# MARKET OBSERVATION

2006 - 2

*for* ***inland navigation in Europe***

Central Commission for Navigation on the Rhine

European Commission
Directorate-General for Energy and Transport

# Market Observation 2006-2

## Report on the economic situation – mid-2007

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*September 2007*

# Contents

## General introduction

The present publication covers the year 2005 and part of the year 2006 for the global evolution of the micro-economic performance of transport using inland waterways. The general trends of offer and demand observed in 2006 are also presented. The report 2006-2 is an interim report; pending more exact and more complete information with more thorough analyses, it offers an initial glimpse of inland navigation in the recent past.

The methodology for taking the micro-economic aspects into account was the subject of a recent exchange of views with professional navigation experts. To apply this aspect to the evaluation and take into account the market and the profession as a whole, including their specific geographic and sectorial characteristics, the monitoring instrument currently being drawn up will be developed and completed as relevant information and appreciations from the profession become available.

Particular attention is paid to evaluation of the operation of the capacity available on the market. An instrument in the form of an economic model is currently being studied, as are a number of evaluations. With regard to the waves of investment observed in the sectors of both dry transport and tanker transport and in the absence of any real withdrawal from the market of tonnage that a priori has become obsolete, it is necessary to evaluate as precisely as possible the development of offer in relation to demand for the market as a whole, inasmuch as the fleet in the two main sectors continues to be allocated globally to the goods transported.

Monitoring the appearance of new structural over-capacity indeed remains one of the decisive aspects of this observation. In the same spirit, it appears to be important to monitor the evolution of the climate and the consequences this may have for navigation and transport on freely flowing inland waterways. Even if a large part of the network will not suffer notable effects in terms of rainfall and water management, the Rhine and the Danube, which still represent about 70% of inland waterway transport, must remain the core of the survey.

As in the previous publications, the present edition contains mainly information on the network of inland waterways of western and central Europe. Taking account of information on operation remains a concern inasmuch as, particularly in the Danube basin and with the exception of basic statistics, very few elements are surveyed systematically and regularly in the geographic sector in question.

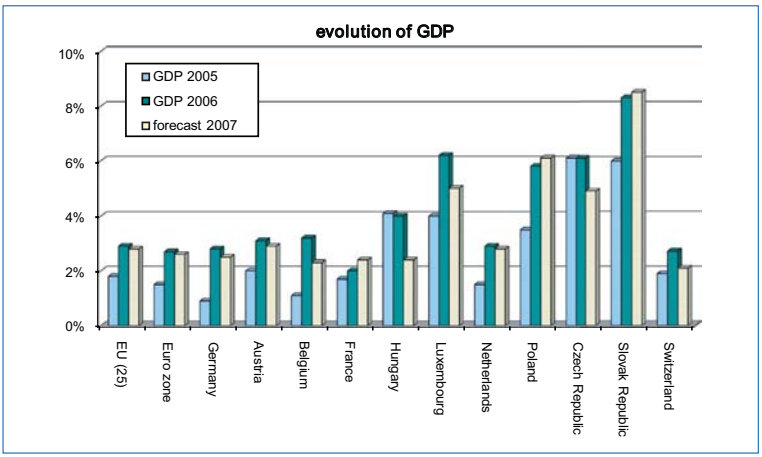
# Chapter 1
# Overzicht van de vervoersvraag in 2006 en 2007

## 1. Evolution of economic growth

In 2006, the European economy saw significantly more growth than in the year 2005. The context favourable to investments, exports to Asia, and increased consumption made it possible to achieve a GDP growth rate for the euro zone of 2.7% (compared with 1.5% in 2005), a level that had not been achieved since 2000. The economic revival recorded in Germany in 2006 (2.8% in 2006 compared with 0.9% in 2005) which will certainly continue in 2007 has without a doubt contributed to this evolution.

In this favourable context of growth of world markets, the prospects for the economy of the euro zone are optimistic. OECD estimates that, as in 2006, the increase in GDP will achieve 2.2% in 2007. In comparison, the rate of growth is estimated at 2.1% in the USA over the same period.

*Graph no. 1:*




*Source : EUROSTAT*

## 2. Demand for transport in the inland navigation sector in Europe

It is generally accepted that the increase in the demand for transport is generally higher than the increase in GDP. In examining these developments in the context of the present market observation, we shall restrict ourselves to those States where there is inland navigation. We shall distinguish between firstly the Rhine States plus the Grand Duchy of Luxembourg and Belgium, and secondly the States of the Danube basin, some of which are in a stage of strong economic growth as a result of their recent accession to the European Union – this growth is overall higher than growth in GDP.

**Situation in the States of western Europe**
*(Germany, Belgium, France, Grand Duchy of Luxembourg, Netherlands)*

In 2006 these States recorded an average GDP growth rate of 2.7%. At the same time, demand for transport increased by about 5%. It should be emphasised that, thanks to the increase of 2.8% in its GDP, Germany recorded a 7.3% increase in its services in Tkm. Germany recorded significant development in rail transport, with an increase of 10.3% compared with the previous year. In France, on the other hand, rail freight transport has been regressing for a number of years.
In general, demand for transport in these States has mainly been met by road and rail, whereas the figures for inland navigation transport have hardly increased (barely 1% in Tkm).

**Situation in the States of the Danube basin**
*(Austria, Bulgaria, Croatia, Hungary, Romania, Serbia, Slovakia)*

The accession to the European Union of some of these States has evidently stimulated economic growth in this geographic sector. In this context, these States are currently showing a stronger increase in GDP and a proportionately higher development in the transport of goods. Thus in 2006 these States recorded an average increase in GDP that was higher than 5%. The increase in demand for transport over this period is higher than 7% in terms of Tkm. Thanks to its flexibility, road transport is the main beneficiary of this. It should nevertheless be stressed that inland navigation also recorded honourable results.

*Evolution in average performance of the various modes of transport*

| **Danube area** | **2006/2004** |
|---|---|
| Inland navigation | + 10,2% |
| Rail transport | + 5,1% |
| Road transport | + 12,7% |
| **Western Europe** | |
| Inland navigation | + 0,9% |
| Rail transport | + 3,9% |
| Road transport | + 4,9% |

*Source : CEMT database*

**Situation in the States of central Europe (excluding the Danube basin)**
*(Poland and Czech Republic)*

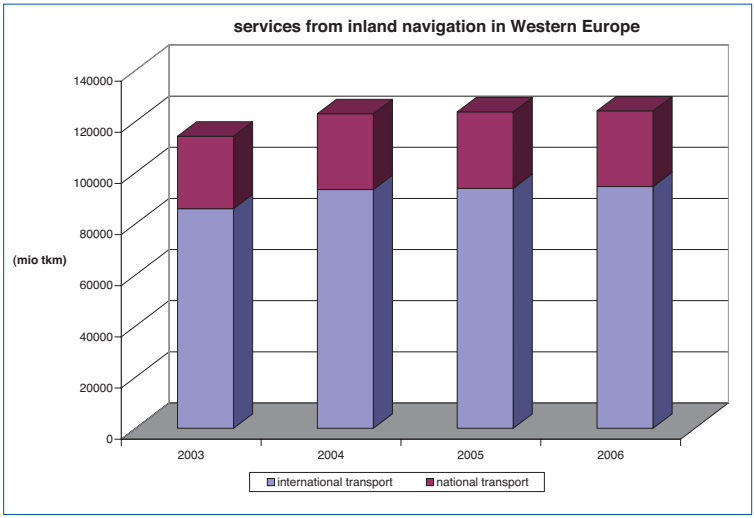
In terms of economic growth, those States of central Europe where inland navigation exists are in a similar situation to the States of the Danube basin. In 2006, their GDP increased by 6% while demand for transport increased by almost 8%. Here again, demand was mainly met by road transport. Because of its infrastructure, however, inland navigation was not able to hold as strong a position as in the States of the Danube basin.

## 3. Inland navigation in Europe

Looking at the information available for 2006, the evolution in transport by inland navigation in Europe has been positive. The various geographic areas have seen varying levels of development; these have mainly been positive, but there have been occasional negative developments as well. More details will be given on this point later. Whereas the volumes transported on the Rhine increased by about 3%, the increase in transport performance was only about 2%. On the Danube, transport services even fell back slightly in 2006. It should be emphasised in this respect that the results for this transport route were particularly good in 2005.

The serious slowing of growth in the transport of containers on the Rhine is a significant feature. 9% of the volume carried on the Rhine is in containers and over 10% of the volume carried in the delta is in containers. The development of world trade and the strong increase in exports, particularly from China and to Europe, has resulted in a substantial increase in the number of containers transiting through the sea ports of western Europe.
This increase has not, however, produced a comparable increase in the transport of containers on inland navigation vessels. More detailed information on this point will be given later.

*Graph no. 2*




*Source: ECMT*

## 4. Inland navigation by geographical area

### 4.1 Network of inland waterways - France

2006 was marked by the return to a favourable evolution in the transport of goods by inland waterway. Transport services reached 7.95 billion Tkm, representing an increase of 1.2% compared with 2005. This growth has essentially been the result of the increase in international transport (+2.8%), more particularly in the Moselle basin, which recorded an increase of

16.9%. In this respect, mention should be made of the favourable evolution in the sectors of iron and steel products (+11.4%) and manufactured products.
In the field of container transport, more than 400 000 TEUs were carried on the French inland waterways network. The evolution is particularly notable in the Paris basis, which recorded an increase of 17.8%, and on the inland waterways network in northern France, where the increase reached 13%.

This growth is even more evident for river/sea transport, with an increase of 31.4% in Tkm, representing almost 4 million tonnes.

### 4.2 Network of inland waterways - Belgium

In the absence of statistical data for 2006 on the transport of goods on the network of inland waterways in Belgium at the time of drafting the present publication, the evolution of transport services can only be appreciated on the basis of handling in ports. On the basis of handling in inland ports in Belgium in 2006, the transport of goods remained more or less stable. An increase in tonnage was recorded for iron and steel products (+14%), chemicals (+9%) and foodstuffs (+5%). On the other hand, there was a drop in oil and oil-based products (-2.5%) and coal and coal-based products (-6%). Handling of ores dropped back by about 4%, and fertilisers by 6%.

2007 began with an increase in handling of about 2% during the first quarter.

The proportion occupied by inland navigation in the modal split in Belgium was relatively stable, at about 24%.

### 4.3 Network of inland waterways - Netherlands

In the Netherlands, transport services on the inland waterways network increased by almost 1% in 2006 compared with 2005. Expressed in tonnage transported, growth achieved 1.6%. This represents almost 43.3 billion Tkm, or about 330 million tonnes. The manufactured products sector saw growth of 9.3%, which represents an increase of almost 4.6 million tonnes. The transport of oil and oil-based products reached 59 million tonnes and the transport of solid fuels 29.2 million tonnes (i.e. growth of +3.3% and +4.8% respectively). International transport services contributed to the increase in transport by inland waterway vessels in the Netherlands, with growth of 1.4%.

The international transport of containers regressed by more than 1%. This situation is a direct consequence of the bottleneck affecting the port of Rotterdam at the interface with transport by boat. In terms of handling in sea ports, however, the tonnage has increased significantly.

### 4.4 Network of inland waterways - Germany

2006 was marked by an increase in demand for the transport of dry goods. The tonnage transported over the entire network of inland waterways in Germany increased by 2.7%, whereas transport services were practically stagnant. The iron and steel products sector, in particular, benefited from the favourable situation of the world market. This was also the case

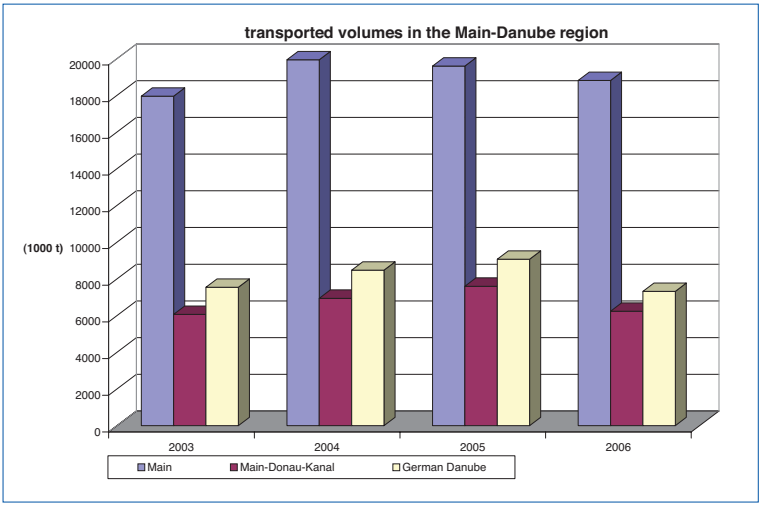
for the coal and coal-based products sector, which benefited from the increase in demand from the iron and steel sector and from power stations because of the high price of oil and oil-based products. In western Europe and particularly in Germany, inland navigation benefited from the upturn in the construction sector after a number of years of regression.

For tanker transport, demand increased throughout the year in the chemicals sector, which is showing constant growth. The tonnage transported increased by 2% on the Rhine. The demand for transport for oil and oil-based products varied considerably because of the price of oil. Overall, the tonnage transported on the Rhine increased by 1%, as oil and oil-based products to and from the sea ports of Amsterdam, Rotterdam and Antwerp are carried on this river.

Container transport on the inland waterways system in Germany dropped back slightly; expressed in TEUs, the reduction was 1.5%. For the Rhine, the reduction was due to the difficulties encountered in the port of Rotterdam and to a lesser extent in the port of Antwerp. The evolution of container transport to and from the sea ports of Hamburg and Bremen was even more disappointing for inland navigation, particularly as the strong increase in the handling of containers transiting through these two ports, which was as much as 10%, did not result in a corresponding increase in transport on the inland waterways network. The proportion of inland navigation regressed by 6.3% in terms of tonnage in relation to total transport between these ports and their hinterland.

On the Main-Danube route the tonnage transported dropped back substantially 2006. The reduction was about 4% on the Main, about 17.9% on the Main-Danube Canal and about 19.3% on the German section of the Danube. These substantial reductions, after the record years of 2004 and 2005, are the result of adapting to climate conditions. The canal was closed for 37 days because of ice. Navigation on the Main was also suspended for 8 days because of ice, and for 10 days because of flooding. On the upper section of the Danube navigation was suspended for 10 days because of ice, and for 15 days because of flooding.

*Graph no. 3*

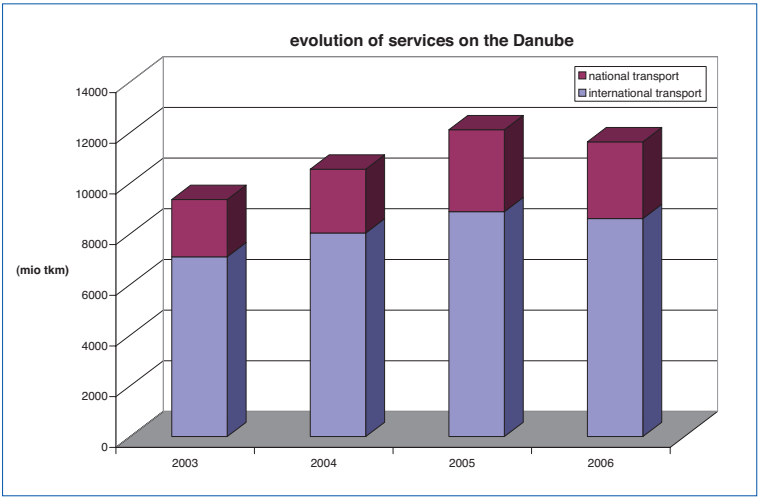



*Source : WSD-Süd*

## 4.5 Danube basin

After a very good year in 2005, transport services on the Danube route regressed slightly in 2006 (-3.9%). This evolution in current economic conditions does not affect the tendency to an increase observed on this route.

*Graph no. 4*




*Source: ECMT*

According to the forecasts for the evolution of demand for transport on this route, the potential for developing inland waterways transport and its market share is very high. However, this potential can only be developed if a number of bottlenecks hampering the development of inland waterways transport can be removed. The main problem here is the shallows that seriously limit the draught of vessels and often make it necessary to suspend the transport of goods during periods of low water.
Projects for the development of the infrastructures are currently in hand on the Austrian part of the Danube. The main purpose of these projects is to ensure a more stable draught. Other development measures aimed at converting the ports on the Danube into intermodal handling points have also been approved.

The tonnage carried mainly comprises packaged goods and about 20% liquid goods such as petrol and diesel. The transport of containers is still very limited at present. However, like evolution on the Rhine, the transport of containers on the Danube should develop gradually over the coming years. For example, the port of Constanza on the lower Danube was fitted in 2004 with a terminal specialising in handling containers and since that date has become an intermodal handling point.

### 4.6 Activity in the sea ports

As the German ports on the North Sea coast are developing considerably, it appears to be important for inland waterways transport and more particularly for navigation on the Rhine to keep an eye on the evolution of the ARA sea ports, as these are decisive in the matter of demand for transport in inland waterways. Transfers to other sea ports on the North Sea are scarcely of any benefit to inland navigation because of the current network of inland waterways.

The world context of strong economic growth and the use of increasingly large vessels for international transport by sea are reflected in the substantial increase in activity in the sea ports. The importance of the sea ports depends nevertheless on their connections with their hinterland for transport. If these connections are unsatisfactory, activity is transferred to other sea ports that are better served.

| Ports | Goods, in 1000 t | | Evolution in % |
|---|---|---|---|
| | 2005 | 2006 | |
| Hamburg | 125 743 | 134 861 | 7,3 |
| Bremen | 54 342 | 65 099 | 19,8 |
| Amsterdam | 74 858 | 84 350 | 12,7 |
| Rotterdam | 370 238 | 378 185 | 2,1 |
| Antwerp | 160 055 | 167 372 | 4,6 |
| Zeebrugge | 22 222 | 24 143 | 8,6 |
| Ghent | 34 557 | 39 472 | 14,2 |
| Dunkirk | 53 437 | 56 642 | 6,0 |
| Le Havre | 75 023 | 73 804 | -1,6 |
| Total | 970 475 | 1 023 928 | 5,5 |

*Source: Port of Rotterdam*

This table shows that Rotterdam and Antwerp, the main ports connected to the network of inland waterways, have seen the volumes they handle increase by less than the average increase of 5.5% observed in the sea ports.

This tendency is also observed for the transport of containers, at least in the port of Rotterdam; the port of Antwerp remains close to the average figure of 9.5%. The port of Bremen shows an impressive increase in handling, higher than the increase observed for Amsterdam, which shows that the port is on the right track for refocusing its activity on handling containers.

| Ports | Containers, in 1000 TEUs | | Evolution in % |
|---|---|---|---|
| | 2005 | 2006 | |
| Hamburg | 8 088 | 8 862 | 9,6 |
| Bremen | 3 735 | 4 450 | 19,1 |
| Amsterdam | 65 | 306 | 370,8 |
| Rotterdam | 9 288 | 9 690 | 4,3 |
| Antwerp | 6 488 | 7 018 | 8,2 |
| Zeebrugge | 30 | 36 | 20,0 |
| Ghent | 1 408 | 1 653 | 17,4 |
| Dunkirk | 204 | 205 | 0,5 |
| Le Havre | 2 058 | 2 121 | 3,3 |
| Total | 31 364 | 34 345 | 9,5 |

*Source: Port of Rotterdam*

The following table illustrates the importance of the port of Amsterdam for inland waterways transport, particularly as this mode of transport has the benefit of excellent interconnections with the hinterland, which is not the case for rail or road transport, where the infrastructures are by and large saturated.

Evolution in the transport of containers to and from the hinterland:

| Ports | Market share, in % | | | | |
|---|---|---|---|---|---|
| | 2002 | 2003 | 2004 | 2005 | 2006 |
| **Rotterdam** | | | | | |
| *Transport by inland waterway* | 32,8 | 31,3 | 30,7 | 30,5 | 30,5 |
| *Transport by rail* | 9,3 | 9,6 | 9,2 | 9,4 | 10,9 |
| *Transport by road* | 57,9 | 59,1 | 60,1 | 60,1 | 58,6 |
| **Amsterdam** | | | | | |
| *Transport by inland waterway* | 49,1 | 41,5 | 41,3 | 41,1 | - |
| *Transport by rail* | 3,8 | 3,6 | 3,5 | 3,5 | - |
| *Transport by road* | 47,1 | 54,9 | 55,1 | 55,4 | - |
| **Antwerpen** | | | | | |
| *Transport by inland waterway* | 31,3 | 30,6 | 32,1 | 32,9 | - |
| *Transport by rail* | 8,4 | 9,4 | 7,4 | 7,3 | - |
| *Transport by road* | 60,2 | 60,0 | 60,5 | 59,8 | - |

*Source: Port of Rotterdam*

Recent figures for the breakdown of volumes transiting through the port of Rotterdam between the various modes of transport indicate an important increase in favour of rail transport, with a number of operators competing for connections with the hinterland. While the possibilities for developing this market were limited until 2006 because of the saturation of the Dutch railway network, the opening of the Betuwe line in the early summer of 2007 should open up new prospects. In view of the difficulties over interconnection with the German network, this line will not be used fully for months or even years.

## Amsterdam

The development of the oil and oil-based products sector, for which river/sea handling shows an increase of 11.2% (i.e. an increase of more than 1.5 million tonnes), is the main factor in the 12.3% increase in inland waterways transport activities in the port of Amsterdam in 2006. At the same time, container handling has more than tripled. It should however be noted that the total volume has not been as high as in other sea ports and inland ports. The strong increase in container handling is mainly the result of the congestion of the port of Rotterdam and the resulting transfer to the port of Amsterdam. At the same time, there has also been an increase in handling seagoing freight which, for all types of goods taken together, reached 20%.

## Rotterdam

The handling of goods between inland navigation and seagoing navigation in the port of Rotterdam reached about 146 million tonnes in 2006, i.e. an increase of 1.2% compared with 2005. The largest increase was recorded for solid fuels (+7.9%) and for oil and oil-based products (+3.2%). A 6.7% drop in TEUs has been observed for the transport of containers by inland waterway vessels; this is due to the momentary saturation of the handling infrastructures and the transfer to other sea ports. Overall, the handling of goods in the port of Rotterdam increased by 2.2% in 2006, for all types of freight taken together. The handling of containers

increased by almost 4.1%, whereas the increase was as much as 8.3% in Antwerp and 7.6% in Hamburg. The figures for the first half of 2007 indicate a slight improvement of 4.2% for goods. On the other hand, the transport of containers has developed substantially, once again reaching the equivalent of world growth (12.8%, or 5.3 million TEUs).

For oil and oil-based products, Rotterdam remains the main European port and there are plans to increase storage capacity there. The port of Rotterdam is also looking to a significant development in its handling capacity by 2013, more particularly so that it will be able to cope with the rapid increase in the number of containers.

**Antwerp**

In the port of Antwerp, river/sea handling increased by 1.7% compared with 2005. About 86 million tonnes of goods transited through the port. The increase concerns mainly chemicals (+9.8%) and oil and oil-based products (+3.5%). The transport of containers showed an increase of 8.3%, i.e. more than 530 million TEUs.

The changes that have taken place in 2006 in handling into and out of inland waterway vessels are connected with the handling of seagoing freight in the port of Antwerp, which recorded total growth of 4%. The signs of a drop in the transport of goods in bulk were observed in 2007, a drop of almost 5% having been recorded in the course of the first semester. The drop was particularly noticeable for dry goods, which fell back by 16%.

At the same time, the transport of containers recorded a substantial increase of 15% in the course of the first half of the year. Apart from world growth and saturation of the port of Rotterdam, from which the port of Antwerp derived benefit, the growth is also the result of the opening of the Deurganck dock at the start of the year.

## 5. Evolution of inland navigation by economic sector

The indications given below concern mainly the Rhine basin and western Europe. This area has the highest transport volumes and benefits from the presence of heavy industry supplied by the ARA ports and which use the same ports for their exports. Although the economic situation of the various industries that use inland waterways transport is uniform on a European scale, the demand for transport by inland navigation vessel may vary from one region or industry to another.

### 5.1 Agriculture

The transport of agricultural products on the Rhine dropped by almost 4% in 2006. Compared with the previous year, there was a drop of 6% in the tonnage carried in the second half of 2006, particularly for agricultural products. The transport of wheat dropped (-4%), although the transport of other cereals increased. The transport of animal feed was also less, whereas the transport of vegetable oils and oleaginous plants increased by 12%. This evolution is more particularly the result of adapting crops to repeated periods of drought that affect the growth of certain plants and the interest in bio-energy and the growing of oleaginous plants, which will undoubtedly have an effect on demand for transport.

## 5.2 Energy
### • Coal and coal-based products

The tonnage of coal and coal-based products transported on the Rhine increased by more than 7% in 2006. The generally high demand for transport was a result of the iron and steel industry operating at full capacity and the high level of consumption of steam coal by power stations because of the high price of oil. Consumption increased by more than 11% in 2006.

During the same period, the transport of coal and coal-based products in the 25 Member States of the European Union regressed by 4.7%. This drop is offset by a 10% increase in imports. The increase in imports is reflected above all in a 16% increase in the tonnage carried by inland waterways transport during the second half of the year.
It was expected that demand for transport would fall back in the first months of 2007 as a result of the particularly mild winter and the corresponding drop in the consumption of coal and coal-based products, and a drop of 11.7% in the tonnage of coal and coal-based products was indeed recorded in the first half of 2007 in the port of Rotterdam.
There is a long-term trend towards an increase in the consumption of coal and coal-based products in the European Union, and requirements will need to be covered by imports through the sea ports. This tendency will be reflected by a structural increase in the tonnage carried on inland waterways, but there is still the possibility of temporary fluctuations in the demand for transport resulting from the current economic conditions.

### Sector of oil and oil-based products

The transport of oil and oil-based products increased by more than 1% in 2006 and by almost 5% in the second half of the year compared with the same period of the previous year. The transport of petrol downstream increased by 20% because of exports to the United States of America. In the light of the figures recorded in the first half of 2007 in the port of Rotterdam, this tendency should continue for some time yet – a 60% increase in exports of oil and oil-based products, which thus reached the level of 12 million tonnes.
Upstream transport by inland waterways vessel regressed, however.
At the same time the transport of diesel increased by 5% downstream and by 3% upstream in 2006. The tendencies observed throughout the year were even more marked during the second half of 2006.
The temporary drop in the price of oil on the world market observed between September and December 2006 kept demand high, as this period made it possible to renew stocks.
Demand for transport fell by about 25% at the start of 2007 because of the mild winter and the resulting low consumption of domestic fuel oil, as well as the requirement in Germany to incorporate additives in the form of bio-fuels from 1 January 2007 and the further increase in the prices of oil and oil-based products.

## 5.3 Iron and steel industry

The iron and steel sector continues to take advantage of strong European and world demand. Thus world demand for steel increased by 8.5% in 2006 and should increase by a further 5.9% in 2007. The growth in the construction and public works sector observed in 2006 also contributed to supporting demand for steel in Europe.

In this sector, the increase in 2006 was almost 1% for raw materials and 5% for finished and semi-finished products. The second half of 2006 featured an increase of 6% in the transport of raw materials and an increase of 17% for iron, steel and non-ferrous metals.
In view of the anticipated increase in world demand, although it will be less marked at the European level, demand for transport should remain steady at least during 2007. However, the 5.5% drop in imports of ore observed in the first half of the year in the port of Rotterdam appears to herald the start of a relative fall, despite strong demand for steel from European industry. This demand will also result in an increase in imports of steel. Thus the port of Antwerp recorded a significant increase of 17.6% during the first half of 2007 for the transport of imported steel.

### 5.4 Sand, gravel, stone and construction materials

Over the year as a whole, the transport of construction materials increased by 10%. The transport of sand and gravel downstream, which alone represents 50% of the transport of construction materials on the Rhine, increased by almost 15% in terms of tonnage and by 18.5% in terms of transport services. In the course of the second half of 2006, the increase in the tonnage of construction materials carried reached 17%, with transport downstream having increased by 21%. It appears that downstream transport services increased more during the first half of 2006 (+30%) than the tonnage carried, which reflects an upswing in demand in the lower Rhine area.
The favourable evolution for the demand for transport for construction materials can be put down to the development of the market for construction and public works, particularly in Germany. Both the construction of housing and civil engineering companies benefit from this growth in this period of favourable economic circumstances. This tendency should continue in 2007.

### 5.5 Chemicals

During this period of favourable economic circumstances observed in 2006 and during the first few months of 2007, the tonnages carried on the Rhine during the year increased by 2% and by 5% during the second half of 2006 compared with the second half of 2005.

The forecasts are optimistic for this sector of the industry, in terms of both national demand and imports, so demand for transport ought to stay at the same level for the Rhine as well.

### 5.6 Transport of containers

For the transport of containers, despite the development of this type of transport in other river basins and on other transport routes than the Rhine, the traffic on the traditional Rhine provides decisive indications of market shares and the competitiveness of inland waterways transport[1].
In 2006, the transport of containers on the Rhine recorded for the first time a drop of about 1%. This drop is all the more significant in the light of the substantial increase in the volumes transiting through the main sea ports, ranging from 4% for Rotterdam to 19% for Bremen.

1 Tables showing the evolution of container transport are given in Appendix 3.

This tendency towards a fall appears to be continuing into 2007. During the first three months of the year, total transport of containers showed a drop of almost 5%[2], whereas over the same period of time the ports of Antwerp and Rotterdam were beating records for handling[3] with increases of 15% and 12.8% respectively. Only transport on the upper Rhine recorded an increase in 2006, although this is relatively modest in comparison with the traditional results for transport on the Rhine. Over all the sectors of the Rhine, the greatest drops affected the transport of empty containers downstream. This reduction in the number of TEUs for destinations on the lower and middle Rhine reflects a significant weakening in the competitivity of inland waterway transport. For a number of years now, inland waterway vessels have had to cope with bottlenecks at the sea terminals in Rotterdam, and to a lesser extent at the terminals in Antwerp, resulting in delays of 24 or 48 hours, or even longer. In the circumstances, it is understandable that the proportion of containers to or from these terminals that carry goods which are more sensitive in terms of transport duration should turn to other modes of transport that are more flexible. Although the parties concerned have taken steps to relieve the congestion, the causes have not been removed, and it appears that the steps have not produced the anticipated results. It is clear that the evolution of this sector of the market for inland waterways transport has not been hindered by a lack of available capacity on the river network or at the inland terminals.
The commissioning of a new dock in Antwerp will also certainly contribute to improving the performance of the port's terminals. For the port of Rotterdam, there are no plans for significantly extending the capacity of the maritime terminals any sooner than in the medium term.

In the context of preserving a level playing field for the various modes of transport, transport on the inland waterways must be integrated into the system of interconnections with the hinterland in a way that is both appropriate and balanced. It appears nevertheless that the general conditions in the sea ports and more particularly at Rotterdam and Antwerp are no longer such as to ensure good performance for transport using inland waterway vessels. This means that inland waterway container vessels are fighting an unequal battle against seagoing vessels for the use of quays and infrastructures at the terminals. It is important to seek more fundamental solutions, and these should be taken into account in designing new terminals.

2 Period during which all navigation in the Rhine was suspended level with Cologne for one week in March.
3 For the first half of 2007.

# Chapter 2
# General overview of the offer of transport

*New capacity on the market*
The evolution of the offer of transport on the market may be followed by referring to the new vessels that have been commissioned. In the two segments – dry goods and tanker transport – there has been considerable activity in the shipyards, with production capacity being used to the full. For a variety of reasons, investment in transport capacity has been very high in recent years in this profession. In the dry goods sector, the situation may be qualified as satisfactory since it is adapted to the level of demand for transport and to the level of freight rates. These relatively advantageous operating conditions have allowed a renewal and the modernisation of the fleet, which is thus better suited to the demands of both the market.

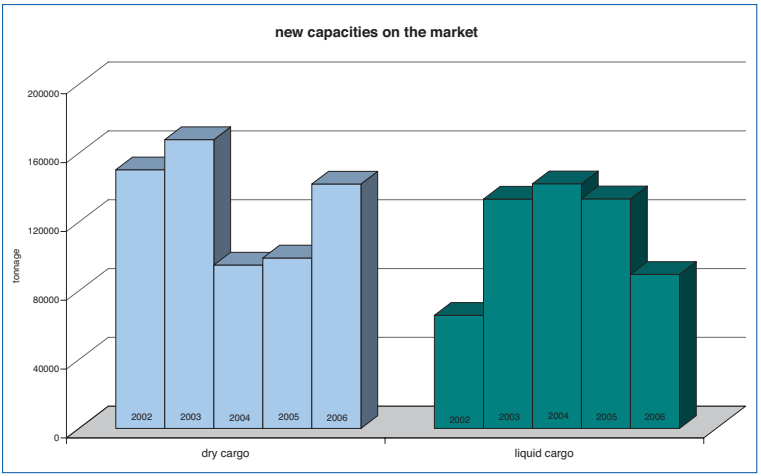
The situation for tanker transport is somewhat different. While the recent past may also be qualified as satisfactory in terms of operation, it is above all the influence of new regulations and of the demands of shippers, particularly the oil companies, that make renewal of the fleet necessary.

With the prospect of the introduction between 2009 and 2018 of new criteria for the transport of products in double-hulled vessels, the tanker navigation profession needs all its capacity to transform the fleet, which in future should comprise mainly double-hulled vessels. The appropriate regulations will come into force from 2009. They include the obligation to use double-hulled vessels for almost all oil and oil-based products, on the basis of a transitional scheme spread over time. The market appears to be anticipating these new regulations, as some shippers are already imposing rules that go beyond the current regulations, particularly in terms of placing a limit on the age of the vessels used for the transport.
Under these circumstances, a large number of new tanker vessels have been commissioned in recent years. There may be about 700 vessels still to be replaced by 2018. To achieve this objective, between 50 and 60 vessels should be commissioned each year until that date.

Unfortunately, despite all the efforts made in terms of registering vessels, precise indications are not available. As a result, the following table can only constitute an indication of the evolution of the offer on the market. More particularly, the number of 31 tanker vessels recorded for 2006 could be too low, whereas for 2007 at least 44 additional units are expected.

The table also shows that the passenger vessel segment is a sustained activity. Both day trips, particularly in Germany, and cruises show a clear increase in 2006, and this would appear to be continuing into 2007 and 2008, at least for cruise vessels, with a similar rate of growth.

*Graph no. 5*




*Source: IVR*

| Types of vessel | 2006 | | 2007 | |
|---|---|---|---|---|
| | number | tonnage | number | tonnage |
| self-propelled | 42 | 117000 | 9 | 25000 |
| barges | 23 | 25000 | 5 | 11000 |
| tankers | 31 | 89500 | [44]* | [100000]* |
| passenger vessels:<br>- cruise<br>- day excursion | <br>12<br>20 | | [11]* | |

*Source: IVR*

** : number of units forecast for 2007*

# Chapter 3
# Water conditions

## 1. Water conditions and operational capacity

The observation of water conditions is important in economic terms. The figures are given per day and in cm, but they are also converted into values for possible draught, which determines the theoretical loading capacity. The graphs below give the figures for the Kaub scale for the Rhine and the Hofkirchen scale for the Danube.

For freight vessels of varying dimensions, this gives the following loading capacities according to draught.

| Loading capacity according to vessel dimensions | Draught | | | | |
|---|---|---|---|---|---|
| | 1,50m | 2,00m | 2,50m | 2,80m | 3,50m |
| L. 135,00 X B. 11,45 | 750t | 1 475t | 2 225t | 2 600t | 3 700t |
| L. 110,00 X B. 11,40 | 600t | 1 200t | 1 800t | 2 100t | 3 000t |
| L. 85,00 X B. 9,50 | 570t | 930t | 1 350t | 1 350t | 1 350t |
| L. 67,00 X B. 8,20 | 420t | 670t | 1 000t | 1 000t | 10 00t |

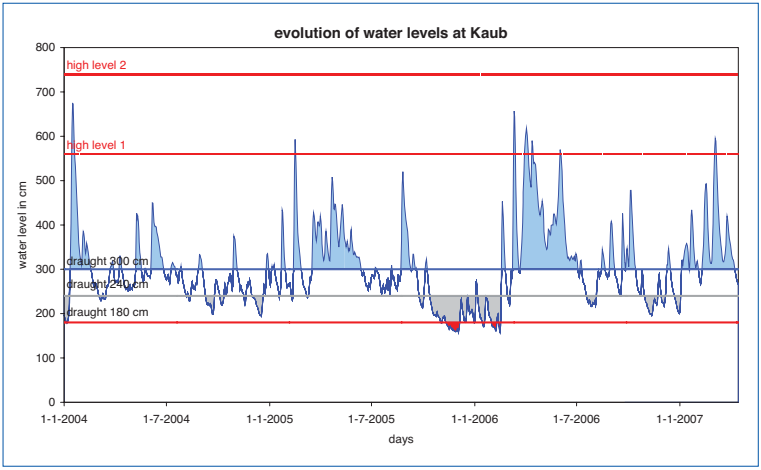
L : Length
B : Width

Source : VBW (WESKA)

This figures show clearly the effect that water conditions have on the offer of transport. Periods of low water affect large vessels more particularly.

## 2. Water conditions on the Rhine

*Graph no. 6*



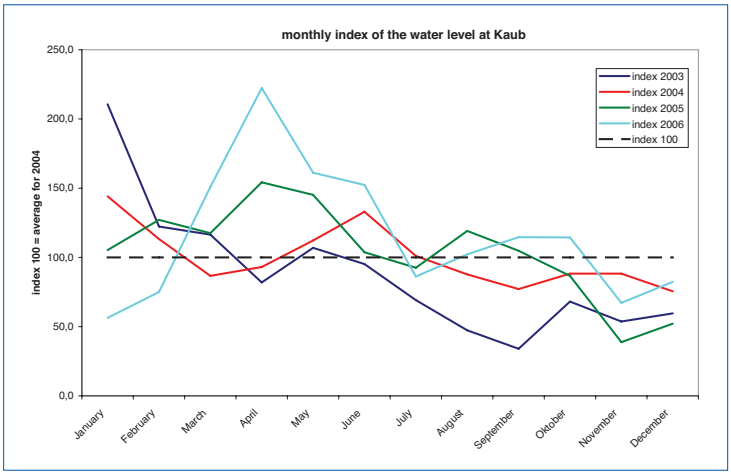

*Source: German Institute of Hydrology (Bundesanstalt für Gewässerkunde)*

*Indexing of water levels recorded at the scales*
To be able to compare the variations in water levels at the scales and the variations in freight rates, it is necessary to index the main scale for the inland waterway concerned. Indexing calculations must nevertheless be based on quarterly values. The annual average for 2004 could be used as the base index (100).

At the Kaub scale, the annual average for 2004 was 188 cm, and this is used as the base index (100).

The values of the index may also be expressed in monthly values, which can be compared with other variables.

*Graph no. 7*




*Source: German Institute of Hydrology (Bundesanstalt für Gewässerkunde)*

*Examination of the situation in 2005*

During the autumn of 2005, the water conditions were insufficient, particularly on the Rhine. This situation had the initial effect of supporting freight rates on the Rhine market but deteriorated as weeks went by with no rainfall. The negative effects recorded over several months are reflected in the volumes transported during the fourth quarter of 2005. A slight improvement in the situation was not apparent until the end of the year, with the return of precipitation; the levels of water in the Rhine were still insufficient, however, at the beginning of the following year, and this situation lasted until the end of January.

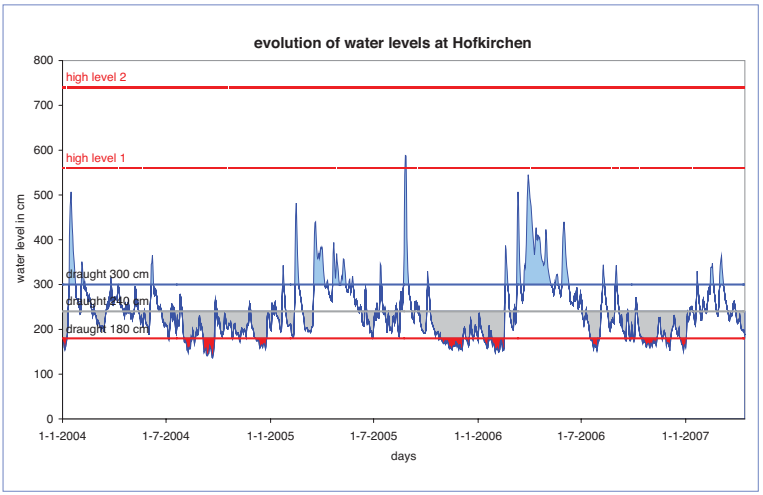
*Examination of the situation in 2006*

The periods of low water recorded in 2006 did not last as long as in 2005. After the spring floods, the variations in water conditions were due to rainfall, with alternating periods of high and low water.

## 3. Water conditions on the upper reaches of the Danube

The method applied for examining the water conditions of the upper Danube is the same as that used for the Rhine. An index is calculated with reference to the annual average for 2004.

*Graph no. 8*




*Source: German Institute of Hydrology (Bundesanstalt für Gewässerkunde)*

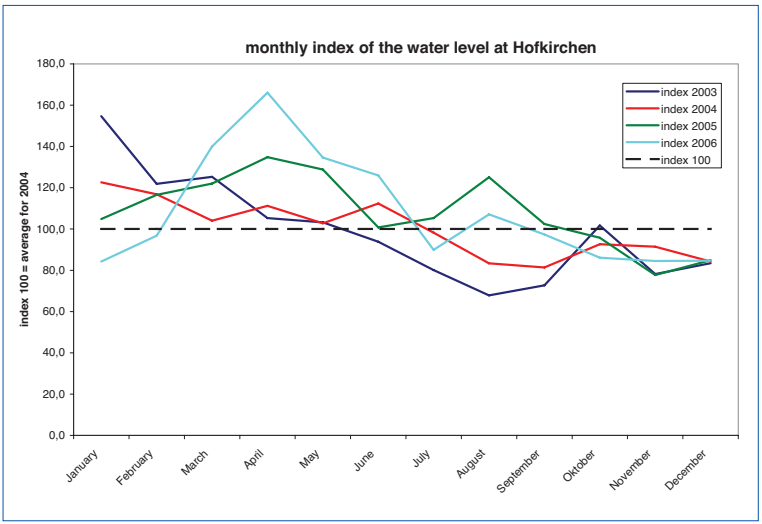
Navigation on the upper Danube suffered from periods of low water even more frequently than navigation on the Rhine. In the absence of sufficient information concerning freights, it is not possible to analyse the effect of water conditions on freights and on the operations of inland waterways transport in this sector.

In the course of 2006, river traffic on the German section of the Danube was suspended for 10 days because of ice and for 15 days because of flooding.

Graph no. 9 shows the periods of seasonal low water during the last months of the year.

Like the Rhine, the Danube saw flooding in the spring of 2006. The year nevertheless ended at the usual level.

*Graph no. 9*




*Source: German Institute of Hydrology (Bundesanstalt für Gewässerkunde)*

# Chapter 4
# Micro-economic approach

## 1. Operation of vessels in 2005

Appreciation of the micro-economic situation of inland navigation calls for a comparison of operating costs and turnover in the sector, and their evolution. As indicated in the preceding chapter, this appreciation is made possible by comparing the various development indexes, and should be carried out for the transport of dry goods and for tanker transport.[4)]

### 1.1 Transport of dry goods

Evolution of volumes carried

Although the demand of inland waterways transport is not particularly elastic compared with water conditions and hence capacity available on the market, existing capacity reserves nevertheless offer sufficient flexibility to be able to react directly to spot increases in demand. In extreme situations there may, however, be some interference. Thus very poor water conditions over an extended period of time, as observed in 2003, appear to have affected demand during the same period, and there has sometimes been a trend towards using other modes of transport. Conversely, 2004 may be considered a very balanced year for water conditions and in consequence also for demand for inland waterways transport.

The effect of the lower water levels observed in 2005 on the volumes carried was noticeably less marked than in 2003, as the period of low water was shorter and the industrial sectors that constitute the usual clientele of inland navigation were enjoying favourable economic conditions that resulted in increased demand for transport.

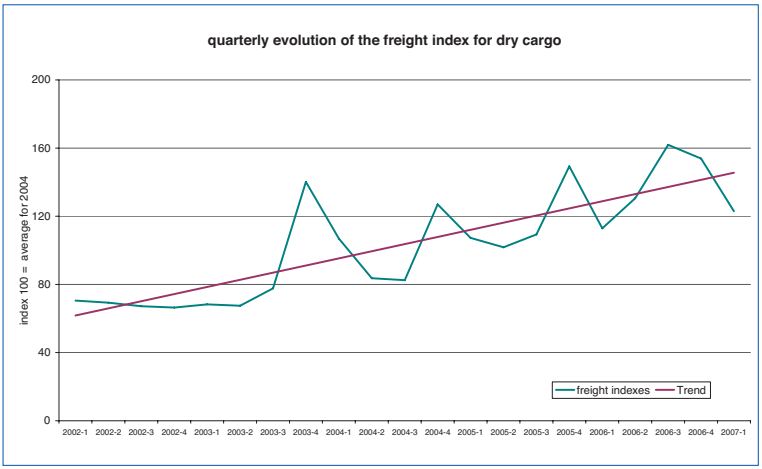
In 2006, the volumes of dry goods carried on the Rhine progressed by 4.7%, while services increased by 2%.

Evolution in freight rates

Freight rates saw a globally favourable evolution for the transport of dry goods. Despite the particular importance of water conditions, it appears that freight rates increased in 2004 thanks to favourable water conditions and high demand. The graph below shows the trend over four years, which is likely to remain stable, given the evolution in the demand for transport.

4) Since we only have a summary index for the years 2002-2006 for the level of freight rates and transport in the Rhine basin, the volumes of goods carried on the Rhine are used as the base value.

*Graph no. 10*




*Source: NEA; CCNR Secretariat*

## Occupation level

The relative flexibility of the various markets, both geographic and in terms of the variety of goods carried, makes it difficult to represent the level of operation for the transport of dry goods. In addition, day-to-day operation varies more or less according to vessel dimensions and operating modes.

Seasonal aspects aside, the variations in demand for the transport of dry goods are not as sizeable as for tanker transport. Capacity uptake is therefore more regular, although not always optimal. The market for the transport of cereals is a good example of this. The quantities carried often represent 1000 to 1500 tonnes, which does not make it possible to make full use of the capacity of a large vessel.

In general, the transport of dry goods shows that the commissioning of new vessels makes it possible to increase available capacity in proportion to the volumes carried. This evolution is set against a background of increased freight rates in the past few years.

These elements make it possible to state that the market and more particularly the occupation rate of vessels is evolving positively. The occupation rate could, however, be improved in certain segments by optimising procedures and transport.

*Production/yield from the transport of dry goods*

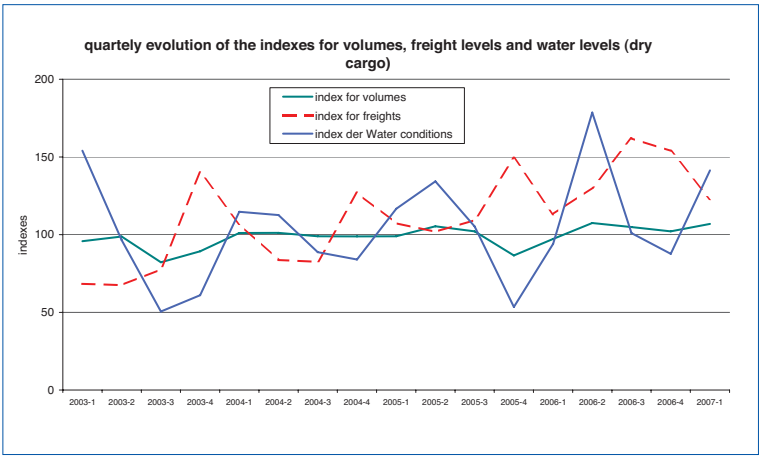
The performance achieved by inland waterways transport is the result of the combination of the volumes carried and the freight rate. Examination of these two factors shows that, because of the long period of low water and despite the resulting restrictions on volumes carried, the productivity of the fleet remained at an average level in 2003, as freight rates were high.

As water conditions made it possible to increase the loading level of vessels in 2004, the level of the average freight rate dropped.

The conjunction of these two factors makes it possible to qualify the production/yield in 2004 as "average" with, at the same time, a slight increase in operating costs due to the increase in the price of diesel.

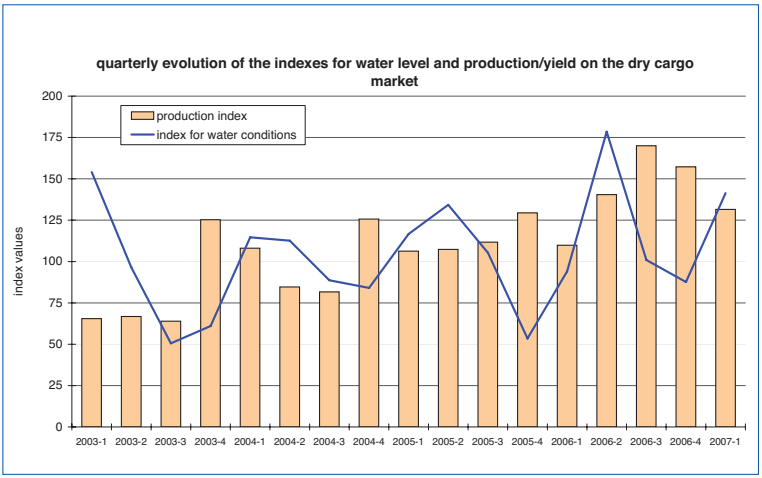
Graph no. 11 reflects the interaction of water conditions, volumes carried and freight rates in a context of high demand for transport.

*Graph no. 11*




*Source : CCNR Secretariat*

*Graph no. 12*




*Source : CCNR Secretariat*

Production/yield increased noticeably in 2005 and even more in 2006, thanks to high freight rates and an increase in the volumes carried, despite the poor water conditions observed in the last quarter of 2005. In terms of yield, this year appears to be the most productive of the three years under examination in the present study, despite the increase in operating costs produced by the increase in the price of diesel.

## 1.2 Tanker transport

Demand for the transport of oil and oil-based products, which represents two-thirds of the volumes carried on the Rhine, showed important fluctuations. These variations were partly seasonal, but they were also the result of the variation in the price of oil on the world market and the level of stocks in the European States. Demand for the transport of chemicals, which represents about one-third of the volumes carried by tanker, was more stable.

*Evolution in the volumes carried*

The transport of chemicals)[5] showed an increase of almost 10% between 2003 and 2004 and of about 5.6% between 2004 and 2005. This evolution reflects industrial production in this sector of the economy and has taken the form, over the past few years, of a regular increase in demand for transport.

80% of the transport of oil and oil-based products by inland waterway vessel involves the transport of petrol and domestic fuel / diesel. We have detailed representative data for the evolution of freight rates for these two types of cargo. Since the micro-economic analysis carried out as part of the present market observation is based on the comparison of several representative factors likely to provide indications of trends in the general situation of this mode of transport, this paragraph will merely be an analysis, in the form of an index, of the volumes carried for these

5) Unfortunately we do not have representative information on the evolution of freight rates for this type of cargo.

two types of cargo on the transport routes taken into account in analysing freight rates.

| Index of volumes carried | 2003 | | 2004 | | 2005 | | 2006 | |
|---|---|---|---|---|---|---|---|---|
| | Petrol | Fuel oil | Petrol | Fuel oil | Petrol | Fuel oil | Petrol | Fuel oil |
| **Transport routes** | | | | | | | | |
| ARA – Duisburg | 147 | 136 | 100 | 100 | 98 | 108 | 44 | 119 |
| ARA – Dortmund | ns | 216 | 100 | 100 | 698 | 130 | 190 | 170 |
| ARA – Cologne | 159 | 402 | 100 | 100 | 112 | 34 | 137 | 27 |
| ARA – Frankfurt | 542 | 142 | 100 | 100 | ns | 157 | ns | 167 |
| ARA – Karlsruhe | 40 | 111 | 100 | 100 | 83 | 103 | 86 | 224 |
| ARA – Basle | 190 | 134 | 100 | 100 | 61 | 119 | 27 | 111 |
| **Global index** | **174** | **140** | **100** | **100** | **170** | **144** | **96** | **156** |

*n.s.: not significant*

*Source: CCNR Secretariat, on the basis of CBS indications*

The global index is determined by weighting each transport route on the basis of the volumes of goods carried. This shows that although 2004 was taken as the base year for all the analyses, it was in fact a year of low demand for oil and oil-based products. In 2005, demand for transport achieved a level comparable to that of 2003.

## Evolution in the level of freight rates

Oil and oil-based products are mainly carried in vessels on the Rhine.

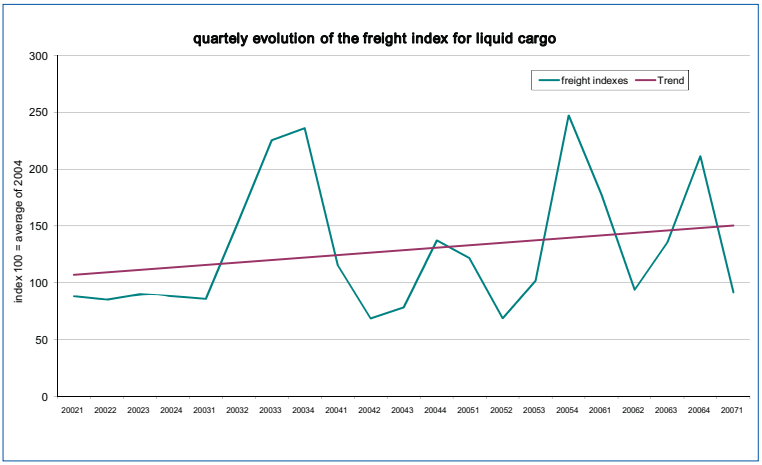
According to market logic, 2003 and 2005 featured increases in freight rates that were at times considerable, as a result of both strong demand for transport and water conditions that, over a relatively long period of time, did not allow optimum operation of the capacity available.

| Index of volumes carried | 2003 | | 2004 | | 2005 | | 2006 | |
|---|---|---|---|---|---|---|---|---|
| | Petrol | Fuel oil | Petrol | Fuel oil | Petrol | Fuel oil | Petrol | Fuel oil |
| **Transport routes** | | | | | | | | |
| ARA – Duisburg | 184 | 191 | 100 | 100 | 136 | 139 | 158 | 163 |
| ARA – Dortmund | 156 | 159 | 100 | 100 | 124 | 126 | 140 | 142 |
| ARA – Cologne | 161 | 163 | 100 | 100 | 134 | 135 | 156 | 159 |
| ARA – Frankfurt | 163 | 165 | 100 | 100 | 151 | 152 | 158 | 160 |
| ARA – Karlsruhe | 158 | 160 | 100 | 100 | 149 | 150 | 155 | 157 |
| ARA – Basle | 162 | 183 | 100 | 100 | 146 | 147 | 150 | 151 |
| **Global index** | **174** | **170** | **100** | **100** | **140** | **144** | **156** | **154** |

*Source: CCNR Secretariat – P J K International b.v.*

Graph no. 13 reflects the slight tendency to an increase in freight rates over the four years under examination, although the rates were very volatile.

*Graph no. 13*




*Source: CCNR Secretariat – P J K International b.v.*

*Operation of transport capacity and commissioning of new vessels*

In examining the evolution of the volumes carried in relation to the various water levels, the central issue of the present market observations necessarily arises – the question of whether the capacity available is adapted to the demand for transport from this sector and to its variations.

As for dry transport, for comparable demand, the level of operating the fleet's capacity is higher when water conditions are poor since more capacity is required to transport the same volume of cargo when the vessels' draught is limited. Water conditions should be considered here as an exogenous factor.

The level of occupation in the tanker transport sector, where demand is particularly unstable for the transport of oil and oil-based products because of a number of factors such as prices on the world market, the state of stocks and the capacity of refineries, is very variable.

Capacity on the market is deemed optimum when it is possible to satisfy strong demand for transport even though water conditions do not permit maximum draughts.

To appreciate the present situation of the market, it is necessary to consider separately the market for the transport of chemicals, which represents almost one-third of the volumes carried by tanker vessels, and the market for the transport of oil and oil-based products, which represents two-thirds of the volumes carried.

In the chemicals segment, the volumes representing individual transport are significantly lower than those observed in the oil and oil-based products sector; they are often between 1000 and 1500 tonnes. This quantity is partly determined by storage capacity, particularly in the hinterland. As a result, this segment is mainly served by vessels of moderate capacity, ranging

from 1000 to 2500 tonnes. The market concerned is also more reactive, requiring capacity to be made available rapidly.

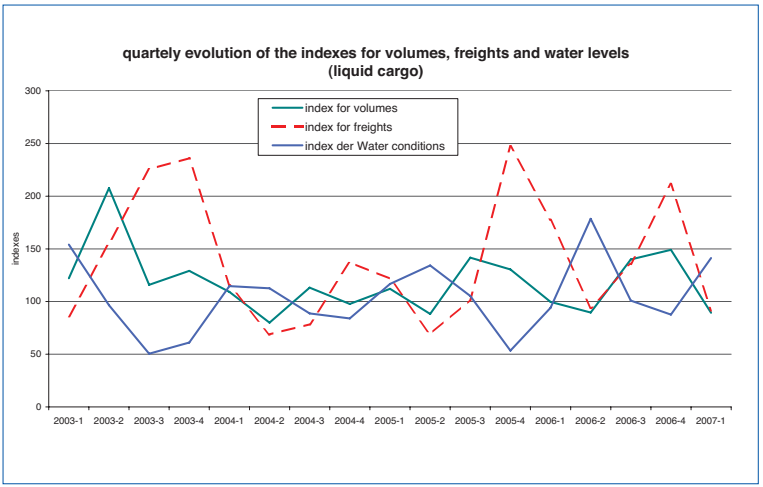
Unlike the market for chemicals, the market for oil and oil-based products is mainly carried in large volumes, the largest units being operated at full load when demand and water conditions permit. During periods of low water and strong demand, small vessels become more interesting because they remain operational for longer without their loading capacity being affected.

An endogenous factor in the operation of capacity is the new vessels put into service with the prospect of the regulations being made stricter. In order to take into account new criteria for protecting the environment, a new classification of substances is being considered, as is the allocation of substances to vessels that correspond to the various safety standards. In this context, a new type of double-hulled vessel for the transport of those substances considered to be the most dangerous for the environment has been designed. In fact, for almost all substances assimilated to oil and oil-based products, use of this type of vessel will gradually become a requirement. The profession has therefore already begun to prepare for these new demands. Thus there has been a regular renewal of tanker vessels in the order of 50 to 60 vessels per year over the past few years. Their average size is distinctly different from that of the existing fleet, which means that the fleet has been extended considerably. At the same time, very few vessels have been withdrawn from the market to leave room for this new capacity, whereas demand in the oil and oil-based products sector has tended rather to stagnate or even drop back slightly.
Although there is as yet no tendency to structural overcapacity, the behaviour of the market in the present situation, which is characterised by moderate demand and optimum water conditions, reflects nevertheless a degree of saturation. In view of the large number of vessels already announced in the medium term, particular attention should be paid to monitoring capacity in this segment.
The chemicals transport segment is neutral in this respect, since until now – and pending the finalisation of the new regulations on single-hulled vessels – virtually all the new vessels being commissioned are able to carry chemicals, and therefore greater internal competition could be expected here.

*Production/yield for tanker transport*

Graph no. 14 highlights the symmetry of the level of freight rates and water conditions.

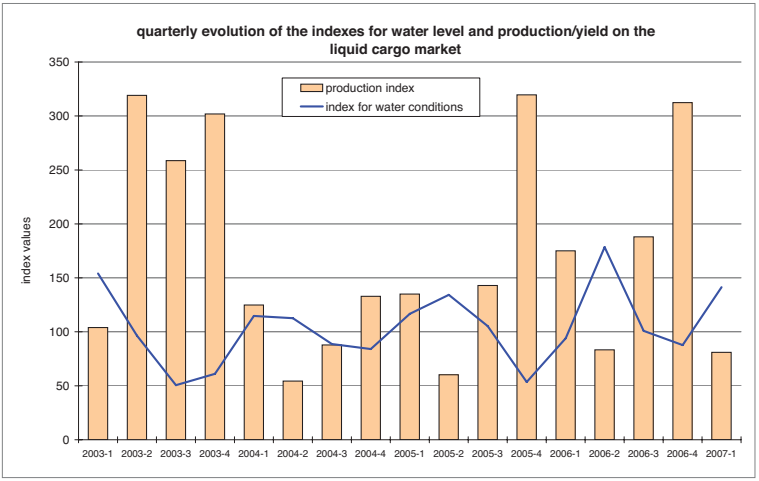
*Graph no. 14*




*Source: CCNR Secretariat*

Graph no. 15 gives a general overview of the evolution of the operating performance of transport by tanker vessels in relation to water conditions.

*Graph no. 15*




Source: CCNR Secretariat

The production/yield for tanker transport was satisfactory in 2003, particularly for the transport of oil and oil-based products. The first half of the year was marked by strong demand for transport, and this continued until the summer. Demand then dropped because of the increase in oil prices. Freight rates stayed at a high level because of the poor water conditions.

2004 appears to feature a low volume carried although water levels were satisfactory, resulting in a low level for freight rates. Even the seasonal increase in demand in the last quarter had only a slight effect on the increase in inland waterway transport activity. Compared with 2003 and 2005, the production/yield was relatively low during the year.

The third, and more particularly the last, quarter of 2005 were marked by a very clear upswing in occupation because of anticipated purchases of stocks in view of the constant increase in oil prices. Water conditions were not sufficient to allow the operation of vessels at full loading capacity but this did not have any effect on the volumes carried, although freight rates increased significantly.

Graph no. 14 shows clearly that although operating conditions in the last quarter of 2005 contributed to the improvement in results for the financial year 2005, particularly in comparison with 2004, productivity in 2005 remained rather average, particularly in comparison with the years 2002 and 2003.

## 1.3 Evolution in operating costs

Structure of costs for freight vessels

| 2004 | Vessels for dry goods Individuals | Tanker vessels Companies |
|---|---|---|
| Fuel costs | 20 % | 18 % |
| Personnel costs | 40 % | 42 % |
| Other costs | 40 % | 40 % |

*Source: CCNR Secretariat*

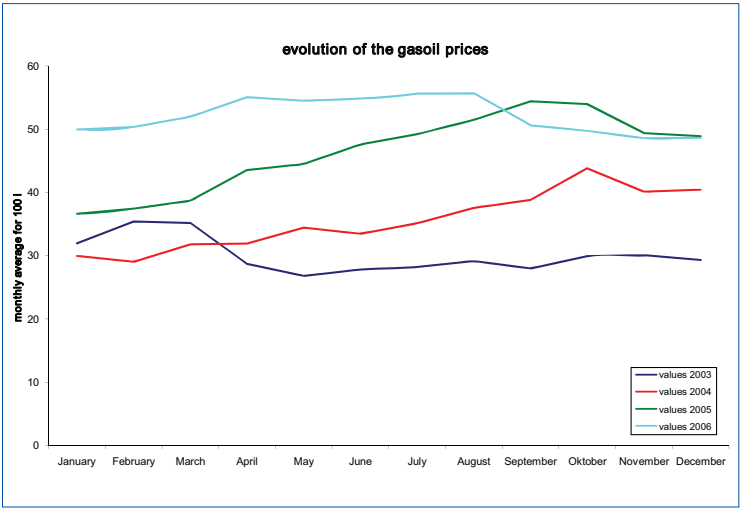
The structure of costs is merely indicative, and refers to a vessel of approximately 2500 tonnes.

| Indexes | 2003 | 2004 | 2005 |
|---|---|---|---|
| Fuel costs | 84 | 100 | 130 |
| Personnel costs | 98 | 100 | 101 |
| Other costs | 98 | 100 | 102 |
| Annual global index – dry goods | 95,2 | 100,0 | 107,2 |
| Annual global index – tankers | 95,6 | 100,0 | 106,3 |

*Source: CCNR Secretariat*

The table shows an increase of about 12% in the main items of expenditure in the years from 2003 to 2005. Salary and other costs have evolved in line with inflation, while the cost of fuel has increased by almost 74%. This item thus represents the largest part of the increase in operating costs. Part of the consequences of this increase in costs, which cannot, however, be determined precisely, has been attenuated by the application of clauses included in transport contracts.

*Graph no. 16*




*Source: CBRB*

Graph no. 16 shows the increase in the price of diesel over a period of three years.

This data is indicative of these analyses. In the market, prices are negotiated and the variation in prices may be as much as 15%, depending on the place of purchase, although the general trends remain unchanged.

### *Annual averages*

| Year | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|
| **Price of 100 litres of diesel** | 28,50 | 30,07 | 35,88 | 46,67 | 52,12 |

*Source: CBRB*

It should be emphasised that, despite a downward trend in the price of diesel during the third quarter of 2006, the current average for this price is still at a record level.
Diesel costs have shown a further upward trend in 2007. Significant increases are also expected for the maintenance heading, because of strong demand at shipyards, which are currently saturated, combined with an increase in the price of spare parts.

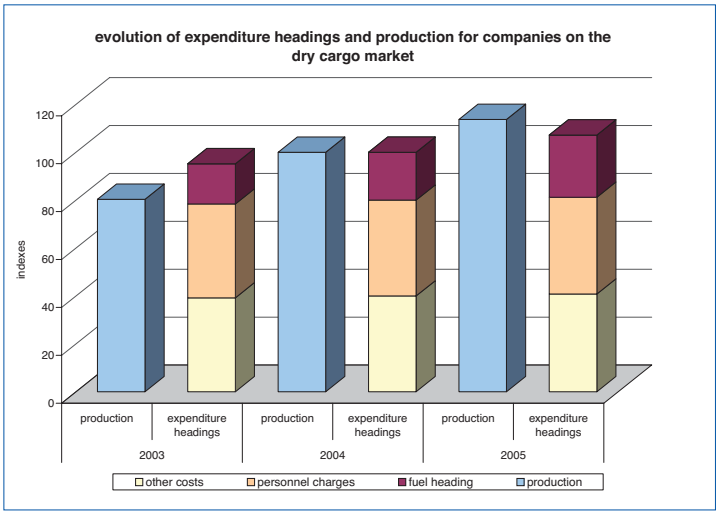
# 2. Conclusions and forecasts

## 2.1 Operation of vessels during the period 2003-2005

*Transport of dry goods*

It is apparent, on the basis of the information available, that operating costs have increased by almost 12% over the three years, mainly because of the high price of diesel, but that the turnover for the transport of dry goods has improved nevertheless. This improvement is the result of the tendency for an increase in the level of average freight rates, together with an tendency for an increase in the volumes carried. This is a consequence of the current economic growth in Europe.

*Graph no. 17*




*Source: CCNR Secretariat*

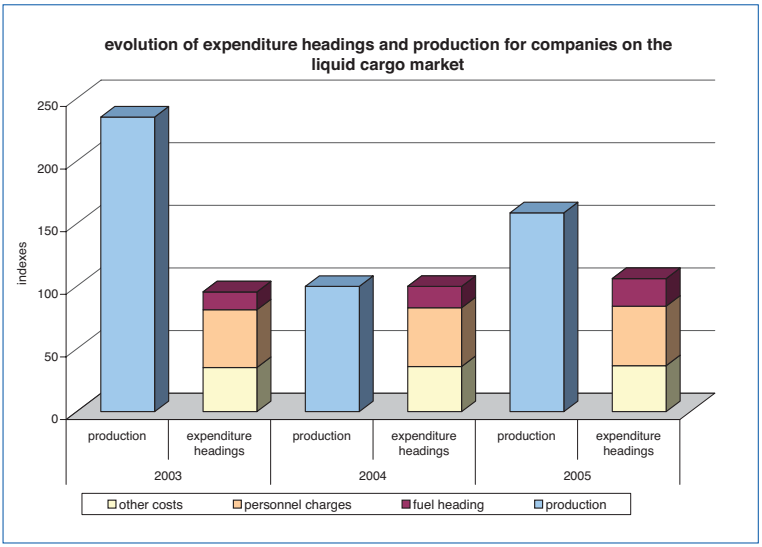
*Transport in tanker vessels*

The data referred to above that is at our disposal shows that operating costs in this sector have also increased by about 12% in the course of the three years under examination.

The evolution of yield is divergent, however. The demand for transport has been very unstable in this sector because of high oil prices. The low demand in the course of 2004, when oil prices began to rise, reflects a wait-and-see attitude in the hope of prices coming back down.

As prices continued to rise, purchases in 2005 were mainly for essential transactions, resulting in wide variations in freight rates in a context of poor water conditions. In 2005, transport services increased more rapidly than costs.

*Graph no. 18*




*Source: CCNR Secretariat*

It can nevertheless be seen that demand for transport for oil and oil-based products is tending to stagnate, because costs have remained at a very high level, encouraging economy and the use of less expensive fuels where this is possible.

## 2.2 Forecasts

In the dry transport sector, the increase in the fleet's capacity by the commissioning of new vessels is in line with the increase in the demand for transport due to strong economic activity. This strong demand for transport should continue and contribute to maintaining a degree of equilibrium. For dry transport, 2006 seems to be characterised by strong demand for transport and a level of freight rates that is moving upwards. Despite the many new structures currently being put on the market for dry transport, strong demand makes it possible to avoid overcapacity. The upward trend for freight rates observed in this sector reflects this situation.

The consequences of the saturation of posts for handling containers in sea ports were very marked in 2006 for inland waterway vessels. Many structural bottlenecks have been observed, particularly in Rotterdam. This means that navigation on the Rhine had only had limited benefit from the substantial increased in the transport of containers. It is important to continue efforts to remove these bottlenecks in the sea ports.

For tanker transport, the chemicals sector saw strong activity throughout the year, whereas demand for the transport of oil and oil-based products saw substantial variations. The situation is different for the transport of oil and oil-based products. Thus since the start of the year there has been a significant drop in demand for upstream transport which has not been offset by the increase in transport downstream in connection with the sustained level of exports.

In combination with the arrival on the market of a considerable number of new vessels, freight rates stagnated throughout the year at a level considered as the lowest the market could bear. This situation is evidence of very strong internal competition, produced not only by the conditions already mentioned but also by very balanced water conditions. This seems to constitute an indication of the emergence of overcapacity in this segment of the market. The inland waterways profession does not seem to be able to maintain a respectable level of freight rates except when water conditions are poor. The autumn of 2007 will make it possible to better determine current conditions for tanker transport in the light of traditionally more sustained demand – for the supply of winter-quality products – and water conditions that are lower than average. Although the autumn may in this way compensate in part for a year that has until now been completely uninteresting, the medium-term prospects remain morose. For the current year, more than 30 new vessels of considerably larger than average size are expected whereas there is no sign of a similar evolution in demand.

# Appendices

## 1. Offer of transport capacity
## Table of new vessels

| Type of vessel | 2002 | | 2003 | | 2004 | | 2005 | |
|---|---|---|---|---|---|---|---|---|
| | Number | Capacity | Number | Capacity | Number | Capacity | Number | Capacity |
| Vessels for dry goods | 45 | 113 114 | 34 | 89 676 | 28 | 71 326 | 34 | 87645 |
| Push barges | 29 | 37 180 | 28 | 78 156 | 14 | 23 636 | 12 | 11401 |
| **Total** | **74** | **150 294** | **62** | **167 832** | **42** | **94 962** | **46** | **99046** |
| Tanker vessels | 22 | 65 548 | 45 | 131 455 | 54 | 139 718 | 46 | 130860 |
| Tanker push barges | 2 | 178 | 1 | 1 800 | 3 | 2 427 | 2 | 2527 |
| **Total** | **24** | **65 726** | **46** | **133 255** | **57** | **142 145** | **48** | **133387** |
| Pusher tugs | 2 | | 0 | | 1 | | 0 | |
| Tugs | 3 | | 1 | | 1 | | 0 | |
| **Total** | **5** | | **1** | | **2** | | **0** | |
| Cruise boats | 17 | | 10 | | 5 | | 5 | |
| Day-trip boats | 9 | | 1 | | 1 | | 5 | |
| **Total** | **26** | | **11** | | **6** | | **10** | |

| Type of vessel | total 2002 - 2005 | |
|---|---|---|
| | Number | Capacity |
| Vessels for dry goods | 141 | 361761 |
| Push barges | 83 | 150373 |
| **Total** | **224** | **512134** |
| Tanker vessels | 167 | 467581 |
| Tanker push barges | 8 | 6932 |
| **Total** | **175** | **474513** |
| Pusher tugs | 3 | |
| Tugs | 5 | |
| **Total** | **8** | |
| Cruise boats | 37 | 30790 |
| Day-trip boats | 16 | 9894 |
| **Total** | **53** | **40684** |

Source: IVR

| 2. Evolution of transport services for inland waterways transport | | | | |
|---|---|---|---|---|
| | | | | |
| **Country** *in million Tkm* | **Type of transport** | **2005** | **2006** | **Evolution in %** |
| **Germany** | National | 11694,8 | 11230,0 | -4,0% |
| | International | 52400,8 | 52745,2 | 0,7% |
| | **Total** | **64095,6** | **63975,2** | **-0,2%** |
| **Austria** | National | 37,3 | 137,3 | 268,1% |
| | International | 1715,2 | 1699,9 | -0,9% |
| | **Total** | **1752,5** | **1837,2** | **4,8%** |
| **Belgium** | National | 3067,0 | 3067,0 | 0,0% |
| | International | 5651,0 | 5651,0 | 0,0% |
| | **Total** | **8718,0** | **8718,0** | **0,0%** |
| **Bulgaria** | National | 54,1 | 58,2 | 7,6% |
| | International | 700,6 | 701,2 | 0,1% |
| | **Total** | **754,7** | **759,4** | **0,6%** |
| **Croatia** | National | 39,2 | 38,6 | -1,5% |
| | International | 79,4 | 77,8 | -2,0% |
| | **Total** | **118,6** | **116,4** | **-1,9%** |
| **France** | National | 4640,0 | 4646,0 | 0,1% |
| | International | 3217,0 | 3306,0 | 2,8% |
| | **Total** | **7857,0** | **7952,0** | **1,2%** |
| **Hungary** | National | 5,0 | 8,0 | 60,0% |
| | International | 2105,0 | 1890,0 | -10,2% |
| | **Total** | **2110,0** | **1898,0** | **-10,0%** |
| **G.D. Luxembourg (*)** | National | 0,0 | 0,0 | |
| | International | 342,0 | 380,0 | 11,1% |
| | **Total** | **342,0** | **380,0** | **11,1%** |
| **Netherlands** | National | 10519,0 | 10624,2 | 1,0% |
| | International | 32548,0 | 32873,5 | 1,0% |
| | **Total** | **43067,0** | **43497,7** | **1,0%** |
| **Poland** | National | 639,8 | 689,5 | 7,8% |
| | International | | | |
| | **Total** | **639,8** | **689,5** | **7,8%** |
| **Czech Republic** | National | 60,2 | 14,6 | -75,7% |
| | International | 33,3 | 27,7 | -16,8% |
| | **Total** | **93,5** | **42,3** | **-54,8%** |
| **Romania** | National | 2641,0 | 2405,0 | -8,9% |
| | International | 2505,0 | 2552,0 | 1,9% |
| | **Total** | **5146,0** | **4957,0** | **-3,7%** |
| **Serbia** | National | 454,2 | 381,9 | -15,9% |
| | International | 1032,5 | 1321,6 | 28,0% |
| | **Total** | **1486,7** | **1703,5** | **14,6%** |

| | | | | |
|---|---|---|---|---|
| **Slovakia** | National | 3,3 | 0,0 | -100,0% |
| | International | *737,0* | 648,8 | -12,0% |
| | **Total** | **740,3** | **648,8** | **-12,4%** |
| **Switzerland** | National | 1,3 | 1,6 | 23,1% |
| | International | 45,3 | 40,4 | -10,8% |
| | **Total** | **46,6** | **42,0** | **-9,9%** |
| **Total** | **National** | **33856,2** | **33301,9** | **-1,6%** |
| | **International** | **103112,1** | **103915,1** | **0,8%** |
| | **Total** | **136968,3** | **137217,0** | **0,2%** |

*Source: ECMT*
(*) Source: Eurostat

NB: In italics – simulation by CCNR Secretariat

## 3. Evolution in transport of containers in the various geographic sectors

### Transport of containers on the Rhine (in TEUs)
(from the Dutch border to Basle)

| | | Rhine – downstream | | | Rhine – upstream | | |
|---|---|---|---|---|---|---|---|
| **Years** | **Total** | **Total** | **empty** | **loaded** | **Total** | **empty** | **loaded** |
| **Total for the traditional Rhine** | | | | | | | |
| **Rheinfelden Emmerich** | | | | | | | |
| 2003 | 1541996 | 806501 | 119078 | 687423 | 735495 | 405396 | 330099 |
| 2004 | 1810669 | 957730 | 122601 | 835129 | 852939 | 489520 | 363419 |
| 2005 | 1960870 | 1025033 | 164259 | 860774 | 935837 | 536631 | 399206 |
| 2006 | 1935023 | 999765 | 109888 | 889877 | 935258 | 531729 | 403529 |
| | **-1,32%** | **-2,47%** | **-33,10%** | **3,38%** | **-0,06%** | **-0,91%** | **1,08%** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Upper Rhine** | | | | | | | |
| **Rheinfelden Strasbourg** | | | | | | | |
| 2003 | 191520 | 94122 | 12561 | 81561 | 97398 | 55871 | 41527 |
| 2004 | 211926 | 108702 | 10440 | 98262 | 103224 | 59939 | 43285 |
| 2005 | 200346 | 106106 | 11697 | 94409 | 94240 | 50637 | 43603 |
| 2006 | 212934 | 113179 | 14608 | 98571 | 99755 | 51035 | 48720 |
| | **6,28%** | **6,67%** | **24,89%** | **4,41%** | **5,85%** | **0,79%** | **11,74%** |
| **Strasbourg Neuburgweier** | | | | | | | |
| 2003 | 238171 | 122526 | 13520 | 109006 | 115645 | 68974 | 46671 |
| 2004 | 291488 | 155710 | 12524 | 143186 | 135778 | 85372 | 50406 |
| 2005 | 272092 | 144547 | 13598 | 130949 | 127545 | 75277 | 52268 |
| 2006 | 263573 | 140608 | 17647 | 122961 | 122965 | 66927 | 56038 |
| | **-3,13%** | **-2,73%** | **29,78%** | **-6,10%** | **-3,59%** | **-11,09%** | **7,21%** |
| **Neuburgweier Mannheim** | | | | | | | |
| 2003 | 659638 | 344219 | 28293 | 315926 | 315419 | 200356 | 115063 |
| 2004 | 804327 | 424978 | 26749 | 398229 | 379349 | 251620 | 127729 |
| 2005 | 826591 | 428997 | 38740 | 390257 | 397594 | 260807 | 136787 |
| 2006 | 809905 | 412291 | 35753 | 376538 | 397614 | 261109 | 136505 |
| | **-2,02%** | **-3,89%** | **-7,71%** | **-3,52%** | **0,01%** | **0,12%** | **-0,21%** |

| Middle Rhine | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Mannheim Bingen** | | | | | | | |
| 2003 | 861153 | 446949 | 41005 | 405944 | 414204 | 232784 | 181420 |
| 2004 | 1043002 | 551059 | 45002 | 506057 | 491943 | 289128 | 202815 |
| 2005 | 1092998 | 575468 | 85004 | 490464 | 517530 | 304494 | 213036 |
| 2006 | 1051485 | 532874 | 47705 | 485169 | 518611 | 306729 | 211882 |
| | **-3,80%** | **-7,40%** | **-43,88%** | **-1,08%** | **0,21%** | **0,73%** | **-0,54%** |
| **Bingen Lülsdorf** | | | | | | | |
| 2003 | 929011 | 490904 | 45938 | 444966 | 438107 | 246487 | 191620 |
| 2004 | 1149006 | 612931 | 50789 | 562142 | 536075 | 316625 | 219450 |
| 2005 | 1230759 | 646390 | 91203 | 555187 | 584369 | 353477 | 230892 |
| 2006 | 1172605 | 600549 | 52483 | 548066 | 572056 | 344205 | 227851 |
| | **-4,73%** | **-7,09%** | **-42,45%** | **-1,28%** | **-2,11%** | **-2,62%** | **-1,32%** |

| Lower Rhine | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lulsdorf Orsoy** | | | | | | | |
| 2003 | 1414998 | 738026 | 96592 | 641434 | 676972 | 365096 | 311876 |
| 2004 | 1686072 | 888651 | 100939 | 787712 | 797421 | 450111 | 347310 |
| 2005 | 1847298 | 969068 | 145651 | 823417 | 878230 | 498795 | 379435 |
| 2006 | 1806059 | 933077 | 85656 | 847421 | 872982 | 492189 | 380793 |
| | **-2,23%** | **-3,71%** | **-41,19%** | **2,92%** | **-0,60%** | **-1,32%** | **0,36%** |
| **Orsoy Emmerich** | | | | | | | |
| 2003 | 1485675 | 772369 | 103117 | 669252 | 713306 | 384474 | 328832 |
| 2004 | 1745474 | 912949 | 105183 | 807766 | 832525 | 470112 | 362413 |
| 2005 | 1885195 | 972788 | 127207 | 845581 | 912407 | 517699 | 394708 |
| 2006 | 1876188 | 968057 | 94828 | 873229 | 908131 | 507914 | 400217 |
| | **-0,48%** | **-0,49%** | **-25,45%** | **3,27%** | **-0,47%** | **-1,89%** | **1,40%** |

*Source: St BA, Wiesbaden*

| North-south transport (in TEUs) | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Total | Imports | | | Exports | | |
| North-south transport | | Total | empty | loaded | Total | empty | loaded |
| Belgium / Netherlands | | | | | | | |
| 04 | 720378 | 376957 | | | 343421 | | |
| 05 | 833200 | 466649 | | | 366551 | | |
| 06 | 814708 | 433210 | | | 381298 | | |
| Evolution (2006 / 2005) | -2,22% | -7,17% | | | 4,02% | | |
| France / Belgium | | | | | | | |
| 04 | 32050 | 14787 | 10089 | 4698 | 17263 | 3509 | 13754 |
| 05 | 35292 | 16181 | 10913 | 5268 | 19111 | 3470 | 15641 |
| 06 | 38809 | 17441 | 9587 | 7854 | 21368 | 5986 | 15382 |
| Evolution (2006 / 2005) | 9,97% | 7,79% | -12,15% | 49,09% | 11,81% | 72,51% | -1,66% |
| France / Netherlands | | | | | | | |
| 04 | 4498 | 1949 | 911 | 1038 | 2549 | 814 | 1735 |
| 05 | 4785 | 2349 | 1040 | 1309 | 2436 | 789 | 1647 |
| 06 | 8493 | 4596 | 807 | 3789 | 3897 | 2070 | 1827 |
| Evolution (2006 / 2005) | 77,49% | 95,66% | -22,40% | 189,46% | 59,98% | 162,36% | 10,93% |
| Total 04 | 756926 | 393693 | | | 363233 | | |
| Total 05 | 873277 | 485179 | | | 388098 | | |
| Total 06 | 862010 | 455247 | | | 406563 | | |
| Evolution (2006 / 2005) | -1,29% | -6,17% | | | 4,76% | | |

*Source: CBS, VNF*

| Transport of containers on the other European inland waterways | | | | |
|---|---|---|---|---|
| | 2004 | 2005 | 2006 | Evolution 2006/2005 |
| Mittellandkanalgebiet (TEUs) | 49389 | 84900 | 77858 | - 8,3% |
| Central / Upper Elbe (TEUs) | 17700 | 23148 | 36178 | + 56,3% |
| | | | | |
| German Danube | 77415 | 38166 | 15829 | - 58,5% |
| Austrian Danube | - | 4654 | 3671 | - 21,1% |

*Source: WSD Ost, Mitte and Süd, Austrian statistics office*

**National transport of containers (in TEUs)**

| | | Total | empty | loaded |
|---|---|---|---|---|
| **Netherlands** | | | | |
| | **04** | 706289 | | |
| | **05** | 746981 | | |
| | **06** | 816234 | | |
| | **Evolution (2006 / 2005)** | **9,3%** | | |
| **Germany** | | | | |
| | **04** | 171812 | 68832 | 102980 |
| | **05** | 203709 | 97521 | 106188 |
| | **06** | 182076 | 80488 | 101588 |
| | **Evolution (2006 / 2005)** | **-10,6%** | **-17,5%** | **-4,3%** |
| **France** | | | | |
| | **(Bassin du Rhône) 04** | 46412 | - | - |
| | **05** | 55807 | - | - |
| | **06** | 61258 | | |
| | **Evolution (2006 / 2005)** | **9,8%** | - | - |
| | **(Bassin de la Seine) 04** | 86358 | - | - |
| | **05** | 121584 | - | - |
| | **06** | 143206 | | |
| | **Evolution (2006 / 2005)** | **17,8%** | - | - |
| | **(Canaux du nord) 04** | 58146 | - | - |
| | **05** | 61709 | - | - |
| | **06** | 69751 | | |
| | **Evolution (2006 / 2005)** | **13,0%** | - | - |

*Source: St BA, CBS, VNF*

## 4. Glossarium

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

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

**Downstream navigation**: navigation downriver

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

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

**Dry hold**: Used for the transport of dry cargo.

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

**Handling**: Transshipment of goods from one means of transport to another.

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

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

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

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

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

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

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

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

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

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

**Upstream navigation**: Navigation travelling upstream.

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

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

## 5. Sources of information

**International organisations**
Eurostat
CEMT
Danube Commission
Moselle Commission

**National administrations**
Statistisches Bundesamt (Germany)
WSD Süd-West (Germany)
WSD Ost (Germany)
Bundesanstalt für Gewässerkunde (Germany)
Bundesamt für Güterverkehr (Germany)
CBS (Netherlands)
Voies Navigables de France (France)
Statistic Austria (Austria)
Via Donau (Austria)
Institut National Statistique (Belgium)
Service public fédéral Mobilité and Transports (Belgium)

**Economic institutes and consultants**
Institut pour le Transport par Batellerie (Belgium)
NEA Consulting
P J K International b. v.

**Inland waterways transport organisations**
IVR (Netherlands)
CBRB (Netherlands)
EBU
ESO
VBW

**Industrial organisations**
Mineralölwirtschaftsverband
BDI
CEFIC
Fédération Française de l'Acier
Fertilizer Industry Association
Hauptverband der deutschen Bauindustrie
International Iron and Steel Institute
Verein der deutschen Kohleimporteure
Stahl Online

**Ports**
Port of Antwerp
Port of Rotterdam
Port of Amsterdam

**Groups of professional experts**
H. HÖNEMANN (LEHNKERING Reederei GmbH)
H. FEIERABEND (RF CONSULTING GmbH)
H. SPITZER (EBU)
H. VELDMAN (OEB)
H. GIERKE (BAG)

**European Commission**
Mr DIETER (Administrator)

**Layout**
Bitfactory
Willem Buytewechstraat 40
3024 BN Rotterdam (Netherlands)

**CCNR Secretariat**
Mr VAN DER WERF (Project Manager)
Mr WEBER (Administrator)
Ms NOËL (Econometrician)
Ms GEROLT (Secretariat)
Mr LAUGEL (Printer)

Contact: jp.weber@ccr-zkr.org

**Printed in September 2007**

Edited by the Secretariat of the Central Commission for Navigation on the Rhine
Secretariat: 2 Place de la République, F67082 STRASBOURG cedex [France]
www.ccr-zkr.org