

ANNUAL REPORT

2016

**INLAND NAVIGATION
IN EUROPE**
MARKET OBSERVATION

In partnership
with the



CCNR

CENTRAL COMMISSION
FOR THE NAVIGATION OF THE RHINE



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June 2016



FOREWORD

The Market Observation for European inland navigation is based on collaboration between the EU Commission and the CCNR. This collaboration was consolidated and developed in 2013 in the form of a cooperation agreement between DG-Move (Directorate General for Mobility and Transport) and the Secretariat of the CCNR.

As part of this close partnership between the two international organisations, a Market Observation work programme was drawn up for the period 2016-2018, which is intended to ensure a representative and objective description of the economic development of the inland navigation market in Europe.

In this way political decision-makers, the industry, administrative authorities and last but not least, scientists are provided with market reports based on statistical data, quantitative analyses and qualitative information. Quantitative and qualitative information go hand-in-hand and complement one another. These market reports are intended to describe and analyse economic trends and developments within the industry in the most comprehensible, objective and representative form possible.

Moreover, the Market Observation is also to be construed as a continuation of the ongoing monitoring of the Rhine navigation market by the Central Commission for the Navigation of the Rhine (CCNR). With 330 million t per annum, the Rhine accounts for a 2/3 share of European inland waterway transport volumes, totalling around 550 million t.

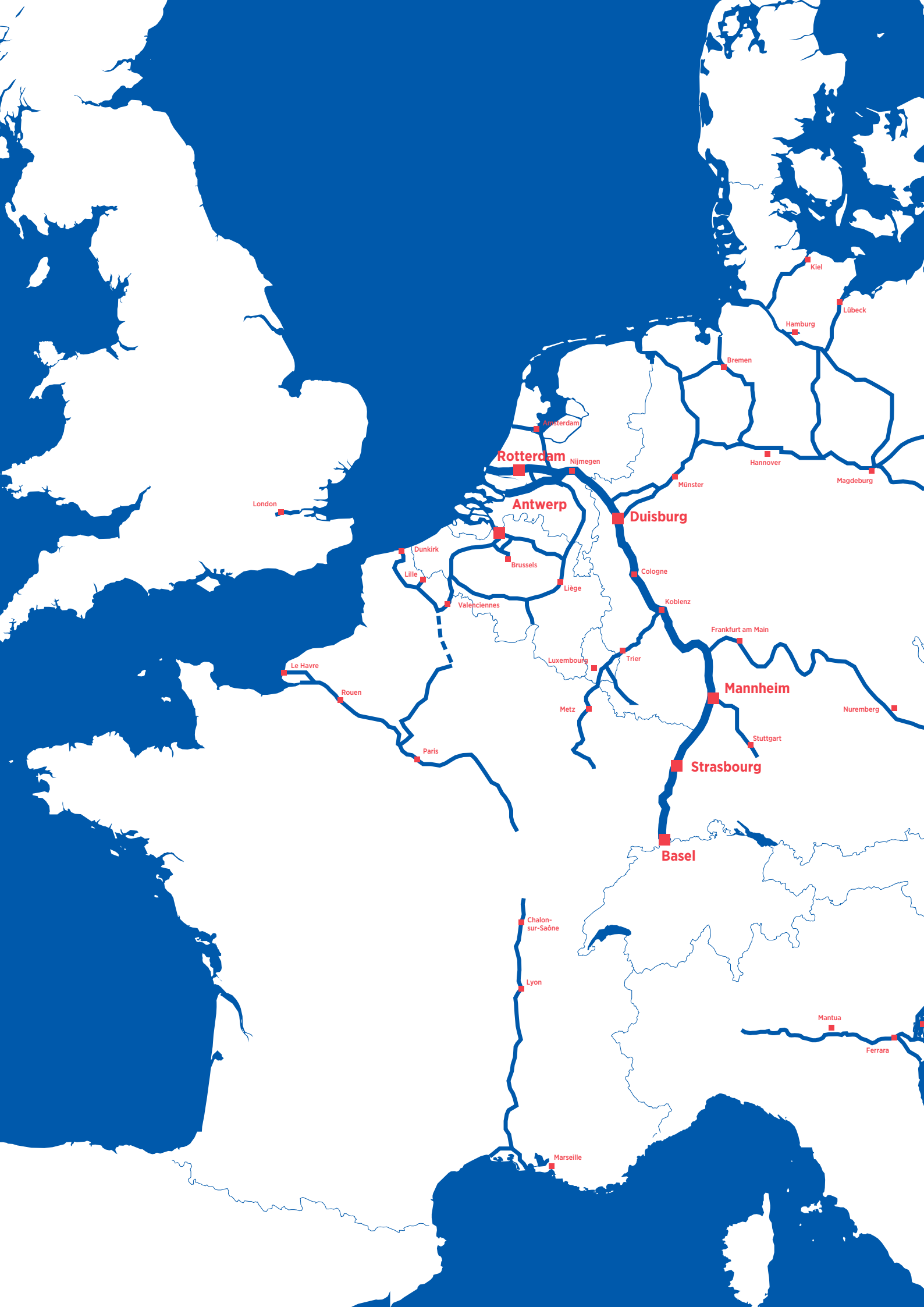
As concerns its integration into the European transport corridor system, the Rhine is part of the Rhine-Alps corridor, which stretches from the Netherlands to Italy via Germany, France and Switzerland. The Rhine-Alps corridor exhibits a very high demographic and economic-industrial density; in conjunction with institutional and economic historical factors, this explains the great importance it has today.

This year's Market Observation report obviously looks at other European waterways as well. Here we can mention in particular the dense network of inland waterways extending throughout the Netherlands, Belgium and northern France and which, as concerns cross-border transport movements between these countries, is also referred to as the North-South axis. With around 100 million t per annum, this axis accounts for almost 20% of European traffic volume.

The Danube, with a current share of almost 10% of European traffic volume, has thus far been unable to exploit its potential as a traffic axis between Western, Central, and South-Eastern Europe to the extent desirable from a pan-European perspective. But the Danube already fulfils a valuable function as a mode of transport for the agricultural and foodstuffs sector. In the Danube region these are economic areas which, compared with industrial sectors, exhibit greater resilience in the face of economic crises, and thus confer on the navigation of the Danube an indispensable basis on which to formulate a future growth strategy.

Moreover, this annual report contains information on the development of the fleet, the development of freight rates, turnover and costs. The modal split position of inland navigation, fleet capacity utilisation, passenger navigation, water conditions, port transshipments and the labour market, all have their own dedicated chapters.





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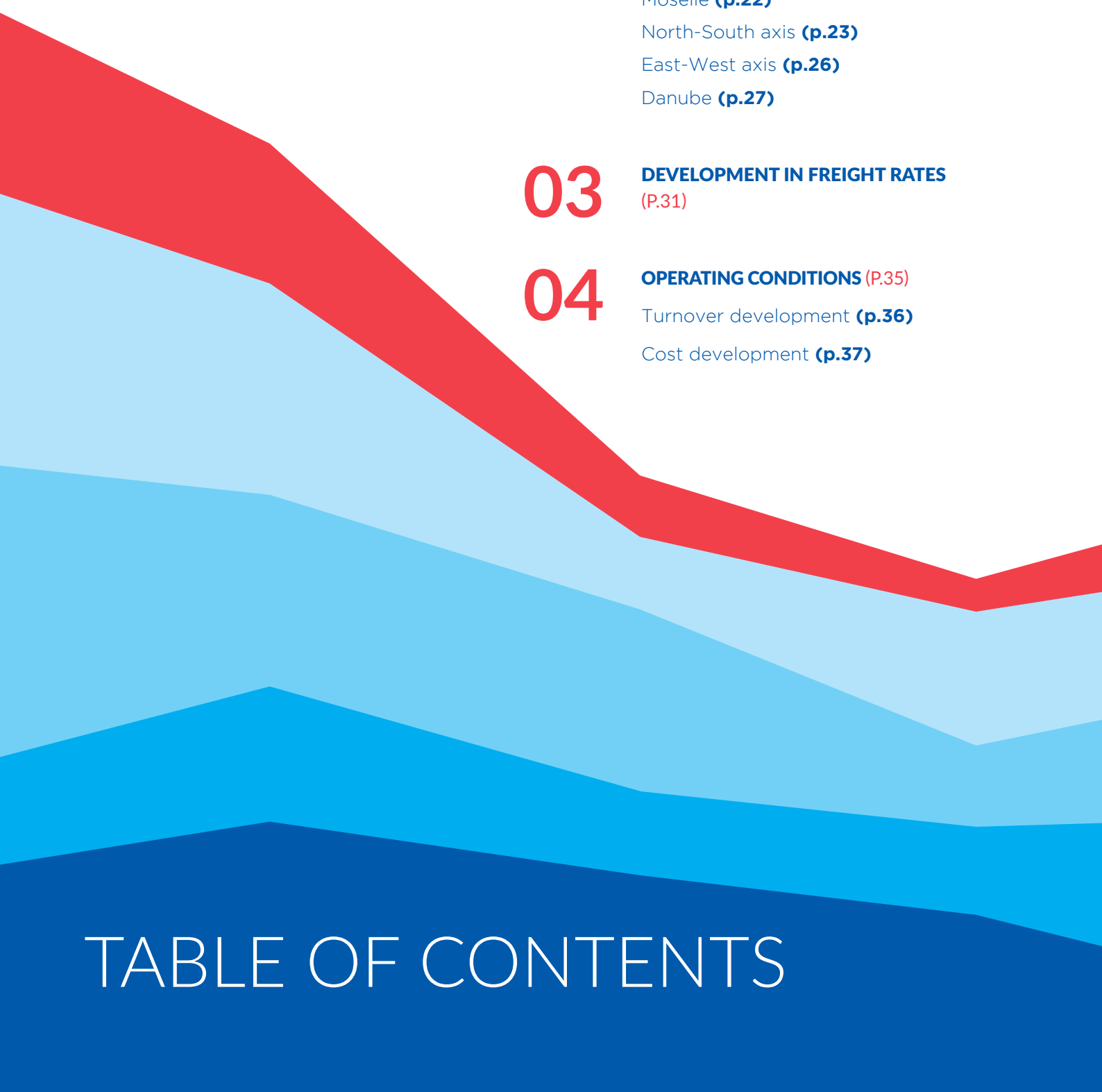
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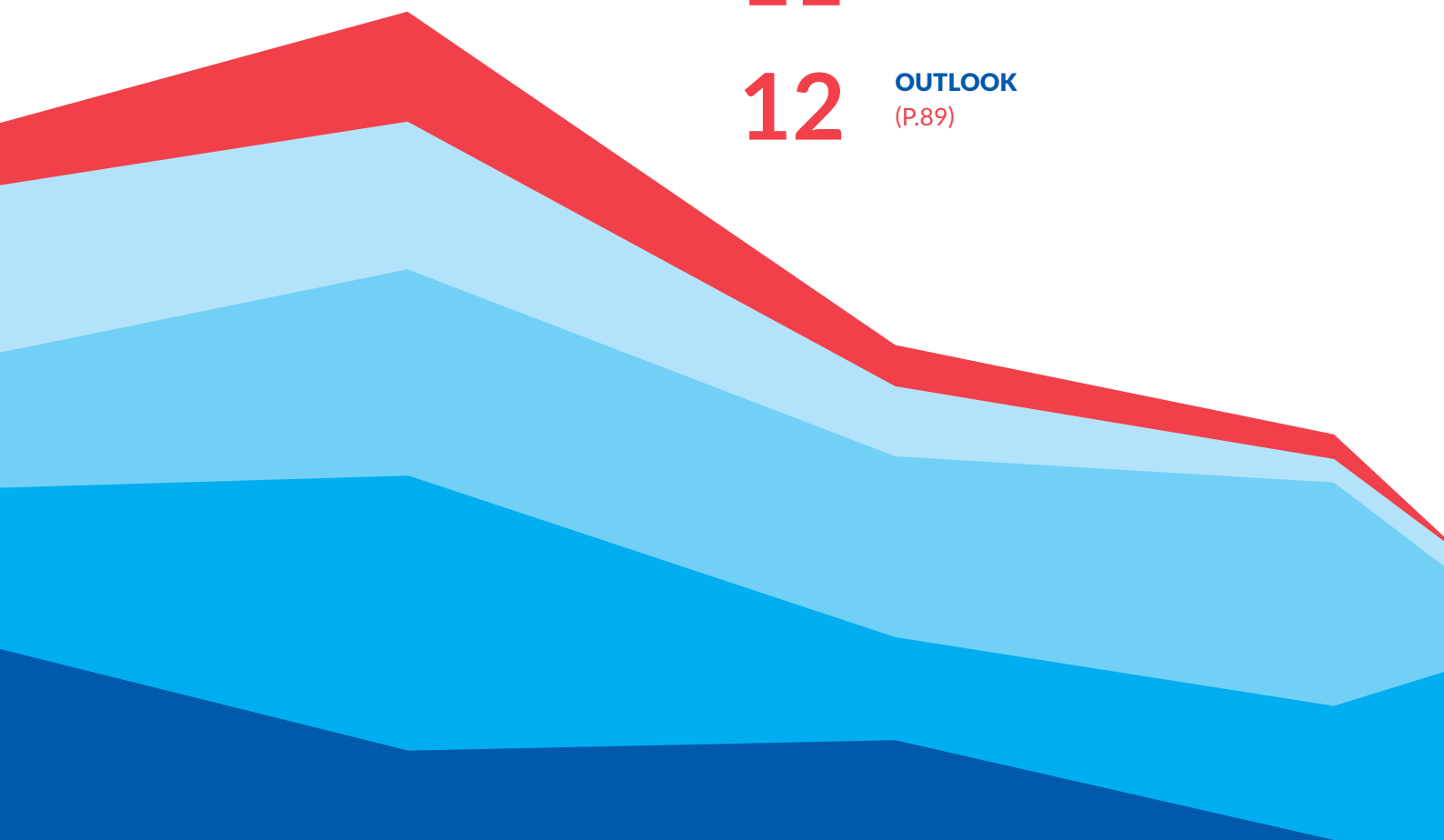
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SUMMARY

EUROPEAN INLAND NAVIGATION

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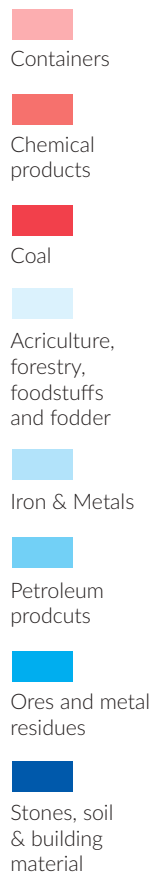
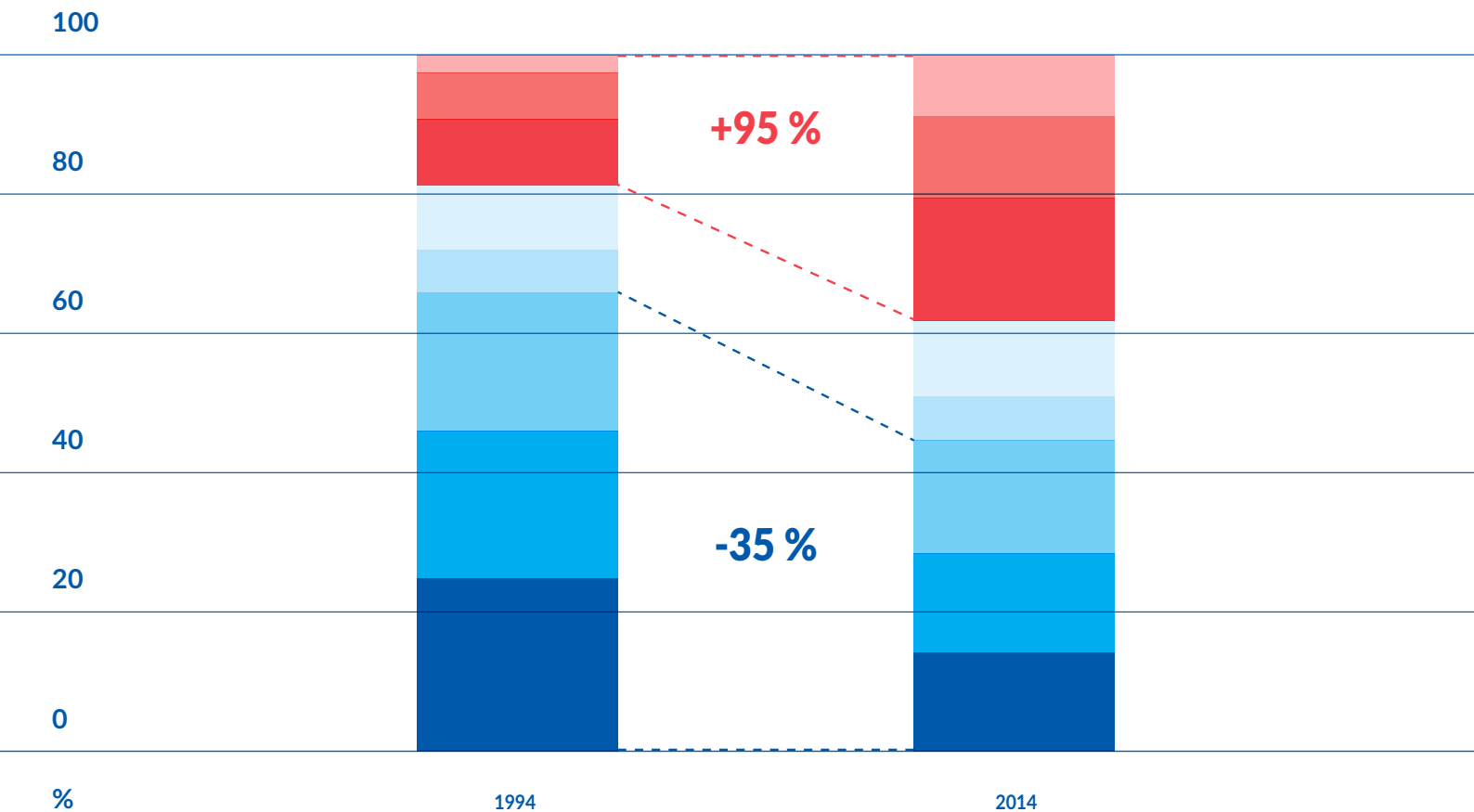
- Currently, around **550 million t** of goods are carried on inland waterways within the EU
- **330 million t** of this is accounted for by the Rhine (= 2/3 of the EU total)
- Transport on the Rhine:
 1. 1st half 2015: **+ 3 %**
 2. 2nd half 2015: **-11 %**
 3. Period of time from 2010 to 2015 (= period starting with the recovery from the crisis) : average yearly growth rate **+ 1,5 %**

A MODE OF TRANSPORT

BETWEEN STABILITY AND CHANGE

- The volume of goods carried on European inland waterways is relatively stable over a multi-year period.
- But in tandem with this stability there are also fluctuations in transport demand, associated with cyclical fluctuations in economic activity.
- Notwithstanding the constant multi-year trend, there is a structural change going on.
- The goods that dominated transport 20 years ago, namely ores, petroleum products and building materials, have posted a 35% decline over the past 20 years. Ores and building materials are bulk goods with a low value-weight ratio.
- At the same time there has been a 95% increase in the carriage of other goods such as containers, chemical products and coal over this same twenty-year period.

COMPOSITION OF GOODS CARRIED ON THE RHINE



A MODE OF TRANSPORT

EMBEDDED WITHIN AN ENVIRONMENTAL, POLITICAL, ECONOMIC AND INTER-MODAL LOGISTIC FRAMEWORK.

- Inland waterway transport depends greatly on exogenous factors, such as natural environmental conditions (see the impact of low water levels in the second half of 2015) or the socio-political environment, as is evident from the energy policy in countries such as Germany.
- Inland waterway transport is connected with other modes of transport and thus offers a complementary logistics supply within European transport corridors.

A MODE OF TRANSPORT

WITH A NUANCED DEVELOPMENT TRAJECTORY IN 2015

- Transport demand on the Rhine enjoyed a positive development in the first half of 2015. There was a 3% growth in transport volumes. The product of transport volume and transport distance (transport performance) even grew by 7%.

- The downturn in transport volume that occurred on European waterways in the second half of this year was attributable to a low-water phase that lasted from August to November. Low water levels meant that vessels could only be loaded to a certain extent. The consequence was limitations in the carriage of large volumes of dry and liquid bulk goods. A small 4% dip in full-year transport demand was thus to be observed for the Rhine.
- The low water was also in evidence on other European rivers and here too acted as a dampening and inhibiting factor on transport volumes. This affected not just freight navigation, but passenger navigation as well. The low water resulted in isolated cruise restrictions.
- The north-south axis, extending from the Netherlands via Belgium to northern France, carries approximately 20% of European freight volumes. In 2015 there was a spike here in the carriage of agricultural produce; these are very important on the north-south axis, along with other goods categories (petroleum products, sand, soil & building materials). There is a positive trend on this axis in the carriage of petroleum products and agricultural produce.
- Danube navigation, which accounts for approximately 10% of European transport volume, posted freight transport declines in 2015. Consequently, there was a fall in the freight index for transport movements on the Danube. The absence of steady and adequate rainfall in the Danube basin resulted in a reduction of vessel capacity utilisation in the second half of 2015. It also resulted in a necessary lightening of vessels to negotiate critical stretches, as well as in occasional halts to navigation.
- But the low water conditions were also associated with positive effects. For example, there was a significant increase in freight navigation transport prices, which also boosted revenue, notwithstanding the fall in volumes. In the countries carrying the greatest transport volumes on inland waterways, the Netherlands and Germany, turnover increased by 4% for 2015 as a whole. Operating conditions in the West European industry improved in response to the modest cost reduction as a result of lower fuel costs.
- The development in the freight navigation fleet continues to be characterised by very low new construction rates. This applies both to Western Europe and the Danube region. Only in passenger navigation, or in the river cruise sector to be more accurate, is there a very high rate of new construction. In 2015 almost 30 new river cruise vessels came onto the European market. This equates to almost 10% of the existing river cruise ship fleet for 2015.
- The prospects for freight navigation for 2016 are cautiously positive; volumes are anticipated to increase by between 3 and 5%. On the one hand, this increase is the result of a base effect, which has to do with the low water and attendant reduction in volumes in 2015. This base effect therefore results in catch-up effects, which manifest themselves in a

higher growth rate. On the other hand, however, the anticipated increase is also the result of the economic estimates of transport demand, which are overall positive when weighing up the different goods segments.

■ A MODE OF TRANSPORT

LOOKING TO THE FUTURE AND WITH THE POTENTIAL FOR RENEWAL

- What is currently to be observed is a low rate of renewal of the fleet; but there are innovative initiatives enabling lower fuel consumption, thus making this mode of transport more sustainable. Especially noteworthy in this respect is the use of liquefied natural gas (LNG) as fuel.
- But we can also cite regional initiatives such as the introduction of a regular container service on the Moselle. This demonstrates the ability to introduce new business models and also proves that new supply are capable of creating new demand.







01

ECONOMIC
ENVIRONMENT

ECONOMIC ENVIRONMENT

Europe's economic recovery is continuing but the latest forecasts are less optimistic than in November 2015. Macro-economic phenomena such as the decline in global trade, which have contributed to the fall in commodity prices (ore, oil, minerals, agricultural produce), are one explanation for the negative revision in forecasts.

Another explanation, for the Eurozone, is that high unemployment and low investment have prompted a downward revision of November 2015 forecasts. Regarding the United States, their anticipated GDP growth rate of 2% for 2016 is somewhat higher than for the Eurozone, the reason being stronger investment demand.

REAL GROSS DOMESTIC PRODUCT GROWTH RATE (IN %), INCLUDING FORECASTS FOR 2016 AND 2017

	2012	2013	2014	2015	2016	2017
France	0,2	0,7	0,2	1,1	1,2	1,5
Germany	0,6	0,2	1,6	1,6	1,3	1,7
Netherlands	-1.1	-0.5	1.0	1.9	1.8	1.9
Belgium	0.2	0.0	1.3	1.4	1.2	1.4
Switzerland	1.1	1.8	1.9	0.9	1.2	1.5
Luxembourg	-0.8	4.3	4.1	4.5	3.5	3.4
Eurozone	-0,8	-0,3	0,9	1,4	1,4	1,7

Source: OECD (February 2016)¹ and IMF (April 2016) economic outlook for the Netherlands, Belgium and Switzerland. The figures for 2016 2017 are forecasts.

GDP forecasts for the Danube countries are positive, which can certainly be explained by the economic catch-up phenomena these countries are experiencing.

¹The preliminary data of the OECD do not yet provide adequate forecasts for Belgium, the Netherlands and Switzerland.

**REAL GROSS DOMESTIC PRODUCT GROWTH RATE (IN %),
INCLUDING FORECASTS FOR 2016 AND 2017**

	2012	2013	2014	2015	2016	2017
Romania	0.6	3.5	3.0	3.7	4.2	3.6
Bulgaria	0.2	1.3	1.5	3.0	2.3	2.3
Hungary	-1.7	1.9	3.7	2.9	2.3	2.5
Austria	0.8	0.3	0.4	0.9	1.2	1.4
Slovakia	1.5	1.4	2.5	3.6	3.3	3.4
Croatia	-2.2	-1.1	-0.4	1.6	1.9	2.1

Source: IMF. The figures for 2016 and 2017 are forecasts







02

TRANSPORTATION
BY WATERWAYS
AND TRAFFIC AXES

TRANSPORTATION

BY WATERWAYS AND TRAFFIC AXES

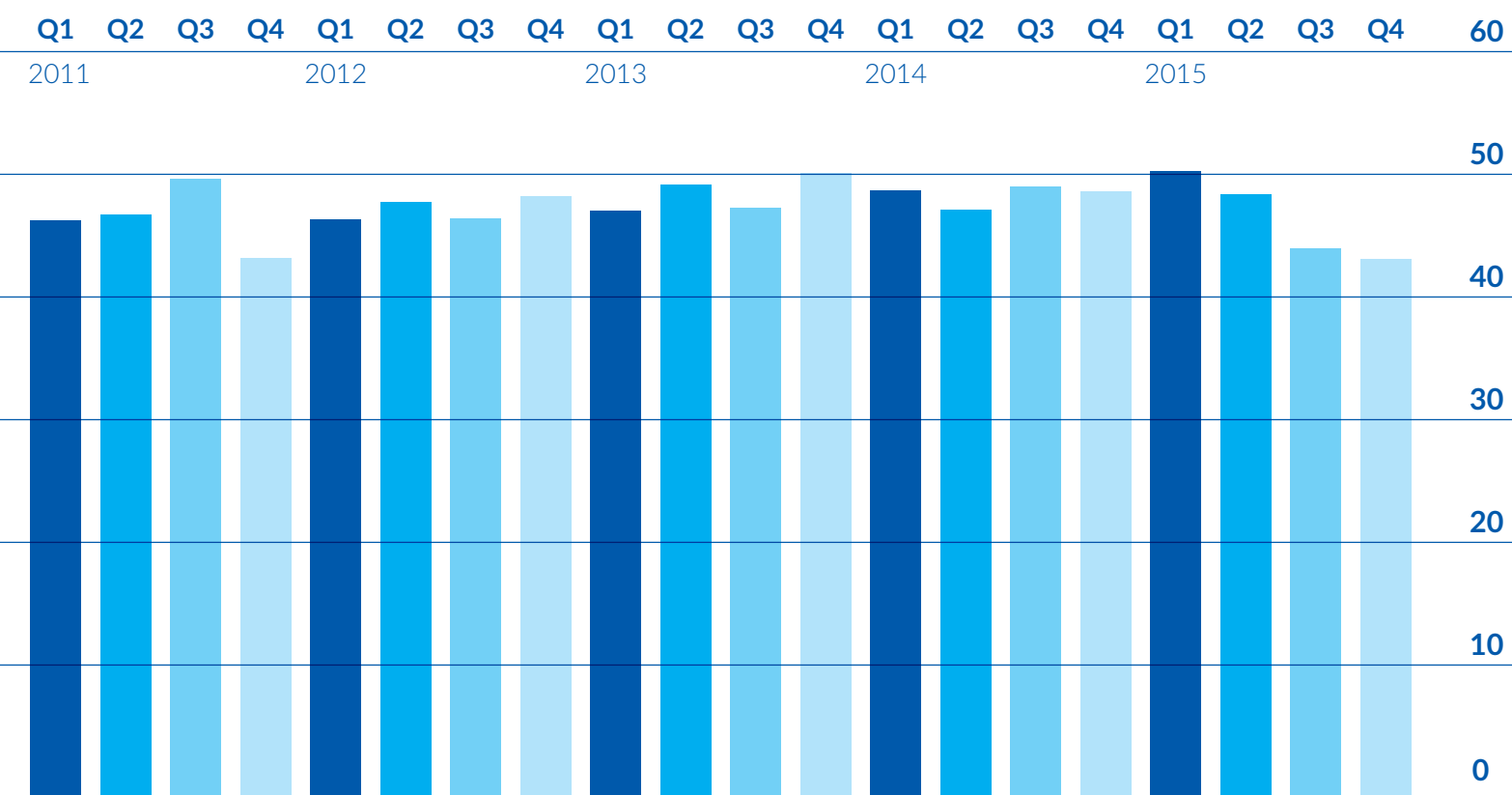
RHINE

Every year around 330 million t are transported on the Rhine as a whole, from Switzerland to its confluence with the North Sea. The Rhine axis is thus responsible for approximately 2/3 of European inland waterway transport. Almost 200 million t are accounted for by the traditional part of the Rhine from Switzerland to the German-Dutch border.

The first half of 2015 was akin to the positive trend of previous years. There was a rate of freight growth of 3% and transport performance growth of 7%. The second half of the year ushered in a low-water phase between August and November which restricted transport movements of large volumes. This resulted in a slackening of transport volume.

QUARTERLY FREIGHT TRANSPORT ON THE TRADITIONAL RHINE (Q1/2011-Q4/2015) IN MILLION T

Source: CCNR calculation based on destatis data



Because of this slackening in the second half of the year, the annual transport volume in 2015 was 4% lower than the year before. Transport performance fell by 5% to 38.3 bn. tkm. The following table shows the development by freight segment as well as the overall development.

TRANSPORT VOLUME AND RATE OF CHANGE IN RHINE NAVIGATION YEAR-ON-YEAR (TRADITIONAL RHINE)

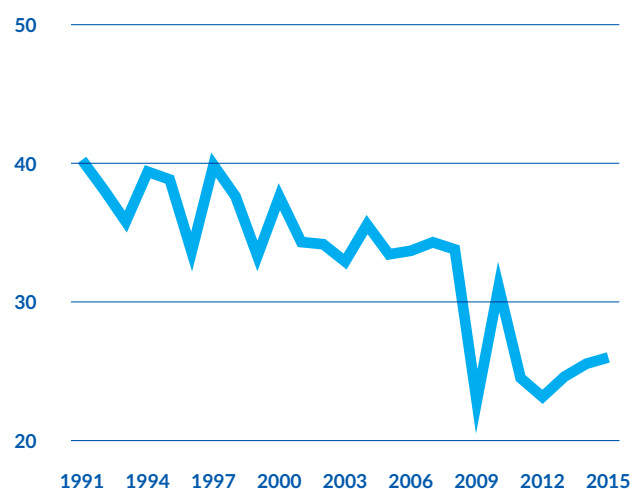
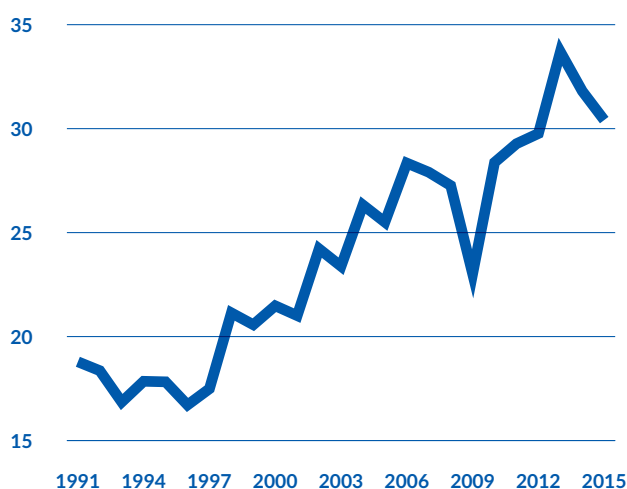
	Mio. t			%	
	2013	2014	2015	2014/2013	2015/2014
Agriculture and forestry	12,7	12,1	11,5	-4,7	-5,2
Foodstuffs and fodder	7	7,5	7	7,4	-7,5
Ores	24,4	25,5	26	6,3	1,8
Metals	10,6	11,4	11,2	7,4	-2
Sand, soil & building material	25,3	25,6	24	1,3	-1,3
Coal	33,7	31,8	30,4	-5,6	-4,3
Petroleum products	30,9	29,4	28,7	-5	2,4
Chemical products	20,8	21,2	19,9	2	-6,4
Containers	15,3	15,8	15,4	3,8	-2,5
Total	193,4	193,3	185,6	0	-4

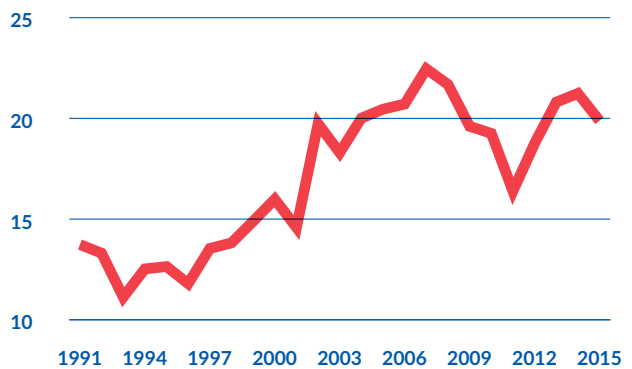
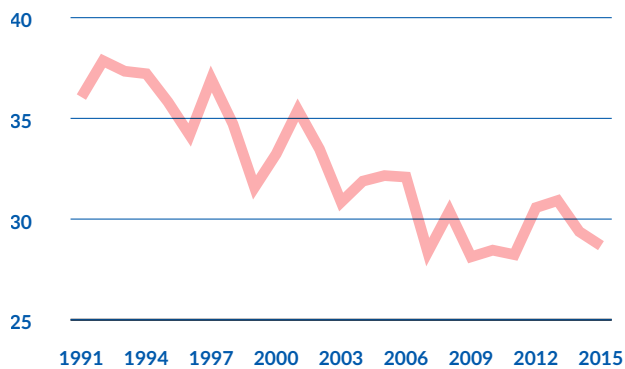
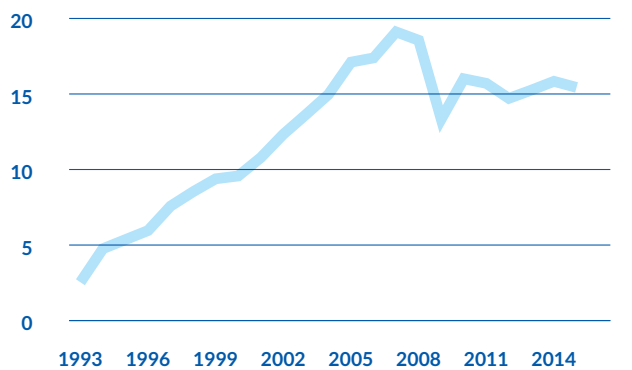
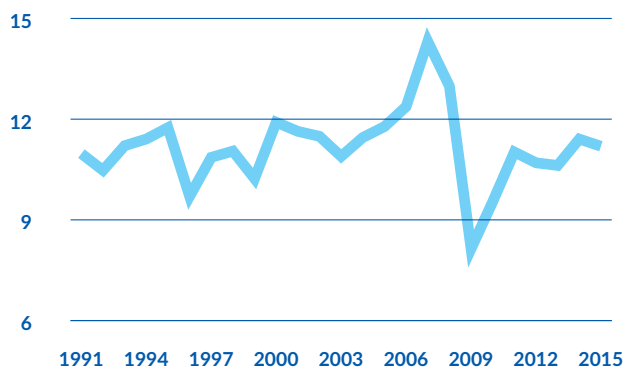
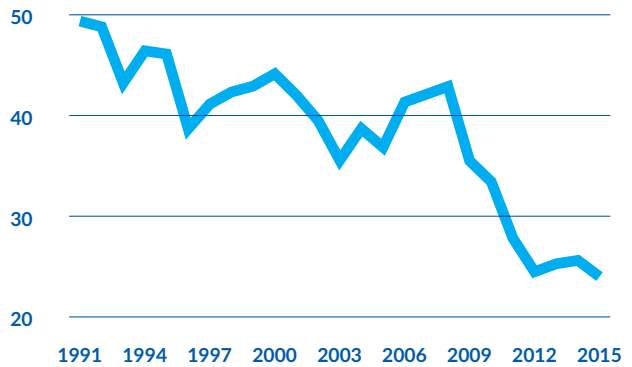
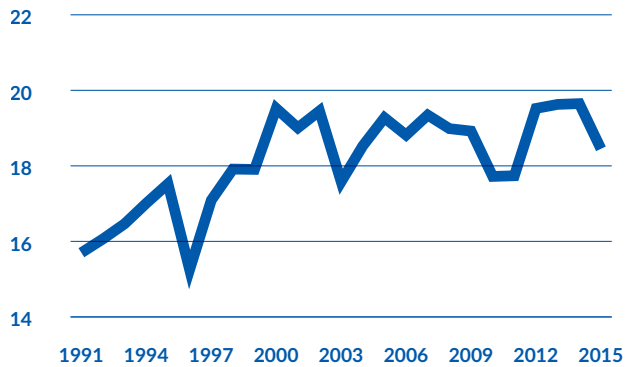
Source: CCNR calculation based on destatis

An initial basis for a medium to long-term outlook is the observation of existing trends by freight segment. Certain trends can be discerned that can be explained by economic factors. A further illustration of the outlook is also to be found in the "Outlook" chapter of this report.

Solid fuels (coal)
Ores

MULTI-YEAR TRENDS FOR FREIGHT SEGMENTS IN TRADITIONAL RHINE NAVIGATION (IN MILLION T)





Source: destatis.



SOLID FUELS

In the past this was a growth sector, primarily because of an increasing demand for coal imports by Germany. Declines are in evidence for 2013-2015, however, related to the increasing importance of renewable energies.

ORES

One factor explaining the downward trend is the increasing raw materials efficiency in steel production. Consequently, significantly less iron ore is required nowadays to produce a ton of steel than previously.² No significant increases are to be anticipated in future steel production in Europe. As such the iron ore trend will probably remain on a downward trajectory.

² See: Steel Institute VDEh / German steel industry federation (Wirtschaftsvereinigung Stahl)
*weight of freight transported

AGRICULTURE, FEEDSTUFFS AND FODDER

There is a slightly positive trend here. Inland navigation is increasingly able here to leverage its logistic advantages (economies of scale, uncomplicated scheduling) and is valued by major players in the agricultural and feedstuffs sector as an essential mode of transport.

SAND, SOIL & BUILDING MATERIAL:

There is a downward trend for the Rhine, attributable to the difficulty in opening up new areas for extraction and to the tendency towards falling demand on the part of the construction industry.

METALS & METAL PRODUCTS

This segment is essentially cyclical in nature, meaning that its development tracks the cyclical fluctuations of the steel industry. The long-term trend however is towards a constant development, in similar fashion to the multi-year tendencies in steel production itself (see “ores”).

CONTAINERS

Although container traffic continues to be an inland navigation growth segment, for a number of years now the transport volume has grown less strongly than the number of TEUs carried. The recurring low water periods play a role in this as they increase freight rates for full containers in the form of low water supplements, resulting in a price disadvantage relative to rail. The consequence of this is temporary losses of market share relative to rail.³

PETROLEUM PRODUCTS

A reduction in the consumption of heating oil by private households and a reduction in fuel consumption in the automotive sector are major factors explaining the slight downward trend. Superimposed on this are the short-term influences of the oil price.

CHEMICAL PRODUCTS

The transportation of these products depends on the state of the economy on the one hand, overlaid with a positive trend on the other hand. This trend can also be explained in terms of the investment made over a long period of time in achieving a high level of safety in the West European tanker navigation sector, and which has created a positive perception on the part of shippers.

³ See: CCNR/EU Market observation for European inland navigation, report 2012-1, page 40.

MOSELLE

The international shipping lane that is the Moselle links the three countries of Germany, France and Luxembourg. It is mainly frequented by Dutch and Belgian vessels.⁴ Both agricultural produce as well as raw materials for the steel industry and - increasingly - containers are carried on the Moselle. The biggest ports on the Moselle are Metz, Thionville and Trier.

The navigation of the Moselle exhibits a clear structure as regards freight flows and traffic direction. Solid fuels (coal) are carried almost exclusively upstream and account for approximately half of total volumes on the German stretch of the Moselle. Agricultural produce is transported almost exclusively downstream, where it also represents around half of the volumes transported. For both types of goods, as far as the German stretch of the Moselle is concerned, a relatively constant multi-year pattern is to be noted.

This also applies, as far as agricultural produce is concerned, for the French stretch of the Moselle. Coal transport movements in France on the other hand, have declined significantly in the past three years, which has to do with the closure of coal-fired power stations.⁵ Accordingly agricultural products are accounting for an ever greater share of total traffic on the French Moselle.⁶

However, the relatively small transport volume in 2015 compared with previous years is attributable primarily to the low water levels.

TRANSPORT VOLUMES ON THE MOSELLE (MILLION T)

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
14,5	14,0	15,8	14,6	15,1	11,6	14,5	12,6	12,6	13,5	12,6	10,8

Source: destatis

There has been a regular scheduled container service on the Moselle since 2014, with connections to the ports at the mouth of the Rhine via a hinterland hub in Bonn. This schedule service started with the Port of Metz, since joined by the ports of Nancy and Trier. This provides industrial and trading companies in the Moselle region with inexpensive access to the sea ports of Rotterdam and Antwerp and thus to world markets. The companies availing themselves of this container line come from the engineering sector, timber industry, furniture industry and food business.⁷

⁴ The share of Dutch-flagged vessels at the Koblenz lock in 2015 was 49%, of Belgian-flagged vessels 33% and of German-flagged vessels 10%.

⁵ See: Panteia (2016), *Middellange termijn prognoses voor het ladingvolume in de binnenvaart*

⁶ At the Apach lock (Franco-German border) agricultural produce now accounts for a 40% share. Source: Moselle Commission, *Market Observation 2016*.

⁷ See the article "Eine neue Zeitrechnung an der Mosel" (A new era on the Moselle) in: *Zeitschrift für Binnenschifffahrt* (Inland navigation magazine), edition 11/2015

The success of this container service is evident from the figures. Around 3.6 thousand TEU of loaded containers were recorded at the confluence of the Moselle with the Rhine at Koblenz in 2013, in 2014 it was then 5.2 thousand TEU, and in 2015 more than double that, namely 11 thousand TEU. The potential of this container service to the ports on the Moselle is estimated at 100,000 TEU in 2030.⁸

NORTH-SOUTH AXIS (NETHERLANDS – BELGIUM – NORTHERN FRANCE)

GENERAL OVERVIEW

The north-south axis is the second most important shipping axis in Europe, after the Rhine axis. From a geographical perspective it comprises the Netherlands, Belgium and northern France. Goods in this region are carried on a dense network of natural and artificial waterways.

International traffic on this north-south axis is considered below. The greatest transport volumes are accounted for here by cross-border traffic between the Netherlands and Belgium. The waterways enabling this traffic are the Rijn-Schelde Canal, the Gent-Terneuzen Canal and the Maas.⁹

Total freight transport on the Rijn-Schelde Canal, according to information from the company responsible for the canal, nv Scheepvaart, is currently around 73 million t per annum. According to Dutch statistical office estimates, approximately 48 million t of this are accounted for by cross-border transport movements between Belgium and the Netherlands.

The second most important waterway for cross-border transport between Belgium and the Netherlands is the Gent-Terneuzen Canal, which connects the Westerschelde with the Port of Ghent. This waterway carries approximately 21 million t of international traffic between the Netherlands and Belgium.¹⁰ A total volume of around 32 million t can be assumed for this canal.

The Maas carries around 10.3 million t per annum of cross-border traffic between Belgium and the Netherlands. This yields a total annual cross-border transport volume of almost 80 million t between Belgium and the Netherlands.

Official European statistical sources (Eurostat) indicate very similar volumes. The resultant total cross-border transport volume is around 77 million t: 46 million t are exported by the Netherlands to Belgium by inland waterway, and Belgium exports 30.8 million t to the Netherlands.

⁸ See: Panteia (2016), *Middellange termijn prognoses voor het ladingvolume in de binnenvaart*

⁹ The Zee-Schelde, on the other hand, which links the port of Antwerp with the North Sea, is primarily used for maritime traffic and scarcely at all for inland traffic.

¹⁰ Source: CBS

INTERNATIONAL TRANSPORT MOVEMENTS BETWEEN BELGIUM, FRANCE AND THE NETHERLANDS (1000 T)

Export / Import	France	Belgium	Netherlands	Total
France	-	4 732	4 772	9 504
Belgium	4 307	-	30 860	35 167
Netherlands	4 854	46 268	-	51 122
Total	9 161	51 000	35 632	95 793

Source: Eurostat, CBS

The table gives rise to the following conclusions:

- Far and away the greatest quantities are accounted for by the trade in goods (export/import) between the Netherlands and Belgium. The Netherlands export more goods to Belgium than they receive from their neighbour.
- The trade in goods (export/import) between Belgium and France, and between the Netherlands and France, represent a volume of between 4 and 5 million t per annum respectively
- Total cross-border traffic on the north-south axis is almost 100 million t per annum. The biggest export country is the Netherlands, and the biggest import country is Belgium.

INTERNATIONAL TRAFFIC BETWEEN THE NETHERLANDS AND BELGIUM

The following table illustrates the development in international transport movements between Belgium and the Netherlands as a function of time.

INTERNATIONAL TRANSPORT MOVEMENTS BETWEEN THE NETHERLANDS AND BELGIUM (1000T)

	2007	2008	2009	2010	2011	2012	2013	2014
Exports NL → BE	42 660	43 065	34 779	42 345	44 907	43 038	44 896	46 268
Imports NL ← BE	29 874	30 501	26 625	27 639	31 116	31 162	30 116	30 860
Total	72 534	73 566	61 404	69 984	76 023	74 200	75 012	77 128

Source: Dutch statistical office CBS

The total cross-border traffic between the two countries increased by 6% between 2007 and 2014. At 8.5%, exports grew more strongly than imports (3%). An examination of freight groups permits a more accurate analysis of the figures.

It is evident here that liquid cargoes represent the quantitatively most important freight segment in international traffic between these countries; they exhibit a rising trend. This can be explained by the major importance of the refinery cluster and chemical cluster in the seaports of Antwerp and Rotterdam. Exchanges also take place between the ports.

Stone, soil and other building materials are transported in large quantities. There is however a declining trend here, and it is anticipated that future exports of construction materials from the Netherlands to Belgium will tend to decrease.¹¹

INTERNATIONAL TRAFFIC BETWEEN THE NETHERLANDS AND FRANCE

CBS data were used to investigate cross-border transport movements between France and the Netherlands.¹²

It can be noted that the relationship between exports and imports has shifted throughout this period. Exports from the Netherlands to France within the period being considered have increased, whereas the Netherlands' imports from France have declined somewhat.

As far as goods segments are concerned, it can be observed that:

- primarily agricultural produce and sand, soil & building materials are transported from France bound for the Netherlands.
- petroleum products (with an upward trend), coal and chemical products are transported from the Netherlands to France.

INTERNATIONAL TRAFFIC BETWEEN FRANCE AND BELGIUM

French waterways authority VNF data were used for cross-border transport movements between France and Belgium. The total trade in goods between the two countries was around 8 million t in 2015. Of importance here are French exports of agricultural produce to Belgium, which increased from 1 million t to 1.8 million t in the period 2008-2015.

This produce is harvested in the fertile areas of northern France (Nord-Pas-de-Calais, Picardy, Normandy) then transported by inland vessel to the northern French and Belgian seaports, as well as to customers in the agro and feedstuffs and fodder industry in Belgium and the Netherlands.

¹¹ See: PANTEIA (2016), *Middellange termijn prognoses voor het ladingvolume in de binnenvaart*

¹² It was noted that the CBS data differ from French waterways authority (VNF) data. As regards exports from France to the Netherlands (= Dutch imports from France) VNF data are around 26% higher. This is the average difference for the period 2007-2014. In the case of French imports from the Netherlands, the average difference for the period 2007-2014 is approximately 35%; it does however exhibit a decline within this period and in 2014 was only 17%. In order to retain consistency the data source used was CBS, because the CBS was also used as the source for international transport movements between the Netherlands and Belgium.

In 2015 there was yet another sharp increase (+23%) in exports of agricultural produce originating from the Nord-Pas-de-Calais region bound for Belgium and the Netherlands. Far and away the lion's share of these agricultural exports (80%) is accounted for by cereals. Transport movements of sand, soil & building materials and all steel industry-related products exhibit a declining trend.

■ EAST-WEST AXIS (MITTELLANDKANAL)

The Mittelland Canal is an East-West link in Northern Germany between the Rhine region, the Ruhr region, the Berlin area and the Oder. It is Germany's longest canal at 321 km. Construction of the Mittelland Canal commenced in 1906 and its primary objective was the low-cost transportation of agricultural produce from the agricultural surplus generating regions east of Berlin to the heavily populated west of Germany.

Nowadays its function is more diverse, as is reflected in a more balanced relationship between the flow of goods in each direction. That is to say that in 2015, the volume of goods transported from West to East (11 million t) almost exactly matched that from East to West (11.2 million t).¹³ The goods structure is also no longer limited exclusively to agricultural produce.

Various industrial sectors are to be found the length of the Mittelland Canal, including the steel industry. Coal and ores are transported to the Mittelland Canal region from the Rhine region and from Hamburg. A side canal runs southward from the Mittelland Canal to Salzgitter, the site of an important steelworks.

Important ports on the Mittelland Canal are Minden and Braunschweig, their goods transshipments following a relatively constant trajectory. The transport volume on the Mittelland Canal as a whole is also following a constant trajectory:

TRANSPORT VOLUMES ON THE MITTELLAND CANAL (MILLION T)

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
22,4	23,5	22,0	22,7	22,9	20,0	21,4	22,9	21,9	21,5	22,3	22,2

Source: WSV / destatis

Approximately 5 million t are accounted for by through traffic. An additional 17 million t is regional traffic. This means that these transport movements either terminate at a port on the Mittelland Canal or originate there. The biggest exchanges here are with the Rhine, the Elbe, the Elbe Side Canal and the seaport of Hamburg.

¹³ See the article "Binnenschifffahrt stützt Hamburgs schwache Bilanz" (Inland navigation boosts Hamburg's weak performance) in: Zeitschrift für Binnenschifffahrt (Inland navigation magazine), edition 3/2016

According to Federal Statistical Office information, 79% of all freight transported on the Mittelland Canal in 2015 was carried in motor cargo vessels or pushed cargo barges, whereas 21% was transported in tankers.

Transport movements of agricultural produce have developed very positively in the past ten years. Transportation has more than doubled in this period. Metals as well have posted growth. For sand, soil & building materials and chemical products on the other hand, there has been a declining trend. Container traffic on the Mittelland Canal in 2015 totalled 38,000 TEU.

■ DANUBE

The Danube's share of the total volume of goods carried on European inland waterways in 2015 was less than 10%, and exhibited a downward tendency. In the period 2012 to 2015 approximately 37-38 million tonnes of goods were carried on the Danube, broken down as follows:

- Danube country exports: approx. 19.5 million t;
- imports: approx. 20 million t;
- internal traffic: approx. 11 million t;
- via the Rhine-Main-Danube Canal: approx. 4 million t;
- via the Sulina Canal into the Danube: approx. 3.3 million t;

As regards traffic intensity (traffic density) in passenger and freight navigation, the transport structure of the Danube can be described as follows:

- Upper Danube (German, Austrian, Slovakian, and some Hungarian stretches);
- Middle Danube, (Hungarian, Croatian and Serbian stretches);
- Lower Danube (Serbian, Romanian, Bulgarian, Moldavian and Ukrainian stretches).

DEVELOPMENT 2015

The quantities of cereals and foodstuffs carried downstream increased sharply, whereas the quantity of iron ore carried upstream declined. The upstream and downstream transport of metal products and fertilisers remained stable over a 4-year period. A continuous increase in the downstream transportation of petroleum products is discernible.

An 18% decline in freight transport on the **Upper Danube**, compared with 2014 is evident, primarily as a consequence of the decline in the upstream transportation of iron ore (-30%) and foodstuffs (-10%). The volumes of metal products and fertilisers transported remained stable in the period 2012-2015.

Transport volumes between the river basins via the **Rhine-Main-Danube Canal** also declined, by 14.8% between the Danube and Rhine and by 9.6% via the Danube-Black Sea Canal throughout the period under observation (2012-2015). Crucial in this were the difficult nautical conditions both on the Danube and on the Rhine.

Freight transport on the **Middle Danube** increased by 25% compared with 2014, following a sharp increase in the carriage of cereals (8-fold) in the first half of the year.

Transport volumes on the **Lower Danube** remained at 2014 levels, primarily because of the downstream transportation of large quantities of cereals and other agricultural produce in the first half of the year.

Traffic on the Danube-Black Sea Canal and on the Sulina Canal has a significant influence on the Lower Danube's transport market.

Freight transport on the Danube-Black Sea Canal was 14 million t, of which 5.4 million t as cabotage. In March, April and May, international freight transport exceeded 900,000 t owing to the large volumes of cereals bound for the Black Sea.

Freight transport on the Sulina Canal totalled 3.8 million t (105% of the 2014 transport volume, and more than in previous years), of which by direction of travel:

- Black Sea-Danube: 585,000 t (138% of the 2014 transport volume);
- Danube-Black Sea: 3.2 million t, in line with the 2014 transport volume (3.2 million t). Compared with 2014, monthly traffic volumes in the second half of the year were more even.

TRANSPORT MOVEMENTS BY FREIGHT SEGMENT

Raw materials for production and metalworking industry products

In principle, it is the metalworking businesses in the Danube catchment area that constitute the demand market for the carriage of these goods. Transport on the Danube only partially satisfies these businesses' requirements for the movement of raw materials and finished goods.

Steel demand in 2015 was stable at 2014 levels. At the same time the raw materials market was subject to sharp price fluctuations as a result of global cyclical economic developments; for example, the price of ore with an iron content of 62% fell from 58-60 USD/t (compared with an average of 90 USD/t in 2010).

The bulk of the metalworking companies' products is carried by rail, but a considerable volume (approx. 1.5 million t) converges on ports on the Danube headed for Turkey, via Constanta, bound for ports in North Africa and the Near East, as well as via German, Dutch and Belgian ports.

AGRICULTURAL PRODUCTS

Demand for the carriage of cereals and other agricultural produce (sunflower seeds, rape, soya) has been stable over the past five years.¹⁴ This demand is determined by the requirement for cereals in the markets of the Rhine and Danube catchment areas, as well as by the ever growing demand for cereals in the Mediterranean countries (Greece, North Africa, near East).

The export of large volumes of cereals (most important export countries: Hungary and Serbia) is very obviously seasonally driven (mainly from September to December), but in 2015 the bulk of cereals exports from Hungarian ports bound for Constanta (more than 1.2 million t) occurred in the first half of the year.

LIQUID CARGOES

The greater part of liquid cargoes (petroleum products) carried on the Danube (a total of more than 3 million t) originates from ports located in the vicinity of oil companies with terminals for the transshipment of petroleum products: Vienna, Bratislava and Pancevo.

Most (a total of more than 1.3 million t) of the chemical industry's products (fertilisers, raw materials for plastics production) are concentrated in the ports of Linz and Enns (Austria), Bratislava (Slovakia), and Ismail and Reni (Ukraine).

¹⁴ USDA Foreign Agricultural Service.







03

DEVELOPMENT
IN FREIGHT RATES

DEVELOPMENT IN FREIGHT RATES

■ DRY GOODS SHIPPING

Transport prices for international Rhine traffic and in Germany were relatively low in the first half of this year and exhibited little upward movement.¹⁵ According to market participants, when concluding new contracts the agreed freight rates increased only moderately in most cases.¹⁶

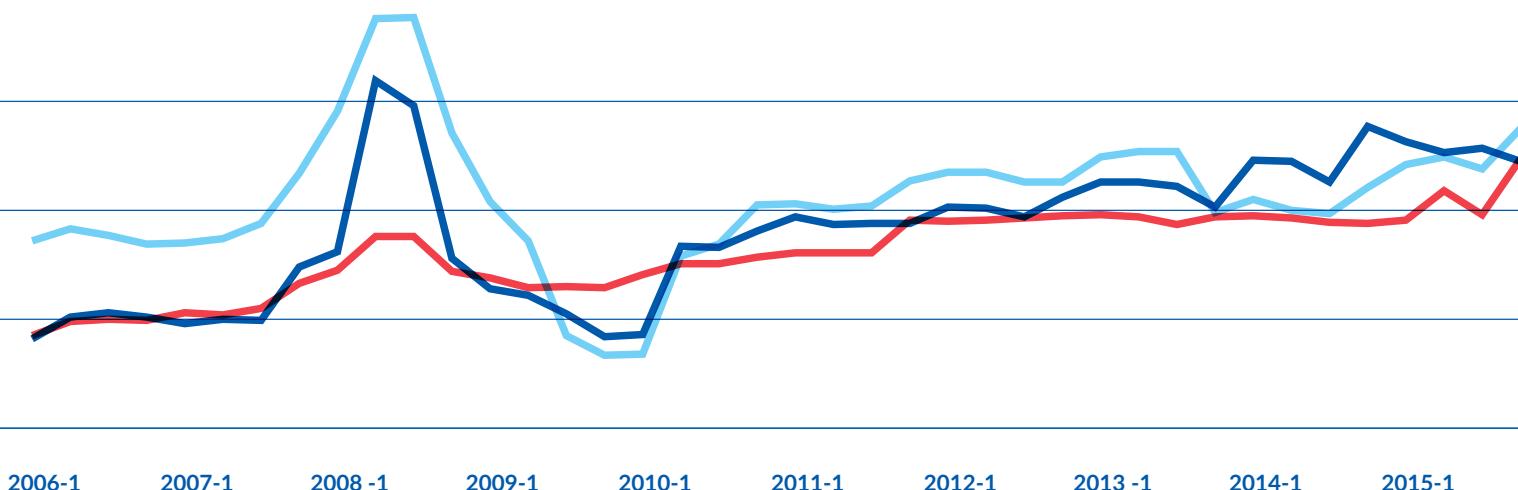
The second half of the year saw spot freight rates increase significantly as a result of the low water. In the case of contract freight rates, contractually agreed low water supplements had to be paid.

As was evident in the first half of 2015, competition in the Rhine region remains keen, which is a powerful brake on price development – even when volumes are growing. Only the low water phase in the second half of this year finally resulted in appreciable price increases.

Inland navigation surveys in France also revealed an increase in the second half of the year. What can be seen here for agricultural produce is that even in a multi-year comparison there has been growth, whereas for sand, soil & building materials this increase occurred only as a result of low water. This is also consistent with the trends in the transport of goods, as agricultural products exhibit a more favourable development than sand, soil & building materials.

TRANSPORT PRICE INDEX IN FRENCH FREIGHT NAVIGATION (2010 = 100)

Source: Ministère de l'Écologie, du Développement durable et de l'Énergie



The following observations can be made as regards navigation of the Danube: as the Danube fleet provides sufficient capacity for bulk goods (lighters), the carriage of iron ore is characterised by contracts with stable freight rates, with the possibility of special supplements in the event of a steep hike in bunker fuel prices and in rare cases in the event of reduced fairway depths.

The freight index for transport movements fell in 2015, with the 2012 weighted average freight rate for the carriage of bulk goods to and from the ports of the Middle Danube being taken as 100%.

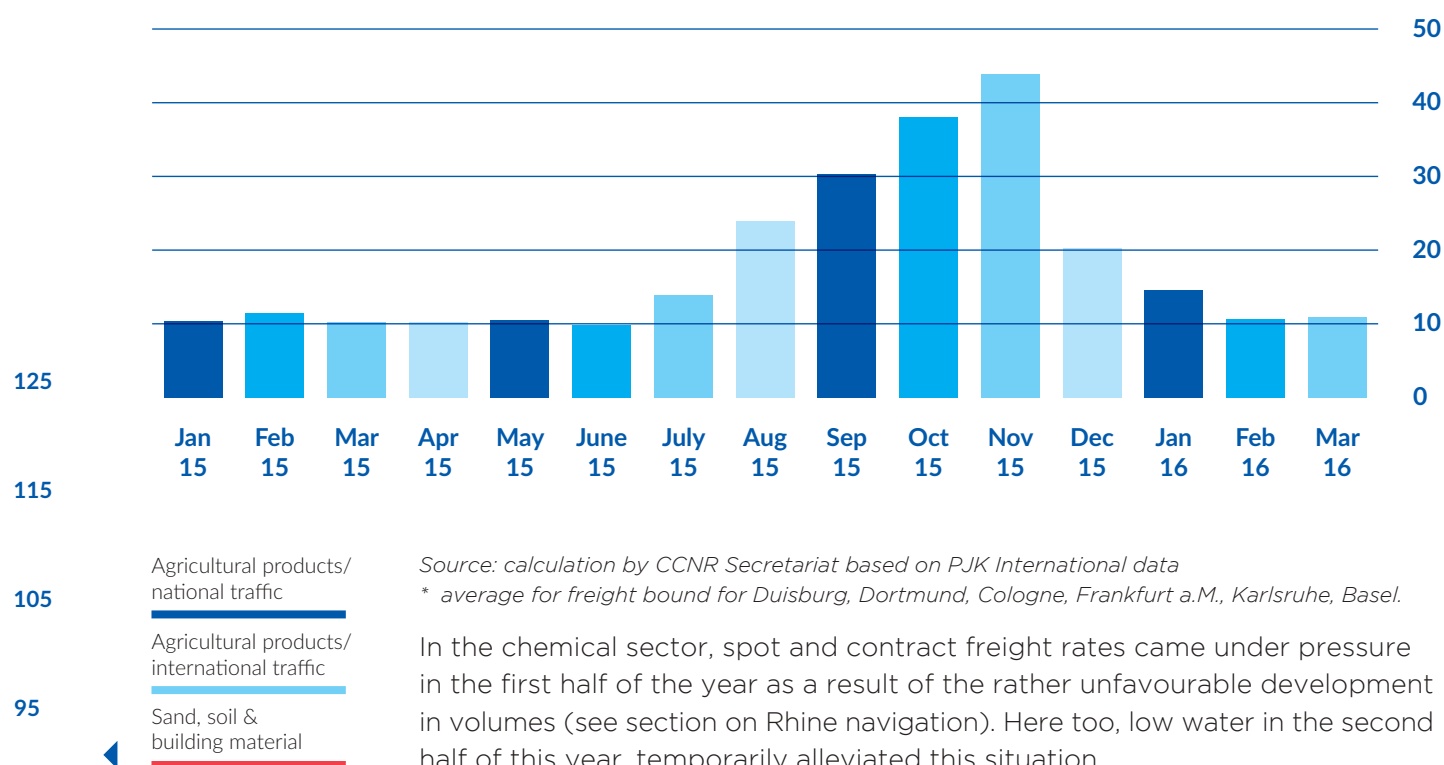
TANKER SHIPPING

Overall, the development in transport prices correlated more closely with the development in water levels than with the development in volumes. Moreover, a different development is discernible between the chemical and petroleum sectors.

Although appreciable quantitative growth in petroleum products was already evident in the first half of the year, this had only a very limited positive effect on spot freight rates. There was no increase in basic freight rates when concluding new contracts with a term of between 1 and 2 years.

The second half of the year was characterised by a marked rise in spot rates as a result of the low water. This rise then continued until November, when water levels reached their minimum. From that point on, rates once again declined steeply. In the first few months of 2016, freight rates were broadly the same level as the year before.

AVERAGE FREIGHT RATES FOR GAS OIL TRANSPORTED BY TANKER FROM ROTTERDAM*
(€/METRIC TON)



Source: calculation by CCNR Secretariat based on PJK International data
* average for freight bound for Duisburg, Dortmund, Cologne, Frankfurt a.M., Karlsruhe, Basel.

In the chemical sector, spot and contract freight rates came under pressure in the first half of the year as a result of the rather unfavourable development in volumes (see section on Rhine navigation). Here too, low water in the second half of this year, temporarily alleviated this situation.

¹⁵ See "Schuttevaer" magazine, various issues in 2015
¹⁶ See: Federal Office for Freight Transport (2015), Market observation for freight transport, autumn 2015 report





04

OPERATING
CONDITIONS

OPERATING CONDITIONS

125

115

TURNOVER DEVELOPMENT

In 2015 both Dutch and German freight transport turnover rose 4% year-on-year.¹⁷ This positive turnover development is primarily attributable to the low water levels in the second half of the year. These drove a rise in freight rates, and turnover with it.

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TURNOVER DEVELOPMENT IN DUTCH INLAND NAVIGATION (IN% YEAR-ON-YEAR)

95

Period	Q1/2013	Q2/2013	Q3/2013	Q4/2013	Q1/2014	Q2/2014	Q3/2014
Rate of change (%)	-4,7	-0,7	+2,0	+2,2	+4,6	+2,8	-0,9

Period	Q4/2014	Q1/2015	Q2/2015	Q3/2015	Q4/2015
Rate of change (%)	-1,2	-2,6	-0,1	+10,0	+8,0

85

Source: CBS

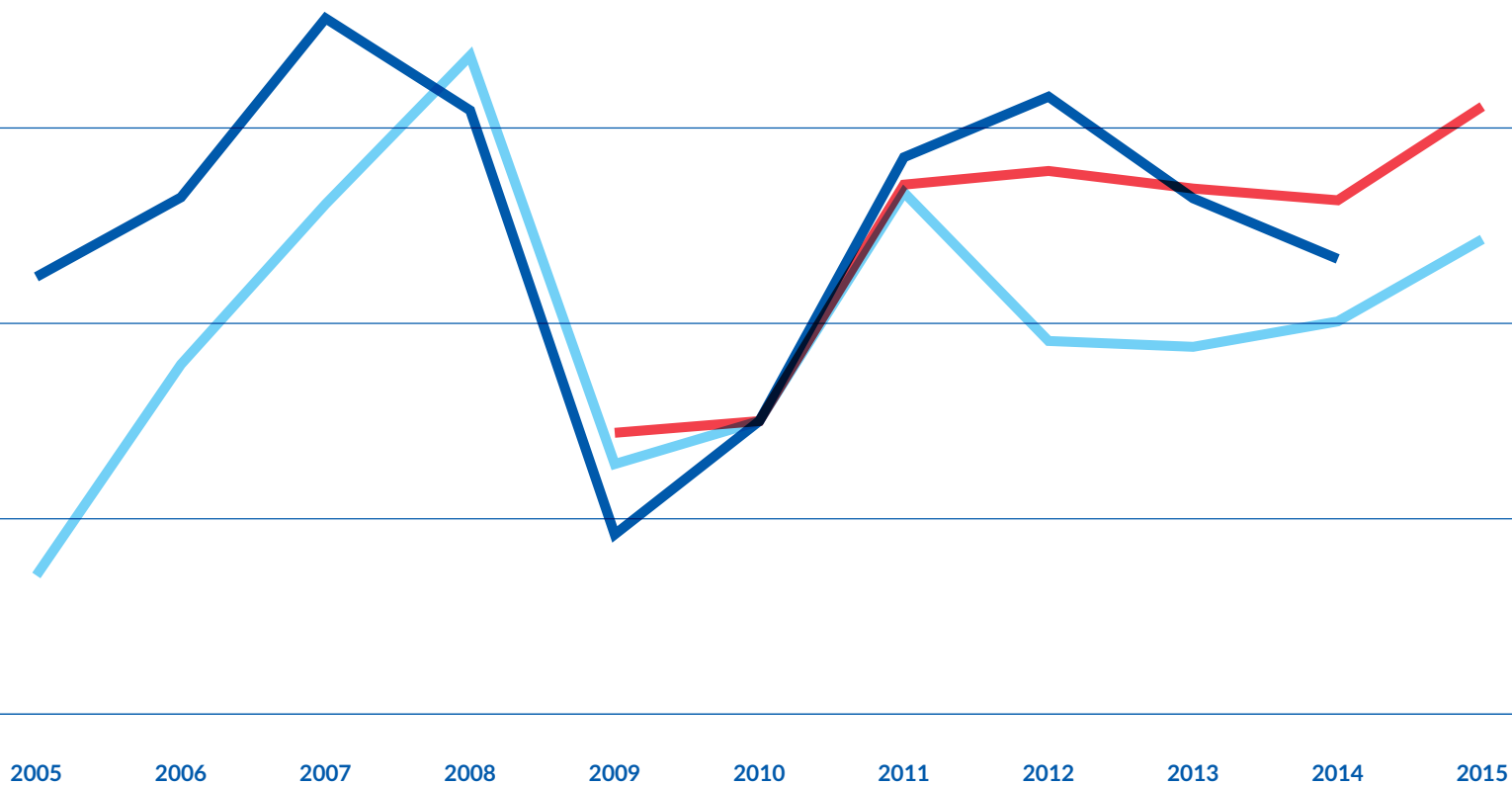
What is also interesting is a comparison between annual turnover development for multiple countries. Data are available for the Netherlands, Germany and France. The data were prepared as an index. This shows the development over time for each country but the index values shed no light on the differences in turnover levels between these countries.

¹⁷ Source: CBS / destatis



ANNUAL TURNOVER DEVELOPMENT IN THE GERMAN, FRENCH AND DUTCH INLAND NAVIGATION SECTOR (INDEX 2010 = 100)

France
Netherlands
Germany



Source: Centraal Bureau voor de Statistiek (CBS); destatis; INSEE and CCNR calculations

A comparison of turnover development for different modes of transport shows that in 2015 rail and road in the Netherlands had regained a higher level of turnover than in 2008. This was not the case for the shipping sectors (inland navigation, maritime and coastal navigation).

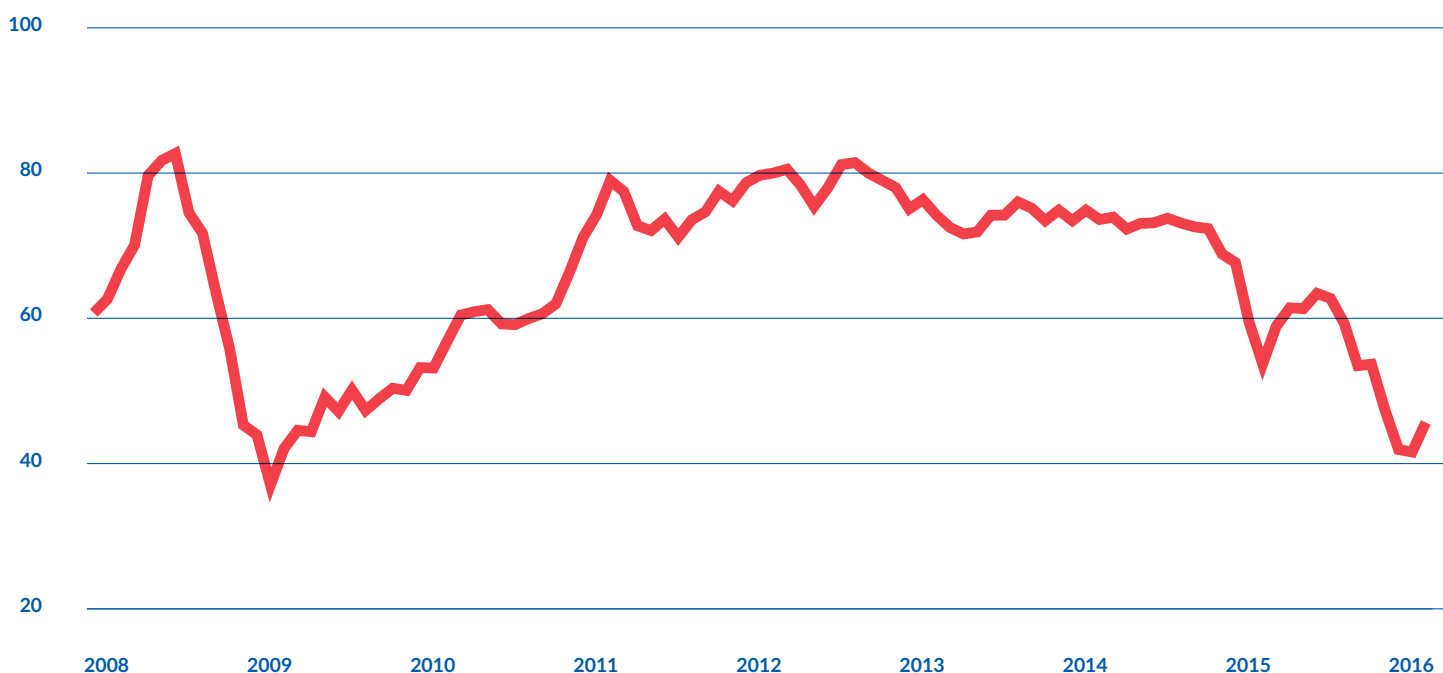
COST DEVELOPMENT

FUEL COSTS

The CBRB fuel circular is to be used in evaluating the fuel cost level. Based on market prices provided by the major oil producers, the CBRB (Central Bureau for Rhine and Inland Navigation) uses a formula that continuously calculates an average fuel price. This is increasingly being applied, outside the Netherlands as well, as a yardstick for the gas oil supplement in transport contracts. A business's actual fuel costs then inherently vary depending on the different operating areas, type of business (continuous journey or operating mode B / A1 journey up to 14 hours / A2 journey up to 18 hours),¹⁸ the vessels' load factor, and other operational and technical factors. According to the CBRB, average fuel prices in 2015 were 20% lower than they were in 2014.

¹⁸ Refer to: CCNR (2015), Regulations for Rhine navigation personnel, as at 1 December, 2015

DEVELOPMENT IN GAS OIL PRICES*



Source: CBRB* in Euro per 100 litres, excluding value added tax and CDNI fee.

In 2015 the average price of bunker fuel in the Danube ports fell by between 36-38% compared with 2014, a critical factor in the level of freight rates for transport movements as fuel costs there account for between 45% and 60% of a vessel's total running costs.

STAFF COSTS

According to information provided by the German and Dutch associations (BDB and CBRB), the first half of 2015 saw only moderate increases in wages and salaries. In Germany pay in the freight and passenger navigation sector increased by 1.1% as at 1 July 2015. The year before there was an increase of 2.3% as at 1 July. According to the CBRB wage scales, wages and salaries in the Netherlands as at 1st July 2015 had increased by an average of 0.5% (compared with the year before).

According to surveys conducted by Germany's Federal Office for Freight Transport,¹⁹ the minimum wage of €8.50 / hour introduced in Germany on 1st January 2015 had no appreciable effect on actual wage levels. The reason for this is that wages for German inland navigation employees, whether they are covered by a collective wage agreement or not, exceed the statutory minimum wage.

¹⁹ See: Federal Office for Freight Transport (2015), Market observation for freight transport, autumn 2015 report

CAPITAL COSTS

As the cost of buying new vessels is slightly down, and because the interest rate is persistently low, new vessel financing costs are typically lower than before the economic crisis. Admittedly, higher equity ratios than before the crisis are a prerequisite for loan finance. For example, German banks actively involved in ship finance are looking for a target equity ratio of around 25 - 30%.²⁰

There is a favourable environment for financing new construction primarily for tankers up to a length of 110 metres for canal use. This segment of the fleet was able to generate a positive revenue situation in the second half of 2015, thanks to a favourable development in freight rates.²¹ With the declining demand for loans in the tanker segment, the focus is shifting back to the dry goods shipping sector. All in all, the non-quantitative capital costs, such as a logical and resilient cargo concept, adequate sureties (first-class ship mortgage) and adequate professional experience remain important prerequisites for a new building loan.

INSURANCE COSTS

Insurance premiums are relatively constant owing to fierce competition between the insurance companies. Furthermore, the falling accident rate in inland navigation also provides no arguments for increasing premiums.

MAINTENANCE AND REPAIR COSTS

The prices of primary relevance here are steel and energy prices. Steel prices in Western Europe declined throughout 2015, persisting to the beginning of 2016. From January 2016 onward, however, iron ore prices, and, thus also steel prices, resumed their rise.²² In 2015 therefore, a minor reduction is to be observed, whereas an increase is to be anticipated for 2016.

CONCLUSION: OPERATING CONDITIONS

Freight transport turnover in 2015 increased by 4% in the Netherlands and Germany. Cost developments both in 2015 and in 2016 were on a downward trajectory, primarily as a result of lower fuel costs. Maintenance and repair costs were also lower. Consequently, overall operating conditions in 2015 slightly improved. A similar development is to be expected for 2016.

²⁰ See: *European inland navigation forum in Cologne, 25.9.2014. Talks by UniCredit Leasing GmbH and the Ostfriesische Volksbank.*

²¹ See: Article "Ostfriesische Volksbank wächst in der Krise" (Ostfriesische Volksbank growing in the crisis); in: *Die Binnenschifffahrt, (Inland Navigation) edition 1/2016*

²² See: <http://www.stahlpreise.eu/>





05

WATER
CONDITIONS

WATER CONDITIONS

The second half of 2015 was characterised by a very pronounced and persistent low-water phase. This caused navigation restrictions, and in particular a decline in vessels' load factor and a reduction in transport, especially for dry bulk goods. More vessels had to be employed, which is evident from the increasing number of ships in many harbours.

For the Rhine this yields the following average maximum load factors per quarter in 2015 for Kaub (middle Rhine), Maxau (upper Rhine) and Ruhrort (lower Rhine).

AVERAGE LOAD FACTOR FOR VESSELS OF DIFFERENT DRAUGHTS AT LOCATIONS ON THE RHINE (IN %)

Kaub	2,5 m	3,0 m	3,5 m	4,0 m	Maxau	2,5 m	3,0 m	3,5 m	4,0 m
Q1	100	99	90	83	Q1	100	97	89	78
Q2	100	100	97	89	Q2	100	100	100	95
Q3	81	68	58	51	Q3	91	79	67	59
Q4	76	63	54	47	Q4	81	68	58	51

Ruhrort	2,5 m	3,0 m	3,5 m	4,0 m
Q1	100	100	100	100
Q2	100	100	100	100
Q3	100	91	79	69
Q4	98	89	81	73

Source: CCNR calculation based on Federal German Waterways and Shipping Administration (WSV) data, provided by the Federal Institute for Hydrology (BfG)

The low water was not of course restricted to the Rhine. The same phenomenon was to be observed on the Moselle, Danube and Elbe. For the Moselle the benchmark is the level at Koblenz. If the water level of the Rhine at Koblenz is less than the 1.30 metre mark (this means a possible vessel draught of approximately 3 metres) the Moselle can no longer be operated economically. This restriction applied on a total of 135 days, namely one third of the year.²³

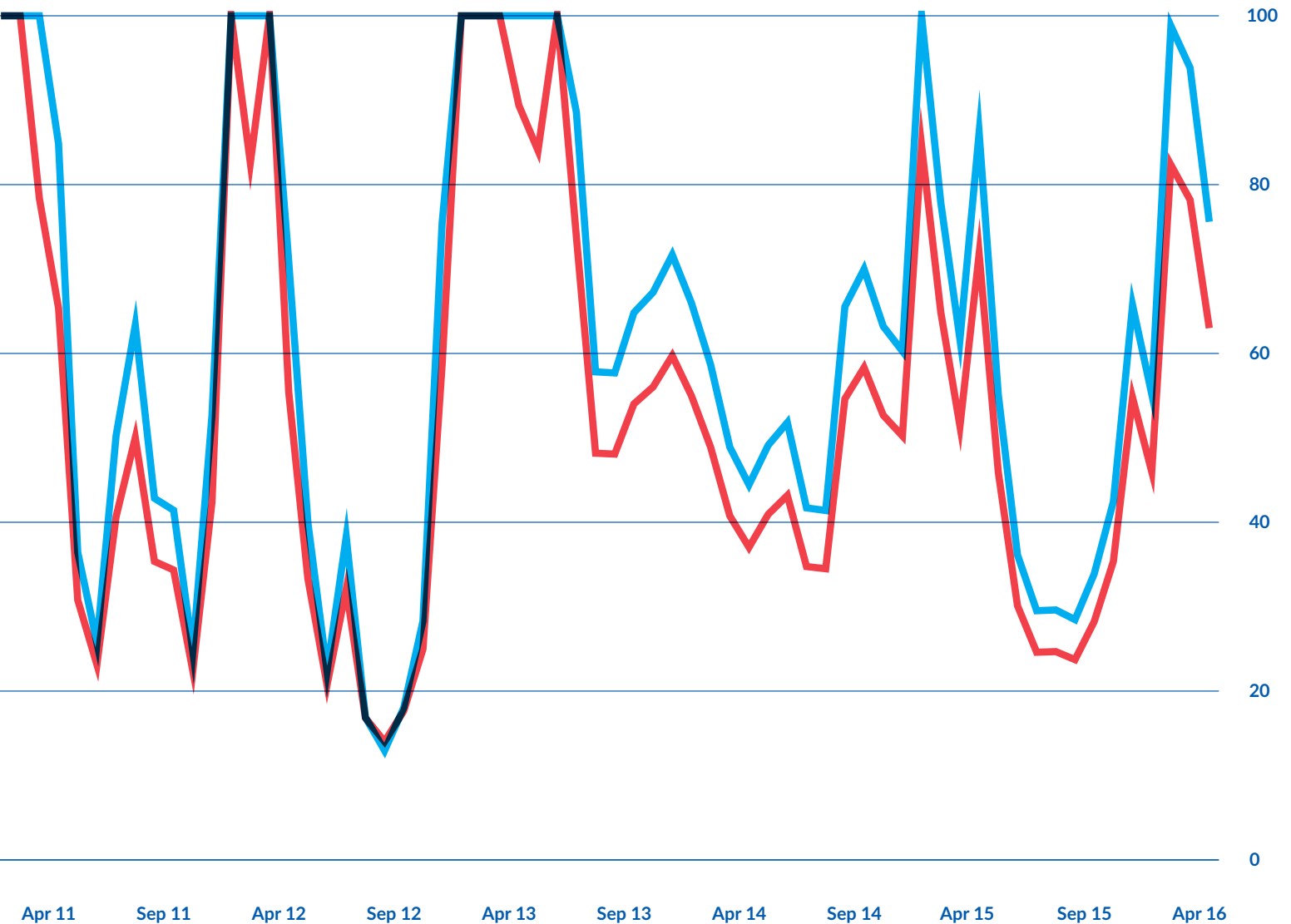
²³ Source: Moselle Commission, Market Observation 2016.

Compared with the Rhine, the Elbe and Danube are characterised in any event by somewhat more difficult water level conditions. The low water in 2015 occasionally posed major challenges for the shipping industry on both rivers.

The lowest water level on the Elbe for over 50 years was measured in Magdeburg. Freight transport on the Elbe had to be temporarily suspended. Passenger transport was also affected. For example, a cruise vessel ran aground at Lutherstadt Wittenberg and some American passengers cancelled their trip.

MAXIMUM POSSIBLE LOAD FACTOR AT MAGDEBURG AN DER ELBE FOR VESSELS OF DIFFERENT DRAUGHTS (2.5 M – 3 M) IN %

2.5 Meter
3 Meter



Source: CCNR calculation based on Federal German Waterways and Shipping Administration (WSV) data, provided by the Federal Institute for Hydrology (BfG)

All in all, nautical conditions on the Danube in the first half of 2015 were favourable to navigation. The deterioration in the nautical situation, primarily as a result of the premature transition to the summer low water phase in the first 10 days of July, resulted in a reduction in loaded draughts on the Middle Danube and, on individual stretches of the Danube, in an increase in the required number of lightering operations (and associated time loss).

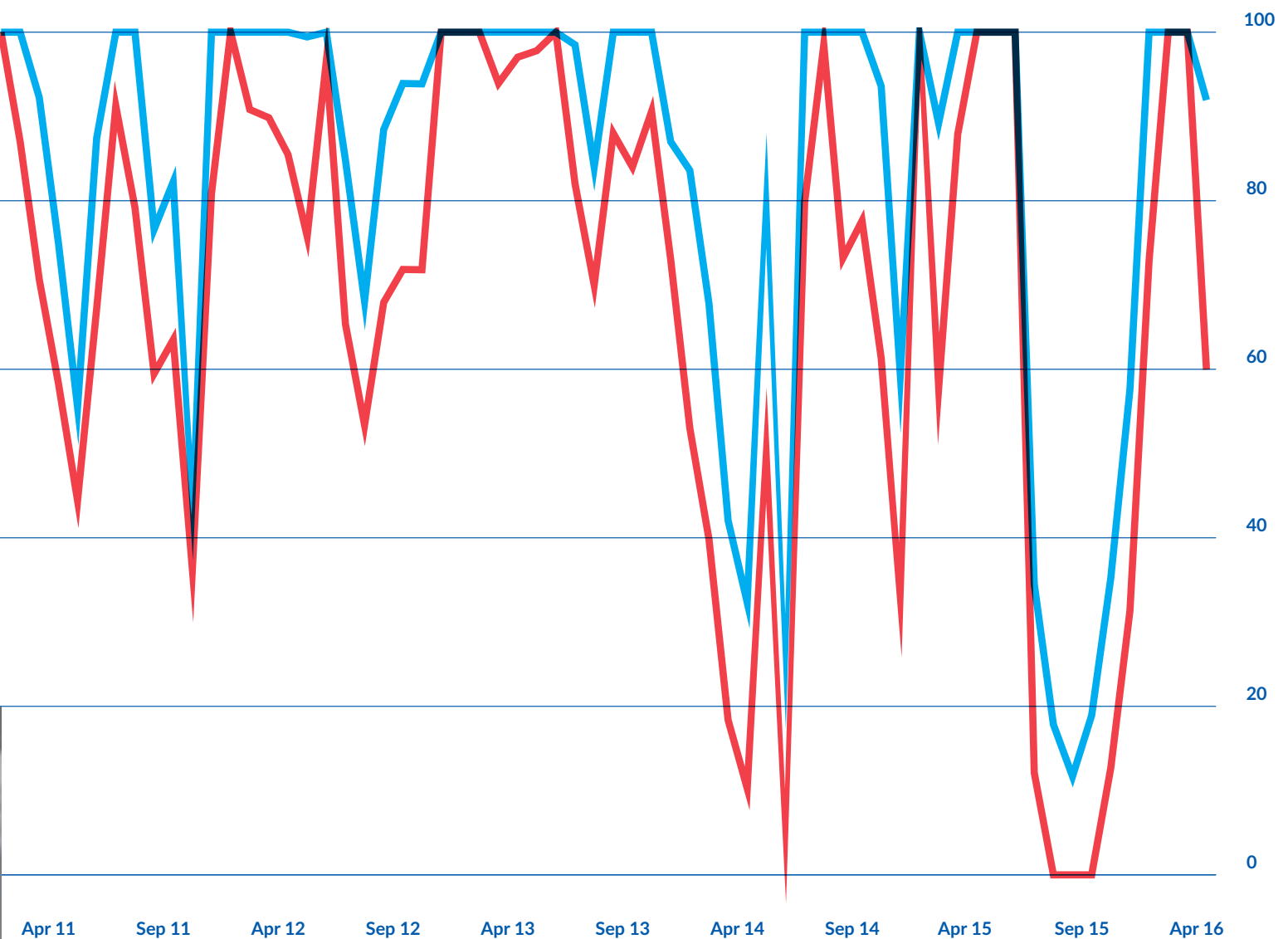
In the second half of 2015, the absence of steady and adequate rainfall in the Danube basin resulted in a reduction of vessel capacity utilisation of between 35 - 40% compared with the first half of the year, in the need to unload vessels in order to transload critical stretches of river and also in a temporary halt to navigation.

Analysis of the water level data for Hofkirchen on the Danube, north of Passau, clearly highlights the low water phases for 2014 and 2015. The low water in August was so extreme that a freighter carrying a cargo of steel ran aground at Niederaltreich.²⁴ Navigation between Regensburg and Passau had to be suspended for several days. Numerous vessels were therefore unloaded in these cities' harbours, with the freight being transferred to HGVs and rail.

Apart from the halt to navigation caused by the stranded freighter, the analysis of the water level data for August basically shows that loading vessels during this time was all but impossible. As for other rivers, such as the Rhine and Elbe, water levels again rose markedly towards the end of 2015, easing the navigation situation.



MAXIMUM POSSIBLE LOAD FACTOR AT HOFKIRCHEN ON THE DANUBE FOR VESSELS OF DIFFERENT DRAUGHTS (2.5 M – 3 M) IN %



Source: CCNR calculation based on Federal German Waterways and Shipping Administration (WSV) data, provided by the Federal Institute for Hydrology (BfG)

2.5 Meter
3 Meter

²⁴ See: press release by the Regensburg water and navigation authority on 12.8.2015.





06

DEVELOPMENT
OF FREIGHT
CAPACITY OFFERING

DEVELOPMENT OF FREIGHT CAPACITY OFFERING

Currently in Europe there are 11.5 thousand units in the dry goods shipping sector (motor cargo vessels, lighters). Around two thirds of these units are registered in countries within the Rhine region (Belgium, Germany, France, Luxembourg, Netherlands, Switzerland).

In the tanker shipping sector, encompassing approximately 2 thousand units in Europe, there is an even greater focus on the Rhine region. For example, 86% of all tankers are registered in the western part of Europe.

Pushed barges and tug navigation on the other hand are especially strongly represented in the Danube countries as well as Poland. As such, the Danube countries and the third group of countries (Poland, Great Britain, the Czech Republic, Italy) account for an appreciable proportion of Europe's total of tugs and pusher vessels, which is around 2.6 thousand.

FLEET SHARES OF THE RHINE COUNTRIES, THE DANUBE COUNTRIES AND OTHER COUNTRIES IN EUROPE (IN%, BASED ON THE NUMBER OF VESSELS)

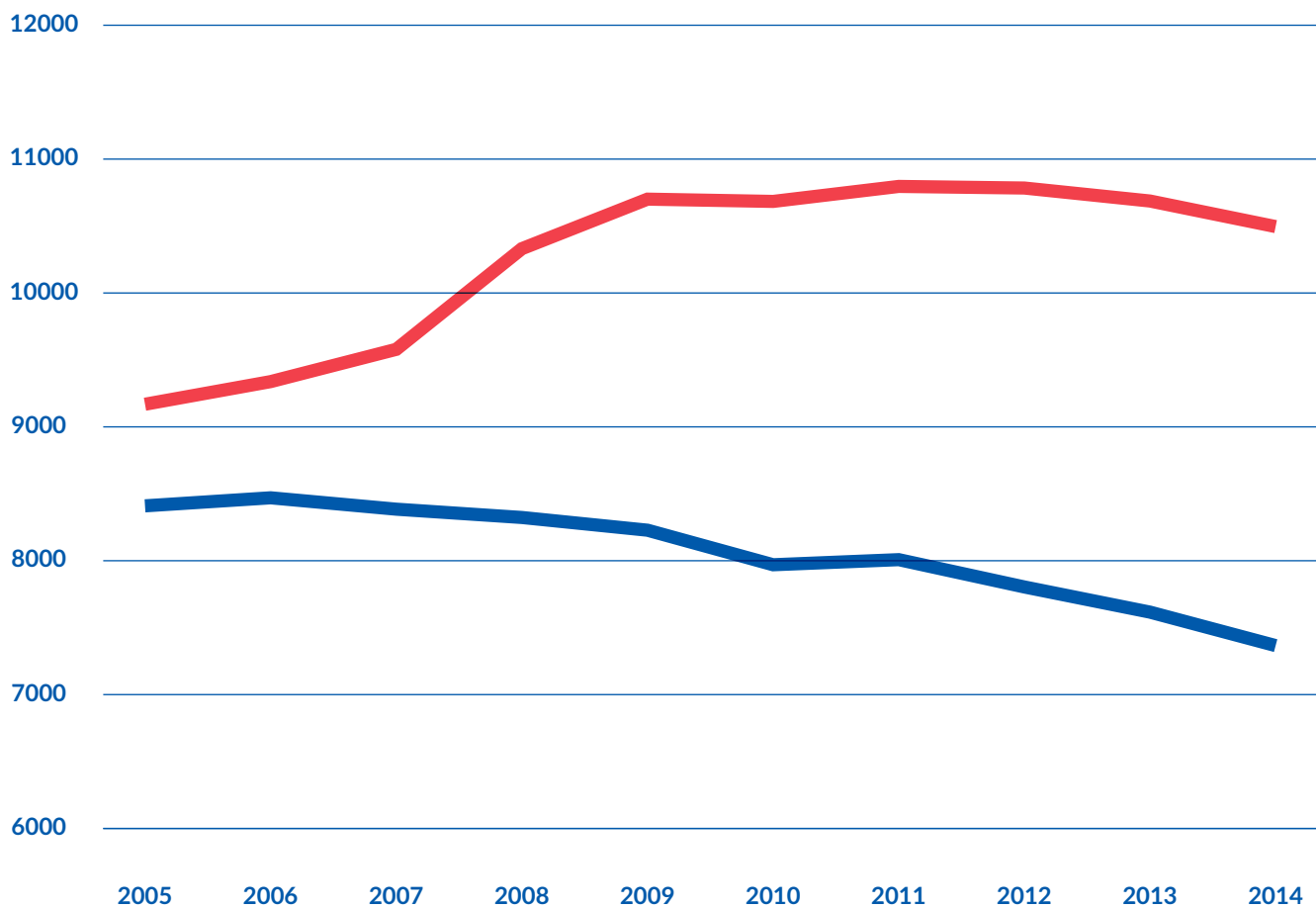
	Dry shipping	Tanker shipping	Pusher vessels and tugboats
Rhine countries	64	86	58
Danube countries	25	14	26
Third group of countries	11	0	16
Total Europe	100	100	100

Source: CCNR based on national authorities

DRY GOODS SHIPPING

The number of vessels units in Western Europe (motor cargo vessels, lighters) declined by around 12% between 2005 and 2014 while tonnage increased by 14%. This can be explained primarily by the elimination of smaller vessels by scrapping or selling abroad, and by the construction of new units with a greater cargo volume, which primarily occurred before 2009.

DRY GOODS FLEET IN WESTERN EUROPE*



Tonnage (1,000t)
Number of ships

Source: CCNR based on national authorities.*Netherlands, Germany, Belgium, France, Luxembourg, Switzerland. Motor cargo vessels and lighters were counted.

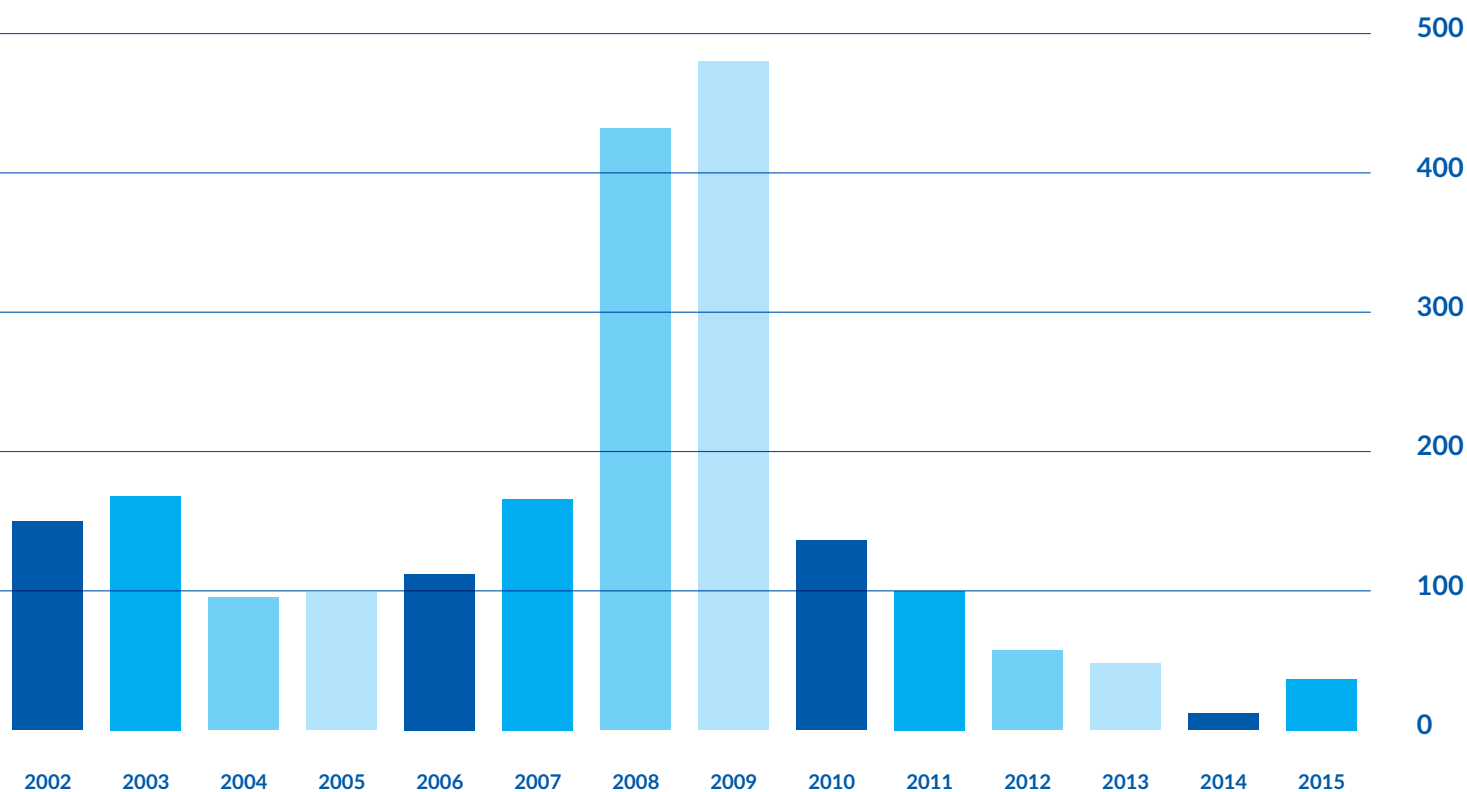
In the Western European dry goods shipping sector almost half (49%) of the vessel inventory is accounted for by Dutch vessels on a numerical basis and more than half (56%) of the tonnage. These proportions have increased slightly since 2005.

In the Netherlands however a decline in the number of vessels has been observed since 2012. This has also slightly reduced total West European tonnage accordingly. The number of bankruptcies increased in 2012 and ships were scrapped or sold abroad.

In 2015 the new construction rate in Western Europe increased slightly compared with 2014, to around 37 thousand tonnes. However, the total tonnage added to the market in 2013, 2014-2015 represented scarcely 1% of the current fleet capacity of around 10.5 million t.

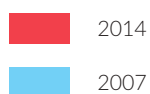
The increase of 37 thousand tonnes compares with scrappings of 60 thousand tonnes (65 vessels). A number of lighters and older freighters were sold to the Danube region. The downward trend in the size of the fleet therefore continued in 2015.

NEW CONSTRUCTION RATE IN THE DRY GOODS SHIPPING SECTOR IN WESTERN EUROPE (IN 1,000 T)



Source: IVR

Almost half of the fleet in 2014 was accounted for by vessels with a cargo volume not exceeding 1000 t. As recently as 2007 this proportion was still 55%.



SHARES OF INDIVIDUAL TONNAGE CLASSES IN THE DRY GOODS FLEET IN WESTERN EUROPE (IN%)

Source: CCNR calculation

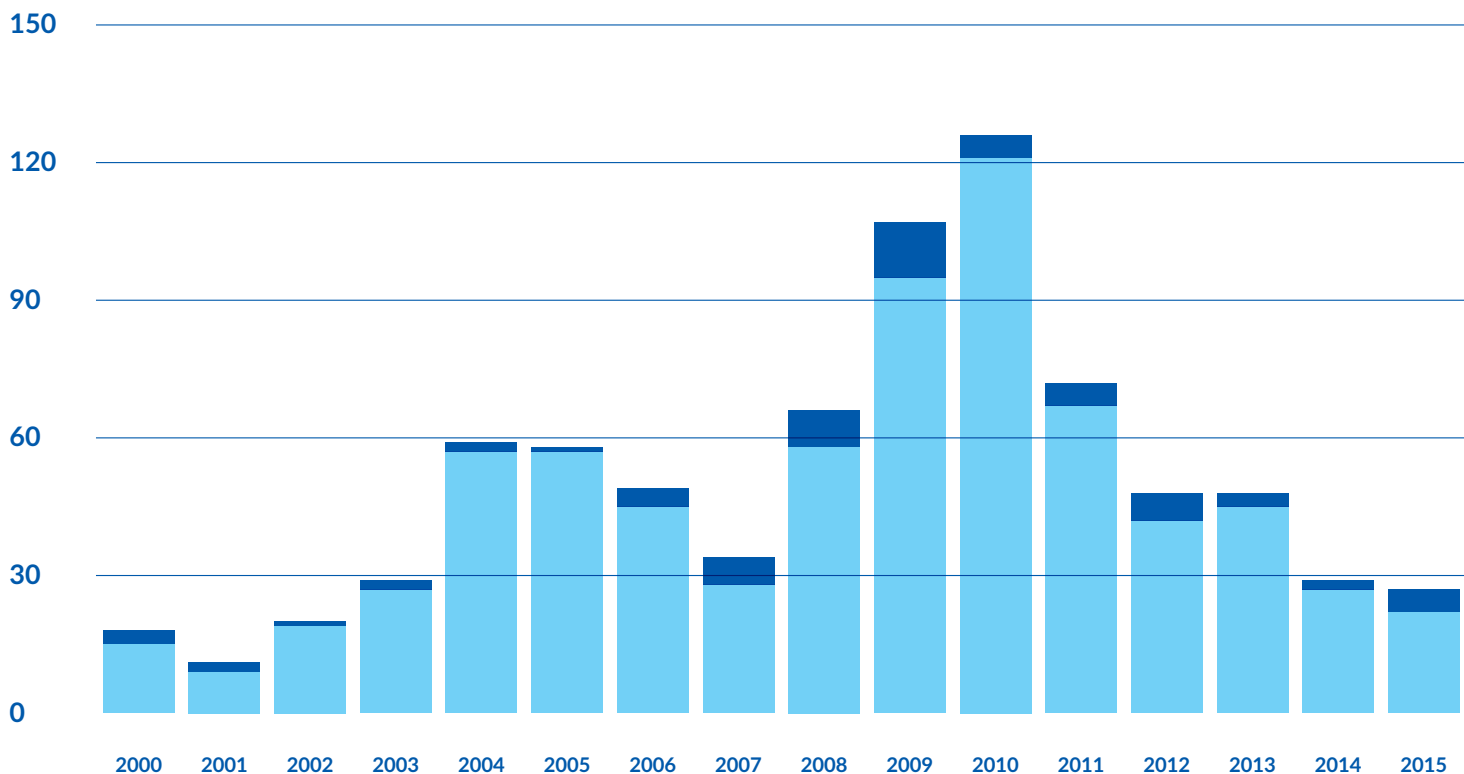


Recently, individual banks signalled a certain “comeback” of investment in small dry goods vessels (of a length up to 86 metres and the tonnage of up to 1200 t).²⁵ These projects are supposed to finance both new construction as well as second-hand tonnage – in the latter case to save them from scrapping.

TANKER SHIPPING

Whereas the number of vessels has been falling slightly since 2010, cargo hold capacity as a whole has remained constant. This trend continued in 2015. According to the European Barge Inspection Scheme (EBIS) 27 new double hull ships entered the market in 2015.²⁶ At the same time, 21 single hull ships were scrapped and 8 exported (Africa, Eastern Europe). Departures totalled 29 tankers with a total cargo hold capacity of 46,500 t (year before: 65,000 t).²⁷ This therefore leaves a small net growth in total cargo hold capacity.

NUMBER OF NEW VESSELS ENTERING THE TANKER NAVIGATION MARKET IN WESTERN EUROPE



Double hull
Conversion of single to double hull

Source: EBIS

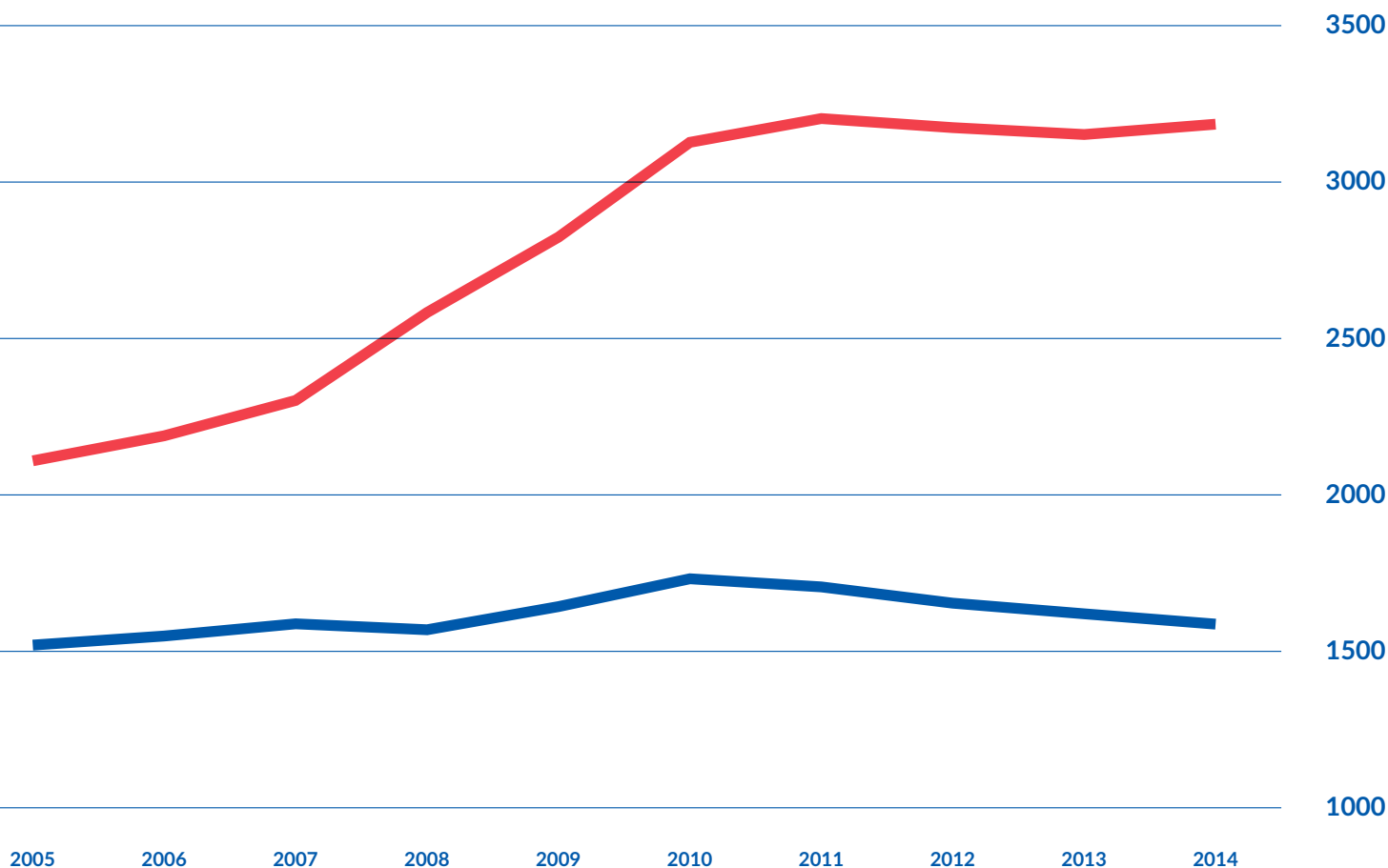
This therefore continues the existing horizontal tonnage trend. The total West European tanker navigation fleet currently comprises around 1500 units.

²⁵ See: Article “Ostfriesische Volksbank wächst in der Krise” (Ostfriesische Volksbank growing in the crisis); in: Die Binnenschifffahrt, (Inland Navigation) edition 1/2016

²⁶ EBIS currently inspects 1,244 tankers with a total tonnage of 3.1 million t.

²⁷ Source: Article “Übersicht der Binnenschiffs-Neubauten 2015” (“Overview of new inland vessel construction”), in: Schifffahrt, Hafen, Bahn und Technik (“Shipping, Harbours, Rail and Technology”) magazine, March 2016.

TANKER FLEET IN WESTERN EUROPE*



Tonnage (1,000t)

Number of ships

Source: CCNR based on national authorities.

* Netherlands, Germany, Belgium, France, Luxembourg, Switzerland

Between the end of 2016 and mid-2018, around 15 liquid natural gas (LNG) propelled tankers will come onto the European market, where they will operate in the ARA area and on the Rhine. This investment by a major petroleum company is pursuing a number of objectives. It creates major opportunities to build a critical mass of demand for LNG as a fuel, which in turn promotes the development of an LNG infrastructure in Western Europe.²⁸

The investments should therefore somewhat increase new construction rates in 2016, 2017 and 2018. However, given the comparatively small number of the ships, it cannot be said that there is any negative effect on the relationship between supply and demand and the level of freight rates. Instead, this investment is to be seen as the beginning of the propagation of a new technological paradigm that goes hand in glove with both economic (lower fuel costs) and environmental (lower emissions) benefits, and is thus very beneficial for the future attractiveness and competitiveness of European inland navigation.

²⁸It is anticipated that these LNG-propelled tankers will operate from the LNG break bulk terminal at the Gate terminal in Rotterdam. This terminal is an important building block in the LNG infrastructure in Europe. The petroleum company will therefore be this terminal's first major customer.

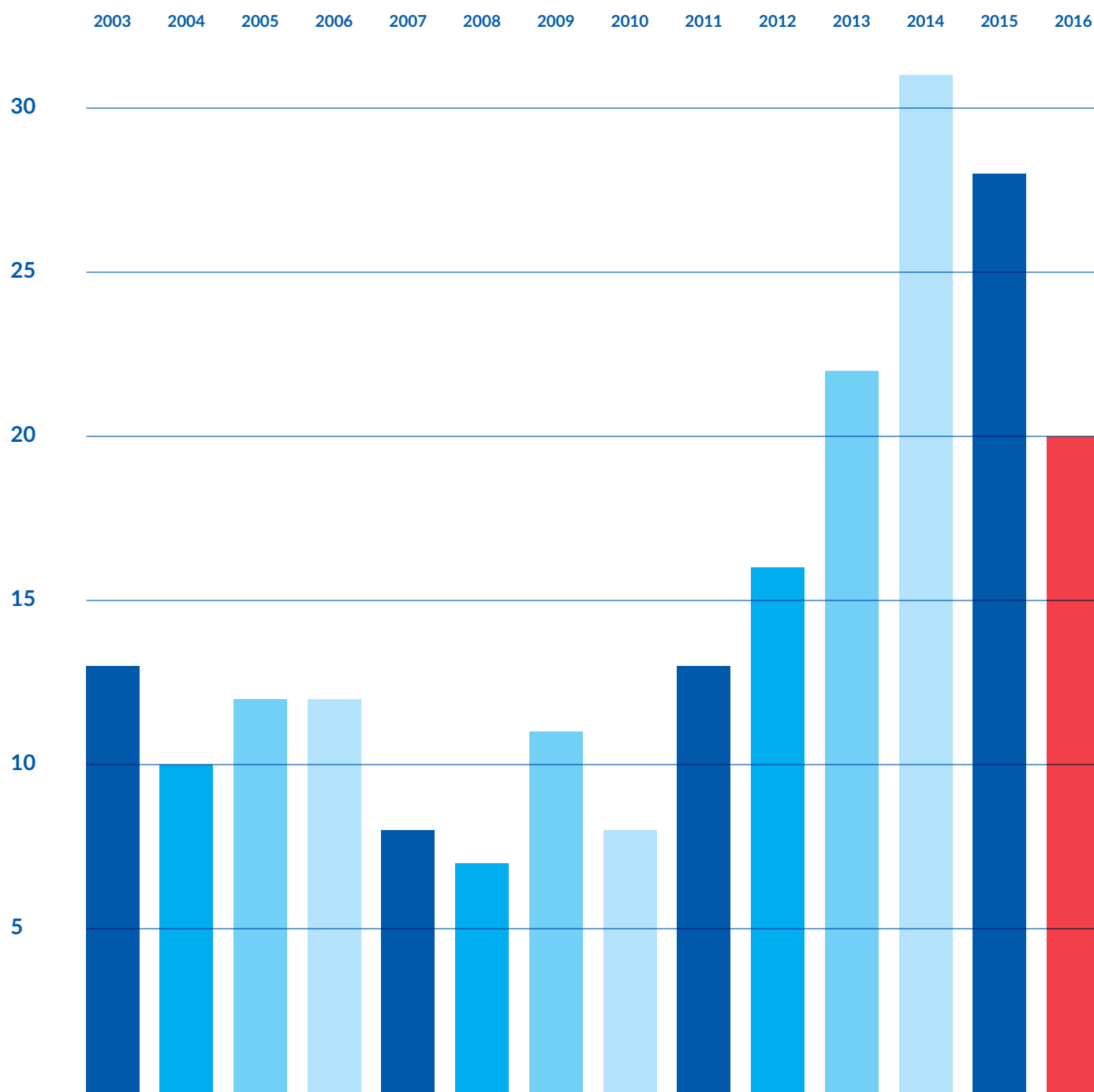
PASSENGER NAVIGATION

There are around 340 cruise ships in active operation on Europe's rivers in 2016, or 20 more than in 2015. Bed capacity has increased from 46,661 (2015) to 49,812 (2016), an increase of 7%. The increase in bed capacity has thus been somewhat greater than in the number of ships.

New building activity has dipped slightly in 2016 compared with the previous two years. The order books also point to a slowdown for 2017. The reason is to be seen in a halt on new construction by American tour operators who are responsible for more than half of new construction activity.

NUMBER OF NEW RIVER CRUISE SHIPS ENTERING THE EUROPEAN MARKET

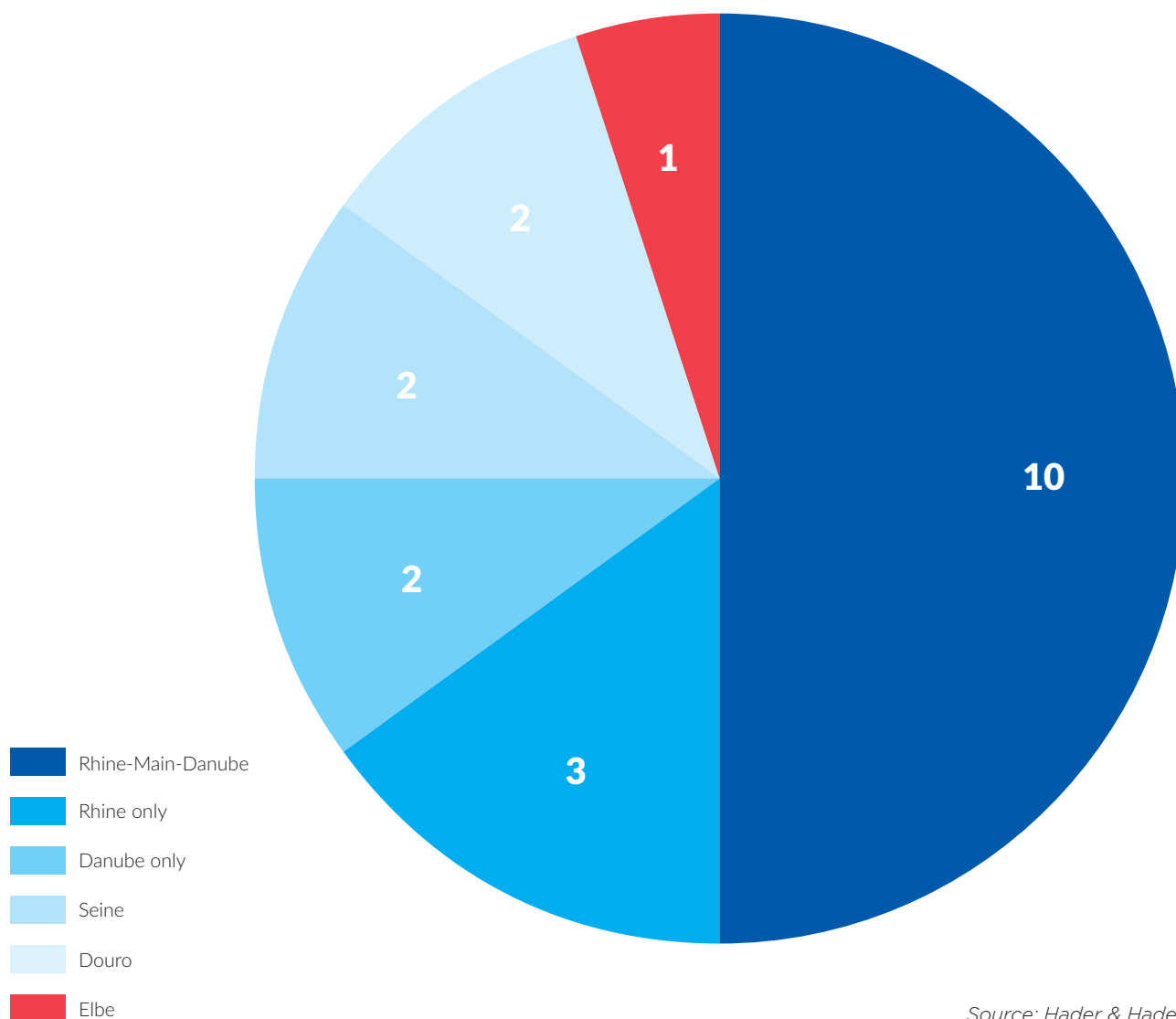
Source: Hader & Hader, IVR



The new ships' capacity is between 80 and 190 beds. The 80-bed ship is intended to operate on the Elbe and Modau, between Berlin, Dresden and Prague, and is propelled by paddle wheel. This enables it to cope with the relatively difficult water level conditions on both rivers throughout the entire year. The next new ships (96 and 106 beds respectively) are designed for the Douro in Portugal. The ships with the most beds (190 beds) operate on the Rhine, Main, Danube and on the Seine.

Approximately 3/4 of all active river cruise ships in Europe are earmarked for the Rhine and Danube and are able, because of their dimensions, to switch between these river areas. The remaining quarter of the fleet can be found on the French rivers of the Seine, Rhone, Loire and on the Douro in Portugal, or exclusively on the Danube.

OPERATING AREAS OF NEW RIVER CRUISE SHIPS ENTERING THE EUROPEAN MARKET IN 2016



Source: Hader & Hader

3/4

of all **river cruise vessels** active in Europe
are earmarked for the Rhine and Danube







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07

DEMAND
IN PASSENGER
NAVIGATION

DEMAND

IN PASSENGER NAVIGATION

The demand for European river cruises increased sharply again in 2015. The number of people undertaking a cruise on the European river increased from 1.13 million to 1.33 million. This is a 17% increase in only one year.

Within this, the demand by overseas tourists (USA, Canada) increased disproportionately stronger than the demand by European tourists. A further result of this was that 2015, was the first time that more Americans and Canadians undertook a European cruise than Germans.

This means that the share accounted for by Americans and Canadians has increased from 32% (2014) to 38% (2015), whereas the Germans' share has declined from 36% (2014) to 29% (2015). These movements are the outcome of a quite extraordinarily extreme growth in demand by overseas customers.²⁹

In 2015 the Rhine enjoyed steeply rising popularity among German tourists. The share of river journeys on the Rhine increased from 30% (2014) to 38% (2015), whereas the proportion accounted for by the Danube declined from 41% to 38%.³⁰ The Rhine and Danube therefore currently account for equally high shares within the German source market. In total, Germans therefore make three quarters of their river journeys on these two European rivers.

Amsterdam is an important point of departure for river journeys on the Rhine, Main and Danube. Approximately 80% of port calls are so-called "turnaround calls", namely Amsterdam is both the journey's point of departure and terminus.³¹

Passengers primarily come from the USA, Canada, Germany, Great Britain and Australia. The city of Amsterdam benefits enormously from these river journeys as the tourists also add a lot of value to the city's hotel and gastronomy sectors. For example, before they board their vessels, tourists typically spend a few days in an Amsterdam hotel in order to discover the city and region. If Amsterdam is the journey's terminus, this holiday ashore is taken after the river journey.

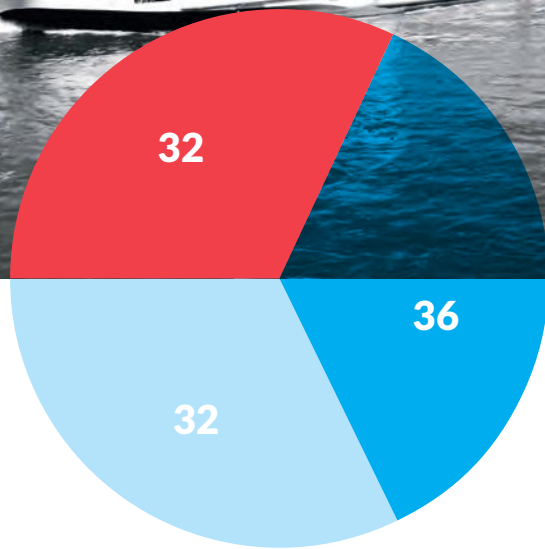
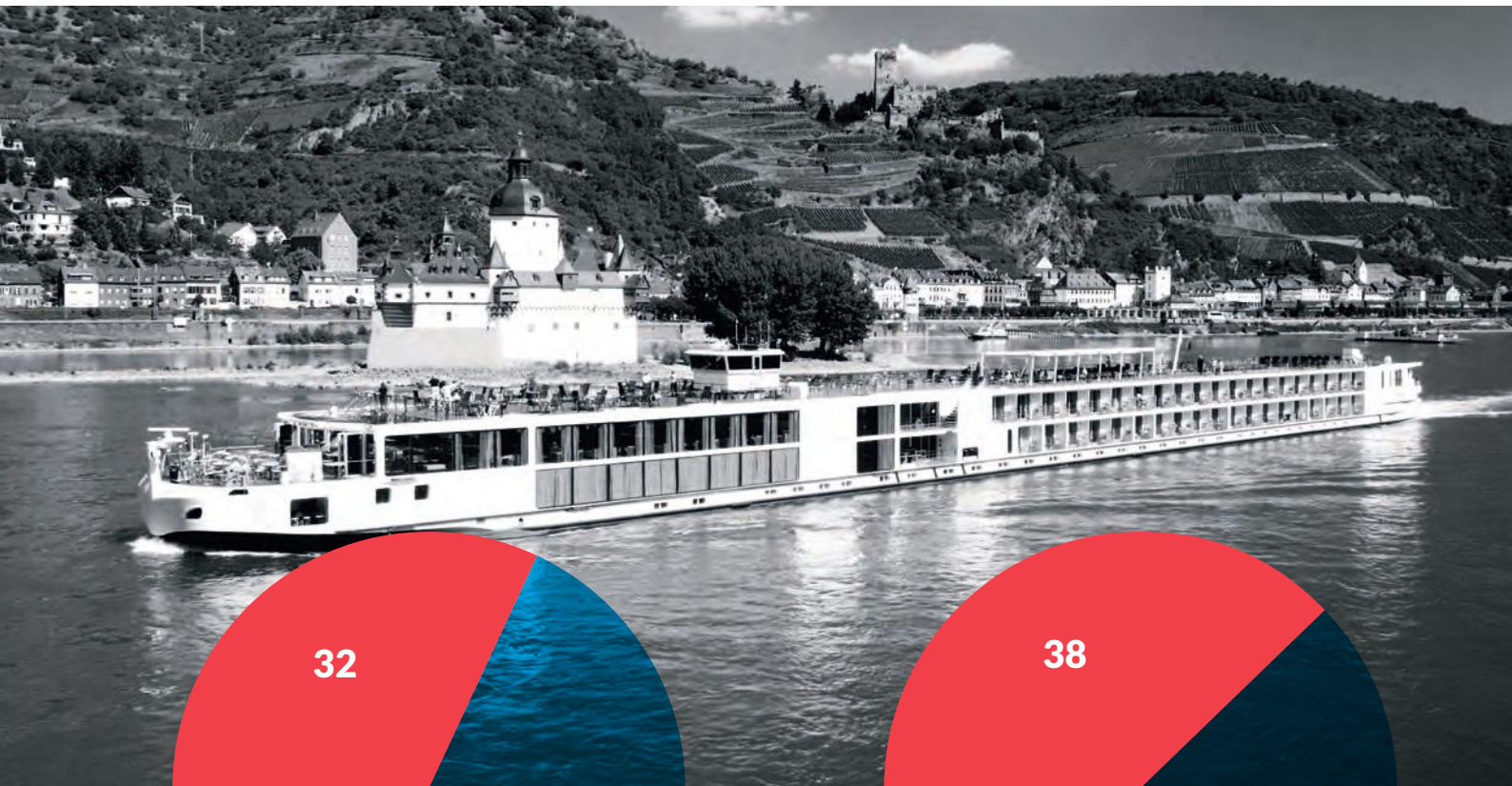
²⁹ Source: Deutscher Reiseverband DRV; press release dated 10.3.2016: "Flusskreuzfahrt in Europa erneut auf Rekordniveau" (River cruising in Europe again at record levels)

³⁰ Source: Article "Mehr ausländische Gäste auf Flussschiffen" (More foreign guests on river ships), in: Die Binnenschifffahrt, No. 3 / 2016

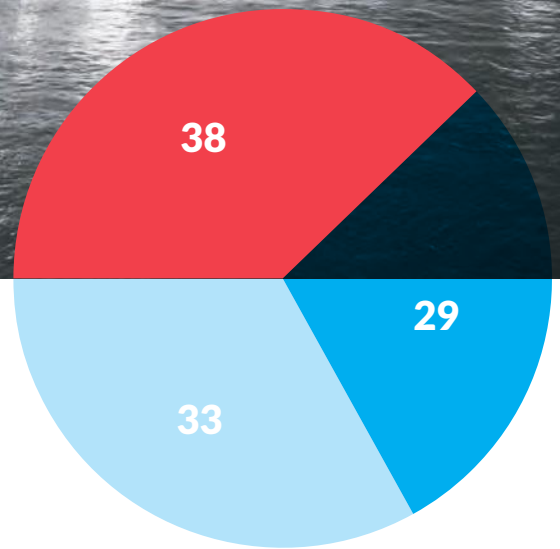
³¹ Source: Article "Goed voor (bijna) honderd miljoen per jaar", in: Havenmagazin des Haven Amsterdam, February 2016

+17%

increase in demand for European river cruises
between 2014 and 2015

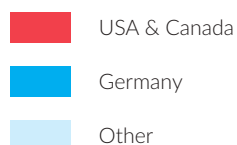


2014



2015

PASSENGERS
NATIONALITY (IN %)







08

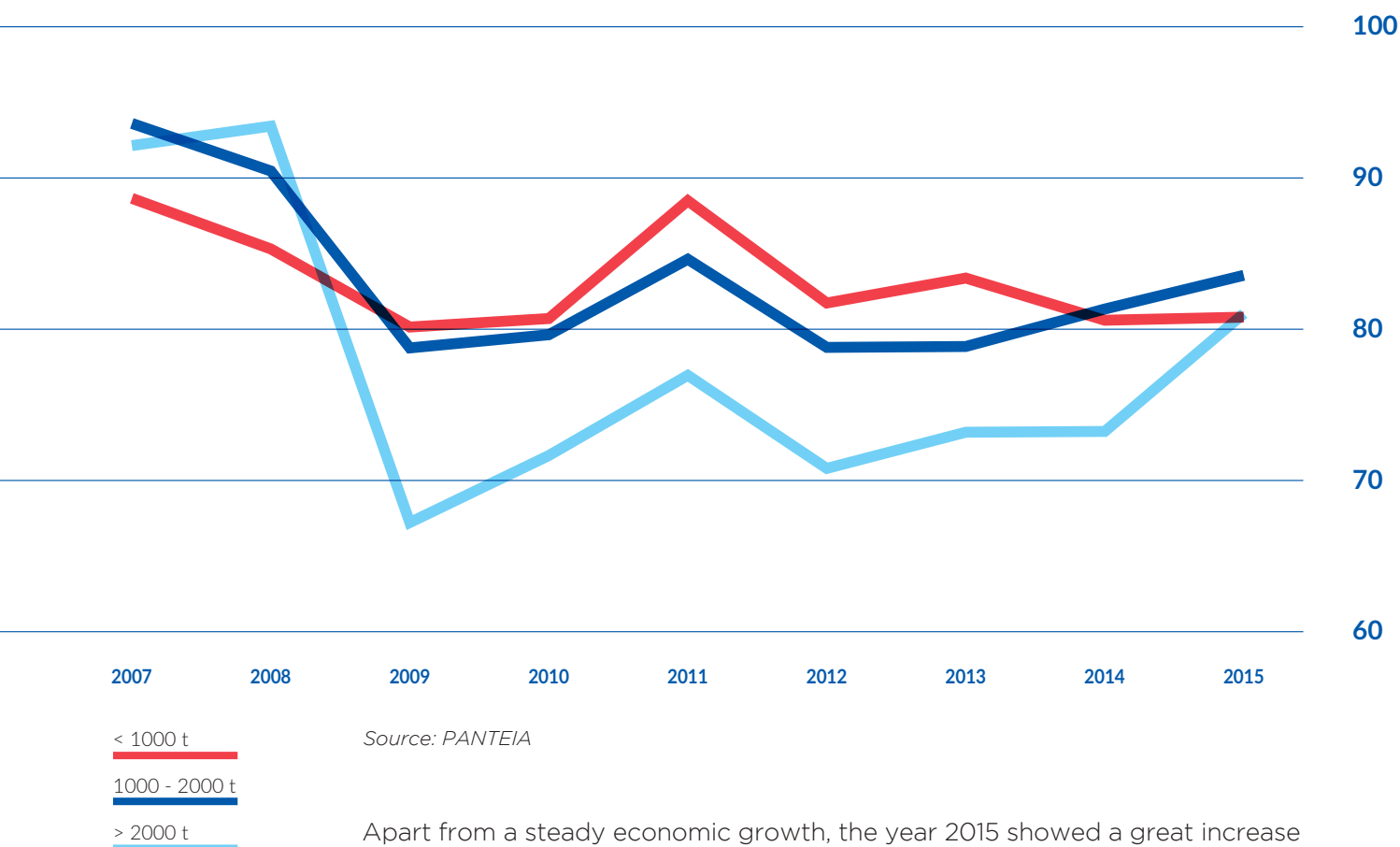
CAPACITY
MONITORING

CAPACITY MONITORING

DRY CARGO SHIPPING

In 2015, the average utilisation rate of the dry cargo fleet has increased greatly. In the corresponding graph and table, the evolution of the demand/supply ratio is plotted for the different fleet segments.

CAPACITY UTILIZATION RATES FOR THE FLEET OF DRY CARGO VESSELS (IN %)



Apart from a steady economic growth, the year 2015 showed a great increase in the average fleet utilisation rate in Western Europe. This was mainly due to the low water levels on the Rhine in the second half of the year. Fleet utilisation rates increased to the highest levels since the 2008/2009 crisis.

Although the dry cargo fleet shows a structural recovery from the crisis, fleet utilisation rates did not reach the values of 2007 and 2008. A decrease of freight volumes, especially in France, has led to lower transport demand and therefore hampers the recovery of the inland navigation market, despite the recovery of the Belgian, Dutch and German economy. Developments in the French energy market, which has seen a quick decarbonisation in both 2014

and 2015, reducing volumes of coal transported by 40% in 2015, has had a decreasing effect on the freight volumes and thus the fleet utilisation rate.

For ships with a load capacity lower than 1,000 tonnes, no significant effect of low water levels can be seen in the figure and table. However, these ships are also affected by low water levels, although to a lesser extent. The opening on the Maximakanaal has shifted transports of classical Campinois vessels (400 – 650 tonnes) to vessels between 1,000 and 2,000 tonnes and therefore, the utilisation rate of the smallest vessels in the fleet has not shown an increase between 2014 and 2015.

These developments still show indications of overcapacity in the dry cargo fleet. For the different size classes, the following conclusions are valid:

- For vessels smaller than 1,000 tonnes, there is currently a theoretical overcapacity of about 75 ships, with a total tonnage of 50,000 tonnes.
- For ships with a loading capacity between 1,000 and 2,000 tonnes, the reported theoretical overcapacity equalled about 180 ships (including barges) in 2014 and 127 ships in 2015 (includes barges). In tonnage, this equals 0.25 million tonnes for 2014 and 0.18 million tonnes for 2015.
- For ships with a loading capacity over 2,000 tonnes, the theoretical overcapacity equals 0.49 million tonnes in 2015 and 0.97 million tonnes by 2014. This means an overcapacity of about 180 ships in 2015 and 320 ships in 2014.

It should be noted that the fragmented structure in the inland navigation market hampers regulation of capacity.

COMPARISON BETWEEN NEEDED AND AVAILABLE TONNAGE IN THE DRY CARGO MARKET (MIO. T)

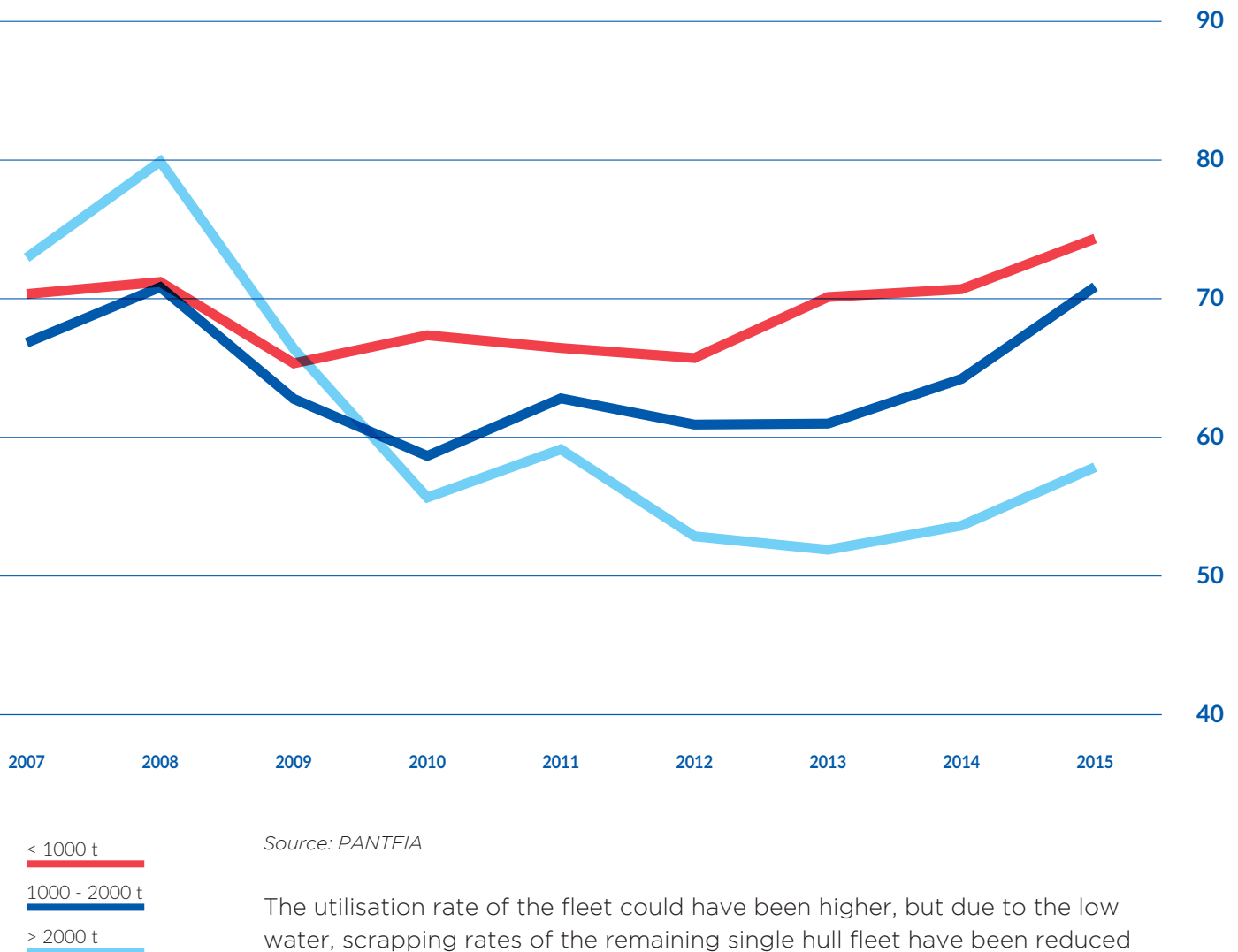
	2007	2008	2009	2010	2011	2012	2013	2014	2015
Needed tonnage									
less than 1000 tonnes	1.98	1.86	1.73	1.70	1.85	1.66	1.66	1.57	1.56
1000 - 2000 tonnes	2.73	2.67	2.37	2.36	2.48	2.30	2.29	2.34	2.39
more than 2000 tonnes	3.93	4.11	3.40	3.74	4.05	3.73	3.92	3.90	4.34
TOTAL	8.64	8.63	7.50	7.81	8.38	7.70	7.88	7.82	8.28
Available tonnage									
Less than 1000 tonnes	2.24	2.18	2.16	2.11	2.09	2.04	1.99	1.95	1.93
1000 - 2000 tonnes	2.92	2.95	3.02	2.97	2.94	2.92	2.91	2.88	2.86
More than 2000 tonnes	4.27	4.40	5.06	5.22	5.26	5.28	5.36	5.33	5.35
TOTAL	9.42	9.52	10.23	10.30	10.28	10.23	10.26	10.16	10.14
Average utilisation rate	92%	91%	73%	76%	81%	75%	77%	77%	82%

TANKER SHIPPING

Both 2014 and 2015 have shown increasing capacity utilisation of liquid cargo vessels. This is shown in the corresponding graph and table. Increasing transport demand in combination with low water levels in the second half of 2015, a slower introduction of new tankers and reduction of tonnage due to scrapping of the remaining single hull fleet have led to a larger utilisation rate of the tanker fleet. The average utilisation rate of the liquid cargo fleet has therefore increased from an all-time low of 55% in 2013 to 62% in 2015.

One important development in the tanker shipping market has been the closure of the Tamoil (Collombey) refinery in Switzerland. This has led to an increasing demand for fuels in Switzerland, which are being sourced from ARA-seaports.

CAPACITY UTILIZATION RATES FOR THE FLEET OF LIQUID CARGO VESSELS (IN %)



COMPARISON BETWEEN NEEDED AND AVAILABLE TONNAGE IN THE LIQUID CARGO MARKET (MIO. T)

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Needed tonnage									
less than 1000 tonnes	0.13	0.13	0.11	0.11	0.10	0.10	0.10	0.10	0.10
1000 - 2000 tonnes	0.48	0.51	0.47	0.47	0.50	0.47	0.48	0.49	0.53
more than 2000 tonnes	1.04	1.15	1.09	1.08	1.21	1.11	1.11	1.19	1.30
TOTAL	1.64	1.79	1.67	1.65	1.82	1.69	1.69	1.78	1.92
Available tonnage									
Less than 1000 tonnes	0.18	0.18	0.17	0.17	0.16	0.15	0.14	0.14	0.13
1000 - 2000 tonnes	0.72	0.72	0.75	0.79	0.80	0.78	0.78	0.76	0.75
More than 2000 tonnes	1.42	1.44	1.63	1.93	2.05	2.11	2.14	2.23	2.24
TOTAL	2.32	2.34	2.55	2.89	3.01	3.04	3.07	3.13	3.12
Average utilisation rate									
	71%	76%	65%	57%	60%	56%	55%	57%	62%







09

PORT
TRANSSHIPMENTS

PORT TRANSSHIPMENTS

THE THREE BIGGEST EUROPEAN SEAPORTS

In Rotterdam, 2015 saw a total increase in seaport traffic of 5% to 466 million t. The dry cargo goods segments relevant to Rhine traffic stagnated at 33.8 million t (ores and scrap metal) and 30.7 million t (coal). Container traffic also stagnated (126 million t). There were considerable increases in petroleum product volumes, 288.5 million t (+18%). Inland waterway traffic in Rotterdam is approximately 160 million t, always posting increases in recent years.

Seaport traffic in Antwerp exceeded the 200 million t mark for the first time, at 208 million t (+5%). Liquid bulk goods in containers are the port's main priority areas. Growth of 6% to 67 million t was posted by the first-mentioned category of goods. Container traffic increased by 5% to 114 million t. Inland waterway traffic in Antwerp was 91.5 million t, a decline compared with the year before (96 million t).

The outcome in Hamburg was down 5% on the year before at 138 million t. This is primarily attributable to the slowdown in trade with China, Russia and Poland. But 2015 saw positive developments in hinterland traffic. Inland waterway traffic in general increased by 13.6% to 12.4 million t. Inland waterway container transport increased even more sharply, by 27% to 130,000 TEU.

THE THREE BIGGEST EUROPEAN INLAND PORTS

Ship traffic in Europe's biggest inland port Duisburg is dominated by the steel industry: Around 70% of goods are accounted for by ores, coal, steel and steel products. Linked with this is a very high proportion of freight received relative to total riverside port transshipments of 76%.

Ship traffic in Paris is driven by sand, soil & building materials, and cereals. 60% of the supplies to the building industry in the Ile-de-France region are carried by inland vessel on the Seine.³² The cereals harvested in the Ile-de-France, Normandy and Picardy is exported via the river and maritime port of Rouen, primarily to Spain, North Africa and China. Rouen is Europe's biggest port for the export of cereals and, together with Paris and Le Havre, is organised within a port network.

³² Source: www.haropaports.com

SHIPPING TRAFFIC OF THE THREE BIGGEST EUROPEAN INLAND HARBOURS

(IN 1,000 T)

	2012	2013	2014	2015
Duisburg	49.182	49.444	54.431	54.132
Paris	22.100	20.742	20.101	20.553
Liege	13.343	13.233	13.540	14.605

Source: destatis, HAROPA, Port de Liège

The port of Liège is in a diversification phase. In 2011 it had to cope with 1.6 million t of transshipment losses within a year because of the closure of a steel mill. Since then, approximately half of these losses have been compensated for by other goods segments, and port transshipments are on an upward trend.

RHINE PORTS

The following table shows the transshipment volumes (riverside port transshipments) of the most important Rhine ports after Duisburg.

SHIPPING TRAFFIC OF IMPORTANT RHINE PORTS (IN 1,000 T)

	2012	2013	2014	2015
Cologne	11.693	11.682	12.017	11.063
Mannheim	7.931	8.753	8.494	8.208
Strasbourg	7.963	7.956	8.088	7.423
Neuss	6.844	7.590	7.083	7.187
Ludwigshafen	7.448	7.593	7.276	7.040
Karlsruhe	6.196	6.439	6.636	6.576
Basel	7.210	6.829	5.982	6.333

Source: destatis, Port of Strasbourg; Swiss Rhine ports

In 2015 almost all of the Rhine ports featured here posted transshipment losses. Basel is the exception because the receipt of petroleum products here has increased dramatically. While cereals transshipments have increased in Strasbourg, the transshipment of sand and gravel has fallen. In Ludwigshafen there was a slight dip in chemical products, which account for 43% of total transshipments. While coal transshipments in Mannheim were higher, foodstuffs and fodder traffic was down.

FRENCH INLAND PORTS, NOT ON THE RHINE

According to Association française des ports intérieurs (AFPI) data, large French inland ports other than the ports of Paris and the French Rhine ports of Strasbourg and Mulhouse,³³ are Metz/Thionville, Lille and Lyon on the Rhône.

SHIPPING TRAFFIC IN FRENCH INLAND PORTS

(IN 1,000 T)

	2013	2014	2015
Metz and Thionville	2.689	2.794	2.440
Lille	1.646	1.585	1.548
Lyon	1.489	1.553	1.390

In Metz, cereals and agricultural produce accounts for 92% of the riverside port transshipments. The waterway's modal split share is 47%.

Source: AFPI

GERMAN INLAND PORTS, NOT ON THE RHINE

Together with Frankfurt am Main, Berlin and the Ruhr city of Gelsenkirchen are Germany's three largest inland ports outside the Rhine region. Since 2009 there has been an Elbe-Spree container line in the Port of Berlin. It is the first maritime port-hinterland connection between Hamburg and Berlin by inland container vessel.³⁴

SHIPPING TRAFFIC IN GERMAN INLAND PORTS

(IN 1,000 T)

	2013	2014	2015
Frankfurt am Main	4.182	4.490	4.227
Berlin	3.988	4.095	3.886
Gelsenkirchen	3.978	3.885	3.886

Source: destatis

BELGIAN AND DUTCH INLAND PORTS

In the Netherlands and Belgium, sand, soil & building materials account for a relatively high proportion of the transport volume compared with Rhine navigation. This share was 20% in the Netherlands, compared with 13% on the traditional Rhine. This is also reflected in the activities of the Belgian and Dutch ports. For example, in Brussels, sand and building materials account for more than half (55%) of port transshipments.

³³ The port of Mulhouse-Ottmarsheim handles annual transshipments of 4.9 million t (2015).

³⁴ Source: BEHALA - Berliner Hafen- und Lagerhausgesellschaft mbH; <http://www.behala.de/>

SHIPPING TRAFFIC IN DUTCH AND BELGIAN INLAND PORTS (IN 1,000 T)

	2013	2014	2015
Maastricht	5.547	5.548	5.802*
Utrecht	5.583	5.787	5.447*
Velsen	4.692	5.090	5.750*
Dordrecht	4.615	4.380	5.264*
Brussels	4.324	4.439	4.364

Source: CBS; Port of Brussels; Panteia (*estimated values)

DANUBE PORTS

The ports of almost all the countries in the Danube region are involved in the transshipment of large quantities of cereals and other agricultural produce. The biggest export volumes of these goods to the port of Constanta originate from ports in Hungary, Serbia, Romania and Bulgaria.

The available capacity for the transshipment of goods in the Danube ports is used to 80-85%,³⁵ with more than 50 million t of freight being transported in 2013-2014. In terms of types of goods, the largest volumes (more than 10%) of goods transshipments in ports on the Danube is accounted for by bulk goods.

³⁵ This is based on information for 2009-2010.







10

MODAL SPLIT

MODAL SPLIT

The modal split is an important element in monitoring the inland navigation market, inasmuch as the way in which these parameters make it possible to understand the competitive position of waterway transport relative to its principal competitors, namely road and rail. Although other modes of transport may feature, such as (oil) pipelines, or even maritime/coastal navigation, it is mainly the two modes already mentioned which count.

As inland navigation does not have a comparable geographical footprint to road and rail, with universal territorial coverage, it is important to define a basis which enables useful comparisons with the other modes.

This basis is to be found in three distinct approaches:

- the geographical area served by waterways;
- the transport corridors in which the waterway is located;
- the industrial or even commercial or trading sectors implying that the waterway enjoys significant activity.

The geographical aspect could be covered based on port statistics, typically available for the three modes of transport, thus enabling the changing relationship between the different modes to be tracked. Provided that the statistics lend themselves to this, comparisons between regional levels can also be considered.

The market share of waterways nationally is a valid indicator of the success of this mode of transport for certain countries only. This is because in many countries navigable inland waterways exist only in certain regions, which by definition, limits the potential development of rivers as a mode of transport.

Transport policy, at a European level, is based to a considerable degree on developing, or even creating, transport through corridors: major axes connecting the various centres of economic activity within the European geographical space. In the meantime, a great deal of information has already been systematically gathered on the way in which these corridors operate, thus enabling both a reliable and relevant comparison to be made of the relationships between theoretically competing modes. What we are primarily talking about in the inland navigation context are the Rhine-Alpine, Rhine-Danube and North Sea-Mediterranean corridors. These corridors will thus be monitored in terms of the development of modal relationships.

Finally, the available statistics for industries, or groups of industries, enable the market shares of the various modes of transport to be monitored, in particular as regards the supply of raw materials. We are talking here primarily about activities between maritime ports and their hinterland.

The various approaches will now be examined, for the entire geographical area covered by this report, in order to be able to prepare a summary describing the position occupied by inland navigation in European continental transport.

THE GEOGRAPHICAL AREA SERVED BY WATERWAYS

In terms of maritime ports, the market share of river navigation is very high for the Dutch and Belgian ports in particular. In Rotterdam as in Antwerp, the waterways achieve a 36% market share for container traffic in the ports' hinterland. This share has been increasing since 2011 in these two maritime ports. A decline in the use of road in favour of waterways is to be observed in Antwerp.

For the Port of Ghent, waterways are in even greater demand for container transport. Indeed, more than 40% of containers are transported by river compared with 43% by road.

In the port of Hamburg, the waterways' share reached 12.3% in 2015 given that the Elbe and Elbe Seitenkanal play a marginal role (2-3%) in transporting containers into the Hanseatic port's hinterland. These two waterways are however extensively used for transporting liquid goods and dry cargo. Here, river navigation achieves far higher market shares (37% and 19% respectively).

At the national level, the two European countries with a very dense network of navigable inland waterways, Belgium and the Netherlands, exhibit a growing waterways' market share. In the Netherlands, vessels are responsible for 40% of the country's transport performance. In Belgium, this share is 20%.

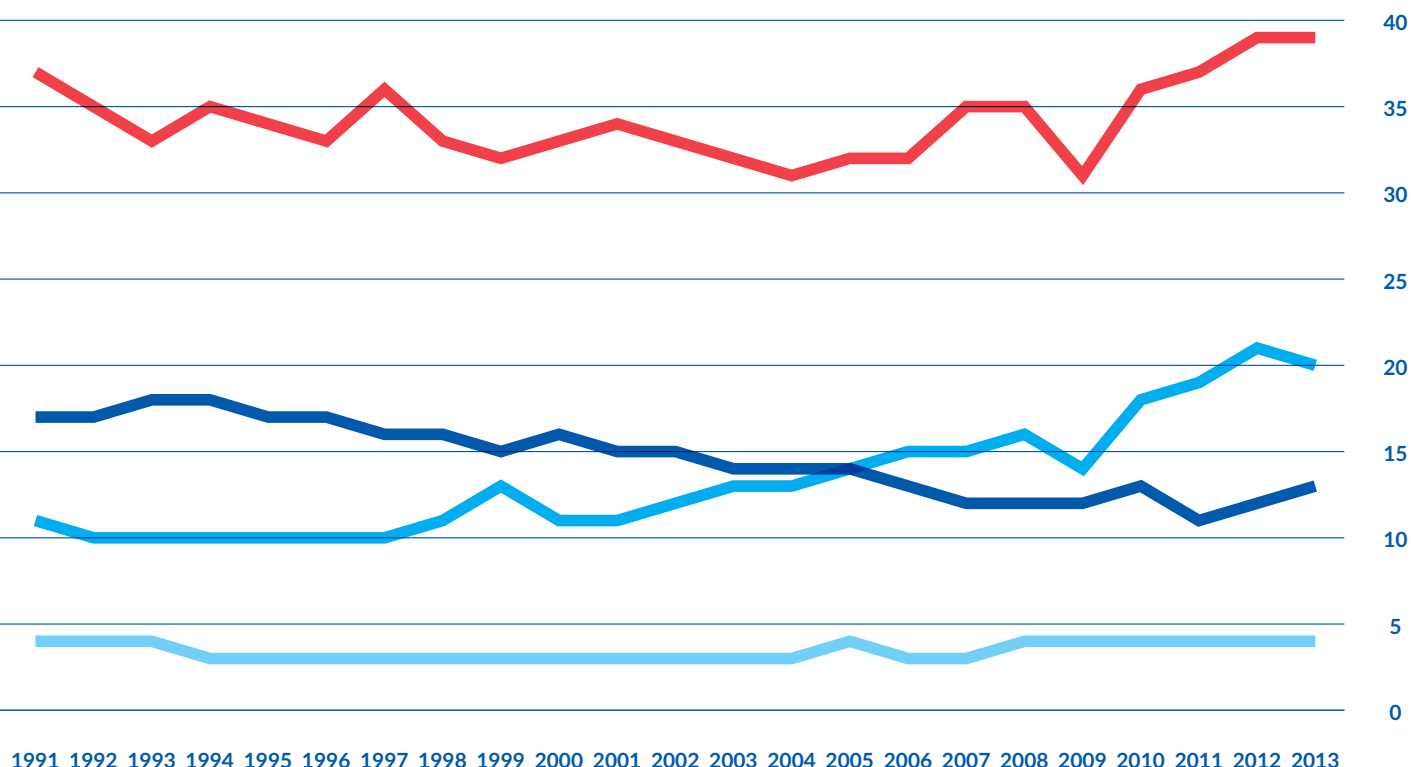
The situation is less favourable for the two large countries, Germany and France. In part, this observation can be explained by the limited presence of navigable waterways in these two countries. Another explanation has to do with the degree of integration of the waterways into logistics chains.

In the Netherlands, inland vessels are responsible for

40 %

of the transport performance

THE SHARE ACCOUNTED FOR BY THE RIVER IN WESTERN EUROPEAN COUNTRIES' MODAL SPLIT (BASED ON TKM) IN %



Netherlands
Germany
Belgium
France

Source: EUROSTAT

For most Danube countries, the waterways' market share is relatively stable, but also quite small: Austria (5%), Hungary (4%), Slovakia (3%), Croatia (6%). Higher figures are to be found in Bulgaria and Romania, with 15% and 21% respectively. The other side of the ledger is a downward trend in the waterways' market share in these two countries.

MODAL SPLIT ACCORDING TO CORRIDOR

The Rhine-Alps corridor runs for 1577 kilometres, passing through the Netherlands, Germany, France and Switzerland. The main navigable waterways used on this corridor are the Rhine, the Moselle and the Neckar. The tonnage transported on this corridor is 202 million t, 178 million of which are accounted for by the Netherlands, Belgium and Germany.

33% of the trade between Belgium and the Netherlands is by waterway. This figure is 47% for trade between Germany and the Netherlands. Navigable inland waterways account for the greater part of trade within this corridor, and especially for several types of goods such as raw materials, petroleum products and ores.

The North Sea-Baltic corridor encompasses Finland, Estonia, Latvia, Lithuania, Poland, Germany, the Netherlands and Belgium and runs for 3200 kilometres. The main navigable waterway within this corridor is the Mittellandkanal, linking the East and West of Germany.

The share accounted for by inland navigation within this corridor is 10%. If one adds the modal share attributable to maritime transport, waterways achieve a 20% share.

The Rhine-Danube corridor connects the central region surrounding Strasbourg and Frankfurt, via the south of Germany with Vienna, Bratislava, Budapest and finally the Black Sea. The main navigable waterway within this corridor is the Danube, which runs for 2860 kilometres. The carriage of goods is concentrated on the west of the corridor. Indeed, transport movements between Austria, Germany, the Czech Republic and Slovakia represent 82% of total quantities carried within the corridor.

More than 18 million tonnes are carried between the Czech Republic and Slovakia with a figure of 14 million for trade between Austria and Germany. The corridor's modal split is as follows: 58% for road, 28% for rail and 14% for navigable inland waterways.

The North Sea-Mediterranean corridor passes through six countries, from Ireland to France, via the United Kingdom, the Netherlands. The corridor runs for more than 6500 kilometres. There is trade between Ireland and the United Kingdom by sea, on the one hand, and for the continental part of the corridor on the other hand, where rivers account for 35%.

This percentage is mainly explained by the high proportion accounted for by waterways' transport in the Netherlands and in Belgium. Moreover, these two countries are developing their inland navigation in order to improve their maritime ports' access to the hinterland. This is explained by the fact that the maritime sector has been booming in recent years.

MODAL SPLIT BY INDUSTRIAL SECTOR

The waterways' market share is very high in the logistics of certain industrial sectors. This is especially the case for the steel, chemicals and petrochemicals industry and the energy sector.

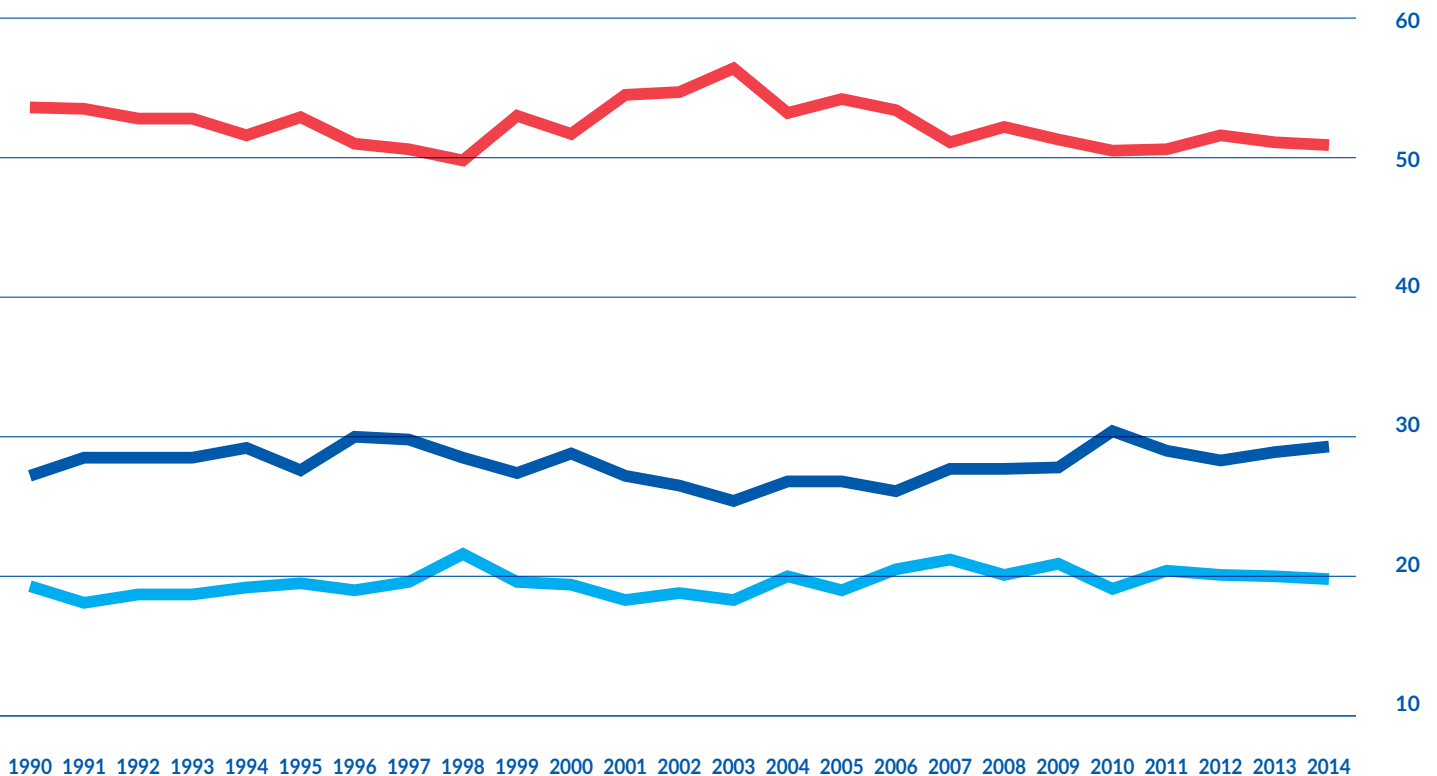
Steel industry

In Germany, Europe's biggest steel maker, the bulk of steel production is sited close to navigable waterways: in the Ruhr Basin, in the Saar and on the banks of the Mittellandkanal, facilitating the use of the Rhine, the Moselle, the Saar and of the Mittellandkanal for the carriage of large quantities of iron ore, coal, scrap metal and steel.

The waterways' share increased from 25 to 29% between 2003 and 2014. At the same time one can see a decline in the railway's share. For raw materials' logistics, the share exceeds 29%, while being lower for finished products.

MODAL SPLIT IN THE GERMAN STEEL INDUSTRY

(BASED ON TONNES) (1990-2014) IN %



Railway
Waterway
Road

Source: Wirtschaftsvereinigung Stahl

In the Austrian steel industry, sited mainly on the banks of the Danube, the waterways' market share is 35%.³⁶

Petrochemical and chemical industry

In the petrochemicals industry, river navigation plays a role in the distribution of finished products (fuels, light fuel oil, naphtha) from the refineries. The waterways' market share differs according to region in Europe.

It is very high in the Rhine region, home to Europe's biggest refineries (Rotterdam, Antwerp, Cologne). In Rotterdam and Antwerp, around 50% of finished products are distributed by waterways, and almost 40% for Cologne. Away from the Rhine access, distribution is dominated by rail.

The chemical industry receives feedstocks, such as naphtha, and turns them into finished products. It is for these latter supplies that river navigation is used. River as a mode of transport competes with oil pipelines, road and rail. The modal split in the German chemical industry is apportioned as follows: oil pipelines (33%), road (40%), rail (16%), river navigation (11%).³⁷

³⁶ Source: Voest Alpine (2015), Environmental Report

³⁷ Source: Verband der chemischen Industrie (2013), Report on the carriage of chemical products.

The energy sector

In the energy sector, the waterways are used primarily for supplying coal-fired power stations. A similar phenomenon for supplying power stations using biomass is developing.

The modal split can be measured using coal import statistics. Around half of German coal imports come from the ARA ports and enter the country via the Rhine. This proportion increased between 2010 and 2014.³⁸

SUMMARY

Transport by waterway in the Rhine-Alps corridor and between the Netherlands and Belgium accounts for a market share of between 30 and 50%. This range can be seen from a number of indicators; it applies for

- cross-border traffic between countries (Netherlands-Belgium; Netherlands-Germany),
- the spread in the major seaports' hinterland traffic (Rotterdam, Antwerp, Ghent),
- raw materials-intensive industrial sectors (steel, petrochemicals, etc.)
- entire countries (Netherlands, Belgium).

The development trends for the modal split share here are positive. For example, the waterways' market share in the Netherlands and Belgium is increasing, and there is also an upward trend to be seen in maritime port hinterland traffic and individual industrial sectors.

The waterways' market share in central Europe is between around 10 and 15%. This is true of the transport corridors transiting central Europe, as it is of the Rhine-Danube corridor and East-West corridor. It is also true for entire countries within Central Europe. For example, the waterway's modal split share in Germany is 13%.

The Rhine-Danube corridor runs from Central Europe into the more easterly parts of Europe, as far as Romania and Bulgaria. The waterways' market share there is between 15 and 20%. Admittedly, the waterways have been in decline here in recent years, which can be explained by the weakness of the industrial sectors using this mode of transport, and by a generally unfavourable environment (Danube infrastructure).

³⁸ Source: Verein der deutschen Kohleimporteure (2015), Annual report 2015



11

LABOUR MARKET



LABOUR MARKET

Employment in Europe, by country and inland navigation segment

In Europe, around 45,000 people are employed in inland navigation. This includes all forms of employment (employed persons, self-employed, family workers). The countries of the Rhine region (Netherlands, Germany, France, Switzerland, Belgium and Luxembourg) account for approximately 35,000 people, namely around 70%. This figure is consistent with the Rhine's share of the total transport volume on European inland waterways.

The following tables provide a detailed overview of the number of companies and people employed for countries in the Rhine region (Germany, France, Netherlands, Belgium). In each case, the sources are these countries' national statistical offices. The Belgian statistical office provides no data, which means that the national insurance offices' registers need to be used. According to the following table containing the figures for the Netherlands, more than one person in every five working in the European inland navigation industry works in the Netherlands.

NETHERLANDS - COMPANIES AND ACTIVE PEOPLE IN INLAND NAVIGATION

	Number of companies			People employed*
	Freight navigation	Passenger navigation	total	total
2007	3.205	825	4.030	n.a.
2008	3.300	830	4.130	n.a.
2009	3.365	855	4.220	8.900
2010	3.475	805	4.280	9.200
2011	3.445	800	4.245	9.100
2012	3.385	815	4.200	9.600
2013	3.305	810	4.115	9.700
2014	3.255	825	4.080	10.000

Source: CBS. *These figures do not include temporary agency workers nor temporary employees. If these two groups were included then there would be 18,800 active individuals in 2014.
n. a. = no information available

The figures for Germany and France can also be broken down by freight and passenger navigation. What emerges from the tables is

- in Germany and France, employment in passenger navigation exceeds that in freight navigation. This is not the case for the Netherlands, where (according to ILO information) employment in freight navigation exceeds that in passenger navigation.
- in Germany and in France there is a greater number of employees per company in the passenger navigation sector.

AVERAGE NUMBER OF EMPLOYEES IN GERMAN AND FRENCH INLAND NAVIGATION COMPANIES

	Freight navigation	Passenger navigation
Germany	5,3	11,4
France	1,5	8,0

Source: destatis / INSEE

- by and large, employment in Germany has remained constant between 2007 and 2014, whereas a modest upward trend is discernible in France. This applies both to freight and passenger navigation.

GERMANY - COMPANIES AND ACTIVE PEOPLE IN INLAND NAVIGATION

	Number of companies			People employed		
	Freight navigation	Passenger navigation	total	Freight navigation	Passenger navigation	total
2007	783	356	1.139	3.644	3.731	7.812
2008	739	341	1.080	2.928	3.900	7.628
2009	735	311	1.046	3.586	3.884	7.470
2010	668	302	970	3.413	3.697	7.110
2011	642	292	934	3.194	3.698	7.096
2012	678	333	990	3.423	3.984	7.580
2013	642	322	964	3.442	4.047	7.489
2014	620	318	923	3.260	3.618	6.878

Source: destatis and BDB

³⁹ See: ILO (2013)

FRANCE - COMPANIES AND ACTIVE PEOPLE IN INLAND NAVIGATION

	Number of companies			People employed		
	Freight navigation	Passenger navigation	total	Freight navigation	Passenger navigation	total
2008	916	180	1.096	1.059	1.810	2.869
2009	894	167	1.061	960	1.900	2.860
2010	800	223	1.023	1.099	1.972	3.071
2011	852	234	1.086	1.163	1.936	3.099
2012	875	229	1.104	1.179	1.897	3.076
2013	818	263	1.081	1.264	2.094	3.358

Source: INSEE

Owing to the absence of Statistical Office figures, data from the registers of the National Institute for the Social Security of the Self-employed (INASTI) and the National Social Security Office (ONSS) were used for employment in Belgium.

INASTI receives statistical data from all Belgian insurance companies for the self-employed and integrates these within an overall database broken down by profession. This yields a figure of 1,376 self-employed inland boatmen in Belgium in 2014. Their numbers have been in decline since 2009 (see table).

Data on employees subject to social security contributions from the National Social Security Office (ONSS) were used for employees. In total, this method yields an employment figure for Belgium of 2,082 for 2014.

BELGIUM - ACTIVE PEOPLE IN INLAND NAVIGATION

ACCORDING TO THE NATIONAL INSURANCE OFFICES INASTI AND ONSS

	Self-employed inland boatmen	Employees*	Total economically active people
2009	1.629	817	2.446
2010	1.638	771	2.409
2011	1.620	779	2.399
2012	1.539	741	2.280
2013	1.429	701	2.130
2014	1.376	706	2.082

Source: INASTI and ONSS *subject to social security contributions

Self-employed

Given their role within the market structure and logistics chain, independent sole proprietors or private owner operators are an important subgroup within total inland navigation employment. As in other sectors of the economy, their profile differs from that of employees. For example, an independent sole proprietor, in addition to nautical and technical expertise, also needs to possess commercial and entrepreneurial “know-how”.

Independent sole proprietors are a very high proportion of the total number of companies in inland navigation. In the Netherlands, approximately 80% of all companies are independent (natural persons), in France, the figure is 96% (as defined by the National Statistical Office INSEE) or 84% as defined by the Chambre Nationale de la Batellerie Artisanale (CNBA).

According to the INSEE definition, a sole proprietor is someone who has no more than 9 employees. According to the definition of the Chambre nationale de la Batellerie Artisanale (CNBA) on the other hand, a sole proprietor is someone with a maximum of 6 employees. This is the origin of the different proportion of total French inland navigation companies accounted for by the self-employed.

The proportion of total employees accounted for by the self-employed is naturally less than their proportion of the total number of companies. The result for France and the Netherlands is that the proportion of self-employed relative to the total number of employees is around one third.

A multi-year downward trend in the number of self-employed can be seen for the Netherlands, France, Belgium and Germany. The reasons for this is to be found in the difficulties with which independent sole proprietors are confronted generally. This is common ground between inland navigation and other sectors of the economy, such as retail or agriculture.

- the requirement for high investment to remain both economically and environmentally sustainable
- coupled with a relatively poor earnings situation owing to the relatively limited shipping capacity (or sales area in the retail context) for small companies
- coupled with the difficulty of finding access to capital.

⁴⁰In Dutch and German legal parlance, sole proprietors are “natural persons”.

The negative trend of previous years is currently continuing:

- According to Chambre Nationale de la Batellerie Artisanale data, significantly more self-employed people in France gave up their business in 2011, 2012 and 2013 respectively than there were new self-employed people beginning a business. Consequently (averaged over these years) there were around 30 self-employed people giving up each year compared with approximately 10 self-employed people starting business.⁴¹ This negative development continued in 2015. The number of self-employed people who have ceased business exceeded the number of start-ups by 60 businesses. Provisional figures up until the middle of the year are available for 2016 from the European Skippers' Organisation; they indicate a negative balance of approximately 20 businesses up until mid-2016.
- In Belgium, according to Insurance Office data, even more self-employed began a business in 2011 than gave one up. But in 2012 and 2013 the reverse situation applied.

EMPLOYMENT BY SIZE CLASS OF COMPANY

People employed in inland navigation predominantly work in small companies. This applies in particular to the Netherlands, Belgium and France whereas in Germany, the proportion of employees working in medium-size companies is somewhat higher.

NUMBER OF COMPANIES BY NUMBER OF EMPLOYEES IN INLAND NAVIGATION*

	Total	0 to <10	10 to < 50	> 50
Netherlands	4.048	3.925	100	18
France	1.104	1.045	29	20
Germany	905	774	112	19

Source: CBS, INSEE, destatis. *excluding own-account transport Figures are for 2015 (Netherlands), 2014 (Germany) 2013 (France)

PERCENTAGE OF COMPANIES BY NUMBER OF EMPLOYEES IN INLAND NAVIGATION*

	Total	0 to <10	10 to < 50	> 50
Netherlands	100%	97,0%	2,5%	0,4%
France	100%	95,5%	2,6%	1,8%
Germany	100%	85,5%	12,4%	2,1%

Source: CBS, INSEE, destatis. *excluding own-account transport

⁴¹Quelle: Chambre Nationale de la Batellerie Artisanale – CNBA (2013), Rapport Annuel 2013.

This high preponderance of small companies is however eroding. For example, the number of companies with one or two employees has indisputably declined in recent years and thus also the proportion of employees working in companies with one or two employees.

One example for Germany: In 2012 there were still 317 companies with one or two employees, two years later there were only 267. That is a decline of 16%. On the other hand, the number of companies with between 20 and 49 employees has slightly increased in the same period. As a result, the distribution to be seen in the tables, at least for Germany and the Netherlands, is shifting towards a higher proportion of companies with more than 10 employees.

NEW RECRUITS AND TRAINING

For trainees from Germany and Switzerland the Schiffer-Berufskolleg Rhein (boatmen's vocational college Rhine) in Duisburg is far and away the most important venue for learning the profession of inland boatman. The total number of trainees, which was 313 in 2015, has risen slightly over the past 10 years. The number of trainees in 2006 was only 250.

The Maritieme Academie Holland in Harlingen, Netherlands, is one of the country's two major training institutes. Currently a total of around 760 trainees are on the school's roll. Numbers remained relatively constant in recent years. The second training institute in the Netherlands is the STC Group in Rotterdam, with currently 445 trainees. Approximately 70% of these are on vocational training schemes in which practical training on board accounts for approximately two thirds of the time, with the remainder of the time spent in the classroom. The number of trainees has increased by around 15% in the past five years.⁴²

CONCLUSION

The existing labour market trends are continuing. A further decline in the number of self-employed can be observed throughout Western Europe. The cause is first and foremost the relatively poor earnings situation of small enterprises, which is an existential issue, especially in difficult economic times. Another reason is questions of company succession.

Linked to this is a further trend, namely the structural changes in employee size categories. It is currently still the case in Western Europe that between 85 and 97% of people working in the inland navigation sector work in companies with fewer than 10 employees. This structure is, however, set to change. The proportion of people working in companies with more than 10 employees continues to increase.

The way in which employment develops also differs by individual country in Western Europe. In the Netherlands, where more than one fifth of the workforce is located, employment is increasing slightly. There is also a slightly positive trend in France. On the other hand, there is a declining trend in Belgium and Germany.

⁴² Source: STC Group



REINFORCED
TECHNICAL



12

OUTLOOK

OUTLOOK

Forecasts for future inland navigation transport volume can be broken down into short-term and medium to long-term forecasts. For short-term forecasts, cyclical economic developments at a macro economic and industry-specific level are important on the one hand, but medium to long-term trends as well on the other hand. For medium and long-term trends, the cyclical effects are in principle hidden because it can be assumed that cyclical “highs” and “lows” cancel each other out in the medium and long-term. In addition to cyclical and medium and long-term factors, factors such as water conditions also play a role in inland navigation, with water conditions, as was evident in 2015, capable of having a marked influence on transport volumes.

The CCNR regularly monitors Rhine navigation as part of its remit and, as a consequence also generates short to medium-term forecasts. The trends and explanations for each freight segment presented in the chapter on Rhine navigation (see Chapter 2) are used for the medium and long-term outlook. The short-term forecasts are based on current macro economic estimates, in conjunction with short-term developments in industrial sectors.

Research and consultancy company PANTEIA recently brought out a study⁴³ for inland navigation in the Netherlands publishing medium term forecasts (2014-2020) for the various categories of goods. There are of course in the findings overlaps with Rhine navigation, but also differences in the trends.

One example mentioned is sand, soil & building materials. The outlook here in the Netherlands is more favourable than for Rhine navigation.⁴⁴ The same is also true of petroleum products. It is true that short-term increases are to be expected on the Rhine as a result of lower oil prices. In Rhine navigation, however, this segment exhibits a downward trend, which can be explained by the effect of economies made by private households (see Chapter 2). In the Netherlands, petroleum product transport movements also fulfil other functions to do with trade and oil price fluctuations. The outlook in the Netherlands is more positive here.

In the medium and long-term, coal transport on the Rhine is coming under pressure from an increasing proportion of renewable energies in the energy mix. The declared political will in Germany to bring about a sustained shift in the energy mix speaks for this assumption. There is to be a progressive withdrawal from coal-fired power generation over the next 25-30 years. Realistically therefore, this will not be a sudden but a slow withdrawal. According to a study commissioned by the German Federal Ministry for Economic Affairs and Energy, the installed generating capacity of lignite

⁴³ PANTEIA (2016), *Middellange termijn prognoses voor het ladingvolume in de binnenvaart – Voorspellingen voor 2016-2020. March 2015*

⁴⁴ PANTEIA (2016), p. 110.

and anthracite-fired power stations will fall somewhat to 2030 and only then decline significantly.⁴⁵ This will result in a corresponding reduction in the need for coal and for coal transport.

The following table contain short and medium-term forecasts, with the medium-term forecast time horizon extending to 2020, and with short-term forecasts referring to 2016.

SHORT AND MEDIUM-TERM FORECASTS FOR RHINE NAVIGATION

short-term	medium-term	
increasing	increasing	Agriculture & feedstuffs and fodder
unchanging	declining	Coal
unchanging	declining	Ores
unchanging	unchanging	Metals
unchanging	declining	Sand, soil & building material
increasing	increasing	Containers
increasing	declining	Petroleum products
increasing	increasing	Chemical products
slightly increasing	slightly increasing	Total

Source: CCNR

An overall increase of 3-5% is expected for Rhine navigation in 2016. On the one hand, this increase is the result of a base effect, which has to do with the low water in 2015 and attendant reduction in volumes in that same year. This base effect therefore results in catch-up effects in 2016, which manifest themselves in a higher growth rate. Furthermore, the anticipated increase is also the result of the economic estimates of transport demand, which are overall positive when weighing up the different goods segments

For transport demand in the Netherlands, PANTEIA is expecting a 3.2% increase in 2016 and 1% in 2017.

Concerning the navigation of the Danube, the Danube Commission is expecting transport volumes in the agricultural sector and chemical industry⁴⁶ in 2016 to rise. The carriage of raw materials for the metal working industry (ores, pellets, coal) will depend to a large extent on the general situation of the local and European metal market, as well as on navigation conditions in the second half of 2016. The medium-term outlook for steel production in Europe is somewhere between stagnation and a slight decline.⁴⁷ This forecast impacts the transport of ores and metal products.

⁴⁵ See the study "Developments in the energy markets – energy reference forecast", study on behalf of the Federal Ministry for Economic Affairs and Energy (2014).

⁴⁶ Source: Danube Commission

⁴⁷ Source: Unicredit Bank Austria (2014), Report on the metals sector

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