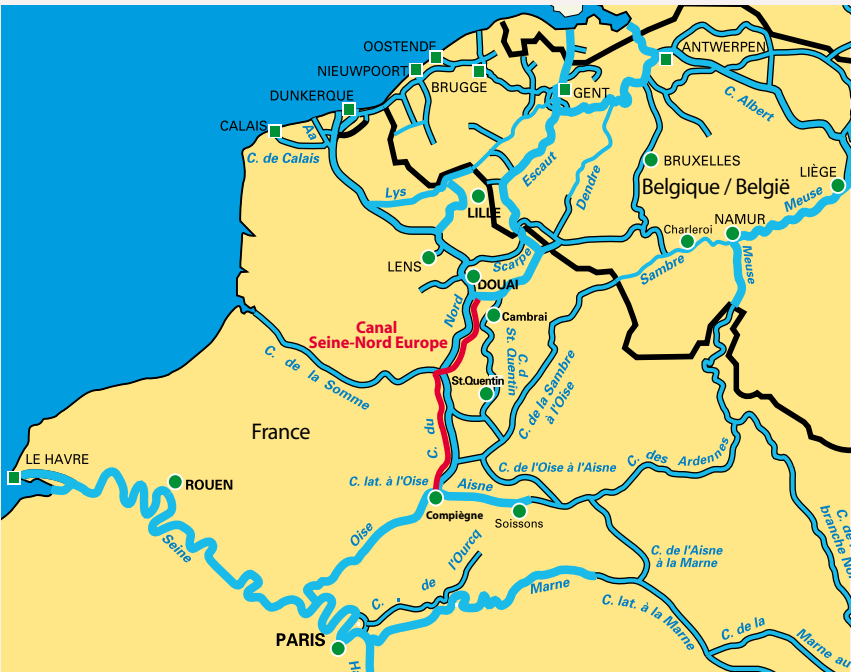
Length:	106 km
Width (on the surface):	54m
Draught:	3m
Clearance under bridges:	7m
No. of locks:	7
No. of multimodal platforms:	4
No. of corn quays:	5
No. of industrial quays:	3

Source: VNF

The canal will run parallel to the existing Canal du Nord. This latter waterway can only hold vessels with a carrying capacity of 600 tonnes.

The Seine-Nord canal, by contrast, will hold vessels with a capacity of 4,500 tonnes and permits three-tiered container transport. The average travelling time on the canal for a large Rhine vessel is about 18 hours.

Figure 19: The planned Seine-Nord-Europe Canal



Source: VNF

Benefits and economic effects

The social benefits that the Seine-Nord Europe Canal is expected to bring in the next 45 years are estimated at about €10 billion. Out of this, 75% is allocated to France, 15% to Belgium, 7% to the Netherlands and 3% to Germany. In France, the Ile-de-France region stands to profit the most (20% of the total benefits), followed by the regions of Nord-Pas de Calais and Picardy (17% each).

These social benefits will be generated by the following factors:

- Lower transport costs
- Availability of a transport route that is safe, predictable in terms of travel time, and independent of traffic jams on the road links (logistics argument)
- Structural effects on regional economies (improvement of local conditions of companies close to the canal)
- Less environmental damage
- Employment effects

Lower transport costs

The existence of a canal which is suitable for vessels with a larger carrying capacity enables transport costs to be reduced by exploiting economies of scale when transporting large quantities of containers, agricultural products, coal, sand, soil and construction materials etc.

This is illustrated by the cost comparison below: The external costs shown here indicate the environmental damage caused by the transport, estimated in money terms.

Table 3: Cost comparison for transporting one ton over 350 km

Means of transport	Commercial costs	External costs
Inland shipping with high loading capacity	€ 12 / t	€ 3 / t
Inland shipping with lower loading capacity	€ 17 / t	€ 4 / t
Truck	€ 21 / t	€ 12 / t
Railway	€ 22 / t	€ 5 / t

Source: VNF

Logistics argument

The Seine Nord Canal will basically run parallel to the existing A1 motorway between Paris and Lille. This A1 motorway is the most traffic intensive motorway in all of France, with an average volume of 14,000 trucks per day. At the same time, the capacity of the French railway system is exhausted, at least for freight transportation.

A canal that holds vessel with a large carrying capacity would relieve traffic and reduce the costs of traffic jams. At present, the waterway on the North-South axis has a market share of 3%. By comparison, the market share of the Seine, which can hold much larger vessels, is 13%.

Structural effects on regional economies:

The canal will provide French industry and agriculture with easier access to the global markets. Moreover, it connects the economic and demographic heart of France, the Ile-de-France around Paris, with the most important European seaports.

Displacement effects between regions are expected. For instance, there may be a partial displacement of logistics distribution centres from the Benelux region to France. Individual distribution centres would thereby move closer to Paris.

Less environmental damage:

Thanks to the canal, it will be possible to redirect truck traffic from the road to the water, which would save enormous quantities of CO₂. It must be remembered that the Seine-Nord Canal will basically run parallel to the existing A1 motorway between Paris and Lille.

Employment effects:

The employment effects of the project include, on the one hand, temporary jobs associated with the construction of the canal. It is estimated that 4,500 jobs could be created in this way. Furthermore, about 25,000 permanent jobs should be created by the year 2025, in the areas of logistics, industry and transport.

Transportation forecast

A traffic volume on the canal of between 13.5 to 15 million tonnes is projected for 2020. This includes 250,000 TEU of container transport. Transit traffic will account for 2/3 of the transportation on the Seine-Nord canal.

In this context, north-south traffic will be twice as important as that travelling south-north. This is because of the supply of sand, soil and building materials to the Parisian construction industry from the North of France and of containers from the seaports.

Table 4: Development of shipments through the Seine-Nord Canal on the North-South axis*

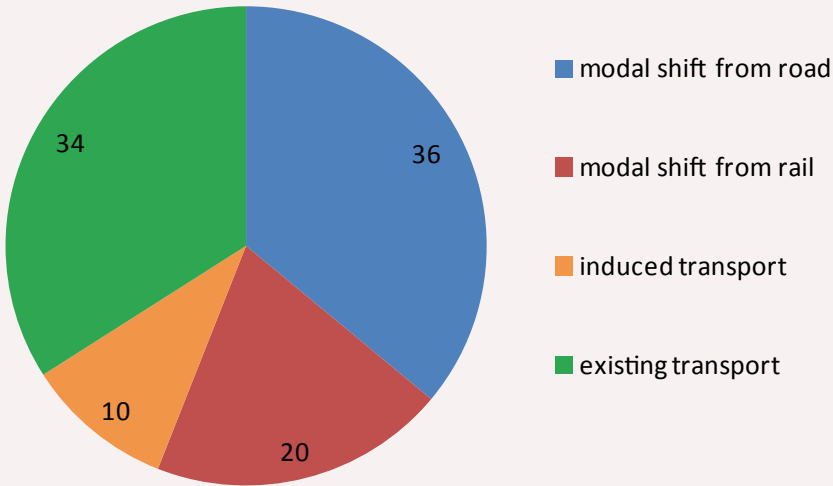
Water-based transport on the North-South axis	2020	2050
With Seine-Nord Canal	13.8 – 14.9 mil t.	16.3 - 27.7 mil t.
Current situation (without Seine-Nord Canal)	5.1 mil tonnes	5.0 mil tonnes

** with a usage charge of €1.75 / ton Source: VNF*

In other words, thanks to the canal, river traffic on the North-South axis is likely to triple between 2012 and 2020. Failure to go ahead with construction of the canal would lead to stagnation of inland shipping, due to the limited capacities of the three existing canals (max. carrying capacity of 600 t).

Over half of the additional traffic, amounting to almost 10 million tonnes, will result from traffic being displaced from roads and railways to the water.

Figure 20: Waterway transport on the North-South axis in 2020 (%)



Source: VNF

In addition to the displaced traffic, there is further traffic which will emerge for the first time in response to the new waterway. This induced transport will originate from industrial sectors which, up to now, have not used or have hardly used the waterway as a transport route in the regions under consideration. These include the chemical industry, the automobile industry, heavy goods and fertiliser.

The **categories of goods** for which the Seine-Nord Canal has a strategic significance include sand, soil, building materials, agricultural products, and containers.

Sands, Earths and building materials

There is considerable potential for the transport of sand, soil and building materials, in view of the high demand in the Ile-de-France (about 30 mil. tonnes per year) and in Picardy (12 mil. tonnes) and of the simultaneously dwindling supply in these regions. The quantity transported in 2020 will be 4.9 million tonnes, which represents 34% of the total transportation on the canal.

Agricultural products

The Seine-Nord canal will pass through regions with significant agricultural production. The opportunity of transporting agricultural products cheaply to the seaports is very favourable to the export opportunities of agriculture

in Picardy and in the region of Nord-Pas de Calais.

Moreover, the supply of raw materials to malt houses and other agricultural operations must also be taken into consideration. The quantity of agricultural products that will be shipped in 2020 is predicted to be 4.2 million tonnes, as compared with the 1.6 million tonnes currently being transported on the waterways of the North-South axis. This category of goods will account for about 21%. Most of the additional shipments will be taken over from the road traffic.

Containers

The canal will exploit the rising trend in maritime container transport for the benefit of inland shipping. There will accordingly be a significant increase in container transport by inland shipping in the North of France. The volume of containers being transported in 2020 is expected to be 250,000 TEU.

An estimated 180,000 TEU, or 72% of the total volume, will be accounted for by transit traffic. In 2020, containers, heavy goods and automobiles will be the second most important category of goods on the Seine-Nord Canal, with a 25% share of the overall transport performance.

Other goods categories

Other segments that will benefit from the Seine-Nord canal include mineral oil products, metal ores and chemical products. About 800,000 tonnes of mineral oil products will be transported on the Seine-Nord canal in 2020, which represents a fourfold increase compared to the situation without the canal. Producers of fluid bio fuels will play an important role here.

The waterway's modal split will increase to about 10% on the North-South axis in 2020. In France as a whole, the market share of the inland waterways will double from 3% to 6% thanks to the Seine-Nord Europe Canal.

Impact on neighbouring countries

The Seine-Nord Canal connects the waterways in Belgium with the Seine basin in the North of France. The improvement of the water-based hinterland connections will result in new perspectives for the large seaports in Belgium and the North of France. Consequently, there will also be an increase in the amount of transport on the waterways of Belgium and the Netherlands.

It is estimated that if the Seine-Nord Canal existed, the transport performance on Belgium waterways in 2020 would be somewhere between 2.5 and 2.9 billion tkm, as compared to a performance between 2 and 2.2 billion tkm without the canal.

In Belgium, the freight transport on roads would thereby lose roughly 3 to 6 percentage points from its modal split. The traffic congestion caused by trucks in Belgium would decrease. An increase in transport performance of a similar order of magnitude is forecast for the Netherlands.

Situation of the demand for transport in autumn 2011 and prospects for 2012

Section 1:

Situation of the demand for transport in autumn 2011 and prospects for 2012

► 1 - Economic growth: trends and prospects

Following a year that was characterised by recovery in 2010, the global economic conditions have slumped during 2011. Individual events, such as the catastrophe in Japan and the political developments in North Africa had a negative impact on economic growth. Above all, the rising oil price lead to a drop in private consumption in the 27 EU countries in the 2nd quarter, compared with the previous year.

The problems in the banking sector and the sovereign debt crisis are far from over and are damping the global economy in various ways. It is once more being demonstrated that financial crises are of longer duration than recessions originating in the real economy.

Sovereign debt in Europe is of great relevance. The government cutbacks which it necessitates restrict both public investment and private consumption, resulting in less growth. This primarily affects the peripheral and southern countries of the euro zone.

The IMF and the OECD, along with various economic research institutes, therefore conclude that the risk of a downturn in the second half of 2011 has increased substantially. These institutes have accordingly revised downwards their forecast for economic growth and global trade in autumn 2011. Weaker growth is expected in most countries for 2012 as compared with 2010 or 2011.

In 2011, the rise in oil prices is likely to continue at the same pace as in 2010. It will fall slightly in 2012 according the estimates of these institutes.

Table 5: Economic growth for the Rhine states and other countries

Country	Rate of change in real GDP (%)			
	2009	2010	2011	2012
Belgium	-2,7	2,1	2,4	1,5
Germany	-5,1	3,6	2,7	1,3
France	-2,6	1,4	1,7	1,4
Netherlands	-3,5	1,6	1,6	1,3
Switzerland	-1,9	2,7	2,1	1,4
Euro zone	-4,3	1,8	1,6	1,1
USA	-3,5	3,0	1,5	1,8
UK	-4,9	1,4	1,1	1,6
Japan	-6,3	4,0	-0,5	2,3

Source: IMF; Autumn Report 2011

Table 6: Global trade and oil price

Country	Rate of change (%)			
	2009	2010	2011	2012
Exports	-14,0	14,4	7,1	5,2
Import	-13,6	13,5	6,9	4,0
Oil price	-36,3	27,9	30,6	-3,1

Source: IMF; Autumn Report 2011. Exports and imports concern the developed countries

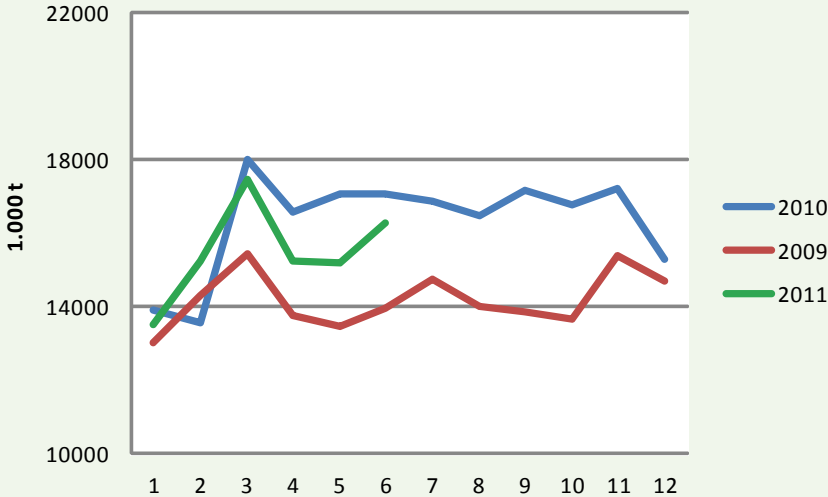
► 2. Transport demand: trends and prospects

In the first six months of 2011, the transport volume on the Rhine was almost 3.4 % lower than the same period of the previous year. However, it must be remembered that besides the weaker economic dynamics, the accident of the Waldhof tanker in January, the catastrophe in Japan in March and the low water levels on the Rhine also had to be coped with. Against this backdrop, the result looks rather positive.¹⁴

¹⁴ The earthquake and the flood in Japan did not have a strong influence on maritime shipping and inland shipping.

In the end, the above-mentioned accident mainly disturbed the Upper and Central Rhine, whereas traffic on the Lower Rhine was not negatively affected. This would explain the relatively high volumes in January.

Figure 21: Transport volume on the Rhine



Source: destatis

In view of the economic forecasts described above, the outlook is not as bright as it was six months ago. The slump in global trade, for instance, will probably dampen growth in the container segment, if not eliminate it altogether.

The steel and coal segment will also suffer from this slowdown. On the other hand, there is some light at the end of tunnel as far as the transport demand for mineral oil products is concerned, thanks to the easing of the oil price expected for 2012.

2.1 Agricultural and forestry products

In the first six months of 2011 this segment profited from rising corn imports from the USA, which passed through the port of Rotterdam and were carried onwards on the Rhine. The rising imports were due to below average harvests in France and Germany.

The reception of corn in Rhine ports in Switzerland grew especially sharply (by approx. 40% in the first six months). In France and in Wallonia, by contrast, there was a decline in this segment, amounting to 16% in France and 24% in Wallonia.

2.2 Foodstuff and animal fodder

In the wake of a reduction in import duties on feed grain by the EU, there was an increase in the amount of this type of good being imported in 2011. For example, the reception of foodstuff and animal fodder at the Swiss Rhine ports gained 15%. In France, the result was roughly 10% below the previous year's level, while it was about 5% higher than the previous year in Wallonia.

2.3 Iron and steel industry

Although steel production in Germany has stabilised again at its long term level, there was relatively weak ore transport on the Rhine during the first half of the year. One reason for this could be the low water levels. There is likely to be an increase in ore transport on the Rhine for the second half of the year, even more so as the port of Rotterdam is expecting more ore imports during this period.

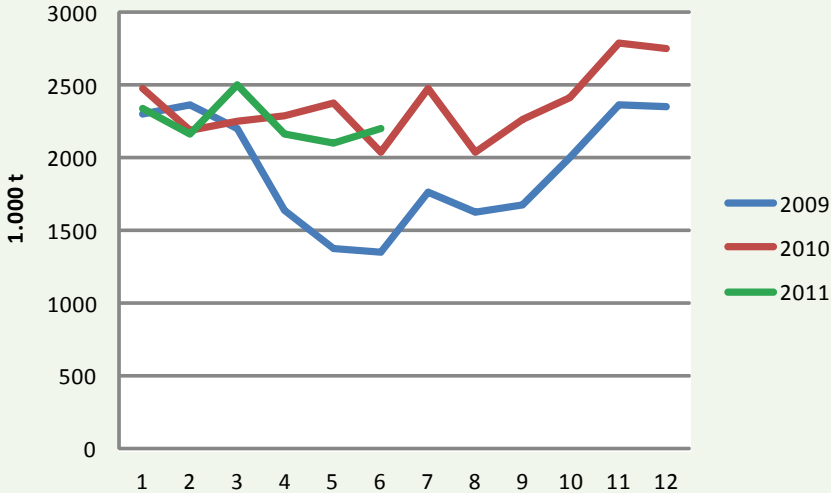
In France, on the other hand, transport of ores and scrap metals rose by 18% in the first half of the year, and there was growth of 66% in Wallonia, a classic steel producing region. This is certainly due to the reopening of steelworks around Liège. Admittedly, the ArcelorMittal steel company announced in October 2011 the final closure of the furnace in Liège. This will have a negative impact on ore transport in this region in the long run.

There has been unreservedly positive development in the metals and metal products sector. This applies to the Rhine as well to France (+17%) and Wallonia (+12%).

2.4 Solid mineral fuels

Altogether, the trend for coal transport on the Rhine remained around the same level as the previous year. During the second quarter, low water levels temporarily hampered the transport of coal on the Rhine.

Figure 22: Transport of solid mineral fuels on the Rhine



Source: destatis

Roughly 1.8 million tonnes of solid fuels were transported on French waterways during the first half of 2011. This corresponds to a reduction of 24% compared to the 2010, despite the fact that the French steel industry saw continuous growth during the first six months of 2011.

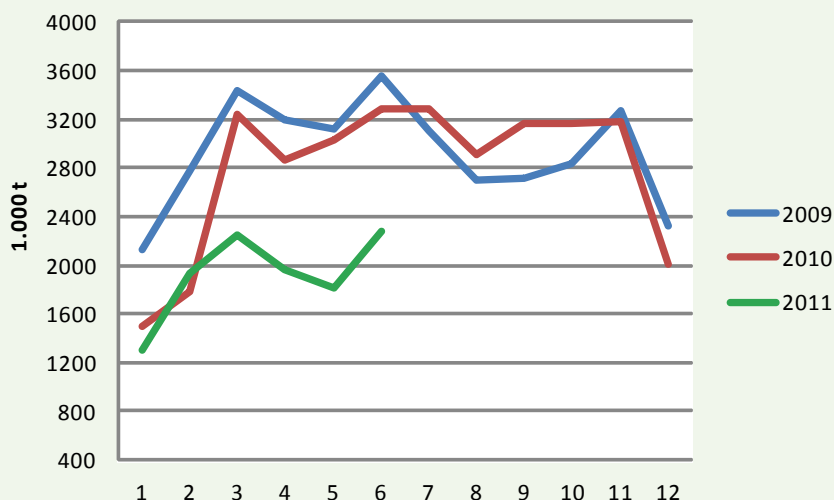
It must be taken into account that coal imports from Australia were interrupted during the first quarter because of heavy rain falls. The coal turnover at Le Havre sank by about 45% in the first half of the year.

And the import quantities also sank at the Swiss Rhine ports (by 40%). Although ore transport increased notably on Wallonian waterways, the transport of coal was still at 10% below the half-year result in 2010.

2.5 Stone, earth and building materials

Presumably due to the low water levels in the second quarter, the transport of sand, stone, earth and building materials developed very modestly during the first months of the year. This applies to the Rhine at least.

Figure 23: Transport of stone, earth and building materials on the Rhine



Source: destatis

On the other hand, there was growth in areas not affected by the low water level. With a volume of 11.5 million tonnes, about 7% more stone, earth, and building materials were transported on in France than in the previous year. Almost 9 million tonnes were moved on the waterways of Wallonia, equivalent to a rise of 14%.

2.6 Chemical products and fertilisers

Transport on the Rhine could essentially match the previous year, though with some slight losses in January. The latter were caused by the accident-related closure of the Rhine, because a large portion of the chemical industry is located in regions on the Central and Upper Rhine.

Vessels coming from the seaport with petrochemical raw materials were unable to approach these locations, and vessels with chemicals onboard could no longer reach the seaports. This was also reflected by a slump in

transport performance (tkm) during the first quarter.

Due to the absence of this long stretch (between the ARA region and the Upper Rhine) transport performance on the Rhine fell much further (-18%) than transport volume (-8%) during the first quarter of 2011. In France the result was more or less stable (-2%), in Wallonia it was 6% lower than the previous year.

In view of the continued strength of the German chemical industry, the trend should rise for the rest of the year. The German Chemical Industry Association (VCI) assumes that chemical production for the whole of 2011 will increase by 5% compared to the previous year.

The transport of fertiliser on the Rhine developed very positively. During the first four months, there was 24% more transported than in the previous year. As in the two previous years, March was the best month. This seasonal peak in March may be connected with the sowing cycle in agriculture. There was an increase of 20% in the fertiliser sector in Wallonia, but a decrease of 11% in France.

2.7 Mineral Oil products

Transport levels were comparable to those of the previous year. In the light of price hikes and full stores, end consumers only purchased absolutely necessary heating oil. In France the result was 10% below the previous year.

Wallonia saw an increase of 2%. This region of Belgium, incidentally, has recorded a steady rise in mineral oil products for several years, in contrast to Germany and the Rhine region, where the transport of mineral oil products has seen a downward trend.

The transport of mineral oil products will probably see some growth in 2012. This is explained by the expectation of economic researchers (cf. IMF) that oil prices will stop rising for a while in 2012. This will result from sluggish economic growth next year.

2.8 Containers

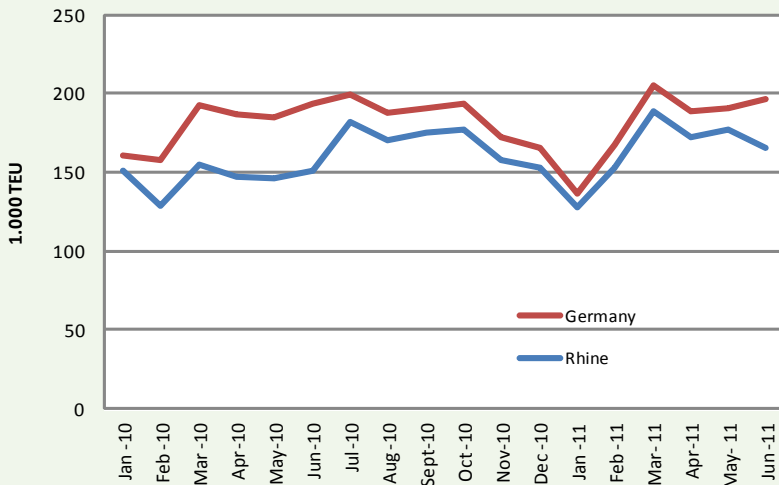
The Container segment was hit particularly badly by the “Waldhof” accident. This is due to the fact that container transport is a scheduled transport, where delays can cause significant economic damages. From the following graph, the fall-off in January can be clearly traced to the closure of the Rhine.

For the first time on German waterways, over 200,000 TEU were transported in March, with a total weight of just over 2 million tonnes. However, this all-time-record also reflects catch-up-effects regarding the closure of the Rhine in January.

The above mentioned figures include both the empty containers and the tare weight of the containers. If we leave out the empty containers, and only include the net weight (without the tare weight of the containers), a similar relationship emerges, namely an average weight of around 10 tonnes per TEU.¹⁵

The illustration shows that the Rhine still accounts for almost 100% of the total container transport on German waterways. This structural picture will probably change only very slowly in future.

Figure 24: Container transport on the Rhine and in Germany



Source: destatis

¹⁵ CCNR calculation based on data from destatis

The Swiss Rhine ports recorded a reduction of 5% in their container turnover during the first six months. It was above container exports which declined (-18%). The slump in exports is a consequence of the appreciation of the Swiss Franc against the Euro. The currency trend damaged Swiss exports for the entire first half of the year.

► 3. Market development for passenger transport

In the last year, the number of tourists who undertook a river cruise on a European river rose by about 10%. By comparison, maritime cruises grew by twice as much (+20%).

However, a survey conducted in Germany last year showed that there still exists a considerable potential demand for river cruises which has yet to be tapped. Out of the persons under 30 years of age who were asked, 42% could imagine booking a river cruise. In the case of the 50 to 58 year olds, the figure was 48 per cent. Only eight per cent of the survey participants had actually travelled by river already. Accordingly, demand is expected to grow by 10% per annum in the next few years.

It is worth noting that the river cruise is becoming more and more differentiated as a product, both in terms of its thematic focus and of the travelling time. Nowadays, the thematic focus of a river cruise can range from special trips for opera fans to trips for hobby cooks or people interested in archaeology. For these special trips, higher margins can be obtained. However, they do not have a high share of the total amount of voyages.

In terms of the time, a move away from the classic travel season can be observed. There is now a travel programme for Winter 2011/2012 on the Rhine, which includes, for example, a 6-day advent trip, a 7-day Christmas trip, and an 8-day New Year's trip. The extension of the season helps to drive down the high costs of the new ships, by distributing the total fixed costs to a higher number of sales days.

Section 2: **Relationship** **between supply and demand**

I. Fleet Development: New ships

► 1. Dry cargo shipping

A slump in the development of newly built ships in dry cargo shipping can be detected, at least in the first nine months of 2011.

Up until the end of September 2011, 12 new ships, with a total tonnage of about 31,000 tonnes, came onto the market. Ten of these were motorised cargo vessels and two were pushed barges. The motorised cargo vessels had an average capacity of 2,570 tonnes.

By contrast, for the whole of 2010, 48 new ships with a total tonnage of 110,000 tonnes were recorded. Assuming that there is no significant surge during the fourth quarter, there is likely to be a lower volume of new vessels in 2011, when compared with the previous year.

One of the important factors here is the fact that the wave of new vessels in 2010 was still essentially produced by orders placed in 2008, and therefore a late result of the strong economy in that year. Likewise, the weak shipbuilding activity in the current year reflects a low demand for transport in 2009, restrictive lending practices in the banking sector, and uncertainty about the future of the economy.

► 2. Tanker shipping

Up until the end of September, 28 new tankers were recorded, with a total capacity of about 94,000 tonnes. Just as in the dry cargo shipping sector, this indicates a slump in shipbuilding activity relative to the previous year.

A further 82 new ships, with a total tonnage of over 250,000 tonnes, came onto the market in the whole of 2010. There was also a very high level of activity in 2009, with over 200,000 tonnes (almost 10% of the capacity of the entire fleet).

Taking into account all the double-hull vessels newly built since 1990 as well as the conversions of single-hull into double-hull vessels, we can determine that 65-70% of tankers are double-hull.

It ought to be mentioned in this connection that some of the major actors in the market (mineral oil companies) have already announced their intention to end the use of single-hull vessels for transport from 2012 to 2015. It is conceivable that others will follow suit. To this extent, the important years of 2016 and 2019 specified in the ADN regulations should rather be seen as a horizon than as a turning point.

► 3. Passenger shipping

In the booming river cruise sector, twelve new vessels came onto the market during 2011. The average capacity of the new ships is around 180 beds.

The number of new vessels in 2011 thus exceeds even the rate of shipbuilding for the maritime passenger transport segment. It can also be seen from the order books that for the next year 2012, even sixteen new river cruise vessels can be expected.

It may be stated that the vessels are getting longer all the time, in order to distribute the high fixed costs over more beds – and thus higher revenue. However, there are limits to future expansions of the dimensions. For instance, the vessel dimensions have to be oriented to the existing lock dimensions and the clearance under bridges.

In the day-trip sector, three new vessels came onto the market during the first three quarters of the year, two for the Rhine and one for day-trips in the Netherlands.

II. Capacity utilisation and its development

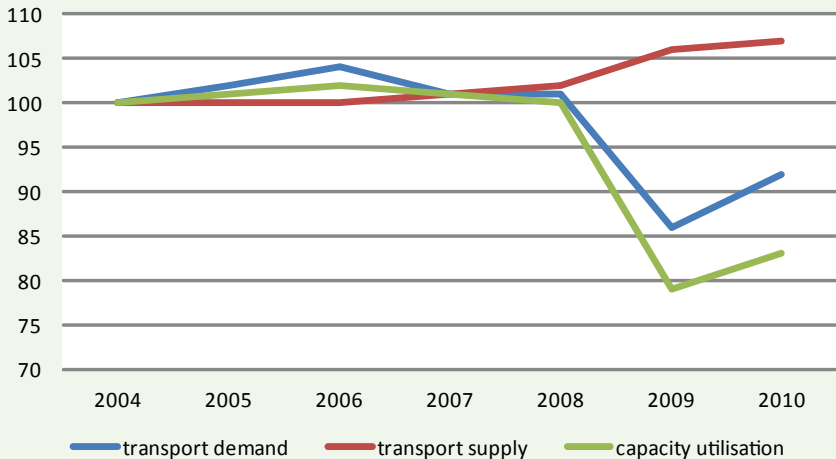
As already described, deployable transport capacities have increased considerably over the last three years, despite the economic crisis. In the same time span, the transport quantities have once again approached pre-crisis levels. The freight rates have risen again in dry cargo shipping. This growth is largely due to the water conditions however. It therefore makes sense in this context to analyse the degree of utilization of the fleets (dry cargo fleet and tanker fleet) and its development over recent years.

In order to calculate the degree of utilisation, both the impact of water conditions and seasonal effects on demand in the various categories of goods are taken into account. Allowance has also been made for the fact that the productivity of the vessels differs in accordance with their size and type of operation.

► 1. Dry cargo shipping

In 2011, the rate of vessel utilisation for the vessel categories in dry cargo shipping was higher than that in 2010. It was, however, significantly lower than the figures for 2007 and 2009, as shown by the following graph.

Figure 25: Development of capacity utilisation in dry cargo shipping



Source: NEA and ZKR Secretariat

This ongoing low capacity utilisation confirms the still highly unsatisfactory production and therefore profit situation of the shipping industry. As a result of the expansion of the dry cargo fleet, the utilisation of capacities did not increase to the same degree as demand. Compared with the time span 2004-2008, capacity utilisation is much lower.

However, the results vary for the different vessel sizes. For instance, it can be shown that the degree of utilization of the smaller units (carrying capacity under 1,000 tonnes) deteriorated slightly from 2009 to 2010. By contrast, it clearly improved for the larger units (over 1,000 tonnes carrying capacity). This is especially noticeable for vessels with a capacity of over 2,000 tonnes.

Smaller and larger units appear to be developing at varying rates. The utilisation of larger units improved somewhat in 2010, which can be explained by generally more favourable water conditions as well as by the fact that the larger vessels which had been introduced to the market in previous years were in full operation in 2010.

If the deployment of the vessels is broken down by size and by goods categories, the following trend clearly emerges: The share of the total transport accounted for by the larger units (>2,500 tonnes) is increasing in all segments. Generally, capacity utilisation was unable to recover to the same extent as demand in 2010, due to the introduction of numerous newly-built ships between 2008 and 2010.

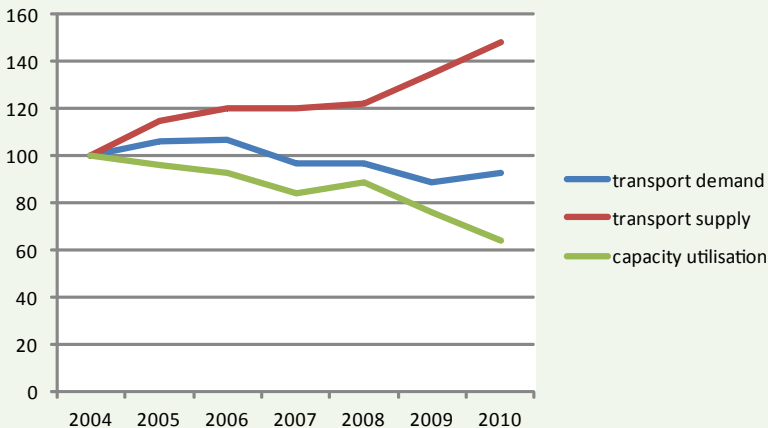
In order to reach a degree of utilisation similar to that before the crisis, the transport demand for dry cargo shipping as a whole would have to be considerably higher than the pre-crisis level. According to projections, this is not expected to happen in the short term. These findings indicate the existence of an over-capacity at present.

► 2. Tanker shipping

In tanker shipping – as a result of the ever increasing transport supply – the degree of utilisation of the fleet deteriorated in 2010. In fact, numerous new double-hull vessels were deployed as part of the ongoing restructuring of the fleet. The slight rise in transport demand was unable to compensate for this situation.

If the utilisation is broken down by vessel size, we find that the smallest units below 400 tonnes and the largest units over 2,000 tonnes have the worst utilisation rates. The category of vessels above 2,500 tonnes is receiving the largest share of the new tonnage, and single-hull vessels in the medium-sized range are still occupying a competitive share of the market.

Figure 26: Development of capacity utilisation in tanker shipping



Source: NEA and ZKR Secretariat

The supply side of the tanker shipping market needs to be viewed against the backdrop of fleet restructuring, from single-hull to double-hull vessels. Investments in new tankers are attributed much more to this development than to any changes in demand. A substantial number of double-hull tankers began operating in 2010, which led to noticeable overcapacity as demand continued at more or less the same level. Utilisation has continued to lag behind the level seen in previous years. On account of these factors, the rate at which new tankers went into operation slowed down considerably in 2010.

This raises the question as to the number of new double-hull tankers still required in order to meet future demand (i.e. in the period following expiry of the transition periods specified by the ADN). No quantitative evaluation of this issue was done as part of the current market observation report. However, we do wish to present several thoughts on the matter.

The sluggish increase in freight rates would indicate that the market is confronted with overcapacity. Assuming that a double-hull tanker has the same nominal capacity as a single-hull vessel, only a portion of the single-hulls still in service would need to be replaced by double-hulls. This leads to the question as to the rate at which the single-hull tankers can be taken from the market. A certain number of these vessels were built recently, so that this portion of the single-hull fleet could remain in operation until the end of the final ADN transition period (2019).

The more dated share of the single-hull fleet, on the other hand, will experience difficulties when having any repairs performed which are required for extension of the inland navigation certificate. The level of the investments required, the situation in the financial markets and the availability of necessary financing represent in this context the main obstacles to making the required investments profitably (the regulation requires the investments to be made by 2019 at the latest).

In view of the policy pursued by a number of oil companies to not allow any more single-hull tankers even before the end of the transition periods, the actual timeframe dictated by the market is likely to be considerably more limited. Consequently, it cannot be ruled out that a portion of this tanker capacity will disappear from the market in the course of a radical restructuring process.

Section 3: Situation of inland navigation companies

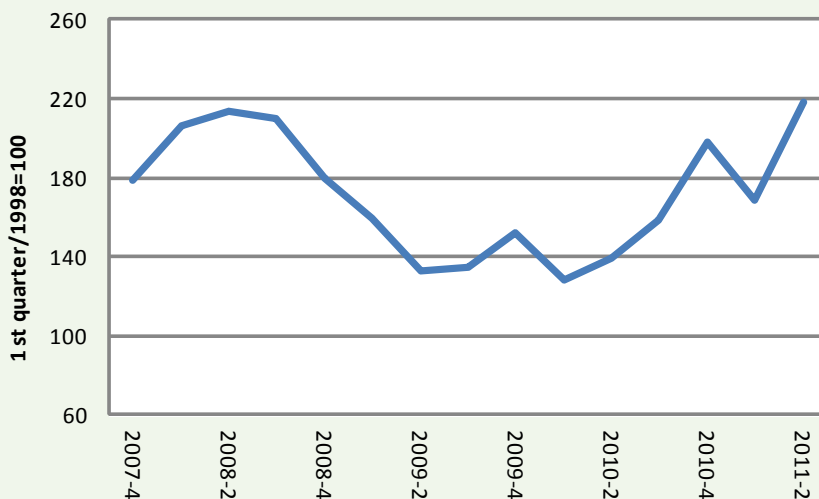
I. Development of freight rates and business activity

► 1. Dry cargo shipping

The freight rates have reached a relatively high level by the middle of 2011. In dry cargo shipping the pre-crisis level has been exceeded again. However, the rise in freight rates is only partially caused by the higher demand. In fact, the very low water level during the first months of 2011 played a large role.

The start of 2010 was roughly speaking the turning point when the demand for transport began to recover. The freight rates rose from this time onwards, as shown in following graph.

Figure 27: Freight rates in dry cargo shipping



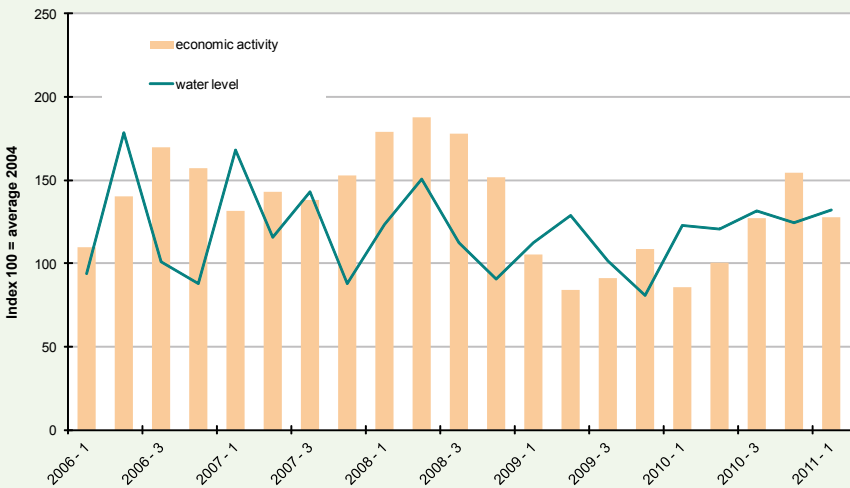
Source: Rabobank / NEA Consulting

The rise was not uniform from a regional point of view. There were greater increases in trips from Rotterdam to the Lower Rhine as in trips to the Central and Upper Rhine.

The transport prices, which have been rising since early 2010, along with the simultaneous increase in transport quantities, have again significantly improved the commercial returns in dry cargo shipping. After economic activity increased for four consecutive quarters, a decline was recorded again in the first quarter of 2011. However, this was primarily owing to seasonal factors (cold winter, temporarily falling freight rates).

The fact that freight rates are higher again should lead to a rise in the second quarter compared to the previous quarter.

Figure 28: Economic activity in dry cargo shipping

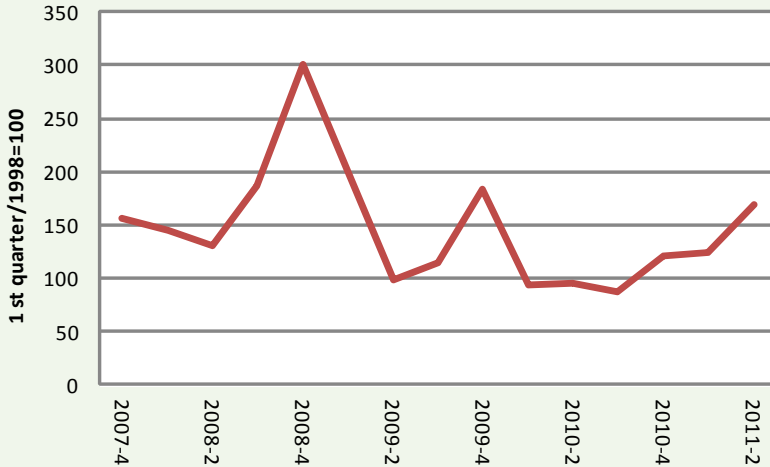


Source: Calculations by the CCNR Secretariat

► 2. Tanker shipping

In the tanker shipping market, the freight rates also rose for the first half of the year, but slightly less so than in dry cargo shipping. This is a consequence of the over-capacities already existing on the market.

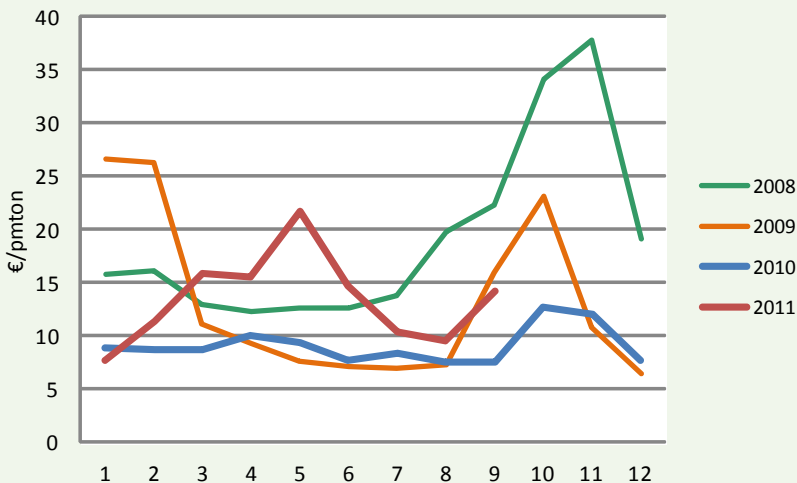
Figure 29: Freight rates in tanker shipping



Source: Rabobank / NEA Consulting

The falling water level made an important contribution to the rise in transport prices. During the 2nd quarter, the water level was relatively high, even in a comparison of several years. In the gas oil market, freight rates reached a higher level than in 2008, 2009 and 2010. However, in the 3rd quarter, there was a decrease.

Figure 30: Development of gas oil freight rates on the Rhine over several years

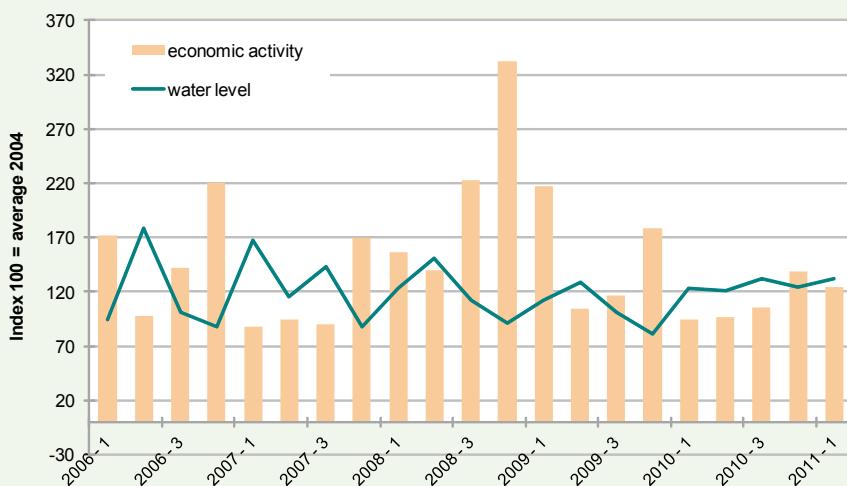


Source: PJK International 1 to 12 = months

Against the backdrop of attractive freight rates and a stable transport demand compared to the previous year, the economic activity (calculated as a product of freight rates and transport quantities) for the first quarter of 2011 was higher than in the same quarter of the previous year, but lower than in the previous quarter, Q4/2010.

This is explained among other things by the fact that economic activity and the freight rates are generally highest in the fourth quarter, as shown by a comparison of several years.

Figure 31: Economic activity in tanker shipping



Source: Calculations by the CCNR Secretariat

During the first six months of 2011, tanker shipping was confronted with another event, following upon the “Waldhof” disaster:

The insolvency of a major German freight company from Hamburg was announced on 21 February. This company had roughly 100 inland tankers under contract and a market share of 10% of European inland tanker shipping. As a consequence, the affected owner operators had to conclude new contracts of affreightment. In many cases, higher freight rates were realised in the process, which was another contributing factor to the rise of the average freight rate, apart from the low water level. However, this insolvency does not stand in direct relationship with the general economic development.

II. Cost development

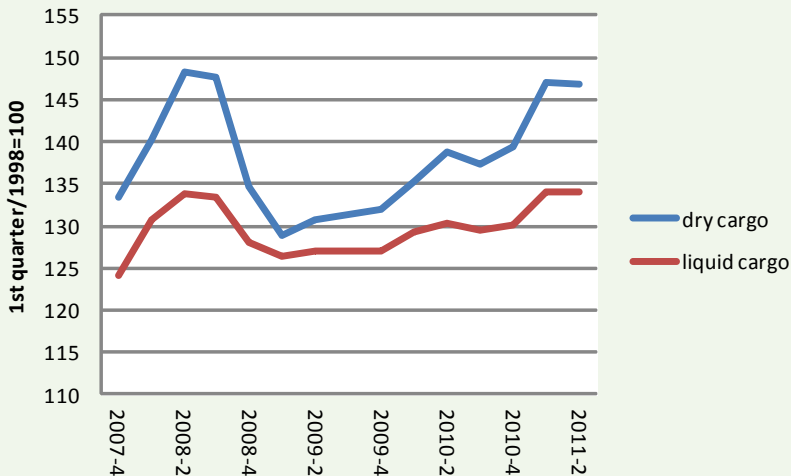
1. General cost structure and development

When it comes to the costs of inland shipping, as in other branches of industry, it is necessary to distinguish between fixed and variable costs. Most of the costs incurred by the operation of inland vessels are fixed costs, such as labour costs, financing expenses, depreciation and insurance costs. Generally speaking, only the fuel costs can be treated as variable costs.

The cost structure also depends on the type of vessel and the route: the proportion of the costs accounted for by fuel costs increases with the length of the route. For older vessels the proportion of the costs accounted for by the capital costs is lower than for new vessels, since the financing of older vessels have often been completed already, or they may even already have been written off completely.

As a general trend, it is safe to say that for short journeys, the labour costs and the capital costs are the two most important components. For long journeys, on the other hand, the fuel costs are the most important cost category, slightly ahead of the labour costs.¹⁶

Figure 32: Cost development for inland shipping by quarter



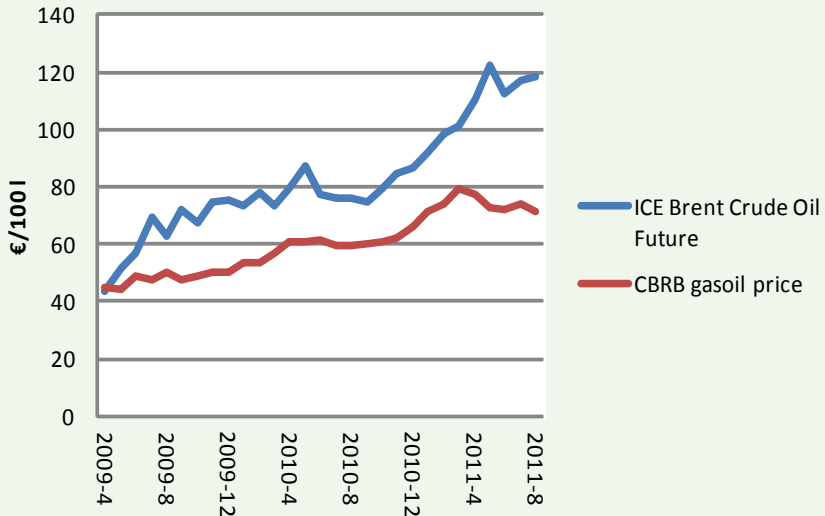
Source: Rabobank/NEA

¹⁶ Cf. the report 'Kostenstructuur tankvaart 2010 en raming 2011' by the NEA (published in January 2011).

2. Fuel costs

The development of the fuel prices for inland shipping is based on the oil price. The oil price has risen significantly after having dropped to a very low level in early 2009. This rising trend was accelerated further by the relatively rapid economic recovery in 2010.

Figure 33: Development of gas prices and the price of crude oil futures



Source: ICE Future Exchange, London; CBRB

Overall, the price of gas oil rose by some 20% between August 2010 and August 2011. By comparison, between the first half of 2010 and the first half of 2011 the price rose by an amazing 28%.

Since the 1st of January 2011, shipping companies have been required to pay a disposal charge of €7.50 per 1,000 l of gas oil. This charge is used to finance the disposal of waste oil and grease from shipping operations.¹⁷

Furthermore, the use of low-sulphur fuel has been mandatory on inland waterways in the EU since the 1st of January this year. There is no formal transition period, the maximum sulphur content of the new fuel is 10mg/kg. According to industry experts the new fuel is slightly more expensive than the old fuel and results in marginally higher fuel consumption.

¹⁷ Cf. Article 3.01 of the CCNR Convention on the Collection, Discharge and Reception of Waste arising from Rhine and Inland Navigation.

3. Labour costs

To get an idea of the trend in costs for labour or personnel, we referred to the pay scales for the Netherlands, looking at the wages in every branch of the inland shipping industry (dry cargo, tanker and push tug shipping) as well as the various ranks (captain, helmsman, able seaman and sailor). This data shows that the official wages laid down in the collective agreement rose by about 2% across the board between mid-2010 and mid-2011.

However, the wages actually paid to captains were probably significantly higher than the wages laid down in the collective agreement. Such extra payments, which are not governed by the collective agreement, reflect the supply and demand on the job market for captains. It was revealed by surveys conducted in the Dutch shipping industry by the research institute NEA.¹⁸ The actual development of labour costs thus probably exceeded 2%.

The rate of inflation in the Netherlands rose from 1.6% in July 2010 to 2.0% in January 2011, before reaching 2.6% in July 2011.¹⁹ The average rate of inflation for the period July 2010 to July 2011 was 1.9%. The wage increases – if you take the official increase in wages laid down in the collective agreement – in the period 2010-2011 was thus in line with the rise in consumer prices, meaning that real income for employees in the inland shipping industry remained stable.

¹⁸ Cf.: NEA (2011), Kostenstructuur Tankvaart 2010 en raming 2011; p. 11.

¹⁹ Source: CBS

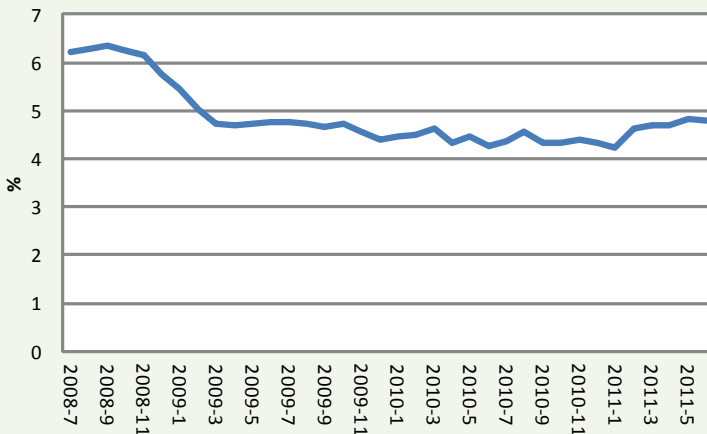
4. Capital costs

Most loans taken out to finance new vessels are for a term of somewhere between 7 and 10 years, with a fixed interest rate over the entire term of the loan in most cases. If we look at the general level of interest rates for loans granted to individual enterprises and partnerships, we find the following:

- In the period from 2008 until 2009 interest rates went down as a result of the cuts in base rates made by the European Central Bank in response to the global financial and economic crisis
- Interest rates then remained relatively stable up until the end of 2010
- In early 2011 interest rates rose as the ECB raised base rates.

Surveys of shipping banks suggest that this trend in interest rates also basically applies to loan agreements for ship financing in the inland shipping industry.

Figure 34: Development in interest rates for loans granted to individual enterprises and unincorporated partnerships*



Source: ECB *For loans with a term of between one and 5 years; with a fixed interest rate

The average interest rate for loans granted to German inland shipping companies (new builds) in recent years was between 4-5% for 5 year loans. For 10 year loans it was slightly higher and fluctuated between 5 and 6%.²⁰ In the light of the trend in interest rates shown above, a slight increase in financing costs has been seen since the beginning of 2011.

²⁰ Source: Survey of shipping banks conducted by the CCNR Secretariat

The economic crisis brought about a fundamental change in credit conditions. Before 2008 it was not unusual to have a debt component as high as 80 to 85% – especially in the Netherlands. Now, however, Dutch and German banks require a much higher equity ratio. The maximum debt component accepted by Dutch banks for financing new builds has dropped to about 70%.²¹

German banks have reported strong growth in the demand for credit for financing new ships (approx. 30%) for 2010. This growth is solely due to the dynamic development of the tanker market, whilst demand for credit in the dry cargo shipping industry has stagnated.

The capital costs also include depreciation, in other words the decline in the value of capital equipment (the ships) over time. The level of depreciation depends on the value of the ship and its working life. As the value of ships increases – in particular due to the rising number of high-cost double-hull tankers – the depreciation rate, and thus the capital costs, increases, assuming that the working life remains constant.

5. Insurance costs

Before describing the development of insurance premiums for ship insurance, we will first take a brief look at the structure of the ship insurance market. Of the various insurance products available to the inland shipping industry, three play a dominant role in practice:

1) Protection & Indemnity (P&I)

This is a form of liability insurance offered by P&I Clubs. This insurance provides third-party liability insurance cover to ship operators, which can include:

- Death and injury of passengers or third parties
- Pollution or contamination of water, air or land
- Loss of or damage to the load

For shipping companies that transport dangerous goods (ADN), this insurance is stipulated as mandatory by the cargo shippers (chemical companies etc.). Serious damage can result from the loss of cargo when carrying hazardous substances. It is often stipulated for transporting dry goods, too, however.

²¹ Source: Dutch inland shipping consultancy

For companies involved in dry cargo shipping the cost of P&I insurance is generally lower than for tanker shipping companies, since the potential damage that may result from an accident is significantly higher for the latter, and because the tankers are usually more expensive.

2) Hull & Machinery insurance (together with engine insurance)

Hull & machinery insurance provides protection for the ship against the risks of navigation such as storms, stranding, sinking, accidents, fire and explosions. In the event of loss, the insured company receives the salvage costs. In Germany a separate insurance policy is often taken out for ship engines, elsewhere they are often included in the hull & machinery insurance. The latter is often required by banks as a prerequisite for granting a loan to finance a ship.

The insurance premium payable for hull & machinery insurance varies widely and depends on a number of different factors, including:

- Vessel type
- Vessel size
- Value of the vessel
- Customer's claims history
- Engine details (primarily its power in kW) and the year the engine was built

3) Loss-of-Hire

Is an insurance against a loss of income, which takes effect when, for whatever reason, the ship is "out of hire".²²

Loss of Hire insurance can, for example, cover the loss of income resulting from the ship being repaired due to a Hull & Machinery claim, the income in this context being freight income. The insured receives a daily amount, up to an agreed maximum.

Premium development

Overall, the surveys conducted by Dutch and German shipping underwriters indicate that insurance premiums have remained relatively stable. There are variations among the different types of insurance cover, however:

²² Heuer' is an old German word for the wages earned by a seaman or sailor (similar to the word 'anheuern').

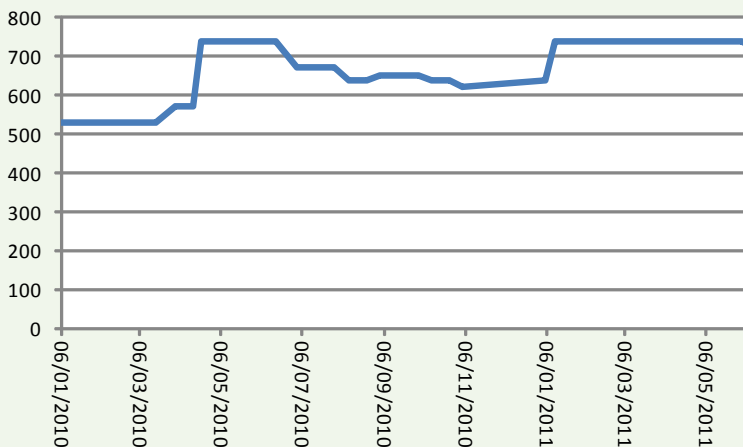
- There is a slight downwards trend for hull & machinery insurance. This slight downwards trend can be put down to greater competition between a rising number of insurers.
- P&I insurance has remained fairly stable, but there is upwards pressure resulting from the increasing number of claims and rising reinsurance premiums. In the long term, P&I insurance premiums could well rise due to the rising maximum limits of indemnity (increasing liability limits).²³

6. Maintenance costs

The level of maintenance costs is dependent on steel prices, on the one hand, and on the capacity utilisation of shipyards, on the other. Steel prices (average price of the main types of steel) rose by about 37% between the start of 2010 and the middle of 2011, which entails an increase in maintenance costs.

The rate of inflation accelerated too. This also affects the maintenance costs, as repair costs increase with rising prices for energy and electricity. In August 2011, the annual rate of price increases in the 27 EU countries was 2.5%, a significant jump from August 2010 (1.6%), mainly due to the higher energy prices.

Figure 35: Development of steel prices (index)



Source: E.L.F. Hallen- und Maschinenbau

²³ The legal provisions regarding the maximum liability are laid down in the Strasbourg Convention on the Limitation of Liability of Owners of Inland Navigation Vessels (CLNI).

7. Passenger shipping

The cost structure of passenger shipping is somewhat different from that of freight shipping. On the one hand, because passenger vessels are on average considerably more expensive than freight vessels. A typical price for a passenger vessel is roughly €15 million and therefore on average about 2.5 to 3 times more expensive than a new freight vessel. These higher procurement costs entail higher capital costs (interest, depreciation).

On the other hand, the operation of passenger vessels is considerably more labour intensive than freight vessels. A typical river cruise ship with 150 passengers has from 6 to 8 nautical employees and about another 30 employees in the hotel department.

In the context of the insurance costs, P&I insurance plays an especially important role. It covers risks to the health and life of the passengers.

The amount of the P&I premium depends among other things on the travellers' country of origin. The presence of US American passengers results in higher premiums for the shipping company: premiums are at least doubled in this case. The reason for this is the distinct "lawsuit culture" in the US, together with a high occurrence of legal insurance cover.

The cost of comprehensive insurance increases with the value of the vessel. For instance, the annual premium for a river cruise ship with an insurance value of €6 million is approximately €40,000, whereas it is already €90,000 for a vessel with an insurance value of €14 million.

A statement of costs for a typical river cruise ship is presented below. A ship with 150 beds is considered, which has an operational time of 210 days per year (during the season from April to October). Most river cruise ships operate between 210 and 240 days per year.

Table 7: Statement of costs for a typical river cruise ship (costs per year, model calculation)

<i>Operating costs</i>	€ 2 million
<i>Of which:</i>	
Labour costs / nautical department	€ 0.3 million
Labour costs / hotel department	€ 0.5 million
Insurance costs	€ 0.12 million
Other operating costs (fuel, etc.)	€ 1.1 million
<i>Capital costs</i>	€ 1.5 million
Total costs	€ 3.5 million

Source: River Advice Basel

As far as the rise in fuel prices is concerned, passenger vessels are affected in the same way as freight vessels. This also applies to insurance, maintenance and capital costs. There are differences with regard to labour costs, however, as the recruitment of hotel staff is not confronted with the same difficulties which affect the recruitment of qualified nautical personnel.

Conclusion

The two most important cost drivers in inland shipping at present, and for the foreseeable future, are fuel costs and labour costs.

The rise in gas oil prices is due to the increasing oil price and is set to continue. It can be cushioned only temporarily using futures contracts. Moreover, further cost increases can be expected due to the introduction of environmentally friendly fuels.

Labour costs shall rise in the medium-term as a consequence of the shortage of personnel in the inland shipping industry. At present, the employment of personnel from countries on the Danube is still facing bureaucratic hurdles, leading to a situation in which shipping companies are finding too few qualified workers on the market.

SUMMARY AND OUTLOOK

The difficult economic situation that was imminent by the end of last year has continued and become even more critical in 2011, so that the growth forecasts for several countries have had to be revised downward. While the prospects for the next few years have consequently become less favourable, 2011 will probably come to be judged a satisfactory year, at least for dry cargo shipping. This judgement needs to be stated more precisely, since the sector has not yet returned to the conditions seen prior to the crisis. Still, an increase in freight rates could be observed for the dry cargo sector, even though the increase was to be attributed in part to water conditions.

Nonetheless, a strong upwards trend was seen for the dry cargo market on the whole. This situation is also reflected in the improved level of fleet utilisation. Further growth is required, however, in order to reduce the overcapacity available on the market in the wake of the crisis.

Tanker shipping, in contrast, is in an entirely different position. Growth rates for transport demand will increase only slightly in the short and medium term and depend largely on developments in the transport of chemical products. There continues to be noticeable overcapacity in the tanker shipping market. Overcapacity accounts for the fact that freight rates in the tanker shipping sector increased only slightly in comparison with the dry cargo sector.

The tanker fleet is in the midst of a critical phase within the restructuring process. On the one hand, the supply of new double-hull tankers meets the requirements of regulators and cargo shippers, while at the same time the rate at which single-hulls are being withdrawn from the market has slowed down. Appropriate market framework conditions are required in order to profitably operate the new double-hull tankers. Despite current overcapacity, additional investments are necessary in the long term in order to succeed in meeting future demand; specifically in the years after the transition periods expire (by the end of 2018).

Even though 2008 can be considered an above-average year for tanker shipping on account of the high freight rates, the losses in turnover experienced since have weakened the financial situation of many companies. A number of market participants have announced initiatives to no longer employ single-hull tankers for their transports. This is certain to accelerate fleet restructuring, as will the impact felt from the expiry and

non-renewal of inland navigation certificates. Yet it remains to be seen whether these measures are sufficient to ensure a balanced rate of old hull capacities being withdrawn from the market and additional double-hull tankers entering into service.

Annex

New Constructions

Ship type	2008			2009			2010		
	Number	T	kW	Anzahl	T	kW	Anzahl	T	kW
Motor cargo vessels	68	226750	92944	72	237668	114002	24	73000	36000
Pushed cargo barges	38	70206		44	97461		24	37000	0
Total	106	297010	92944	116	335129	114002	48	110000	36000
Motor tankers	47	117500	31870	87	228020	72778	79	250000	42000
Pushed tanker barges	0	0		0	0		3	5230	
Total	47	117500	31870	87	228020	72778	82	255230	42000
Pusher boats	3		1684	6		11188	2		1368
Tug boats	3		0	6		1697	0		0
Total	6		1684	12		12885	2		1368
Cabin ships	3		5092	9			3		2871
Excursion ships	6		5092	1			4		2828
Total	9		8184	10		0	7		5699

Ship type	2011 (End of September)			Total since 2008		
	Number	T	kW	Anzahl	T	kW
Motor cargo vessels	10	25704	12430	174	563122	255376
Pushed cargo barges	2	4983		108	209704	0
Total	12	30687	12430	282	772826	255376
Motor tankers	28	94000	32080	241	674701	178728
Pushed tanker barges	0	0		3	5230	0
Total	28	94000	32080	244	679931	178728
Pusher boats	1		1268	12	0	15508
Tug boats	0		0	9	0	1697
Total	1		1268	21	0	17205
Cabin ships	7		3682	22	0	11645
Excursion ships	3		1658	14	0	7578
Total	10		5340	36	0	19223

GLOSSARY

20-foot Equivalent Units (TEUs): Unit of measurement for registering containers according to their dimensions and for the description of the capacity of container vessels and terminals. One ISO 20-foot container (20 feet long and 8 feet wide) corresponds to 1 TEU.

ARA ports: Abbreviation for the three major European ports of Amsterdam, Rotterdam and Antwerp.

Demand of transport: demand coming from the industry to the shipping industry for transportation of goods. Is calculated in Tons and TKM.

Downstream navigation: navigation downriver

Downstream: Refers to the part of an inland waterway located between a given point and the embouchure or confluence.

Draught: Height of the immersed part of a vessel; thus draught affects the loading level.

Dry hold: Used for the transport of dry cargo.

Econometric ratio: Estimated ratio between two or more values (e.g. production of steel, transport on inland waterways, imports of coal, etc.) on the basis of statistical data, using electronic calculation procedures. This estimate is used in making forecasts.

Electric steel: Electric steel is produced by melting down scrap metal using electric arc technology.

Freight: Refers to goods being transported or the price of transport.

Handling: Trans-shipment of goods from one means of transport to another.

Hold: Compartment covering the larger part of a commercial vessel, for the storage of cargo to be transported.

Inland navigation / inland waterways transport: Transport of goods or persons on board a vessel intended for transport on a given network of inland waterways.

Inland waterway: Navigable inland waterways that may be used with a normal load by vessels with a minimum deadweight of 50 tonnes. Inland waterways include navigable rivers, lakes and canals.

Loading depth of a ship: Mesure of the loading capacity of a ship as it can be used in accordance to the water depth.

Offer of transport or of capacity: Total loading capacity of the available fleet, expressed in tonnes.

Oxygen steel: Steel produced from iron ore and coal using blast-furnace technology, passing through a number of stages (injection of oxygen, etc).

Production/yield: The notion of production/yield as used in this publication is intended to define in index form the activity of inland waterways transport, taking into account a given level of demand and the freight rates applied on the market.

River/sea transport: Transport of goods on board a river/sea vessel (seagoing vessel designed for use on inland waterways), carried out entirely or partly on the inland waterways network.

Service: Refers to the service of the transport of goods, expressed in tonnes/kilometre.

Tanker hold: Used for the transport of cargo in tankers.

Tonnes/kilometre (Tkm): Unit of measurement for transport services, corresponding to the transport of one tonne over one kilometre of an inland waterway. Determined by multiplying the volume carried in tonnes by the distance travelled in kilometres.

Transshipment: Unloading of a cargo from one seagoing freight vessel and loading onto another seagoing freight vessel, even if the cargo has remained on land for any length of time before the transport continues.

Upstream navigation: Navigation travelling upstream.

Upstream: Refers to the part of an inland waterway located between a given point and the source.

Water conditions: Height of the water in a river or canal, in cm.

SOURCES OF INFORMATION

International Organisations

European Union
European Central Bank (ECB)
Eurostat
International Monetary Fund (IMF)
OECD

Industrial Organisations and Associations

German Chemical Industry Association (VCI)
German Association of Coal Importers (VDKI)

National authorities

German Federal Institute of Hydrology
Centraal Bureau voor de Statistiek (CBS)
Direction générale opérationnelle de la Mobilité et des Voies hydrauliques (Wallonia)
East Midlands Development Agency
Region Emilia-Romagna / Directory Infrastructure, Logistics and Mobility
German Statistical Office
Polish Office of Statistics
UK Department for Transport
Wasserschiffahrtsdirektion Südwest

Inland Shipping Organisations

Agenzia interregionale per il fiume Po (AiPo)
British Waterways
CBRB
EBIS
ELWIS
EBU
IVR
Voies Navigables de France

Ports

Amsterdam
Antwerp
Le Havre
Rotterdam

Private Companies:

Allianz Versicherung Hamburg

Cory Environmental

E.L.F. Hallen- und Maschinenbau

Hamburger Sparkasse

ICE Futures Europe

NEA Consulting

Post & Co (P&I) B.V.

PJK International B.V.

Rabobank

River Advice Basel

Stichting Abri – Administratiekantoor

Venezialogistics

Vereinigte Schiffsversicherung V.a.G.

Several other banks and insurance companies, anonymous

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