INLAND NAVIGATION IN EUROPE

Marketobservation

2010
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Market observation no. 11

Supply and demand situation in 2009 and analysis of the state of the economy in mid-2010

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FOREWORD

Even if it cannot be the goal of the market observation to point the sector or individual companies towards a hard and fast path through an economic crisis, this tool should however contribute to a better understanding of the perceptions that exist in the market.

To this end, this publication encompasses a detailed description of the latest supply and demand side developments.

What clearly emerges from this is that industry, and inland navigation with it, are on the path to recovery.

At the same time however we note that the imbalance between supply and demand in dry goods shipping is currently relatively acute so that it will be some time yet before the inland navigation industry reaches “calmer waters” again.

Transport prices, for example, are still proving relatively sticky in the face of currently positive developments in fleet utilisation. Of importance however is the observation that the multi-annual wave of new construction in the dry goods shipping sector will come to an end this year.

In the tanker shipping sector, on the other hand, the restructuring of the fleet will necessarily require a considerable number of new vessels. At the same time however there are still numerous single hull ships operating in the market that are not being withdrawn at the same rate, most of which however will be excluded from access to cargo carrying by 2019 at the latest. It will become apparent in the years ahead to what extent the market is able by its own endeavours to forge an equilibrium between supply and demand.

By way of a contribution to a better understanding of how the tanker shipping market operates, this report contains an analysis of freight rates for gasoil transportation, quantitatively the most important tanker shipping segment.

An additional topic area is dedicated to passenger traffic, a segment of the inland navigation industry of considerable economic importance.

Finally, also mentioned here is the modal split fact sheet, which is intended to help to assess the economic importance and position of inland navigation relative to the other land transport sectors.

Although the crisis and its repercussions have not yet resulted in any irreversible structural developments, the second half of 2010 and beginning of 2011 will show how resilient the inland navigation industry will be in the face of this recession. Because the massive investment during the past decade has resulted in a high proportion of loan capital. It should be noted here that loan financing has recently become more expensive owing to a revaluation of ship values and the resulting higher risk premiums.

The recovery in demand that can be felt in important areas of the inland navigation market has not yet resulted in a sufficient improvement in individual shipping companies' profit situation. This means also that the corresponding financial outlay in the relevant parts of the industry has not again become affordable.

Fact sheet 1: Passenger transport market

1. INTRODUCTION AND PRELIMINARY REMARKS

In very general terms, passenger navigation comprises day trips (also referred to as passenger traffic or excursion traffic) and river cruises (or cabin navigation). Day trips comprise scheduled and occasional traffic. A river cruise is the term given to a river trip involving an overnight stay in cabins on board. A distinction can be drawn here between the smaller hotel ships with a maximum of 50 beds and the larger ones with more than 50 beds. The hiring of ships and sports boats also has to be included in river tourism, playing a major role especially in France. [1]

Inland waterway navigation also includes excursion traffic on lakes which is important for example in Switzerland, Austria and parts of Germany but which is not investigated in this current study. An additional category is (short haul) public passenger transport on rivers involving ships and ferries. While it is theoretically possible to distinguish this from tourist traffic, in practice such a distinction is virtually impossible from a statistical perspective. As far as day trips are concerned there is a degree of overlap between tourism and public passenger transport. These areas of overlap are more pronounced in individual countries, such as Hungary or the Netherlands for example, than in other countries. These areas of overlap are not relevant to river cruises as they are of a distinctly tourist nature.

As far as the factors influencing passenger numbers are concerned, what we can note in general terms is that passenger navigation demand is not entirely independent of economic and cyclical trends but does not respond as sensitively to economic fluctuations as freight transport. What are more important are long-term factors such as demographics or consumer habits which sometimes also depend on culture. For example, river cruises were previously rather unusual in France whereas in Germany they have a very long tradition.

The demographic factor is significant in two respects: Firstly, because the target group's average age is currently relatively high. The situation in Germany is that ap-

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1 *France was home to 68 companies and 127 rental locations in 2007. The fleet comprised 1838 ships. 159,000 passengers were carried in 2007, primarily in Languedoc-Roussillon, Burgundy and Lorraine.*

proximately two thirds of river cruise passengers are currently at least 58 years old. For demographic reasons this target group will grow by roughly 20% over the next ten years. To some extent - assuming travel habits remain constant - this reflects the anticipated market potential.
Secondly, demographics also play a role because recently other age groups as well have been attracted. This has been achieved for example by adapting the on-board musical programme to younger customers. This therefore is a case of expanding the potential market by adding an additional (demographically separable) target group which is distinct from the growth of an existing target group described above.

Day trips or excursions are dominated primarily by medium-sized companies with relatively local operations. As a rule therefore the company's locations coincide very largely with the ships' areas of operation. This also facilitates the statistical measurability of this economic sector. Day trips are therefore presented according to travel areas in individual countries (France, Germany, Switzerland, Austria, Hungary, Slovakia). Where the statistics permit the trend in supply and demand is compared over time. But this is only possible for France as a result of the data situation. For Germany the only figures available are for the trend in supply whereas for Austria, Slovakia and Hungary it is only possible to show the trend in demand.

The river cruise sector on the other hand is characterised by international, typically larger companies. Complex international intercompany ties make it more difficult to measure this economic sector in statistical terms. This is especially so for the supply side of the market. The demand side can be better captured in terms of national customer groups. This present study looks at the demand side for the French and German markets. To some extent Germany is a classic country for river trips because the Rhine alone is one of the world's most important cruise rivers. The more in-depth treatment of France is explained by the fact that French travel areas, and in this case especially the Rhone, have attracted significantly greater interest among international customers in recent years.

2. DAY TRIPS

The following tables provide an overview of the fleet, capacity and annual passenger numbers for European day trip navigation. The French and Austrian data also include foreign providers operating in these two countries whereas the remaining countries feature only the national fleet.

The ships specified in the table are generally used only for day excursions. But for Germany the statistics do not permit a clear split between ships for day excursions and ships with overnight cabins. That is why the table for Germany only features the ships that are clearly used for excursion traffic. The figures thus represent the lower end of the minimum number of ships and capacity, while in reality probably being higher.

The chart is broken down into Western European and Central and Eastern European countries, with the rivers Rhine and Danube being selected as reference points. The German fleet has hence been divided up and the ships belonging to the German Danube shown separately.

Table 1: Daytrip boats, capacity and passengers: Rhine/Western Europe

Number	Germany	France	Netherlands	Belgium	Switzerland
Ships	642*	378	713	26	7
Places	148,709	47,268	177,000	approximately 3,000**	1,627
Passengers	No info	10,700,000	No info	No info	94,601

*Sources: Germany: Wasserschifffahrtsdirektion Südwest (Southwest Waterways Directorate); France: Voies Navigables de France; Netherlands: Inspectie Verkeer en Waterstaat; Belgium: Service Public Federal Mobilite et Transport; Switzerland: Bundesamt für Statistik; Schweizerische Rheinhäfen; * excluding ships on the Danube, daily excursion boats only ; ** partly estimated*

Table 2: Daytrip boats, capacity and passengers: Danube/Central and Eastern Europe

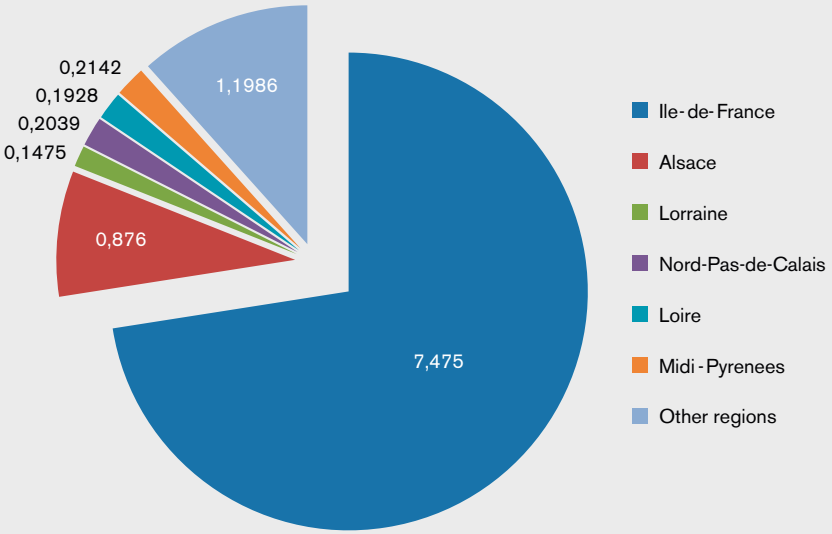
Number	Austria	Hungary	Germany	Slovakia
Ships	56	74	23**	15
Places	16,300	11,628	9,249	1,421
Passengers	850,000*	No info	No info	122,000

*Sources: Germany: Wasserschifffahrtsdirektion Südwest (Southwest Waterways Directorate); Austria: Via Donau; Slovakia: National Statistical Office; Danube Commission; Hungary: Danube Commission. * incl. foreign providers ** daily excursion boats only*

94,601 people were carried on routes in **Switzerland** in 2009 compared with 100,100 in 2008 (-5.5%). Scheduled services have a 67.6% share of excursion traffic, namely two thirds. A further 13.5% are accounted for by entertainment trips and approximately 19% by charter trips. The seven ships belonging to Swiss shipping companies are based in Basle and the surrounding area. The routes range from Rheinfelden via Kaiseraugst, Basle, Weil am Rhein to Huningen in France.

With approximately 10.3 million passengers transported (2007) **France** is an important market. Just less than 73% of all excursion ship passengers in France are carried in Paris and the Ile-de-France. This is followed in second place by Alsace, other regions are of almost no significance (see following chart).

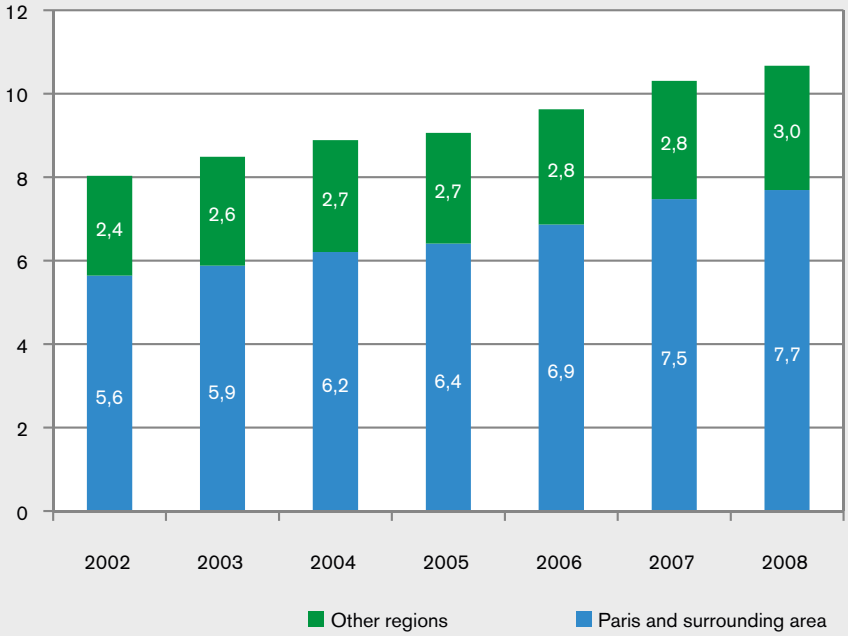
Figure 1: Number of people transported on daytrip boats in France (in millions) in 2007



Source: VNF; Ile-de-France = Paris and environs; figure for Alsace also contains a number of foreign ships

Excursion demand in recent years has exhibited a positive trend. Paris and the environs (Ile-de-France) recorded growth of 36% between 2002 and 2008, at 24% the rate of increase in the other regions was somewhat less. For France as a whole this resulted in an increase of 33%. In 2008 Alsace was the fastest growing region, also attributable to the building of a fast train link (TGV) between Paris and Strasbourg in 2007.

Figure 2: Number of passengers carried on excursion boats in France



Source: VNF. In millions of people

By contrast, the transport capacity (in terms of the number of available passenger places) in the same period rose only slightly, increasing by only 5% nationwide. In 2008 the French day excursion industry (boats for hire are not included!) numbered 378 ships with a total of 47,268 places. For a number of years the share of the national transport capacity accounted for by the Ile-de-France has been somewhat more than 50%. The ships used in Paris are on average considerably larger than those in other French regions. The average capacity of a boat used in the Ile-de-France is approximately 300 places compared with 136 places per boat in the other parts of the country.

In summary we can say that in Paris and its environs the increase in demand between 2002 and 2008 significantly outstripped supply (+36% compared with

+2%). In France's other regions demand growth also outstripped supply but the difference here was not so great (+24% in the case of demand, +8.5% for supply).

For some time now a new trend has been apparent in **Germany**, which could be dubbed "home country vacationing". River day trips also stand to benefit. Unfortunately however there are no official figures available for the number of river day trip passengers, only information on ship capacity broken down by individual rivers. If one ignores a special statistical effect explained below in greater detail, the Rhine is the most important river in terms of passenger capacity. The middle Rhine valley between Mainz and Coblenz, which is a UNESCO world cultural heritage site, is one of the world's most famous river trip routes. The numerous castles and ruined castles were behind the notion of the romantic Rhine.

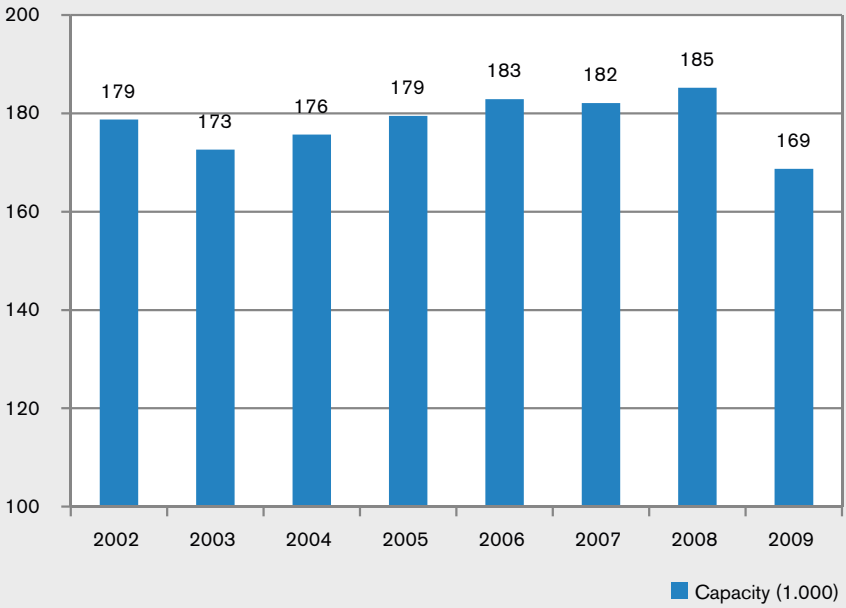
In Germany day trips on the river are dominated by small companies (private owner operators) with between one and two vessels. A larger company is the Koeln-Duesseldorf Deutsche Rheinschiffahrt, which is also Germany's oldest public company. With a fleet of 15 ships it is the market leader for day excursions on the Rhine. According to company information, in the past year the economic crisis has primarily impacted the charter business, many companies having cut out boat excursions in light of the depressed economic situation. This has been partly offset by the rise in the number of private travellers. This scenario can be taken as typical for 2009 and was also observed on other rivers, such as the Elbe.

In 2009 the company transferred ten of its ships to a foreign subsidiary.[2] Accordingly these ships no longer appeared in German statistics although in reality they continue to ply their route on the Rhine between Duesseldorf and Mainz. This is the reason why since 2009 the Rhine officially no longer heads the passenger capacity rankings, having been overtaken by the Elbe. But even without this special effect the Elbe was ahead of the Rhine on two other capacity indicators, namely the number of ships and the number of shipping companies. The attraction of navigation on the

2 *These ships' destination country was Malta. Source: Central inland waterway master file of WSD Southwest and article in the Cologne Rundschau, "KD under Maltese flag" dated 08.04.2009.*

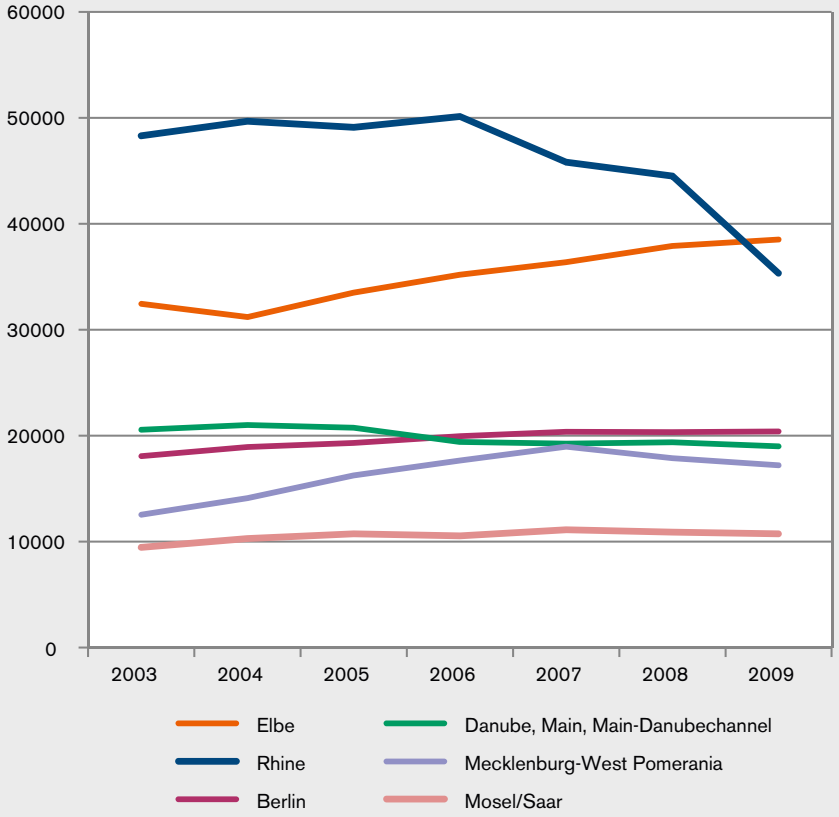
Elbe is certainly to do with the cultural centre of Dresden and the Elbe Sandstone Mountains and probably also with the Hanseatic City of Hamburg.
The figures below indicate the overall trend in capacity broken down by the seven most important travel areas. The decline in 2009 is partly attributable to the special effect referred to above.

Figure 3: Number of passenger places in the German daytrip sector



Source: Wasserschifffahrtsdirektion Suedwest. Figures in 1,000s of people

Figure 4: Capacities in the German daytrip sector*



*Source: Wasserschifffahrtsdirektion Suedwest; * Maximum permitted number of passengers*

The German stretch of the Danube, at least as far as Passau[3], is at a disadvantage for day trips as a result of the low height of the bridges. That is why the bulk of the daytrip business doesn't begin until Passau, heading down the Danube towards **Austria**. Next to Vienna, Passau is the most important departure location for trips on the German and Austrian Danube. With 11 ships, the Passau company Wurm

3 *Over a distance of roughly 25 km downstream from Passau, the Danube is the river border between Germany and Austria.*

und Köck is the most important shipping company in the day excursion sector. Since 1995 river day trips have extended as far as Vienna.
Approximately 150 km downstream from the German-Austrian border town of Jochenstein begins the famous Wachau countryside, the stretch of the river between Melk and Krems, 80 kilometres west of Vienna. Here are to be found, similar to the Middle Rhine, numerous castles and historic towns within a relatively short distance. In just the same way as the Middle Rhine valley, Wachau is a UNESCO world cultural heritage site.

As in Germany, so too in Austria no figures are collected by the national statistical office on passenger navigation demand. The state navigation agency Via Donau uses questionnaires to collate relevant figures but which also contain estimates. This process also involves polling companies that are not headquartered in Austria but which operate on the Danube.[4] According to these polls approximately 700,000 passengers were carried on scheduled services in Austria in 2008 and around 150,000 occasional traffic passengers.

Hungary possesses the largest national fleet on the Danube. In recent years however Hungarian passenger shipping companies have been characterised by a downward trend.[5]

The largest Hungarian shipping company in the passenger navigation arena is the formerly state-owned company Mahart Passnave. The company operates more than 30 ships (20 excursion ships and 10 Russian-made hydrofoils). Excursion ship traffic has declined in recent years. 115,670 passengers were transported in 2009

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4 *This relates to the German shipping company Wurm & Koeck, which operates scheduled services between Linz-Schloegen-Linz and Linz-Vienna-Linz. For eastern operations we are talking about the ships and hydrofoils of the Slovakian provider SPaP-LOD (on the Bratislava-Vienna-Bratislava stretch) and the Hungarian company Mahart PassNave (Budapest-Vienna-Budapest).*

5 *According to information from the Hungarian statistical bureau, specific figures are not allowed to be published but indicate a steep downward trend, especially in 2007 and 2008.*

compared with 152,000 in 2005. Passenger volumes have risen only for the faster hydrofoils, numbering approximately 16,000 passengers in 2009.

This decline, which is typical for the country as a whole, is related to a number of structural and cyclical factors. For example it was and remains the case that passenger navigation in Hungary is used to a considerable degree not for tourism but for public transport purposes (as an alternative to bus or railway). This primarily concerns scheduled services between Budapest and towns on the Danube in northern Hungary such as Szentendre or Visegrád.

Mahart Passnave has estimated that approximately 25% of passengers on scheduled services in and around Budapest are using these services for public transport and 75% are tourist activities within the proper meaning of the term. The rise in car ownership since the fall of the Iron Curtain provoked a decline in these means of transport starting in the mid-1990s and increasingly so from 2000 onwards. This is one reason for the decline in passenger numbers. An additional reason is to be seen in increased fares as a result of higher fuel costs. Fares per passenger kilometre are approximately eight times higher than the price of rail travel for the same distance.[6]

Thirdly, customers are increasingly demanding shorter travel times which can more easily be achieved by the modern hydrofoils, of which there are relatively few, than by excursion ships most of which were built in the 1960s. It should also not be forgotten that in recent years Hungary has had to content with severe economic problems that have adversely affected income growth.

In **Slovakia** in 2008 a total of 121,509 passengers were transported by domestic passenger navigation companies. Accounting for 90,586 people, national transport dominated international transport with 30,923 people. The Danube is far and away the most important river for freight and passenger navigation. Its share of the country's entire passenger navigation is approximately 92%. That means that transport movements on the two other rivers (Waag, Bodrog) account for 8.5% of total passenger navigation in Slovakia.

6 *Information provided by the Hungarian National statistical office.*

The National Statistical Office captures passenger navigation companies by means of company statistics. There are currently 15 ships registered, 12 of which operate on the Danube. The remaining three ships operate on the 400 km long River Waag, which rises close to the Polish border and flows southwards to the Danube, and also on the Bodrog, which flows in the east of the country.
With the exception of 2003 and 2004 the number of people carried on domestic waterways has hardly changed. The anomaly seen in 2003 and 2004 is attributable to the fact that during this time a shipping company from Kosice established a scheduled service between Devin near Bratislava in Slovakia and Hainburg in Austria. But this scheduled service was discontinued in later years.

3. RIVER CRUISING

In addition to the Danube and the Rhine, other important rivers in the European cruise market are the Moselle and the Main, then the Elbe and also the Rhone, Seine and Saone. Of the 209 river cruise ships operating in Europe in 2009 approximately 96 percent are to be found on these rivers. The remaining 4 percent operate on rivers in Spain and Portugal (Douro, Guadiana), also in Sweden and Poland, and a single ship operates on the Po in Italy. To some extent the positive trend in the demand for river cruises can also be seen in conjunction with the boom in ocean cruises. Between 1999 and 2008 cruise companies operating on the German market saw passenger numbers increasing by 210 % for ocean cruising and by 186 % for river cruising.[7] The growth in river trips was frequently at the expense of the market share accounted for by coach travel.

Approximately three quarters of river trips are of one-week duration. That means for example that the Passau-Budapest-Passau route can be tackled in one week, including sightseeing and excursions ashore. Also of one-week's duration is a river trip on the Rhine between Basle and Amsterdam. Yet another one-week trip is from Dresden to Prague and back. A river cruise lasting two weeks might take you, for example, from Passau to Constanza via Vienna, Budapest and Belgrade.

7 *German Travel Association (DRV)*

The building of the Rhine-Main-Danube Canal was of great importance for the European industry. This created a unified river system enabling most ships to sail from the Rhine via the canal to the Danube and back. This linked Europe's two most important rivers for cruising. There are however a number of ships that are too large for the locks on the Rhine-Main-Danube Canal so that to be strictly accurate we need to talk about a partial fragmentation of the market.

As regards customer structure it should be noted that US American tourists play a more important role in the cruising business than they do for day trips. In a number of submarkets, such as small hotel ships in France, they account for approximately two thirds of total passenger volumes. For larger ships their share is currently one third. Generally speaking however their importance is increasing such that industry experts anticipate that US American customers will in future take a 50% share. Isolated events such as 11th of September 2001 resulted only in a one year stagnation in visits by US American customers but were unable to halt long-term growth.

Each year on average approximately ten new ships arrive on the European market, most of them for the rivers Rhine, Danube, Elbe, Moselle and Main (see following table). Numerous Dutch shipyards and two German shipyards dominate when it comes to shipbuilding yards.

Table 3: New construction on the European river cruise market

Cruise area	2003	2004	2005	2006	2007	2008	2009
Central system*	9	9	7	11	8	6	11
Danube only	1	1	-	-	-	-	-
Rhone	-	-	2	1	-	1	-
Douro	2	-	1	-	-	-	-
Algarve	-	-	2	-	-	-	-
Other	1	-	-	-	-	-	-
Total	13	10	12	12	8	7	11

*Sources: Hader & Hader; River Advice. * Rhine, Main, Moselle, Elbe, Danube*

Building a cruise ship is a major investment which can only be amortised if there is sufficiently high market demand. The investment volumes are frequently five times higher than for freight ships. An additional factor is that the cruise ship season is mainly limited to the period between March and October whereas freight ships operate throughout the entire year (with the exception of particular winter periods or in the event of extreme water levels). Whereas the water level is very important for freight ships typically this is not the case for passenger ships. Low bridges can however be a problem here.

Because of the high initial investment, a limited season and labour intensive ship operations high revenues have to be generated within a relatively short period. The ships are also becoming ever larger partly in order better to absorb the high fixed costs. For a long time the average capacity of a river cruise ship was between approximately 120 and 130 beds. In recent years it has increased and since 2005 has been approximately 160 beds.

There are various possible business model scenarios. We can fundamentally differentiate three tiers:[8]

1) Ship ownership
2) Ship operation
   a) Navigation/technology
   b) Hotel operations/gastronomy
3) Ship marketing

Tiers 1) and 2a) are frequently both in the hands of a shipping company. The hotel and gastronomy (2b) sides on the other are often handed over to professional hotel and catering firms as these are not shipping companies' traditional areas of responsibility. In Europe there are currently roughly three such hotel and catering companies who share the market. International river shipping companies often charter their ships under contract for several years to national river trip organisers. Longer-term contracts with one and the same tour operator have the advantage of triggering so-

8 *Information provided by River Advice*

called ‘repeater effects’ among customers who having once encountered a ship’s crew enjoy renewing their acquaintance the following year.

When it comes to travel marketing (tier 3) the customers’ country of origin is very important. That is why shipping companies with international operations frequently retain general agencies for individual countries where they are responsible for organising sales. But there are also cases in which the aforementioned tiers 1) to 3) are controlled by one party meaning therefore the shipping companies simultaneously operate their ships and manage the marketing themselves. This applies for example to the French market leader in Europe CroisiEurope, headquartered in Strasbourg, and also to the German company A-Rosa Flussschiff.

As already mentioned at the beginning it makes most sense to break the river cruise market down from the demand side by individual markets and countries as the supply side is characterised by complex, international corporate structures and a breakdown by ships’ flag is no longer very meaningful.

For the **German** market, every year the German Travel Association (DRV) conducts a poll of ship owners, charterers and international shipping companies’ sales agents concentrating primarily on customers in Germany. A total of 23 providers were polled for 2009 eight of which were ship owners, 14 charterers and one sales agency (belonging to the European market leader CroisiEurope). Viking Flusskreuzfahrten (Viking River Cruises) was among the companies polled.

These charter ships represent a significant proportion of the offering available to German customers. In 2009 they numbered 154 ships with just fewer than 22,000 beds. This means an increase of five ships and 827 beds compared with the year before. There is relatively strong price competition between the various providers.

According to these surveys the demand for river cruises among German tourists has more than doubled since 2000 (by a factor of 2.1). It rose 20% between 2005 in 2009. In 2009 not quite 400,000 Germans went on a river cruise on the European river (including the Nile). If we exclude the Nile then the Danube and the Rhine are the most important rivers for German customers. Last year 146,000 passengers

were carried on the Danube. In Germany it was 74,000, in Russia and the Ukraine combined 35,500, in France 26,300, in the Benelux countries 20,700.[9]

The average age of the German travellers is just under 58 years. In recent times it has fallen only marginally. Roughly 30% of cruise passengers are aged 66 or over and 68% (namely more than 2/3) are at least 56 years old.

In 2009 revenues on the German market as a whole fell only slightly by approximately 4%, which was admittedly also caused by the departure of two providers as a result of insolvency. 64% of providers recorded increased passenger numbers and 68% of providers increased their turnover compared with the year before. A further 14 % achieved similarly high passenger numbers as in the year before and for 14% there was no change in turnover compared with the year before.[10] This demonstrates that in this sector even the worst economic crises have only very limited effects.

Direct sales on the German market in 2007 reached 292 million Euros, an increase therefore of 60% compared with 2004. In addition to these direct revenues we can also of course assume a considerable level of indirect revenue primarily generated during excursions ashore and as a result of the supporting cultural programme accompanying river navigation.

Information about the national river cruise market in **France** is collated by the state agency VNF. Both French and foreign companies are included.[11] When it comes to river cruises in France a distinction needs to be made between two segments: Cruises with larger ships (Paquebots fluviaux or large hotel ships > 50 beds) and journeys involving smaller ships (Peniches-hotel or small hotel ships < 50 beds). When it comes to volumes, measured in terms of passenger beds, the large ships with a total of 3,541 beds were more important in 2008 than the small ones with 1,224 beds. The preponderance is even clearer when it comes to demand. For

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9 German Travel Association DRV
10 German Travel Association DRV
11 This makes the results broadly comparable with those of Germany.

example the ‘paquebots fluviaux’ carried 154,000 passengers in 2008 compared with 25,000 passengers in the case of the ‘peniches-hotel’.

There are also differences as regards the areas served, the customers and the offering. The larger hotel ships primarily operate on the Rhine in Alsace, in Burgundy, on the Seine and on the Rhone. The smaller ships tend to operate in southern French regions (especially Languedoc, Provence). They also host significantly more US Americans (approximately 2/3), joined also by French, British and other foreign guests. These small ships’ supporting programmes have an even stronger focus on French gastronomy and French ‘savoir vivre’ than is the case on the larger cruise ships. There are more German guests in the case of river cruises on large ships.

As is apparent from the following table, the small hotel ships segment is characterised by a high degree of supply-side fragmentation: The market is divided between numerous small providers. The average capacity of the small ships is 13.7 beds and is thereby smaller than that of the large ships by a factor of ten (136.2 beds)

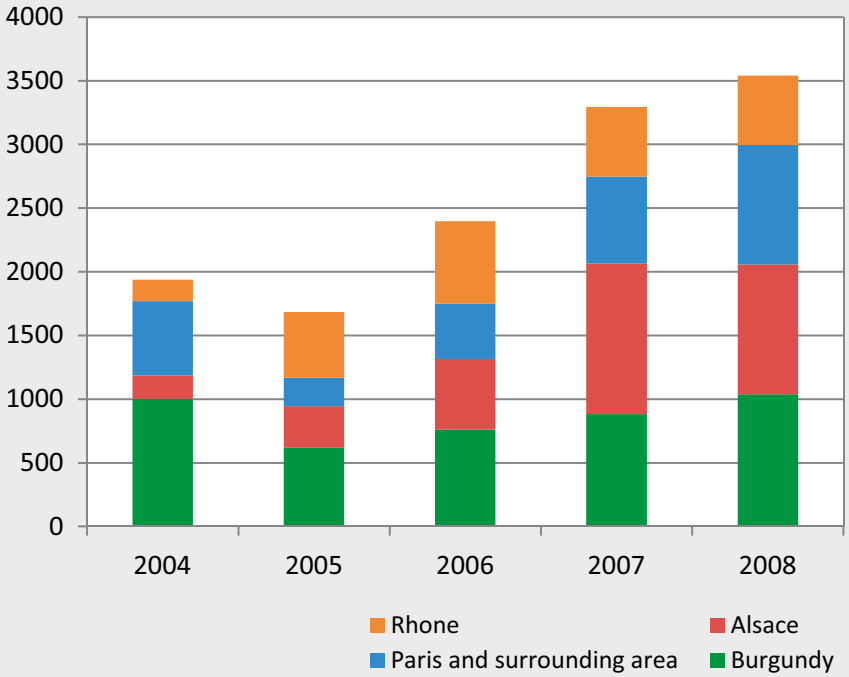
Table 4: Hotel ships in France

	Number				
	Companies	**Ships**	**Places per ship Average**	**Total places**	**Customers**
Small ships	69	89	13.7	1,224	25,000
Large ships	9	26	136.2	3,541	154,000
Total	78	115	-	4,765	179,000

Source: VNF; CCNR calculations

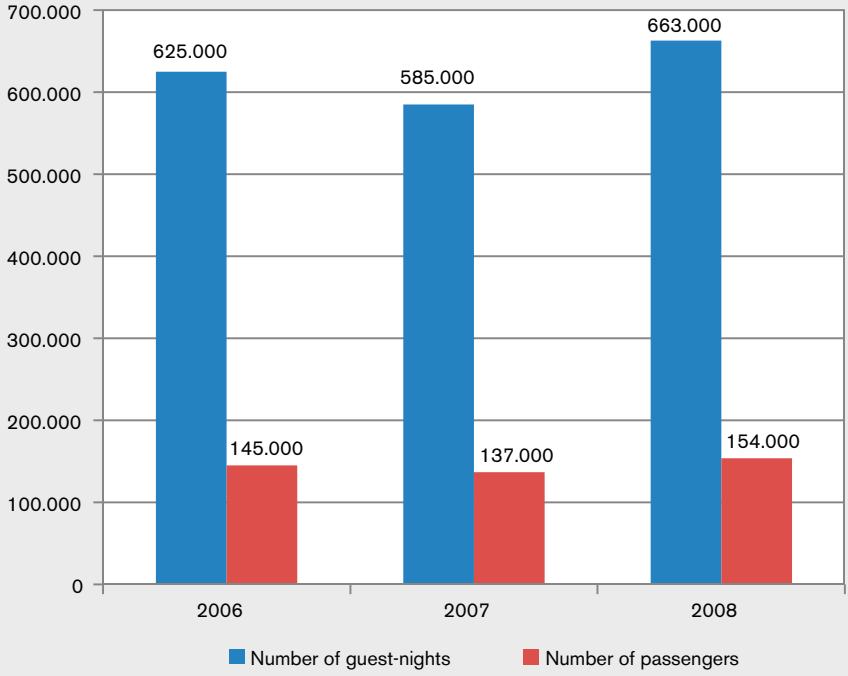
It will be noted when looking at the trend in supply and demand that the capacity in the large ship segment in recent years has increased at a faster rate than demand, whereas for small ships the converse is true. The two figures below show the evolution of large ship bed capacity and demand with the far stronger supply growth and regional hotspots (Alsace, Burgundy, Rhone, Ile-de-France) clearly evident.

Figure 5: Trends in French cruise ship bed capacity (large ships) by cruise area



Source: VNF. Figures in number of beds

Figure 6: Trend in demand for river cruises in France (large ships)



Source: VNF

For small hotel ships the number of passengers between 2004 and 2008 rose by 51% to a total of 25,000 people and the number of overnights by 53% to 139,000. Small hotel ship bed capacity increased by 30% between 2004 and 2008. That means - as already mentioned - that demand outstripped supply, unlike the large cruise ships.

In the **Netherlands**, as in France, a distinction is made within the cabin cruise sector between smaller (< 40 beds) and larger hotel ships (> 40 beds). Smaller hotel ships tend to be used by younger people (from the Netherlands, from Germany and Denmark). Some of these ships are frequently used as so-called 'Fietsschip', which means that cyclists use the ships for overnight accommodation and an evening meal and follow the ships on their bicycles by day. For these reasons these ships

often do not have very many passengers. The so-called 'brown fleet' is also primarily frequented by a younger clientele. These are old cargo sailing ships that are now used for tourism. The larger hotel ships on the other hand tend to have older customers.

In **Switzerland** the Rhine ports of both parts of Basle registered almost a doubling of passengers carried in ships with cabins between 1999 and 2005 (+93%). There was an increase of 77% between 2005 and 2009.[12] That marks an almost exponential increase in the number of passengers carried in ships with cabins engaged in international traffic on the Rhine. This is all the more remarkable as there was a downward trend between the mid-1980s and the end of the 1990s.

4. SUMMARY

There are considerable differences between the countries considered here in the way that day trip navigation has evolved. France and Austria registered double-digit growth rates in demand between 2002 and 2008. The overall trend in Slovakia was one of stagnation whereas in Hungary there was a fall in the number of people carried. This decline is to be seen in the context of structural factors which make it difficult for the Hungarian industry to achieve growth rates (general economic factors, structure and efficiency of the fleet, etc). No demand information is available for Germany.

Demand growth in French excursion traffic as a whole has outstripped capacity. This was especially so in Paris but also to a somewhat lesser extent in the other regions as well. There were minor capacity increases in Germany between 2003 and 2008 but just recently a decline, albeit primarily to do with a statistical one-off effect.

This study initially looked at the river cruise market for Europe as a whole and then for Germany and France. What this reveals is that demand in the last few years appears to have risen more strongly in Germany than in France. The number of people

12 *Source: Swiss Rhine ports*

carried has more than doubled in Germany since 2000. There have also been recent capacity increases.

In France, growth in the demand for river cruises (in the large ship segment) since 2006 - earlier years are not available - has been relatively moderate. There has been a more dynamic trend in the small hotel ship sub segment, which might have something to do with certain country-specific peculiarities of the French market. These small ships are a better fit with the French river cruising tradition than the large ones. Demand for the small hotel ships also grew quicker than supply whereas the converse was true for large cruise ships. For Europe as a whole capacity has been growing at a relatively constant rate for approximately ten years: Each year approximately ten new ships enter the market.

Fact sheet 2: Evolution of the modal position of inland navigation

1. PRELIMINARY REMARKS

The modal split relates to the percentage distribution of traffic volumes or transport services between individual means of transport. It can be determined for passenger transport on the one hand and freight transport on the other. The former case concerns the split between rail, bus and car, which has remained virtually stable in Europe since 1990 and which will moreover not be analysed in any further depth in this report.

The fact sheet therefore concentrates on freight transport and primarily on selected western European countries (Netherlands, Germany, Belgium, France) which account for far and away the greatest proportion of European inland waterway transport volumes. The Danube countries are also analysed.

The means of transport being compared with inland navigation in this report are the railway, road and pipeline. Although maritime navigation is also occasionally looked at in modal split analyses, this investigation will confine itself to looking at inland means of transport only. The rationale for this is that maritime transport takes place upstream within the logistic chain and to that extent does not compete with inland navigation.[13]

2. INTRODUCTION

Freight traffic is growing faster than the economy as a whole. The bulk of European freight transport is carried by road. Within the EU road traffic accounts for a 73% share of transport output[14] in the modal split. The waterways' share is 5.3%, rail accounts for 17% and pipelines 5%. By way of comparison: In 1995 the share accounted for by the road was still 67.4 % with waterways having a 6.5 % share

13 *The rolling medium term forecast for freight and passenger transport (published in February 2010), written by Intraplan Consult GmbH on behalf of the Federal Ministry of Transport, also confines itself to the four inland forms of transport.*

14 *Measured in tonne kilometres*

of transport services.[15] This illustrates the trend in recent years which has been characterised by an increasing importance of the road at the expense of inland navigation.

The importance of waterways differs very markedly between individual European countries. This is partly to do with the different availability of navigable rivers. But economic and geographical factors such as the geographical location of certain industrial sectors are also important. Especially when raw materials-intensive industries and power stations too are located in close geographical proximity to efficient waterways, the result is high modal split shares for inland navigation.

Political factors also play a role. By prioritising infrastructure investments they influence the competitive environment in which the individual means of transport operate.

The modal split share of inland navigation is generally lower for national transport[16] than it is for international transport. On the one hand the reason for this is that the waterways' cost advantages are felt to greater effect over long distances.

On the other hand there are differences between national and international transport as regards the freight being carried. Industrial countries, for example, import raw materials such as ores or solid fuels, the bulk goods quality of which readily lends itself to inland ships and which are therefore primarily imported on waterways and are recorded as a receipt in the transport statistics.

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15 *Eurostat information*

16 *National transport means domestic freight transport with the transport's point of origin and destination being within the country. By contrast with international transport either the point of origin or the destination is not domestic.*

3. LONG-TERM FORECASTS FOR TRAFFIC VOLUME AND MODAL SPLIT

Different models are predicting strong growth in European freight transport. But the assessment of how this is split between the different means of transport varies according to model. The TREMOVE model developed on behalf of the European Commission, Directorate General for the Environment, is forecasting an increase in transport capacity of 3.8 billion tonne kilometres between 2005 and 2030. This equates to growth of 52%. [17] Another model, also issued by the European Commission (General Directorate MOVE), arrives at identical traffic growth estimates.

Whereas the TREMOVE model has the waterways' modal split share remaining unchanged until 2030, the MOVE Directorate General's model calculates that the modal split will almost double to 10%. However, other European forecasts, such as the PINE study[18] dating from 2004, assumes that inland navigation will retain a broadly constant modal split share, with a slightly downward trend. The modal split for the countries of Eastern Europe is forecast to converge with that in Western Europe.

Forecasts for the modal split for Germany, the country with the highest volume of traffic in Europe, are rather pessimistic for inland navigation. A report written by the consulting company Intraplan and BVU for the German Ministry of Transport in 2007 forecasts a 28% growth in traffic volumes (tonne) for the period 2004 to 2025. Traffic performance (tkm) should increase by 71%. Inland navigation's share of the modal split in this period is anticipated to fall slightly. Rail too, according to the study, should lose market share with road freight transport recording growth.[19]

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17 *Bureau Voorlichting Binnenvaart / EBU / Expertise en Innovatie Centrum Binnenvart (2009)*

18 *PINE = Prospects of Inland navigation within the enlarged Europe.*

19 *Federal Ministry of Transport, Building and Urban Development*

4. MODAL SPLIT IN WESTERN EUROPE

a. Modal split and capacity utilisation of the waterway network

Within the European Union approximately 88% of all the transport services performed by inland ship in the EU are accounted for by the four countries Netherlands, Germany, Belgium and France. Two of these four countries, Germany and the Netherlands, represent approximately 77%.[20] This result however only partially reflects the relative importance of the waterways as a means of transport in the individual countries, as the following table shows.

Table 5: The waterways' modal split share and capacity utilisation of the national waterway network*

Country	The waterways' modal split share [%]	Transport output / network length [Million tkm/km]
Netherlands	26,5	9,1
Belgium	13,0	5,7
Germany	9,1	8,8
France	3,5	0,9

Source: CCNR calculation based on International Transport Forum data; 2008 values; waterways used for navigation; based on tkm except for the Netherlands (based on tonnes)*

The market share enjoyed by inland navigation in the individual countries correlates to some extent with the capacity utilisation of the national waterway network. However a somewhat low modal split share is also possible if the transport output per kilometre of waterway is very high, as the example of Germany illustrates. Here the total transport output of all means of transport together is far and away the highest of all European countries. This explains the relatively high capacity utilisation of the waterways and does not contradict a modal split share which is somewhat on the low side.

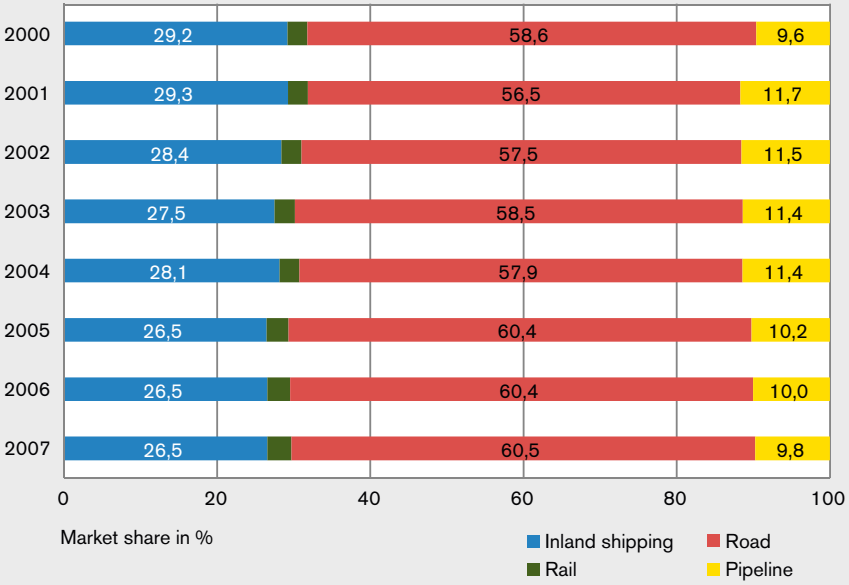
20 *Eurostat data; transport capacity measured in tonne kilometres*

b. Individual countries

Netherlands

The Netherlands' waterways' market share is the highest in Europe. However, as can be seen in the graph below, it has declined slightly since 2000. Further discernible characteristics are a very low share for rail as well as a disproportionately high share for pipelines.

Figure 7: Modal split for freight transport for the Netherlands (quantity transported)



Source: CBS

Inland navigation is particularly important for export and transit traffic. This is very much to do with Rhine navigation bound for Germany, France, Switzerland and Austria (via the Rhine-Main-Danube Canal). When it comes to national transport however, its representation is below average, the share accounted for by road exceeding 75%.

In the hinterland of the Port of Amsterdam, waterways currently have a share of approximately 43% - across all freight categories - which has remained relatively stable since 1995. The road has a market share of 53 % whereas rail only manages 4 %.[21]

The waterways' market share in the Port of Rotterdam is around 30%. Whereas this share has remained constant in recent years, the importance of the railway increased from 11% to 13% between 2007 and 2008. This was at the expense of road traffic, which was forced to concede two percentage points of modal split, falling to 57%. The aim of the port's investments, such as the new Delta Barge Feder Terminal or the Euromaxterminal, is to further boost the share accounted for by inland navigation and rail.[22] The long-term goal is a modal split of 45 % inland navigation, 20 % rail and 35 % road.

Approximately 85% of rail freight movements in the Netherlands are to and from the seaports.[23] Rail's currently very low market share might increase in the wake of the Betuwe route, opened in 2007 and fully electrified from December 2009 onwards. This freight rail stretch runs from the Port of Rotterdam to the German border where it links with the Arnhem-Oberhausen railway line.

The importance of pipelines is explained in large part by Rotterdam's role as a European distribution centre for crude oil and mineral oil products. An important crude oil pipeline runs from the Port of Rotterdam via Venlo to Cologne (to the refineries at Godorf and Wesseling) and on to the chemical industry around Frankfurt/Main and Ludwigshafen and Frankfurt airport. Further pipelines run to Belgium (e.g. Antwerp, Gent, Mons, Liege) and northern France (Cambrai, Maubeuge). In addition to pipelines transporting crude oil and ethylene to Belgium and France there are also pipelines transporting industrial gases.

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21 Source: Port of Amsterdam
22 Source: Port of Rotterdam
23 Source: DVB Bank

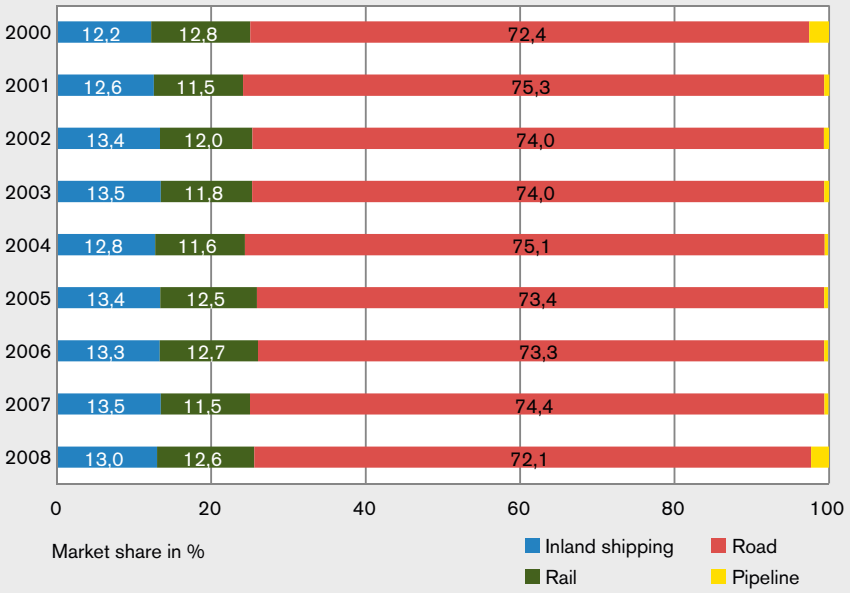
Belgium

Belgium is one of the very few countries in which the share accounted for by waterways has increased in recent years. It is currently approximately 13%, the railways on 12.6% are more important than in the Netherlands, road accounts for approximately 72% and pipelines for around 2%.

As in the Netherlands the country boasts important seaports in the hinterland of which inland navigation plays an important role. In the Port of Antwerp it currently has a modal split share of 45%, rail 12% and road 43%. The waterways' share has significantly increased in the past ten years. Container traffic in Antwerp as well, where domestic navigation was previously disproportionately underrepresented, has been increasingly integrated with inland shipping in recent years. Almost one third (32%) of containers are now already handled by inland ships and the port has set itself the goal of increasing this share to 43% by 2020. The role of rail is also to receive a boost, increasing its market share from currently 11% to 15%. [24]

24 *According to information from the Port of Antwerp. The railway is also to receive a helping hand to include intensifying the "Iron Rhine" freight line.*

Figure 8: Evolution of the modal split in Belgian freight transport (transport output)



Source: Direction générale Statistique et Information économique, excluding pipeline figures: Eurostat; pipeline figures for 2000-2003 and 2008: Estimate based on 2004 to 2006

Belgium's waterways have the highest market share for imports from abroad. Roughly 25%, namely one quarter of the transport capacity here is handled by inland ship. Its share is significantly lower for movements abroad and for transit traffic (respectively around 11%). Its importance is also disproportionately low on the national transport scene where it accounts for approximately 9% of transport services.[25] A study carried out by the University of Brussels revealed that an even more significant increase in the waterways' market share would be achievable if the planning of inland navigation terminals were to be more closely coordinated from

25 *Source: Bureau Fédéral du Plan (Brussels)*

the centre. Conversely, excessively strong regionalisation promotes fragmentation and locations that are not economically viable.[26]

Germany

In Germany the modal split is characterised by an importance of road freight traffic on a par with that of Belgium. In 2009 its market share of total transport capacity was 72%. Inland navigation was 9.1% and rail 16.2%. Pipelines play a small role, only 3%. Unlike the waterways the railway maintained its relative position between 2000 and 2009.

Inland navigation is disproportionately highly represented in receiving freight from abroad. Here it has a significantly higher market share at 15% than it does for transportation as a whole. Pipelines as well exhibit a higher modal split share for the receipt of freight than they do for transportation as a whole. [27] This picture is to be seen in the context of the high share of exports that inland navigation has in the Netherlands. For example, numerous raw materials arrive in Dutch seaports from overseas and are transported onwards to Germany on the Rhine or in pipelines (ores, coal, crude oil etc).

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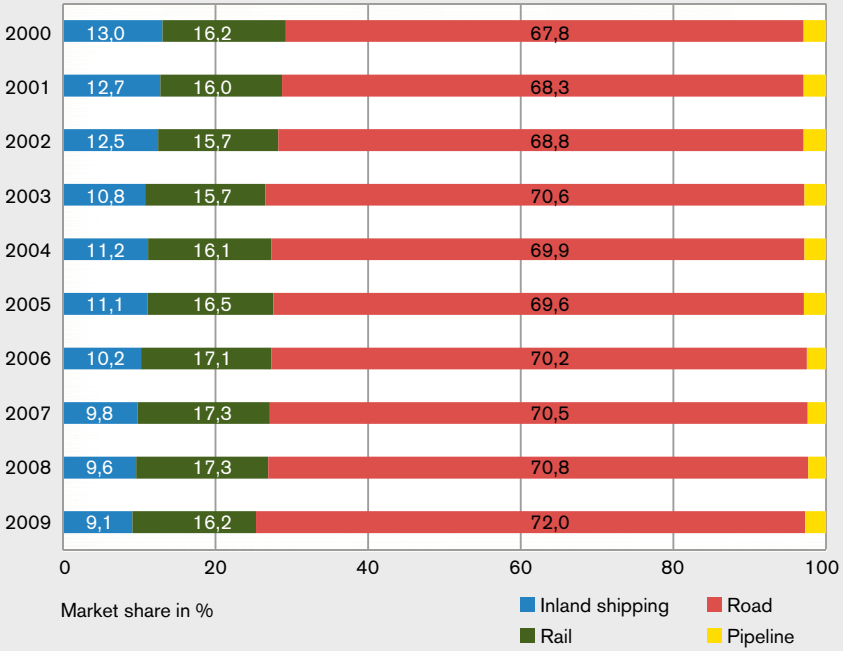
26 *Analysis by Ethem Pekin of the Economics Faculty of the University of Brussels., see: Pekin, E. (2009), Intermodal Transport Policy: A GIS-based Intermodal Transport Policy Evaluation Model, Vrije Universiteit Brussel*

27 *Calculations by the CCNR Secretariat based on data from destatis and from the Federal Motor Transport Authority*

Figure 9: Evolution of the modal split in German freight transport (transport output)*



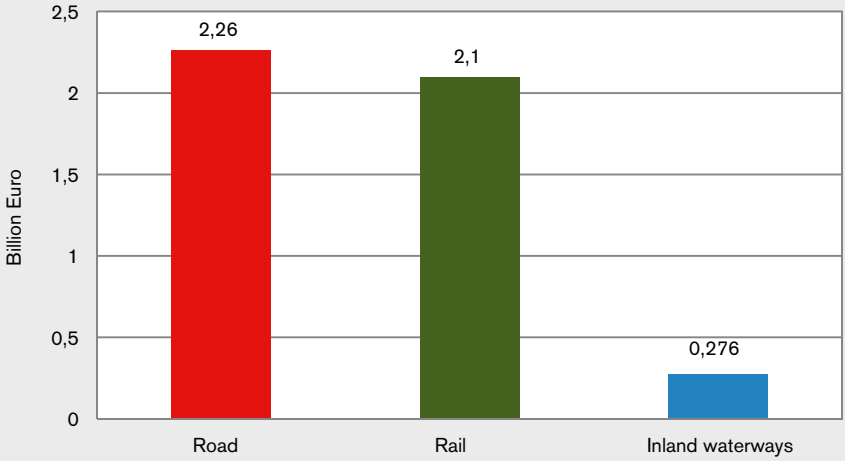
*Source: destatis; * road freight transport: including transport output of foreign goods vehicles in Germany; 2009: provisional figures; 2001: estimate*

A major reason for the declining share of inland navigation is its insufficient transport integration with German seaports' hinterland. Hinterland transport is deemed to be an essential source of future transport growth such that insufficient seaward connections are to be seen as a strategic weakness. The JadeWeserPort currently under construction near Wilhelmshaven, which is meant to be the only German deep water port able to handle containerships with a draught greater than 16 metres irrespective of the tide, is not connected to the waterway network.
Inland navigation currently has a market share of only 2% of the hinterland transport of Germany's largest seaport, Hamburg. It must however be added that there has been a steep increase in the volumes carried per inland ship in Hamburg in 2008.

A recent report[28] provided a number of pointers on how to stimulate inland navigation in Hamburg (e.g. modernising the infrastructure and ships, earmarking special inland ship berths around the sea terminal). Improving Berlin's links is also of strategic importance because this would considerably expand inland navigation's market volume and sales potential.

The current situation is reflected in the relative weighting of the different means of transport when it comes to state investment in developing links between German seaports and their hinterland. As the following figure illustrates, even in recent times, between 2006 and 2010, inland navigation was underrepresented here relative to road and rail.

Figure 10: Investment volumes for developing connections between German seaports and their hinterland*



*Source: Calculations by the CCNR Secretariat based on Federal Ministry of Transport information; * estimated funding for the period 2006 to 2010 according to the Federal Ministry of Transport's planning framework.*

28 *UniConsult GmbH report*

France

With 3.5% (2009) inland navigation in France has a very small share of the modal split. At 80%, road freight transport has the highest share of the countries studied to date. Rail accounts for 17 % of transport services.[29]
The waterways' relatively low share is also to do with the relatively low network density.[30] For example commercially usable waterways are located almost exclusively in the east and north of the country whereas large tracts in the west and south are impassable to inland ships (in the context of freight transport). By virtue also of the great importance of nuclear energy, the transportation of solid fuels plays a far smaller role relative to Germany, which has in the past also contributed to the negative development suffered by the waterways.

1994 marked a turning point in French inland navigation. This period also coincides with the setting up of the State inland navigation agency Voies Navigables de France (VNF). From this point onwards it was especially growth on the Seine, Oise and Rhone that contributed to stabilising and even growing the modal split share. Between 1995 and 2008 it increased from 2.8% to around 3.1% and - notwithstanding the economic crisis - rose to 3.5% by 2009. Between 1995 and 2005 inland navigation even enjoyed the highest average annual growth rate of all three means of transport (+3 % per year compared with -1.9 % for the railways and +2 % for road freight transport).[31]

Container traffic on the Seine increased by a factor of almost five between 2002 and 2007.[32] The country's largest seaport, Le Havre, is linked by the Seine with the capital Paris and its surrounding area. According to estimates by the Institut d'Amenagement et d'Urbanisme the inland ship has a modal split share of 67% for container transportation between Le Havre and the Ile de France. The remaining 33 % of containers are transported by lorry.[33]

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29 *Information provided by: International Transport Forum*
30 *Length of the waterway network relative to the country's area*
31 *Ministere de L'Ecologie, de l'Energie, du Development durable et de la Mer (2007)*
32 *cf. Market observation 2009-1*
33 *Institut d'Amenagement et d'Urbanisme (2008)*

Further inland ship terminals are being built in the Ile de France, including along the banks of the Oise, which flows in a south westerly direction from Belgium to Paris and the extension of which represents the planned Seine-North Europe canal. In 2009 as well, a year of crisis, container traffic on the Seine between Le Havre and Paris increased 10% although container handling in Le Havre itself fell by 12%. This illustrates that here too inland navigation is still capable of winning market share.

The modal split share should increase significantly once the Seine-North Europe canal has been completed. Its target completion date is 2015. Its purpose is to connect Paris with the Belgian seaports and Dunkirk in the north of France. The canal's anticipated transport capacity in 2020 is estimated to be between 6 and 7 billion tonne kilometres. That would make it approximately equal to the French waterways' entire current transport capacity.

Switzerland, Luxembourg

With Basle, Switzerland possesses an important Rhine port which is of enormous strategic significance for the country. Because of topographical circumstances however, freight navigation is only significant within a geographically narrowly circumscribed area, namely in the context of international navigation on the Rhine to below Rheinfelden. As a result, the waterways' modal split share is far less than one percent. In Luxembourg, which is connected to the waterways network via the Moselle, the share is just under 4 %.[34] Transport movements here are dominated by ores, solid fuels and metal wastes upstream and agricultural products downstream.

5. DANUBE COUNTRIES

a. Modal split and capacity utilisation of the waterway network

The Danube countries are an example of how inland navigation can develop very differently in different countries despite enjoying almost equally good natural conditions. For example its importance in Slovakia declined from 12% to roughly 2% within only ten years whereas in Austria and Hungary it remained relatively stable between 4% and 6%. The following table depicts the evolution in the modal split

34 *Information obtained from International Transport Forum / OECD*

share per country together with the coefficient of transport capacity and waterway network length already mentioned above.

Table 6: The waterways' modal split share and capacity utilisation of the national waterway network*

Country	The waterways' modal split share [%]**	Transport output / network length [Million tkm/km]
Serbia	20.1	2.3
Romania	6.4	2.9
Hungary	4.7	1.4
Austria	4.1	6.7
Slovakia	2.8	6.5

*Source: CCNR calculations based on International Transport Forum data, the Institute for Mobility Research ifmo und progtrans; * navigable waterways; ** based on transport performance (tkm)*

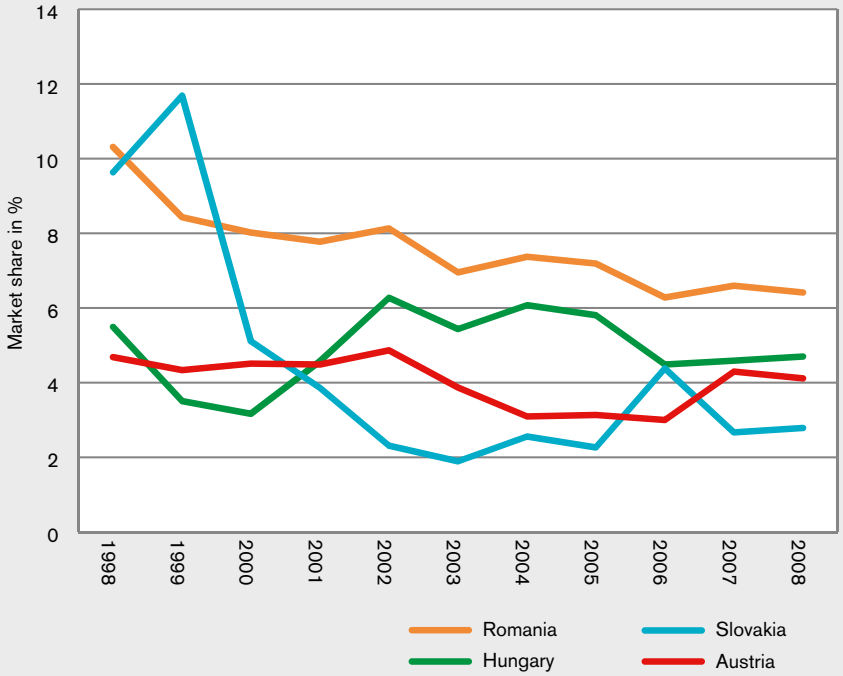
What this shows is that a high modal split share does not necessarily permit the conclusion that the waterway network is at a high level of capacity utilisation. Serbia for example has the highest modal split share among the Danube countries but is in last place but one when it comes to the capacity utilisation of the waterway network. This reflects the untapped potential of inland navigation in that country but also differences in total traffic volumes between the individual countries.

b. Individual countries

In 2008 inland navigation in Romania had a market share of approximately 6.4%, having accounted for 10% of the country's transport capacity in 1998. The Danube's navigational infrastructure is to be modernised in accordance with European guidelines. One problem is periods of low water which result in the absence of permanent compliance with minimum depths.

In Slovakia the modal split share is around 2.8% having been 12% in 1998. However a modest upward trend in the modal split share has been discernible in this country in recent years. In Hungary it is 4.7% and in Austria 4.1%. In both countries domestic navigation has been able more or less to maintain its market share since 1998.

*Figure 11: Inland navigation share of the modal split in the Danube countries **



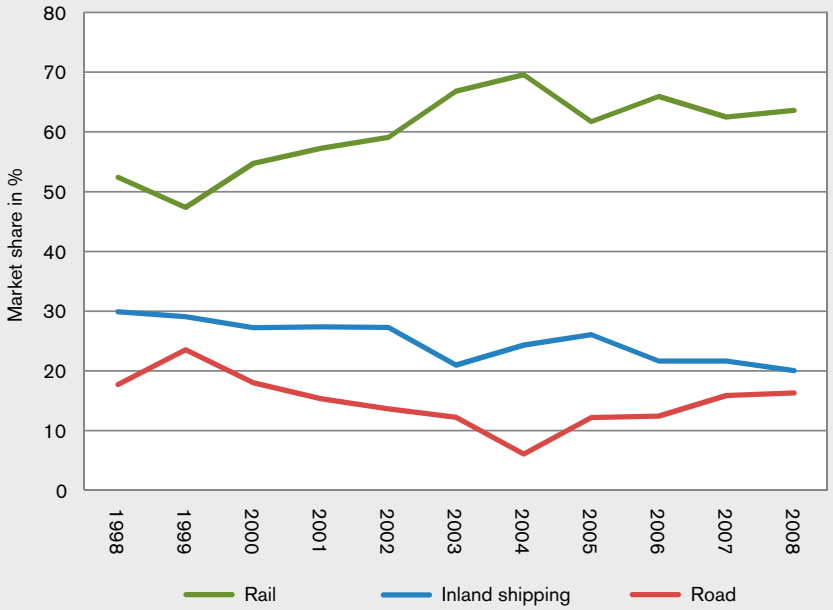
*Source: International Transport Forum; *based on transport output; excluding Serbia*

The Austrian Danube is dominated by imports of raw materials and goods heading upstream from neighbouring countries to the east. On the German stretch of the Danube the assumption has to be that there is still untapped transport potential owing to the absence of river infrastructure. [35]

35 *A potential customer for transport heading down the Danube towards Austria is the steel industry in Linz in Austria, for example, that requires ores and coal. More than in the past, ores and coal can reach this destination from the Dutch and Belgian North Sea ports via the Rhine and Rhine-Main-Danube Canal.*

Serbia is a remarkable national example of modal split. The country exhibits a high share of rail traffic and inland navigation is also well represented with around 20%. But since 1998 it has lost around ten percentage points. Road plays only the third most important role here although its share is increasing in parallel with the slight decline in the waterways' share. In addition to the Danube, the Sava could again play an important transport role in Serbia.

Figure 12: Modal Split in Serbia*



*Source: International Transport Forum; *based on transport output*

The Sava is the largest tributary of the Danube in terms of water flow, rising in Slovenia before flowing through Bosnia, Croatia and Serbia to join the Danube in Belgrade. Inland navigation ceased as a result of the Balkan war in the 1990s.

The Sava River Basin Commission has set itself the objective of reactivating freight transport on the Sava. The largest transport volumes are to be expected on the Serbian stretch of the Sava. To ensure safe navigation, however, the shells and ship

wrecks that have been left in the Danube and Sava from previous wars, which pose an obstacle especially at low water, have to be removed. The EU has made roughly four million Euros available for this purpose.

6. OUTLOOK: GROWTH AREAS FOR THE WATERWAYS

Inland navigation currently enjoys a high market share in a number of markets or is in the process of conquering additional market share. The anticipated growth in these sectors could thereby again boost the waterways' total long term market share. Its positive influence on the modal split can already be detected as far as individual inland and sea ports are concerned.

One such prospect is the transportation of biomass products. Generating energy from biomass, especially the construction of industrial biofuel plants, is grist to the inland navigation mill as these substances are transported in large quantities. In the Port of Papenburg on the Ems in the north of Germany, inland navigation's modal split share has increased significantly as a result of a biomass thermal power station commissioned in 2003. This was critically influenced by the waterborne delivery of waste wood for the power station. In the port of Leer, just a few kilometres away, inland navigation's share increased from 45% to 78% between 1998 and 2005 mainly because of the receipt of oils and fats for biodiesel manufacturing. [36]

In the port of Straubing on the Danube in Bavaria, biomass logistics has also given the port a considerable boost. It is this that the port has to thank for 2009 growth of not quite 20% in the handling of ship borne goods, bucking the trend of the economic crisis. Every year, the oil mill belonging to a US American foodstuffs, fodder and energy company, located in the port, turns 600,000 tonnes of oil seed rape arriving by ship from the Lower Danube into 250,000 tonnes of oil for the biofuel industry and 350,000 tonnes of rape groats as animal fodder.

36 *Source: Ministry of Economic Affairs, Employment and Transport of Lower Saxony (2007), pp 27-37.*

Heavy cargo is also of increasing importance. Transporting especially heavy cargo weighing up to 500 tonnes requires capabilities and safety precautions best provided by inland ships. Most inland ports are equipped with heavy lifting cranes which can be used to lift cargo such as transformers, generators, crane equipment and tanks from a lorry on to the inland ship or from the inland ship on to the ocean-going ship. [37]
Heavy cargo includes wind turbines. In addition to Spain and Denmark, Northern Germany as well is an important production location for this equipment. A number of the ports there are in the vicinity of wind turbine manufacturers. For example the port of Emden on the Ems is only 25 km from Aurich (East Frisia), the headquarters of Enercon GmbH, Germany's largest wind turbine manufacturer. The company has other production sites in Emden as well as in Magdeburg on the Elbe.[38]

There are also opportunities arising from the rising trend in coal imports. This trend is driven by the continuing decline in mineral coal mining in Western Europe. In Germany production between 2005 and 2009 declined from 24.7 million tonnes[39] in 2005 to 13.7 million tonnes in 2009, a decline of 44 % in only four years. Moreover domestic navigation has gained market share within the steel industry's consumption of mineral coal between 1996 and 2007. Its modal split share in the transport of solid fuels (coking coal and coal) has increased from less than 20% in 1996 to more than 40% in 2007.[40]

Inland navigation has also benefited considerably to date from the growth in container transportation.[41] Especially in the context of state-supported combined transport in which containers are carried by a number of modes of transport in succession within an overall transport scheme there is still considerable growth potential for the waterways, in national transport as well.

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37 *For example in 2008 60 Siemens transformers were handled in the inland Port of Nuremberg. Source: Bavarian Port of Nuremberg 2009*

38 *Ministry of Economic Affairs, Employment and Transport of Lower Saxony (2007), p 9.*

39 *Tonnes of usable production; source: Coal industry statistics Essen; VDKI*

40 *See CCNR market observation 2008-1, p. 33. For coal imports see also Planco (2007), pp. 99-103.*

41 *Cf. also market observation report 2009-1*

7. CONCLUSION

In recent years, inland navigation's position within inland means of transport has declined within the EU-27. Positive exceptions such as Belgium or France however indicate that a declining modal split share for inland navigation is not inevitable. However, in order for the waterways' share in Europe as a whole to return to growth it must in particular increase in those countries accounting for the lion's share of total European traffic. This means in particular Germany but also the Netherlands.

With the growth of new markets, such as renewable energies, inland navigation's market share could once again increase over the long term. When it comes to transporting this freight, inland navigation offers capacity benefits that are reflected in bulk cost advantages. All in all, renewable energies (biomass, wind turbines) can be identified as a key future market for inland navigation. If the conventional energy source that is mineral coal is added to these energy sources then it becomes clear that energy sources as a whole are of strategic importance for inland navigation.

Other key markets are heavy freight and container transportation. In the latter case the waterways should benefit from the declared intention of the western sea ports to boost their promotion of the waterways.

The modal split share is also subject to a degree of political influence. This influence is exercised for example by means of control mechanisms in the guise of certain taxes and levies, the subsidy of particular forms of transport (e.g. combined transport) as well as infrastructure investments in the transport sector. Especially in Germany more attention needs to be paid to inland navigation than has previously been the case. Support for combined transport also needs to be continued.

There are positive examples of support for the waterways to be found in France. Companies that are located on waterways received financial support from the state to build quay installations and purchase handling equipment. The company reciprocates by undertaking to transact a proportion of its logistics via the waterways. This financial support helps to overcome the problem of the critical start-up investment when switching to the waterways. In 2007 revenue from ecological taxes accounted for 2.5% of the EU's gross domestic product. The largest share fell on the taxation

of energy consumption, primarily on the taxation of fuels in the transport sector.[42] These taxes as well offer clues on how to internalise the negative external effects of road transport to a greater degree than at present, thus boosting the competitiveness of the waterways and rail.

42 *European Community (2009)*

Fact sheet 3: Freight rates in the tanker sector

1. SUMMARY

From a seasonal perspective, the analysis of gasoil freight rates for navigation on the Rhine indicates relatively low and declining levels in the first half of the year and strongly increasing levels in the second half. This pattern suggests that the water level is having an influence as the water level exhibits exactly the opposite seasonal picture. The seasonal figure also indicates clear signs of the influence of transport demand. A relationship can also be discerned between fuel prices (gasoil prices) and freight, which is also supported by evidence in the literature.

An econometric model confirms the pronounced influence of the water level. For example, in the period 2002 to 2008 an average increase of one percent in the water level resulted in a 0.8% reduction in freight rates. The negative sign is consistent with the inverse relationship between water level and freight levels. An additional supply-side factor is the price of gasoil, the increase in which by one percent increased freight rates by an average of approximately 0.4%. The demand side is also important. A one percent increase in the transport demand for diesel, light heating oil and gas oil in the specified period resulted in an increase of the same magnitude for freight rates for gasoil as did the price of gasoil.

Although from a theoretical perspective capacity utilisation should influence freight rates, there is scarcely any evidence of this in the data. This might however be explained by the unavailability of monthly figures for this estimated value. Overall fleet utilisation has however been in decline for a number of years. This somewhat contradicts tanker navigation freight rates, which do not display any negative trends notwithstanding marked fluctuations. Only in the second half of 2008 were there any indications of influence as a result of capacity utilisation.
It may however be that the occurrence of a one-off effect is also related to simultaneous developments on crude oil markets. For example, in the second half of 2008, there was a reversal in the term structure of crude oil prices. A backwardation situa-

tion was followed by a contango situation, which acted as an incentive to stockpile mineral oil products. This should also have stimulated transport demand.[43]

1. Introduction and approach

This analysis investigates the factors driving gasoil freight rates in navigation on the Rhine. In selecting the possible influencing factors, attention is paid to a theoretically justifiable association with the factor to be explained, the freight rates. Reference is also made to the relevant literature. For example, various inland navigation publications regularly report freight rate trends, often in conjunction with an explanation of their correlation with the water level, transport demand or developments on the crude oil markets.[44] The possible determining factors can be subdivided into supply-side and demand-side factors.

An important supply side determinant is the water level; a fluctuating level influences the supply of shipping space actually available for transport. Other supply-side factors are fuel costs. The capacity utilisation of the fleet contains both supply and demand-side elements.

Transport demand is to be seen as a demand-side factor. The transportation of diesel, gasoil and light heating oil were identified as being the segment related to gasoil cargoes. The term structure of crude oil prices also plays a demand-side role; the transition from a backwardation to a contango situation in particular may trigger increased purchases, which also stimulate transport demand.

2. Data and sources used

The information service PJK International B.V. uses current surveys to capture freight rates actually practised in the Rhine navigation market. These figures relate to transport movements between Rotterdam and six different destinations along the Rhine (Duisburg, Dortmund, Cologne, Frankfurt, Karlsruhe and Basle). Average monthly

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43 *Contango = the price for the future delivery of oil is higher than the price of oil delivered shortly after purchase (forward prices are higher than spot prices). Backwardation = spot prices are higher than forward prices*

44 *See for example the weekly column "De Rijn van A tot Z" in the Weekblad Schuttevaer, which reports on freight rate trends.*

values are calculated for the freight rates for these six destinations based on these raw data. These average values can be seen as indicating the level of freight in the month in question. Monthly values are also used for the variables “transport demand”, “gasoil price” and “water level” (level at Kaub). In the absence of appropriate figures for traffic on the Rhine the demand for transport on German waterways has been used as a proxy. [45]

3. Trend problems

In analysing the influence of the demand for transport it needs to be borne in mind that the latter exhibits a downward trend. This trend can also be discerned for the transport submarket of light heating oil, diesel and gasoil (or rather specifically for this submarket). In order to be able to compare the calculations with the other parameters not exhibiting any trend, trend components were removed from the transport demand time series (see annex).

4. Seasonality

Existing seasonal cycles shed light on important characteristics of the variables being analysed. The figure below shows the seasonal cycle for gasoil freight rates. The first half of the year is characterised by falling freight rate trends. The low point is reached in June. As the year progresses the seasonal component rises appreciably, peaking in November.

The seasonal trend in the water level plays an important role in explaining this pattern. For example, the seasonal picture of the level of the Rhine at Kaub is characterised by high water levels in the first half of the year, steeply falling water levels between June and September (low point) and subsequently by moderately rising water levels.[46] The relatively low freight rates in the first half of the year therefore correspond to the high water levels in the first five months of the year. In line with the falling water level from June onwards freight rates in the same month rise significantly.

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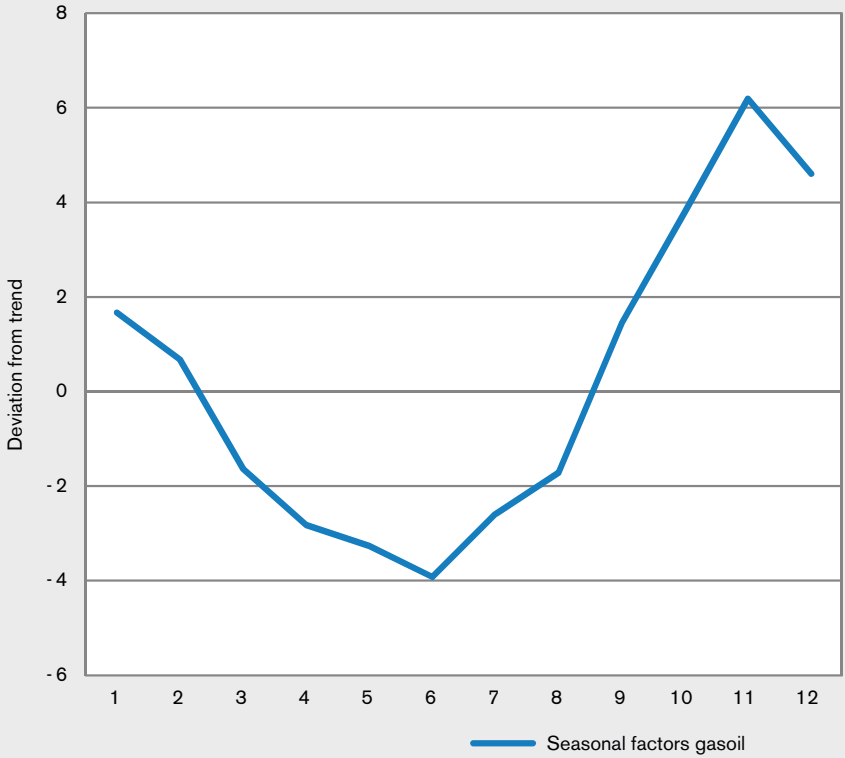
45 *Source transport demand: destatis (original values in 1,000 tonnes); Source Water level: Federal Institute for Hydrology*

46 *Own calculations based on data between 2002 and 2008*

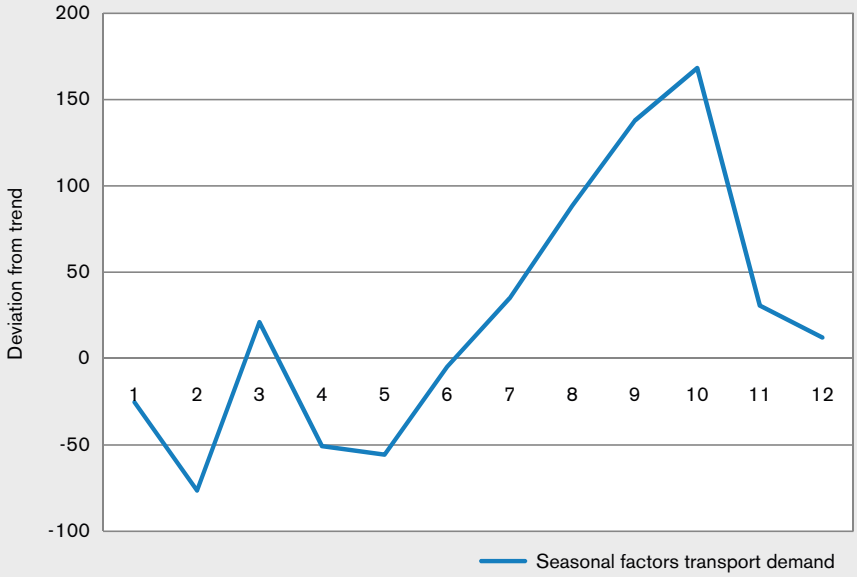
Figure 13: Seasonal factors in gasoil freight rates



Source: CCNR calculations based on data from PJK International BV for the period 2002 to 2008; figures 1 to 12 = months

It is also conceivable that an additional reason for the high freight levels in autumn is the delivery of heating oil before the onset of winter. What emerges from the following graphic is that there is a sharp increase in the transportation of heating oil and diesel between June and October, peaking in October.

Figure 14: Seasonal factors in the transportation of diesel and heating oil



Source: CCNR calculations based on destatis data; figures 1 to 12 = months

5. Influencing factors

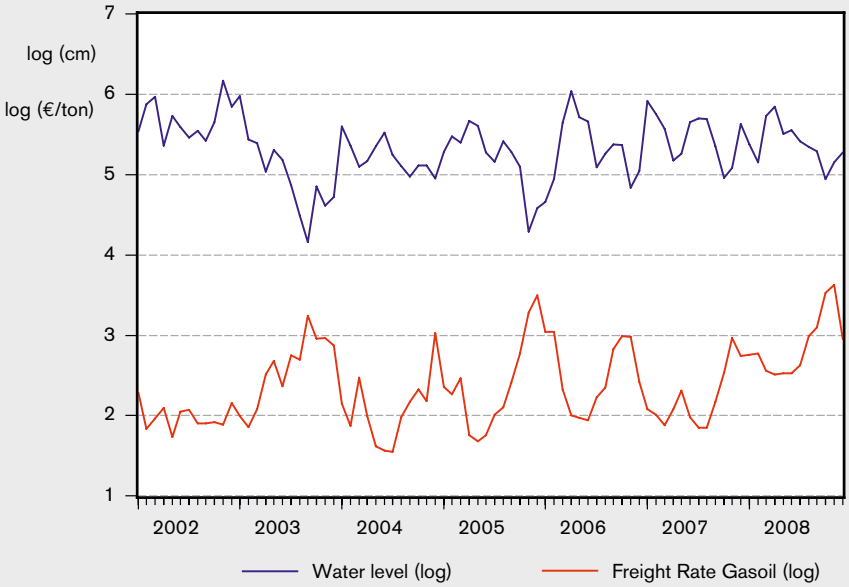
The econometric analysis is preceded by an initial check for possible connections in graphical form. This is intended to indicate specific patterns but does not replace the econometric calculations.

a. Water level

When the water level is falling there is indeed less shipping space as the reduced draught per ship is accompanied by a lower maximum permissible load factor. Low water levels therefore cause the shipping price to rise.[47] The following graphic shows the water level at Kaub/Rhine and the gasoil freight rates between 2002 and the end of 2008.

47 *Compare also O. Jonkeren (2009), Adaptation to Climate Change in Inland Waterway Transport, pp. 17-19.*

Figure 15: Water level and freight rates



Source: PJK International B.V ; Federal Institute for Hydrology; CCNR calculations

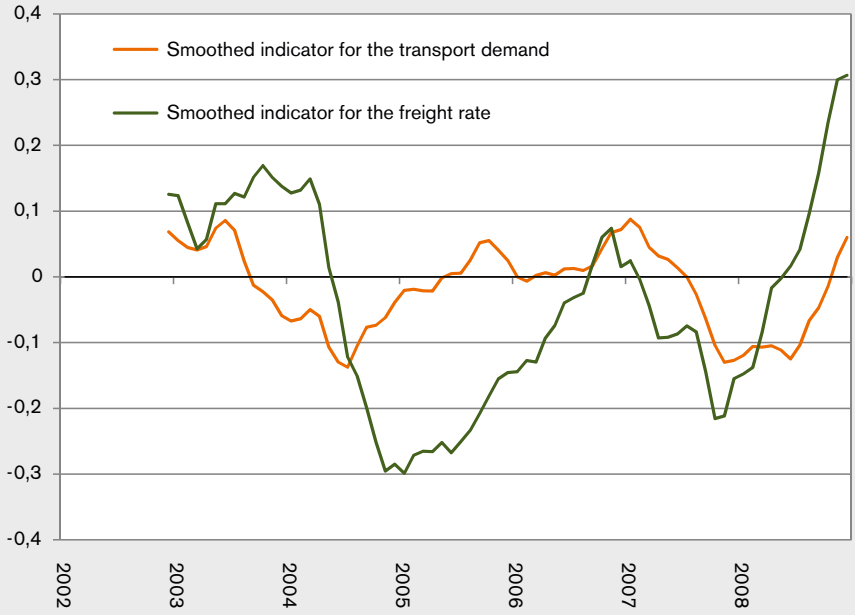
What is clearly apparent is the inverse relationship between water level and freight rates. That means that when there is a marked fall in the water level (such as at the end of 2003 and 2005) one can see a clear rise in freight rates. Conversely, when the water level was relatively high (as in 2002, early in 2006, the first half of 2007) very low freight rates were observed. Admittedly cargoes also rose strongly towards the end of 2008 notwithstanding the water level during this period being average. This implies additional influencing factors such as the trend in demand on the one hand and the gasoil price trend on the other hand.

b. Transport demand

To make the influence in demand visible in the form of a graph, the freight rate time series has to be “adjusted” for the impact of the water level and the gasoil costs (details: see annex). What emerges from the adjustment process detailed in the

annex is an indicator for freight that can be compared with an indicator for transport demand.

Figure 16: Trend variance for transport demand and a demand-induced residual series for freight rates*



*Source: CCNR calculations; * smoothed path for both series*

As a rule the freight rates appear to be subject to more pronounced fluctuations than the transport movements. All in all, the graphic suggests that a relationship between the two indicators can be seen as relatively probable. Just how strong this is is investigated in more detail using an econometric model.

c. Gasoil price

The price of gasoil plays a major role as a cost factor in operating inland ships. In tanker navigation, fuel costs (gasoil/lube oil) account for the largest proportion of

overall costs along with personnel costs.[48] In addition to personnel and fuel costs other cost factors are duties and fees, insurance premiums and administrative costs.

It should also be noted that because of their dependence on the price of crude oil, gasoil prices are subject to significant volatility, which does not apply to the same extent to the other cost factors. Clues as to the influence of fuel prices on freight rates can also be found in reports in the relevant press.[49]

As with transport demand, here too the freight rate time series can be adjusted for the effect of the two other factors. In the case at hand we are talking about adjusting for the influence of transport demand and the water level. In a subsequent step a comparison is then made between the trend in gasoil costs and a freight rate residual amount that is not influenced by water level and transport demand. The results indicate an influence on freight rates which is less however than that of the water level.

d. Capacity utilisation

It is to be assumed that the freight rate level is also influenced by other variables. From a theoretical perspective we are primarily talking about the capacity utilisation of the fleet. Increasing utilisation represents a shift in the supply/demand ratio and should exert upward pressure on freight.

Tank space capacity utilisation has been declining for a number of years.[50] In addition to the modest declining trend in demand this is primarily attributable to the high

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48 *The available costs are based on the cost structure for a tanker making 48 seaport trips a year on the route Basle-Rotterdam-Basle and consuming approximately 24,000 litres of gasoil for each round trip. The average cargo is 1,900 tonnes, the economic life 20 years and the purchase costs are 4 million Swiss francs.*

49 *For example read the article "High price of fuel is pushing up freight rates" in the 1st July 2008 edition of the newspaper "De Binnenvaartkrant".*

50 *See the CCNR market observation report "European inland navigation - market observation 2009/2", p.35*

levels of investment in new ships as practised in recent years.[51] Only in 2008, when tanker navigation was experiencing exceptional economic circumstances (owing to a sharp fall in oil prices) was the downward trend in capacity utilisation temporarily halted. However in the following year capacity utilisation resumed its declining trend.

Factoring capacity utilisation into this analysis is problematic for a number of reasons. On the one hand capacity utilisation data are currently only available on an annual basis and are incompatible with the other monthly data being used here. And on the other hand there are also substantive doubts about the ability to quantify and measure its influence. For example, a fall in capacity utilisation should have also tended to trigger a declining trend in freight rates. But there is no evidence whatsoever of such a falling trend in freight rates. What can be seen here are relatively pronounced fluctuations which - if anything - tend to exhibit a modest increasing trend.

Admittedly, calculations using the econometric model have indicated that freight rate levels in the second half of 2008 cannot be explained by the model's existing variables alone (transport demand, water level, gasoil costs). To that extent one could imagine attributing this temporary "inexplicable" portion of the increase in freight rates to the increase in capacity utilisation which occurred in the same period.

e. Crude oil markets

The weakening economy in 2008 resulted in a fall in the price of crude oil and crude oil products within a very short space of time. This also impacted the term structure of prices. For example, within a very short space of time, a backwardation phase turned into a contango situation (cf. figure). This increased the incentive to stockpile crude oil products. On the Rhine navigation market this also boosts transport movements as more ships are required in the short term for delivery to storage facilities.[52]

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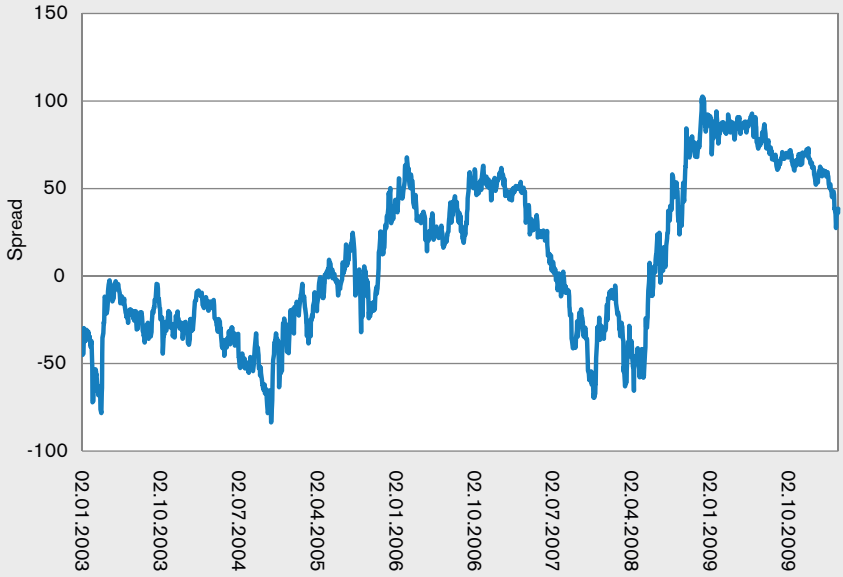
51 *These investments are partly due to a special situation affecting tanker navigation characterised by a progressive migration from single hull to double hull ships.*

52 *Information provided by industry consultant Patrick Kulsen of PJK International B.V.*

To that extent the temporary "inexplicable" portion of the increase in freight rates in late 2008 can also be attributed to this higher level of stockpiling in addition to the increase in capacity utilisation.

Figure 17: Term structure of gasoil prices*



** Difference (spread) between the 12 months future and the 2 months future; source: Reuters*

6. Overall results and interpretation

The results permit the conclusion that water level, transport demand and gasoil prices influence freight rates. For example it can be seen that freight rates in the period under investigation rose by an average of approximately 0.4% if transport demand increased by one percent. The inverse relationship between water level and transport prices is reflected in the negative elasticity of -0.8%. The effect of an increase in gasoil prices is of similar magnitude to that of transport demand.

The diagram below shows the empirical freight rates and values calculated by the model. The model only replicates the steep rise in transport prices that occurred in late 2008 by taking account of a one-off effect. One possible cause of this one-off effect is the increase in capacity utilisation that occurred in this period. This positive short-term effect in capacity utilisation was a consequence of the temporary spike in transport demand for heating oil and diesel. On the other hand the characteristic feature of the market during this period was the transition from backwardation to contango, which stimulated stockpiling and thus the demand for transport.

A final and additional observation is that according to the calculations the transport demand for heating oil and diesel primarily depends on the price of crude oil and temperature trends. A rising oil price has the effect of reducing the transport demand for mineral oil products (see also market observation report 2009-1). It was not possible to demonstrate any significant influence of freight rates on the demand for transport. This might primarily be explained by the fact that transport costs are only a very small part of the final price of the product for goods such as heating oil and diesel.

That would mean that transport demand is essentially price inelastic as regards freight rates. It is however price elastic with regard to the price of crude oil. The transporting of heating oil is also significantly influenced by changing temperatures (courtesy of the winter effect).

*Figure 18: Empirical freight rate and freight rates according to the econometric model**

*Source: CCNR calculations; * logarithmised values*

7. Annex

To chapter 3) Trend problems:

The trend in the transport series was removed using a deterministic linear trend model.

To chapter 5b) Adjustment of freight rates for the effects of water level and gasoil costs:

This adjustment entails estimating an equation which calculates the influence of the water level and gasoil costs on the freight rate. The deviations between the actual freight rate and the freight rate explained by the said equation were then calculated. These deviations are a sort of residual amount. If transport demand is of significance for freight rates then it must have a certain relationship with this residual amount. In both cases the series were smoothed using a moving average filter of a 12 month duration.

To chapter 6) Overall results and interpretation:

The econometric model uses a "dummy" variable to capture the one-off effect in the second half of 2008. It is supposed to depict the possible effect of the temporary increase in capacity utilisation in tanker navigation.[53] The entire model is as follows:

Freight rate /gasoil =
(C) · (transport demand) ^{ß1}· (water level) ^{ß2} · (gasoil price) ^{ß3} · ß4 · dummy(2008/8 to 2008/12)

The parameters to be estimated are the elasticities[54] ß1, ß2 , ß3 , ß4. The value for ß1 states by how much (in percent) the freight rates increased in the period 2002 to 2008 if transport demand increased by one percent. The two other parameters ß2 and ß3 are to be interpreted accordingly. If the coefficient of the dummy variable (ß4) differs significantly from zero, this can be interpreted as a temporary influence of the increased capacity utilisation on freights. The calculations yielded the following result for the equation to be estimated[55]:

Freight rate /gasoil =
(4.7) · (Transport demand)$^{0.42}$ · (Water level)$^{-0.8}$ · (Gasoil price)$^{0.43}$ · 0.53 · (Dummy)

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53 *The dummy variable has the value "0" for all months prior to August 2008 and the value "1" for the months from August 2008 to December 2008. Between August and December 2008 the transport of mineral products was governed by a special economic situation attributable to the drastic fall in oil prices.*

54 *An elasticity states by how many percent a dependent variable changes if the independent variable increases by one percent. The interpretation of the parameters as elasticities derives from the non-linear specification of the model in the form of a multidimensional power function.*

55 *The Newey-West estimator was used to calculate standard deviations to take account of the existing autocorrelation in the equation. With these standard deviations also, all influencing factors are significant to a 5% level of probability. The coefficient of determination is 0.63. That means that approximately two thirds of the freight variation is explained by existing variables.*

The inland navigation market in 2009 and early 2010

Section 1

ANALYSIS OF TRANSPORT DEMAND

1. ECONOMIC GROWTH: DEVELOPMENT AND PROSPECTS

Both the global and European economies have recovered somewhat since bottoming in the first half of 2009. The capacity utilisation of important industrial sectors, such as the German steel industry, has increased from 50% in the spring of 2009 to 87% in the spring of 2010. The industrial new orders index has increased almost continuously since February 2009. This points to rising economic growth in the spring. But many economic experts still consider current developments to be unstable.

Within the EU 27 the biggest increases in new orders in February 2010 were reported by Latvia (+40%), Slovakia (+30%) and Germany (+24.5%). The Netherlands reported a 20% increase, contrasting with a 3% decrease in France. The increase in orders was fuelled above all by demand from China, the USA and Japan. The principal beneficiaries were the chemical industry and the metals sector.
The recovery therefore depends in large part on demand from Asia. For example, Chinese GDP growth in the first quarter of 2010 was again rocketing at a rate of 12%. The Asian Development Bank anticipates growth of 9.6% for 2010 as a whole. The Chinese industrial sector, the slowing of which last year was the main reason for China's low growth[56] has also recovered. Between January 2009 (almost 0 %) and January 2010 growth reached approximately 20 %.[57]

The International Monetary Fund is anticipating GDP growth in the Eurozone of approximately 1% in 2010 and 1 ½ % the following year. As usual growth fore-

56 *The industrial sector accounts for roughly three fifths of Chinese GDP.*
57 *A base effect has to be borne in mind with these rates as the previous year's performance was very low.*

casts for the USA and China are significantly higher than in Europe. But individual associations such as the Federation of German Industries (BDI) or the German Wholesale and Export Trade Association (BGA) arrive at somewhat more optimistic forecasts for Germany.[58]

Table 7: IMF economic growth forecast for selected countries

Country/Region	GDP vs previous year in %	
	2010	**2011**
Eurozone	1.0	1.5
Germany	1.2	1.7
France	1.5	1.8
Netherlands	1.3	1.3
Belgium	1.2	1.3
Switzerland	1.5	1.8
USA	3.1	2.6
China	10.0	9.9

Source: International Monetary Fund IMF

The price of oil has risen with almost frightening speed in recent months. If it went on to reach an extremely high level it would severely curtail almost all areas of the economy, especially private consumption of oil intensive products. In addition, the effective prices for European consumers are being further increased because of the depreciation of the euro. This is threatening to slow the recovery.

2. TRANSPORT DEMAND: DEVELOPMENT AND PROSPECTS

Transport demand in Germany suffered a significant reduction last year with -17%. Transport performance fell somewhat less, by 13%. French transport demand however defied the economic crisis. Growth in the agricultural products, finished

58 *The BDI is even forecasting +2% for 2010, the economic research institutes +1.5% and the BGA +1.4%.*

products and container sectors offset the heavy losses suffered by ores, metal wastes and chemical products. Overall French transport output fell by only 1.1%. The waterways' modal split share (based on tonne kilometres) in France increased from 3.1% in 2008 to 3.5% in 2009 whereas in Germany it declined from 9.6% to 9.1%.

In view of the world economic recovery, the outlook for transport demand this year and next year is fundamentally positive but with major differences between freight segments. The individual market segments will therefore be evaluated below in terms of their past performance and prospects

2.1 Agricultural and forestry products and fertilisers

The transportation of agricultural produce in 2009, especially in the summer months, benefited from the very good harvest in Europe. There was 9.5% growth for the year as a whole. Because of the long and cold winter, the harvest in central Europe this year should be somewhat lower than in 2009. A further contributing factor is the fact that farmers severely curtailed their use of artificial nutrients in the autumn as a result of very high fertiliser prices. Subject to essentially normal weather conditions for the rest of the year the German Cooperative Association, Deutscher Raiffeisenverband, is currently estimating a modest decline of 7.4% for the forthcoming cereal harvest. The result should be somewhat lower transport demand in the summer months. A smaller crop does however drive an increase in imports through seaports so that the overall result taken over the year as a whole need not necessarily be any less.

Fertiliser transport movements in 2009 fell by 27% compared with the previous year. Following the collapse in sales last year the fertiliser and salt producers are again seeing signs of a pick up in activity. Following a significant price reduction we can again expect an increase in the use of fertilisers. This should provide a boost for transport demand. Port transshipments provide the first indications of this. These have doubled in Ludwigshafen in the first four months of 2010 compared with the year before.

2.2 Iron and steel industry

Ores & metal wastes

This segment has been very hard hit by the crisis. Transport volumes in 2009 fell by a total of 31% compared with 2008. Since April 2009 however, steel production in Germany and France has slowly worked its way back up from its low point in April 2009. In Germany, production in the first quarter of 2010 was only 12% below the level of 2007 and 10% below the level of 2008. In France however the shortfall was somewhat larger (-23% compared with Q1/2008; -29% compared with Q1/2007). German steel production is however of great importance to transportation on the Rhine.

The following figure, covering the period January 2008 to March 2010, indicates that in March 2010 Germany had again reached its multi-annual average steel production of approximately four million tonnes.

Transport demand on the Rhine[59], or to be precise on German waterways, has developed positively - in step with steel production.[60] This recovery should have continued in the period for which data are not yet available (first quarter 2010). There are indications to this effect in the number of transshipments being handled by individual Rhine ports, such as the Port of Neuss-Düsseldorf. This port saw a doubling in transshipments of ores and metal wastes in the first quarter of 2010 compared with the year before (+105%). This doubling correlates very closely with the doubling of steel production in the same period (see following graphic).

The forecast in the market report 2009-2 therefore remains intact, that transport on German waterways will get back to its multi-annual level of approximately 3 million tonnes before the end of 2010. In France, transports showed a growth of 61% in the first quarter of 2010.

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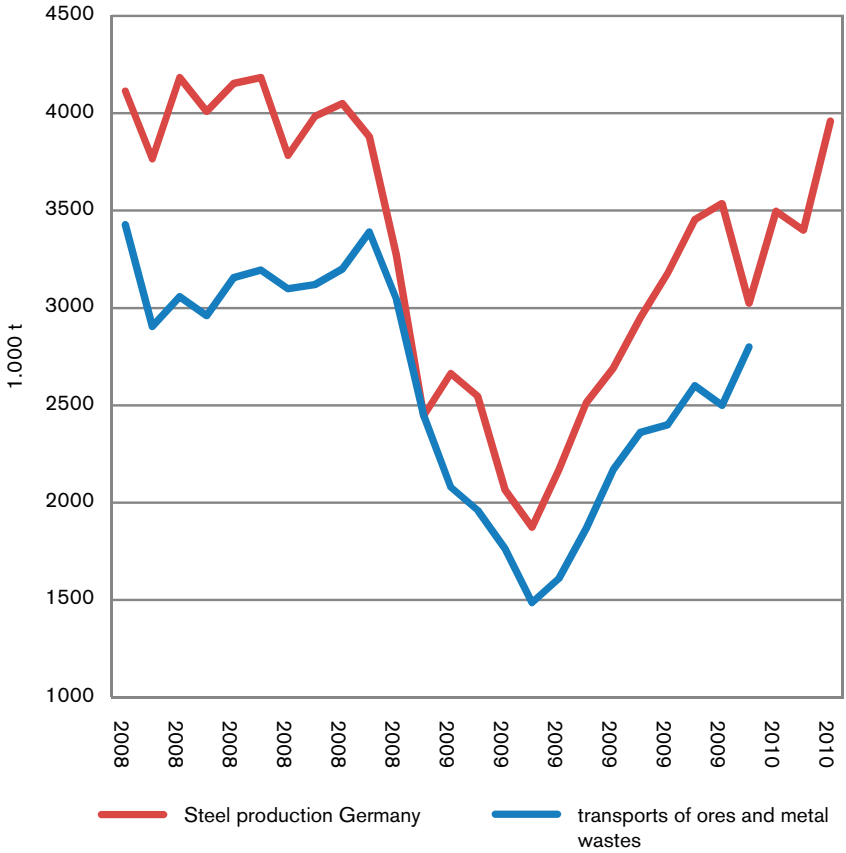
59 *When it comes to ores, transport on the Rhine has more than a 95% share of transport on German waterways.*

60 *Information for inland navigation was available up to and including December 2009.*

Figure 19: Transportation of ores and metal wastes and steel production in Germany



Source: destatis; German Steel Federation; Eurofer; transport demand only until December 2009

In view of the steel industry's healthy order books in the first quarter a high level of production and correspondingly high demand for transport is anticipated for the second quarter. The recovery of the automotive industry points in the same direction (cf. section on iron & steel products).

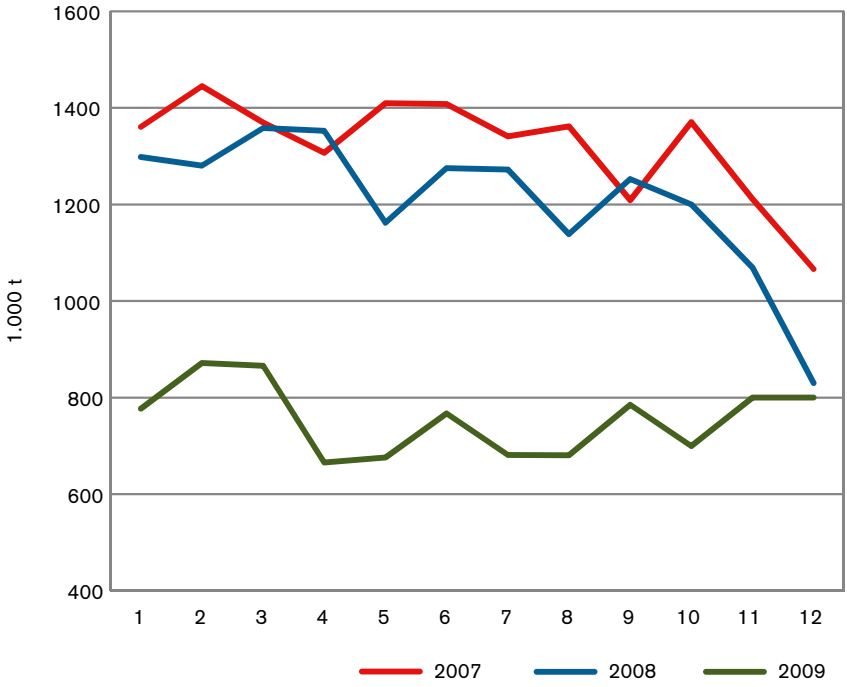
Developments on the commodity markets pose certain risks for the recovery process. Iron ore prices have more than doubled within a year. Even more significant however is that the three largest mine operators (a Brazilian company with a 33% market share, an Australian-British company with 19% and an Australian company with 17%) have now attained a certain market power that they have used to impose shorter supply contract terms on Chinese steel companies. As a result prices will be adjusted more frequently in future. The annual contracts of the past will be replaced by quarterly contracts. It is relatively probable that this price system will be applied to Europe as well; should this indeed be the case then the European steel industry would be faced with cost increases.

It is not currently possible to predict how or whether this will impact steel production and the demand for inland navigation transport in the medium to long term.
A diversification in the sources of supply is conceivable in principle (iron ore is also mined in Sweden and South Africa) or a switch to electric steel production. For a more accurate assessment however we first have to await the effects of the current changes.

Iron & steel products

Contrary to the transport of ores and metal wastes there was scarcely any recovery to be seen for steel end products by the end of 2009. Last year this segment recorded the deepest decline of all segments with -38%.

Figure 20: Transport demand for iron, steel and nonferrous metals on German waterways



Source: destatis

There was not much that the construction industry could be expected to do for steel demand to March owing to the particularly severe winter 2009/2010. There was however a significant export push in the automotive industry in the spring of 2010 which has not yet been captured by the currently available data for transport demand. For example Germany exported more than one million new cars in the first quarter of 2010, 47% more than the year before. German automotive production increased by 32 %.[61]

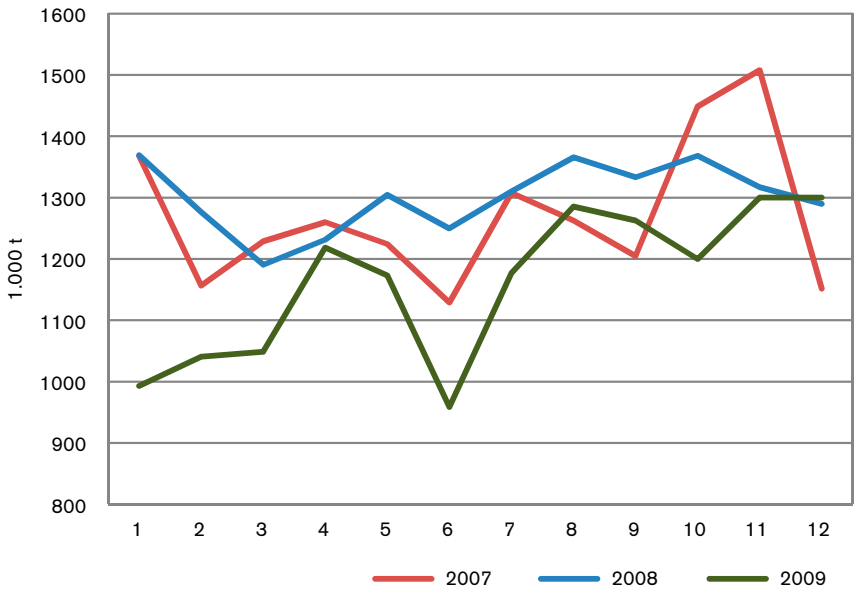
61 *German Automobile Industry Association (VDA)*

2.3 Solid mineral fuels

In 2009 solid fuels suffered a 17% decline compared with the previous year (on German waterways). On French waterways transport output fell 12%. All in all earlier forecasts that the transportation of solid fuels is far less affected by the crisis than ores and metal wastes for example (see figure) are proving correct. Towards the end of 2009 transport demand was at the same level as towards the end of 2007.

In Germany and the Netherlands a major proportion of power and heat supply continues to be provided by mineral coal. Energy production is less sensitive to the state of the economy than the industrial sector. That is why coal consumption is less prone to crises (see figure).

Figure 21: Transport demand for solid fuels on German waterways



Source: destatis

A number of new coal-fired power stations are planned along the Rhine and in the Ruhr. Because of public resistance not all of these projects will be implemented but others will be built on schedule. For example an existing large coal-fired power station in Mannheim will have a 910 Megawatt block added to it in the next few years. The imported coal for the existing power station is already being delivered by inland navigation. The commissioning of this additional block is scheduled for the end of 2013 as a public petition against the construction of the power station failed because of inadequate support.

Also, because of declining coal production, the requirement for imported coal will remain high, at least for the next few years. Because of their large capacities the western seaports are predestined to receive these imports and send them into the hinterland using inland ships on the Rhine. According to logistics experts the German seaports lack harbour capacity to accommodate rising coal imports.

2.4 Aggregates, clay & building materials

With a 16% decline in 2009 the impact of the crisis on this segment has been comparatively moderate. The industry has however made a weak start to 2010 owing to the severe winter, which has delayed numerous building projects. According to Eurostat information the seasonally adjusted output in the building industry in the EU 27 in February fell by 3% compared with January following a fall of 1% in January. Building output in Germany in February fell by 14% compared with the previous month; it remained constant in France. This development is reflected in the fall in port transshipments for the three most important Rhine ports in this segment: Strasbourg, as well as Cologne and Neuss-Düsseldorf, reported lower figures for the first quarter of 2010 (see section on inland ports) than the year before.

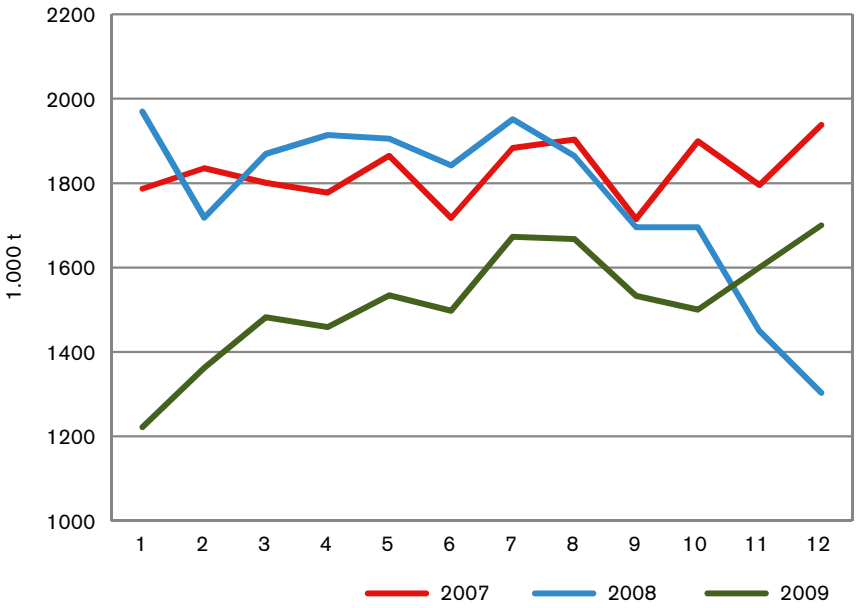
In 2010 we can expect increased construction activity owing to the governments' economic stimulus programmes (many of them were infrastructure projects) which should also stimulate transport demand.

2.5 Chemical products

As a matter of principle this sector operates cyclically and in step with industrial activity. As a consequence the economic crisis in the second half of 2008 had a significant impact but a sustained recovery has been underway throughout 2009

(cf. figure). For 2009 as a whole there was therefore only a moderate decline in transport demand of -15%. In December 2009 transport demand was only 12% below the level of December 2007 compared with a year on year difference of 32% in January. Increased transshipments in the chemical ports of Ludwigshafen and Cologne also point to a recovery (see section on inland ports).

Figure 22: Transport demand for chemical products on German waterways



Source: destatis

As to future developments attention needs to remain focused on the state of the economy and the price of oil. It plays an important role for the chemical and petrochemical industry as a raw material price. During an economic recovery moderate oil price rises can be passed on to chemical product customers. But extreme upwards or downwards fluctuations are dangerous and can cause sales to collapse.

Overall, the current environment can be described as favourable as cyclical demand (especially from Asia) is picking up again and the price of oil is still relatively

moderate. We can therefore assume that transport demand this year will continue to exhibit strong growth.

2.6 Mineral oil products

Transport demand has fallen from a very high level in March 2009 to a very low level towards the end of the year. Compared to the year before, transport volumes on German waterways were 21% lower in November 2009 and 16% lower in December 2009. This overall trend very clearly tracks the price of crude oil and oil products. Purchases, transportation and stockpiling increased in the wake of the slump in prices in the second half of 2008 with the result that stockpiling and demand had become saturated in the second half of 2009.

The economic recovery is accompanied by a growing demand for fuel in 2010. Moreover, the long cold winter in individual regions has caused additional heating oil consumption of between 15 and 20%. These factors argue for higher transport demand in this current year.

But there are also factors acting as a brake. This includes the increase in the price of oil. 'Brent crude' has risen from approximately US $40 to more than US $ 80 (end of April 2010). This is compounded by the fact that owing to the depreciation of the euro relative to the US dollar (in the wake of the discussions about Greece) mineral products have effectively become more expensive for European consumers.[62]

Should both these effects persist for the rest of the year (which seems very likely when it comes to the price of oil) this will act as a brake on the demand for transporting heating oil and fuel. If one offsets the stimulating factors against those acting as a brake, the net result should be stagnation for this year.

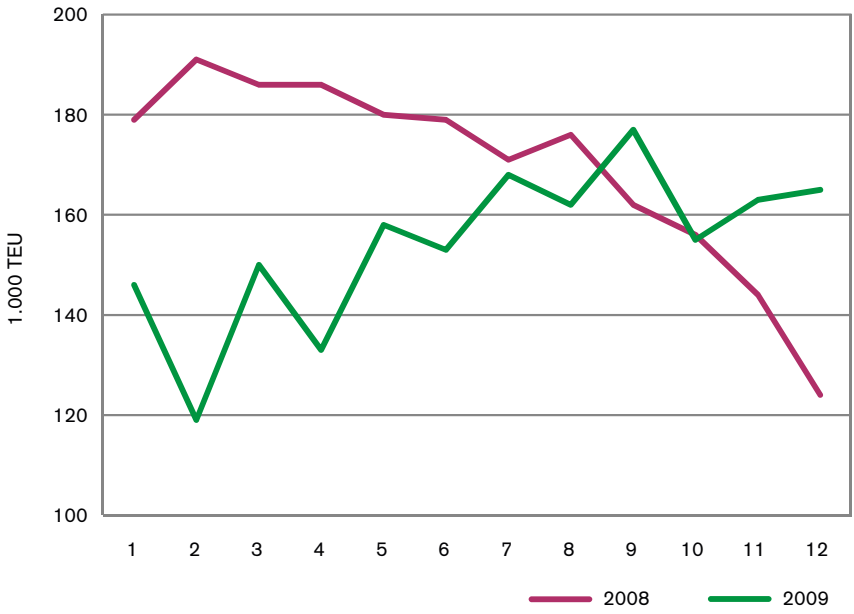
62 *This is because most oil products are traded in dollars and a weaker euro therefore results in higher import prices.*

2.7 Containers

The clouds were already gathering over the container market at the beginning of 2008 as a result of the slowdown in world trade. There was a significant recovery during 2009. This manifested itself earlier than in other segments (cf. figure) partly because the crisis had struck here earlier. In Germany the result for 2009 measured in TEUs was 8% below that of the previous year. In France however it increased by 11%. There was growth of 4.1% on the French stretch of the Rhine.

In view of positive forecasts for world trade - following a decline of 11% in 2009 the International Monetary Fund is anticipating +7% in 2010 and +6% in 2011 - container traffic can be expected to continue to recover in 2010.

Figure 23: Container transport in inland navigation in Germany



Source: destatis

Transshipment activity in the western seaports of Rotterdam and Antwerp is also showing clear signs of recovery. Both in Rotterdam and in Antwerp the maritime transshipment of containers rose by approximately 20% in the first quarter of 2010 (cf. section on seaports). As the market share of inland navigation in both seaports is approximately one third this increase should have a significant positive impact on inland container navigation.

3. HARBOUR TRANSSHIPMENTS

3.1 Seaports

In the first quarter of 2010 14% more goods were handled in the seaport of Rotterdam than in the same period one year before. Imports of ores and scrap metal even increased by 94%; almost a doubling. Chemical materials were also able to post growth, in step with increasing industrial output. Container traffic has increased by 21% in tonnage terms, with outbound traffic growth somewhat stronger than for inbound traffic. We mainly have the rapid economic recovery in Asia to thank in both cases.

Imports of agricultural products have fallen by 32%, a consequence of Europe's very good harvest in 2009. Solid fuels posted a surprising decline of 16.5%. This has to do with increases in coal prices in the energy sector. As expected the building sector lagged behind in the first quarter.

In the seaport of Antwerp, transshipments in the first quarter of 2010 increased by just short of 13% compared with the year before. Concerning raw materials for the steel industry, there was recorded growth of 21% for scrap metal contrasting with a 15% decline for coal and ores. Finished steel products continued to buck the recovery trend and fell 20% compared with the year before.

Container transshipments - measured in tonnes - rose 20%, almost at the same rate as in Rotterdam. Measured in terms of TEUs, growth was 16%. Transshipment volumes in TEUs even recovered to the level achieved in the first quarter of 2008.

3.2 Inland ports

The following account deals with the most recent developments in the transshipments handled by important Rhine ports. Only the most important ports are shown for each segment (where data are available). The figures are therefore based on information from the ports of Basle, Cologne, Kehl, Ludwigshafen, Mannheim, Neuss-Düsseldorf and Strasbourg. In all cases the growth rates quoted refer to the corresponding period last year (same quarter last year or same month last year).

Agricultural and forestry products and fertilisers

Strasbourg is the most important Rhine port for agricultural produce, ahead of Basle. Cereal transshipments in the first quarter remained virtually stable (-0.7%). There was hardly any change in Basle either. Receipts rose here by 6%. Outbound movements in this segment are less important than receipts in most ports. In the Port of Neuss-Düsseldorf transshipments have increased by 4 %. Fertiliser transshipments in Ludwigshafen doubled in the first four months of the year.

Foodstuffs and fodder

The Port of Neuss-Düsseldorf is the most important Rhine port here. Transshipments in the first quarter of 2010 were 6% higher than the year before. In Neuss-Düsseldorf and in Basle this sector is especially important for receipts whereas in Strasbourg outbound shipments predominate. Deliveries in Basle in January and February combined fell by 23%. The Port of Strasbourg (placed 4th in this segment by order of importance) posted a growth of 18% in the first quarter.

Ores & metal wastes

In the Port of Neuss-Düsseldorf transshipments doubled in the first quarter of 2010. Growth figures in Mannheim are as follows: January: +62 %, February: +181 %, March: +14 %. Admittedly, the figure for February is attributable in large part to a one-off effect (major investment by a new company). Despite that the first quarter reveals a clear increase in the transport of ores and scrap metal in the wake of the recovery in the steel industry and resurgence in seaport transshipment activity.

Iron & steel products

As regards steel products, Mannheim is in fourth position behind Duisburg, Kehl and Basle. March saw a recovery even in this segment, which has previously been

immune to any improvement. Transshipments rose 63 percent. In Basle as well, imported steel products increased 30% in the first two months of the year (exports are almost negligible).

Solid fuels

Transshipments of solid fuels in the Port of Mannheim (the second most important Rhine port in this segment) increased by a total of 11% in the first quarter of 2010. March featured particularly prominently in this quarter with growth of 19%. Coal transshipments in Mannheim are driven by a large coal-fired cogeneration power station, namely one which generates both heat and power at the same time. The steep increase in March must be related to the harsh winter temperatures experienced in 2010.

Aggregates, clay & building materials

The Port of Strasbourg is the busiest Rhine port in this sector and posted a 12.7% decline in the first quarter. Transhipments in Neuss-Düsseldorf also fell, specifically by 17 %. The Port of Cologne, placed third in this segment, handled 3 % less in the first quarter. This fall will have been to do with the weak state of the building sector as a result of the weather (cold winter 2009/2010).

Chemical products

In Ludwigshafen, the most important Rhine port in this segment, transshipments in the first four months increased by 21% compared with the year before. Because of the chemical industry in the Cologne region, the Port of Cologne is the second most important chemical port on the Rhine. The port's import operations are dominated by aluminium hydroxides (a raw material for the chemical industry), cellulose (a raw material for the paper industry) and raw materials for plastic manufacturing.

Deliveries of aluminium hydroxides in Cologne increased by 64% in the first quarter, the receipt of cellulose by 12 % and transshipments of raw materials for plastic manufacturing by 17 %. The increase in aluminium hydroxides indicates a continuing recovery in chemical output. The same conclusion can be drawn when looking at the export side. The most important exports of chemical products are benzene, caustic soda and oils. Benzene is used as a primary product in the manufactur-

ing of a number of industrial chemicals. Outbound movements in the first quarter increased by 28%. Transshipments of caustic soda remained constant.

In the Port of Mannheim as well, which is the third most important Rhine port in this segment, riverside transshipments grew very strongly in the first quarter. They increased by 83.4% in January, 91.3% in February and 80% in March.

Crude oil and crude oil products

The Port of Cologne is the most important Rhine port for mineral oil products. These goods are handled primarily in the Port of Cologne-Godorf. Here are to be found berths from which pipelines lead directly into the factories of the surrounding petrochemical and plastic manufacturing companies. The refineries primarily manufacture fuels such as kerosene as well as heating oils and bitumen. These goods therefore play an important role in the port's outbound deliveries. Transshipments of heating oil increased by 13% in the first quarter of 2010, diesel and petrol remaining virtually unchanged. Deliveries of mineral oil products increased by 15 % in total and total transshipments by 4 %. The growth in heating oil, which was the key driver behind the increase in total transshipments, would have been related to the harsh winter.

Containers

In the Port of Mannheim 31,779 TEUs were registered on the waterway side of container transshipment operations in the first quarter; it was 27,005 TEUs for Strasbourg. In Mannheim, movements were 53% higher than in the previous year. March was the outstanding month with +58%. The final result in Strasbourg was an increase of 37%. In the Port of Cologne the number of loaded containers transhipped increased by 25% in January. The Port of Duisburg as well, the largest inland container port on the Rhine, recorded an increase in waterway-side container transshipments in recent months.

Sources: Inland ports mentioned

Section 2

ANALYSIS OF TRANSPORT SUPPLY

INTRODUCTION

At any given time, the transport supply on the European waterways network comprises the operational transport capacity. For these purposes, an inland ship is considered to be operational if it possesses the required, valid certificates such that it can be used on the market at any time if the corresponding transport demand exists.

From a geographical perspective we can see that 83% of the operational capacity for dry goods shipping and almost 99% of tanker shipping is in Western Europe (Belgium, Germany, France, Luxembourg, Netherlands, Switzerland) as well as being registered under these flags. In this part of Europe it is possible to track operational capability status and how it has developed over the years with "acceptable" accuracy.

Owing to the absence of standardised definitions of flag affiliation and registration methods in the Danube area, Poland and the Czech Republic, there are currently still problems in obtaining an approximate idea of operational ships registered in these countries. This is why the analyses set out here are largely given over to the transport offering in the West European market and how it has evolved.

Trends in fleet development and structure are based on a comparison between fleets at the end of 2002 and at the end of 2009. 2002 is the year in which restructuring measures came to an end. We can therefore assume that supply and demand at this point in time were more or less in balance.

For dry goods shipping the trend in capacity and demand shows that this equilibrium was more or less maintained until the outbreak of the financial crisis. For tanker shipping however the existence of an equilibrium needs to be fundamentally called

into question. This is attributable to the fact that while numerous new vessels (in the context of a restructuring of the fleet) were increasing market supply, demand in this market is tending to be reduced.

1. THE DIFFERENT FLAGS' MARKET SHARES

The German waterways network was taken as an indicator of market share because of its central location in Europe. In addition the required data are available for this network. The market share was estimated based on the tonne kilometre performance.

Table 8: Tkm performance of the various flags on German waterways

Flags	Dry shipping	Tanker shipping
Belgium	7.3%	6.4%
Germany	29.0%	48.0%
France	0.8%	0.3%
Luxembourg	0.2%	1.2%
Netherlands	57.4%	39.7%
Switzerland	0.6%	4.0%
Great Britain	0.8%	0.4%
Poland	1.9%	
Austria	0.5%	
Czech Republic	0.8%	
Bulgaria	0.2%	
Romania	0.3%	
Other	0.2%	

Source: CCNR Secretariat - Destatis

NB : Even if a number of transport movements are being conducted on continental European waterways under a British flag, the British inland fleet nevertheless remains a special case as it operates on waterways that are not connected to the European waterway network. Its influence on the Western European transport offering is therefore small.

2. FLEET STRUCTURE IN WESTERN EUROPE

Motor cargo vessels and motor tankers continue to play a dominant role. Motor cargo vessels account for more than a 65% share of European operational capacity in the dry goods shipping market. These motor cargo vessels are supplemented by a significant number of pushed barges. Motor tankers account for a 92 % share of European operational capacity in the tanker shipping market.

What we can note in general is that both in the dry goods and tanker shipping markets ships' average capacity is increasing:

- more than 1,200 tonnes average capacity for motor cargo vessels in 2009 compared with 930 tonnes in 2002.
- 1,660 tonnes average capacity for motor tankers in 2009 compared with 1,200 tonnes in 2002.

If however we look at fleets by flag affiliation, we can see major differences as far as ship size and ship age are concerned.

2.1 Structural trends in the dry goods shipping fleet

For a number of years many ships with carrying capacities of at least 3,000 tonnes have been built in the dry goods shipping market. For economic reasons there are hardly any ships with a carrying capacity less than 1,500 tonnes built any more. By contrast, each year a not insignificant number of smaller vessels are withdrawn from the market. Moreover, these small ships are not being replaced.

By tonnage categories

Observation of fleets' statistical breakdown by tonnage categories clearly indicates that the size categories of the smallest ships are gradually dwindling away.

That means that since 2002, following the expiry of the capacity restructuring policy, more than 1,400 motor cargo vessels and more than 350 pushed cargo barges have been withdrawn from the West European operational fleet. Some of them were sold to the Danube countries, Poland and the Czech Republic and are therefore still capable of participating in the transportation of goods in Western Europe. Some of

the ships were converted for residential purposes or used in some other capacity. A number of these ships are also broken up.

In the medium term, the departure from the market of these small vessels (that are no longer being replaced) threatens to create a shortage of ships on smaller waterways, which is already making itself felt. For example, more than 60% of the French motor cargo vessel fleet (in tonnage terms) comprises ships with a carrying capacity of less than 1,000 tonnes. This is justified by the capacity constraints on canals in the North of France where a major proportion of French inland navigation occurs. The new capabilities that the “Seine-Nord Europe” link will offer may influence future fleet structure in France. In Belgium and the Netherlands the proportion of motor cargo vessels of less than 1,000 tonnes is approximately 22% and even 15% in Germany.

In terms of their carrying capacity, these ships are operating in a market segment in which the demand for transport is for smaller quantities of goods. As a result, this market segment is the one most exposed to competition from the lorry industry.

Seen in its totality, despite the departure of these numerous smaller vessels the dry goods shipping fleet grew by approximately 11.6% (in tonnage terms) between 2002 and 2009 as a result of the addition of new capacity, including +13.3% for motor cargo vessels and +9.7% for pushed cargo barges. This increased capacity however only benefits the major waterways, especially the Rhine.

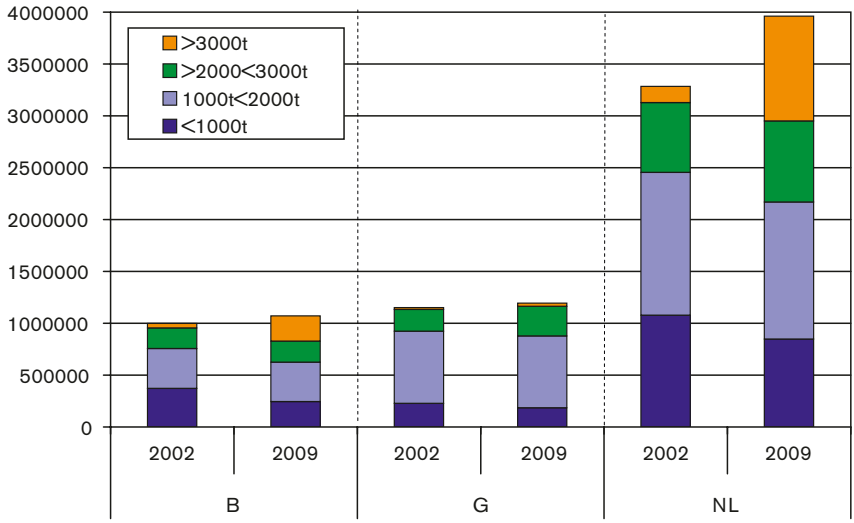
The analysis of the evolution in fleet structure clearly shows that the proportion of large vessels within existing capacity is only growing in those national fleets which have used numerous new vessels in recent years: primarily the Netherlands and Belgium. In Germany and especially France the proportion of large vessels has barely risen. Fleets such as those in Luxembourg and Switzerland comprise a relatively small number of vessels. They are composed of medium sized and large vessels that are used on the Rhine and Moselle.

The evolution in fleet structure by ship size is most striking in the Dutch and Belgian fleets. The growth in these fleets’ capacity is directly attributable to the introduction

of vessels of more than 2,000 tonnes and even more so of vessels of more than 3,000 tonnes.

This trend is a clear indication of an investment dynamism not encountered on the same scale in other states. The national economic environment and funding measures support this dynamism.

Figure 24: Structure of the Western European motor cargo vessel fleets (in tonnes):



Source: CCNR Secretariat

Calculated in terms of tonnes of capacity, the share of capacity accounted for by motor cargo vessels over 2,000 tonnes has increased from 22% to 39% whereas the proportion of ships of 3,000 tonnes and more has risen from somewhat more than 4% to somewhat more than 19%. In tonnage terms almost five times as much capacity has entered the market in the 3,000 tonnes and more category than in the 2,000 to 3,000 tonne class.

By year of construction

The fleet's age structure as well has changed in recent years. More than 300 new ships have been added. At the same time numerous ships built before 1980 were withdrawn, usually smaller vessels that were sold to Danube countries, to Poland and the Czech Republic or converted into houseboats. The operational ships' average age has therefore also fallen, from approximately 50 years in 2002 to barely 45 years in 2009.

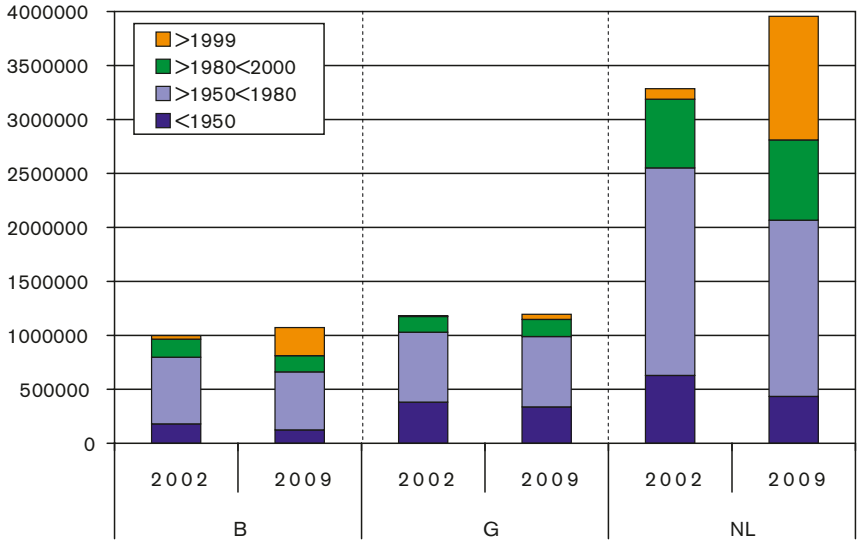
Table 9: Trend in the number of dry goods ships in the West European fleet by year of construction

2002 / 2009	Motor cargo vessels	Pushed cargo barges
Total	-941	-183
Built before 1990	-1,334	-412
Built in 1990 and after	393	229

Source: CCNR Secretariat

If one looks at national fleets, one will be struck by differences in how they have evolved. The average age of the Swiss fleet was already relatively low in 2002. But this is a relatively "small" fleet, comprising only Rhine-based ships. The Luxembourg fleet is tending to decline from one year to the next and currently there are hardly any new vessels being added.

Figure 25: Structure of the Western European motor cargo vessel fleets by year of construction (in tonnes):



Source: CCNR Secretariat

Far and away the majority of "new" vessels (built since 2002) are to be found in the Dutch and Belgian fleets. These two fleets contain between 40% and 50% of tonnage that first entered service from 1990 onwards. By contrast, in the German and French fleets respectively, only 20% and 16% of current capacity was first deployed after 1990.

Conclusion

The massive introduction of large new vessels that are forced to switch to around the clock operation for profitability reasons is driving a disproportionate increase in transport capacity. On the major waterways this kept pace with the trend in demand until at least mid 2008. This was accompanied however by an ageing, or even shrinking of the operational fleets on smaller waterways. The modernisation of this segment of capacity, for which the main competitor is considered to be the lorry, remains as yet unresolved for economic reasons.

2.2 Structural trends in the tanker fleet

As is generally known, the tanker shipping market is in a restructuring phase. This is related to the progressive expiry of the transitional measures of the AND regime pertaining to transportation in double hulled ships. Deadlines up until 2018 are envisaged to give the industry time to overhaul the fleet that is still predominantly made up of single hulled ships.

To highlight the effect on the market of the transition to double hulled ships the ADN substance list was used in conjunction with the quantities of liquid cargo being transported to arrive at the following estimate:

Table 11: Estimate of the progressive requirement for double hulled capacity (based on quantities carried)

Sectors	Market share	Specification
Chemicals	25 %	Double hull (type G/C)
Crude oil products	24 %	Double hull (type N) w.e.f 31.12.2015
	42 %	Double hull (type N) w.e.f 31.12.18
	4 %	Single hull
Other	5 %	

Source: CCNR Secretariat

According to the estimate that means that double hulled ships will be required for approximately 90% of tanker cargoes from the end of 2018 onwards. This development will require replacement of a large part of the fleet. Liquid goods are predominantly carried on the Rhine and on the West European waterway network.

Between 2002 and 2009 the capacity of the motor tanker fleet increased by 47.5%, pushed tanker barge capacity, by contrast, declining by approximately 20%.

The number of operational motor tankers has not increased in the same proportion because around 250 motor tankers have also been removed from this market, mainly by being sold to Danube countries and to Africa.

Moreover, hardly any pushed tanker barges are being built any more and they are tending to disappear from the market.

Overall, however, contrary to the dry cargo fleets, which have done no more than adapt to demand in recent years, the tanker fleets have continued to add new vessels but without this greater capacity matching the development in demand. That means that for the time being, many new tankers are currently having to share the market with the older ships. At the moment there is no balance between newly added capacity and capacity exiting the market.

By tonnage categories

If one looks at the structural trend in the tanker fleet by carrying capacity between 2002 and 2009, one will observe the same tendency as is to be noted for dry goods shipping: an increase in the proportion of ships of more than 2,000 tonnes and especially those of more than 3,000 tonnes.
With tankers as well there are significant differences between national fleets. In exactly the same way as for dry goods shipping, the most significant developments are to be seen with the Belgian and Dutch fleets.

In the Belgian fleet, more than 70% of the capacity in 2009 is comprised of ships with a carrying capacity of more than 2,000 tonnes (compared with 55% in 2002).

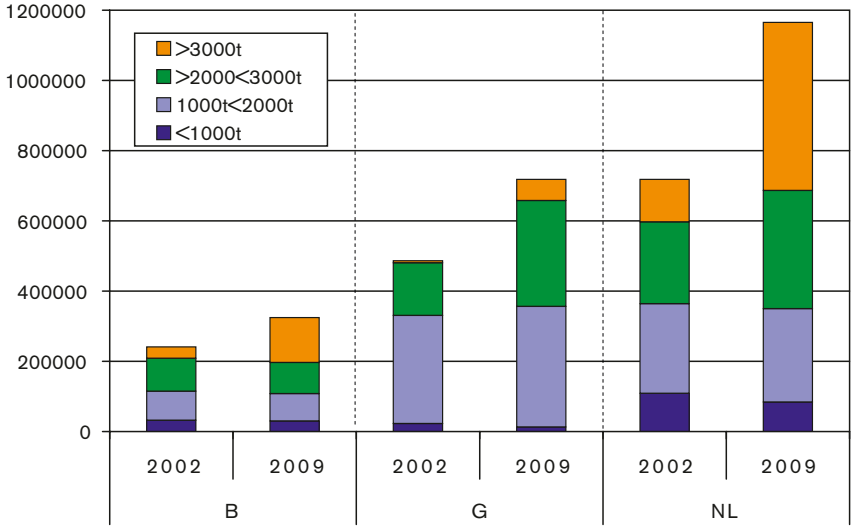
In the Dutch fleet, 76% of the capacity is comprised of ships of more than 2,000 tonnes (compared with approximately 66% in 2002). The proportion of tankers over 3,000 tonnes in particular increased significantly.

As a result, the Belgian and Dutch fleets alone contain 74 ships with a carrying capacity of more than 3,500 tonnes.

It needs to be noted at this point however that a considerable proportion of these, especially the largest vessels, are ships for bunkering in seaports but which can however also occasionally be used for transport. However this in no way alters the fact that - as in dry goods shipping - the trend to larger vessels is justified on economic grounds.

This trend is significantly less prominent in France and Germany. The Swiss and Luxembourg tanker fleets comprise 48 and 17 motor tankers respectively. These are predominantly larger vessels, especially so in the case of Switzerland (more than 2,300 tonnes on average), built since 1970.

Figure 26: Western European tanker fleet structure by tonnage



Source: CCNR Secretariat

What is particularly noteworthy is the development of the Dutch tanker fleet, the operational capacity of which grew by 58% between 2002 and 2009. By comparison, the capacity of the German tanker fleet grew by not quite 48% and the Belgian fleet by just short of 35%. The capacity of the Swiss tanker fleet also increased by 11.5%. By contrast the capacities of the French and Luxembourg fleets have declined.

By year of construction

In addition to the development in fleet structure by ship size category, it is also possible to analyse the development in distribution by year of construction. The massive addition of new construction in recent years is very apparent in all countries except

France. It should be noted that the new ships are being added without single hull capacity being withdrawn.

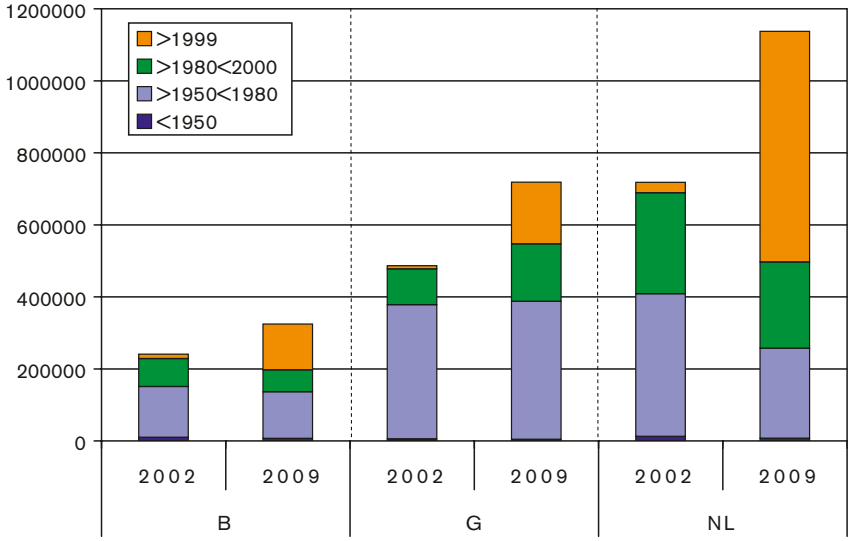
Table 11: Trend in the number of tankers in the West European fleet by year of construction

2002 / 2009	Motor tankers	Pushed tanker barges
Total	+70	-72
Built before 1990	-248	-66
Built in 1990 and after	+318	-6

Source: CCNR Secretariat

In 2002 barely half of the available fleet (in terms of units) featured a double hull. As already mentioned, the greater part of the 2002 capacity must be equipped with a double hull by 2018. By then at the latest, most older vessels that cannot be converted into double hulled ships for structural reasons will not be permitted to operate in the European market. That is why the numbers of pre 1990 age categories predominantly comprising single hull ships have been falling since 2002. The many new built ships, by contrast, are being added to the age group from 1990 onward. These are almost exclusively double hulled ships.

Figure 27: Western European tanker fleet structure by year of construction:



Source: Secretariat

In terms of age structure, what we can note is that 68% of the transport capacity in the Netherlands in 2009 was delivered by tankers (in terms of tonnage) less than 20 years old. The corresponding proportion for Belgium was 45% and for Germany 33%. In view of the fact that almost only double hulled ships have been built since 1990, these figures illustrate the progress that has been made in restructuring these countries' fleets.

Conclusion

The development in the European tanker fleet between 2002 and 2009 clearly shows that the transition process to the double hull is in hand. The available capacity in the market is temporarily significantly higher than would be required to meet current demand. This situation has arisen from the temporary simultaneous presence of numerous new double hulled ships and single hulled ships.

From a commercial perspective the single hull ships enjoy a clear advantage in that most of these ships are no longer burdened with loans. The new double hull ships on the other hand generally have higher operating costs (attributable among other reasons to the financing and additional personnel required) and therefore must be operated around the clock as far as possible in order to cover these costs. The current transitional phase for the new ships may therefore prove to be a difficult one.

In all probability this situation will become even more acute in the next few years as long as the single hull ships are still permitted under the rules to operate in the market on an equal footing with the double hulled ships.

3. FLEETS IN THE DANUBE AREA, POLAND AND CZECH REPUBLIC

The fleets in this region represent approximately 7% of European dry goods capacity and barely more than 1% of tanker capacity.

They are made up predominantly of dry goods ships. The proportion of pusher vessels and pushed barges in the Danube countries is extremely high compared with West European fleets. For example, 76% of current operational capacity is made up of pushed barges. Pushed barges are a very commonly practised form of shipping on the Danube although for a number of years now motor cargo vessels have been increasingly used for transporting cargoes. This compares with the tendency to use smaller motor vessels on the Elbe and in north-eastern waters (as a result of the shallow draught).

Size categories

Motor cargo vessels have a carrying capacity between 500 and 2,000 tonnes. There are hardly any larger vessels. Pushed barges on the other hand exist in all size categories.

Age categories

Most ships date from the years between 1960 and 2000. There is hardly any new construction. The ships joining these fleets often come from the West European

fleets. The pushed barges are mainly ships built between 1970 and 1990, the cargo vessels and motor tankers are also frequently older ships. It is evident for example that this part of the European fleet is not developing with the same dynamism as that of the West European fleets, except on the lower Danube.

According to available information, in 2009 a not insignificant number of dry goods ships, mainly pushed barges and pusher vessels were sold to Poland, less so to other countries. These sales however do not mean that these ships are no longer being used on West European waterways.

NB : Ships from third party EU countries such as Serbia and Ukraine are also active on the Danube.

4. NEW CONSTRUCTION

Notwithstanding the economic crisis, 2009 was a record year for new construction. Newly deployed dry goods shipping capacity was approximately 13% higher than the year before, 93% higher than the year before for tanker shipping.

Structure by new build size category

What can be observed for motor cargo vessels is that between 2002 and 2009 almost 60% of the ships had a capacity greater than 3,000 tonnes. In 2009 the proportion of motor cargo vessels with a carrying capacity of more than 3,000 tonnes was even in excess of 70%.
What can be seen for operational motor tankers is that approximately 1/3 have a capacity of more than 3,000 tonnes (including bunker ships), 1/3 have a capacity between 2,000 tonnes and 3,000 tonnes and a third less than 2,000 tonnes.

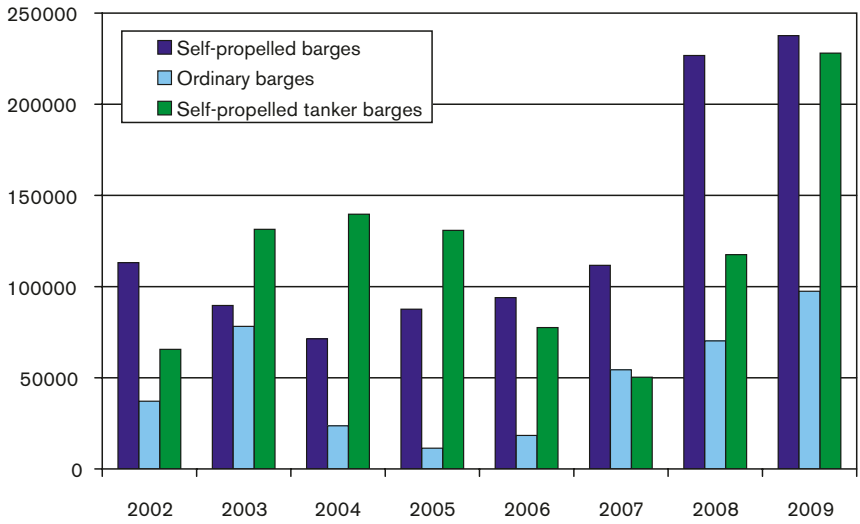
Structure by ship nationality

Between 2002 and 2009 almost 80% of newly deployed motor cargo vessels were registered in the Netherlands and 19% in Belgium. Rather more than 50% of pushed cargo barges were registered in the Netherlands, approximately 27% in Belgium and 17% in France. 70% of motor tankers were registered in the Netherlands, 14% in Germany and 12% in France.

These statistics indicate the dynamism of the Dutch inland navigation environment for investment and innovation; this dynamism is supported by a tax system that stimulates investment.

For example, since 2002 almost 1.3 million tonnes of new dry goods shipping capacity has been deployed and more than 0.875 million tonnes of tanker capacity. This corresponds to an increased capacity of 13.8% for dry goods ships and 54% for tankers.

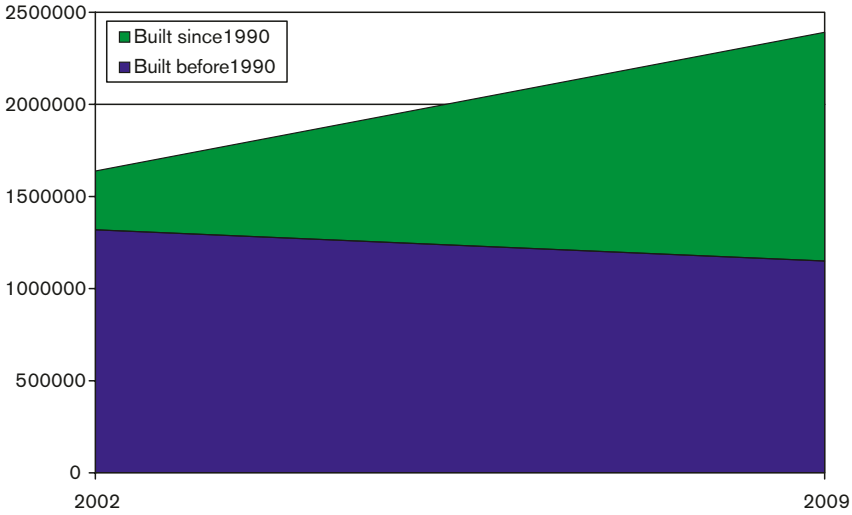
Figure 28: New construction trend between 2002 and 2009 (in terms of new tonnage deployed)



Source: IVR

In both sectors it needs to be noted that these new ships trigger a disproportional increase in the transport offering as a result of their significantly higher productivity.

Figure 29: Development in motor tanker capacity between 2002 and 2009



Source: CCNR Secretariat

2009 saw 11 new ships deployed in the passenger navigation sector, corresponding to the average rhythm since 2002. The capacity in this market is evolving in connection with the demand for transport.

5. CAPACITY UTILISATION

The model that has been developed for monitoring capacity utilisation indicates a fall in utilisation of between 10 – 20% for 2009 depending on ship size. In the dry goods shipping sector this is primarily attributable to significantly lower transport demand. In the tanker sector this development is primarily caused by the current restructuring process.

Even if forecasts are being hazarded as to how transport demand will develop in 2010 based on anticipated output in the various industrial sectors it is not possible to make any forecasts as to capacity utilisation. There are too many different influ-

encing factors at play: Transport demand, available capacity in light of the addition of numerous new vessels and water flow are the most important.

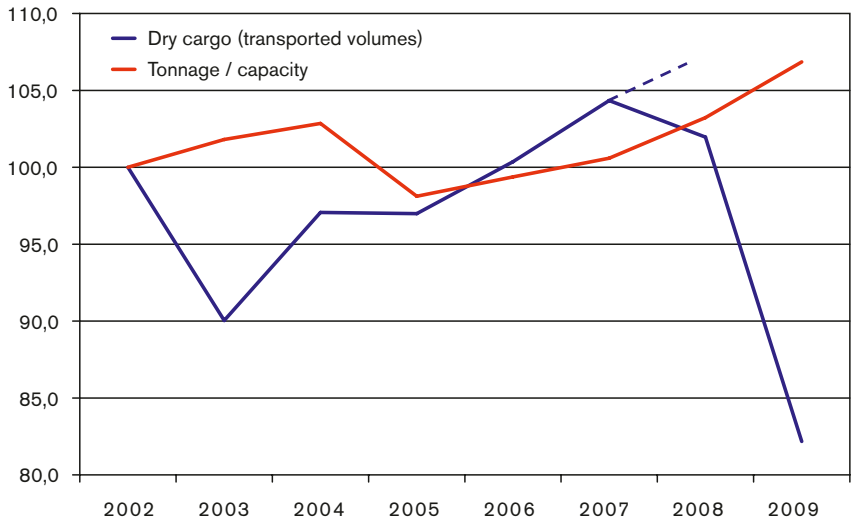
In the dry goods shipping sector

Transport capacity has grown in the years to 2008 as a result of the deployment of new vessels but in a comparable rhythm to that of transport demand.
What can be noted is that since the economic crisis began in autumn 2008 many more new vessels have come onto the market. These were already under construction and had to be completed.

In this context, the "collapse" of transport demand caused a temporary imbalance between supply and demand.

Even if transport demand has slowly started to grow again it is possible that capacity utilisation will suffer for some time yet from this surplus capacity.

Figure 30: Comparison between capacity development and quantities transported in the dry goods shipping sector on German waterways



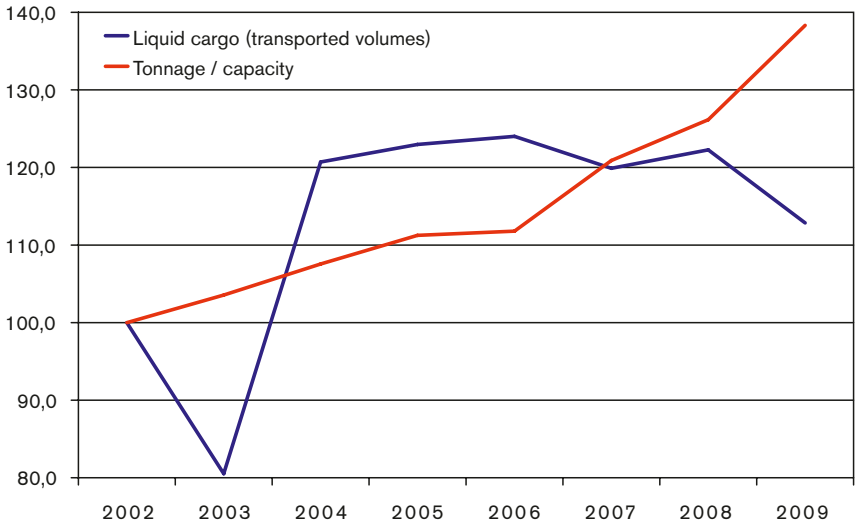
Source: CCNR Secretariat

In the tanker sector

Numerous new double hulled vessels are being deployed in the market under the restructuring of the tanker fleet. As already mentioned this is not being matched by the withdrawal of an equivalent amount of single hulled tonnage. This is why existing capacity is temporarily growing.

At the same time demand is following a slight downward development trajectory, ignoring seasonal and speculative fluctuations, the latter being attributable to weather-related effects and to developments on the crude oil markets. The growth in the transportation of chemical products is not sufficient to compensate for the structural decline in mineral oil products. The balance between supply and demand is being increasingly disrupted by the continuing expansion in supply. A further deterioration in capacity utilisation is therefore to be expected in this market.

Figure 31: Comparison between capacity development and quantities transported in the tanker shipping sector on German waterways



Source: CCNR Secretariat

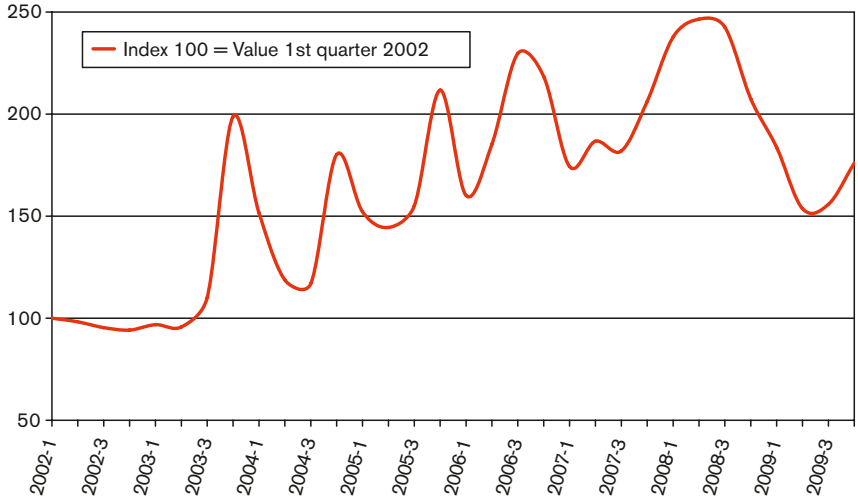
6. FREIGHT RATE DEVELOPMENT

Both in the dry goods and tanker sectors the freight rate level and its development is deemed to be an indicator of the market equilibrium between supply and demand.

Freight rates in the dry goods sector

The development of freight rates in the dry goods sector reflects the crisis situation in 2009 in which supply far outstripped demand. An increase in freight rates has however been observed in the last quarter. This is to be attributed to a pick up in demand as well as to periods of low water. The 3.5% increase in new capacity in 2009 will doubtless place a further strain on freight rates.

Figure 32: The trend in freight rates on German waterways



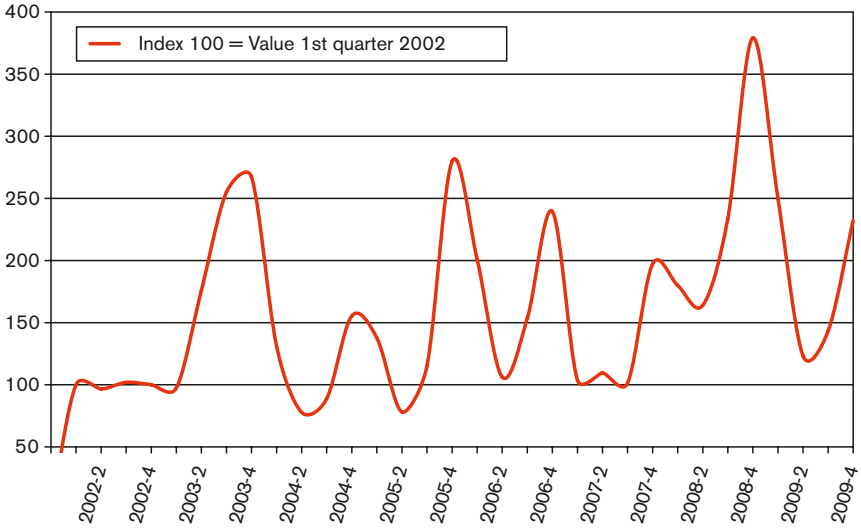
Source: NEA freight rate index

Freight rates in the tanker sector

Following the peak freight rate levels in the second half of 2008 the tanker shipping market has calmed down somewhat, expressed as a decline. The key driver here was the decline in transport demand for mineral oil products.

Speculation on the crude oil market and water flow, as set out in fact sheet 3, continue to be of primary importance here.

Figure 33: Freight rate index for liquid cargo on the Rhine



Source: NEA freight rate index

Section 3

WATER CONDITIONS AND OPERATING CAPACITY

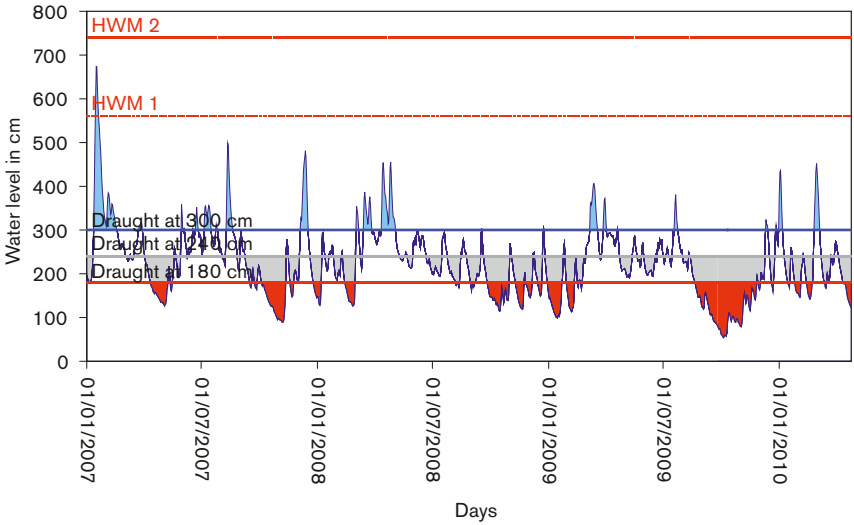
All in all, water conditions in the first nine months of 2009 were at a satisfactory level. At the same time the demand for transport was relatively low as a result of the economic crisis. Therefore there was sufficient capacity available.

Not until the autumn of 2009 were there sustained low water levels on most waterways. This coincided with the start of an increase in transport demand. This combination resulted in a modest increase in freight rates. This seasonal low water period could be felt on all European waterways. It was shorter lived than the year before but often on a larger scale.

1. WATER CONDITIONS ON THE RHINE

Overall, the water level on the Rhine in 2009 was average. It followed the seasonal cycles, that are linked to precipitation. The late summer and autumn saw the beginning of a period of low water levels which, as usual, constrained shipping operations on individual sections of the Middle Rhine. For example, water conditions in 2009 were less than 180 cm on 146 days compared with only 105 days in 2008.

Figure 34: Water conditions on the Rhine at Kaub



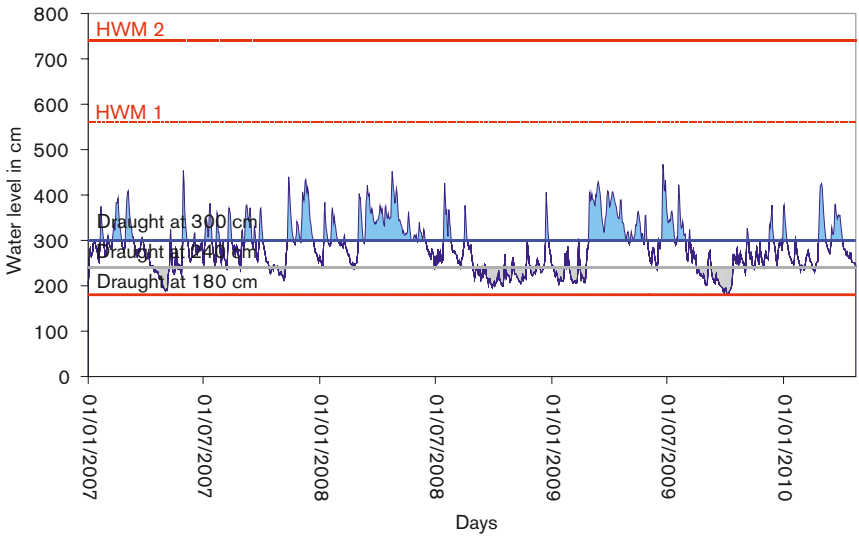
Source: BAFG

No high water mark was exceeded in 2009.

2. WATER CONDITIONS ON THE UPPER REACHES OF THE DANUBE

Water conditions in Hofkirchen in 2009 were comparable with those in 2008. The draught exceeded the 240 cm mark on 99 days.

Figure 35: Water conditions on the upper Danube at Hofkirchen



Source: BAFG

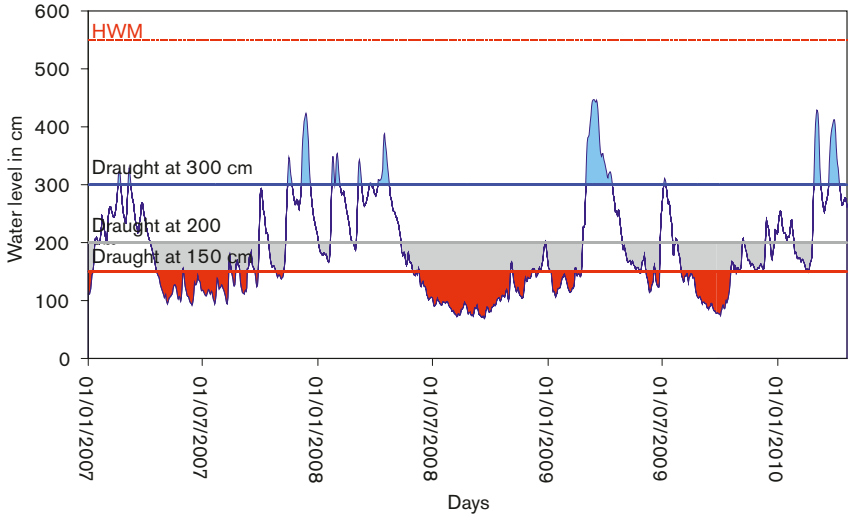
Navigation on the Main-Danube canal was blocked by ice in February 2010.

3. WATER CONDITIONS ON THE ELBE

Water conditions on the Elbe in 2009 were better than the previous year. Water levels were below 150 cm on only 150 days compared with 189 days in 2008. In the winter of 2009/2010 as well water conditions were significantly better than in the year before.

In January 2009 navigation was blocked by ice for approximately 2 weeks. This was not the case in the early months of 2010.

Figure 36: Water conditions on the Elbe at Magdeburg

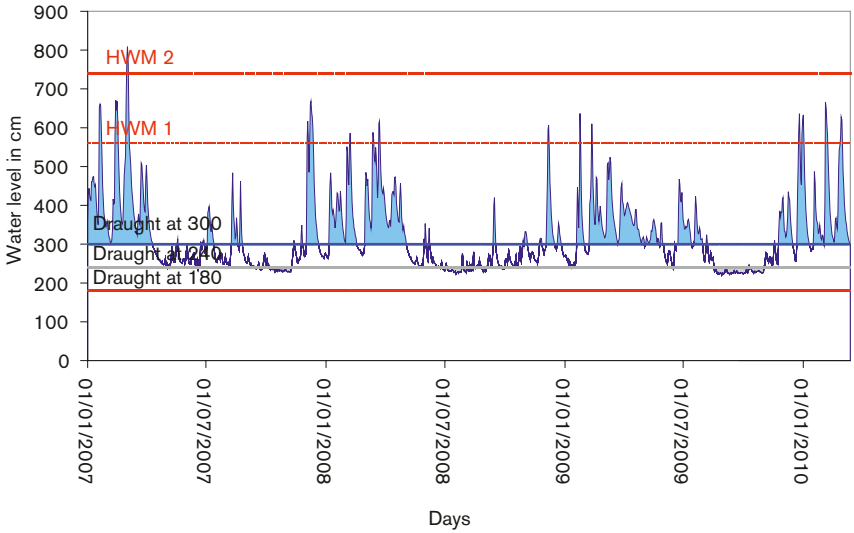


Source: BAFG

4. WATER CONDITIONS ON THE MOSELLE AT TRIER

Water conditions on the Moselle in 2009 was not as favourable as in 2008, especially in the autumn. The draught fell below the 240 cm mark for 76 days compared with only 56 days the year before.

Figure 37: Water conditions on the Moselle at Trier



The high water mark 1 in 2009 was exceeded on a total of 6 days.

SUMMARY

At a time when there are still no definitive figures available for Europe as a whole, it can nonetheless be noted that last year in Germany, the hub of the European waterways network, the volumes transported by inland navigation declined by 17% as a result of the financial crisis. Transport output fell by somewhat less, by 13%. The French inland navigation market, by contrast, was less affected, mainly because of the large proportion of agricultural products transported on these waterways. Agricultural produce and fodder have proved resilient in the face of the economic and financial crisis as they are far more dependent on natural factors such as the weather.

The global and European economies alike have notably recovered from their low point in the first half of 2009 and more rapidly than most experts initially expected. Since the autumn of 2009, and especially in the opening months of 2009, the recovery had gathered pace in major industries and industrial sectors. For example, the capacity utilisation of important industrial sectors, such as the German steel industry, has increased markedly from 50% in the spring of 2009 to 87% in the spring of 2010. In view of the world economic recovery, the outlook for transport demand this year and next year is fundamentally positive but with relatively pronounced differences between freight segments.

The bulk goods sector witnessed a notable resurgence in transport demand in 2009. For example, the quantities carried in the last months of the year were again almost 15% higher than the low point in the crisis. The forecasts for important areas of industry, primarily the steel industry, point to the pace of recovery continuing in 2010. For example, German steel industry output is forecast to grow by 15% with corresponding knock on effects for the carriage of steel goods, coal, ores and metal wastes by inland navigation. The recovery seems to be proceeding at a faster pace in the container sector. Approximately 2/3 of the lost quantities have been made good and inland navigation is expected to grow at around 20% for 2010 as a whole.

Overall, throughout the whole of 2010, the demand for transport in the dry goods arena is expected to increase only slightly (in the single digit range) compared with the year before (on German waterways).[63]

As transport demand was already affected by the economic crisis in 2008, the year 2007 is chosen as reference year for "normal" market conditions.

For the German inland navigation market, it can be said that – based on the volumes of 2009 – transport demand would have to increase by 25 % in order to reach the level of the year 2007 again. Furthermore, transport supply in Western Europe has grown by 6 % since 2007. The ships that have been added to the fleet have a higher productivity than the older ones.
In order to establish a similar relationship between supply and demand as in the year 2007, transport demand would have to grow by approximately one third.

In the tanker shipping sector the significant resurgence in crude oil prices should moderate the transport demand for mineral oil products. The anticipated demand is therefore on the moderate side. Ultimately the outcome for the year as a whole is only somewhat improved by weather-related factors. For example, the cold winter of 2009/2010 should have resulted in increased demand for heating oil, countering the attenuating factors. But a fundamental reversal in the "demand climate" in the crude oil segment would only come about in the event of a renewed economic collapse; such a scenario is typically accompanied by a sharp drop in the oil price, which would significantly stimulate the demand for transport. But such a scenario of a fundamental trend reversal is – for the coming months – hardly probable. What is more likely is a further slight increase in the price of oil or a persistence of the currently high level.

The chemical sector on the other hand remains in a "catch up phase", similar to the dry goods shipping segments. Consequently, demand on the part of the chemical industry should continue to increase during the year.

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63 *This forecast is based on econometric models of the secretariat of the CCNR as well as the outlook of the main industry associations that are relevant for the inland navigation sector.*

Freight rates in the first half of 2009 have continued to fall as a result of the decline in demand for transport. They bottomed in the middle of the year and it was not until the autumn that freight rates gained a little ground thanks to the resurgence in transport demand. Water conditions that temporarily did not allow ships to be fully loaded also contributed. As a result freight rates in the fourth quarter were again well above their low point in the summer.

Once the special demand for tanker shipping, including the replenishing of stocks of mineral oil products, was over, no later than in the first quarter of 2009, freight rates also fell to a very low level. They reached a low in the middle of 2009. An increase was not seen again until autumn 2009. This is attributable to pre winter seasonal transport and to low water levels, resulting in draught restrictions.

Annexes

Fleet structure end 2009

31.12.2009	Motor cargo vessels			Pushed cargo barges			Total dry goods shipping		
	Units	Ton-nage	Engine power	Units	Ton-nage	En-gine power	Units	Tonnage	Engine power
	Number	T	kW	Number	T	kW	Number	T	kW
Germany	932	1194845	551138	902	955467		1834	2150312	551138
Belgium	891	1071864	723662	224	440150		1115	1512014	723662
France	861	566459	184145	392	438743		1253	1005202	184145
Luxem-bourg	11	10321	5402	0	0		11	10321	5402
Nether-lands	2919	3961891	2023184	888	1656236		3807	5618127	2023184
Switzer-land	16	28872	15679	3	5647		19	34519	15679
Poland	109	67571	32533	431	212445		540	280016	32533
Czech Republic	44	48780	19970	158	75920		202	124700	19970
Total	5783	6950603	3555713	2998	3784608		8781	10735211	3555713
Austria (2004)	5	7058	-	54	84807		59	91865	0
Slovakia	14	20697	11013	133	215624		147	236321	11013
Hungary	6	6219	2935	1	793		7	7012	2935
Romania	304	369066	13978	601	1073187		905	1442253	13978
Bulgaria	15	10328	12569	150	74893		165	85221	12569
R. of Mol-davia (*)	9	4065	11150	48	41829		57	45894	11150
Croatia (*)	5	2851	2503	23	34030		28	36881	2503
Serbia (*)	67	17171	65924	252	350261		319	367432	65924
Ukraine (*)	94	132479	207045	403	623784		497	756263	207045
Total	519	569934	327117	1665	2499208		2184	3069142	327117

31.12.2009	Motor tankers			Pushed tanker barges			Total tanker shipping		
	Units	Ton-nage	Engine power	Units	Ton-nage	En-gine po-wer	Units	Ton-nage	Engine power
	Number	T	kW	Number	T	kW	Number	T	kW
Germany	404	718581	364248	43	45636		447	764217	364248
Belgium	207	324677	202069	9	12807		216	337484	202069
France	37	42194	10103	46	72606		83	114800	10103
Luxem-bourg	17	27754	15238	2	8435		19	36189	15238
Nether-lands	724	1164099	655020	37	57538		761	1221637	655020
Switzer-land	48	111589	50700	2	4043		50	115632	50700
Poland	0	0	0	0	0		0	0	0
Czech Republic	0	0	0	0	0		0	0	0
Total	1437	2388894	1297378	139	201065		1576	2589959	1297378
Austria (2004)	5	5601	-	15	22055		20	27656	0
Slovakia	3	3669	-	2	4043		5	7712	0
Hungary	2	2328	-	1	1235		3	3563	0
Romania	10	19318	883	0	0		10	19318	883
Bulgaria	0	0	0	0	0		0	0	0
R. of Mol-davia (*)	0	0	0	0	0		0	0	0
Croatia (*)	0	0	0	0	0		0	0	0
Serbia (*)	0	0	0	0	0		0	0	0
Ukraine (*)	0	0	0	0	0		0	0	0
Total	20	30916	883	18	27333		38	58249	883

(*) indicative, source Danube Commission for 2007

31.12.2009	Tug boats			Pusher boats			insgesamt		
	Units	Ton-nage	Engine power	Units	Ton-nage	Engine power	Units	Ton-nage	Engine power
	Number	T	kW	Number	T	kW	Number	T	kW
Germany	137		27899	291		147371	428		175270
Belgium	12		4439	104		62477	116		66916
France	-	-	-	-		-			
Luxembourg	0		0	14		11799	14		11799
Netherlands	122	-	39720	273		167915	395		207635
Switzerland	1			4			5		0
Poland	14		2155	198		54867	212		57022
Czech Repu-blic	-	-	-	-			87		25230
Total	286		74213	884		444429	1257		543872
Austria (2004)	0		0	10		9200	10		9200
Slovakia	9		7290	36		40570	45		47860
Hungary	-	-	-	-					
Romania	46		12641	32		7733	78		20374
Bulgaria	25		10930	24		28083	49		39013
R. of Molda-via (*)	2		1692	4		1248	6		2940
Croatia (*)	48		995	9		5475	57		6470
Serbia (*)	84		15223	40		52824	124		68047
Ukraine (*)	16		14366	74		113054	90		127420
Total	230		63137	229		258187	459		321324

(*) indicative, source Danube Commission for 2007

New construction status

Ship type	2002			2003			2004		
	Number	Ton-nage	kW	Number	Ton-nage	kW	Number	Ton-nage	kW
Motor cargo vessels	45	113114	56138	34	89676	41894	28	71326	34400
Pushed cargo barges	29	37180		28	78156		14	23636	
Total	74	150294	56138	62	167832	41894	42	94962	34400
Motor tankers	22	65548	30547	45	131455	50332	54	139718	61236
Pushed tanker barges	2	178		1	1800		3	2427	
Total	24	65726	30547	46	133255	50332	57	142145	61236
Pusher boats	2		1276	0		0	1		992
Tug boats	3		11670	1		279	1		177
Total	5		12946	1		279	2		1169
Cabin ships	17		13251	10		7238	5		4021
Excursion ships	9		4834	1		1566	1		662
Total	26		18085	11		8804	6		4683

Ship type	2005			2006			2007		
	Num-ber	Ton-nage	kW	Num-ber	Ton-nage	kW	Num-ber	Ton-nage	kW
Motor cargo vessels	34	87645	27490	33	93985	26637	35	111655	31460
Pushed cargo barges	12	11401		18	18385		29	54336	
Total	46	99046	27490	51	112370	26637	64	165991	31460
Motor tankers	46	130860	43736	28	77565	24637	23	50333	16534
Pushed tanker barges	2	2527		0	0	0	0	0	0
Total	48	133387	43736	28	77565	24637	23	50333	16534

Pusher boats	0		0	0		0	1		0
Tug boats	0		0	0		0	0		0
Total	0		0	0		0	1		0
Cabin ships	5		6280	4	1644	3186	2		1816
Excursion ships	5		2832	2	1959	2244	1		1570
Total	10		9112	6	3603	5430	3		3386

Ship type	**2008**			**2009**			**2010 (5 months)**		
	Number	**Ton-nage**	**kW**	**Number**	**Ton-nage**	**kW**	**Number**	**Ton-nage**	**kW**
Motor cargo vessels	68	226750	92944	72	237668	114002	6	18000	9000
Pushed cargo barges	38	70260		44	97461		2	5000	
Total	106	297010	92944	116	335129	114002	8	23000	9000
Motor tankers	47	117500	31870	87	228020	72778	1	1000	588
Pushed tanker barges	0	0		0	0				
Total	47	117500	31870	87	228020	72778	1	1000	588
Pusher boats	3		1684	6		11188			
Tug boats	3		0	6		1697			
Total	6		1684	12		12885	0		0
Cabin ships	3		5092	9					
Excursion ships	6		3092	1					
Total	9		8184	10		0	0		0

Source: IVR and CCNR Secretariat

Synoptic table inland ports (2009 transshipments for the most important Rhine ports)*

In million tonnes	1st place	2nd place	3rd place
Agricultural products & fertilisers	Strasbourg (1.1)	Basle (0.3)	Neuss-Duesseldorf (0.3)
Foodstuffs and fodder	Neuss-Duesseldorf (2.5)	Mannheim (1.8)	Basle (0.5)
Ores & metal wastes	Duisburg (no info)	Kehl (1.75)**	Neuss-Duesseldorf (0.8)
Iron, steel & nonferrous metals	Duisburg (no info)	Kehl (1.0)**	Basle (0.5)
Solid mineral fuels	Duisburg (no info)	Mannheim (2.2)	Karlsruhe (0.7)
Aggregates, clay & building materials	Strasbourg (3.0)	Neuss-Duesseldorf (2.2)	Cologne (1.3)
Crude oil, mineral oil products	Cologne (4.8)	Duisburg (4.6)	Karlsruhe (4.0)
Chemical products	Ludwigshafen (2.8)	Cologne (1.8)	Mannheim (1.1)
Containers (1,000 TEU)	Duisburg (332.9)	Germersheim (117.7)	Mainz (113.1)

** Figures are rounded to a single decimal point. Sources: Named ports, container traffic: destatis. ** based on information from the regional councils of Baden-Wuerttemberg. No info = no information available*

GLOSSARY

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

Downstream: Portion of the water course between the point in question and the mouth or confluence.

Draught: The height of the immersed part of the ship, the draught thus changes as the ship is unloaded.

Dry freight capacity: Used in the context of the transportation of dry goods

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.

Freight: Means either the cargo or price of transportation.

Freight capacity: A cargo vessel's transport capacity expressed in tonnes.

Inland navigation: The carriage of goods or passengers on board a ship, intended for transport by inland ship traffic on a particular inland waterway network.

Inland waterway: Waters located on the mainland capable of being used by ships with a minimum 50 t carrying capacity when normally loaded. These includes navigable rivers, lakes and canals.

Output: Refers to freight transport output, measured in tonne kilometres.

Revenue: The term "revenue" as used in this publication is intended to define inland navigation activity in the form of an index having regard to a specific level of demand and market transport prices.

River/lake traffic: The transportation of goods onboard a river/seagoing ship (seagoing ship designed for travel on inland waterways) performed wholly or in part on an inland waterway network.

Ship/ship-transhipment: Unloading of freight from a cargo ship and the loading of this freight onto another cargo ship, even if the freight remains on land for a period of time before resuming its onward passage.

Tanker freight capacity: Used in the context of the transportation of tanker cargoes

Tonne kilometres (tkm): Unit of measure for recording transport output, corresponding to the carriage of one tonne over 1 km by inland waterway transport. Calculated by multiplying the quantity carried in t by the distance covered in km.

Transport or freight capacity offering: Comprises the total load capacity of the available fleet, stated in tonnes.

Transshipment: The transfer of goods from one means of transport to another or ashore.

Twenty-foot equivalent unit (TEU): Standard unit of measurement for recording containers according to their size and for describing container ship or container capacity. A 20 foot ISO container (20 foot length and 8 foot width) corresponds to 1 TEU.

Upstream: Portion of the water course between the point in question and the source.

Water conditions: Measurement of the water level of a water course or canal in cm.

INFORMATION SOURCES

International organisations
Asian Development Bank
Danube Commission
European Community
Eurofer
Eurostat
International Monetary Fund
International Transport Forum
OPEC

National authorities

Belgium
Bureau Fédéral du Plan
Direction générale Statistique et Information économique
Service Public Federal Mobilite et Transport

Germany
Bundesamt für Gewässerkunde
Bundesministerium für Verkehr, Bau und Stadtentwicklung
Destatis
Kraftfahrzeugbundesamt
Niedersächsisches Ministerium für Wirtschaft, Arbeit und Verkehr
Wasserschifffahrtsdirektion Suedwest

France
Institut d'Amenagement et d'Urbanisme
Ministere de L'Ecologie, de l'Energie, du Development durable et de la Mer

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