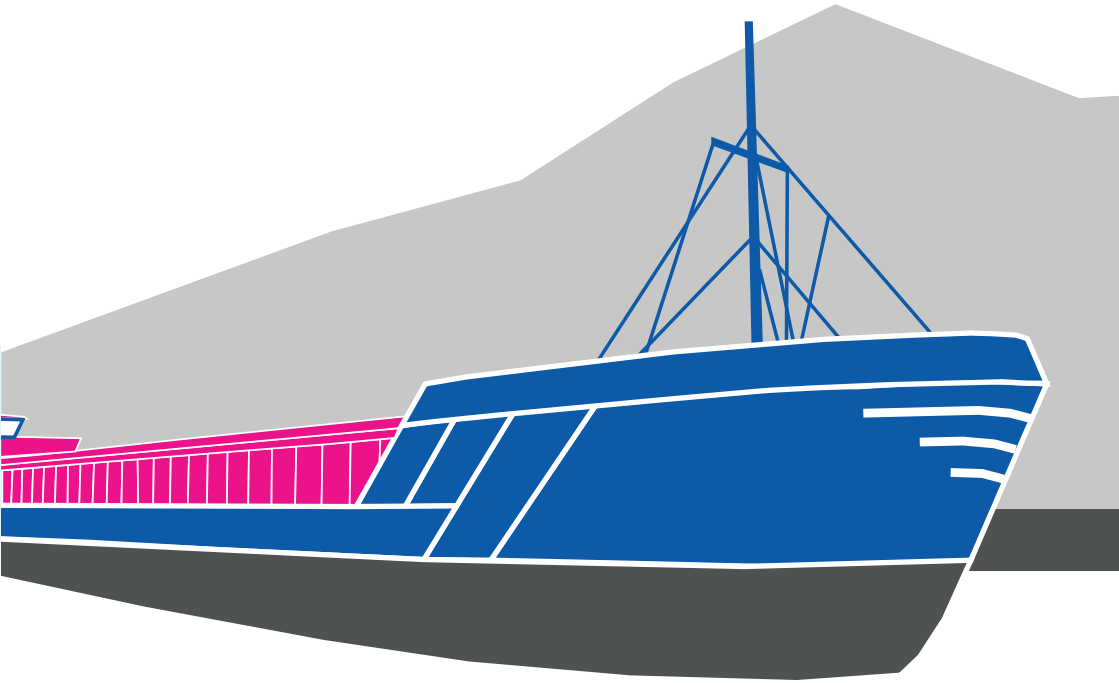
THEMATIC REPORT

RIVER-SEA TRANSPORT IN EUROPE

PUBLISHED IN

JANUARY 2020



European Commission

CCNR

CENTRAL COMMISSION FOR THE NAVIGATION OF THE RHINE

Thematic report
RIVER-SEA TRANSPORT

Published in
January 2020

Please find all our data at:
www.inland-navigation-market.org

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The Central Commission for the Navigation of the Rhine (CCNR), in partnership with the European Commission, publishes annual and biannual reports dealing with the European inland navigation market. From 2020 onwards, thematic reports will also be published once a year. This thematic report on river-sea transport is the first in a series.

No dedicated report providing detailed data on river-sea transport is currently available, hence the decision to dedicate a report to this specific topic, with the objective to improve knowledge and information about river-sea transport in Europe. As only few statistics on river-sea passenger transport are available, this report focuses on river-sea goods transport.

River-sea transport consists in a transport operation partly by inland waterways (IWW) and partly by sea, without transhipment. River-sea transport must therefore not be confused with transport operations combining inland and maritime transport and requiring transhipment operations between the two. River-sea transport can be performed by a seagoing ship or an inland vessel. These two general cases of river-sea transport activities should be distinguished and are analysed separately in the report.

River-sea transport performed by a seagoing ship

In most of the cases, river-sea transport (or lake-sea transport in Sweden and Finland) is performed by small seagoing vessels (also known as river-sea ships), which have an International Maritime Organisation (IMO) number) and are able to navigate both on certain stretches of inland waterways and at sea. This case represents the large majority of all river-sea transport volumes in Europe. A typical river-sea transport operation might start in an inland port (e.g. Duisburg), continue on a river (Rhine), pass a seaport (Rotterdam) without transhipment, continue on maritime waters (the North Sea) and end in a seaport or in an inland port of another country (e.g. in London).

River-sea ships must comply with technical and regulatory requirements in force in both sea and inland waterway areas. On the river Rhine, additional Rhine related requirements apply. In terms of environmental requirements, they are only subject to those applicable to seagoing ships. Beyond such requirements, conditions for river-sea shipping also vary between countries and greatly depend on the geographical situation, the sailing area, the waterways infrastructure and weather conditions. River-sea ships are therefore generally designed for operating in a specific sailing area.

The clear advantage of river-sea shipping lies in the absence of seaport transhipment, which results in lower transport costs, time-saving and a reduced risk of damage to goods, as well as its unique market range. While the versatility of river-sea shipping is an advantage, it is also a drawback, compared to maritime shipping, as its good functioning also depends on the navigation conditions on inland waterways. An important challenge for river-sea shipping therefore lies in its ability to provide transport services all year round and under all weather conditions. In addition, compared to ships exclusively sailing on the sea, river-sea ships are limited in their capacity in order to be able to navigate on inland waterways, making it more difficult for river-sea ships to realise economies of scale.

At present, almost 90.5 million tonnes of goods are transported via river-sea transport in Europe. River-sea transport takes place on all major rivers in Europe that have a connection to the open sea.

The country with the most important volume of river-sea transport in Europe is the United Kingdom (around 47 million tonnes). London, the River Thames, as well as the estuary of the river Humber in north east England, the River Forth in Scotland, and other estuaries are important areas of river-sea activity. Overall, river-sea transport has shown a growing trend in recent years in the United Kingdom.

Russia and Ukraine are two countries with a significant level of river-sea transport, due to very favourable natural conditions. In 2018, around 25 million tonnes of cargo were transported by river-sea ships in Russia, making it the second largest market for this type of transport in Europe.

River-sea transport is also well developed in Sweden and Finland, taking the form of lake-sea transport, where lakes (Lake Vänern and Lake Mälaren in Sweden, and Lake Saimaa in Finland) represent the inland component of the activity. The main product groups traded are wood products and timber.

In western Europe (the Netherlands, Belgium, Germany and France), river-sea transport concentrates mainly on the following areas: the Lower Rhine, the Lower Schelde, the Ghent-Terneuzen Canal, the Maas, the Albert Canal, the Seine and the Rhône.

The Lower Rhine is the nerve centre for river-sea transport in Germany, and a major area for the Netherlands. Steel is the most important segment for river-sea transport in the region, due to the steel industry in Duisburg, which uses the Rhine as an export route for iron, steel, metals and metal products. A large part of these exports goes to the United Kingdom and Scandinavia.

Steel-related products also constitute the main goods segment transported via river-sea in Belgium and in the Netherlands. Indeed, steel products are exported from the Belgian port of Ghent mainly towards the UK through the Ghent-Terneuzen Canal, the Schelde estuary and the North Sea.

Steel-related products and raw materials (ores, scrap metal and metal products) also have the highest share within total river-sea transport in France. As in Germany, exports have around a two-thirds share within the total river-sea transport volume in France. Unlike Germany, the French river-sea routes are mainly linked to countries along the Mediterranean Sea (Turkey, north Africa).

In south-eastern Europe, the Lower Danube offers good natural conditions for river-sea transport. River-sea traffic registered in the three Romanian river-sea ports of Galati, Braila and Tulcea, has been quite stable since 2012. Iron and steel related products, as well as raw materials and agricultural products, are the most important goods segments for river-sea transport in Romania.

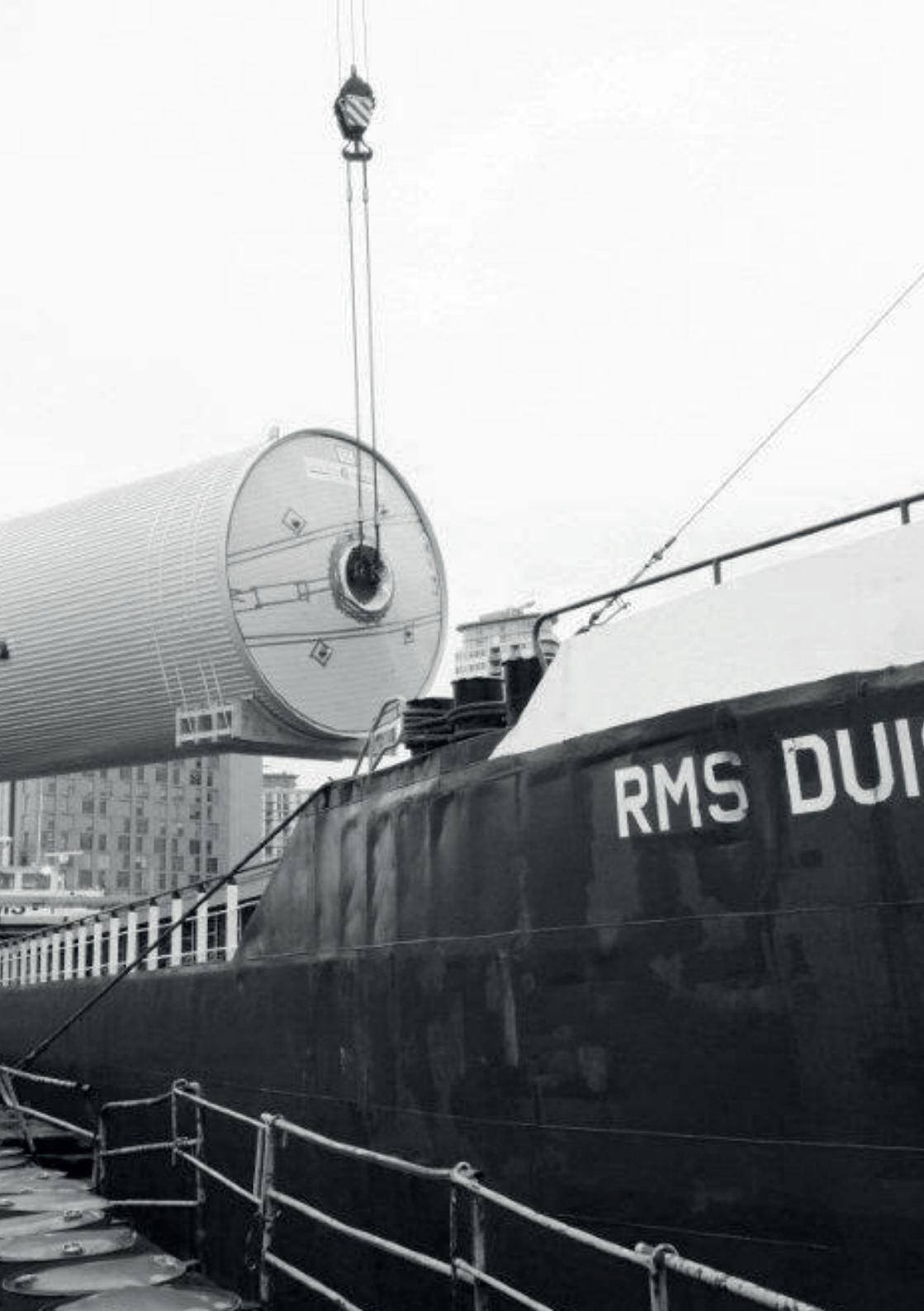
River-sea transport performed by an inland vessel

There are also specific areas in Europe where inland vessels are able to make restricted journeys at sea between two ports of the same country, provided they hold an appropriate authorisation. This authorisation can be obtained subject to compliance with classification and regulatory requirements, which are not harmonised at EU level. This option can be particularly relevant whenever a maritime/coastal port is not sufficiently connected to the inland waterway network, insofar as there is an underlying economic rationale. However, it is currently not permitted in several EU countries.

This type of transport can, for instance, be found in Belgium (known as estuary traffic), where a limited sea trajectory has to be performed by an inland vessel to connect the Port of Zeebrugge to the European inland navigation network (mainly through the North Sea Port and the Port of Antwerp). Estuary goods traffic registered at the Port of Zeebrugge amounted to 2.1 million tonnes in 2018.

In France, some inland vessels are also authorised to operate alongside the coastline in domestic maritime areas in order to connect the container terminal of the Port of Le Havre (Port 2000) to the river Seine. This possibility has recently been extended to other areas in France following the adoption of a national regulation in October 2018, with requirements having to be met by inland vessels to obtain the appropriate authorisation depending on the relevant route.

https://www.inland-navigation-market.org/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01

METHODOLOGY AND SCOPE OF THE REPORT

DEFINITIONS, TERMINOLOGY AND SCOPE OF THE REPORT

According to the Eurostat Reference Manual of Inland Waterways Transport Statistics[1], "fluvio-maritime transport" consists in ***"a transport operation partly by inland waterways (IWW) and partly by sea, without transhipment. It can be operated by inland waterway vessels or seagoing ships. Any inland waterway vessel undertaking such transport will need to have the appropriate authorisation permitting it to operate at sea."*** The same definition is proposed in the 5th edition of the Glossary for transport statistics[2], where an alternative terminology is also used: sea-river transport. The term river-sea transport is also commonly used[3]. Finally, in Sweden and Finland, this type of transport is referred to as lake-sea shipping. For the purpose of this report, the terminology "river-sea transport" will be used.

Based on this definition, two types of river-sea transport will be analysed in this report:

- River-sea transport performed by seagoing ships adapted to navigate on inland waterways (river-sea ships) (see chapter 2).
- River-sea transport performed by an inland vessel adapted to navigate at sea up to a certain point at sea[4]. The specific case of Belgium and France will be addressed in this report (see chapter 3). In Belgium, the term estuary vessels/traffic is used to refer to this specific case.

The objective of this report will be to improve knowledge and information about river-sea transport in Europe. It is worth noting that river-sea transport was also addressed in the 2013 annual market observation report[5].

[1] *Eurostat, Reference Manual of Inland Waterway transport Statistics, Version 9.1 April 2018, sections 4.1.6 and 5.2: https://ec.europa.eu/eurostat/documents/29567/3217334/Inland+waterways-Reference+Manual-v9.1-April+2018.pdf*
[2] *Glossary for transport statistics 5th Edition 2019: https://ec.europa.eu/eurostat/documents/3859598/10013293/KS-GQ-19-004-EN-N.pdf/b89e58d3-72ca-49e0-a353-b4ea0dc8988f*
[3] *E.g. EMMA project Strengthening inland navigation and river-sea-shipping in Europe and the Baltic sea region*
[4] *Also known as fluvio-maritime or sea-river vessels in the Glossary for transport statistics 5th Edition 2019*
[5] *Pages 81-93: https://ccr-zkr.org/files/documents/om/om13_en.pdf*

In addition, a workshop with the main actors for the river-sea transport sector was organised in September 2019 to gain some additional insights into the river-sea market in Europe. All the presentations made during this workshop are available in English on the CCNR website: https://www.ccr-zkr.org/13020153-en.html

METHODOLOGY AND DATA REPORTING AT EU LEVEL

As there are few statistics on river-sea passenger transport in Europe, this report will focus on river-sea goods transport. There is no harmonised data reporting in place at EU level on this and Eurostat does not have a dedicated data collection for river-sea transport.

Therefore, data in this report were mainly gathered directly from national statistical offices, other national statistical sources and stakeholders. These national offices partly apply different methodologies for data collection, resulting in some river-sea transport that is reported in maritime statistics or in IWW statistics or both. However, given the low volumes of river-sea traffic compared to total maritime or IWW transport volumes, double counting (i.e. reporting statistics on both the maritime and IWW database) is tolerated. In addition, the definition of river-sea transport from a statistical point of view may also vary between Member States.

The example of the Kiel Canal, which connects the North Sea at Brunsbüttel to the Baltic Sea at Kiel through Schleswig-Holstein in northern Germany, is relevant in that regard as it will appear in both maritime and IWW sets of statistics.

Indeed, in German statistics, the Kiel Canal is registered as an IWW and a maritime waterway. Transport from one end of the Kiel Canal (Kiel or Brunsbüttel) to a maritime port, for instance in Lithuania (Klaipeda) or in the Netherlands (Rotterdam), transit through the Kiel Canal and transport from one port on the Kiel Canal to another maritime port outside the Kiel Canal will be recorded as maritime transport. However, this last case could be considered as river-sea transport if the definition from the Eurostat Reference Manual of Inland Waterways Transport Statistics is applied.

The methodology for reporting river-sea transport statistics was discussed at several maritime and IWW working group meetings within Eurostat.

Initially, Eurostat recommended national statistical offices to report on river-sea transport according to "type of water". In other words, if transport takes place on IWW it should be reported in the IWW statistics and if transport takes place on maritime waters it should be reported in the maritime statistics.

In the Reference Manual on Inland Waterways Transport Statistics, Eurostat recommends reporting river-sea transport depending on the "type of vessel", in other words, if river-sea transport is performed:

1. By an inland vessel, it should be reported in the IWW statistics and not the maritime statistics;

2. By a seagoing ship, it should be reported in the maritime statistics and not the IWW statistics.

However, if information regarding the type of vessel is unavailable, related information (such as port of loading/unloading) could be used to determine whether river-sea transport is likely to be carried out by IWW vessels or seagoing ships.

If necessary, and in order to compile relevant and coherent IWW statistics at national level, specific cases of river-sea transport performed by seagoing ships could be included in both the maritime and the IWW data reported to Eurostat. However, any such deviations from the main recommendations in points 1 and 2 should be clearly communicated to Eurostat in order to be specified in the metadata of the IWW statistics. Today, some objections to these proposed recommendations still exist. For instance, if this methodology was applied in France, most of river-sea transport would be recorded in the maritime statistics.

It is worth highlighting that most of the statistical data analysed in this report relate to situations where river-sea transport is performed by seagoing ships. Indeed, there is less statistical data available regarding inland vessels at sea as there are only a few places where seagoing inland vessels are in operation, which are mentioned in this report and for which available data are presented.

As consistent data is not available at EU level, data were collected from national statistics, and a country-by-country analysis has therefore been made in this report. The methodology applied to calculate river-sea goods transport per country is explained in each relevant chapter. The degree of comparability of the results analysed in this report might be slightly impacted by such discrepancies.

Finally, for several countries analysed in this report, statistics are derived from inland navigation databases, which shows that the practice applied in some national statistical offices include river-sea transport as part of inland waterway transport (IWT).

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02

RIVER-SEA TRANSPORT IN EUROPE: THE CASE OF SEAGOING SHIPS NAVIGATING ON INLAND WATERWAYS

OVERVIEW OF RIVER-SEA TRANSPORT IN EUROPE PERFORMED BY SEAGOING SHIPS

River-sea shipping takes place on all major rivers in Europe that have a connection to the open sea. In the EU, this type of river-sea transport can especially be found in Sweden, Finland, the United Kingdom (UK), the Netherlands, Germany, France, Belgium, Portugal and Romania. Outside the EU, it is well developed in Russia and Ukraine.

Several major users of sea-river shipping in Europe are the Belgian, German and Romanian steel industries, the Swedish and Finnish timber industries, the petroleum sector in Great Britain, the agricultural sector in the Danube region and in France.

Transport of steel products takes place downstream on the river Rhine and transport of Scandinavian timber, paper products and liquefied gaseous products upstream.

One quarter of the Trollhätte Canal (Sweden) transport movements consists of oil products.

The main trading partners of German river-sea transport are found in northern Europe (Great Britain, Norway and Sweden), while for Belgium and France, there are two main trading routes: one in the north (Great Britain, Finland, the Netherlands, Norway), and another in the south (Spain, Morocco, Algeria, Turkey, Italy). France also imports ammonium nitrate exclusively from Antwerp via river-sea transport up to Rouen, on the Seine.

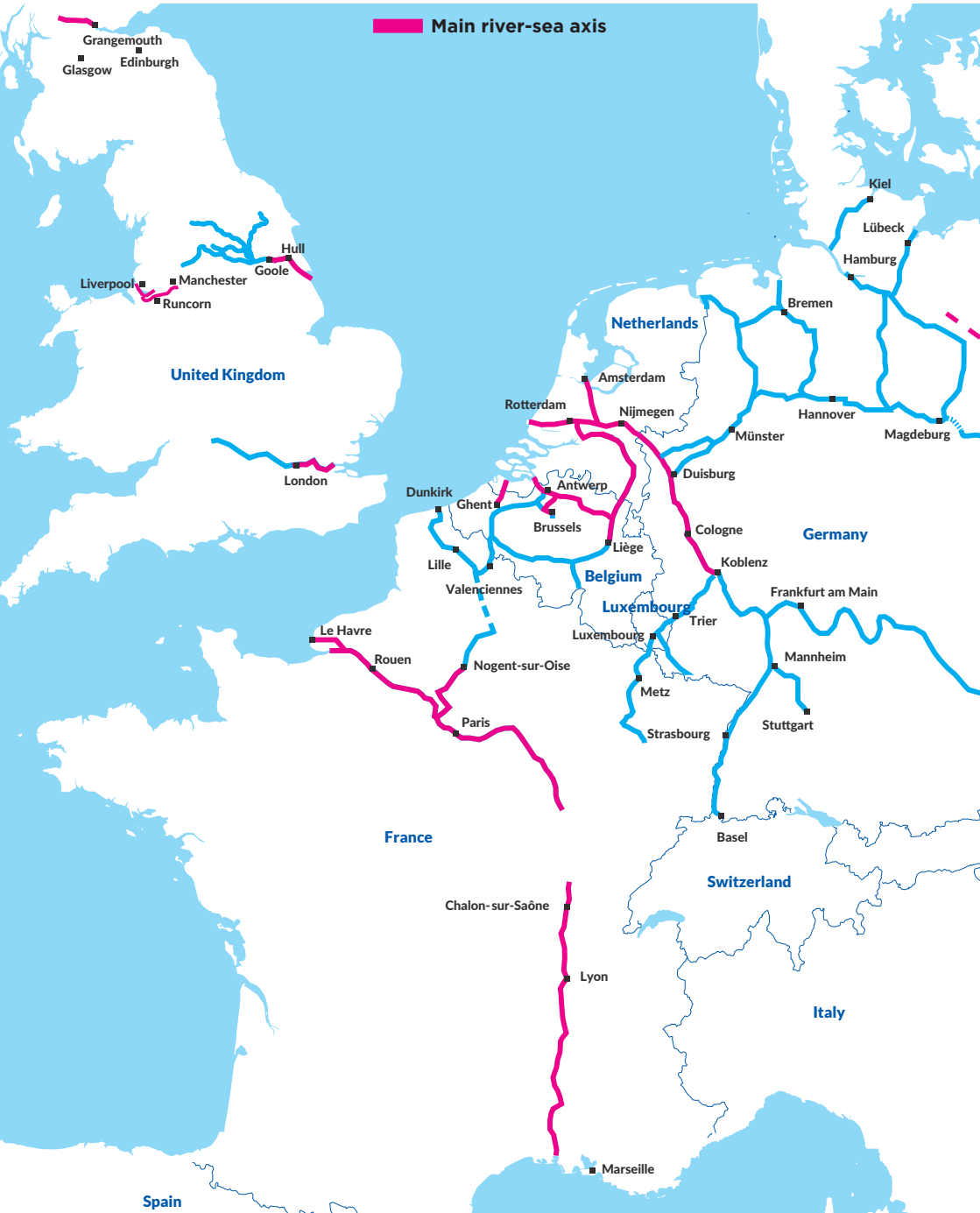
Trading partners of Finland are mainly Russia, the Netherlands, the Baltic states and Germany.

River-sea-transport in Romania is orientated towards the Mediterranean region of southern Europe.

Overall, at present, almost 64 million tonnes of goods are transported via river-sea transport in the European Union. Almost 25 million tonnes of goods are transported via river-sea transport in Russia.

RIVER-SEA TRANSPORT IN EUROPE: THE CASE OF SEAGOING SHIPS NAVIGATING ON INLAND WATERWAYS

KEY RIVER-SEA AREAS IN EUROPE



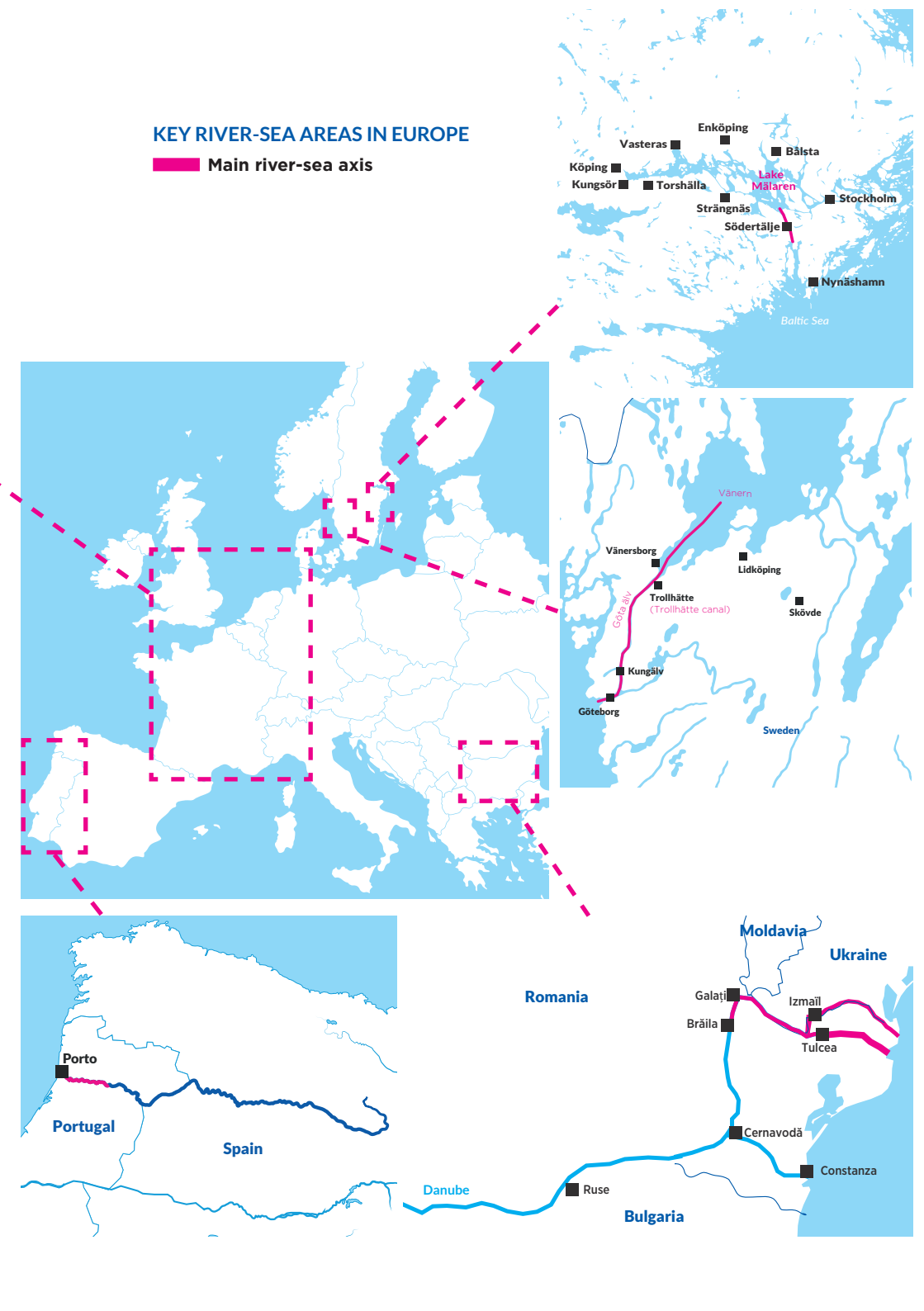

KEY RIVER-SEA AREAS IN EUROPE
Main river-sea axis
Enköping
Vasteras
Bålsta
Köping
Kungsör
Torshälla
Lake Mälaren
Stockholm
Strängnäs
Södertälje
Nynäshamn
Baltic Sea
Vänern
Vänersborg
Lidköping
Trollhätte (Trollhätte canal)
Göta älv
Skövde
Kungälv
Göteborg
Sweden
Porto
Portugal
Spain
Romania
Moldavia
Ukraine
Galați
Izmaïl
Brăila
Tulcea
Cernavodă
Constanza
Danube
Ruse
Bulgaria

TABLE 1: OVERVIEW OF RIVER-SEA TRANSPORT IN EUROPE PERFORMED BY SEAGOING SHIPS

Country	Transport volume river-sea (mio. t)*	Transport volume IWT (mio. t)*	Most important goods segment within river-sea transport
Great Britain	47.6	4.1**	Crude petroleum and petroleum products
Russia	25	115	Oil and oil products, grain, coal, timber, metals, fertilizers
Sweden	6.62	0	Timber and oil products
Romania	4.50	29	Agricultural products
Netherlands	4.48	359	Iron and steel
Belgium	1.9	205	Iron and steel
Finland	1.3	0.4	Timber and raw minerals
Germany	0.76	198	Iron and steel
France	0.75	60	Ores, metallurgical scraps and metal products, agricultural products

Source: CCNR analysis based on national statistical offices of the countries mentioned in the table, TrafikAnalys, Rijkswaterstaat, Russian Chamber of Shipping
** Figures for 2018 for Finland, France, Germany, Romania, Sweden, Russia and the Netherlands; figures for 2017 for Belgium and Great Britain*
*** River-sea traffic in Great Britain is 11.6 times higher than pure inland waterway traffic*

If river-sea transport was understood as part of the total inland waterway transport figures in the UK, Finland, and Romania, the total transport volumes for inland waterway transport would soar. In Belgium, Germany and France, river-sea transport represents less than 1.5% of total inland waterway transport. In Sweden, this comparison is less relevant as no inland waterway transport is currently recorded.

LEGAL AND ECONOMIC ASPECTS RELATED TO RIVER-SEA TRANSPORT PERFORMED BY SEAGOING SHIPS

Seagoing ships that perform river-sea transport are intended to navigate both on inland waterways and at sea, without a transhipment in a seaport. They have an International Maritime Organisation (IMO) number. They must therefore be able to navigate in both areas and comply with specific classification rules. They must be built under the supervision of a recognised Classification Society in accordance with its classification requirements.

In addition, they must comply with regulatory requirements in force in both sea and inland waterway areas. Technical rules related to the equipment and safety of vessels have been settled in an EU directive that apply to all IWWs in Europe[6]. However, seagoing ships with statutory seagoing ship certificates (technical requirements as regards construction, equipment and environment) such as SOLAS, Load Lines, or MARPOL[7], are allowed to operate on tidal waters or temporarily on EU IWW[8] without having to comply with the technical requirements prescribed in this EU directive. Outside the Rhine, as far as these requirements are fulfilled, a river-sea ship can therefore navigate on inland waterways up to the point where the navigation conditions simply do not allow it to navigate any further (depending on the waterways' and river-sea ships' characteristics).

Regarding the Rhine in particular, specific technical requirements apply to vessels navigating on the Rhine. This also applies to seagoing ships on the Rhine, which, as well as a seagoing ship statutory certificate must also hold a "certificate for seagoing vessels operating on the Rhine"[9]. In addition, seagoing ships carrying liquid or gas dangerous goods may navigate on EU inland waterways only if they hold an ADN certificate[10].

[6] *EU Directive 2016/129 laying down technical requirements for inland waterway vessels: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32016L1629*
[7] *Safety of Life at Sea (SOLAS), Load Lines (LL), Prevention of Marine Pollution from ships (MARPOL)*
[8] *Article 2 of EU Directive 2016/129*
[9] *In compliance with Article 25.01.2 of the European Standard laying down Technical Requirements for Inland Navigation vessels laying down special provisions applicable to seagoing ships navigating on the Rhine: https://www.cesni.eu/wp-content/uploads/2018/12/ES_TRIN_2019_en.pdf*
[10] *European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN)*

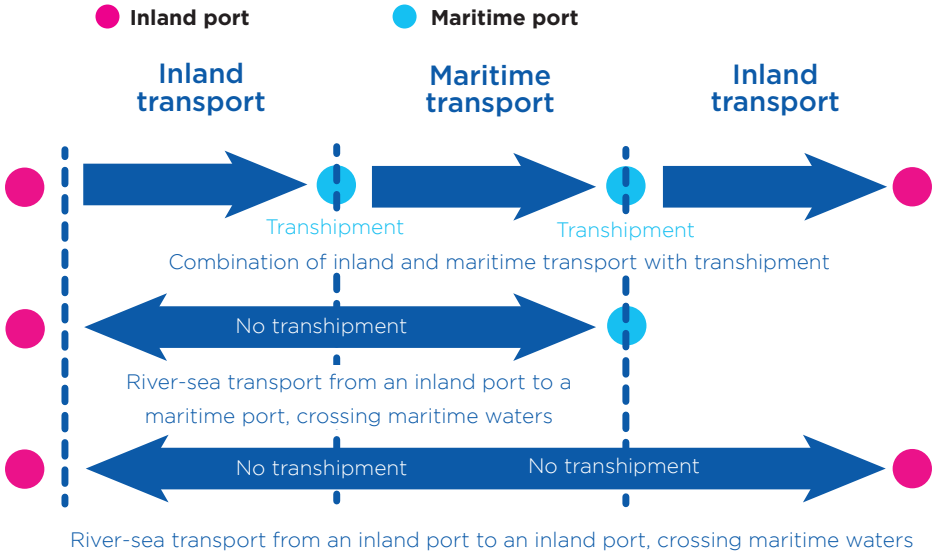
RIVER-SEA TRANSPORT IN EUROPE: THE CASE OF SEAGOING SHIPS NAVIGATING ON INLAND WATERWAYS

Regarding environmental requirements, seagoing ships adapted to navigate on inland waterways must comply with environmental requirements applicable to seagoing ships, in particular IMO pollution and emission standards, and not with those applicable to inland vessels.

Beyond regulatory and statutory requirements, conditions for river-sea shipping also vary between countries and depend greatly on the geographical situation, the sailing area, the waterways infrastructure and weather conditions. Indeed, river-sea ships are often designed for operation in a specific sailing area and have to comply with the length and width requirements as well as draft and height restrictions, specific to the region where they operate. For instance, seagoing ships navigating on the Saimaa inland waterways (lake system in Finland) must have ice class.

River-sea transport performed by seagoing ships must not be confused with transport operations combining inland and maritime transport, requiring transhipment operations between the two.

DIFFERENCE BETWEEN RIVER-SEA TRANSPORT AND COMBINED INLAND AND MARITIME TRANSPORT



The strong advantage of river-sea shipping lies in the absence of seaport transhipment. This results in lower transport costs, time-saving (avoiding possible congestion and related delays in a seaport), and a reduced risk of damage to goods resulting from additional transhipment. River-sea shipping is therefore well adapted to carrying fragile goods (such as paper), goods which need to be transported under very strict "non-damage-conditions" (besides paper, also certain metals and metal products), as well as project cargo (oversized and heavy cargo and equipment).

Another advantage of this type of transport is found in its unique market range, allowing seagoing ships to connect overseas destinations with locations quite far in the hinterland. Indeed, a wide range of ships of different size and capacity is available, with the newest ships often being characterised by lower draught, allowing them to navigate further in the hinterland. For instance, from the port of Duisburg, some river-sea ships are able to carry project cargo all the way to the Iberian Peninsula and Casablanca without transhipment. In addition, it is an environmentally friendly mode of transport. According to the main actors in the river-sea sector, these environmental considerations and political support towards modal shift to greener modes can therefore positively influence demand for this type of transport.

However, as explained above, river-sea ships must be adapted to navigate on IWW, and river-sea shipping is dependent on the state of inland navigation, the related infrastructure and the water levels. The proper development and maintenance of inland waterway infrastructure (in particular ageing of bridges and locks) and the waterways themselves is paramount for the good-functioning of river-sea transport. As is the case for pure inland waterway transport, the lack of predictability (e.g. variation in freight rates) and reliability (delays, variation in water level) of river-sea transport can negatively influence demand for this kind of transport. An important challenge for river-sea shipping therefore lies in its ability to provide transport services all year long and under all weather conditions. In addition, the "just-in-time principle" is hard to maintain with high variations in accessibility of river ports.

RIVER-SEA TRANSPORT IN EUROPE: THE CASE OF SEAGOING SHIPS NAVIGATING ON INLAND WATERWAYS

River-sea ships are also limited in their capacity when navigating on inland waterways, making it difficult for such seagoing ships to realize economies of scale. Moreover, river-sea ships are constructed more heavily and have a smaller displacement volume at similar draft (i.e. a smaller block coefficient) than inland vessels. In addition, river-sea shipping often competes with a combination of maritime and inland waterway transport involving transhipment, in particular when handling rates and inland waterway freight rates are low. River-sea ships are also expensive to build and to operate. For all these reasons, river-sea shipping therefore finds its economic rationale in very specific segments and routes.

Additional challenges that river-sea transport is facing have also been identified by the main actors in this market[11]:

- Language: English not commonly accepted on all inland waterways.
- Ageing fleet: about half of the river-sea fleet is more than 25 years old. About one-third of the fleet is less than 15 years old. Indeed, for companies that have not recently invested in their fleet, new fleet investment is generally considered or approved, in particular to renew an ageing fleet, to anticipate a shortage of river-sea ships in light of increasing demand, or to invest in new engines. However, the high costs related to new river-sea ships can be a barrier.
- General lack of knowledge about river-sea transport.

[11] *In particular, members from the EBU river-sea shipping Committee*

RIVER-SEA GOODS TRANSPORT IN MAIN EUROPEAN UNION COUNTRIES

River-sea transport in the United Kingdom

Definitions and waterway areas

According to definitions by the National Department for Transport, river-sea transport is defined as all seagoing traffic that crosses into inland waters, thereby passing the inland waterways boundary, which is a geographically defined boundary in the estuary region of rivers. The location of this boundary is defined via the average wave height. The boundary itself is a straight line between two points at shore. The exact definition of the UK Department of Transport states that this inland waterway boundary is defined as "the most seaward point of any estuary which might reasonably be bridged or tunnelled [and] this is taken to be where the width of water surface area is both less than 3 km at low water and less than 5 km at high water on spring tides."[12]

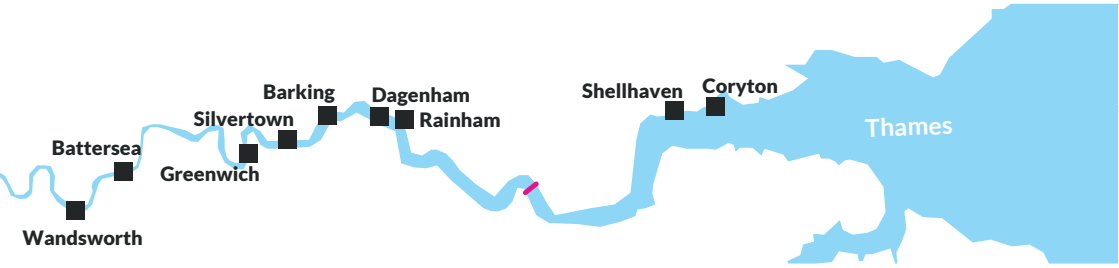
The next four maps cover the four estuary areas in the UK with the highest level of river-sea transport. They show the Inland Waterways Boundary (IWB, in pink) and the most important ports and wharves along the rivers. The blue line shows the so-called Smooth Waterline, which should not be confounded with the IWB. All transport that remains completely within this Smooth Waterline is counted as pure (internal) inland waterway traffic. However, for river-sea-traffic, the IWB is relevant, and all traffic coming from or going to high sea, and crossing the IWB, is counted as river-sea traffic[13]. For the river Thames, the Smooth Waterline lies outside the part of the Thames estuary shown in the map.

[12] *Source: UK Department for Transport (2017), Domestic waterborne freight 2017: notes and definitions*
[13] *Source: UK Department for Transport (2017), Domestic waterborne freight 2017: notes and definitions*


River-sea axis
Teith
Forth
Grangemouth
Glasgow
Edinburgh
Scotland
Northern Ireland
Eden
Tyne
Manchester Ship Canal
Liverpool
Manchester
Derwent
Aire
Hull
Mersey
Runcorn
Goole
Humber
Dee
Derwent
Trent
Severn
Avon
Wales
Wye
England
Stour
Thames
London
Medway

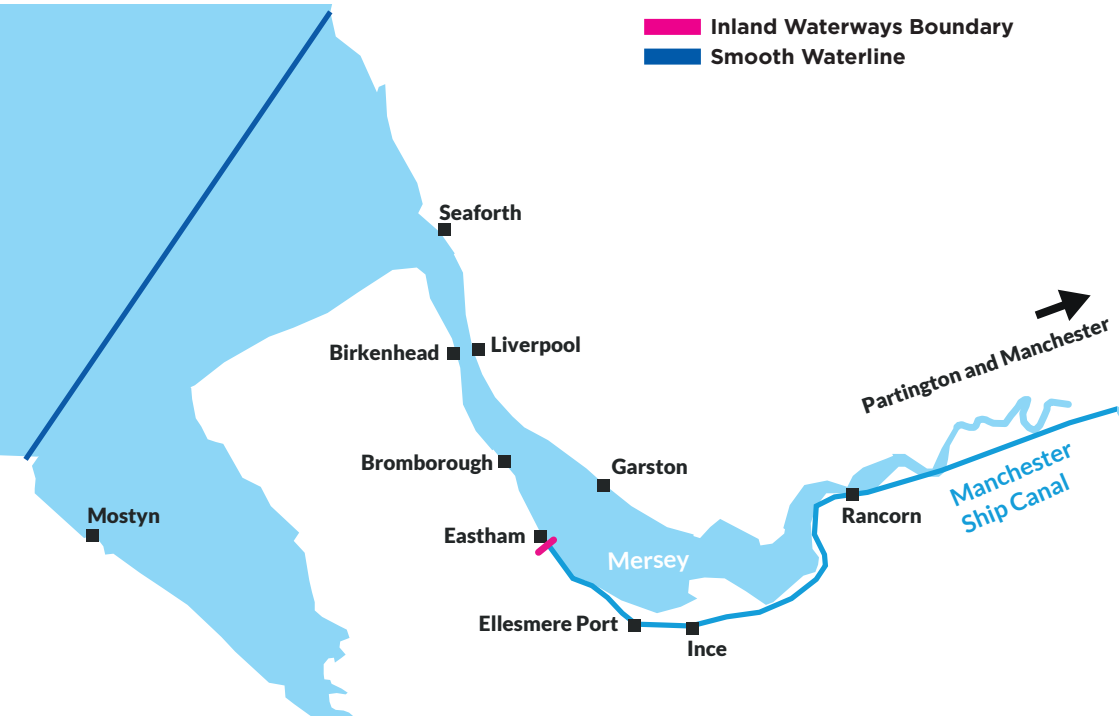
RIVER-SEA TRANSPORT IN EUROPE: THE CASE OF SEAGOING SHIPS NAVIGATING ON INLAND WATERWAYS

RIVER THAMES WITH INLAND WATERWAY BOUNDARY* AND PORTS AND WHARVES FOR RIVER-SEA TRANSPORT



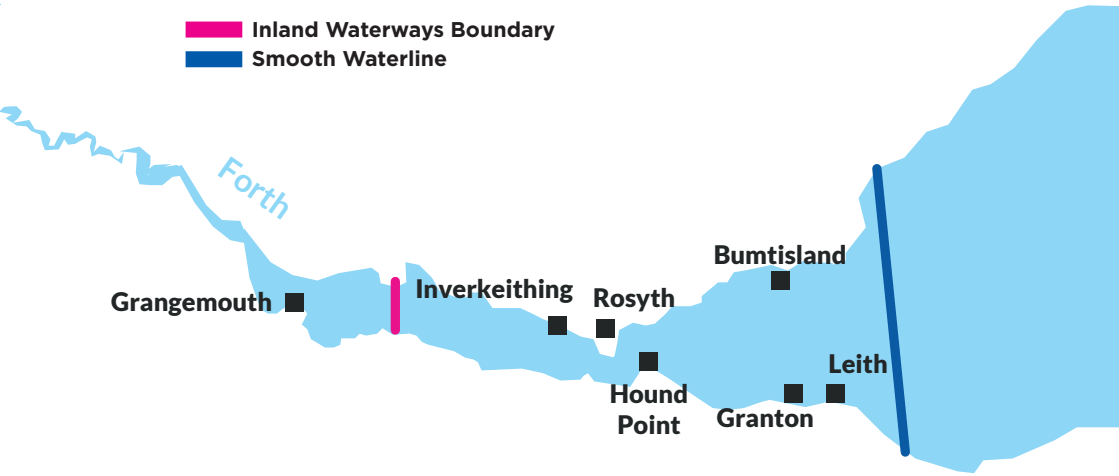
Source: UK Department for Transport/CCNR
** In pink*

MANCHESTER SHIP CANAL/RIVER MERSEY WITH INLAND WATERWAY BOUNDARY AND PORTS AND WHARVES FOR RIVER-SEA TRANSPORT



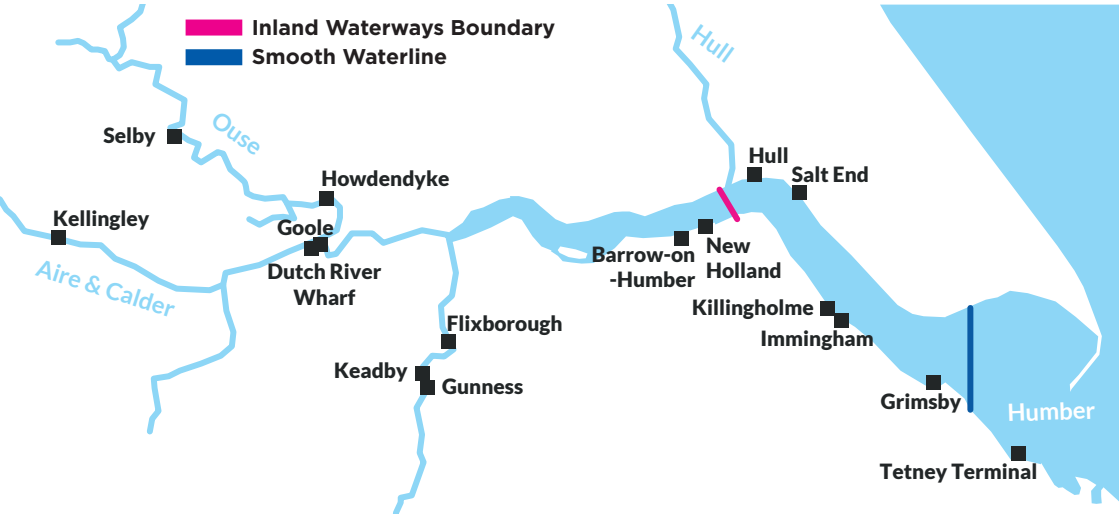
Source: UK Department for Transport/CCNR

RIVER FORTH WITH INLAND WATERWAY BOUNDARY AND PORTS AND WHARVES FOR RIVER-SEA TRANSPORT



Source: UK Department for Transport/CCNR

RIVER HUMBER WITH INLAND WATERWAY BOUNDARY* AND PORTS AND WHARVES FOR RIVER-SEA TRANSPORT

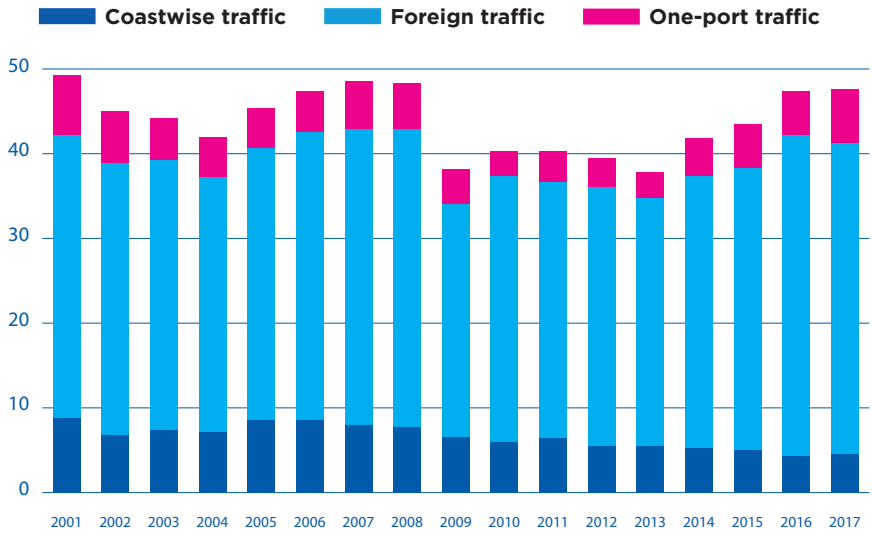


Source: UK Department for Transport/CCNR

Transport by origin and destination

In the UK, the amount of cargo transported by river-sea shipping is by far the largest compared to any other western European country. River-sea traffic can be split into three components: foreign traffic (coming from foreign countries or going to foreign countries), coastwise traffic (seagoing traffic between UK seaports and ports inside the Inland Waterway Boundary) and one-port traffic (seagoing traffic between national offshore installations and ports inside the Inland Waterway Boundary). Foreign traffic has by far the largest share within river-sea traffic in the UK. Its share was between 76% and 80% between 2014 and 2017.

FIG.1: EVOLUTION OF TOTAL RIVER-SEA TRANSPORT IN THE UK
(IN MIO. T)*



Source: UK Department for Transport

** Represents all seagoing traffic on inland waters according to the definitions of the UK Department for Transport (foreign traffic, coastwise traffic, one-port traffic)*

The overall amount of river-sea traffic shows a clear cyclical pattern. The curve reflects to a large extent the overall business cycle movements in Europe, in particular a falling economic activity after the financial crisis in 2000, followed by a rising tendency in world trade and production between 2003 and 2008, another financial crisis between 2009 and 2013, and another recovery since then.

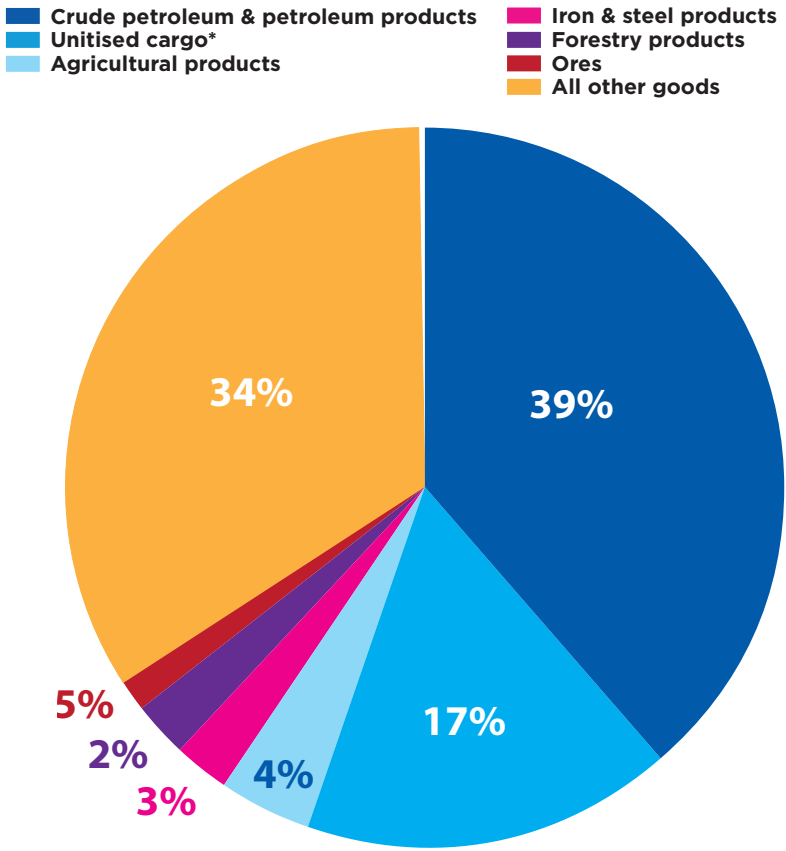
Forth

Transport by type of good

The product segment with the largest share in river-sea transport is the liquid bulk segment of crude petroleum and petroleum products. In the years 2014-2017, its share fluctuated between 37% and 40%. All kinds of liquid bulk taken together had a share of 43% in 2017.

Dry bulk (agricultural products, iron ore, coal, etc.) represented 33% in 2017. Unitised cargo (containers, pallets, etc.) came next with a share of 17%, followed by general cargo (forestry products, iron and steel products and other products) with 7%.

FIG.2: RIVER-SEA TRANSPORT IN THE UK BY TYPE OF GOODS IN 2017



Source: UK Department of Transport

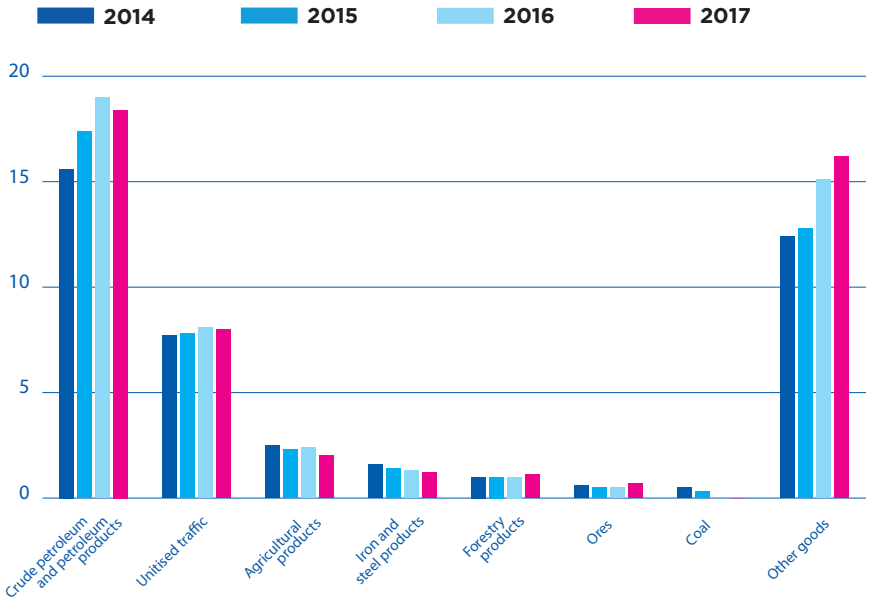
** Unitised cargo = containers, pallets, etc.*

Type of goods	Coastwise (in mio.t)	Foreign (in mio.t)	One-port (in mio.t)	Total (in mio.t)
Liquid bulk *of which:*	1.7	18.9	0.0	20.6
Crude petroleum and petroleum products	1.4	17.0	0.0	18.4
Dry bulk *of which:*	2.5	6.8	6.4	15.7
Ores	0.2	0.5	0.0	0.7
Coal	0.0	~	0.0	~
Agricultural products	0.2	1.7	0.0	2.0
Unitised cargo	0.2	7.8	0.0	8.0
General cargo *of which:*	0.2	3.1	0.0	3.3
Forestry products	0.0	1.1	0.0	1.1
Iron and steel products	0.0	1.2	0.0	1.2
Total	4.6	36.6	6.4	47.6

Source: UK Department of Transport
** Unitised cargo = containers, pallets, etc.*

Humber

FIG.3: EVOLUTION OF RIVER-SEA TRANSPORT IN THE UK BY TYPE OF GOODS 2014-2017 (IN MIO. T)

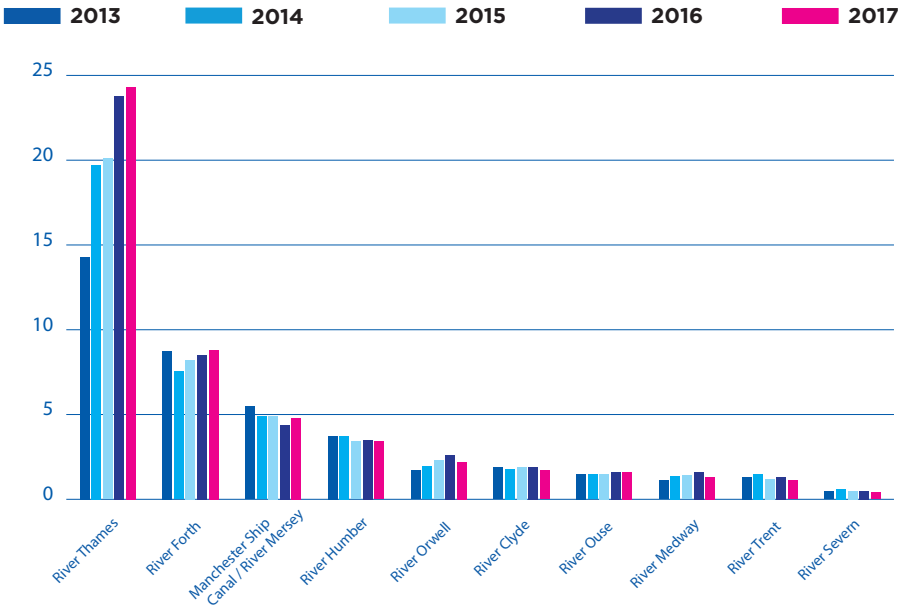


Source: UK Department for Transport

Transport volume by inland waterway

The River Thames is in first place in regard to the amount of cargo transported by river-sea transport, with 24.3 million tonnes in 2017. Its river-sea traffic has grown substantially since 2013, and in general, largely determines the trend of the total river-sea traffic in the country, as described in the figure below. In second place comes the River Forth, a broad estuary in the eastern part of Scotland, and in third place the Manchester Ship Canal/River Mersey.

FIG.4: RIVER-SEA TRANSPORT IN THE UK BY INLAND WATERWAY



Source: UK Department for Transport

Along the Thames, in and around London, several wharves handle both pure inland waterway traffic and seagoing traffic that cross into the River Thames. According to the UK Department for Transport, these wharves are: Barking (London), Croydon (London), Dagenham (London), Erith (London), Greenwich (London), Northfleet (London), Purfleet (London), Silvertown (London), Tilbury (London)[14].

Outlook and specific developments

No specific infrastructure developments have been reported.

As the UK is often a key trading partner for countries which have river-sea transport, this method of transport may be affected if Brexit leads to a decrease in overall transport volumes (in particular the automotive industry for which steel products are traded). The possible impact of Brexit on customs procedures will also affect river-sea transport.

[14] *Source: UK Department for Transport (2018), Domestic Waterborne Freight 2017: Notes and Definitions*

River-sea transport in Sweden

Definitions and waterway areas

Sweden currently has two classified inland waterways areas:

- The Port of Gothenburg, the Göta Alv river and Lake Vänern. The Göta Alv river, in conjunction with the Trollhätte Canal, connects the North Sea with Lake Vänern. Trollhätte Canal has six locks.
- The Södertälje Canal, Lake Mälaren and parts of the Stockholm area. The Södertalje Canal connects the Baltic Sea with Lake Mälaren. The canal is 3.3 nautical miles long and has one lock. The lock is 135 metres long (it was previously 110 meters long).

The Swedish Transport Agency has classified more waterways, such as the Göta Canal (connecting Lake Vänern to the Baltic sea) and inner coastal waterways, but these areas have not yet been ratified by the government.

Since the implementation of the European Directive 2016/1629[15] laying down technical requirements for inland waterway vessels, no inland waterway transport in Sweden has been recorded. However, as the above-mentioned waterways enable unproblematic river-sea connections between the North Sea, the Baltic Sea and the interior of the country, there is a successful integration of river-sea shipping in Sweden.

International transport from and to these waterway areas is operated by seagoing ships, which necessarily cross both maritime and inland waterway areas. All international transport operations to and from these waterway areas can therefore be considered as river-sea transport. Similarly, domestic transport operations between ports on the Swedish coast and inland ports located on the above-mentioned waterways can be considered as river-sea transport.

[15] *Directive (EU) 2016/1629 of the European Parliament and of the Council of 14 September 2016 laying down technical requirements for inland waterway vessels, amending Directive 2009/100/EC and repealing Directive 2006/87/EC*

The infrastructure – lakes, rivers, canals and inner coastal areas – are regarded as being very good. They have suitable depth and no tide or currents, allowing river-sea transport to be performed by seagoing ships with important tonnage capacity:

- Between 3,000 and 4,000 tonnes for seagoing ships reaching Lake Vänern through the Trollhätte Canal;
- Up to 9,000 tonnes for seagoing ships reaching Lake Mälaren through the Södertälje Canal.

RIVER-SEA TRANSPORT IN EUROPE: THE CASE OF SEAGOING SHIPS NAVIGATING ON INLAND WATERWAYS

Today, detailed data regarding inland, maritime and river-sea transport are collected by the Swedish government agency for transport policy analysis (TrafikAnalys). However, as data-collection related to inland waterway areas began after 2016 (i.e. after the implementation of Directive 2016/1629), accurate data for river-sea transport are only available for 2017 and 2018. In addition, and for reasons of confidentiality, no detailed data regarding river-sea transport can be published, in particular related to the type of goods, the main trading partners and the ports of loading and unloading.

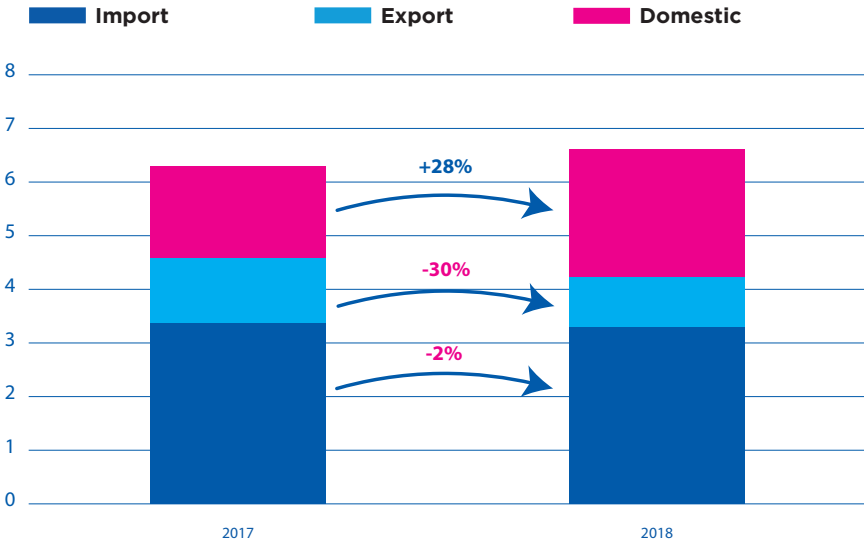
A mirror analysis and available literature however allows the identification of the main goods segments relevant for river-sea transport in Sweden, which are timber/wood products, oil products, crude iron and steel.

In the case of Sweden, it will therefore be important to analyse river-sea figures in a few years' time in order to identify a trend for its river-sea transport, but also to provide more in-depth data if confidentiality concerns are removed.

Transport by origin and destination

In 2018, 6.62 million tonnes of goods were transported via river-sea transport to, from and within Sweden, of which 3.3 million tonnes consist of imports and 0.93 million tonnes consist of exports. Domestic river-sea transport amounted to 2.4 million tonnes. Between 2017 and 2018, overall river-sea transport in Sweden increased by 5%.

FIG.5: EVOLUTION OF TOTAL RIVER-SEA TRANSPORT IN SWEDEN IN 2017 AND 2018 (IN MIO. T)*



Source: TrafikAnalys

Outlook and specific developments

In Sweden, river-sea actors are calling for further alignment of the Swedish inland waterway regulation (implementing the EU Directive 2006/87) with other inland water regulations in the EU, in order to strengthen the competitivity of river-sea transport. Sweden is also one of the very few countries that applies fairway dues for calling ships (with fees dependent on the size of the ship and the weight of the cargo carried). Added to this, pilot fees are expensive.

River-sea transport in Romania

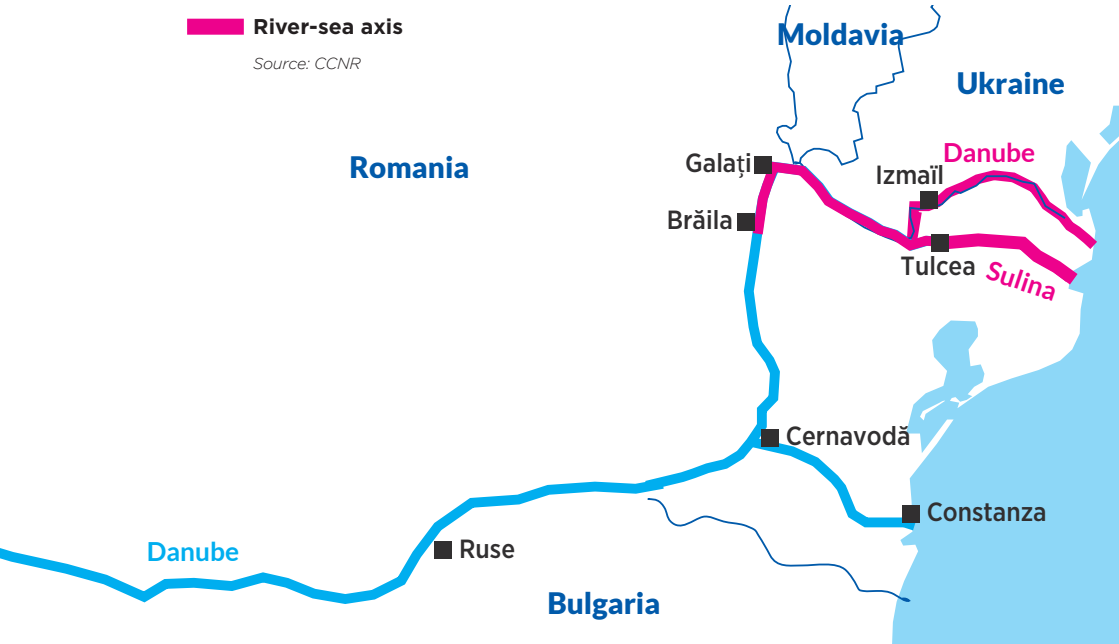
Definitions and waterway areas

The Lower Danube region in Romania plays an important role for river-sea transport in Europe. Three categories of Danube ports can be identified in Romania: seaports (such as the port of Constanza), river-sea ports (Galati, Braila and Tulcea) and river ports.

The river-sea status of the ports of Galati, Braila and Tulcea enables seagoing ships coming from the Black Sea to sail upstream on the Danube to these ports where they can load or unload cargo. The statistical data concerning these three ports are therefore a major source for evaluating the level and the structure of river-sea transport on the Lower Danube.

Braila is the boundary port between the "maritime" Danube and the "river" Danube. Downstream of Braila, the Danube is often also called the "maritime Danube", due to its river-sea character. Upstream of Braila, Danube traffic is classic river traffic[16]. Galati is the biggest river-sea port in Romania and the city of Galati hosts a large industrial area (steel industry).

[16] See the article by Radu SAGEATA (2011), River and Sea transports in Romania in the EU strategy for the Danube region perspective



Transport by origin and destination

Data from the Romanian National Institute of Statistics indicate a volume of almost 1.9 million tonnes of traffic loaded or unloaded by seagoing ships in 2018 in the three river-sea ports mentioned above. The three ports of Galati, Braila and Tulcea represent the river-sea ports of Romania, while Constanza is a seaport.

TABLE 2: CARGO VOLUME TRANSHIPPED BY SEAGOING VESSELS IN THE ROMANIAN RIVER-SEA PORTS OF GALATI, TULCEA AND BRAILA (IN 1,000 TONNES)

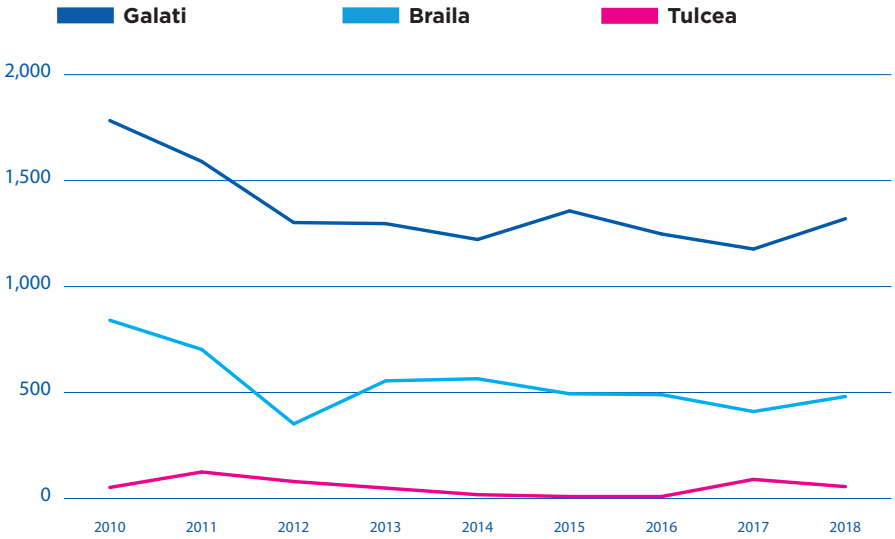
	2010	2011	2012	2013	2014	2015	2016	2017	2018
Galati	1,783	1,590	1,301	1,297	1,222	1,357	1,248	1,177	1,320
Braila	841	703	352	555	565	494	490	410	481
Tulcea	52	125	80	49	18	9	9	90	56
Total	2,676	2,418	1,742	1,901	1,805	1,860	1,747	1,677	1,857

Source: Romanian National Institute of Statistics (several annual reports of the series "Harbour transport of goods and passengers")

The evolution of river-sea traffic in the three Romanian river-sea ports has shown a constant tendency since 2012, but a certain decrease between 2010 and 2012.

Sulina

FIG.6: EVOLUTION OF RIVER-SEA TRANSPORT IN ROMANIAN RIVER-SEA PORTS (IN 1,000 TONNES)



Source: Romanian National Institute of Statistics (several annual reports of the series "Harbour transport of goods and passengers")

There is no detailed statistical information about the countries of loading and unloading of cargo transhipped by river-sea transport for Romania. However, the following table shows that non-EU countries play a quite important role in export traffic (loaded goods). From the Danube Commission's Market Observation, it can be concluded that the countries of loading and unloading are located mainly in the Mediterranean basin, and in particular in northern Africa, as agricultural products are exported from the Danube region to north Africa and to Spain.

TABLE 3: STRUCTURE OF CARGO VOLUME TRANSHIPPED BY SEAGOING SHIPS IN THE RIVER-SEA PORTS OF GALATI, TULCEA, BRAILA (IN 1,000 TONNES, 2018)

	Loaded goods (exports)		Unloaded goods (imports)		Total
	Intra EU trade	Extra EU trade	Intra EU trade	Extra EU trade	
Galati	396	560	75	289	1,320
Braila	258	152	35	36	481
Tulcea	6	0	50	0	56
Total	660	712	160	325	1,857

Source: Romanian National Institute of Statistics

Apart from the loading and unloading activities of seagoing ships in the three river-sea ports themselves, the Sulina Canal, which runs from Tulcea to the Black Sea, is mainly used by seagoing ships.

Regarding the volume of cargo traffic on the Sulina Canal, viadonau's annual report explains that within maritime transport on the Danube, via river-sea ships or sea ships, 4.3 million tonnes of goods were transported via the Romanian Sulina Canal in 2017 (+14.4% compared to 2016)[17].

In addition, the Danube Commission's market observation reports mention the Sulina Canal as a waterway with river-sea traffic and indicate the same amount of traffic as viadonau.

TABLE 4: RIVER-SEA TRANSPORT ON THE SULINA CANAL, LINKING THE BLACK SEA WITH THE DANUBE (IN MIO. T)

	2014	2015	2016	2017	2018
Total	3.66	3.85	3.76	4.31	4.44
Danube → Black Sea	3.24	3.26	3.25	3.61	3.67
Black Sea → Danube	0.42	0.58	0.51	0.70	0.77

Source: Danube Commission market observation

[17] *Source: viadonau (2019), Jahresbericht Donauschifffahrt in Österreich (Annual Report on Danube Navigation in Austria), page 41*

A third waterway with river-sea traffic, although at a lower degree, is the Danube-Black Sea Canal, that runs between the seaport Constanza and the Danube. In 2017, according to viadonau, 57,000 tonnes of cargo were transported by river-sea ships or seagoing ships on this canal. The total amount of cargo on this canal was much higher in 2017 and represented 13.8 million tonnes.

Navigation on the Danube is endangered in winter, when the water freezes once every 2-3 years for a period of some 30-40 days, with floating ice blocks on the channel when the ice thaws.

The difference between the volumes documented for the Sulina Canal (4.4 million tonnes) and the volumes documented for the three Romanian river-sea ports (1.86 million tonnes) can be explained by the fact that the Sulina Canal not only relays the three Romanian river-sea ports to the Black Sea, but also the large Ukrainian ports of Izmail, Reni, and the Moldavian port of Giurgiulesti. These Ukrainian and Moldavian ports are located on the "maritime" stretch of the Danube. Their river-sea cargo volumes are of course not taken into account by the Romanian National Institute of Statistics.

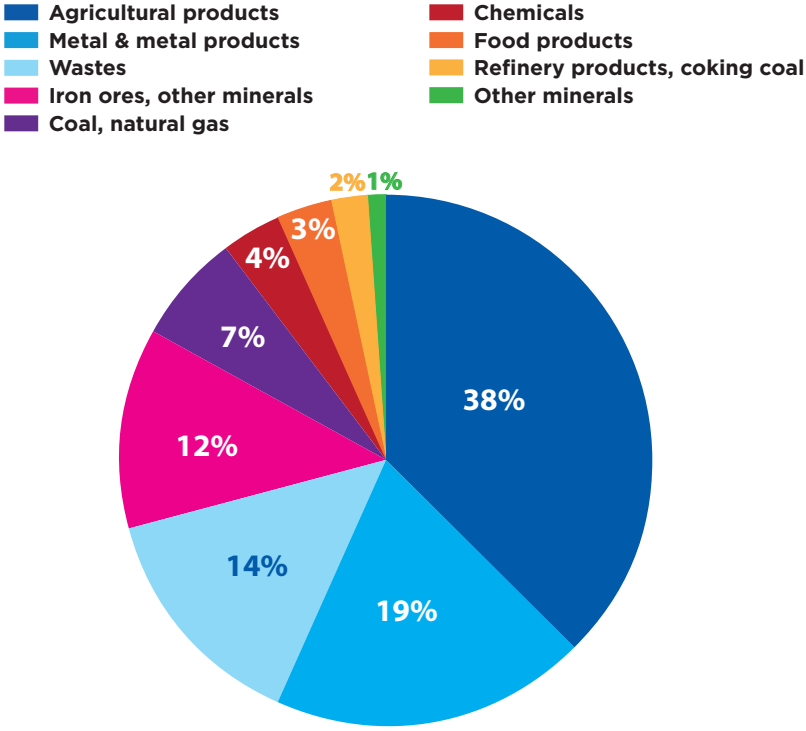
Transport by type of good

The goods transhipped by seagoing ships are mainly dry cargo and conventional cargo. The most important goods categories in the port of Galati are metals and metal products (27% of total river-sea traffic in 2018), agricultural products (22% of total river-sea traffic in 2018), iron ores (14% of total river-sea traffic in 2018).

In Braila, 84% of the total river-sea traffic (481,000 tonnes in 2018) was represented by agricultural products in 2018. In Tulcea, 50,000 of the 56,000 tonnes transhipped were made up of iron ores.

The detailed structure of the river-sea cargo traffic in these ports (taken together) is seen in the following figure.

FIG.7: STRUCTURE OF RIVER-SEA TRAFFIC IN THE ROMANIAN PORTS OF GALATI, BRAILA AND TULCEA

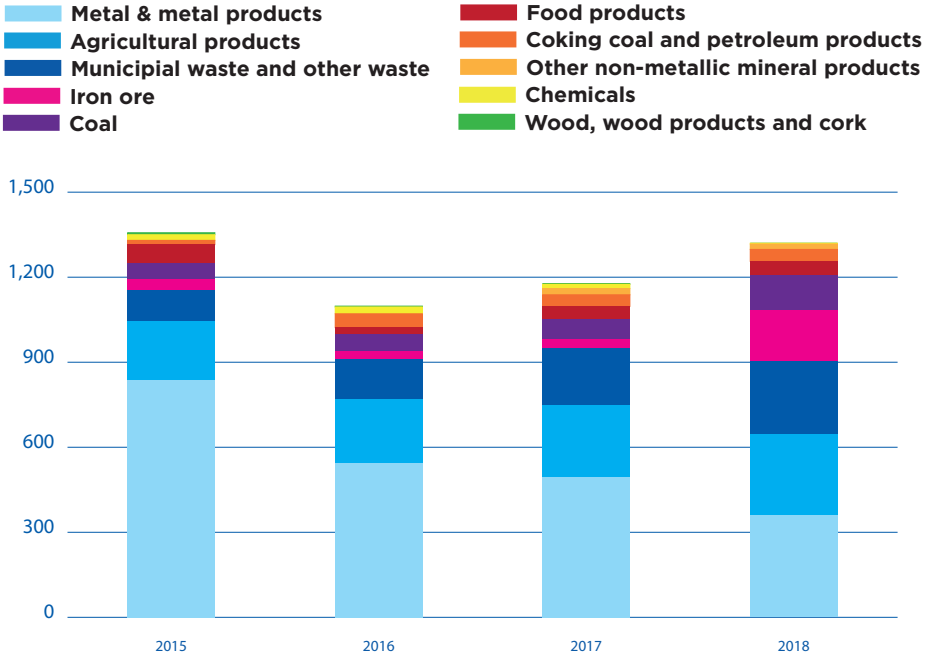


Source: CCNR analysis based on data from the Romanian National Institute of Statistics[18]

With regard to the goods segments for individual ports, the river-sea port of Galati is dominated by metals and metal products, due to the local steel industry, but also offers transhipment of Agribulk. The goods category of waste and municipal waste has increased in recent years.

[18] *http://www.insse.ro/cms/sites/default/files/field/publicatii/transportul_portuar_de_marfuri_si_pasageri_anul_2018_0.pdf*

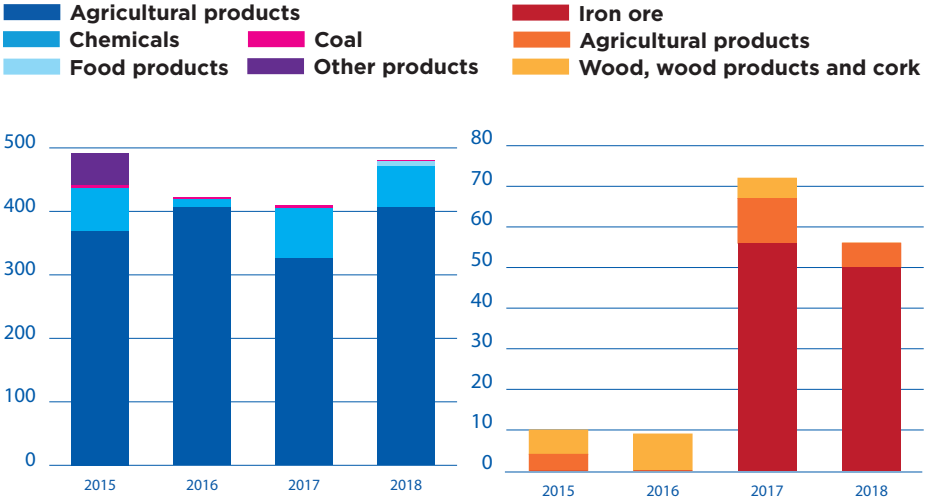
FIG.8: RIVER-SEA TRAFFIC IN THE PORT OF GALATI BY TYPE OF GOODS
(IN 1,000 TONNES)



Source: Romanian National Institute of Statistics (several annual reports of the series "Harbour transport of goods and passengers")

Braila, the second largest Romanian river-sea port exhibits a majority of grain transport, having had relatively constant volumes between 2015 and 2018. Chemicals do play another, albeit smaller role. And the smallest of the three Romanian river-sea ports, the port of Tulcea, showed a pick-up of iron ore transport in 2017 and 2018, which was not the case in the two previous years.

FIG.9: RIVER-SEA TRAFFIC IN THE PORT OF BRAILA (LEFT) **AND THE PORT OF TULCEA** (RIGHT) **BY TYPE OF GOODS** (IN 1,000 TONNES)



Source: Romanian National Institute of Statistics (several annual reports of the series "Harbour transport of goods and passengers")

Danube (Braila)

River-sea transport in the Netherlands

River-sea axis

Definitions and waterway areas

The Netherlands have a number of rivers and canals such as the Rhine, Ghent-Terneuzen Canal, Maas and IJssel and the Amsterdam-Rijnkanaal, all of which are accessible to river-sea ships.

The Dutch waterway administration Rikswaterstaat delivered a dataset in which only seagoing ship traffic is recorded. This dataset was analysed in order to extract information about river-sea transport in the Netherlands. The regions of origin (loading) and destination (unloading) were sorted out according to their location, whether along an inland or a maritime waterway. Based on this classification, river-sea traffic was defined as composed by the following two cases, trips made by seagoing ships partly by inland waterways and partly by sea between:

1. A region/city of loading located along an inland waterway and a region of unloading located either along an inland or a maritime waterway or a maritime port. If the region of unloading is along an inland waterway, the vessel must cross over maritime waterways between its origin and its destination.

2. A region/city of loading located along a maritime waterway or a maritime port and a region/city of unloading located along an inland waterway.

Trips made by seagoing ships between cities or ports that are both located along a maritime waterway, or if both origin and destination are maritime ports, were not counted as river-sea traffic, because these trips do not fulfil the definition of river-sea transport but are rather short-sea traffic.

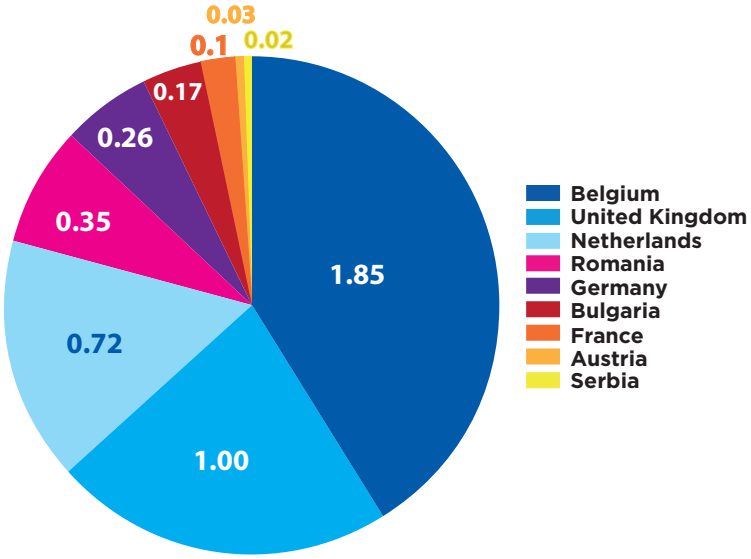
Transport by origin and destination

This analysis delivered a total volume of 4.48 million tonnes of river-sea transport in the Netherlands in 2018. The most important region of destination (where the cargo is unloaded) is the port of Ghent[19].

[19] Ghent was classified as a seaport. Trips where a seagoing ship goes from a river port (e.g. Duisburg) to Ghent were therefore classified as river-sea traffic. The same applies if a seagoing ship makes a trip from Ghent to a river port. However, trips between Ghent and another seaport, such as Amsterdam or Antwerp, were not classified as river-sea traffic but as short-sea traffic.

Indeed, seagoing ships going to Ghent must cross over Dutch territory as Ghent can only be reached via the Lower Scheldt River and the Ghent-Terneuzen Canal which are wholly or partly on Dutch territory. Around 1.75 million tonnes of cargo (39% of total river-sea transport in the Netherlands) is transported from different regions of origin to the port of Ghent. For example, from the Lower Danube in Romania or Bulgaria (Ruse), from the Lower Rhine (Port of Duisburg) as well as from London (the Thames) in the UK.

FIG.10: COUNTRIES OF UNLOADING WITHIN RIVER-SEA TRAFFIC IN THE NETHERLANDS (MIO. T) **IN 2018**



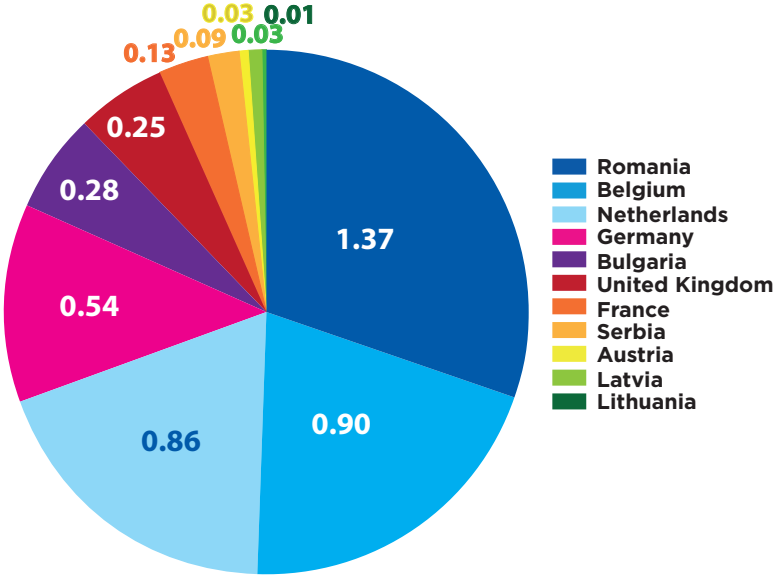
Source: CCNR analysis based on data from Rijkswaterstaat

Apart from Ghent, London plays another important role as a region of unloading, as all cargos heading towards the UK are unloaded in and around London, and have as regions of origin Ghent, the south-western part of the Netherlands (region of Zeeuwsch-Vlaanderen), and the Lower Rhine (Duisburg and Wesel in Germany as well as Arnheim and Nijmwegen in the Netherlands).

The Dutch regions of unloading are mostly in the west (region of Groot Rijnmoond) and the southwest (region of Zeeuwsch-Vlaanderen), main location of origins being the German Lower Rhine, the Romanian Lower Danube and London in the UK.

The Lower Danube also plays an important role, as 30% of river-sea cargos registered in the Netherlands come from Romania, and are unloaded mostly in Ghent in Belgium, and to a lesser extent also in Zeeuwsch-Vlaanderen, in the south-western part of the Netherlands.

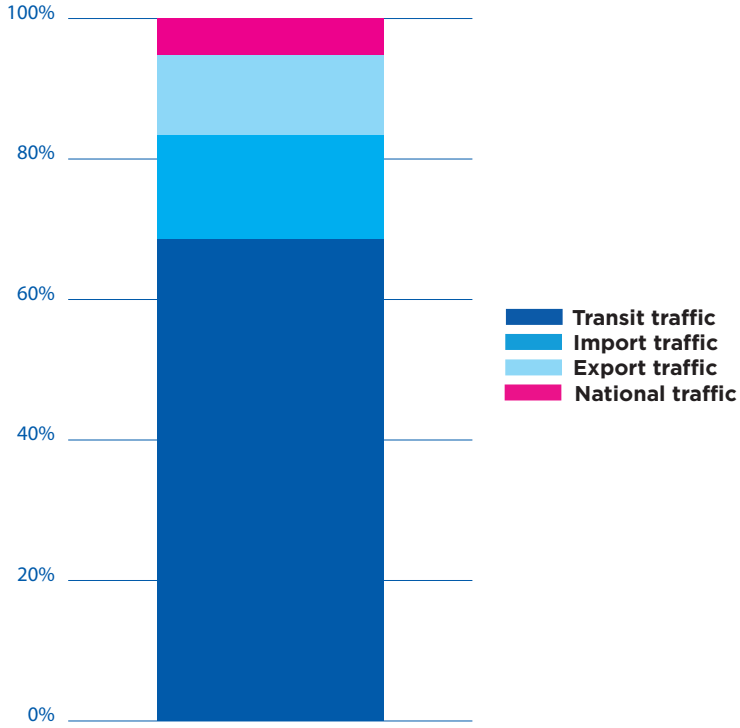
FIG.11: COUNTRIES OF LOADING WITHIN RIVER-SEA TRAFFIC IN THE NETHERLANDS (MIO. T) **IN 2018**



Source: CCNR analysis based on data from Rijkswaterstaat

The cargo that is loaded in Belgium comes almost entirely (> 99 %) from Ghent and goes mainly to London in the UK and to the Lower Danube in Romania.

FIG.12: RIVER-SEA TRANSPORT IN THE NETHERLANDS BY TYPE OF TRANSPORT IN 2018 (IN %)



Source: CCNR analysis based on data from Rijkswaterstaat

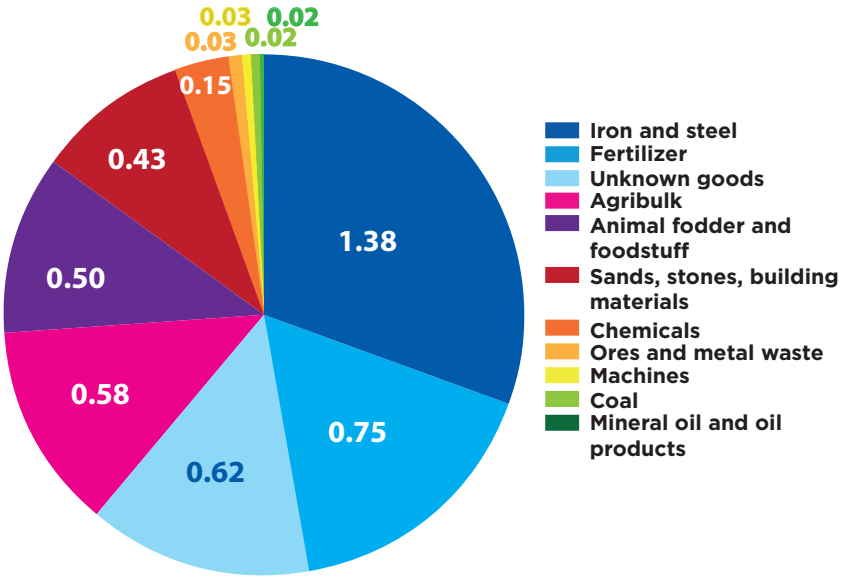
Due to the important role of the port of Ghent as port of loading and unloading of river-sea cargo, the structure of Dutch river-sea traffic is quite different compared to other countries. Indeed, 68.6 % is transit traffic, with Dutch territory as an intermediary between origin and destination of river-sea ships. Another 14.7 % is export traffic, 11.5 % is import and 5.2 % is national traffic.

Transport by type of good

Iron and steel is the most important segment, amounting to 1.38 million tonnes. The most important regions of loading for iron and steel are Ghent (0.67 million tonnes), Duisburg (0.26 million tonnes), and other regions of the Lower Rhine (Wesel: 0.05 million tonnes; Düsseldorf: 0.03 million tonnes). This result reflects the presence of large steel works in the port of Ghent (Arcelor Mittal) and in Duisburg (ThyssenKrupp). Large parts of the steel exports from Duisburg via the Netherlands have as destination the UK, and this confirms the findings of the chapter on Germany, as well as the Dutch region Groot-Rijnmoond near the North Sea.

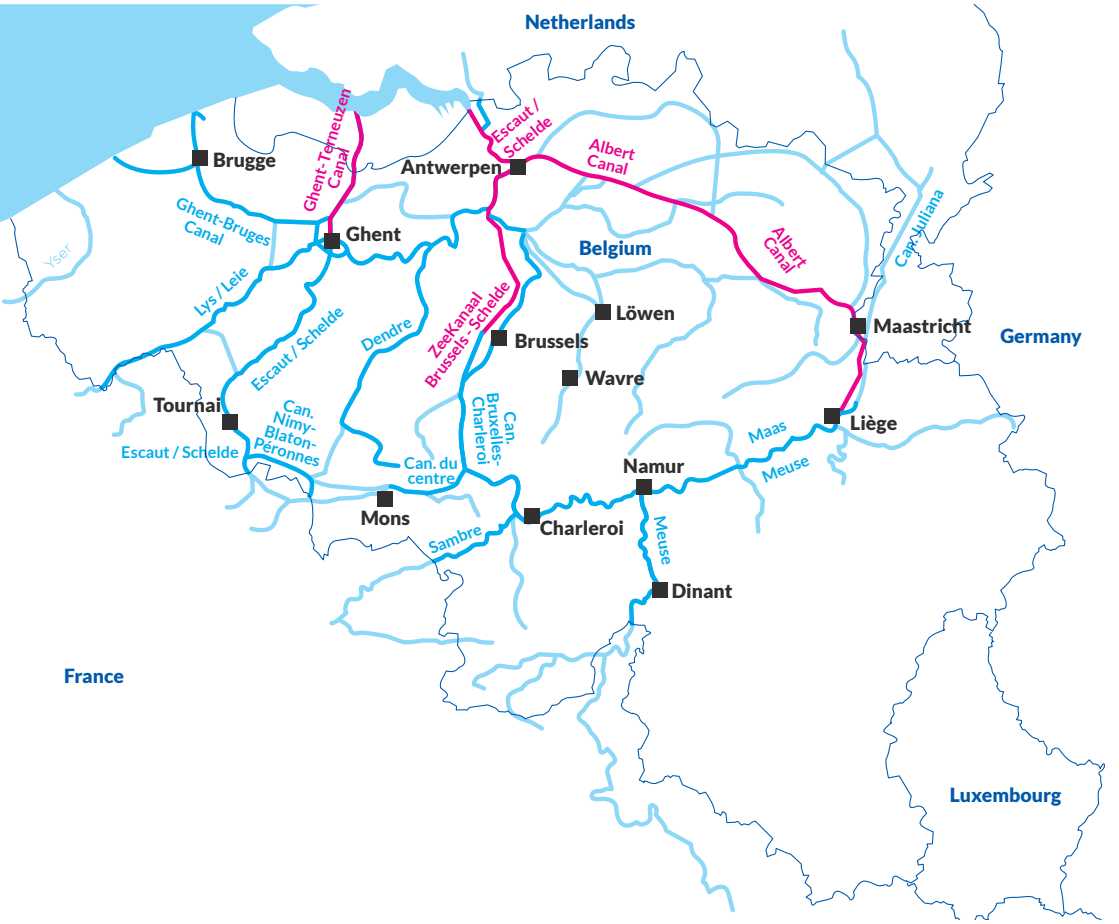
A large part of the steel exports from Ghent also go to the UK, in particular to London (0.325 million tonnes), but also to the Lower Danube in Romania (0.298 million tonnes) and to Ruse in Bulgaria (0.04 million tonnes).

FIG.13: RIVER-SEA TRANSPORT IN THE NETHERLANDS ACCORDING TO GOODS SEGMENTS (MIO. T) **IN 2018**



Source: CCNR analysis based on data from Rijkswaterstaat

River-sea transport in Belgium



Definitions and waterway areas

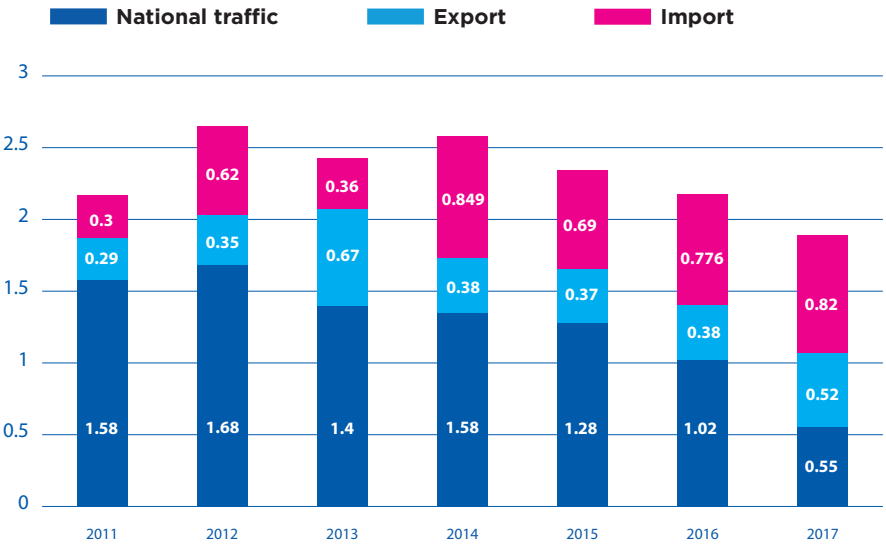
In the data for Belgium, river-sea transport is indicated via the vessel type that is used for the journey (if a seagoing ship is used, this points to river-sea traffic), and also by the country of loading and unloading of the cargo.

In Belgium, river-sea transport takes place mainly on the following waterways: the Albert Canal, Zeekanaal Brussels-Schelde (Escaut), the Ghent-Terneuzen Canal and the Schelde river.

Transport by origin and destination

The river-sea transport of Belgium has a far higher share of national traffic than does Germany. This is attributed to container traffic, which, on a multi-annual basis, accounts for two-thirds of all national river-sea traffic in Belgium. This pattern can be explained by the different geography of Belgium compared to Germany, the broad estuary of the Schelde river downstream of Antwerp allowing seagoing ships to go inland and transport different kinds of goods, including containers. However, national river-sea traffic performed by seagoing ships has followed a downward trend in recent years.

FIG.14: RIVER-SEA TRANSPORT IN BELGIUM BY TYPE OF TRANSPORT
(IN MIO. T)



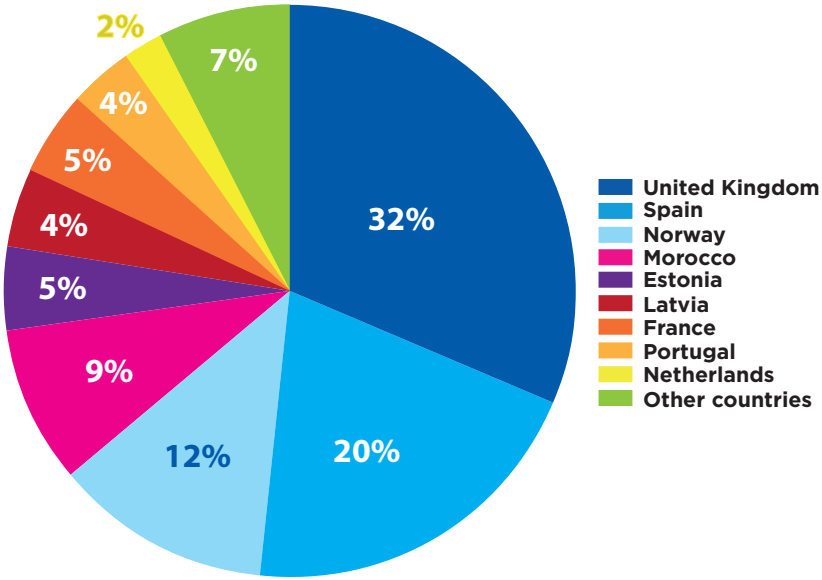
Source: CCNR analysis based on Statbel

In the years 2011-2017, the cargo volume transported by river-sea traffic varied between 2 and 3 million tonnes per year. This number includes transport by seagoing ships that cross into inland waterways. This transport by seagoing ships can be identified within the Belgian IWW statistics.

In Belgium, there exist inland vessels which partly cross into maritime waters, known as estuary traffic. However, according to the Belgian statistical office (Statbel), this type of river-sea traffic by estuary vessels is currently not identified within the IWW statistics.

In looking at the countries of loading and unloading, it can be seen that Great Britain is the most important trading partner for Belgium for river-sea transport (with a 32% share). This is followed by Spain (20%), Norway (12%) and Morocco (9%).

FIG.15: EXPORT AND IMPORT RIVER-SEA TRANSPORT IN BELGIUM BY TRADING PARTNER (2017)



Source: CCNR analysis based on Statbel

With regard to trade with Great Britain, the export side plays a larger role than the import side. In 2017, total exports from Belgium to the UK amounted to 0.34 million tonnes and total imports around 0.1 million tonnes. Export traffic consists mainly of iron and steel. Related volumes amounted to 0.24 million tonnes in 2017.

Regarding trade with Spain, iron and steel products represent also (by far) the majority of goods. Iron and steel are both imported by Belgium from Spain, and also exported to Spain. Belgium also imported wood and wood products from Spain in 2017.

Trade with Norway is mainly import-related, and consists of sands, stones, gravel, as well as iron and steel. The transport relations with Morocco are purely import traffic and consist mainly of basic chemicals that are transported from Morocco to Belgium.

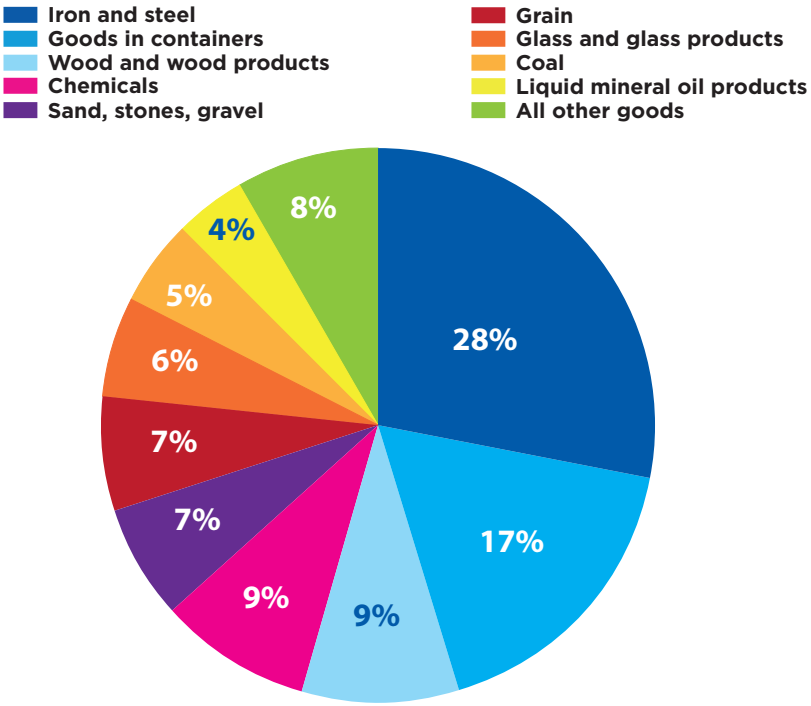
Transport by type of good

As it is the case of Germany, iron and steel has the highest overall share of all goods segments in river-sea transport. Goods in containers, in second place, are mainly transported in the form of national river-sea traffic (where the country of loading and of unloading is in both cases Belgium).

In 2017, container traffic accounted for two-thirds of all national river-sea transport. Mineral oil products and chemicals made up another 19% of national river-sea transport.

Chemicals, which have a 9% share, are almost entirely imported from only one country, that is Morocco. The associated volume of transport is indeed quite high, with more than 120,000 tonnes per year. In considering all the traded goods and the countries of loading, it is clear that this transport of chemicals from Morocco to Belgium by river-sea shipping was the most significant (in terms of volumes) river-sea transport activity with regard to Belgium's imported goods in 2017.

FIG.16: RIVER-SEA TRANSPORT IN BELGIUM BY TYPE OF GOODS (2017)



Source: CCNR analysis based on Statbel

Some features about river-sea transport at the port of Liège

Around 100 river-sea ships arrive in Liège every year, mainly via Antwerp and the Albert Canal, representing about 1% of the port calls, and sailing mainly under Dutch or Antiguan and Barbudan flags. They have to deal with shallow draughts and bridge clearance on the Albert Canal. The tonnage of the units calling at the port of Liège is generally between 1,500 and 2,500 gross registered tonnage. The total river-sea goods traffic at the Port of Liège varies between 200-250 thousand tonnes on a yearly basis. This traffic consists mainly of Arcelor-Mittal steel exported towards the UK and Ireland. At the port of Liège, this type of traffic is highly dependent on the European automotive market. Tonnages have increased slightly in recent years. This traffic has become highly specialised over the years due to its complexity, as shipowners must have the ships that provide the ideal yield on the route to be covered with a crew that is familiar with the various navigation regulations.

River-sea transport in Finland

Definitions and waterway areas

Inland waterway traffic in Finland is concentrated in the Saimaa region. Saimaa inland waterways can be reached only by passing through the Saimaa Canal area as this is the only part of Finland with inland waterway goods transport. The Saimaa Canal is therefore the only inland waterway connection to the sea, which is vital for the area. This canal allows seagoing ships that operate in the Saimaa waterways to transport goods in the whole of Europe, including Russia, and sometimes quite far into the hinterland (France, Germany and the UK), without transhipment. This type of transport therefore qualifies as river-sea transport according to the Eurostat definition. All the traffic going through the Saimaa Canal can therefore be considered as river-sea transport. It should be noted that this type of transport is referred to as lake-sea shipping by Finnish stakeholders.

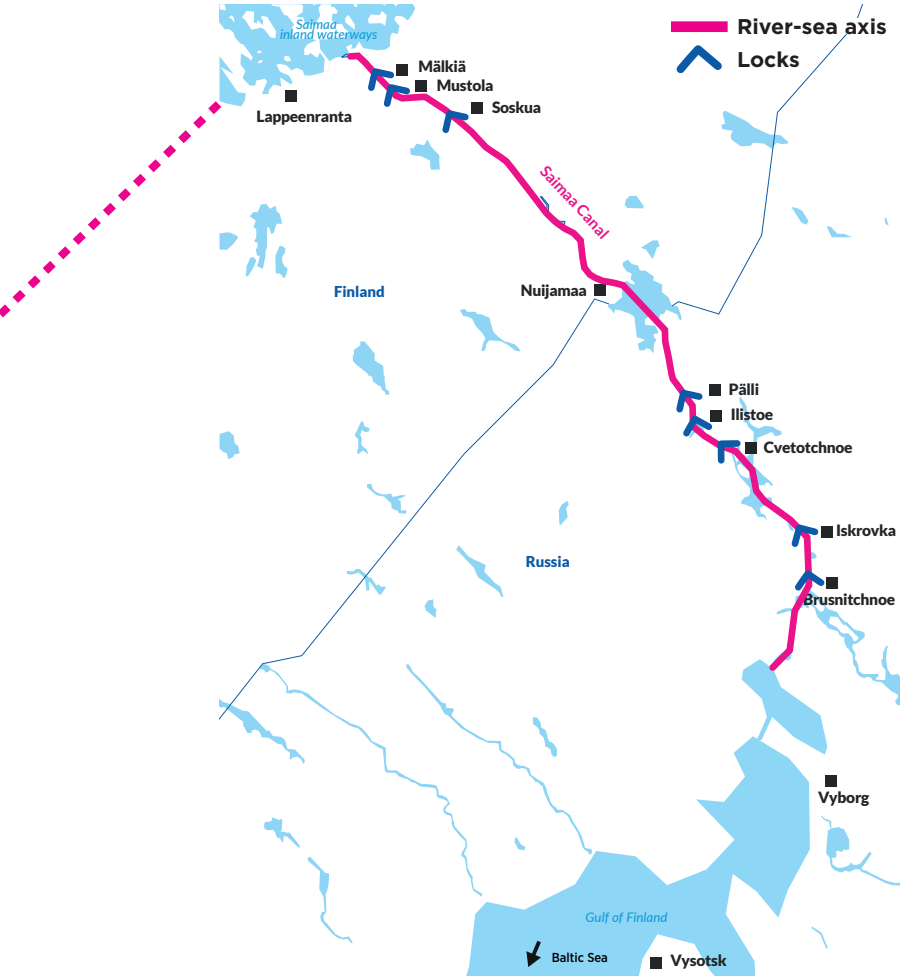
Saimaa ports **Saimaa inland waterways**
Sea route **Large seaports in Central Europe**

Source: The Saimaa inland waterway, EMMA project, Traficom

River-sea transport through the Saimaa Canal can be divided into three categories:

- Cross-border traffic: imports and exports
- Domestic traffic: traffic through the Saimaa Canal from an inland port in the Saimaa region to the Finnish coast or vice versa
- Timber floating (only until 1992)

The travel time of river-sea ships from northern Saimaa to seaports in Central Europe is 4-5 days. The most important inland ports of arrival and/or departure of river-sea traffic going through the Saimaa Canal are the ports of Imatra, Lappeenranta and Joensuu.

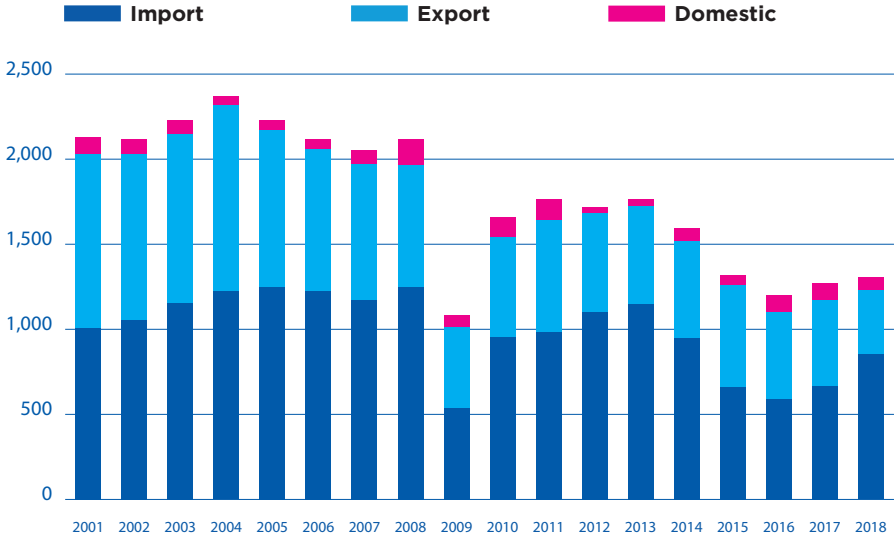


Transport by origin and destination

River-sea traffic through the Saimaa Canal increased from 1971 to reach a peak in 2004 (approximately 2.4 million tonnes). It then followed a decreasing trend until 2016, the lowest volumes of river-sea traffic being reached in 2009 during the global financial crisis. Volumes of river-sea traffic increased between 2016 and 2017 (+ 6%) and again in 2018 (+ 2.5%; 1.3 million tonnes).

Ninety four percent of river-sea transport operations in Finland are international transport operations (1.23 million tonnes). Domestic traffic accounted for 0.07 million tonnes. While domestic and export river-sea transport have remained rather stable over the last 10 years, imports of goods transported via river-sea transport fluctuate more.

FIG.17: RIVER-SEA GOODS TRAFFIC BY TYPE OF TRANSPORT IN FINLAND, 2010-2018 (IN 1,000 TONNES)*

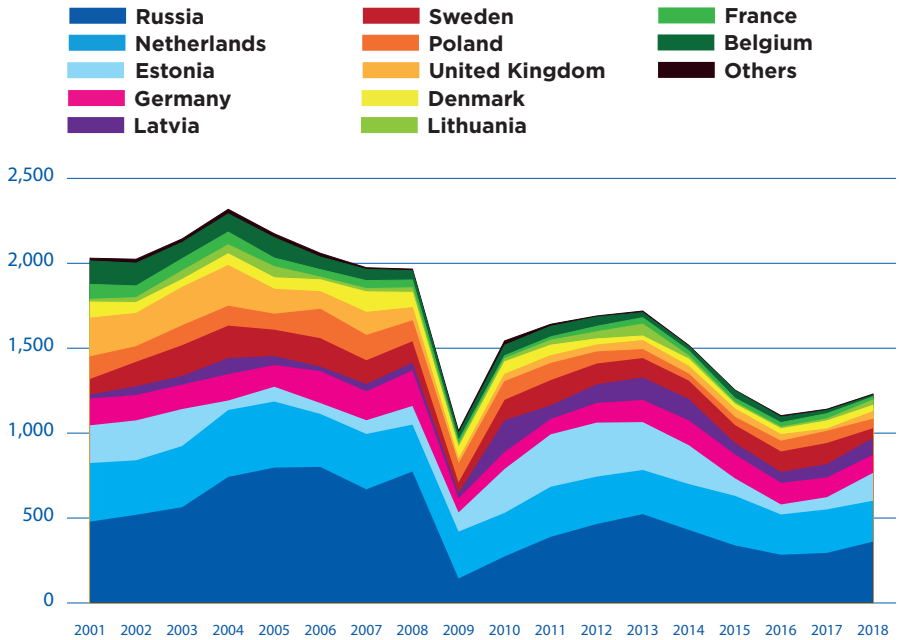


Source: CCNR analysis based on Traficom

** Total river-sea transport data in Finland through the Saimaa Canal include river-sea journeys performed by Russian inland vessels which do not have an IMO number but whose characteristics are similar to seagoing ships.*

The most important trading partners of Finland in relation to river-sea goods transport are Russia, the Netherlands, Estonia and Germany.

FIG.18: RIVER-SEA GOODS TRANSPORT BETWEEN FINLAND AND FOREIGN COUNTRIES, 2001-2018 (IN 1,000 TONNES)*

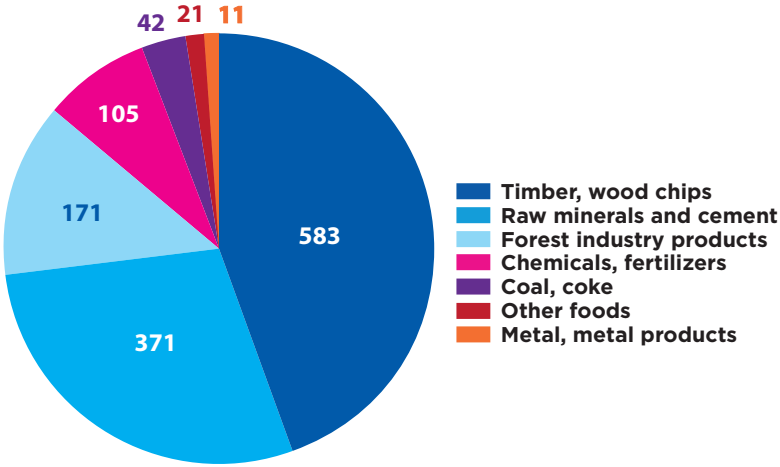


Source: CCNR analysis based on Traficom
** Through the Saimaa Canal*

Transport by type of good

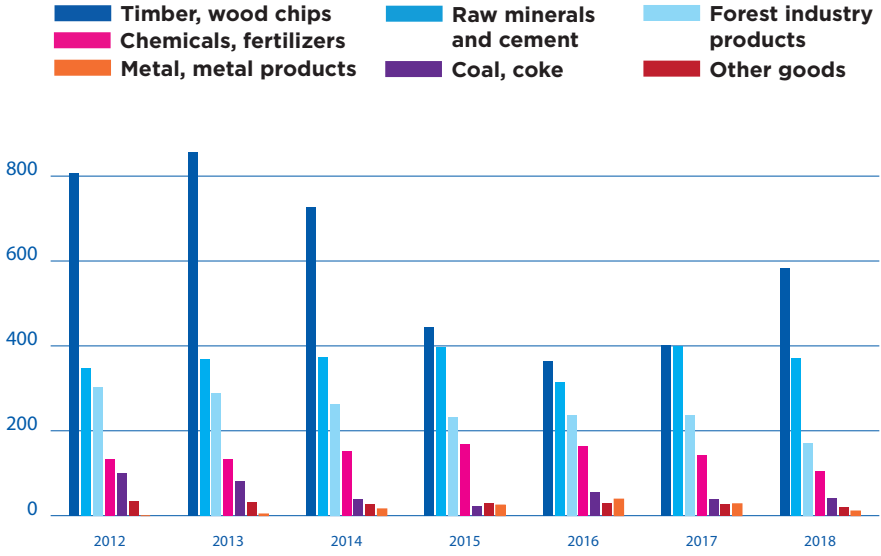
In 2018, the main goods segments transported via river-sea transport were timber (45%), raw minerals (28%) and forest industry products (13%).

FIG.19: RIVER-SEA GOODS TRANSPORT BY TYPE OF GOODS IN 2018 (IN 1,000 TONNES)



Source: CCNR analysis based on Traficom

FIG.20: EVOLUTION OF RIVER-SEA TRANSPORT IN FINLAND BY TYPE OF GOODS, 2012-2018 (IN 1,000 TONNES)*



Source: CCNR analysis based on Traficom
** Through the Saimaa Canal*

Timber (93%) and raw minerals (70%) are mostly imported goods while forest industry products are mostly exported (99%). Coal and coke, chemical products and other goods are exclusively imported while fertilizers and metals are exclusively exported. Domestic river-sea transport consists in the transport of coal and coke. Timber is mostly imported from Russia and Estonia. The main trading partners of Finland for both export and import of raw minerals and cement are the Netherlands. Most fertilizers are exported to Sweden, Germany and Denmark. The majority of the forest industry's shipments are exported to the Netherlands, Germany and Poland, as well as France and, to a lesser extent, the UK.

Additional information

Most of the river-sea ships that go through the Saimaa Canal sail under Dutch (31%), Russian (28%) or Antiguan and Barbudan (23%) flags. Other ships sail under Finnish (8%), Cypriot (4%) or other (6%) flags. In 2018, 1,161 river-sea ships went through the Saimaa Canal (+ 177 cargo ships compared to 2017). Until 2011, some river-sea ships also sailed under the German flag.

Not all passenger traffic in the Saimaa Canal can be considered as river-sea traffic. Indeed, some passenger ships only cruise along the Finnish side of the Saimaa Canal up to the Mustola lock and return. This is not river-sea transport as it does not involve navigating partly on inland waterways and at sea. Only traffic going through the canal, on passenger ships and pleasure boats, can be considered as river-sea passenger transport. Passenger transport on passenger ships constitutes the most important part of river-sea passenger traffic in Finland (nearly 16,500 passengers in 2018). In 2018, about 2,290 passengers travelled through the Saimaa Canal on pleasure boats. Since 2009, river-sea passenger traffic has been fluctuating between 24,000 and 16,000 passengers per year[20].

[20] *Source : Traficom*

Outlook and specific developments

The Saimaa Canal is currently used at a rate of 25%. There is therefore further exploitation potential of this Canal.

The programme of Prime Minister Antti Rinne's Government 2019 states that a development programme for inland waterway transport will be drafted. More specifically, there are plans to promote inland navigation by lengthening the locks in the Saimaa Canal, although it is not yet certain whether such an extension will take place. However, given the plans from certain river-sea companies (especially in the Rhine area) to invest in a new fleet of river-sea ships (as the existing river-sea ships have reached a considerable age), it would be important for these river-sea companies to have more clarity regarding this planned extension as well as the related timetable. In particular, companies in the Rhine area need to know whether or not the locks will be extended. The plans of the Finnish government are crucial for the investment plans of the river-sea transport companies in the Rhine area, as new capital-intensive vessels need to be built soon. They would have to be adapted to the future size of the Saimaa Canal locks, and be active for several decades. Indeed, a possible extension will impact the investment decision of companies looking to renew their fleet, especially when making far-reaching decisions on the dimensions of the newly built river-sea ships. If it takes place, such an extension is expected to have a positive impact for companies active in the river-sea transport sector with a trading partner in Finland.

River-sea transport in Germany

Definitions and waterway areas

In Germany, river-sea transport is not defined according to geographical indications, but according to the port of loading and unloading. If the combination of these two ports – that must be indicated by the ship operator to the German Federal Statistical Office (Destatis) – imply that parts of the journey were made on maritime waters, then a river-sea traffic is assumed.

The Rhine, and in particular the Lower Rhine (the region around Düsseldorf, Cologne and Duisburg), plays a central role for river-sea transport from and to Germany.

Of all goods loaded or unloaded in Germany and transported by river-sea traffic in 2018, 93% were loaded in the NUTS 2 region of Düsseldorf, which includes the port of Duisburg. In this NUTS 2 region, Duisburg is by far the most important port.

© Imperial Logistics

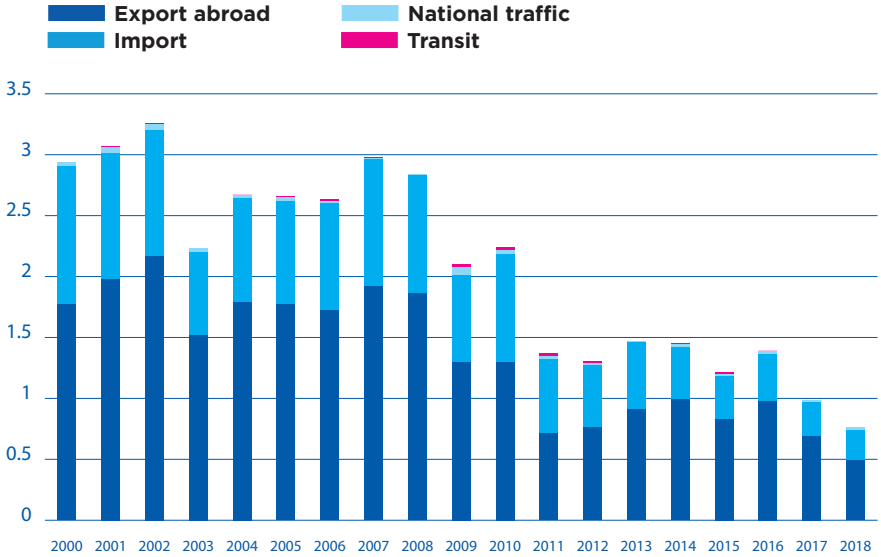
RIVER-SEA TRANSPORT IN EUROPE: THE CASE OF SEAGOING SHIPS NAVIGATING ON INLAND WATERWAYS

Source: Duisport

Transport by origin and destination

In total, 760,000 tonnes of goods were transported in 2018 via river-sea transport within, to and from Germany. However, a long-time series (2000-2018) shows that river-sea transport in Germany has been following a downward tendency since 2000.

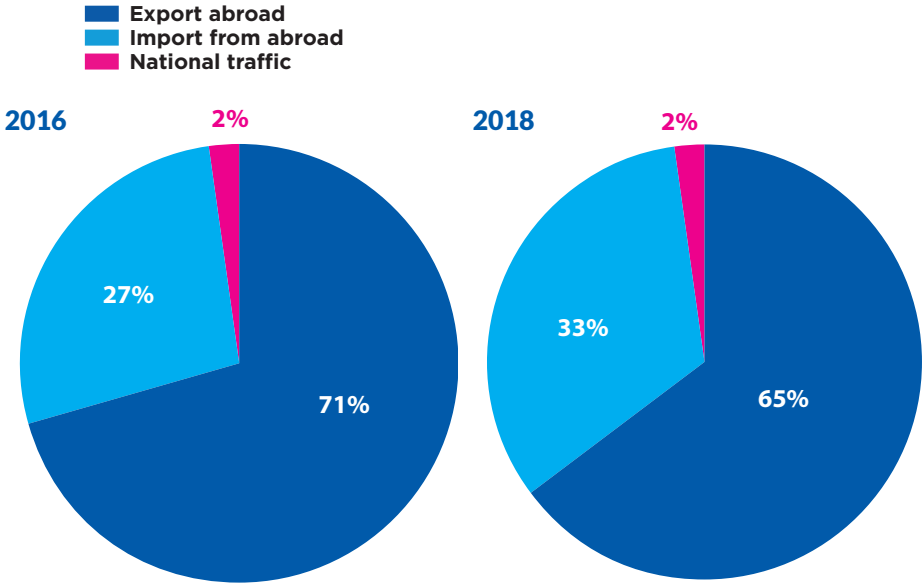
FIG.21: EVOLUTION OF RIVER-SEA TRANSPORT IN GERMANY BY TYPE OF TRANSPORT, 2000-2018 (IN MIO.T)



Source: CCNR analysis based on Destatis

Within the total German river-sea transport, export traffic has the largest share, with 71% in 2016 and 65% in 2018. As will be seen below, this is related to the exports of iron, steel and metals, which accounts for the largest amount of river-sea traffic in Germany. The share of import traffic is around one-third, and national river-sea traffic (origin and destination within Germany) has a very minor share.

FIG.22: RIVER-SEA TRANSPORT IN GERMANY BY TYPE OF TRANSPORT

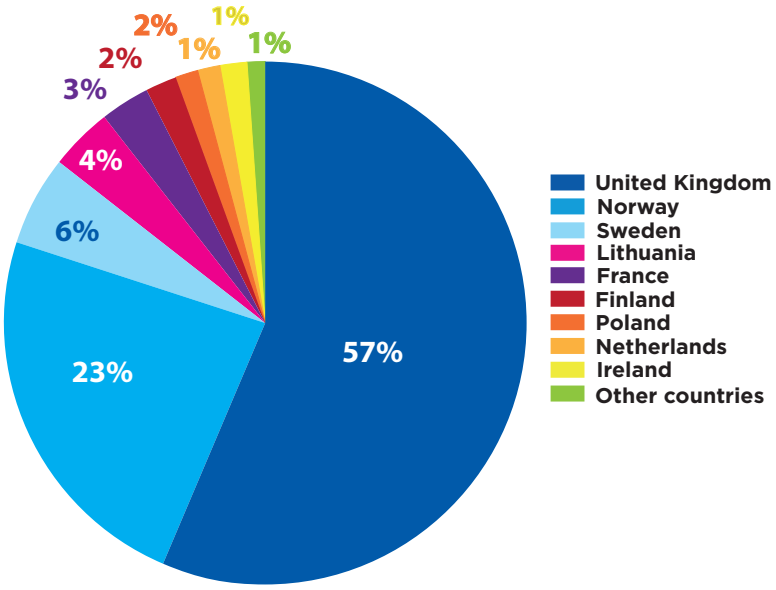


Source: CCNR analysis based on Destatis

The most important destination for exports of iron, steel and metals is Great Britain, and in particular the Humber estuary region on the north-eastern coast of England. This region offers good natural conditions for river-sea traffic, as the Humber river forms a wide estuary, allowing seagoing ships to sail inland. Around the Humber estuary in the NUTS 2 regions of Lincolnshire, East Yorkshire and Northern Lincolnshire are numerous ports and terminals (Kingston upon Hull, Grimsby, Immingham, and others). A smaller part of the iron and steel exports goes to Norway and Sweden, as the following tables show.

Other destinations within Great Britain are London and Scotland. Norway and Sweden play another major role as export destinations.

FIG.23: RIVER-SEA TRANSPORT OF GERMANY – SHARE OF COUNTRIES FOR LOADING AND UNLOADING IN EXPORTS FROM GERMANY TO ABROAD AND IMPORTS TO GERMANY FROM ABROAD (2018)



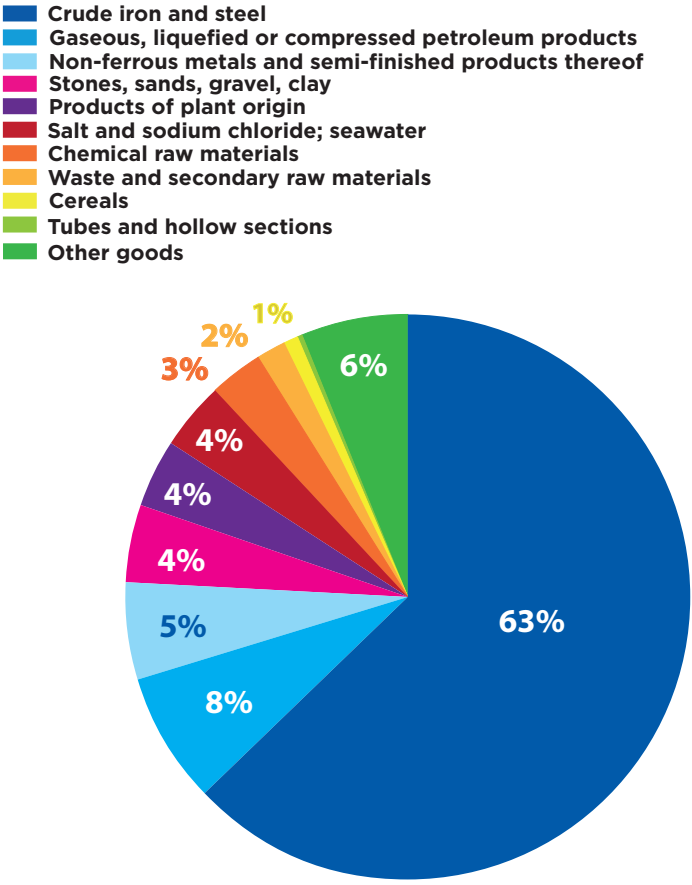
Source: CCNR analysis based on data from Destatis

The following three tables show the evolution for the four largest goods segments, as well as the most important trading routes both for export and import traffic.

Transport by type of good

Iron and steel as well as metals and metal products form by far the most important goods segment in German river-sea traffic. In 2018, pig iron and steel accounted for 63%. Non-ferrous metals and semi-finished products from these accounted for 5%, so that more than two-thirds of all German river-sea transport was linked to iron and steel or related final products.

FIG.24: RIVER-SEA TRANSPORT IN GERMANY BY TYPE OF GOODS (2018)



Source: CCNR analysis based on Destatis

Within the goods segment of crude iron and steel, 77.5% of river-sea transport in 2018 were exports and only 22.5% imports. For the second largest segment (gaseous, liquefied or compressed petroleum products), imports dominated in 2018 with a share of 98.2%. For non-ferrous metals and related products, there was an export share of 100% in 2018. Finally, sands, stones, gravel and clay were predominantly exported in 2018 (share of 78%).

The following three tables show the evolution for the four largest goods segments, as well as the most important trading routes both for export and import traffic.

TABLE 5: VOLUME OF RIVER-SEA TRANSPORT IN GERMANY AND FOUR LARGEST GOODS CATEGORIES 2016-2018 (IN 1,000 TONNES)

	2016	2017	2018
Total river-sea traffic in Germany	1,378	980	765
• Crude iron, steel	958	656	482
• Gaseous, liquefied or compressed petroleum products	76	82	58
• Natural stones, sand, gravel, clay, earth	108	64	34
• Non-ferrous metals and their semi-finished products	50	40	41
Subtotal of four largest goods categories	1,191	842	615
% of Subtotal in total river-sea transport	86%	86%	80%

Source: CCNR analysis based on Destatis

TABLE 6: RIVER-SEA TRAFFIC – EXPORTS BY GERMANY – MOST IMPORTANT TRADING ROUTES IN 2018

Region of loading (NUTS 2)	**Region of unloading** (NUTS 2)	**Goods segment**	**Volume** (in 1,000 tonnes)
Düsseldorf	Great Britain (East Yorkshire and Northern Lincolnshire)	Crude iron, steel	174
Düsseldorf	Great Britain (Lincolnshire)	Crude iron, steel	96
Düsseldorf	Great Britain (London)	Non-ferrous metals and semi-finished products	38
Düsseldorf	Norway (Sør-Østlandet)	Crude iron, steel	33
Düsseldorf	Sweden (Sydsverige)	Crude iron, steel	31
Düsseldorf	Norway (Vestlandet)	Crude iron, steel	22
Sum of volumes above			393
Total exports by river-sea transport from Germany			494

Source: CCNR analysis based on Destatis

Imports by river-sea traffic to Germany contain iron and steel, but also gaseous, liquified or compressed mineral oil products. These last three materials are imported mainly from Norway and Scotland.

In contrast to export traffic, which fell relatively sharply between 2017 and 2018, import traffic remained almost stable between 2017 and 2018.

TABLE 7: RIVER-SEA TRAFFIC – IMPORTS BY GERMANY – MOST IMPORTANT TRADING ROUTES IN 2018

Region of loading (NUTS 2)	Region of unloading (NUTS 2)	Goods segment	Volume (in 1,000 tonnes)
Norway (Agder og Rogaland)	Düsseldorf	Gaseous, liquefied or compressed petroleum products	32
Lithuania	Düsseldorf	Crude iron, steel	25
Norway (Vestlandet)	Düsseldorf	Crude iron, steel	19
Norway (Vestlandet)	Düsseldorf	Stones, sands, gravel, clay	18
France (Nord-Pas-de-Calais)	Düsseldorf	Crude iron, steel	18
Great Britain (East Yorkshire and Northern Lincolnshire)	Düsseldorf	Crude iron, steel	16
Great Britain (Eastern Scotland)	Cologne	Gaseous, liquefied or compressed petroleum products	16
Sum of volumes above			144
Total imports by river-sea transport to Germany			252

Source: CCNR analysis based on data from Destatis

Container traffic is of little relevance within German river-sea transport: in 2017 only 245 TEU were transported between the Lower Rhine region and Great Britain.

National river-sea traffic (loading region and unloading region areas in Germany) amounted to around 10,000 tonnes in 2017. The largest share of this was grain transport (around 3,000 tonnes) from the Baltic coastal region in Germany (Mecklenburg-Western Pomerania) by river-sea ships to the Lower Rhine (NUTS 2 Düsseldorf region). In 2018, the national river-sea traffic was higher than during the previous year, reaching 16,255 tonnes. The largest part of this was coal transported from Schleswig-Holstein to Berlin by river-sea ships (just under 6,000 tonnes).

Some features about river-sea transport at Duisport

In 2018, 264 river-sea ships called at Duisport, but only eight did so between August and November 2018, due to low water levels. Indeed, the first business area of the port impacted by the 2018 low water period was river-sea transportation. Up to September 2019, 227 river-sea ships called at the port. According to Duisport, securing river-sea activity in an inland port comes with challenges, particularly in terms of compliance with security requirements (International Ship and Port Facility Security Code and ensuring secured waiting areas for river-sea ships) and heavy bureaucracy (customs, immigration, IMO). Moreover, Duisport is often treated as a seaport due to the seagoing ships calling at the port. On the other hand, river-sea shipping also presents opportunities, in particular, it allows avoiding congestion and bottlenecks such as deep-sea ports (decentralised traffic), to bypass EU-boarders such as Dover-Calais and rural area connections, and consists in an ideal complementary route for players in the IWT sector.

River-sea transport in France

Definitions and waterway areas

In France, river-sea transport is understood to be a transport operation on a single seagoing ship, partly on inland waterways and partly on maritime waters, without transhipment (goods or passengers).
A seagoing ship must comply with inland waterway regulations once it crosses onto a "line" defined by regulations and known as "1st obstacle to the navigation of ships"[21].

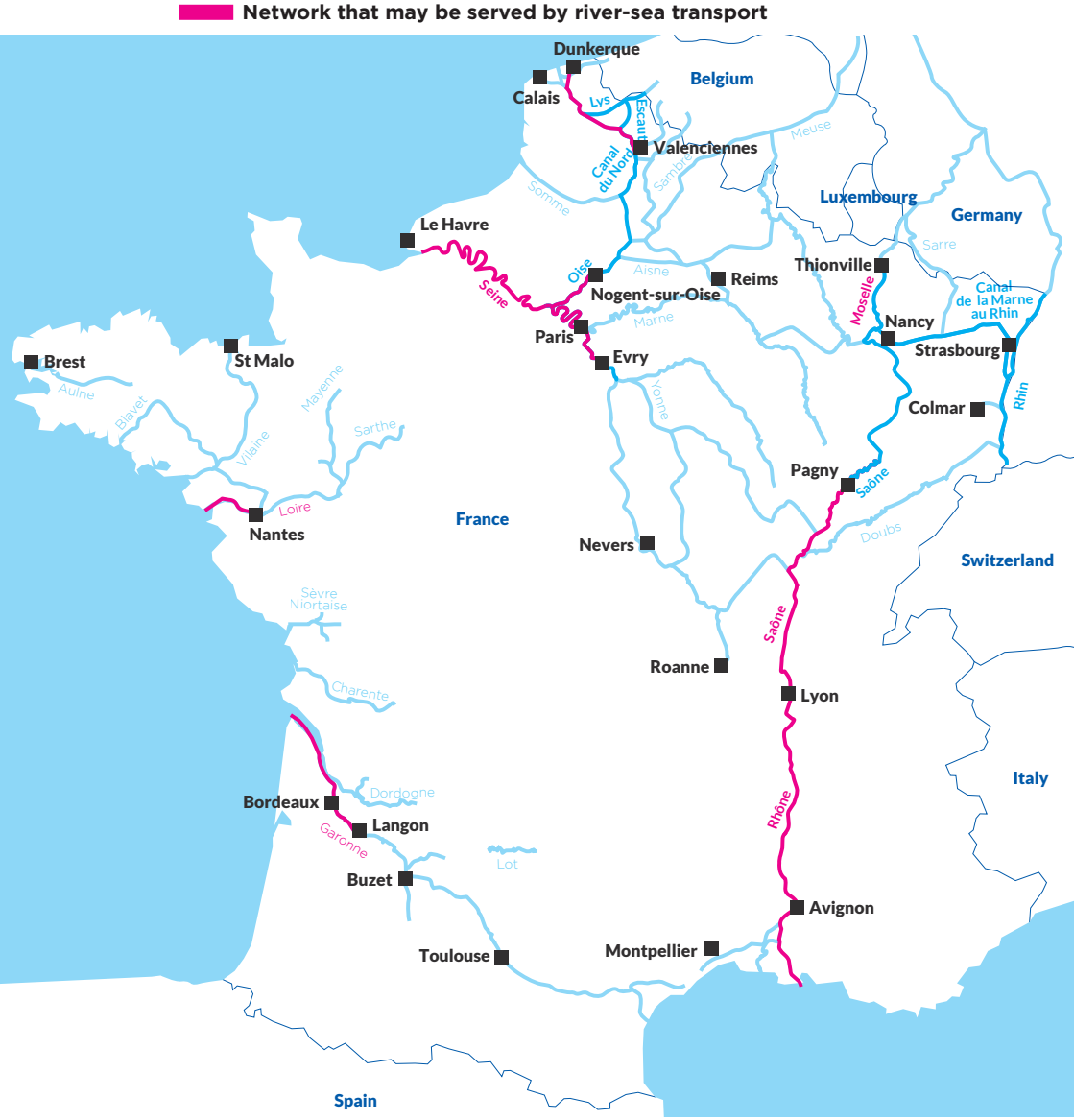
In France, river-sea shipping is concentrated in two main river basins:

- The Rhône (up to Lyon)-Saône (up to Pagny) basin
- The Seine (up to Evry)-Oise (up to Nogent-sur-Oise).

Some river-sea transport is also recorded on the Gironde, with fluctuating volumes depending on the years. Occasionally, some river-sea transport can be observed on Rhine affluents (for instance in 2016 and 2018) or on the Schelde (for instance in 2017 and 2018).

In addition, on the Loire, the specific segment of marine aggregates was transported via river-sea transport up to 2013. However, no specific data are recorded for this type of traffic.

[21] *1er obstacle à la navigation maritime. The 1st obstacle to the navigation of ships is : for the Rhône the « pont de Trinquetaille » ; for the Seine the "pont Jeanne-d'Arc" in Rouen (décret n° 59-951 du 31 juillet 1959 portant fixation des limites de l'inscription maritime dans les estuaires, fleuves, rivières et canaux fréquentés par les bâtiments de mer)*

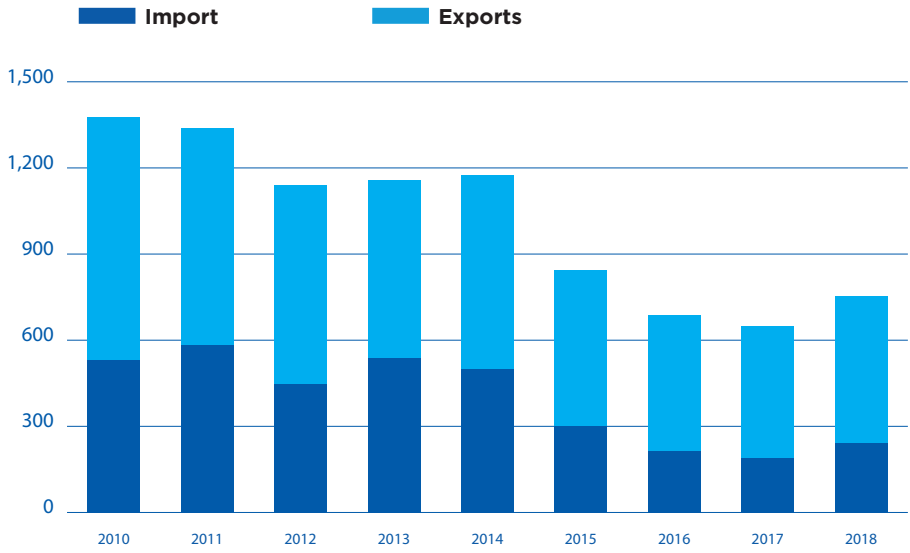

Network that may be served by river-sea transport
Dunkerque
Calais
Lys
Escaut
Belgium
Valenciennes
Canal du Nord
Somme
Sambre
Meuse
Luxembourg
Germany
Le Havre
Seine
Oise
Aisne
Reims
Nogent-sur-Oise
Thionville
Sarre
Moselle
Canal de la Marne au Rhin
Nancy
Marne
Paris
Evry
Strasbourg
Brest
St Malo
Aulne
Blavet
Mayenne
Vilaine
Sarthe
Yonne
Rhin
Colmar
Pagny
Saône
Loire
Nantes
France
Nevers
Doubs
Switzerland
Sèvre Niortaise
Charente
Roanne
Lyon
Bordeaux
Dordogne
Langon
Garonne
Buzet
Lot
Rhône
Italy
Avignon
Toulouse
Montpellier
Spain

Source: VNF

Transport by origin and destination

River-sea goods transport has been fluctuating since 1980. The amount of cargo transported by river-sea shipping increased from 1980 to 1997 and has been following a rather downward trend ever since. In 2018, river-sea cargo traffic amounted to 0.75 million tonnes, compared to 1.4 million tonnes in 2010. In 2018, export traffic represented 68% of total river-sea transport in France while import traffic represented 32%[22].

FIG.25: EVOLUTION OF TOTAL RIVER-SEA TRANSPORT IN FRANCE BY ORIGIN AND DESTINATION FROM 2010 TO 2018 (IN 1,000 TONNES)



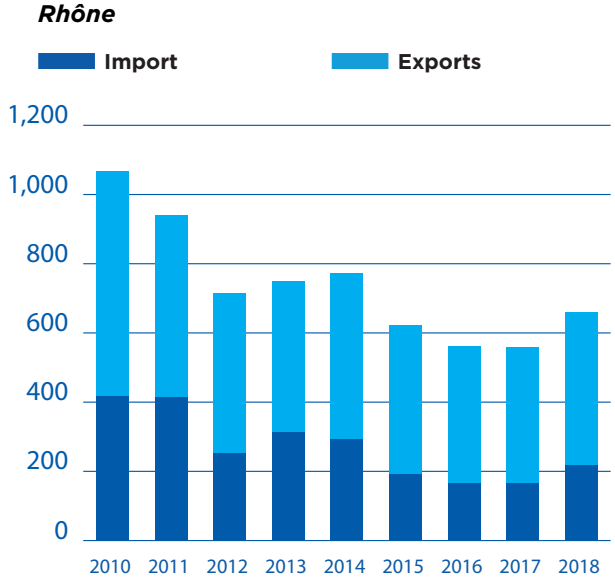
Source: Haropa Statistiques port de Rouen (data on the Seine), VNF (data on other rivers)

[22] *Loading and unloading regions outside France are not collected by VNF, only the name of the first port of entry or the last port of exit is included in French statistics. For imports from and exports toward:*

- *The Manche/North Sea basin, the first port of entry/last port of exit is the Port of Le Havre*
- *The Mediterranean basin, the first port of entry/last port of exit is the Port-of-Saint-Louis-du-Rhône.*

More detailed data were made available for the Seine basin via Haropa - Statistiques port de Rouen.

FIG.26: EVOLUTION OF TOTAL RIVER-SEA TRANSPORT ON THE RHÔNE AND SEINE BASIN (IMPORT AND EXPORT) **FROM 2010 TO 2018** (IN 1,000 TONNES)

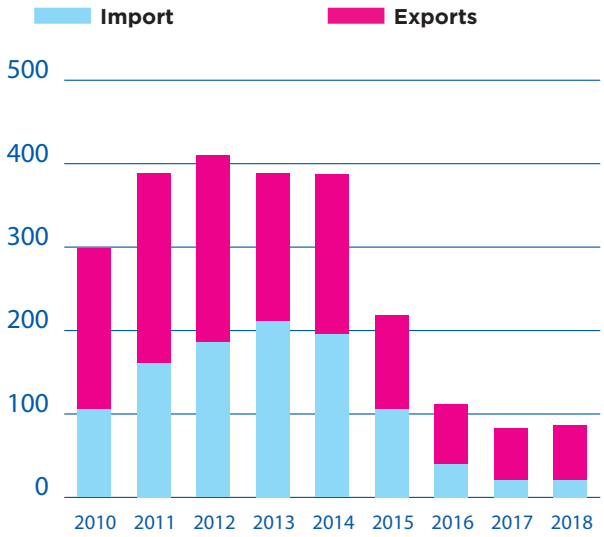


Source: VNF

On the Rhône basin, river-sea transport is positioned at the beginning of the value chain for the transport of raw materials (not yet transformed). It is therefore sensitive to changes of the economic climate of specific industries, such as the steel and agricultural industries, as well as to price fluctuations of raw materials and agricultural products. The low water levels can here play an important role as they increase transport prices, which is of importance for mass cargo that needs low transport prices in order to be sold under competitive price conditions. An increase in waterway transport prices therefore increases the risk of modal shift to other modes of transport, especially rail.

Regarding exports, mainly ores and metallurgical scrap are exported to Turkey, as well as cereals and wood products mainly to Tunisia, Morocco, Algeria and Italy. For imports, mainly metal products are imported from the Mediterranean basin. Clay is also imported from Italy and fertilizers from Tunisia and Egypt.

Seine

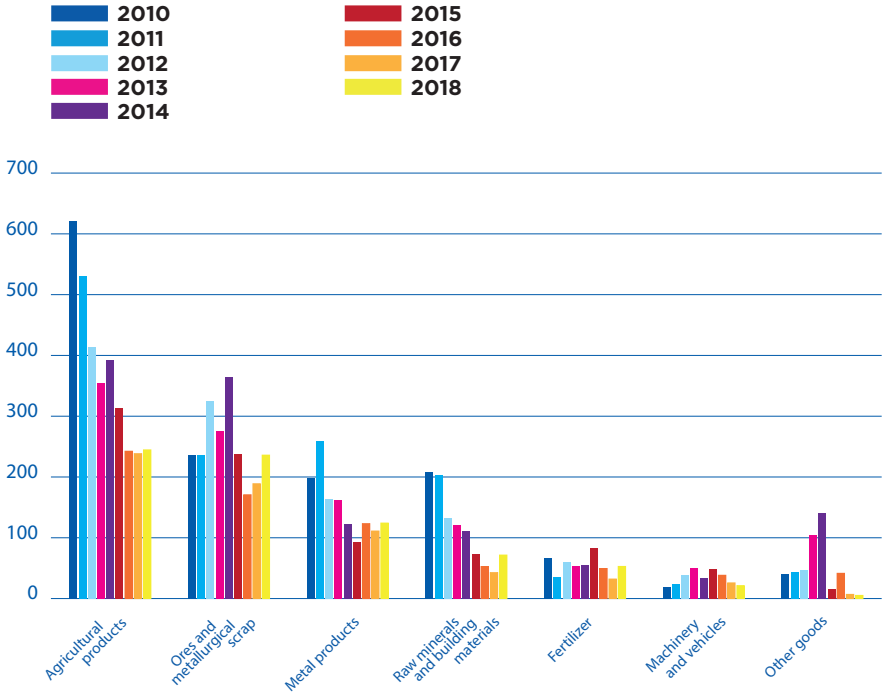


Source: Haropa - Statistiques port de Rouen

On the Seine, the decrease in export traffic observed since 2012 can be attributed to a constant decrease in exports of agricultural products, both for animal and human consumption, and of steel products, mainly towards the UK. The decrease in import traffic observed since 2013 can be attributed to a strong and constant decrease in imports of steel products, from 128,000 tonnes in 2012 to 0 in 2018. In 2013 and 2014 important volumes of coal (respectively 102 and 51 thousand tonnes) were imported, which compensated for the decrease in steel products over the same period. Imports of coal via river-sea transport came to a halt in 2015. Today, only fertilizers (ammonium nitrate) from Antwerp is imported via river-sea transport on the Seine.

Transport by type of good

FIG.27: EVOLUTION OF TOTAL RIVER-SEA TRANSPORT IN FRANCE AND PER MAIN GOODS SEGMENTS FROM 2010 TO 2018 (IN 1,000 TONNES)

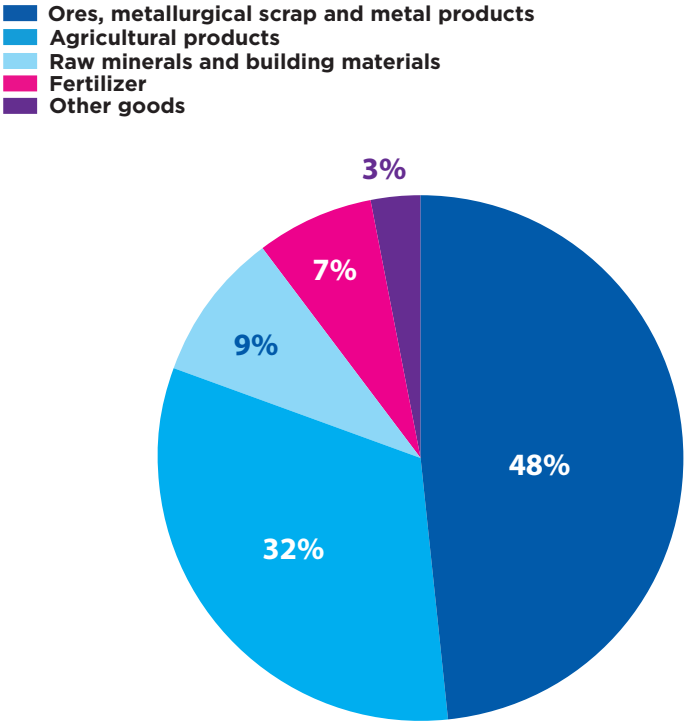


Source: CCNR analysis based on Voies Navigables de France (VNF)

This decreasing trend can be explained by an important decline since 2010 in agricultural products by river-sea transport and, to a lesser extent, raw minerals, building material and metal products. Transport of ores and metallurgical scrap recorded strong fluctuations between 2010 and 2018.

Taken together ores and metallurgical scrap (31%) as well as agricultural products (32%) represent the most important goods segment in French river-sea traffic, followed by metal products (16%).

FIG.28: RIVER-SEA TRANSPORT IN FRANCE IN 2018 BY TYPE OF GOODS
(IN %)



Source: CCNR analysis based on VNF data

Approximately 85% of all goods exported via river-sea transport are unloaded in the Mediterranean basin, while 14% are exported to the Manche/North Sea Basin. Agricultural products, ores and metallurgical scrap are the most important segments for exports. Metal products are the third most important goods segment for exports, all exported through the Port of Le Havre. Less than one thousand tonnes of machinery and vehicles are exported via river-sea traffic towards the Atlantic region after being loaded in the Gironde/Garonne basin.

TABLE 8: RIVER-SEA EXPORTS FROM FRANCE – MOST IMPORTANT TRADING ROUTES IN 2018 (IN 1,000 TONNES)

Region of loading	Country and region of unloading	Goods segment	Volume
Rhône basin	Mediterranean basin – mainly Turkey	Ores and metallurgical scrap	213
Rhône basin	Mediterranean basin - mainly Italy, Morocco, Tunisia and Algeria	Agricultural products (in particular cereals)	200
Seine basin	Mainly UK and Finland	Metal products	44
Seine basin	Mainly UK, the Netherlands and Belgium	Agricultural products	14
Sum of volumes above			**471**
Total exports by river-sea transport from France			**510**

Source: CCNR analysis based on VNF data

TABLE 9: RIVER-SEA IMPORTS TO FRANCE – MOST IMPORTANT TRADING ROUTES IN 2018 (IN 1,000 TONNES)

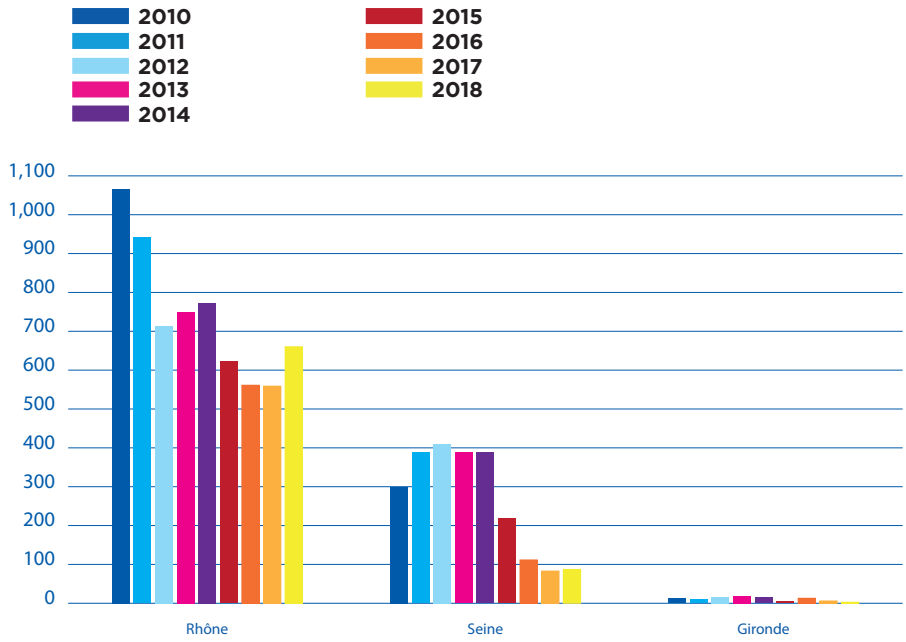
Country and region of loading	Region of unloading	Goods segment	Volume
Mediterranean basin	Rhône basin	Metal products	78
Mediterranean basin - mainly Italy, Spain, Tunisia and Algeria	Rhône basin	Raw minerals and building materials	65
Antwerp	Seine basin	Fertilizers	21
Manche/Mer du Nord Basin	Moselle	Raw minerals and building materials	3
Atlantic region	Gironde/Garonne basin	Machinery and vehicles	2
Sum of volumes above			**169**
Total imports by river-sea transport to France			**243**

Source: CCNR analysis based on VNF data

Ninety percent of all goods imported via river-sea transport into France come from regions located in the Mediterranean basin (in particular Spain, Italy, Algeria and Turkey), most of which are unloaded in the Rhône basin. Other loading regions are located in the Manche/North Sea Basin (especially the UK, the Netherlands, Belgium and Germany) and the Atlantic basin, most of which is unloaded in the Seine basin. Thirty-three percent of all river-sea-shipping imports to France consist of metal products imports. The second most important goods segment for river-sea shipping imports to France is the raw and building materials segment (23%).

Transport volume by inland waterway

FIG.29: RIVER-SEA TRANSPORT IN FRANCE BY INLAND WATERWAY
(IN 1,000 TONNES)



Source: VNF

Additional information regarding the fleet

The number of river-sea ships navigating on the Seine basin has halved since 2013, with 45 river-sea ships in 2013 compared to 20 in 2018. On the Rhône basin, the number of river-sea ships has remained identical with 21 ships. River-sea ships are registered under the following flags:

- On the Rhône basin: Antigua and Barbuda, Belize, Lithuania, Malta, the Netherlands, and St Vincent;
- On the Seine basin: the Netherlands (6), St Vincent (5), Antigua and Barbuda (4), Lithuania (2) and the Bahamas (2)..

River-sea transport in Portugal

In Portugal, river-sea transport only takes place on the Douro. The large majority of river-sea transport on the Douro[23] consists in 27,000 tonnes of sand and stones being exported to Germany (15,000 tonnes), Great Britain (2,000 tonnes), Sweden (9,000 tonnes) and Norway (1,000 tonnes).

[23] APTMCD – Intermodal Promotion Centre Portugal

Douro

RIVER-SEA TRANSPORT OUTSIDE THE EUROPEAN UNION

River-sea transport in Russia[24]

Definitions and waterway areas

Russia disposes of very good natural conditions for river-sea shipping. Compared to rivers in the European Union, rivers are very wide and are thus navigable by seagoing ships until far into the interior. According to the Russian Chamber of Shipping, the inland waterways network in Russia is 102 thousand km long. The Volga and the Neva rivers are particularly relevant for river-sea transport in Russia.

In 2019, the number of river-sea ships with class of the Russian River Register amounted 1,190 transport ships, including 849 motorized and 341 non-motorized[25].They are operating exclusively under the Russian flag.

As for river-sea ships in the EU, Russian river-sea ships must comply with the international SOLAS convention, as well as with specific national provision related to transport safety and security. The challenges of river-sea transport in Russia also mirror those of river-sea transport in the EU: maintenance of inland waterway infrastructure, strong competition from other modes, low water situations and the ageing of the fleet (which is, on average, 32 years in Russia).

Transport by origin and destination

Trading areas for Russian river-sea ships are the following: the Baltic Sea, North Sea, Azov-Black sea, Mediterranean Sea, Caspian Sea and the north and far eastern regions of Russia.

In 2013, river sea transport in Russia amounted to almost 11 million tonnes. In 2018, around 25 million tons were carried by river-sea ships. The main trading partners are Germany, Sweden, the Netherlands, Denmark, Norway, Greece, France and Croatia.

[24] *Source: Russia Chamber of Shipping*
[25] *Register Book of vessels with the Russian River Register class, www.rivreg.ru/activities/class/reg-book*

Transport by type of good

The main cargo transported by river-sea transport within Russia are cereals, fertilizers, steel and wood products. Main export commodities transported by river-sea ships are oil and oil products, grain, coal, timber, metals and fertilize.

Outlook and specific developments

In the context of Russia's strategy for the development of inland waterway transport by 2030, the building of 490 new river-sea ships is foreseen.

River-sea transport in Ukraine

Introduction and waterway areas

In 2019, the number of river-sea ships in Ukraine amounts to 139, of which 18 motorized vessels with the total gross tonnage of 29,757 and 76 non-motorized vessels with the total gross tonnage of 116,484 and 25 tugs and pushers[26].

The Ukraine shares the Lower Danube with Romania and Moldova. Notably, the river-sea ports of Izmaijl and Reni are ports where seagoing vessels can load and unload cargo.

Unfortunately, it was not possible to receive data on this traffic for the present report. Another waterway that enjoys river-sea transport, according to viadonau, is the Kilia-Bystroe Canal in Ukraine (also in the Danube Delta), where 1.5 million tonnes of river-sea traffic were counted in 2017 (+ 362.1% compared to 2016).

[26] *Register of ships with class of the Shipping Register of Ukraine, http://en.shipregister.ua/pdf/reg-ships.pdf*


Volga


OURAL
HAMBURG SÜD
CARU

03

RIVER-SEA TRANSPORT IN EUROPE: THE CASE OF INLAND VESSELS NAVIGATING "AT SEA"

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INTRODUCTION AND GENERAL CLASSIFICATION RULES

Most river-sea traffic is operated by seagoing ships. However, some specific inland vessels can be allowed to make restricted journeys at sea between two ports of the same country provided they comply with specific requirements.

Inland vessels can never be allowed to perform international sea journeys, as they do not hold seagoing ship certificates. As most of IMO regulations applicable to seagoing ships are not entirely appropriate to domestic trade along the coastline in restricted maritime areas, the granting of a special certificate allowing inland vessels to navigate at sea is justified.

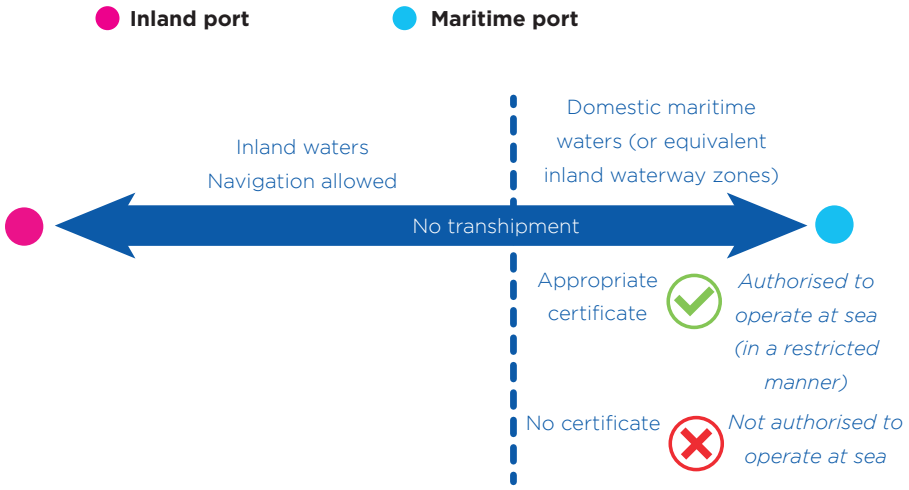
Restricted maritime areas in which inland vessels may be able to operate can be classified for the purpose of suitable requirements consistent with the risk level. This is dependent notably on the severity of the wave and swell, the risk of shipping water, the exposure to strong wind, the distance from shore and refuge and weather conditions. In such areas, inland vessels must be designed to withstand more severe weather conditions than do pure inland vessels. Also, access to maritime areas is given to inland vessels taking into consideration restricted routes and limitations on wave height.

In order to be allowed to navigate at sea (in a restricted manner) and obtain the corresponding certificate, such inland vessels must prove that they comply with:

- Classification requirements related mainly to ship design (hull structure, bow height, stability etc.) and equipment requirements established by classification societies and,
- Regulatory requirements set by relevant state administration which may provide complementary requirements (national law, qualification of crew, radio communication, navigation lights, operational conditions etc.)

The EU Directive 2016/1629 establishes harmonised conditions for issuing technical certificates for inland waterway vessels in EU inland waterways. However, it also allows Member States to apply stricter technical requirements in certain zones of navigation, in particular zones 1 and 2 – estuaries – where inland vessels may be faced with more difficult conditions of navigation than usual. This Directive does not make it mandatory for Member States to identify such zones 1 and 2 on their territory but lists the subjects for possible additional technical requirements applicable to inland vessels in such zones (in relation to stability, equipment, watertightness etc.). In Belgium (Flanders), some inland vessels are allowed to navigate directly at sea, along the coast (estuary transport). This type of traffic is regulated by a Royal Decree, outside the scope of Directive 2016/1629 (see Chapter 3, part 2 below), as no zones 1 or 2 have been defined in Belgium. However, Belgian estuary vessels also need to comply with Directive 2016/1629.

Drawing from the information above, a common case of river-sea transport performed by an inland vessel can therefore be described as follows:



There is currently no harmonisation in the requirements to be complied with by such inland vessels in order to navigate at sea. The possibility for inland vessels to navigate at sea is also not allowed in several EU countries. Given the differences in treatment of this type of transport in the EU, Directive 2016/1629 calls for greater harmonisation of the conditions for the issuing, by Member States, of supplementary Union inland navigation certificates for operations of inland vessels in zones 1 and 2.

For the purposes of this report, the focus will be on the cases of Belgium (Port of Zeebrugge) and France (in the Port du Havre area and Golfe de Fos), where inland vessels navigating "at sea" can be observed, always in compliance with specific national regulations. Such national regulations allowing this type of transport are also applicable in India, Russia, China and Italy.

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INLAND VESSELS AT SEA: ESTUARY TRAFFIC IN BELGIUM

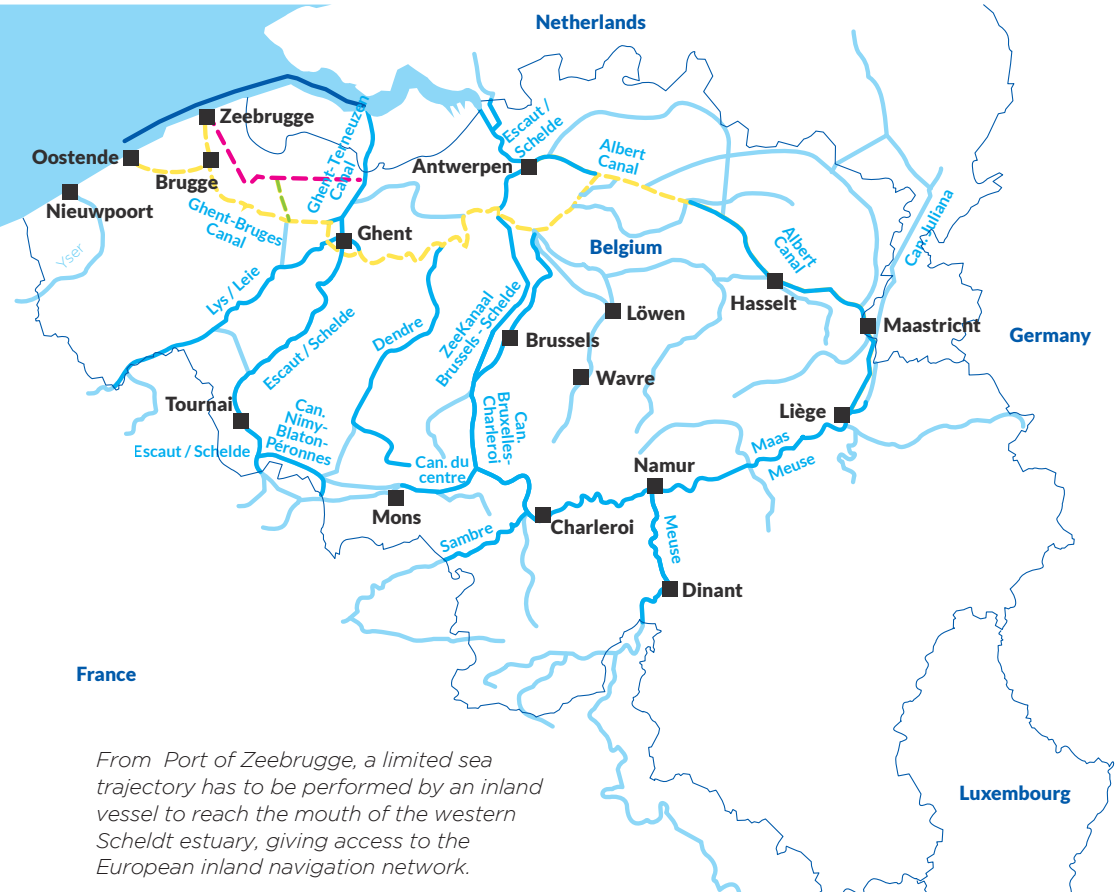
Belgium is the most telling example when studying the case of inland vessels that are allowed to navigate at sea, known in Belgium as estuary transport. Estuary traffic is carried out by estuary vessels, which must hold a certificate provided by a competent Belgian authority, allowing them to navigate at sea under the conditions prescribed in the national and regional regulation. The legal ground is a Royal Decree from 2007[27] which enforces the set of regulations allowing an inland vessel to navigate at sea between Belgian coastal ports. Since the last state reform, which has seen many of these responsibilities move to the regions, Flanders has issued minor changes to this Royal Decree.

According to this Decree, estuary vessels must comply with the rules applicable to inland vessels and must be designed in a way that allows them to navigate at sea (sufficient stability, safety requirements). They must, amongst other requirements, comply with MARPOL, without however holding a certificate, COLREG (preventing collisions at sea) and be equipped with sea radar (navigation equipment). Meteorological aspects must also be taken into account before the captain of such an inland vessel can decide whether or not to perform a sea voyage. The recent changes made by the Region of Flanders allow for some simplifications for this category of vessels and less administrative burden for ship owners. This evolution of the Decree also aims at reducing investment costs needed for building estuary vessels which are of lighter build and more cost-effective than seagoing ships that can also sail on the same routes from Zeebrugge to Ghent and Antwerp, as well as further upstream. With the evolvement of safety technologies, it is possible that the Decree further evolves in the future.

Almost all estuary traffic in Flanders departs from or arrives at the maritime port of Zeebrugge towards or from the port of Antwerp and the North Sea Port[28] and dedicated inland container terminals.

[27] Koninklijk besluit betreffende binnenschepen die ook voor niet-internationale zeereizen worden gebruikt: http://www.etaamb.be/nl/koninklijk-besluit-van-08-maart-2007_n2007014083.html
[28] North Sea Port is the name of the port formed by the cross-border merger between Zeeland Seaports (Flushing, Borsele and Terneuzen) in the Netherlands and Ghent Port Company in Belgium, signed on 8 December 2017.

RIVER-SEA TRANSPORT IN EUROPE: THE CASE OF INLAND VESSELS NAVIGATING "AT SEA"



From Port of Zeebrugge, a limited sea trajectory has to be performed by an inland vessel to reach the mouth of the western Scheldt estuary, giving access to the European inland navigation network.

Source: Based on https://www.binnenvaart.be/images/kaarten-CEMT/index.html

Belgium is the country in western Europe where the highest volumes of goods are transported via estuary transport. In 2018, 2.1 million tonnes of goods were transported via estuary traffic at the port of Zeebrugge, of which 58% were liquid bulk, 41% container and 1% ro/ro. Overall, estuary traffic represents 5.2% of maritime traffic registered at the port of Zeebrugge. Overall, 1,047 estuary vessels called at the Port of Zeebrugge in 2018 (+ 47 compared to 2017).

[29] *Source: 2018 annual report Port of Zeebrugge, https://portofzeebrugge.be/sites/default/files/2019-05/jaarverslag%202018.pdf*

The estuary fleet in Belgium is composed of 12 vessels in total, 8 tankers, 1 Ro-Ro cargo and 3 container carriers. Some are certified according to the prescriptions of the Belgium Royal Decree of 2007, and some obtained a certificate under a previous regime. The Belgian estuary fleet is quite recent, with the majority of the fleet being 15 years old or less.

TABLE 10: BELGIAN ESTUARY FLEET - BUILDING DATE, AGE AND TYPE OF VESSELS

Vessels' name(s)[30]	Built in	Age	Type of vessels
Presto	2003	16	Motor tanker
Polybotes	2004	15	Ro-Ro cargo ship
Tanzanite, Texas	2004	15	Motor tanker
Breitling	2005	14	Motor tanker
New Jersey	2006	13	Motor tanker
Amberes, Deseo, Tripoli	2007	12	Container vessel
Inventory, Montana, Mozart	2011	8	Motor tanker

The Ro-Ro cargo ship "Polybotes" is generally used for the spot market. It is also able to answer to the strong market demand for "high & heavy" cargoes, as it can transport extremely heavy one-piece parts of up to 60m in length, such as wind turbines, industrial transformers, tanks for liquids and yachts. The three container estuary vessels are primarily used to facilitate the connection with Antwerp. They follow a fixed rotational scheme which takes them to Antwerp three times a week. It takes eight hours to reach Antwerp from Zeebrugge, while it would take one and a half days if a conventional inland navigation route along canals was used. These three ships together have a capacity of 800 TEU per day and carry 160,000 TEU per year. These estuary vessels also allow to connect with several shortsea routes, in particular with the Baltic network[31]. Four of these estuary vessels call at North Sea Port, making approximately 75 voyages to and from the North Sea Port each year, carrying mainly containers and cars.

[30] Until 12 November 2018, another motor tanker was also in operation, the Zeebrugge, built in 1971. However, its certificate was not extended after this date.

[31] Source: Connect, Annual magazine of the port of Zeebrugge, 2019, https://portofzeebrugge.be/sites/default/files/2018-09/MBZ_Connect_2018_EN_web.pdf

INLAND VESSELS PUT AT SEA IN FRANCE

In France, some inland vessels are also allowed to operate alongside the coastline in domestic maritime areas (zone 1), beyond the "transverse limit of the sea", subject to restricted requirements prescribed by a national regulation[32], adopted in October 2018, in accordance with Directive 2016/1629. According to this national regulation, exclusive navigation on such zones 1 by inland vessels is forbidden. However, there are seven different pre-identified routes where inland vessels can be allowed to navigate at sea (both for goods and passenger transport). The requirements to be met by inland vessels also vary depending on the relevant route. For goods transport, this type of traffic takes place mainly in two areas: the Port du Havre area in the Seine estuary and the Golfe de Fos. This approach implies having well-defined zones of navigation and "transverse limits of the sea".

It is worth noting that before the adoption of the above-mentioned regulation, inland vessels navigating to Port 2000 (Port du Havre) were subject to a dedicated decree, outside the scope of application of Directive 2016/1629[33] (as the example of the Belgian regulation).

In France, even if inland vessels comply with the necessary requirements to navigate in the identified maritime area, their ability to do so is also conditional upon meteorological and sea conditions at the time the vessels are set to navigate at sea. Other conditions that need to be met are their foreseeable evolution during the journey time, the securement of an authorisation from the competent port police authority to enter or leave a port located on one of the pre-identified routes, and compliance with applicable local pilot regulations. Finally, it is the responsibility of the inland vessel operator to ensure safe navigation.

[32] Arrêté du 2 octobre 2018 relatif au classement des zones de navigation des bateaux de commerce, des bateaux de plaisance et engins flottants et aux compléments ou allégements des prescriptions techniques applicables sur certaines de ces zones de navigation : https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000037469594&fastPos=1&fastReqId=1502111262&categorieLien=cid&oldAction=rechTexte

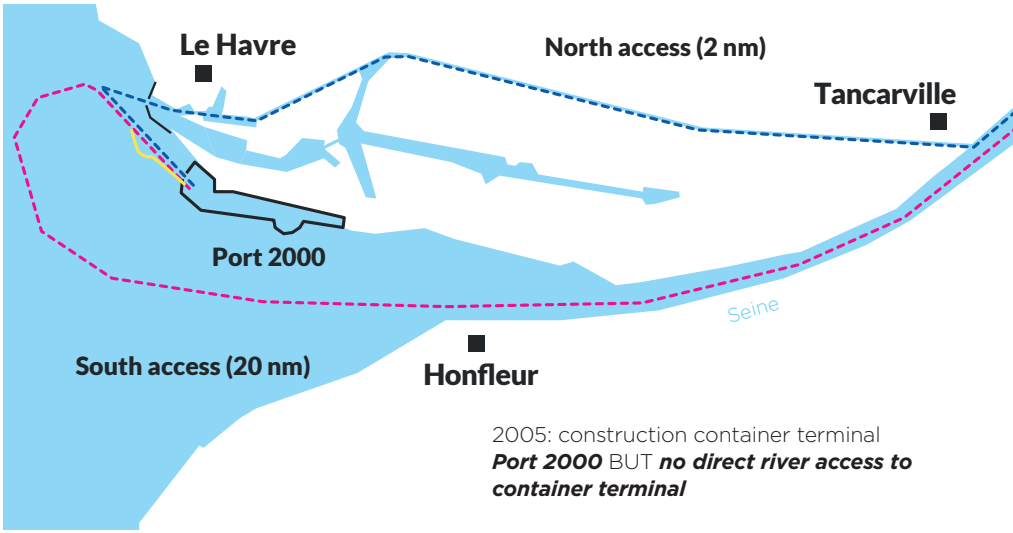
[33] Arrêté du 15 décembre 2014 relatif à la navigation de bateaux porte-conteneurs fluviaux en mer pour la desserte de Port 2000 et des quais en Seine à Honfleur : https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000029958156&categorieLien=id

This solution is particularly relevant when connections between inland waterway systems and maritime ports is insufficient. However, this solution is also dependent upon meteorological conditions, which may hinder its reliability. Where no direct inland access is available, the existence of a route involving transhipment can therefore be a useful complement to connect inland waterways with such maritime ports.

Port of Le Havre

Currently, there is no direct inland access between the Seine and the Port of Le Havre (Port 2000) for inland container vessels. Inland vessels adapted to navigate at sea are therefore the only direct way (without transhipment) to reach the container terminal.

Alternative connections: Sea trajectories to historic port of Le Havre (north access)
OR
Sea trajectories to mouth of river Seine (S)
Future developments (2022): Creation of direct river access with the building of a new dike (accès fluvial direct = "chatière")



Source: Figure based on Vantorre, M., Eloot, K., and Geerts, S. Paper 25 – Inland vessels at sea: a useful contradiction to solve missing links in waterway systems. Proceedings PIANC – SMART Rivers Conference 2013 (Editors: Rigo, P., Wolters, M.). Liège/Maastricht, 23-27 September 2013 and https://www.haropaports.com/fr/havre/concertation-aafp2000

RIVER-SEA TRANSPORT IN EUROPE: THE CASE OF INLAND VESSELS NAVIGATING "AT SEA"

There are currently eight inland vessels allowed to navigate at sea in the port of Le Havre area:

- Six container inland vessels (Oural, Bosphore, Euroports, Arc-en-Ciel, Pythagore and Smack) amounting to 137,500 TEU in 2016;
- Two bunker vessels (the New-York carrying heavy fuel and the New-Jersey carrying gasoil).

A co-funding of 25 million euros for the realisation of the project aiming at creating a direct inland access to Port 2000, and therefore allowing any type of inland vessel to access the Port, was agreed upon in March 2019. It is therefore possible that river-sea traffic in this region decreases once this project is finalised.

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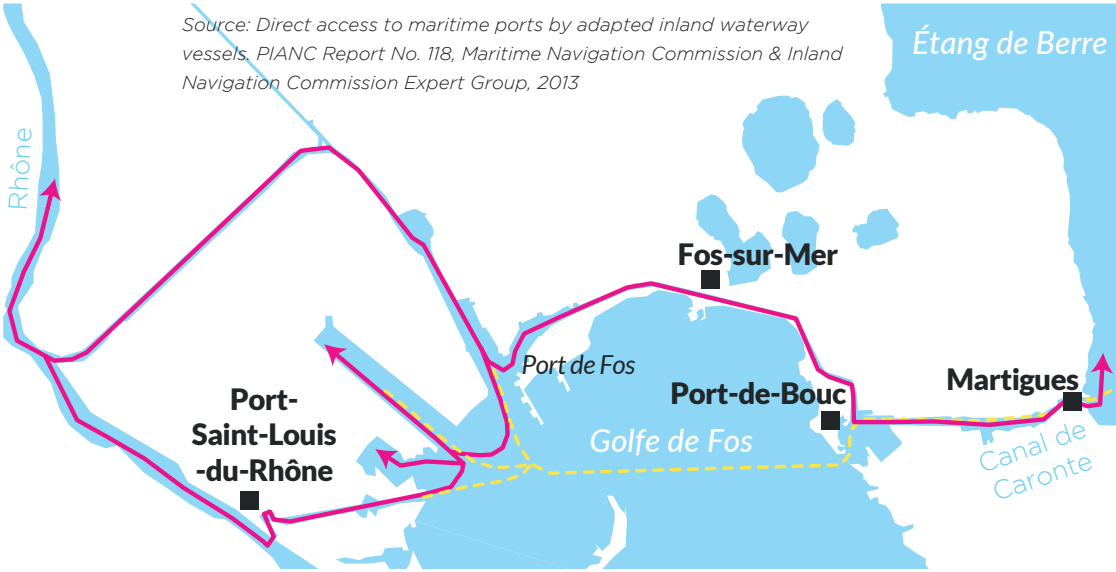
Golfe de Fos area

In the Golfe de Fos area, existing river routes connecting the river Rhône with Martigues and the "Etang de Berre", are currently long journeys that are only accessible by small inland vessels. However, an alternative sea trajectory through the Golfe de Fos is also possible. Given the recent modification of the French national regulation, very few vessels use the sea trajectory alternative, although it may be used more in the future if there is a sufficient business case for it.

Existing inland connection to river Rhône in the Golfe de Fos area from Martigues and the Etang de Berre
Sea trajectory alternative

Source: Direct access to maritime ports by adapted inland waterway vessels. PIANC Report No. 118, Maritime Navigation Commission & Inland Navigation Commission Expert Group, 2013



The possibility for inland vessels to navigate at sea is also very relevant in the context of passenger transport, allowing operators to offer new cruises. This is, for instance, the case of the French company CroisiEurope which offers cruises on the Loire, where the inland cruise vessel must navigate on a short sea stretch to reach Saint-Nazaire. With the adoption of the above-mentioned new French regulation, CroisiEurope will now be able to propose new cruises on the Gironde up to Royan, crossing maritime domestic waters. Allowing inland vessels to navigate at sea can therefore represent an important business opportunity, also in the passenger transport sector.

INLAND VESSELS "AT SEA": OPPORTUNITIES FOR THE FUTURE?

Inland vessels at sea can become relevant whenever a maritime/coastal port is not sufficiently connected to the inland waterway network, insofar as there is an underlying economic rationale (in other words, if this solution is less expensive than a multimodal option involving transhipment). Only then can this type of transport develop in a given area.

It is worth noting that pilot cases for this kind of transport have been elaborated. For instance, in Germany, a special solution for river-sea transport was developed to connect the Jade-Weser-Port to the river Weser. Indeed, the hinterland accessibility of this port is currently limited to trains and trucks as there is no direct access for inland vessels. Conventional seagoing inland ships are not competitive at the given bridge heights and water depths connecting the Jade-Weser-Port to the river Weser. Therefore, a need for a completely new ship design which is seaworthy and which at the same time can be used efficiently on the inland waterways was identified, leading to the German joint research project BiWi[34]. In this context, a solution was developed based on the pusher-barge principle with a special hydraulic coupling. At sea, suitable pushing vessels or tugs will be used to propel a seagoing barge. In inland navigation, a conventional canal pushing vessel is used and, ideally, pushes several barges at the same time. The concept was successfully tested with scale models up to significant wave heights of 2.5 metres.

Although the concept has not yet been expanded upon due to subsequent discussions about the possible creation of a direct inland access, the development of such a transport concept connecting seaports to inland waterways could be possible in other areas.

[34] Schlussbericht zum Teilvorhaben Entwicklung und Optimierung eines seegehenden Binnenschiffsleichters - Friedhoff, B. et al.; DST-Report 2081; Duisburg, 2016

In Sweden, several projects involving inland vessels at sea are also in the pipeline. For instance, on the west coast of Sweden, the petroleum-company Preem would like to transport petrol and diesel on barge-vessels from their coastal refinery in Lysekil down to Gothenburg and up via the Göta Älv river to the town of Karlstad on the northern part of Lake Vänern. The company sees extensive opportunities for a sustainable transport-flow and great environmental and climate advantages. Avatar Logistics is the partner responsible for the logistical solution and the barge-vessel concept.

In May 2020 the Port of Stockholm will inaugurate its new major port Norvik outside the coastal town of Nynäshamn. The traffic between Nynäshamn and Stockholm is dense and the infrastructure with road and rail not fully adequate. A great deal of interest has been shown for a barge-container-shuttle between Norvik and the Södertälje Canal up to the Lake Mälaren and the western parts of the Stockholm area. Avatar Logistics and the four ports in the region are ready to meet the challenges and are discussing barge-logistic concepts.

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GLOSSARY

20XX-1/20XX-Q1: First quarter
ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ESTUARY TRANSPORT: In Belgium, transport performed by estuary vessels, specific inland vessels that can also be used for non-international sea voyages. These inland vessels are allowed by a Royal Decree to operate in coastal areas between the Belgian coastal ports and the Belgian inland waterway network via the Schelde estuary provided they comply with certain requirements.
EU DIRECTIVE 2016/1629: A European directive laying down technical requirements for inland vessels.
EU: European Union
FAIRWAY DUES: Applied by a few countries, these fees were implemented for calling ships and depend on the size of the ship and the weight of the cargo carried.
INLAND WATERWAY BOUNDARY: In the UK, a boundary defined as the most seaward point of any estuary which might reasonably be bridged or tunnelled and this is taken to be where the width of water surface area is both less than 3 km at low water and less than 5 km at high water on spring tides.
INLAND WATERWAY TRANSIT TRANSPORT: Inland waterway transport through a country between two places (a place of loading/embarkation and a place of unloading/disembarkation) both located in another country or in other countries provided that the total journey within the country is by inland waterways and that there is no loading/embarkation and unloading/disembarkation operation in the transit country. IWT vessels loaded/unloaded at the frontier of that country onto/from another mode of transport are included.
IWT: Inland Waterways Transport
IWW: Inland Waterways
LAKE-SEA SHIPPING: In Sweden and Finland river-sea transport is referred to as lake-sea shipping as this type of transport mainly takes place between lakes (Saimaa, Vänern, Mälaren), representing the inland component, and the Sea (Baltic and North Sea).
MARITIME DANUBE: Downstream of the port of Braila, the Danube is often called the maritime Danube, due to its river-sea character.
MIO: Million
RIVER DANUBE: Upstream of the port of Braila, Danube traffic is classical river traffic.

RIVER-SEA SHIP: A seagoing ship adapted to navigate both at sea and on certain stretches of inland waterways

RIVER-SEA TRANSPORT: According to the Eurostat Reference Manual of Inland Waterways Transport Statistics a transport operation partly by inland waterways (IWW) and partly by sea, without transhipment. It can be operated by inland vessels or seagoing ships. Any inland vessel undertaking such transport will need to have the appropriate authorisation
permitting it to operate at sea.
NB: The terminology fluvio-maritime transport is also used to a lesser extent.

SAIMAA CANAL: A Finnish navigable canal connecting the Saimaa lake system near the city of Lappeenranta to the Gulf of Finland on the Baltic sea near the city of Vyborg

SHORT-SEA TRAFFIC: Trips made by seagoing ships between European seaports

SULINA CANAL: Romanian waterway with river-sea traffic linking the Black Sea with the river-sea port of Tulcea.

SÖDERTÄLJE CANAL: Swedish waterway connecting the lake Mälaren at the city of Södertälje to the Baltic Sea

TEU: Twenty-foot Equivalent Unit (unit for container volume)

THE INTERNATIONAL MARITIME ORGANISATION (IMO): The United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine and atmospheric pollution by ships

THE INTERNATIONAL CONVENTION ON LOAD LINES (LL): An international convention whose provisions were made for determining the freeboard of ships

THE INTERNATIONAL CONVENTION FOR THE PREVENTION OF MARINE POLLUTION FROM SHIPS (MARPOL): The main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes.

THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA (SOLAS): An international maritime treaty which sets minimum safety standards in the construction, equipment and operation of merchant ships.

THE SMOOTH WATERLINE: In the UK, this is a boundary within estuaries, where all transport that remains completely within this Smooth Waterline is counted as pure (internal) inland waterway traffic.

TKM: Tonne-Kilometer (unit for transport performance which represents volume of goods transported multiplied by transport distance)

TROLLHÄTTE CANAL: A Swedish waterway connecting the lake Vänern to the Kattegat (Baltic) Sea

WATERSIDE GOODS TRAFFIC: Loading or unloading activity in ports, which includes inland vessels

NATIONAL STATISTICS OFFICES

Acronym	Original Name	English Name	Country
Destatis	Statistisches Bundesamt	Federal Statistical Office of Germany	Germany
INSSE	Institutul National de Statistica	National Institute of Statistics	Romania
Statbel	Statistics Belgium	National Institute of Statistics and Economic Studies	Belgium

OTHER SOURCES

Original Name	English Name	Country
CCNR/ZKR/CCR	CCNR	Europe
Danube Commission	Danube Commission	Europe
Directive (EU) 2016/1629 of the European Parliament and of the Council of 14 September 2016 laying down technical requirements for inland waterway vessels, amending Directive 2009/100/EC and repealing Directive 2006/87/EC	Directive (EU) 2016/1629 of the European Parliament and of the Council of 14 September 2016 laying down technical requirements for inland waterway vessels, amending Directive 2009/100/EC and repealing Directive 2006/87/EC	Europe
EMMA project	EMMA project	Europe
European Commission	European Commission	EU
EUROSTAT	EUROSTAT	EU
International Maritime Organization (IMO)	International Maritime Organization (IMO)	World
Koninklijk besluit betreffende binnenschepen die ook voor niet-internationale zeereizen worden gebruikt/ Arrêté royal relatif aux bateaux de navigation intérieure qui sont aussi utilisés pour effectuer des voyages non internationaux par mer	Royal Decree concerning inland waterway vessels also used for non-international sea voyages	Belgium
Liikenne- ja viestintävirasto (Traficom)	Finnish Transport and Communication Agency (Traficom)	Finland
Ports mentioned in the report	Ports mentioned in the report	Europe
Rijkswaterstaat	Rijkswaterstaat	Netherlands
Российская Палата Судоходства	Russian Chamber of Shipping	Russia
TrafikAnalys	TrafikAnalys	Sweden
UK Department for Transport	UK Department for Transport	UK
Voies Navigables de France	Navigable Waterways of France	France

BOOKS, JOURNAL ARTICLES AND STUDIES

Original Name	Country
2018 Annual report Port of Zeebrugge	Belgium
Connect, Annual magazine of the port of Zeebrugge, 2019	Belgium
Danube Commission market observation	Europe
Jahresbericht Donauschifffahrt in Österreich (Annual Report on Danube Navigation in Austria), Viadonau	Austria
Legifrance, Décret n° 59-951 du 31 juillet 1959 portant fixation des limites des affaires maritimes dans les estuaires, fleuves, rivières et canaux fréquentés par les bâtiments de mer	France
PIANC Report No. 118, Maritime Navigation Commission & Inland Navigation Commission Expert Group, 2013.	Europe
River and Sea transports in Romania in the EU strategy for the Danube region perspective, Radu SAGEATA (2011)	Romania
Register Book of vessels with the Russian River Register class	Russia
Register of ships with class of the Shipping Register of Ukraine	Ukraine
Schlussbericht zum Teilvorhaben Entwicklung und Optimierung eines seegehenden Binnenschiffsleichters" - Friedhoff, B. et al.; DST-Report 2081; Duisburg, 2016	Germany
UK Department for Transport (2017), Domestic waterborne freight 2017: notes and definitions.	UK
Vantorre, M., Eloot, K., and Geerts, S., Paper 25 – Inland vessels at sea: a useful contradiction to solve missing links in waterway systems. Proceedings PIANC – SMART Rivers Conference 2013 (Editors: Rigo, P., Wolters, M.). Liège/Maastricht, 23-27 September 2013	Belgium

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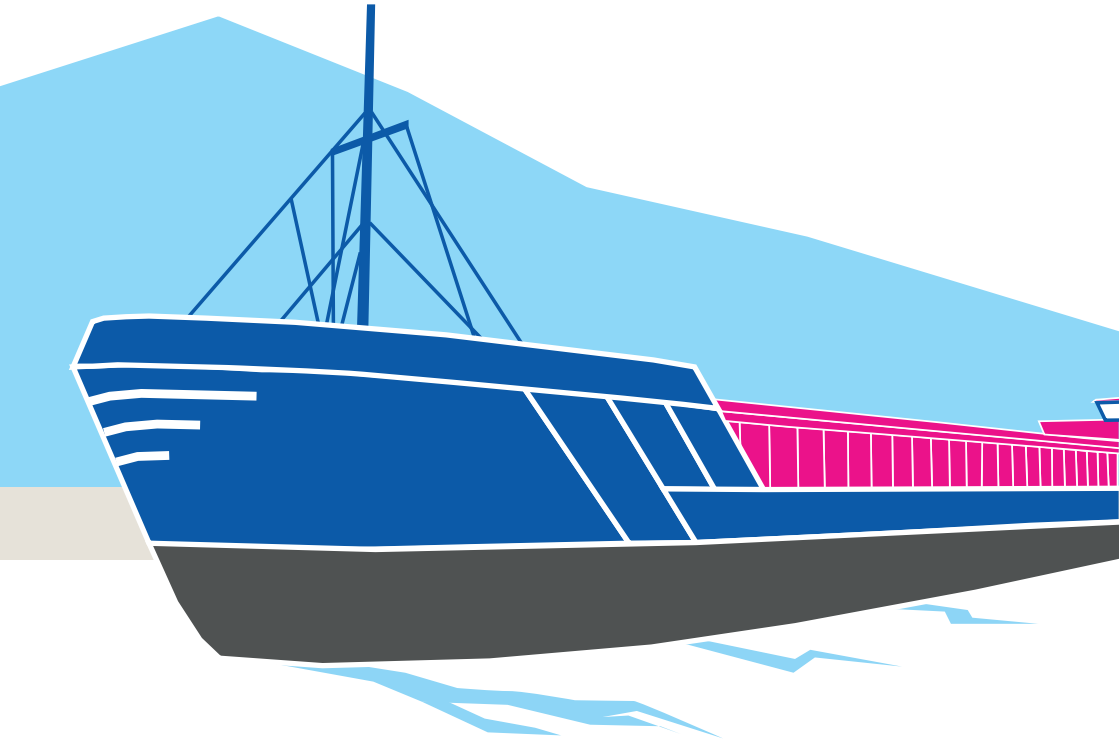

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