



# **Study on the integration of inland waterway transport in the European transport logistics chain from a regulatory, funding and transport economics perspective**



# **Executive Summary**

The study that follows was undertaken in the framework of the cooperation between the European Commission and the CCNR. It provides an analysis of the integration of inland waterway transport in the European transport logistics chain from a regulatory, funding and transport economics perspective is undertaken.

After reminding the objectives set out in the 2011 White Paper on Transport in terms of reduction of greenhouse gases and pollutant emissions as well as modal shift from road freight to other modes such as waterborne and rail transport, this study focuses on some initiatives that have been undertaken so far to reach such objectives. For this purpose, the regulatory environment aiming at boosting the integration of IWT in the EU transport system and strengthening multimodality at EU and national levels is looked at. Recent initiatives, such as the revision of the combined transport directive (still under negotiations), can represent an opportunity for inland waterway transport to unleash its modal shift potential. State aid can also play an important role as a driver to improve multimodality, as illustrated by recent cases and the revision of the General Block Exemption Regulation which provides clarity on the type of support measures encouraging modal shift falling outside the scope of EU state aid control. The role played by the Connecting Europe Facility (CEF) programme for this purpose is also highlighted. While multimodal transport has benefited the least from the CEF programme in terms of co-funding, quite a good number of multimodal projects (approximately 11% of the total number of projects co-funded) has benefitted from the support of CEF.

In order to better understand where inland waterway transport lies within the multimodal transport chain, an in-depth analysis of modal split evolution per good segments is carried out, which allows drawing first conclusions in terms of detailed modal shift evolutions in Europe. It is observed that the modal split tendency for chemicals, petroleum products and containers is rather positive, meaning that inland shipping is rather successful in conquering new market shares within the liquid cargo and the container segments. Chemicals can be regarded as the market segment with the most positive modal split trend for inland shipping in EU countries, at least since 2008.

An investigation into seaport hinterland traffic by region and market shares of IWT is also provided, aiming at understanding further where inland shipping stands in the current multimodal environment. The results of this hinterland traffic (by rail and/or by inland shipping) analysis shows that the western seaports (Antwerp, Rotterdam, Amsterdam) have a high market share in hinterland transport from and to the western and south-western federal states in Germany, as well as from and to Switzerland. At the same time, inland shipping has a high share within this hinterland transport between these regions and the seaports of Antwerp, Rotterdam and Amsterdam. For the Northern, Eastern and South-Eastern German federal states, as well as for Austria and the Czech Republic, the picture looks different. Hinterland transport between these regions/countries and the seaports are much more focussed on rail transport, and hereby, the seaport of Hamburg acts as the major port of destination and origin for the cargo transport.

Eventually, several case studies are being looked at.

The specific case of Rastatt has been chosen to illustrate that multimodality can be seen as a risk reduction option for passengers, manufacturers and industry in case of disruption. Indeed, during the closure of the small stretch of the railway line in Rastatt for several months (from 12 August to 2 October 2017), a large part of the added value in the rail-based supply chain was lost and less than 40% of the capacity of the rail diversion routes could be used. The role played by alternative modes, especially inland waterways, was therefore key to prevent total blockage of traffic and mitigate the negative impact of the disruption. Moreover, figures relating to the impact of Rastatt on inland waterway traffic and on inland ports highlight the capacity of inland waterways on the Rhine to absorb new and unexpected traffic. Overall, the Rastatt incident had rather positive effects, sometimes long-lasting, on inland waterway transport and the traffic at inland ports, such as for the Swiss Rhine ports of Basel, where waterside container traffic was boosted in the 1<sup>st</sup> half year 2018 by a plus of around 10 %.

Successful multimodal projects/strategies which could serve as best practices for a better integration of inland waterway transport in the logistics chain are also identified.

The first example relates to the successful strategy set up by the Port of Liège to enhance its multimodal dimension, which has allowed putting inland waterway transport in top position before road and rail since 1939. Data also show a positive modal split evolution for IWT between 2015 (74%) and 2017 (76%). In terms of tonnes of goods handled at the Port of Liège, IWT has been following a positive trend since 2013. This is also true for container transport.

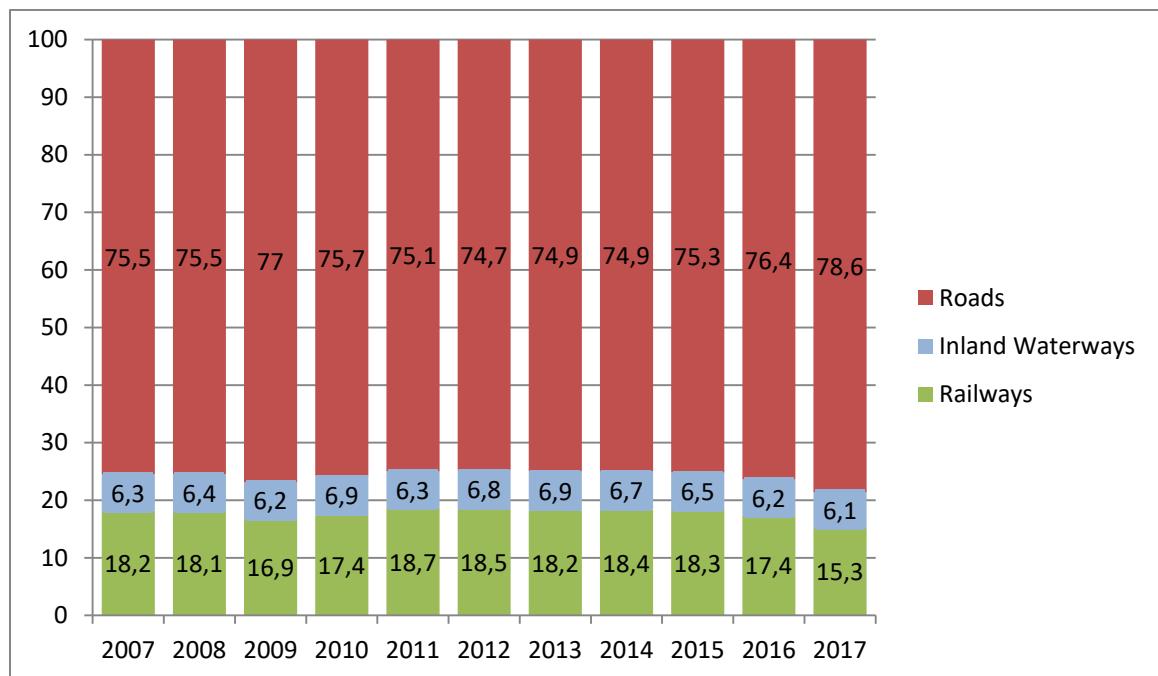
The second case study is about the new entity formed by the cross-border merger between Zeeland Seaports in the Netherlands and Ghent Port Company in Belgium in December 2017, North Sea Port. While it is too early to draw final conclusions as to the impact of the merger, for both maritime traffic and inland navigation, pre-merger ports together showed a positive growth in 2017 and North Sea Port started the year 2018 with record figures for both maritime traffic and inland navigation. In a few years' time, it will be interesting to analyse whether the strong economic developments which the North Sea Port is expected to create for the region have materialised.

# Introduction

The 2011 White Paper on Transport<sup>1</sup> showed that the transport sector faces significant challenges, in particular in terms of the need to cut greenhouse gases and pollutant emissions. The objective set was ambitious: to achieve a “60% CO2 reduction target by 2050” relative to 1990. For this purpose, the paper sets the objective of shifting “30% of road freight over 300 km [...] to other modes such as rail or waterborne transport by 2030, and more than 50% by 2050”. Another objective is that “[...] all core seaports are sufficiently connected to the rail freight and, where possible, inland waterway system” by 2050.

However, in terms of modal shift for freight transport in the European Union (EU), the road still reigns supreme before rail and inland waterways. Indeed, the modal share of rail decreased between 2011 and 2016, while the modal share of inland waterways has been fluctuating between 6% and 7% since 2007. The share of rail and inland waterways in 2016 was lower than in most preceding years.

**Modal split of freight transport (in %) 2007-2017\***

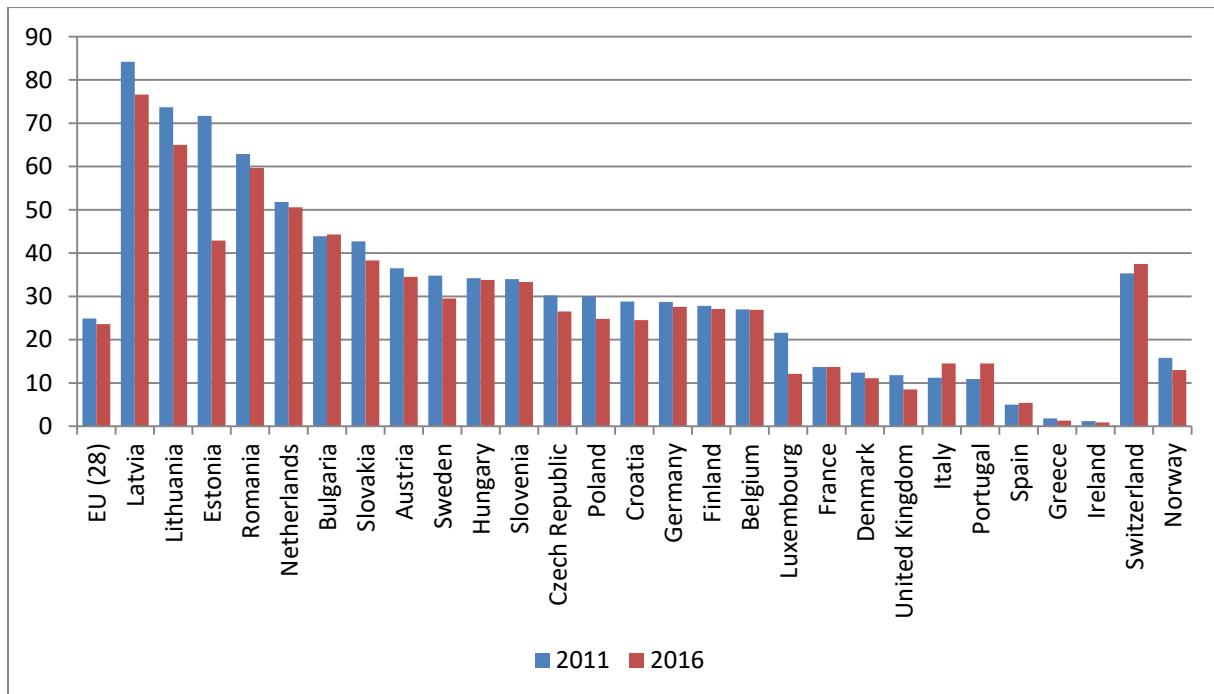


Source: Eurostat [iww\_go\_atygo], [road\_go\_ta\_tg], [rail\_go\_grpgood] \*For 2017, partly estimated due to some missing data at national level.

Between 2011 and 2016, the share of rail and inland waterways in total freight transport declined in the EU. Such a decrease is particularly striking in some Member States such as Estonia and Lithuania. In 2016, the combined share of rail and inland waterways in total freight transport exceeded 50% in four Member States, including one Rhine state only, the Netherlands.

<sup>1</sup> WHITE PAPER Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system /\* COM/2011/0144 final \*/ : <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52011DC0144>

**Share of rail and inland waterways activity in total freight transport by country 2011 and 2016 (in %)\***



Source: Eurostat, CCNR Analysis [sdg\_09\_60] \* Malta and Cyprus excluded

Multimodality strategies can however be a driver for reaching the objectives set in this 2011 White paper on transport. This has been reaffirmed in the European Commission's strategy for low-emissions mobility<sup>2</sup>: "*measures to support multimodal integration have an important role in achieving low emissions mobility by incentivising a shift towards lower emission transport modes such as inland waterways, short-sea shipping and rail.*" In order to underline the added value of multimodal strategies and place multimodality in the spotlight, it was decided that 2018 would be the year of multimodality, a year synonymous of initiatives taken to strengthen multimodality and integration of all transport modes within the EU transport system. This report comes under this initiative.

The report will first provide some elements about the current regulatory environment, which appears to be favourable to a greater integration of inland waterway transport (IWT) in the EU transport system. Secondly, a statistical view of modal split figures per country, goods segment, seaport hinterland traffic by region and market shares of IWT will be provided. Thirdly, the report will analyse how multimodality can play an important role in case of disruption of one mode of transport, as well as the impact of the Rastatt incident on IWT and inland ports. Finally, the report will present two case studies regarding the successful implementation of multimodal strategies: the port of Liège and the North Sea Port.

<sup>2</sup> Communication from the European Commission "A European Strategy for Low-Emission Mobility": <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52016DC0501>

# 1.

## A positive regulatory environment to boost the integration of IWT in the EU transport system



## I. Initiatives in favour of strengthening multimodality at EU and national levels

### i. Added value of the Combined Transport Directive

Decarbonisation of the EU transport system has been on the agenda of the European Commission and has gained momentum for several years. Inland waterways' potential is also acknowledged in the 2011 White Paper on transport "*Inland waterways, where unused potential exists, have to play an increasing role in particular in moving goods to the hinterland and in linking the European seas.*"<sup>3</sup> Moreover, the European Parliament has also been calling on the European Commission to take actions to increase multimodal transport and has underlined the added value of inland waterways, particularly in its recent report "Logistics in the EU and multimodal transport in the new TEN-T corridors" adopted on 19 January 2017<sup>4</sup>. In this report, the European Parliament stresses "*the need to concentrate major efforts on [...] the strengthening of inland waterways as a priority for the EU's sustainable transport strategy*". Similar to the above-mentioned White Paper, it also highlights the potential of IWT in terms of modal shift and notes "*that inland waterways must play an increasing role in serving seaports as well as logistics centres*".

The "Europe on the Move" initiative composed of three packages presented in May 2017, November 2017 and May 2018, includes several actions to modernise the EU transport system. As part of this initiative, a key proposal to promote multimodal transport, relevant to IWT, was published on 10 November 2017 and consists of a proposal to review the "Directive 92/106/EC on the establishment of common rules for certain types of combined transport of goods between Member States" ("the Combined Transport Directive"). This Directive is known as the only legal instrument at EU level which directly incentivises the shift of long-distance transport away from road to lower emission transport modes (rail, inland waterways, maritime transport).

This proposal therefore represents a key opportunity for inland waterways in particular, as it aims *inter alia* at strengthening support measures in favour of combined transport.

First, the European Commission proposes to modify the definition of a combined transport extending eligibility to a wider range of intermodal operations. For inland waterways in particular, the current minimum distance of 100km of the non-road leg excludes a number of operations around ports and in and around agglomerations. The European Commission is proposing to delete this minimum distance limitation. This proposal finds its rationale in the potential of such operations to contribute to decongesting the road networks in sea ports and in the immediate hinterland and to reducing environmental burdens in agglomerations.

Secondly, the European Commission seeks to improve the economic support measures. On one hand, it is proposed to make it mandatory for Member States to encourage investment in combined transport infrastructure, mainly investments into transhipment terminals along the transport European core and comprehensive transport networks. On the other hand, it encourages Member States to implement additional economic support measures to reduce the costs of combined transport operations and make them more competitive compared with road-only operations. This approach is supported by the results of two stakeholder consultations, revealing that 94% of

<sup>3</sup> Paragraph 27 White Paper on Transport 2011

<sup>4</sup> European Parliament report "Logistics in the EU and multimodal transport in the new TEN-T corridors", Rapporteur Inès Ayala Sander, 19 January 2017: <http://www.europarl.europa.eu/sides/getDoc.do?type=TA&reference=P8-TA-2017-0009&language=EN>

respondents wish the EU to continue supporting combined transport operations<sup>5</sup>. Two categories of incentives that could help the support of such operations were identified: investment incentives and/or operational incentives. These two categories are mirrored in the European Commission's proposal to revise the existing combined transport directive.

The European Parliament's Committee on Transport and Tourism<sup>6</sup> drafted the initial position of the European Parliament. The report was adopted by the EP Plenary on September 12, 2018. The report goes in the same direction as the European Commission and sometimes even further. For instance, it is in favour of making it mandatory for Member States to take measures, by 31 December 2021, whether they be economic or legislative, for improving the competitiveness of combined transport operations and by providing at least one of the following: exempting hauliers from external-cost charges and/or congestion charges; reimbursing charges for the use of certain infrastructure to undertakings performing operations as part of a combined transport ; and exempting hauliers from the limitations imposed under national traffic bans. A special emphasis is also put on the necessity to strengthen the competitiveness of waterborne transport, including inland waterways.

Debates within the Council of the EU show that Member States are generally in favour of the objectives of the Directive. However, as seen from the progress report adopted by ministers in June 2018, Member States's proposed amendments would reduce the extension of eligibility proposed by the Commission as well making encouragement of investments optional thereby depriving the amendment from its most useful effect<sup>7</sup>.

The draft proposal for a revision of the directive is still under negotiation between the EU legislators, and the final result of such negotiations is therefore not yet known. Nevertheless, it is clear that the revision of the Combined Transport Directive can be an opportunity for IWT and could support unleashing its modal shift.

## **ii. The important role of State aid as a driver to improve multimodality**

In addition to EU legislative initiatives, State aid decisions can play an important role in enhancing multimodality and modal shift from road to inland navigation. A number of European Commission decisions relating to national State aid schemes that aim at increasing modal shift to inland navigation and rail, as well as supporting inland ports and combined transport infrastructure, have been taken in the past few years.

Because the cost of combined transport is higher than single-mode transport (pure road transport in particular), it lacks the ability to compete without public support. Indeed, the price of combined transport operations is affected by, among others, the cost of transhipment, storage of containers and terminal costs. To give an example, the share of terminal costs represents up to 20% of total costs of intermodal transport, making combined transport comparatively expensive.<sup>8</sup> Public support is therefore a key tool to allow combined transport competing with other modes. The European

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<sup>5</sup> Public consultation on Combined Transport Report on the contributions received:

<https://ec.europa.eu/transport/sites/transport/files/media/consultations/doc/2014-combined-transport/summary.pdf>

<sup>6</sup> <http://www.europarl.europa.eu/committees/en/TRAN/home.html>

<sup>7</sup> Council Progress report on the revision of the combined transport directive:

<http://data.consilium.europa.eu/doc/document/ST-7864-2018-INIT/en/pdf>

<sup>8</sup> European Federation of Inland Ports Position on State Aid in the Inland Ports Sector:

[https://havens.binnenvaart.nl/component/docman/doc\\_view/152-state-aid-position-efip?Itemid=](https://havens.binnenvaart.nl/component/docman/doc_view/152-state-aid-position-efip?Itemid=)

Commission case practice shows that such aids are usually considered as compatible with EU State aid law on the basis of article 93 of the Treaty on the Functioning of the European Union (TFEU)<sup>9</sup>.

Recent State aid decisions can be used as examples to illustrate the European Union case practice in the instance of aid schemes supporting modal shift to inland waterways.

- The Czech aid for intermodal transport units<sup>10</sup> that provide for the purchase of transport units dedicated for continental combined transport (combined transport operation that does not connect to maritime transport (i.e. rail-road or inland waterway-road only)). The aim of the measure is to shift consignments from direct road transport to continental combined transport and to improve the competitiveness of intermodal transport services in the Czech Republic.
- The prolongation of the French aid scheme *Plan d'Aide au Report Modal* (PARM) aiming at encouraging modal shift to inland waterways by reducing the costs of logistics chains, including inland waterway transport. The aid will be granted in the form of subsidies to inland waterway transport operators<sup>11</sup>.
- The German aid scheme on funding for transhipment facilities for combined transport of non-federal companies<sup>12</sup>. The objective of the scheme is to develop combined transport in order to achieve a traffic shift of freight from road transport to other modes of transport, including inland waterway transport. It subsidises the construction or extension of private intermodal terminals.

Several examples also exist in the rail sector where such State aid measures can for instance consist in direct grants to companies using rail services which commissioned multimodal transport and/or transhipment services<sup>13</sup>, including for the transport of intermodal container and single wagonload<sup>14</sup>, aid for the compensation of infrastructure charges and aid for the reduction of external costs<sup>15</sup>.

The simplification of the rules and extension of the General Block Exemption Regulation to ports and airports is also expected to have a positive impact on investments in inland ports, and therefore possibly on hinterland traffic<sup>16</sup>. Indeed, this regulation introduces a new exemption allowing Member States to invest up to €50 million in inland ports without prior control under EU State aid rules by the

<sup>9</sup> Article 93 TFEU “Aids shall be compatible with the Treaties if they meet the needs of coordination of transport or if they represent reimbursement for the discharge of certain obligations inherent in the concept of a public service.”

<sup>10</sup> State aid SA.49153 (2017/N) – Czech Republic – Aid for intermodal transport units, 15/05/2018:

[http://ec.europa.eu/competition/state\\_aid/cases/271167/271167\\_1989527\\_132\\_3.pdf](http://ec.europa.eu/competition/state_aid/cases/271167/271167_1989527_132_3.pdf)

<sup>11</sup> SA.48332 PLAN D'AIDE AU REPORT MODAL (PARM), 29/05/2018:

[http://ec.europa.eu/competition/elojade/isef/case\\_details.cfm?proc\\_code=3\\_SA\\_48332](http://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_48332)

<sup>12</sup> SA.46341 Scheme on funding for transhipment facilities for combined transport of non-federal companies, 04/01/2017:

[http://ec.europa.eu/competition/elojade/isef/case\\_details.cfm?proc\\_code=3\\_SA\\_46341](http://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_46341)

<sup>13</sup> SA.44627 – Italy – ‘Ferrobonus’ - incentive for rail transport, 08/02/2017 :

[http://ec.europa.eu/competition/state\\_aid/cases/264873/264873\\_1872028\\_67\\_2.pdf](http://ec.europa.eu/competition/state_aid/cases/264873/264873_1872028_67_2.pdf)

<sup>14</sup> SA.47109 (2017/N) – Belgique Régime de promotion du transport combiné ferroviaire (unités de transport intermodal) et du trafic ferroviaire diffus, 06/06/2017 :

[http://ec.europa.eu/competition/state\\_aid/cases/269032/269032\\_1926292\\_130\\_2.pdf](http://ec.europa.eu/competition/state_aid/cases/269032/269032_1926292_130_2.pdf)

<sup>15</sup> State aid SA.48390 – Austria Prolongation of aid scheme for transport of goods by rail in certain combined transport services for 2018-2022, 25/10/2017:

[http://ec.europa.eu/competition/state\\_aid/cases/269839/269839\\_1971628\\_105\\_5.pdf](http://ec.europa.eu/competition/state_aid/cases/269839/269839_1971628_105_5.pdf)

SA.45482 (2016/N) – Italy – Rail freight transport support scheme, 08/02/2017:

[http://ec.europa.eu/competition/state\\_aid/cases/265803/265803\\_1871682\\_140\\_2.pdf](http://ec.europa.eu/competition/state_aid/cases/265803/265803_1871682_140_2.pdf)

<sup>16</sup> Commission Regulation (EU) 2017/1084 of 14 June 2017 amending Regulation (EU) No 651/2014 [declaring certain categories of aid are compatible with the internal market] as regards aid for port and airport infrastructure [...]:

<https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1497952641554&uri=CELEX:32017R1084>

European Commission, thereby leaving more room for manoeuvre to Member States and enhancing legal certainty.

In addition to the revision of the General Block Exemption Regulation, the Notion of Aid Notice<sup>17</sup>, adopted in May 2016, provides clarity on the type of support measures falling outside the scope of EU state aid control. Such measures are exempted from prior notification to the European Commission before being implemented. For example, it confirms that "*public investment for the construction or upgrade of infrastructure is free of State aid if it does not directly compete with other infrastructure of the same kind*". While this is typically the case for inland waterways networks, ports infrastructure, on the contrary, are usually in competition with similar infrastructures. In the case of port infrastructure, projects supported by public money may benefit from a selective advantage compared to projects operating without public support. Such financing is therefore subject to prior European Commission scrutiny under EU State aid rules.<sup>18</sup>

**iii. National strategies to support IWT and its integration in the multimodal logistic chains:  
the case of Germany**

In the case of Germany, despite its strong will to support alternatives to road transport and support programmes at EU level, the German federal government was unable to reach the goal set in its 2002 sustainability strategy of significantly increasing the shares of rail and inland waterways in freight transport expenditure by 2015 (rail: 25%, inland waterway: 14%), as shown in the table below. While railways, after a positive development until 2007, have settled at around 17% for years, the share of inland navigation fell continuously to just under 9% in 2016. In light of pressure put on public expenditure, both objectives were no longer included in the latest update of the sustainability strategy (Federal Government 2016<sup>19</sup>).

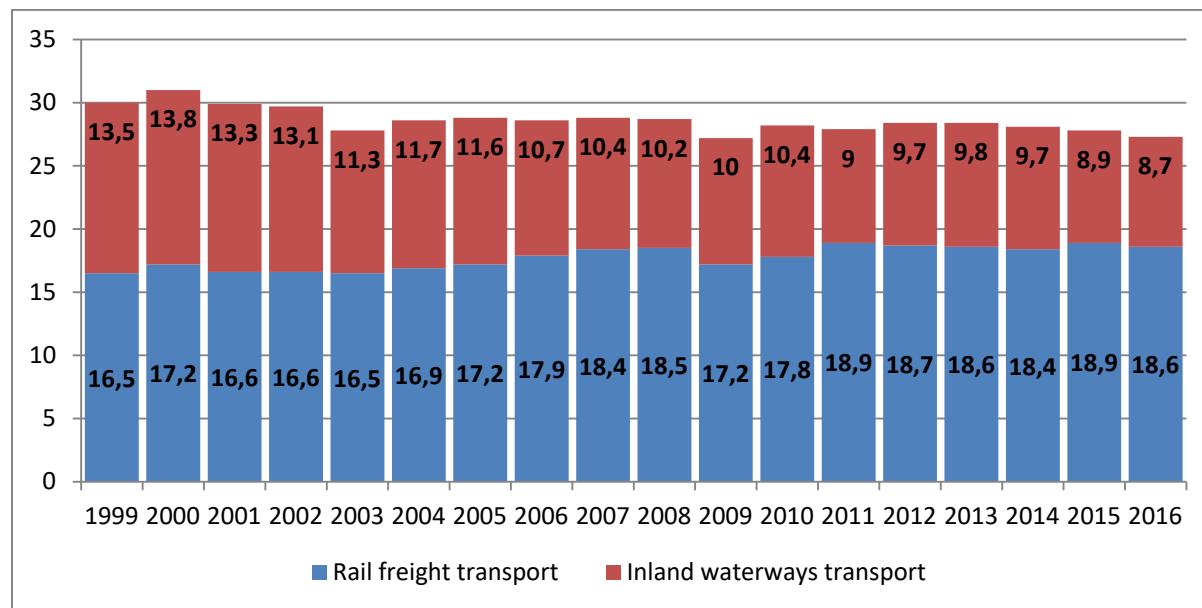
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<sup>17</sup> Commission Notice on the notion of State aid as referred to in Article 107(1) of the Treaty on the Functioning of the European Union, 19/07/2016: [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.C\\_.2016.262.01.0001.01.ENG&toc=OJ:C:2016:262:TOC](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.C_.2016.262.01.0001.01.ENG&toc=OJ:C:2016:262:TOC)

<sup>18</sup> European Commission press release, State aid: Commission clarifies scope of EU State aid rules to facilitate public investment [http://europa.eu/rapid/press-release\\_IP-16-1782\\_en.htm](http://europa.eu/rapid/press-release_IP-16-1782_en.htm)

<sup>19</sup> German sustainable development strategy 2016 (in English)  
[https://www.bundesregierung.de/Content/EN/StatischeSeiten/Schwerpunkte/Nachhaltigkeit/Anlagen/2017-06-20-langfassung-n-en.pdf?\\_\\_blob=publicationFile&v=5](https://www.bundesregierung.de/Content/EN/StatischeSeiten/Schwerpunkte/Nachhaltigkeit/Anlagen/2017-06-20-langfassung-n-en.pdf?__blob=publicationFile&v=5)

### *Share of rail and inland waterway transport in freight transport expenditure in Germany (in %)*



Sources: Umweltbundesamt, BMVI, Verkehr in Zahlen 2016/2017

The German government is however committed to supporting IWT and its integration in the multimodal chain. Indeed, it is now working on a Master Plan for Inland Navigation, which was agreed in the coalition agreement between CDU/CSU<sup>20</sup> and SPD<sup>21</sup>, with first results expected for the end of 2018 ("Masterplan Binnenschifffahrt"). Five working groups were created, including one on the integration of IWT in the multimodal transport chain.

Previously, the updated Freight Transport and Logistics Action plan, dating back to 2016<sup>22</sup>, was also putting some emphasis on modal shift to inland waterways, through several measures such as the implementation of a national Strategy for Sea and Inland Ports, the development of a strategy for improving the interconnectivity and integration of the modes of transport and ensuring the worthiness of road bridges, railway overpasses and locks etc.

Last but not least, the 2030 Federal Transport Infrastructure Plan" (FTIP 2030) adopted on 3 August 2016, contains all investment projects for the roads, railways and, for the first time, inland waterways, which will need to be implemented, and additional investment needed to enhance the transport network by 2030. 24 inland waterway projects with an overall financial volume of €6.5 billion were included in the requirement plan for the first time as "new projects of first priority". This infrastructure plan will most certainly be used as guidelines for future investment and IWT strategy.

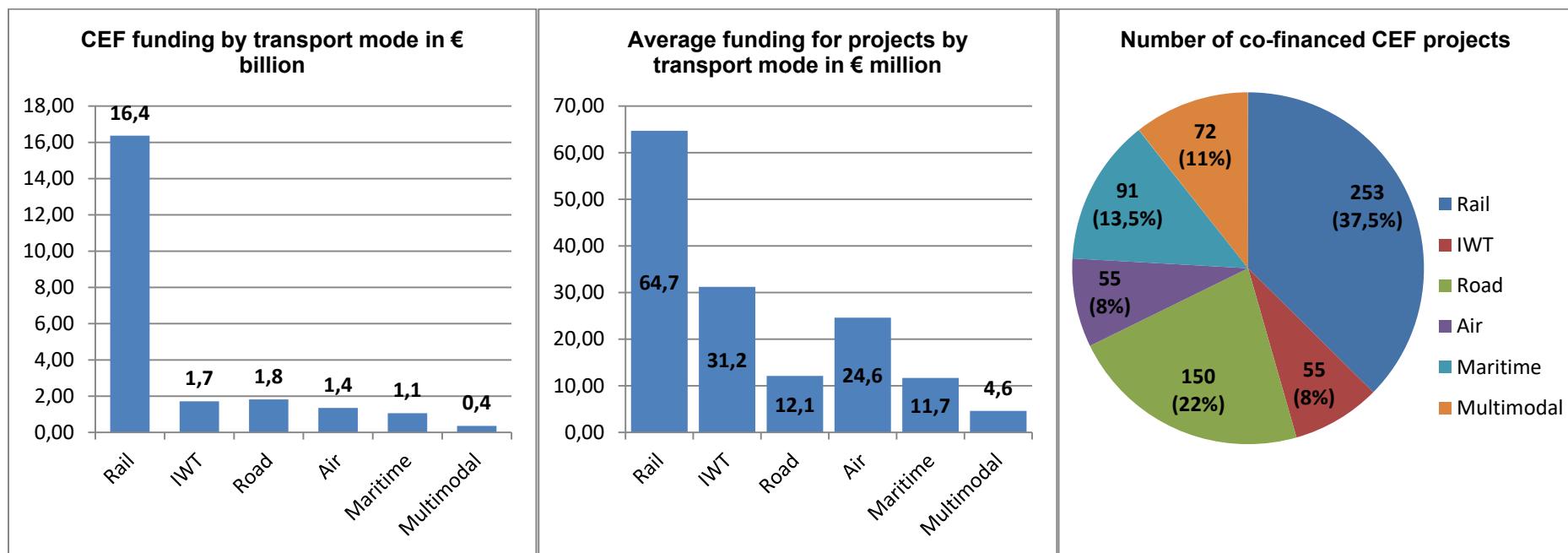
<sup>20</sup> CDU/CSU is the centre-right Christian democratic political alliance of two political parties in Germany, the Christian Democratic Union of Germany (CDU) and Christian Social Union in Bavaria (CSU).

<sup>21</sup> The Social Democratic Party of Germany

<sup>22</sup> [https://www.bmvi.de/SharedDocs/EN/publications/freight-transport-logistics-action-plan.pdf?\\_\\_blob=publicationFile](https://www.bmvi.de/SharedDocs/EN/publications/freight-transport-logistics-action-plan.pdf?__blob=publicationFile)

## II. Funding per transport modes : the important role played by the Connecting Europe Facility (CEF) programme

From 2014 onwards, the Connecting Europe Facility (CEF) programme has supported multimodal transport. Until October 2018, 72 multimodal projects were co-financed under the framework of CEF, including 26 under the priority “multimodal logistics platform” (General and Cohesion envelopes)<sup>23</sup>. Overall €0.36 billion were invested in multimodal projects under CEF, amounting to approximately 1% of total CEF investment. The average co-funding under CEF per multimodal projects is €4.6 million and €31.2 million per IWT project. So far, in terms of co-funding, multimodal transport has benefited the least from CEF funding, however, quite a good number of multimodal projects (72 projects) have been supported by CEF (approximately 11% of the total number of projects co-funded, before air and IWT).

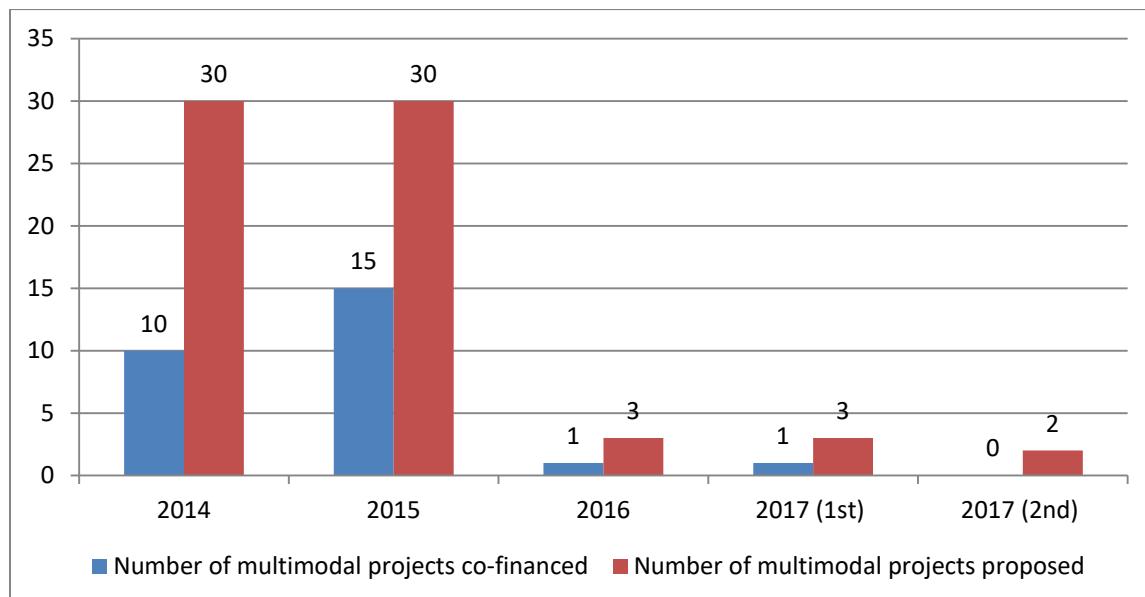


Sources: CEF support to inland waterways (June 2018), proposal for the selection of CEF projects 2014-2017, overview of submitted proposals 2014-2017 and CEF mid-term results

<sup>23</sup> CEF mid-term results [https://ec.europa.eu/inea/sites/inea/files/cef\\_implementation\\_brochure\\_web\\_final.pdf](https://ec.europa.eu/inea/sites/inea/files/cef_implementation_brochure_web_final.pdf) and CEF support to inland waterways, June 2018: <https://ec.europa.eu/transport/sites/transport/files/studies/2018-06-cef-support-to-inland-waterways.pdf>

In looking at the “multimodal logistics platform” priority in detail<sup>24</sup>, it can be observed that this priority was particularly attractive and successful in the first years of the CEF. This can be largely explained by the budget available for this priority, which varied significantly between 2014 and 2017, and the overall CEF budget. Indeed, total envelopes for the 2014 and 2015 calls (respectively €11.93 billion and €7.6 billion) were much higher compared to the envelopes of the 2016 and 2017 calls (respectively €1.9 billion and €1.35 billion). The ratio in terms of project selected compared to project proposed for this priority varies from 1/3 to 1/2.

***Overview of projects under priority “multimodal logistics platform” (cohesion and general envelopes)\****



Sources: *Proposal for the selection of CEF projects 2014-2017 and overview of submitted proposals 2014-2017*

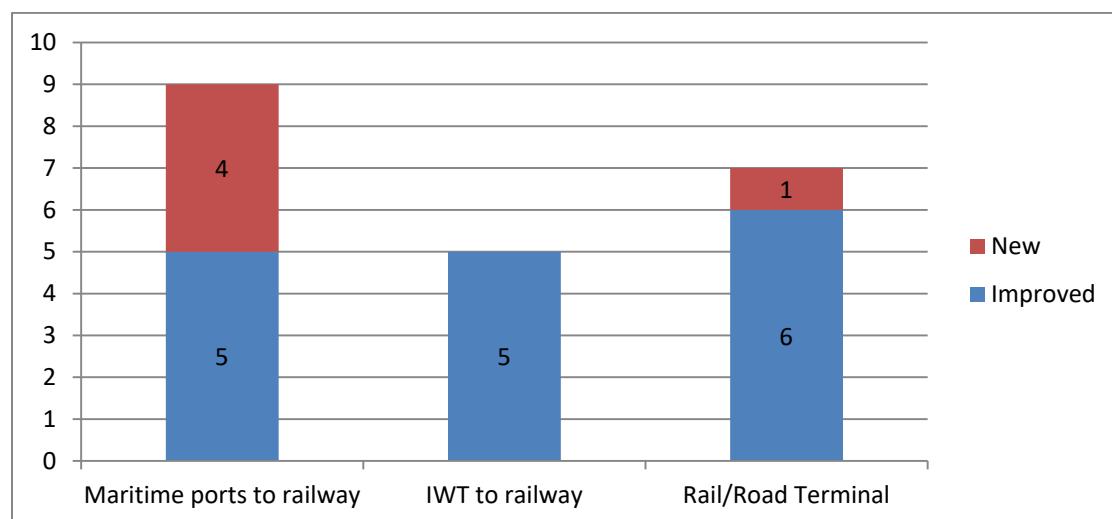
In terms of multimodal connections, co-funding under CEF has allowed:

- the creation of four new connections between maritime ports and the rail network and one new rail/road terminal;
- to improve the connection of five maritime ports, five inland ports and six rail-road terminals to the rail network.

Such investments represent €361.6 million in total, including €107 million granted through CEF. The inland ports of Strasbourg, Lyon, Bremerhaven, Regensburg and Seville benefited from up to nearly 50% of this amount.

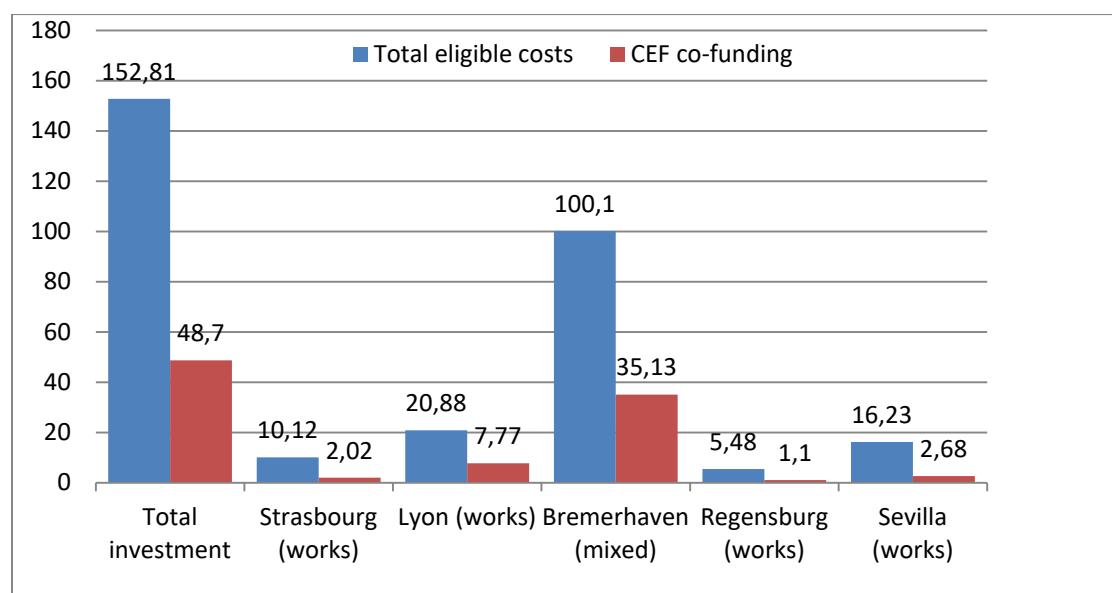
<sup>24</sup> The number of projects falling under the priority “multimodal logistics platform” does not amount to the total number of projects falling under the category “multimodal projects” described above.

**Number of new or improved multimodal connections to the rail network**



Sources: *Proposal for the selection of CEF projects 2014-2017 and overview of submitted proposals 2014-2017 and CEF mid-term results*

**Investment in improving inland port connections to the rail network (€ million)**



Sources: *Proposal for the selection of CEF projects 2014-2017, overview of submitted proposals 2014-2017 and CEF mid-term results*

The interconnection of transport modes is a serious obstacle to the development of multimodal transport, which CEF seeks to address. This problem is highlighted in the TEN-T Coordinator, Paweł Wojciechowski's report on CEF support to the Rhine-Alpine Corridor<sup>25</sup>, revealing that one of the greatest challenges for existing multimodal terminals on this corridor lies in their access link with the rail network. In light of the important role played by CEF to promote a better integrated transport system, the European Parliament called on the European Commission, in its report on "Logistics in the EU and multimodal transport in the new TEN-T corridors", to give priority to the promotion of rail connections with industrial plants and improved interconnectivity of rail with seaports, inland ports and hinterland hubs in the 2017 review of CEF.

Despite the very limited envelope left under CEF, multimodality is not left out of the 2018 CEF transport call, and projects aiming at connecting and developing multimodal logistic platforms are eligible under this call. However, among inland ports, only core ones are eligible, and in line with the last two calls, the funding envelope for this priority is rather low. It can be expected that only a limited number of projects will be funded under this priority.

Multimodal transport and projects aiming at better integrating inland waterways and inland ports in the EU transport system are expected to be supported under the next CEF programme (CEF II), especially in light of the target set by the European Commission of 60% of the CEF II envelope dedicated to climate objectives. The proposal for a regulation establishing a CEF II<sup>26</sup>, presented by the European Commission on 6 June 2018, is currently being negotiated by the EU legislators.

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<sup>25</sup> CEF support to Rhine-Alpine Corridor :

[https://ec.europa.eu/inea/sites/inea/files/201803\\_corridor\\_report\\_rhinealpine\\_withcover.pdf](https://ec.europa.eu/inea/sites/inea/files/201803_corridor_report_rhinealpine_withcover.pdf)

<sup>26</sup> [https://ec.europa.eu/commission/sites/beta-political/files/budget-may2018-cef-regulation\\_en.pdf](https://ec.europa.eu/commission/sites/beta-political/files/budget-may2018-cef-regulation_en.pdf)

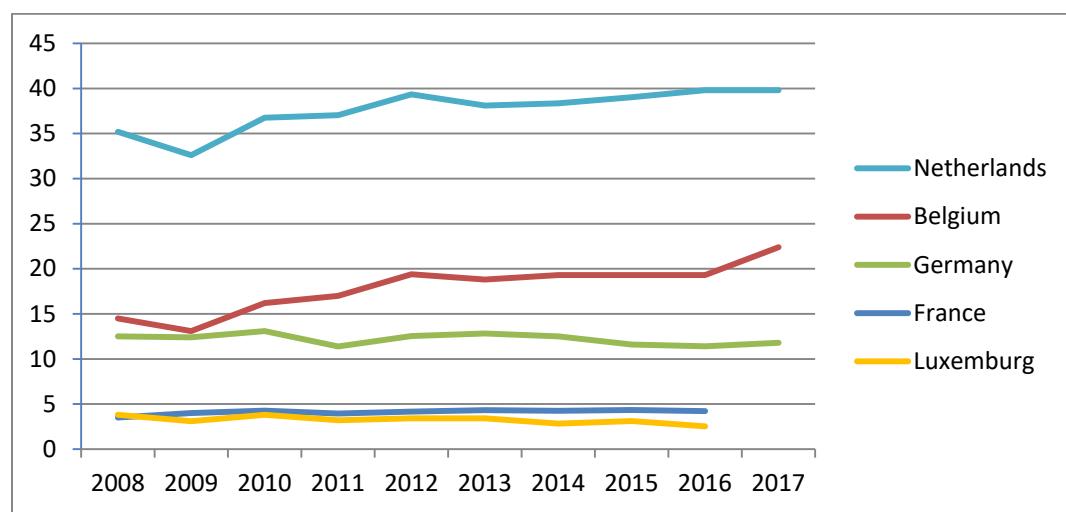
# **2. Inland navigation and other modes of transport: modal split evolution in Europe and analysis of seaport hinterland traffic**



## I. Modal split per country and goods segment

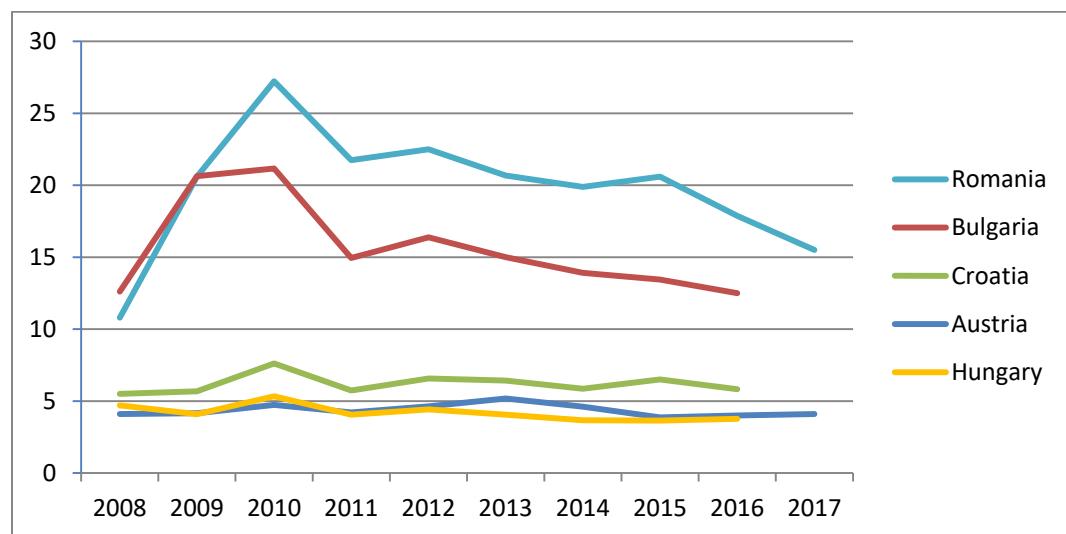
The impact of initiatives to foster modal shift from road to less polluting modes such as railway or inland waterway transport can be observed when analysing the modal split share evolution of IWT in a given country or region. An in-depth analysis of modal split evolution per good segments allows the drawing of first conclusions in terms of detailed modal shift evolutions in Europe (according to regions and market segments). Such an analysis is carried out in the paragraphs below. *N.B. The modal split share evolution depicted in the graphs below refers to the share of inland waterway transport performance in total (IWT + Road + Rail) transport performance.*

**Modal split share evolution in Rhine countries (%, based on transport performance)**



Source: Eurostat [*iww\_go\_atygo*], [*road\_go\_ta\_tg*], [*rail\_go\_grpgood*]

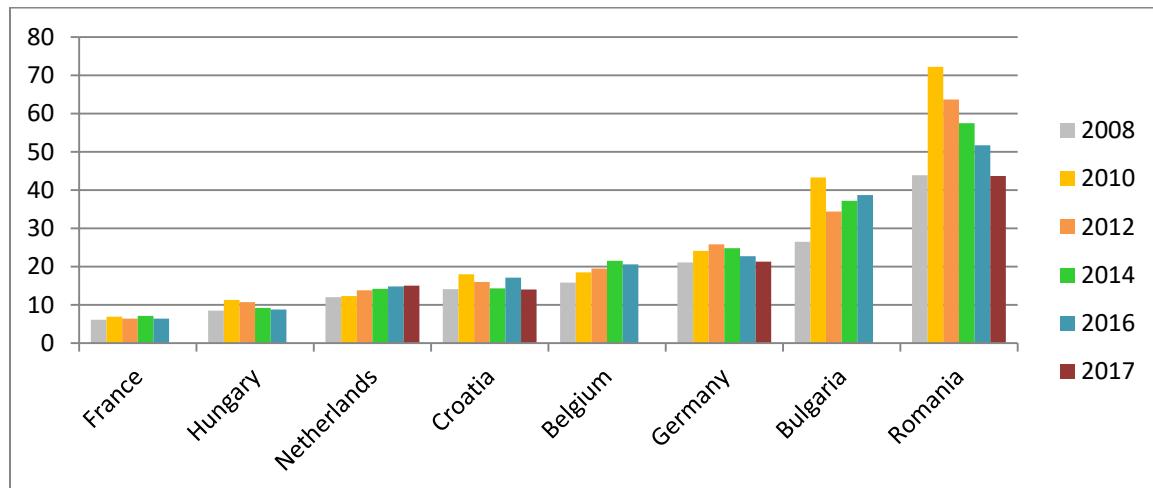
**Modal split share evolution in Danube countries (%, based on transport performance)\***



Source: Eurostat [*iww\_go\_atygo*], [*road\_go\_ta\_tg*], [*rail\_go\_grpgood*] \*Data for Hungary, Croatia and Bulgaria not yet available for 2017

Overall modal split figures are in a certain fashion statistical averages. The underlying reasons for modal share evolutions can only be revealed by going deeper into the intermodal data. The following figures present the results of modal split calculations for eight European countries, which together have a share of about 99% of the total transport performance on European inland waterways. For some countries, data for the year 2017 were not yet available.

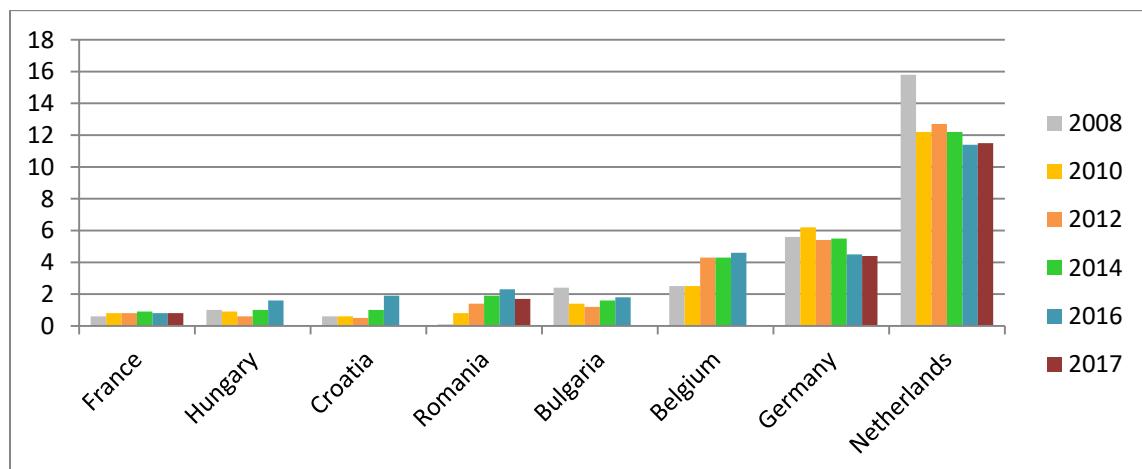
#### ***Modal split share evolution for agricultural products (%, based on transport performance)\****



Source: Eurostat [iww\_go\_atygo], [road\_go\_ta\_tg], [rail\_go\_grpgood], CCNR analysis \*Data for France, Hungary, Belgium and Bulgaria not yet available for 2017

The intermodal data for Romania reveals that IWT increased its transport performance for agricultural products over the years but has nevertheless lost market shares against road and rail. Most of the other countries show a relatively constant modal split share of inland navigation for this product segment.

#### ***Modal split share evolution for food products (%, based on transport performance)\****

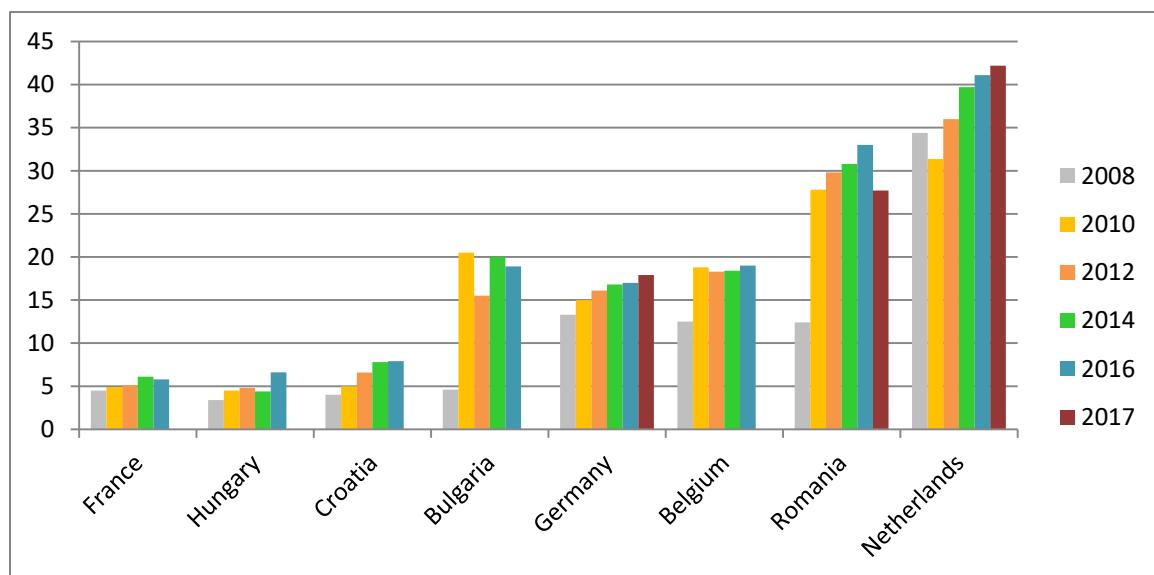


Source: Eurostat [iww\_go\_atygo], [road\_go\_ta\_tg], [rail\_go\_grpgood], CCNR analysis \*Data for Hungary, Croatia, Belgium and Bulgaria not yet available for 2017

Food products are a segment with, on average, quite low IWT modal shares. This is due to the fact that food products are often perishable goods, thus, long transport times cause major issues in terms of quality and service. But not all parts of this segment are perishable. For non-perishable products, such as rapeseed oil, inland shipping could gain further market shares in the future, as such products have a mass cargo character and show a large potential as an energy resource. Besides, more urban transport chains involving inland vessels could also be a potential for increasing the food products that are transported on rivers.

For chemical products, the multimodal data show that IWT gained market shares. Detailed analysis reveals that such an increase can be explained for different reasons.

#### ***Modal split share evolution for chemical products (%), based on transport performance)\****



Source: Eurostat [iww\_go\_atygo], [road\_go\_ta\_tg], [rail\_go\_grpgood], CCNR analysis \*Data for France, Hungary, Croatia, Bulgaria and Belgium not yet available for 2017

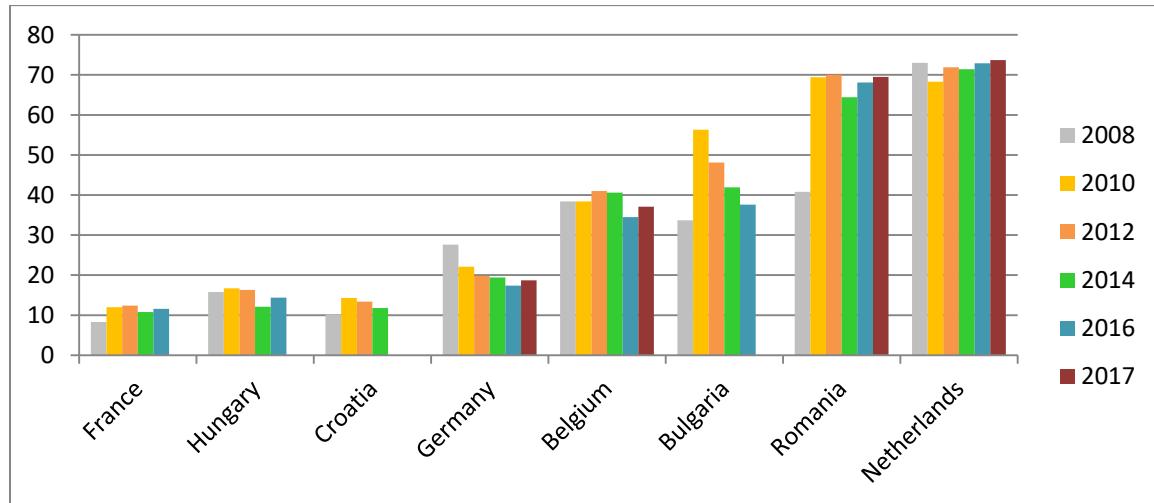
In Rhine countries, road transport for chemicals has been decreasing over several years with quite a robust trend. For example, in Germany, transport of chemicals by road fell by 31% between 2008 and 2017, and rail transport by 15%. However, transport of chemicals on inland waterways increased by 3% over the same period. In Rhine countries, falling figures for road transport and partly for rail transport can be explained by safety issues. Indeed, higher safety standards apply today to tanker shipping, which is an advantage compared to other transport modes in this segment.

The Danube countries show different patterns. Here, road transport of chemicals follows a more or less increasing trend. The national transport sectors of these countries are overall more orientated towards road transport. Nevertheless, IWT has gained market shares for chemicals in Danube countries because the performance of IWT has increased, while the market shares of rail transport for chemicals mostly fell.

The next segment includes ores, sands, gravel and stones, and can be regarded as a “hybrid” product segment, as it is related to quite different industrial activities: steel production on the one hand (related to ores) and the construction activity (related to sands, stones, gravel) on the other hand.

Overall, the results of the modal split calculations are, in this hybrid segment, quite difficult to interpret. There are many different trends present, in two quite separated markets, which may be overlapping or overlaying each other.

#### ***Modal split share evolution for ores, sands, stones, gravel (% based on transport performance)\****

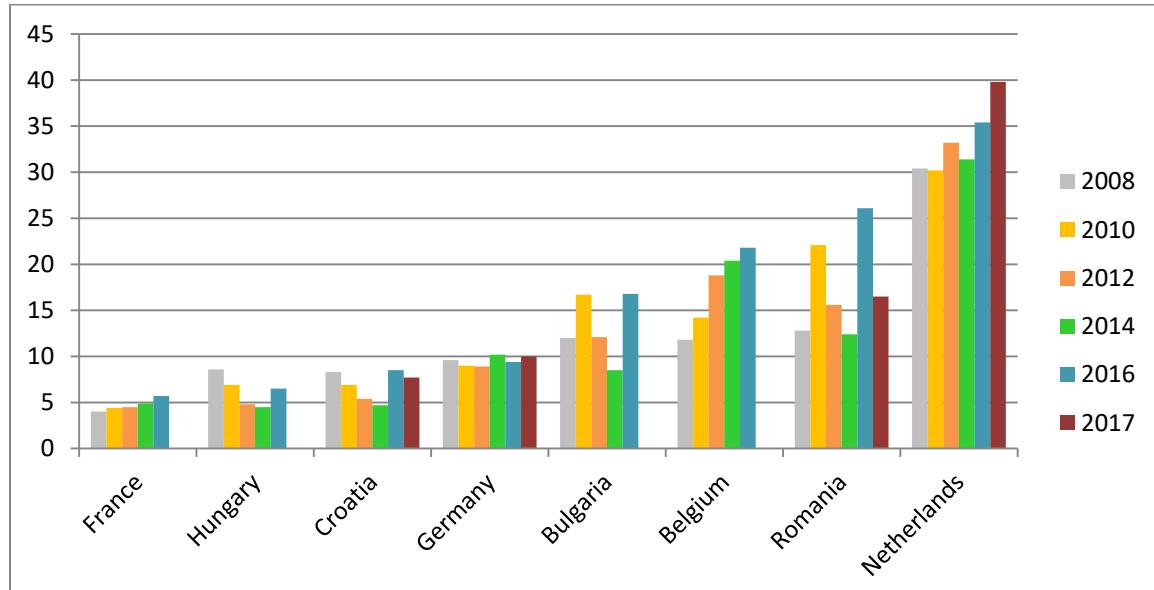


Source: Eurostat [iww\_go\_atygo], [road\_go\_ta\_tg], [rail\_go\_grpgood], CCNR analysis \*Data for France, Hungary, Croatia and Bulgaria not yet available for 2017

Metals and metal products are parts of a segment where road transport still has the highest modal shares, although it has decreased since 2008, due to a reduction of absolute transport performance.

Rail and inland waterway transport of metals have both shown a rather stable evolution since 2008. Due to the reduction of road transport, IWT could gain market shares in some countries.

#### ***Modal split share evolution for metals and metal products (% based on transport performance)\****

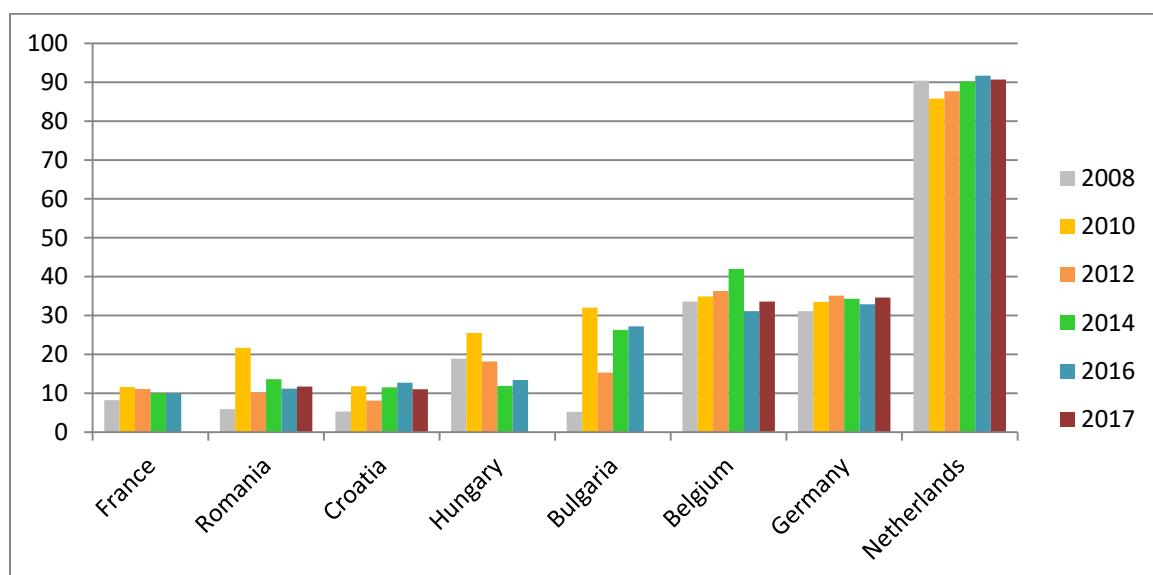


Source: Eurostat [iww\_go\_atygo], [road\_go\_ta\_tg], [rail\_go\_grpgood], CCNR analysis \*Data for France, Hungary, Bulgaria and Belgium not yet available for 2017

For the liquid cargo segment of petroleum products, very high market shares for IWT can be observed in the Netherlands. Inland vessels carry around 90% of all petroleum products. This is even more important, as this country is one of the largest producer countries for petroleum products in Europe.

Europe's largest refineries can be found in the Netherlands, in particular in the areas of large seaports such as Rotterdam. According to Eurostat data, IWT's modal share has increased even further since 2010 in the Netherlands. In Belgium and Germany, which are also countries with a high level of refinery production, the modal share of IWT is very high and slightly above 30%.

#### ***Modal split share evolution for petroleum products (% , based on transport performance)\****



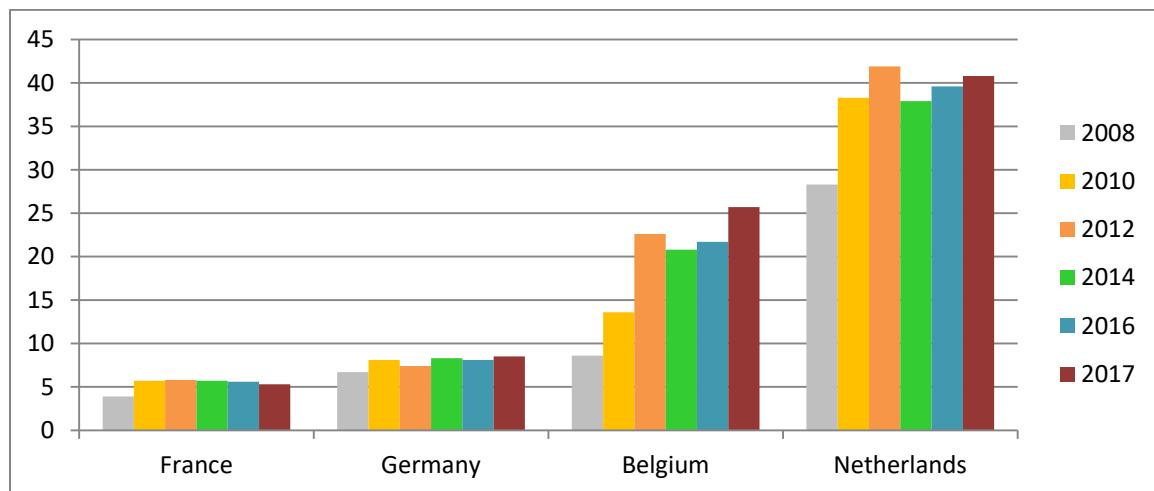
Source: Eurostat [iww\_go\_atygo], [road\_go\_ta\_tg], [rail\_go\_grpgood], CCNR analysis \*Data for France, Hungary and Bulgaria not yet available for 2017

Around 99% of total container transport on European inland waterways takes place in Rhine countries. Indeed, only four Member States have significant inland waterway container transport: the Netherlands, Germany, Belgium and France<sup>27</sup>. Therefore, the following analysis will focus on these four countries. While the modal share of IWT in France and Germany is rather low and quite constant, an upward trend can be observed – on a high level – in Belgium and the Netherlands.

The reasons are manifold: a dense and ever-growing network of intermodal container terminals, a dense network of rivers and canals, densely populated urban areas with a high market potential for container transport, and short distances to major seaports, are certainly the main reasons for the success of inland waterway container transport in the Netherlands and in Belgium.

<sup>27</sup> CCNR annual market observation report 2018: [https://ccr-zkr.org/files/documents/om/om18\\_II\\_en.pdf](https://ccr-zkr.org/files/documents/om/om18_II_en.pdf)

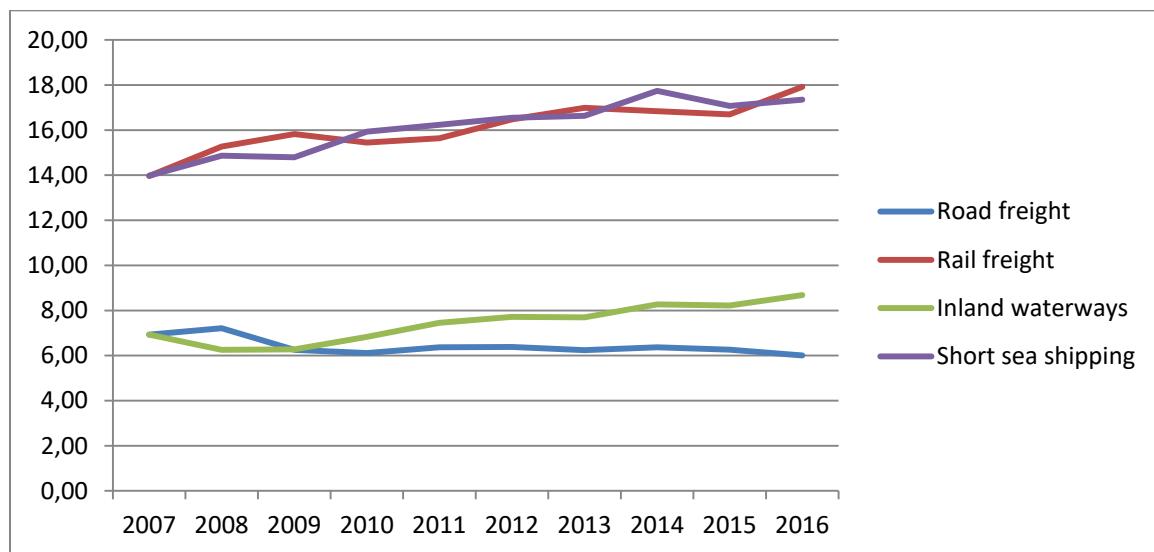
**IWT modal split share evolution for container transport (%, based on transport performance)**



Source: Eurostat [iww\_go\_actygo], [road\_go\_ta\_tcrg], [rail\_go\_contwgt], CCNR analysis

Data shows that the unitisation rates vary greatly across modes. Short sea shipping and rail transport rates are indeed largely above the rates for freight transport by road and by inland waterways. However, the unitisation rate of goods transported by inland waterways increased overall between 2007 and 2016. This is in line with the increasing trend observed in recent years for container traffic.

**Share of containers in total goods transport by mode of transport 2007-2016 (% of total tkm)**



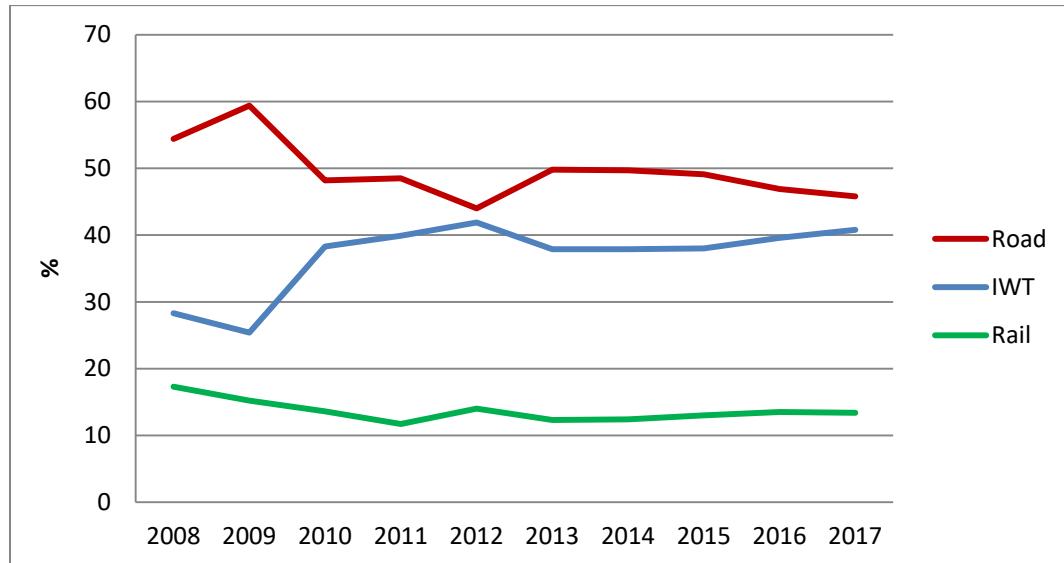
Source: Eurostat [tran\_im\_umod]

For the container segment, it was decided to show not only the modal split evolution of IWT, but also the evolution for the other two inland transport modes.

*N.B. The evolution of modal share depicted in the graphs below refers to the percentage share of IWT transport performance (tkm) for containers compared to total transport performance for containers (IWT+rail+road).*

In the Netherlands, inland vessel container traffic has recently conquered market shares against road transport. The modal share of IWT in the container segment is, with 40%, almost exactly as high as for the overall IWT transport market in this country.

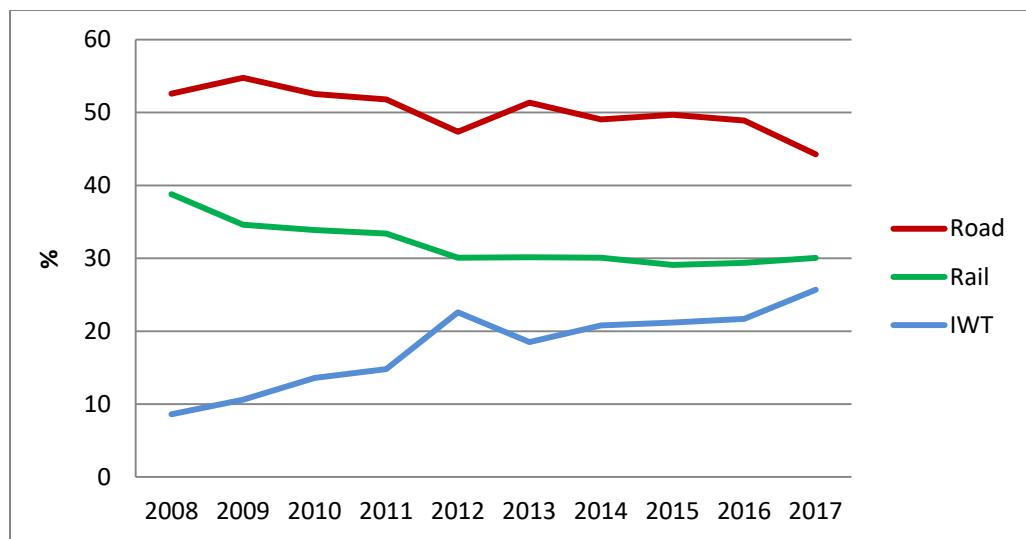
***The Netherlands – evolution of modal share for road, IWT and rail within container transport (%)***



Source: Calculation CCNR based on Eurostat [iww\_go\_actygo], [road\_go\_ta\_tcrg], [rail\_go\_contwgt]

Also for Belgium, the data show that inland vessels could gain market shares against road transport.

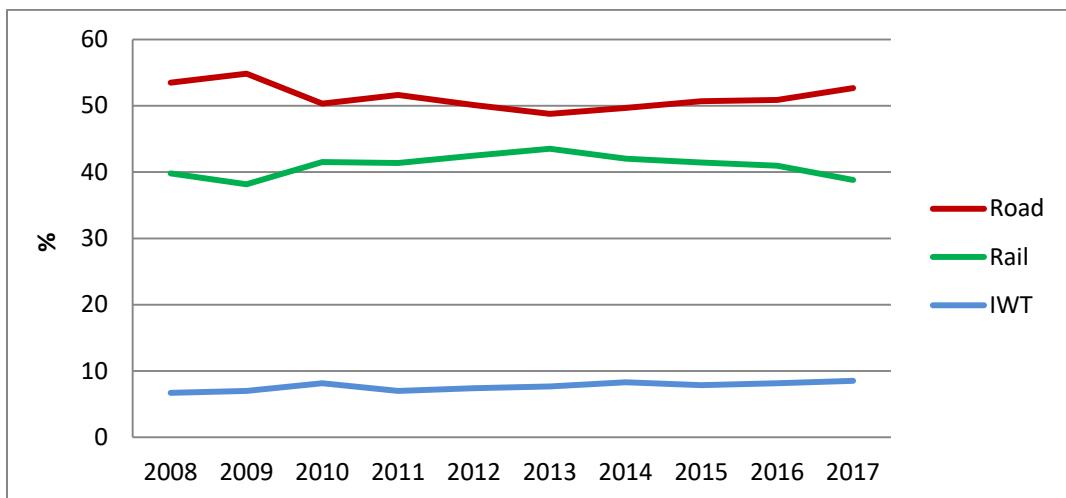
***Belgium – evolution of modal share for road, rail and IWT within container transport (%)***



Source: Calculation CCNR based on Eurostat [iww\_go\_actygo], [road\_go\_ta\_tcrg], [rail\_go\_contwgt]

In Germany, inland waterway transport of containers had a share of 8.5% in 2017, which is slightly below the overall average modal share of IWT in this country. But the share has been following a slight upward trend since 2008.

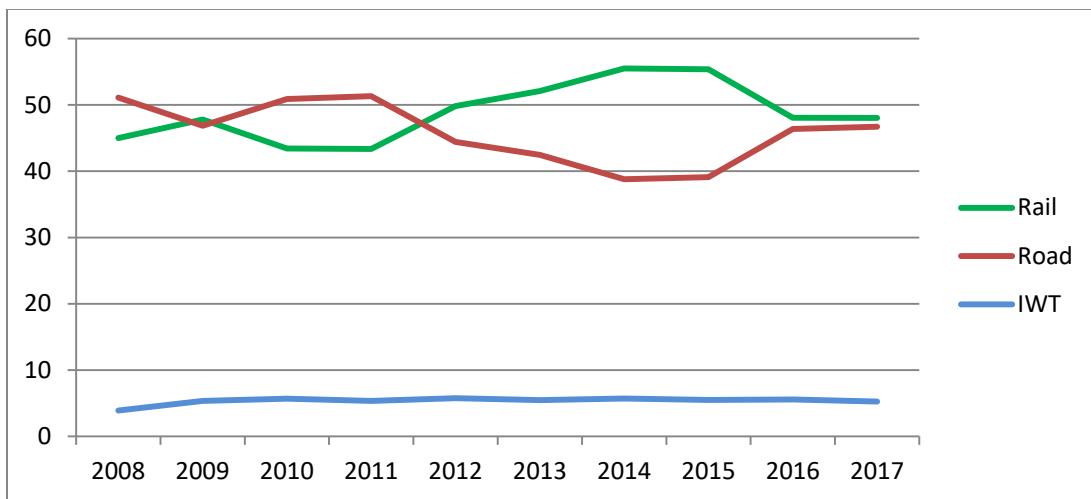
**Germany – evolution of modal share for road, rail and IWT within container transport (%)**



Source: Calculation CCNR based on Eurostat [iww\_go\_actygo], [road\_go\_ta\_tcrg], [rail\_go\_contwgt]

In France, IWT's share was 5.2% in 2017, and therefore slightly above the overall average modal share of IWT in this country. Since 2008, the share has been quite stable.

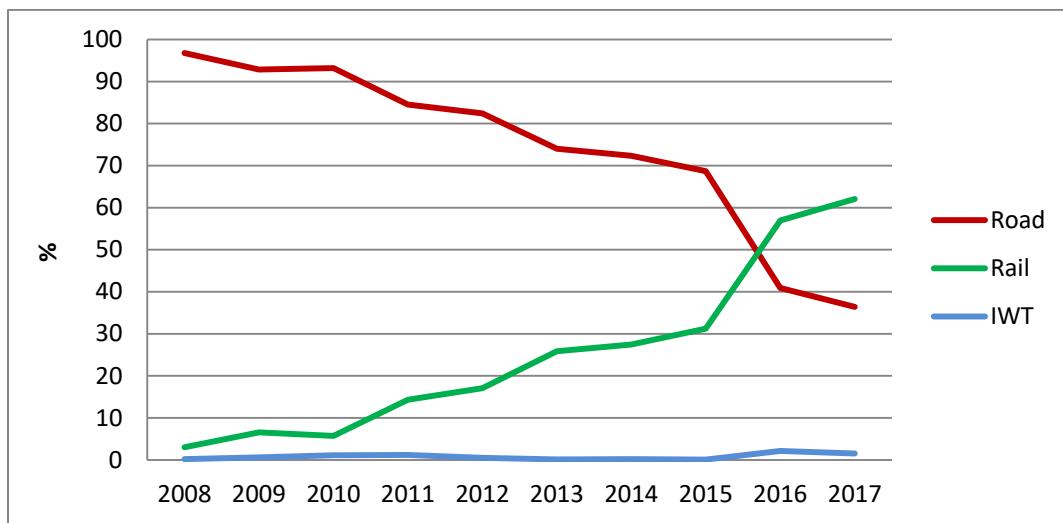
**France – evolution of modal share for road, rail and IWT within container transport (%)**



Source: Calculation CCNR based on Eurostat [iww\_go\_actygo], [road\_go\_ta\_tcrg], [rail\_go\_contwgt]

Even if the Danube countries do not have significant container transport on inland waterways, it was decided to depict the modal split evolution for Romania, the largest Danube country, in order to have a general idea of the dominant mode in relation to container transport in this country. The results show that rail transport was able to gain a substantial amount of market shares in the last 10 years, to the detriment of road transport.

**Romania – evolution of modal share for road, rail and IWT within container transport (%)**



Source: Calculation CCNR based on Eurostat [iww\_go\_actygo], [road\_go\_ta\_tcrg], [rail\_go\_contwgt]

If the modal split evolutions for the eight countries under study are summarised, the following matrix table can be depicted. The modal split tendencies for inland shipping are expressed, in this table, by simple arrows.

**Modal Split Tendencies for inland navigation per country and per goods segment in Europe\***

|     | AGRI | FOOD | CHEM | ORES & SANDS | PETRO | METALS | CONT | TOTAL |
|-----|------|------|------|--------------|-------|--------|------|-------|
| NL  | ↗    | ↘    | ↗    | ↗            | ↗     | ↗      | ↗    | ↗     |
| BEL | ↗    | ↗    | →    | →            | →     | ↗      | ↗    | ↗     |
| GER | ↘    | ↘    | ↗    | ↘            | →     | →      | ↗    | →     |
| FRA | →    | →    | ↗    | ↗            | →     | ↗      | →    | →     |
| HUN | →    | →    | ↗    | →            | ↘     | ↘      | →    | →     |
| CRO | →    | ↗    | ↗    | ↘            | ↗     | →      | →    | →     |
| ROM | ↘    | ↗    | ↗    | ↗            | ↗     | →      | →    | ↘     |
| BUL | ↗    | →    | ↗    | ↘            | ↗     | →      | →    | ↘     |

Symbols: ↗ = rising modal split tendency; ↘ = falling modal split tendency; → = modal split is rather stable

Source: Analysis CCNR based on Eurostat [iww\_go\_actygo], [road\_go\_ta\_tcrg], [rail\_go\_contwgt], [iww\_go\_actygo], [road\_go\_ta\_tcrg], [rail\_go\_contwgt]

A further summary of this table can be made by counting the number of countries for which a positive, or a negative or a constant modal split trend is observed over time. This is done for each product segment.

#### ***Modal Split Tendencies per goods segment in Europe\****

|              | ↗ | → | ↘ | Overall score |
|--------------|---|---|---|---------------|
| AGRI         | 3 | 3 | 2 | 1             |
| FOOD         | 3 | 3 | 2 | 1             |
| CHEM         | 7 | 1 | 0 | 7             |
| ORES & SANDS | 3 | 2 | 3 | 0             |
| PETRO        | 4 | 3 | 1 | 3             |
| METAL        | 3 | 4 | 1 | 2             |
| CONT         | 3 | 5 | 0 | 3             |

\* The numbers in the table indicate how often (in how many countries) there was a positive (↗), a negative (↘), or a stable (→) modal split trend. The overall score is calculated by subtracting the frequency for (↘) from the frequency for (↗), while (→) has a “weight” of zero.

It is observed that chemicals and petroleum products, but also containers, have a somewhat high overall modal split score. This means that inland shipping is rather successful in conquering new market shares within the **liquid cargo** and the **container segments**. Chemicals are, hereby, on top of the list, and can be regarded as the market segment with the most positive modal split trend for inland shipping, at least since 2008.

#### **II. Investigation into seaport hinterland traffic by region and market shares of IWT**

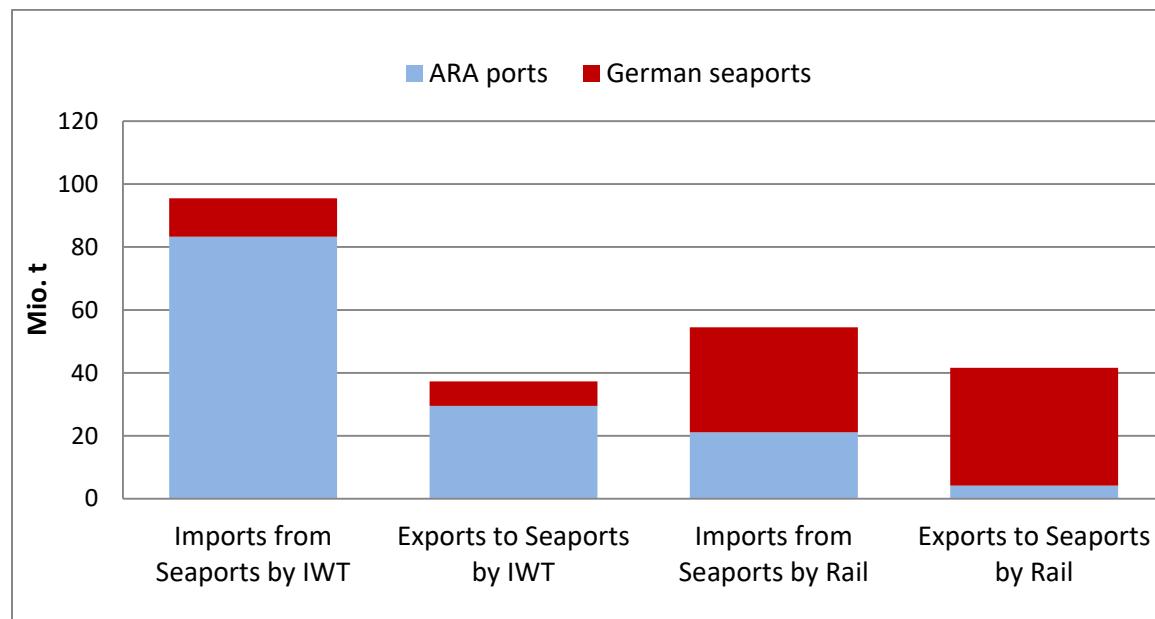
Seaport hinterland traffic is a very important part of international transport chains. It exists mainly as long-distance transport by rail or inland waterway transport (export or import traffic).

The following figure shows the amount of seaport hinterland traffic per rail and per inland waterways for Germany, Switzerland and Austria. A further distinction is made between ARA ports (Amsterdam, Rotterdam and Antwerp)<sup>28</sup> and German seaports (Hamburg, Bremen, etc.)

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<sup>28</sup> Other Dutch or Belgian seaports do not play a significant role.

### ***Seaport hinterland traffic by rail and inland waterways for Germany, Switzerland and Austria***



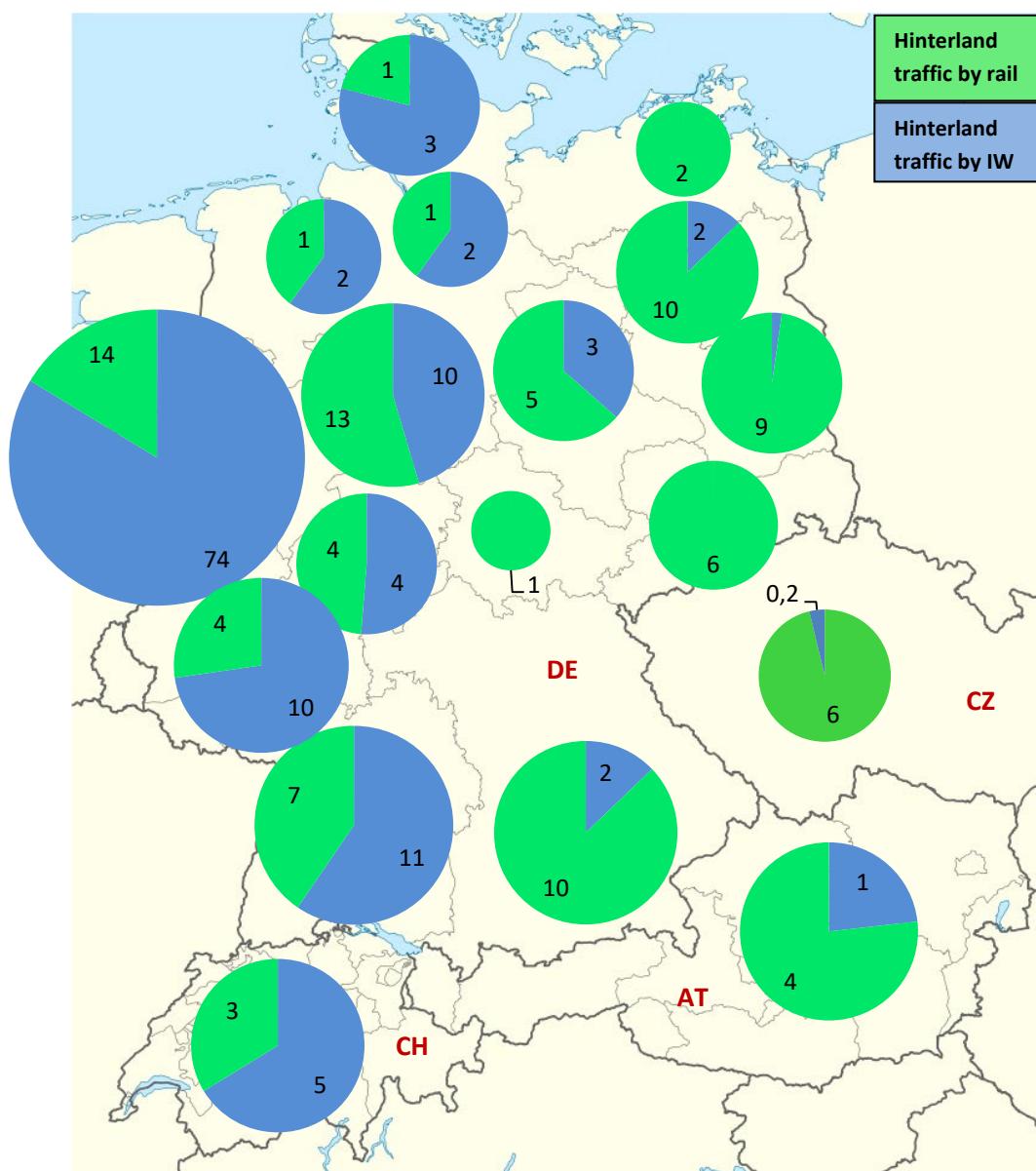
*Source: CCNR analysis based on Destatis data*

Import volumes passing to the hinterland are in general quite high, and the share of inland waterway transport is relatively high. Imported goods are often commodities, such as iron ores, or coal, which are imported in very large volumes, preferably by inland vessels. Export traffic is more concentrated on finished products, with relatively less volume transported (higher value-volume relation).

Furthermore, the majority of inland waterway traffic in the hinterland is in fact related to ARA seaports (Amsterdam, Rotterdam and Antwerp) and only a small part goes to or comes from German seaports. This is due to the Rhine axis, which represents a very important hinterland axis for inland waterway transport.

The following map presents the hinterland volumes in absolute numbers for each of the 16 federal states in Germany, as well as for Austria and Switzerland. As it can be seen, the western states of Germany are more orientated towards inland shipping, and also have higher overall figures in hinterland transport, due to their higher population and industrial activity. North-Rhine-Westphalia, the state with the highest population in Germany, has by far the highest amount of hinterland transport of all German regions, with a value of 88 million tonnes altogether (rail + IWT).

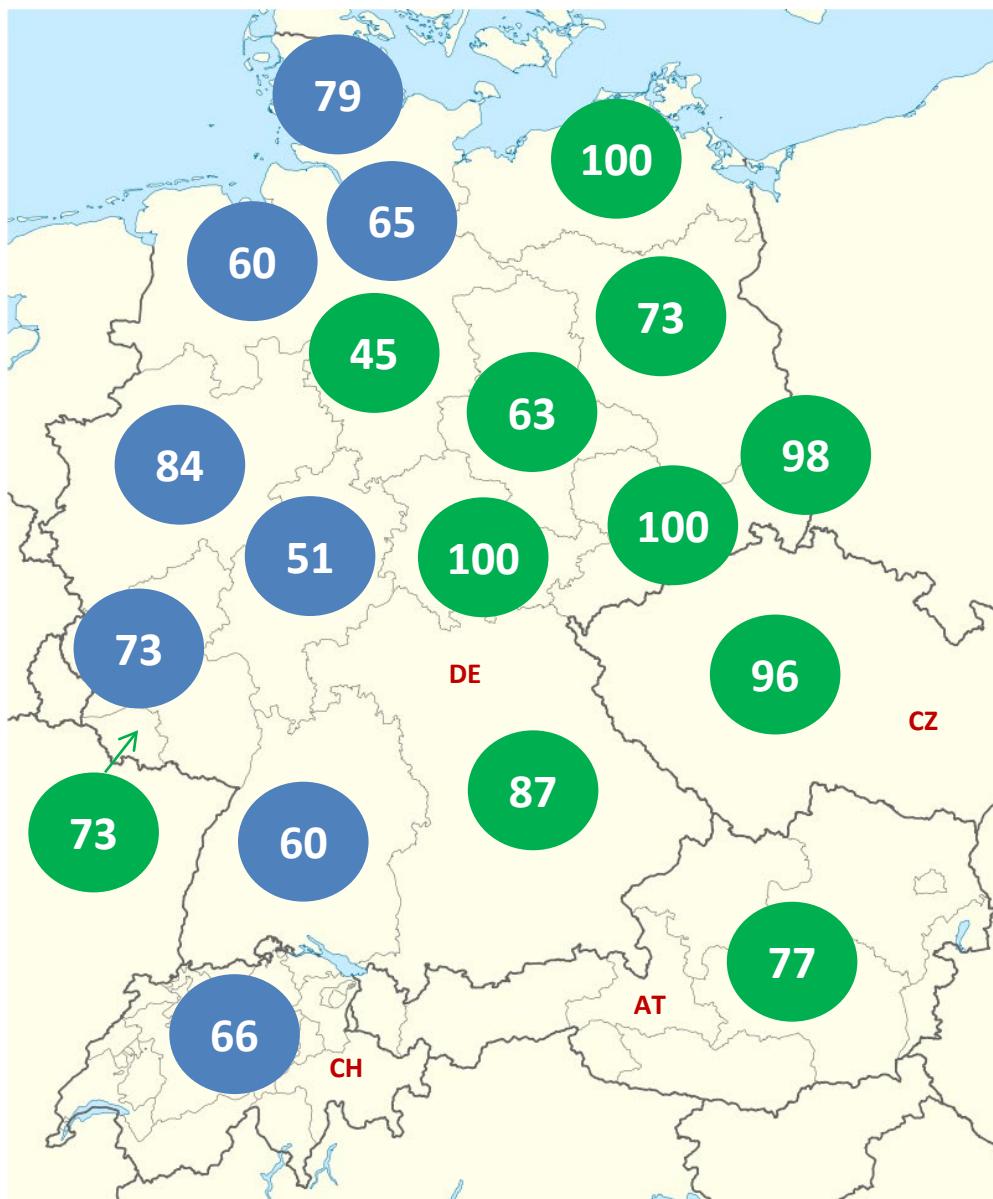
**Seaport hinterland traffic by rail and inland waterways (IW) for German federal states, Austria, Switzerland and the Czech Republic (in Mio. t)**



*Source: CCNR Analysis based on Destatis*

For each German state, for Austria, Switzerland and the Czech Republic, the percentage shares of IWT and rail are depicted in the following map.

*Percentage share of inland waterway transport (blue) and railway transport (green) within total seaport hinterland traffic per region in Germany (federal states), Austria, Switzerland and the Czech Republic (in %) \**



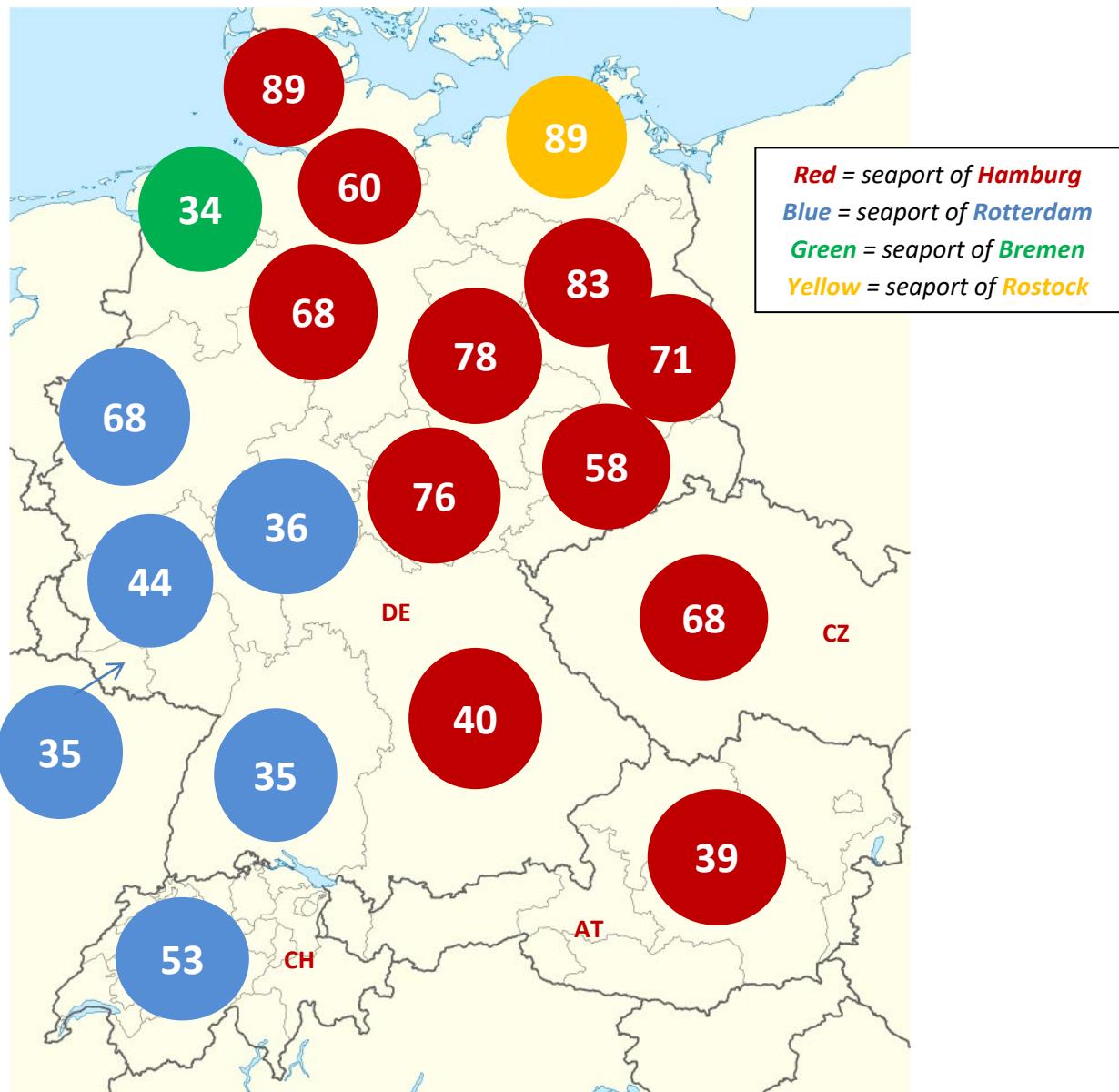
Source: CCNR analysis based on Destatis data \*Federal states/countries **in blue** are states where, within seaport hinterland traffic, inland waterway transport has a higher volume than rail transport. Federal states/countries **in green** are states where railway transport has a higher volume within seaport hinterland traffic than IWT.

In parallel with the modal shares, certain maritime ports have a high market share within hinterland traffic of certain regions. As the western or ARA seaports have a higher orientation towards inland shipping, it is only logical that the hinterland transport of the western regions of Germany, which are geographically near to the ARA ports and perfectly related to them via the Rhine, is predominantly transport from and to the ARA ports. Indeed, the port of Rotterdam has the largest market shares for North-Rhine Westphalia (68%), Rhineland-Palatinate (36%), Hesse (44%), Saarland (36%),

Bade-Wurttemberg (36%) and Switzerland (53%). Behind Rotterdam, the port of Antwerp also plays a major role for these regions.

The port of Hamburg, however, dominates the hinterland traffic in the northern and eastern states of Germany, as well as in Bavaria, Austria and the Czech Republic. Other German seaports such as Bremen and Rostock reach the highest market shares in the federal states of Bremen and Mecklenburg-Western Pomerania respectively.

**Market share of the dominant\* seaport in total hinterland transport (IWT + rail) per region in Germany (federal states), Austria, Switzerland and the Czech Republic (in %)**

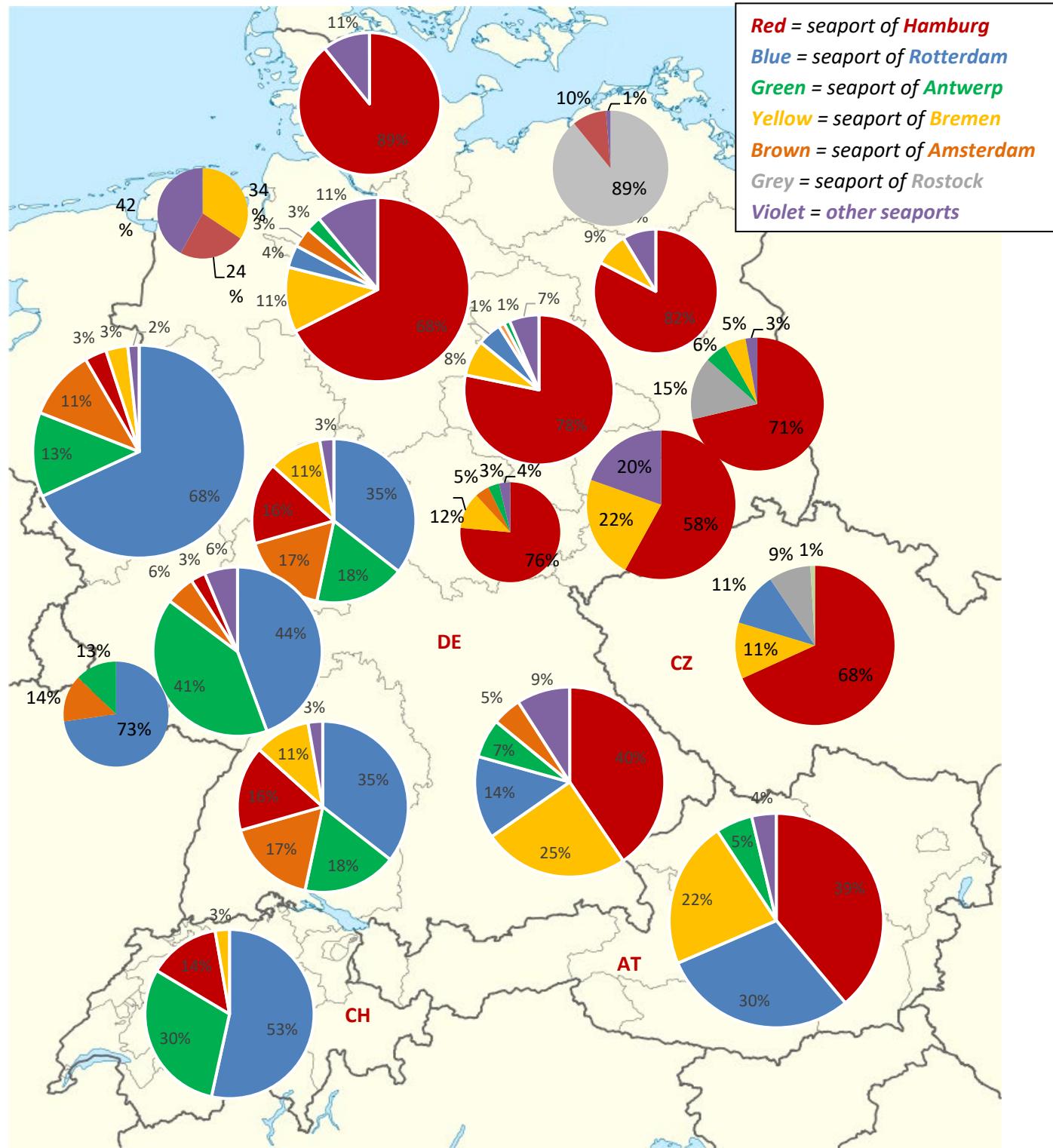


Source: CCNR analysis based on Destatis data \*Depicted is the market share for the most important seaport for each region, in terms of volume of hinterland transport per IWT and rail taken together.

In those western federal states in Germany, where Rotterdam has the lead position, Antwerp is in second place in every case. In the middle and upper Rhine state of Rhineland-Palatinate, the market

share of Antwerp is, with 41%, even almost as high as the share of Rotterdam (44%). Again, in Switzerland, the share of Antwerp is quite high, with 30%.

#### *Share of seaports in hinterland traffic by region / country (in %) \**



Source: CCNR analysis based on Destatis data \*Hinterland traffic by rail and IWT taken together

# 3.

## Lessons to be learnt from disruptions of transport modes



## I. Vulnerability of one mode acting alone

The benefits of coordination and cooperation between modes should not be underestimated, as these are crucial to ensure efficient and reliable logistics chains. This is even more visible in the case of unexpected disruptions, the most recent example being the incident of Rastatt in August 2017. Indeed, the collapse of a tunnel near the German town of Rastatt made rail traffic along the Rhine axis impossible for several weeks.

Inland waterways are also subject to serious and unexpected disruptions such as low water levels phenomena and strikes. For instance, in 2013, German passenger numbers suffered a fall for the second consecutive year. This can be partly explained by the week-long strike by lock workers resulting in a temporary immobilisation of the fleet and in considerable revenue losses by the shipping companies. The Waldhof incident<sup>29</sup> in January 2011 also led to the Rhine being partially or fully closed to vessel traffic for a 32-day period. BASF was among the first companies to acknowledge logistical problems due to the disruption on the Rhine and quickly had to face shortages of certain raw materials. However, since the Rhine-Alpine corridor allows for several high-capacity and performant modes to run in parallel, BASF was able to move more goods by rail and road as an alternative to IWT, hence mitigating the cost of this incident.

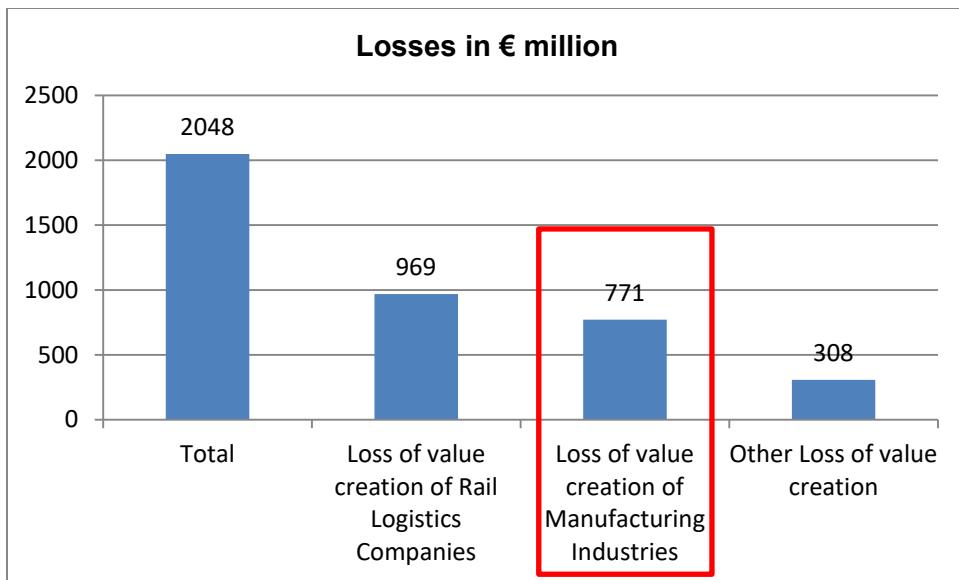
All such disruptions show that one mode acting alone is often vulnerable. Where the transport system allows for several modes to run in parallel and which can enable alternative routing options in case of disruption, significant damages can be avoided for passengers, manufacturers and industry. This report will now focus on the specific case of Rastatt and its impacts on IWT traffic.

## II. The specific case of Rastatt and positive impact for IWT traffic

The closure of the small stretch of railway line in Rastatt for several months (from 12 August to 2 October 2017) led to wide-reaching economic damage for the rail-based supply chain and industrial companies. Indeed, less than 40% of the capacity of the rail diversion routes could be used. Thus, during the interruption, a large part of the added value in the rail-based, often multimodal, supply chain was lost. Losses resulting from the Rastatt incident rose to €771 million for manufacturing industries.

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<sup>29</sup> Sinking of the 100-meter chemical tanker known as the “Waldhof”, between Koblenz and Mainz, carrying 2,400 tons of sulfuric acid in its tanks. To prevent that this highly corrosive liquid spills into the Rhine, river authorities decided to close the waterway to traffic.



*Source: Study from ERFA, NEE, UIRR Consultant HTC "Estimation of the economic damage of the Rastatt interruption from a rail logistics perspective"*

However, without the possibility of using alternative modes of transport such as road or inland waterways, the impact of the Rastatt incident on industry could have been even worse. Multimodality can therefore be seen as a risk reduction option for industrial companies in case of disruption. Indeed, with railway undertakings being denied access to their customers during the interruption, goods continued to be transported south (Switzerland, Italy) and west (Belgium, the Netherlands) by switching to other modes of transport such as inland waterways and trucks. In the case of Rastatt, the role played by alternative modes, including inland waterways, was therefore key to prevent total blockage of goods traffic.

In relation to road traffic, the interruption led temporarily to a significant increase in heavy truck traffic in the area between Karlsruhe and Basel. According to the Swiss Federal Office of Transport, during the interruption, there was only a slight increase in lorry traffic in Switzerland, with around 1000 more lorry journeys per week<sup>30</sup>.

Figures relating to the impact of Rastatt on inland waterway traffic and on inland ports highlight the capacity of inland waterways on the Rhine to absorb new and unexpected traffic. Indeed, overall, the Rastatt incident had a rather positive impact on the traffic at inland ports near Rastatt, in particular container traffic.

### Port of Strasbourg

The port of Strasbourg had a good year in 2017 with an increased traffic of 6.3% compared to 2016, with 7.993 million tonnes of goods transported. Such a threshold had not been reached since 2014. One of the factors for such good results can be attributed to the Rastatt incident which resulted in a shift from rail to inland waterways from August to October. However, this event remains temporary and seen as marginal compared to the impact of the overall positive economic environment.

<sup>30</sup> Source: Hanseatic Transport Consultancy (HTC) study ordered by two associations of freight railway undertakings (ERFA and NEE) and, the association for Road-Rail Combined Transport (UIRR) on the economic damage from the Rastatt interruption

## **Port of Karlsruhe**

In 2017 handling volumes in the Port of Karlsruhe were higher than in 2016. From August to October 2017, handling volumes were significantly higher compared to 2016. For instance, in September 2017, the handling volume was 658,000 tonnes while it was only 489,000 tonnes in 2016 (+ 169,000 tonnes) and in 2015 467,000 tonnes (+191,000 tonnes). Such positive results for the 3<sup>rd</sup> and 4<sup>th</sup> quarters and 2017 could be linked to the Rastatt interruption and possible modal shift from rail to inland waterway during this period. However, we did not find any conclusive effects of Rastatt on the activity port.

## **Swiss Rhine ports – Case study for the effects of the Rastatt incident**

The port of Basel further strengthened its role as gateway to Switzerland and Italy during the Rastatt interruption. Indeed, after a weak first quarter in 2017 due to low water levels on the Rhine, inland navigation container traffic was boosted by the Rastatt incident in the 3<sup>rd</sup> quarter of 2017, which generated a strong modal shift to inland waterways. The Rastatt incident led to an interruption of railway traffic along the upper Rhine for seven weeks, between August and September 2017.

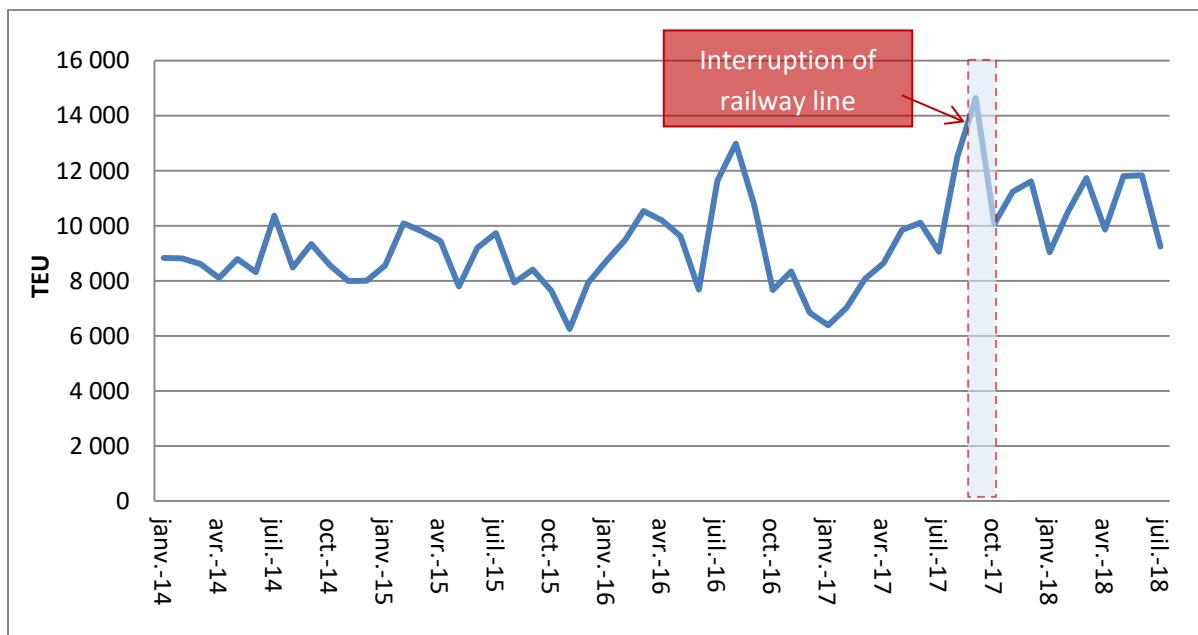
In September 2017, waterside TEU volumes in the port of Basel were 36% higher than in September 2016. Even after the railway lines were re-opened, traffic had similar growth rates (October: +31%, November: +34%).

Overall, with a total of 119,200 TEUs, the Port of Basel's container traffic on the Rhine reached an historic record in 2017 (+4.1% compared to 2016). In contrast, in 2017, the rail container logically fell by almost 12% to just 15,200 TEUs. It can therefore be assumed that large parts of the additional waterside traffic generated by the Rastatt incident will remain on the Rhine.<sup>31</sup>

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<sup>31</sup> Spring 2018 CCNR Market Observation Report: <https://www.inland-navigation-market.org/en/rapports/2018/q1/2-freight-traffic-on-inland-waterways-and-in-ports-3/>

### **Waterside container traffic in the Swiss Rhine ports of Basel and the Rastatt incident**



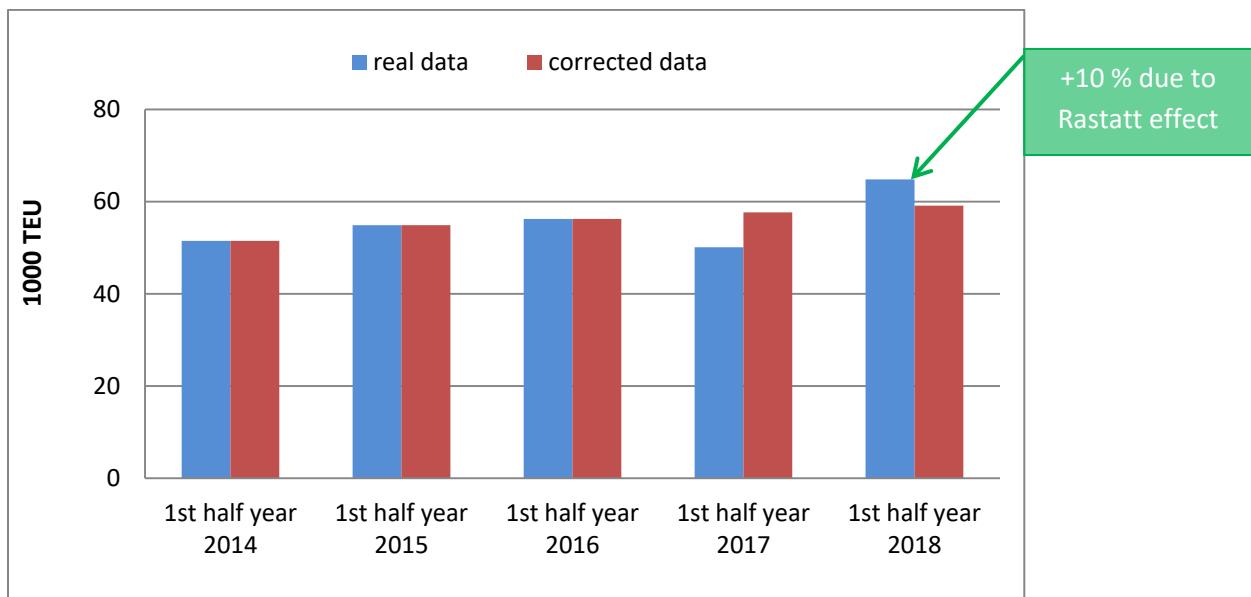
*Source: Swiss Rhine ports, monthly bulletins*

The evolution of the monthly series of waterside container traffic shows a peak in September 2017, when the railway line along the Upper Rhine was interrupted due to the Rastatt event. After September 2017, the volumes seem to have returned to normal to a certain degree, but they were still at a higher average level than before the Rastatt event. This seems to indicate that parts of the "Rastatt effects" were not only temporary, but long-lasting.

Estimating the strength of this long-lasting effect of the Rastatt event on waterside transport is, however, not easy, as there are other factors, in particular low water periods, that also have to be taken into account. Indeed, the first months of 2017 saw low water levels on the Rhine, with the consequence of a much lower transport volume than under normal conditions.

In order to estimate the Rastatt effect, it seems more appropriate to compare the half-year figures of 2018 with those of 2016, 2015 and 2014, as these time periods were characterised by relatively normal and comparable water conditions. On the other hand, comparing the 2018 figures with those of 2016, 2015 and 2014 does not take into account the growing container traffic from year to year. Therefore, the data for 2017 and 2018 were "corrected", which means that values for these years were calculated, by assuming a "normal" growth rate for the container traffic. This "normal" rate was set at +2.5 %, which is the growth rate between 2015 and 2016.

### **Waterside container traffic in the Swiss Rhine ports of Basel per 1st half-year and Rastatt effect**



Source: Swiss Rhine ports and calculation CCNR (corrected data)

If we apply this growth rate for 2017 and 2018, the resulting traffic levels are 57.6 [1000 TEU] in 2017 and 59.1 [1000 TEU] in 2018. As for 2017, this result was not achieved due to low water levels, while the “normally expected” result was outperformed in 2018, due to the Rastatt effect.

As can be seen in the figure, the real value for the 1<sup>st</sup> half year 2018 is 10% higher than the “expected” value that would have resulted if TEU volumes would have continued to grow by 2.5 % between the first half years of 2016 and 2017, as well as between 2017 and 2018.

Hence, the increase of **10%** can be regarded as an estimate for the **Rastatt effect as a supplementary growth effect** for the volume of container traffic in the Swiss Rhine ports. As will be seen further below, the growth effects for the entire traditional Rhine are within the same magnitude. The last monthly statistical bulletin of the Port of Switzerland supports this tendency by a 16% growth in comparison to year before period.

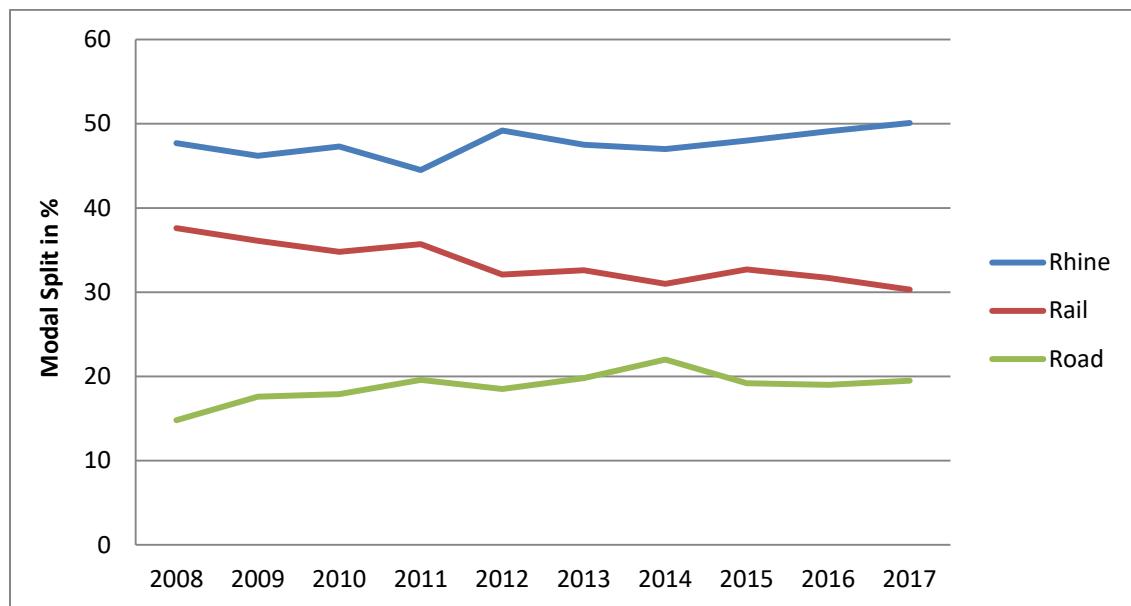
The Swiss Rhine ports themselves also claim to observe some permanent Rastatt effects in their monthly bulletins.<sup>32</sup> In the bulletin on the 1<sup>st</sup> quarter 2018, the port expresses “the forecast, that, given sufficiently high water levels, the Rastatt effect should continue to rest in place also in the future”.<sup>33</sup>

The following figure shows the overall modal split evolution in the Swiss Rhine ports since the year 2008. The Rhine has gained market shares since 2014, and inland navigation reached the 50% level in 2017. Railway traffic has suffered since 2008, and the more recent part of this phenomenon can be partly attributed to the Rastatt event with its negative impact on railway traffic.

<sup>32</sup> See: Swiss Rhine ports, Press Release „Schweizerische Rheinhäfen im 1. Halbjahr 2018: Gutes Zwischentotal – Starkes Containerwachstum.“ July 2018

<sup>33</sup> See: Swiss Rhine ports, Press Release „Schweizerische Rheinhäfen im 1. Quartal 2018: Gutes Quartalsergebnis“ April 2018

### **Overall modal split evolution in the Swiss Rhine ports of Basel (all goods categories)**



Source: CCNR analysis based on data from Swiss Rhine ports

According to information provided by the port<sup>34</sup>, logistical service providers have expanded their intermodal capacities following the Rastatt event, in order to minimize the risk of possible similar events in the future. Having both transport modes in their portfolio means a risk reduction for the future.

In general, inter-modality involving both railway traffic and inland waterway traffic is boosted by the investment in bundling points in the harbour, where large volumes of mass cargo can be gathered and distributed over long distances. A large hinterland with a great potential is of course another important factor which promotes railway and IWW traffic. Especially important for the railway traffic over long distances is the interoperability at border points. From a technical viewpoint, railway systems of different countries should be complementary at the interface points (border points), in order to guarantee an efficient cargo flow. This requires technical equipment, such as ETCS systems (*European Train Control Systems*).

#### **Rhine traffic figures**

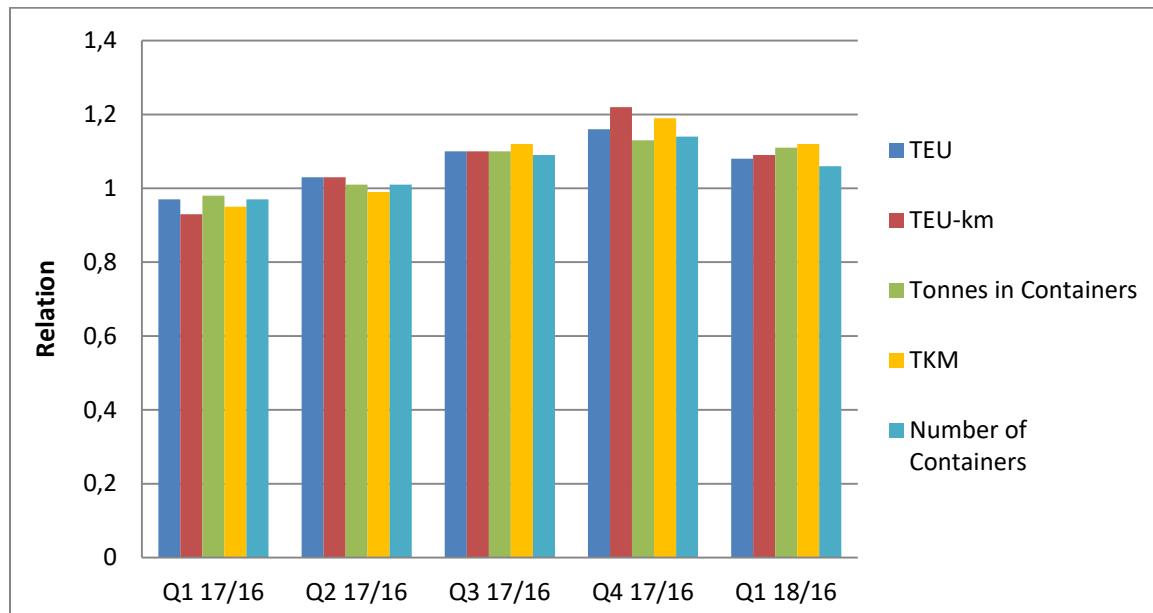
Overall, after a relatively weak growth in previous years, container traffic on the Rhine increased strongly (by 6%) in 2017. This can be partly explained by better water conditions compared to the years 2016 and 2015 as well as the special effect due to the Rastatt event.<sup>35</sup>

<sup>34</sup> Interview with Mr. Florian Röthlingshöfer, deputy division manager in the department for aerials and port railways (Swiss Rhine ports), 25 September 2018

<sup>35</sup> CCNR Annual Market Observation Report, September 2018: [https://ccr-zkr.org/files/documents/om/om18\\_II\\_en.pdf](https://ccr-zkr.org/files/documents/om/om18_II_en.pdf)

To isolate the Rastatt effect is not an easy task, as the container traffic was also influenced by low water levels to a strong degree. Low water periods occurred in October and November of 2015 and 2016, and also in January of 2017. The figure below shows the relationship of container transport, represented by several indicators (TEU, TEU-km, Tonnes in Containers, TKM, Number of Containers) per quarter. A value of "1" indicates that the level of container traffic was the same, comparing the two quarters.

#### **Rhine traffic figures in the container segment – relationship of quarterly values**



Source: CCNR analysis based on data from Destatis

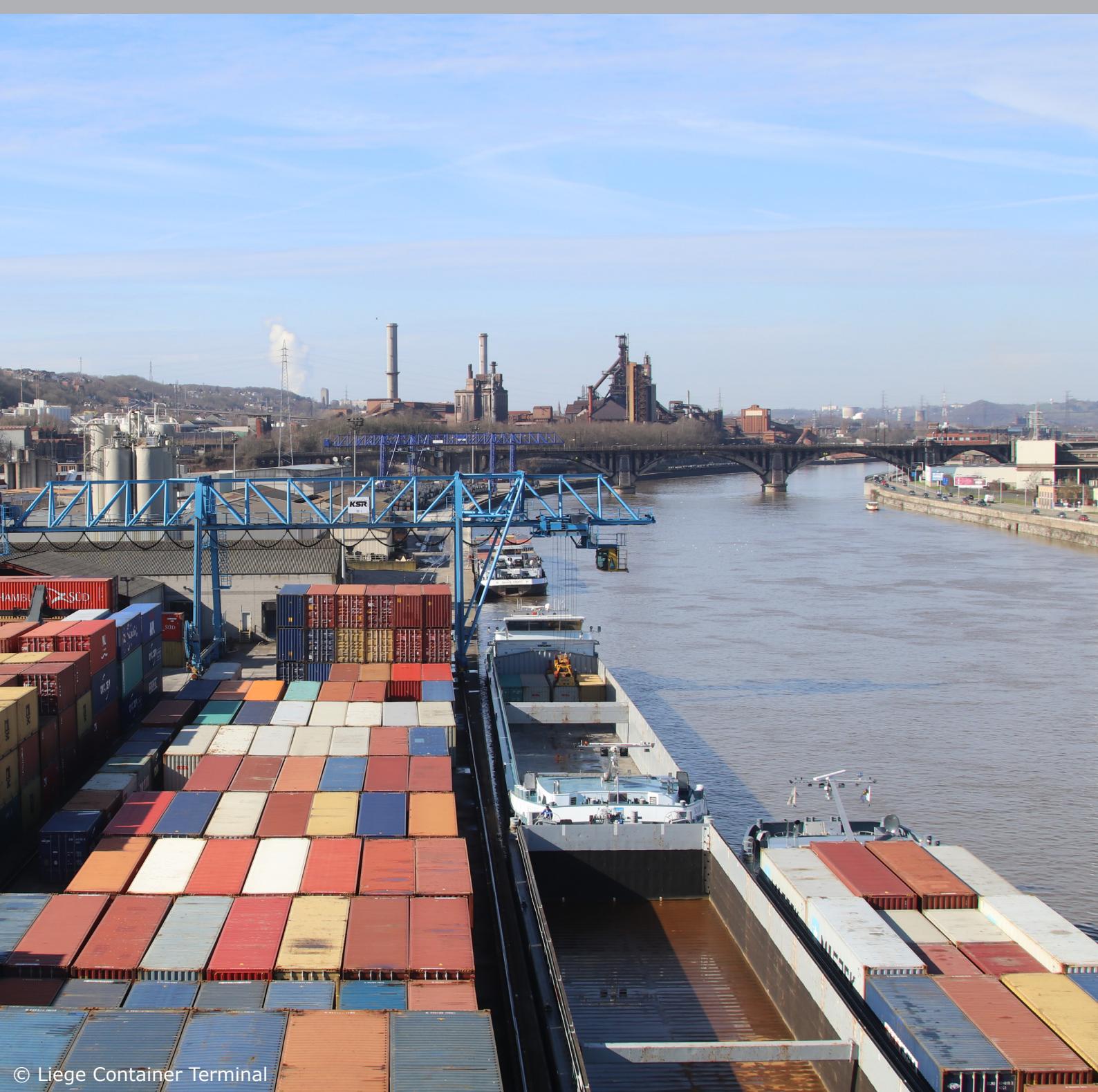
It is observed that container traffic on the Rhine was, in Q3 2017, around 10% higher than in Q3 2016, but this result cannot only be explained by the Rastatt effect. Indeed, the low water period in autumn 2016 must also be taken into account. As there was no such low water period in autumn 2017, it is only natural that the result in Q3 2017 was higher than in the previous year. The same reasoning applies to the comparison between Q4 2017 and Q4 2016.

On the other hand, the water conditions in Q1 2018 were quite comparable with those in Q1 2016. Therefore, the 8% increase in Q1 2018 compared to Q1 2016 can be explained by the Rastatt effect. This interpretation rests also on the judgement of the Swiss Rhine ports themselves (see the bulletin of Swiss Rhine ports for the 1<sup>st</sup> quarter 2018<sup>36</sup>).

To conclude, the impact of Rastatt on inland navigation traffic reveals that inland shipping on the Rhine proved its free capacities and its reliability when acquiring a higher and unexpected number of containers, in order to keep logistical chains running. In the case of Rastatt, inland waterway transport therefore acted as an alternative to face the disruption. In case of disruption, multimodality plays a key role to prevent a complete blockage of goods and/or passenger transport and to ensure the continuity of the transport system. It also appears as a risk reduction option for industrial companies.

<sup>36</sup> See: Swiss Rhine ports, Press Release „Schweizerische Rheinhäfen im 1. Quartal 2018: Gutes Quartalsergebnis“, April 2018

# **4. Successful multimodal projects: Port of Liège and North Sea port**



## I. Port of Liège: the success of a comprehensive multimodal strategy rather than one single multimodal project

The Autonomous Port of Liège is today the first Belgian inland port and the third inland port in Europe. Such a result can be explained by several factors, including its truly multimodal nature, its strategic geographical position and the performance of its concessionaires.

Indeed, it is located in the heart of the hinterland of four major North Sea seaports (Antwerp, Zeebrugge, Rotterdam and Dunkirk), at the crossroads of two trans-European network Rhine-Alpine and North Sea-Baltic corridors and in a region that represents a market of possible consumers of 56 million people. Hélène Thiébaut<sup>37</sup>, Communication Director at the Port of Liège, even identifies the port as being the “hinterland of maritime ports” with inland waterway links to Antwerp, Rotterdam and Dunkirk.

Although the economic crisis that affected the Belgian steel industry after 2009 reduced the freight traffic in the Port of Liège, since 2014 the port has managed to recover. This is partly because concessionaires at the Port of Liège have started to develop new market segments, including container traffic.

Moreover, trimodality has always been a characteristic of the Autonomous Port of Liège, with four trimodal ports (waterway, railway and road), the Port of Monsin, the Renory Terminal, the Semeries Terminal and, since early 2016, the multimodal platform Liège Trilogiport. The multimodal nature of the port is further explained below.

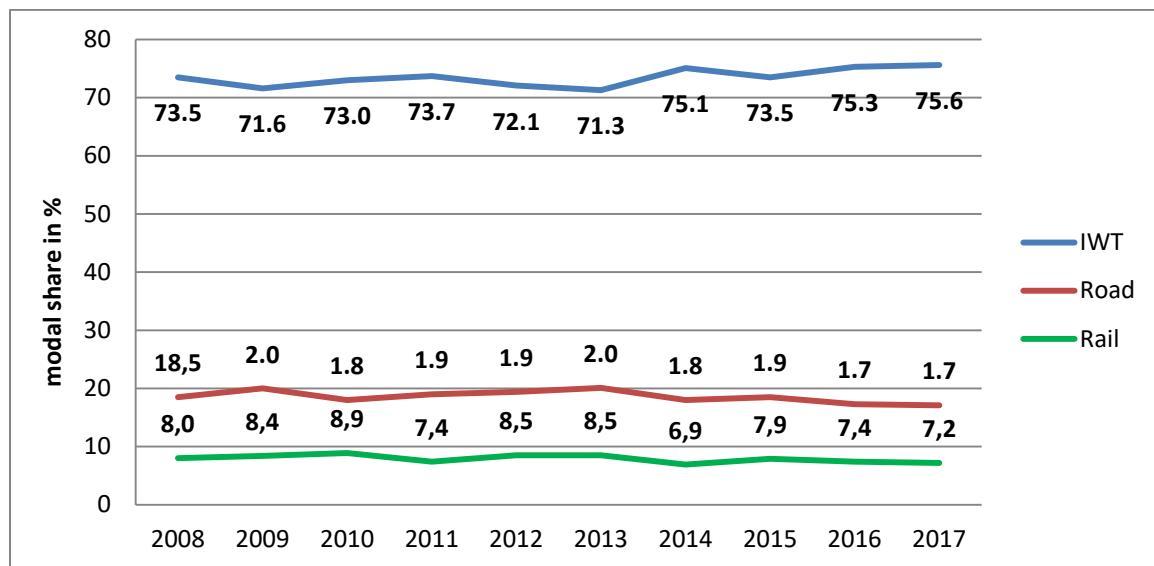
Modal split data for the Port of Liège show the presence of inland waterway (IWT), rail and road transport on the site, with IWT occupying a top position before road and rail since 1939<sup>38</sup>. Moreover, such data show a positive modal split evolution for IWT between 2015 (74%) and 2017 (76%).

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<sup>37</sup> Interview with Ms Hélène Thiébaut, Communication Director (Port de Liège), 18 September 2018

<sup>38</sup> Liège Port Authority Annual Report 2017, p. 44 : [http://www.portdeliege.be/fr/news/455\\_rapport-annuel-2017](http://www.portdeliege.be/fr/news/455_rapport-annuel-2017)

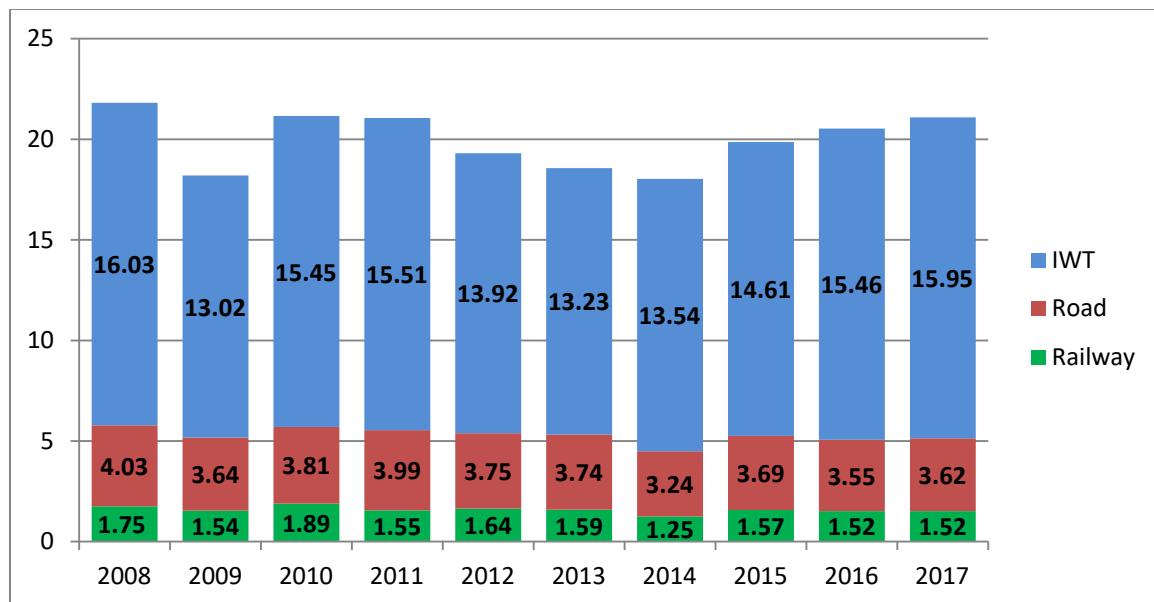
### Modal split evolution at the port of Liège (in %)



Source: Port de Liège, CCNR analysis

In terms of tonnes of goods handled at the Port of Liège, IWT has been following a positive trend since 2013 (+ 2.72 millions of tonnes in 2017).

### Traffic evolution at the Autonomous Port of Liège (in millions of tonnes)

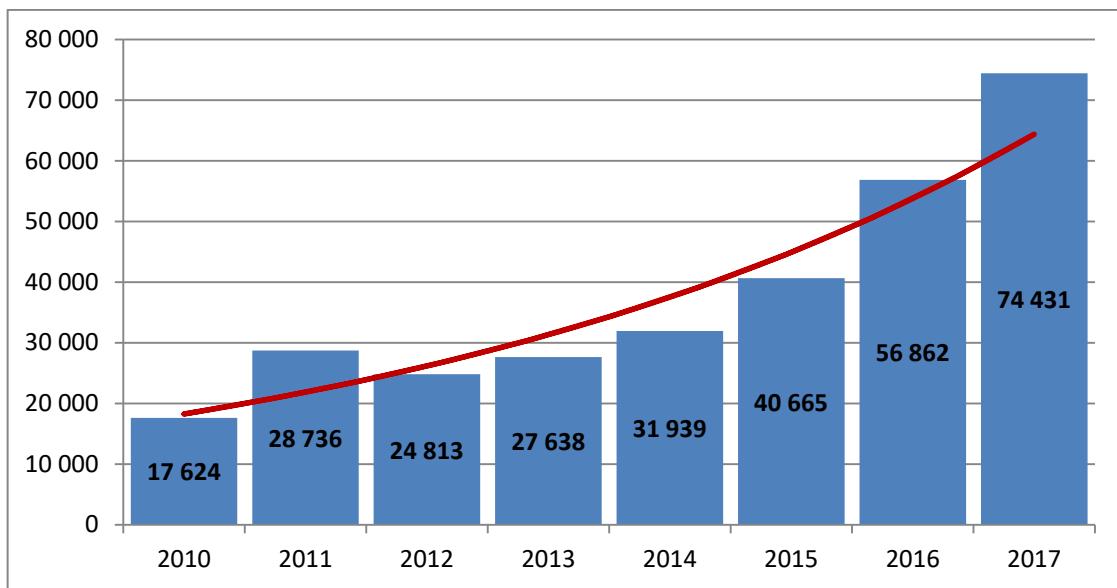


Source: Port de Liège, CCNR analysis

The results of the first half of 2018 are also very encouraging, as they show a 4% increase compared to the first half of 2017 in terms of tonnes of goods transported by waterway, and a similar growth rate for global traffic (waterway + road + rail).

Regarding container traffic at the Port of Liège, this segment has continuously and significantly been growing since 2012 with new record levels being reached every year, in terms of EVP transported.

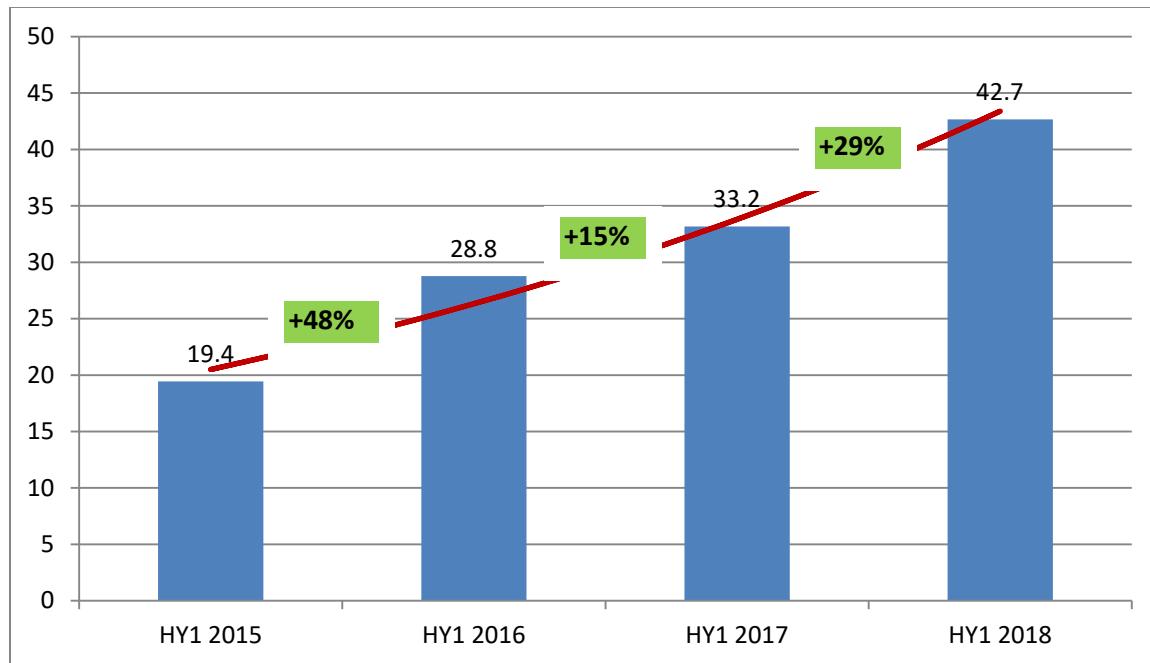
### Waterside container traffic at the Autonomous Port of Liège (in TEU)



Source : Port de Liège, CCNR analysis

Data for the first half of 2018 also indicate a continuously positive evolution for container traffic in 2018: + 29% compared to the first half of 2017.

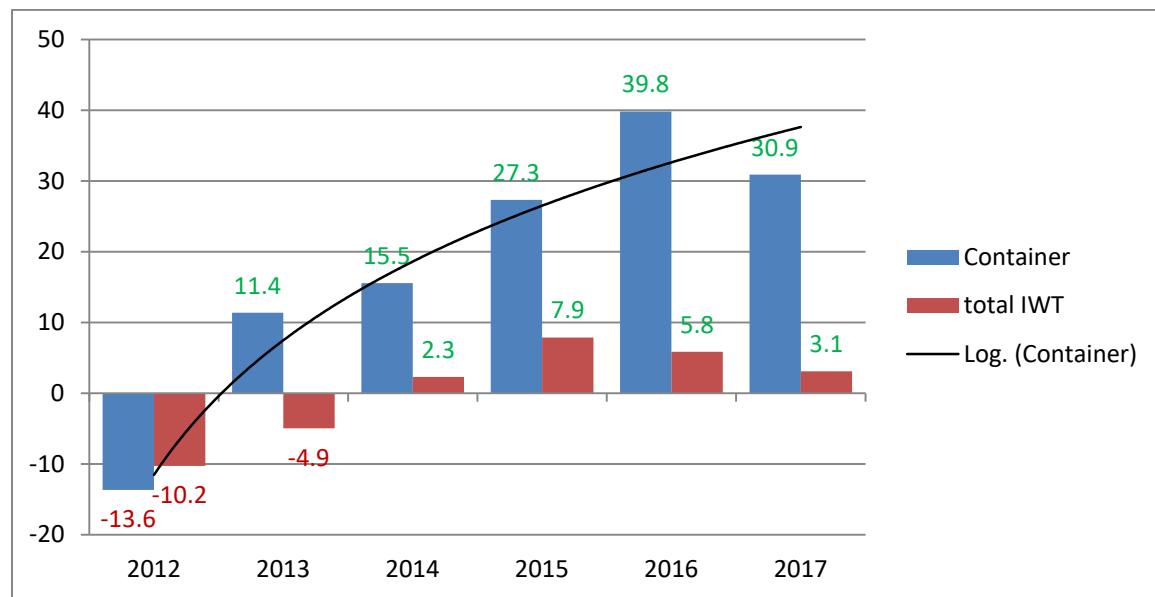
### Waterside container traffic per half year (HY) at the Autonomous Port of Liège (in TEU)



Source: Port de Liège, CCNR analysis

Since 2013, container traffic has increased at a higher pace than total IWT. Indeed, in 2017, the container traffic growth rate was three times higher than the total IWT growth rate. A certain parallel can also be observed between the two growth rates, with container traffic always following the IWT growth rate evolution (whether a positive or a negative evolution).

### Growth rate of container traffic compared to total traffic in the port of Liège (in %)



Source: Port of Liège, CCNR analysis

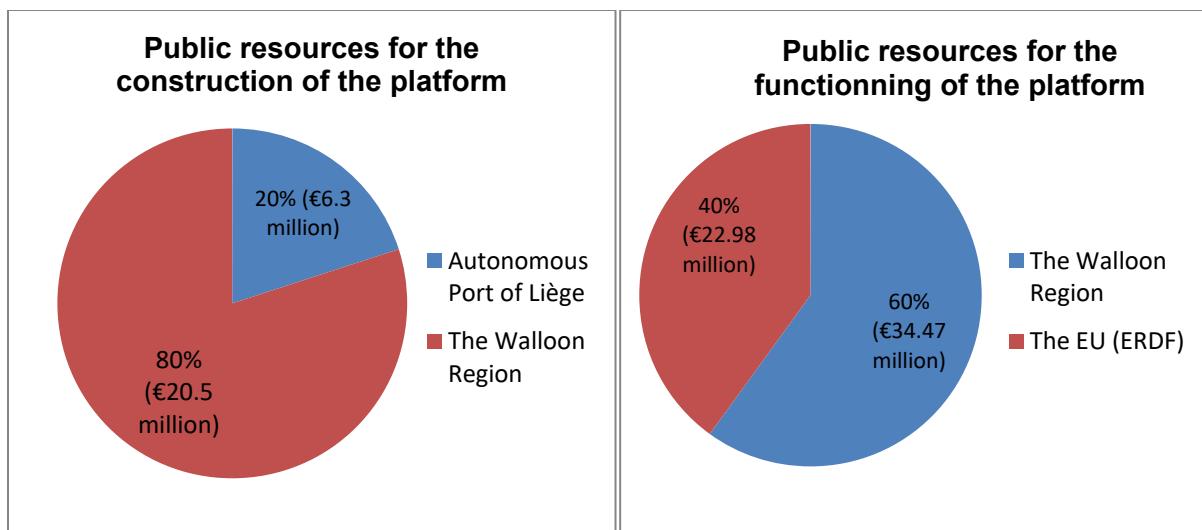
This rise in container traffic can be explained by the considerable development of the three terminal containers at the Port of Liège, including the Liège Trilogiport container terminal operated by DP World. It is also one of the reasons that triggered the launching of the Liège Trilogiport project. Indeed, as container traffic is expected to grow at EU level<sup>39</sup>, the idea behind the project was for the Port of Liège to be able to absorb this potential for more container traffic in the long run.

The willingness of the port to develop its multimodal nature by integrating further two other modes (rail and road) next to the waterway is also a key rationale behind Liège Trilogiport.

Liège Trilogiport was inaugurated on 13 November 2015 and is managed by the Liège Port Authority. It is connected to three maritime access points at the sea (Antwerp, Rotterdam and Dunkirk), three modes of transport (waterway, railway and road) and three trans-border markets (France, the Netherlands and Germany). The project aims at attracting new companies interested in the multimodal nature of the new platform, which allows them to benefit from a range of river, road and rail transport services in the same place, as well as consolidating the expansion in inland traffic, developing new traffic and creating new job opportunities. Moreover, it is close to Liège Airport (8<sup>th</sup> European cargo airport), thereby providing even a quadrimodal dimension to the port. Finally, Liège Trilogiport is located in a strategic geographical location in the heart of the hinterland of four major North Sea seaports (Antwerp, Zeebrugge, Rotterdam and Dunkirk), in a region representing a market of possible consumers of 56 million people.

Total investment including all access roads and rail tracks is estimated at more than €160 million, of which almost €45 million came from the public sector (Liège Port Authority, the Walloon Region and the European Union) and €115 million from the private sector.

<sup>39</sup> CCNR annual market observation report 2018, chapter 2 : <https://www.inland-navigation-market.org/en/>



Source: Port de Liège, CCNR analysis

The budget for the study contract for the development of the area as a multimodal platform came entirely from the EU (ERDF): €712 366.

While it is too early to draw first conclusions about the impact of Liège Trilogiport – as it has been operational only since early 2016 – it is however correct to say that the recent Liège Trilogiport is a step towards strengthening the position of the port as a multimodal hub.

In terms of European and international outreach, the added value of Liège Trilogiport can nevertheless already be observed, with the arrival of the company Alpargatas on the Liège Trilogiport site, well known for its star product, the “Havaianas sandals”. The company chose Liège Trilogiport as the starting point for the distribution of its products in the UK, Benelux, France and Germany. This decision was motivated by the excellent geographical location of Liège Trilogiport and its multimodal access. According to Hélène Thiébaut<sup>40</sup>, since the launching of Liège Trilogiport, some ports outside the European Union are even showing interest in the project which they qualify as an excellent example of multimodal integration.

It is worth noting that Liège Trilogiport is also an “environmental integration zone” (zone d’intégration environnementale). In other words, a quarter of Liège Trilogiport’s surface is dedicated to environmental and urban developments (bicycle paths, community gardens), thereby reinforcing public awareness and social acceptance of the project, key factors for the successful implementation of a project.

Beyond Liège Trilogiport, the development of the Port of Liège is also supported by a comprehensive network strategy, for instance, with the signature of a memorandum of understanding with the Port of Antwerp in order to optimise the logistic chain between the two ports and a closer collaboration in terms of new technologies, sharing of information, etc. A similar approach has been undertaken with the Port of Rotterdam. Other projects, such as Connecting Citizen Ports 21, aim at further integrating transport modes into the logistical chains.

<sup>40</sup> Interview with Ms. Hélène Thiébaut, Communication Director (Liège Port Authority), 18 September 2018

Drawing on the analysis above, the following conclusion can be drawn from this case study: the success of the port of Liège as a multimodal hub does not lie in one successful multimodal project but in the deployment of a long-term multimodal strategy.

## **II. North Sea Port: a cross-border and multimodal port area**

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. The cross-border merger port started to operate on 1 January 2018. It represents a 60-kilometre-long cross-border port area and consists of:

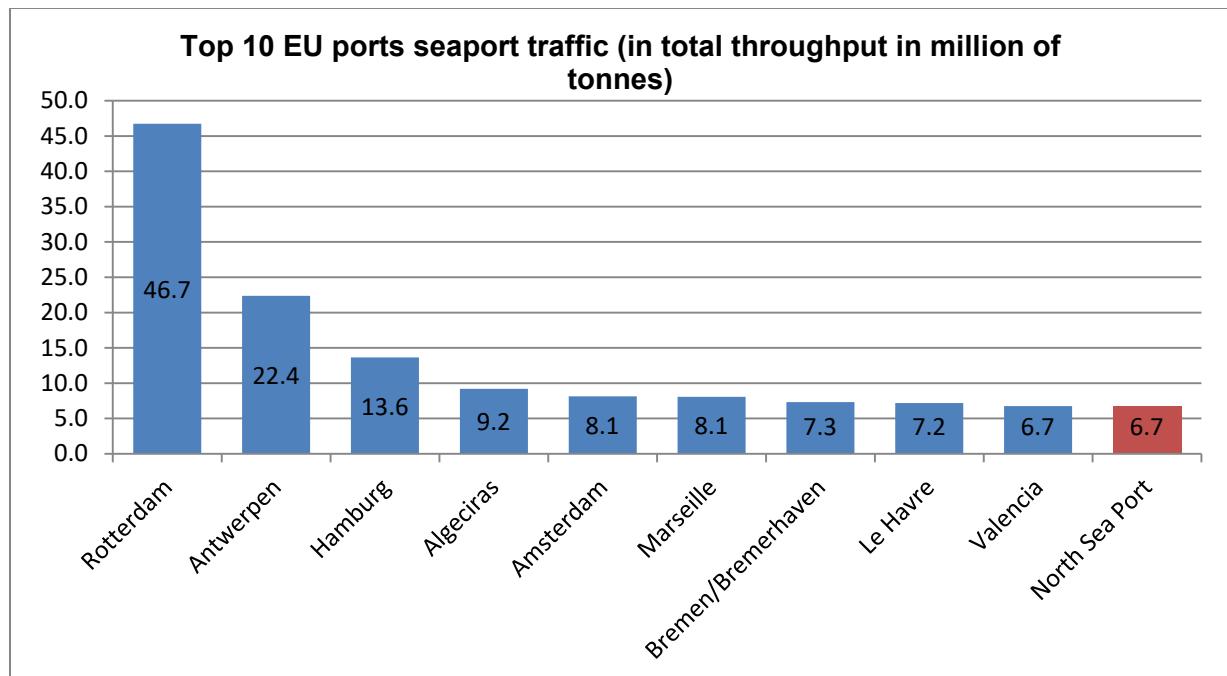
- the Zeeland Seaports of Flushing, Borsele and Terneuzen in the Netherlands: ranked 33 among EU ports before the merger;
- the Ghent Port Company in Belgium: ranked 25 among EU ports before the merger.

The creation of North Sea Port is expected to create strong economic developments for the region in terms of increase in economic activity and employment, more efficient use of regional infrastructure and better chances or realising cross-border infrastructure as well as more rapid realisation of sustainability goals.

By 2022, North Sea Port aims to be a leading brand in the international port world and wants to increase:

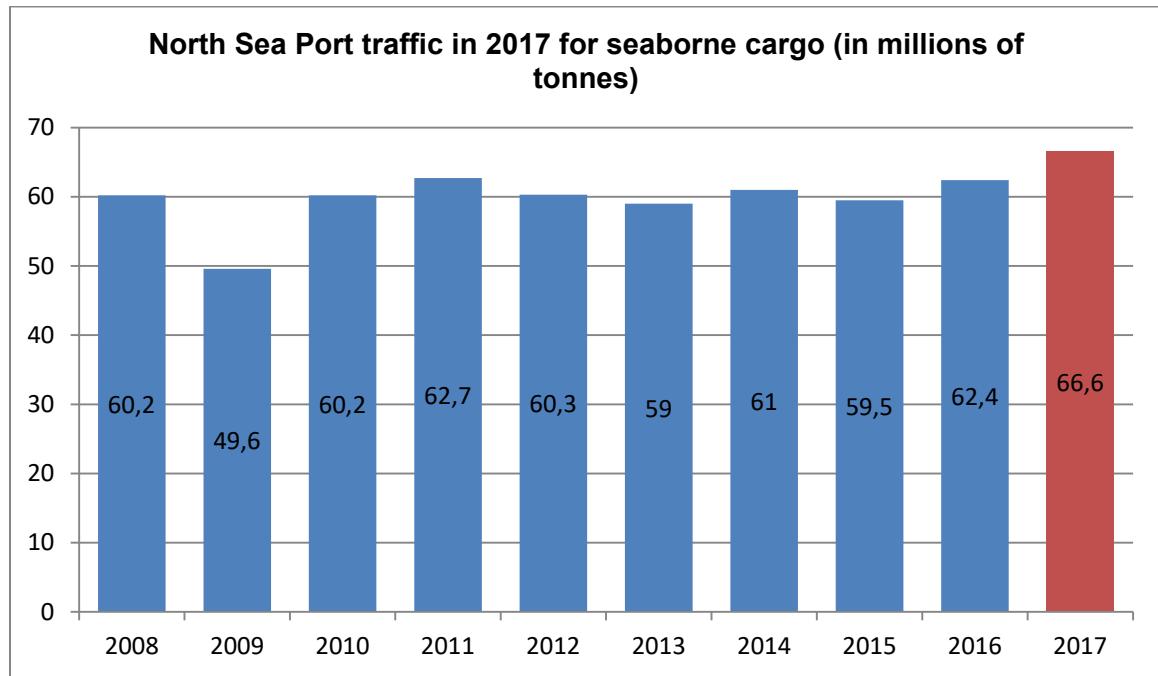
- its added value by 10%, with 13.4 billion euro, North Sea Port is currently the 3<sup>rd</sup> EU port in added value
- its maritime traffic to 70 million tonnes: currently 66.6 million tonnes of cargo carried by 8,700 seagoing ships and ranked 10 in the EU for seaborne cargo traffic;
- its inland traffic to 60 million tonnes: currently 56.5 million tonnes of cargo carried by 36,500 inland waterway vessels.

The port is currently number 10 on the list of European ports in relation to employment (96,274 jobs direct and indirect (2016). Employment is expected to grow up to 100,000 jobs. Indeed, the labour market in the region is expected to benefit from a more integrated cross-border market.

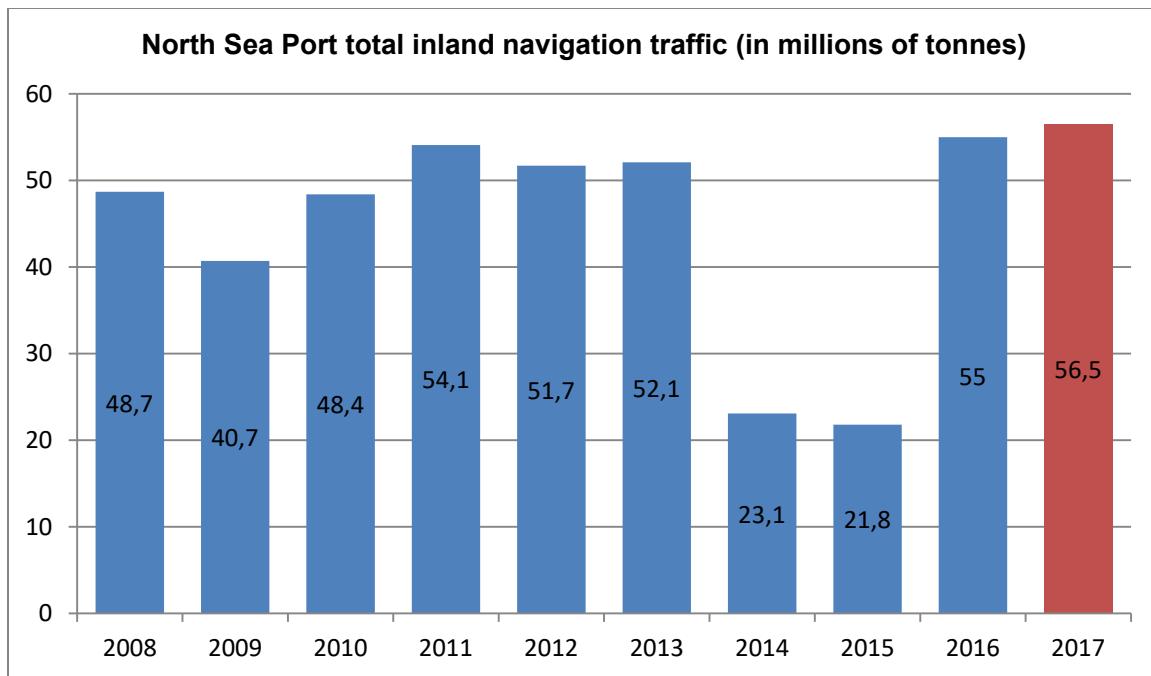


Source: North Sea Port

In 2017, both pre-merger ports together already showed a positive growth: +6.9% in maritime traffic and +2.7% in inland navigation. North Sea Port started the year 2018 with record figures for both seaborne cargo and inland navigation traffic, with respectively 66.6 and 56.5 millions of tonnes.

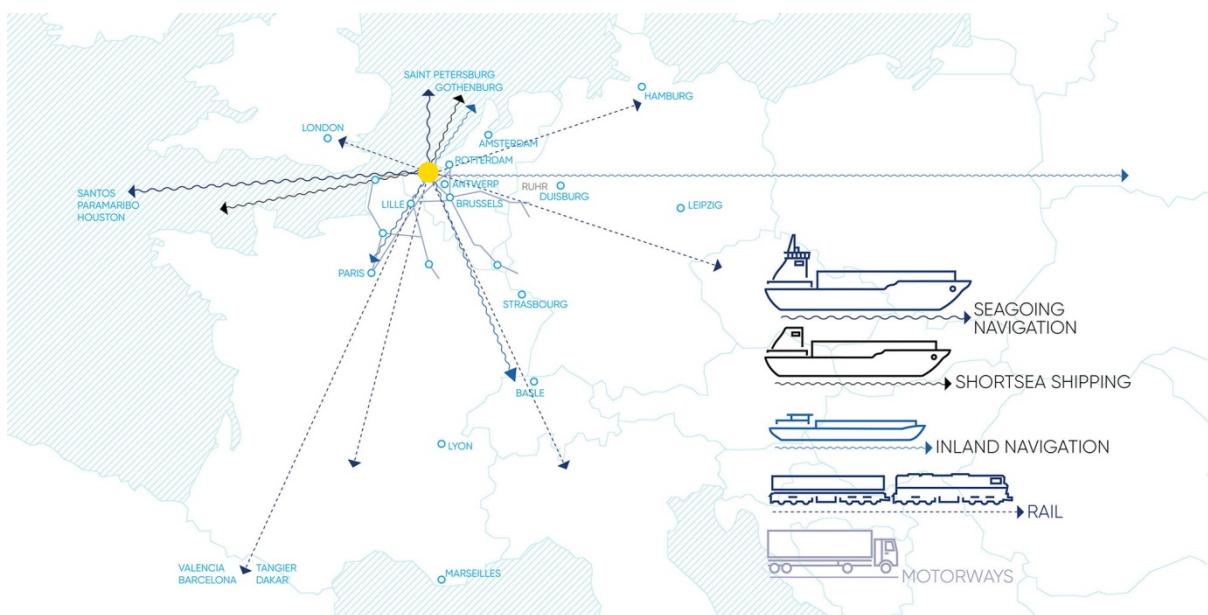


Source: North Sea Port, CCNR analysis



Source: North Sea Port, CCNR analysis

The merger of Zeeland ports and the Ghent port area has allowed North Sea Port to become not only a cross-border port but also a true multimodal port, located at the crossroads of the European motorways (E17/E40), of inland waterways in the direction of Germany and France and of the European railway network. It is also a hub for seagoing navigation and shortsea shipping. Its location, connected to both the ‘North Sea-Mediterranean Corridor’ and the ‘Rhine-Alpine Corridor’, is also strategic for the future development of the port.



Source: North Sea Port

It is equipped with several multimodal terminals in Vlissingen, Terneuzen and Ghent. This merger has also allowed diversifying and increasing maritime connections, both deep-sea and shortsea, as well as barge connections and rail connections (both for containers).

For companies, such collaboration between ports can be identified as an added value, especially in terms of increased possibility for industrial symbiosis, also cross-border in the case of North Sea Port, and opportunities to group cargo flows.

The pooling of resources within North Sea Port should also boost the investment capacity of the port. For instance, ArcelorMittal Gent, the Participatiemaatschappij Vlaanderen (PMV), the transhipment company Euroports and North Sea Port are currently collaborating on the construction of the very first covered loading dock in Ghent, requiring an investment of more than €50 million. Moreover, the possible construction of a new railway line between Terneuzen and Zelzate is being discussed, in order to solve the missing link between Zelzate and Axel on the right bank. Studies are currently being carried out to examine the feasibility of this new rail line and the optimisation of the existing cross-border railway network. Finally, an investment plan to renew the terminal and upgrade the facilities is currently under review in order to improve multimodal access to the North Sea Port. Sam de Wilde, Managing Director, DFDS Terminal Ghent recently stated that they will “continue on the path of multimodality” and will further expand their “barging activities as a congestion-free alternative to trucking to/from nearby deep-sea ports, as well as longer haul rail connections”. The idea is to offer end-to-end integrated logistics for companies based in the region.

Eventually, the development of neighbouring projects represents additional market opportunities that North Sea Port can exploit. For instance, the construction of the 100km Seine-North Canal, will allow bigger inland vessels to sail from Belgium to Paris, which means a bigger market for building materials, and containers for North Sea Port.

This phenomenon is not specific to the case of North Sea Port as enhanced cooperation can also be seen in the Upper Rhine where key inland ports set up a project called “TEN-V-Project Upper Rhine Ports – A connected corridor”<sup>41</sup> in 2012, co-financed by the EU, in order to identify growing market segments and to work out a common investment strategy for the future development of the port.

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<sup>41</sup> <http://www.upper-rhine-ports.eu/fr/>

## **GLOSSARY**

CCNR: Central Commission for the Navigation of the Rhine

CEF: Connecting Europe Facility

EU: European Union

IW: Inland waterways

IWT: Inland waterway transport

TEN-T: trans European transport network

TEU: Twenty-foot equivalent units

TFEU: Treaty on the Functioning of the European Union

TKM: Tonne-kilometre

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