



# 2024 Report on Combined Transport in Europe



## Foreword – UIC



**François Davenne**  
UIC Director General

The importance of intermodal and Combined Transport (CT) for the entire rail market and for the entire logistics system cannot be neglected. This new report on the state of play of combined and intermodal transport in Europe shows that these types of rail freight transport are the ones that have supported the entire sector with growth figures over the last decade. Moreover, we are also convinced that in the coming years intermodal transport will continue to be a sector of growth, as it ties in well with industrial evolutions such as smaller average load sizes and different types of goods that need to be transported.

New technological evolutions are creating a market that presents a set of opportunities. One trend that will massively influence the future of rail freight is electrification. It will require space and time. This space can be more easily found on terminals than in green field locations along transport routes. Battery charging takes time, particularly in a heavy-duty environment like good transportation: time which is available during transit (on the rail wagon) or during

dwelling time at the terminal. These are two assets which intermodal and Combined Transport can offer to the entire logistics chain. Once wagons are equipped with charging facilities, a whole new set of markets is open for rail freight transport. One of these is the refrigerated transport of perishables in reefer containers, which could then be charged during transport.

Therefore, the technical interoperability of the rail system remains crucial. Innovations in the wrong direction, towards non-interoperability, could potentially completely offset any positive effect which could occur from electrification due to reverse modal shift. Combined Transport operators reach out to the road sector as a solution provider for the time and space issue which will inherently emerge once electric trucks reach the level of breakthrough in the market. These technological evolutions will only be successful if developed with the vision of a full interoperable system in mind.



## Foreword – UIRR



**Ralf-Charley Schultze**  
UIRR Director General

Today more than ever, European Combined Transport (CT) has the capability and mission to deliver. For their third report issued together on the state of Combined Transport (intermodal rail freight), UIRR and UIC present an in-depth analysis of the sector's current state, recent challenges, and the opportunities ahead.

While the resilience of Combined Transport in the face of disruptions and the punctuality still must be improved, it remains the best opportunity for European Freight Logistics with a view to the new political priorities taking shape in Europe. The target is the transition to more sustainable, low-external cost logistics, and Combined Transport's efficiencies are in perfect alignment with the objectives of competitiveness and resilience underpinning the Clean Industrial Deal.

The report highlights Combined Transport as the only alternative to unimodal road transport. Over half of Europe's Unaccompanied Combined Transport connections are cross-border services, and SCI Verkehr foresees the growth of intermodal rail freight by 3% per year until 2040.

However, to deliver this growth, Combined Transport must compete on a level playing field with unimodal road transport, and it must be capable of delivering quality services. Key legislative actions are essential, including the adoption of the Rail Infrastructure Capacity Management Regulation and a supportive revision of the Combined Transport Directive, alongside consistent implementation of the TEN-T Guidelines Regulation and the Electronic Freight Transport Information (eFTI) Regulation.

Creating an effective European crisis and contingency management framework, advancing digitalisation, and establishing a standardised intermodal codification system will also be key to further empower Combined Transport.

Already today, the report shows that one out of eight Combined Transport connections are operated with a daily frequency. With the proper legislative framework, Combined Transport will continue to improve, to grow and to deliver into becoming and staying the backbone of European Freight Logistics.

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# Executive Summary

59%

Overall growth of Combined  
Transport between  
2010 and 2023

50%

Market-assessed Combined  
Transport share of the total  
European rail freight sector in 2023

88%

Growth of continental Combined  
Transport performance between  
2013 and 2023

52%

Share of cross-border  
connections for unaccompanied  
Combined Transport in 2022

40%

Growth of intermodal wagon fleet  
between 2013 and 2023

8.7%

Growth of Combined Transport  
rail freight performance between  
2018 and 2023

6.4bn

Revenues in EUR for railway  
undertakings from Combined  
Transport trains in 2022

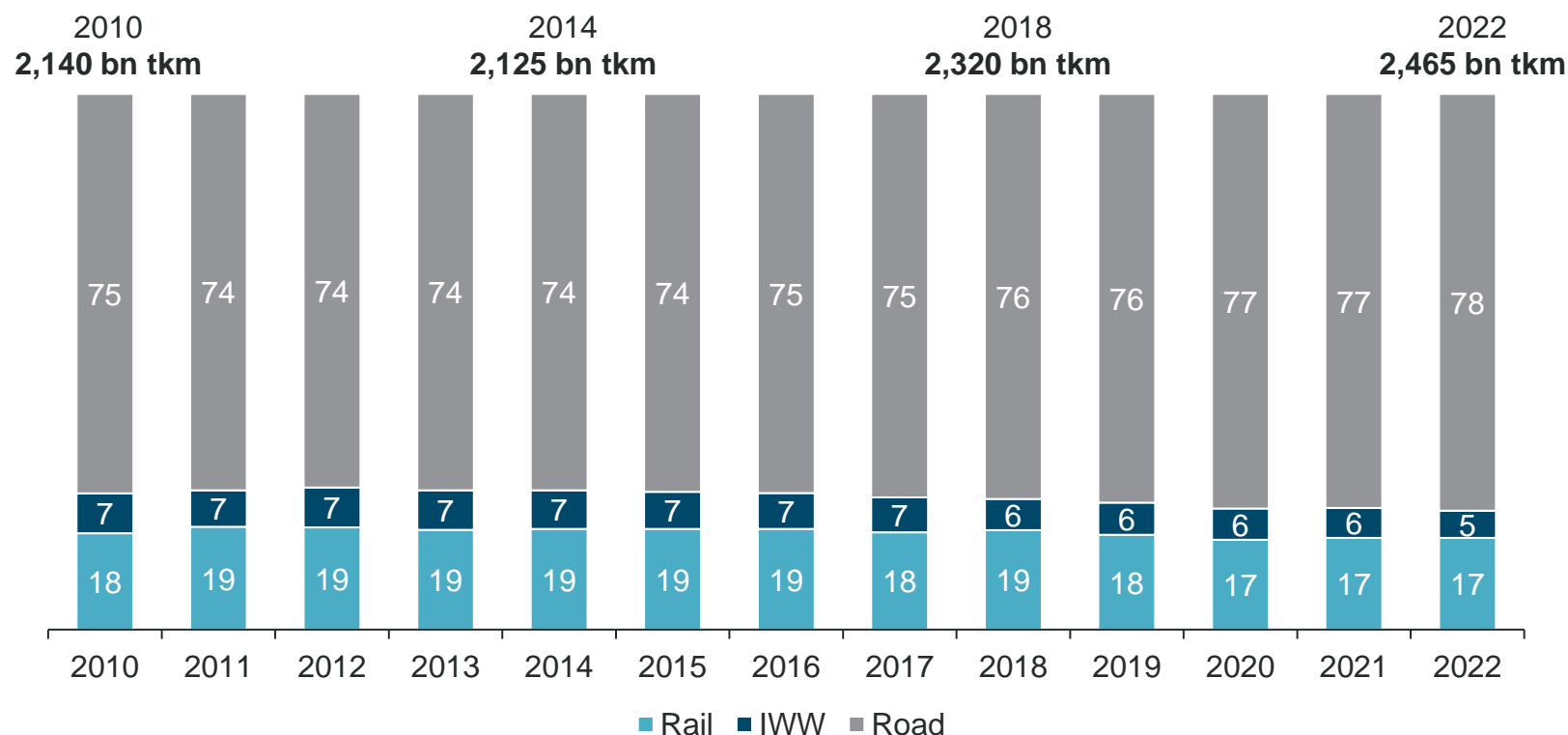
350

Combined Transport connections  
with at least weekly departures in  
2023



## The modal share of rail freight stabilised thanks to the growth of Combined Transport but needs further action to reach the 30% target of the European Union

**Development of modal split of European freight transport**  
(% of tkm)



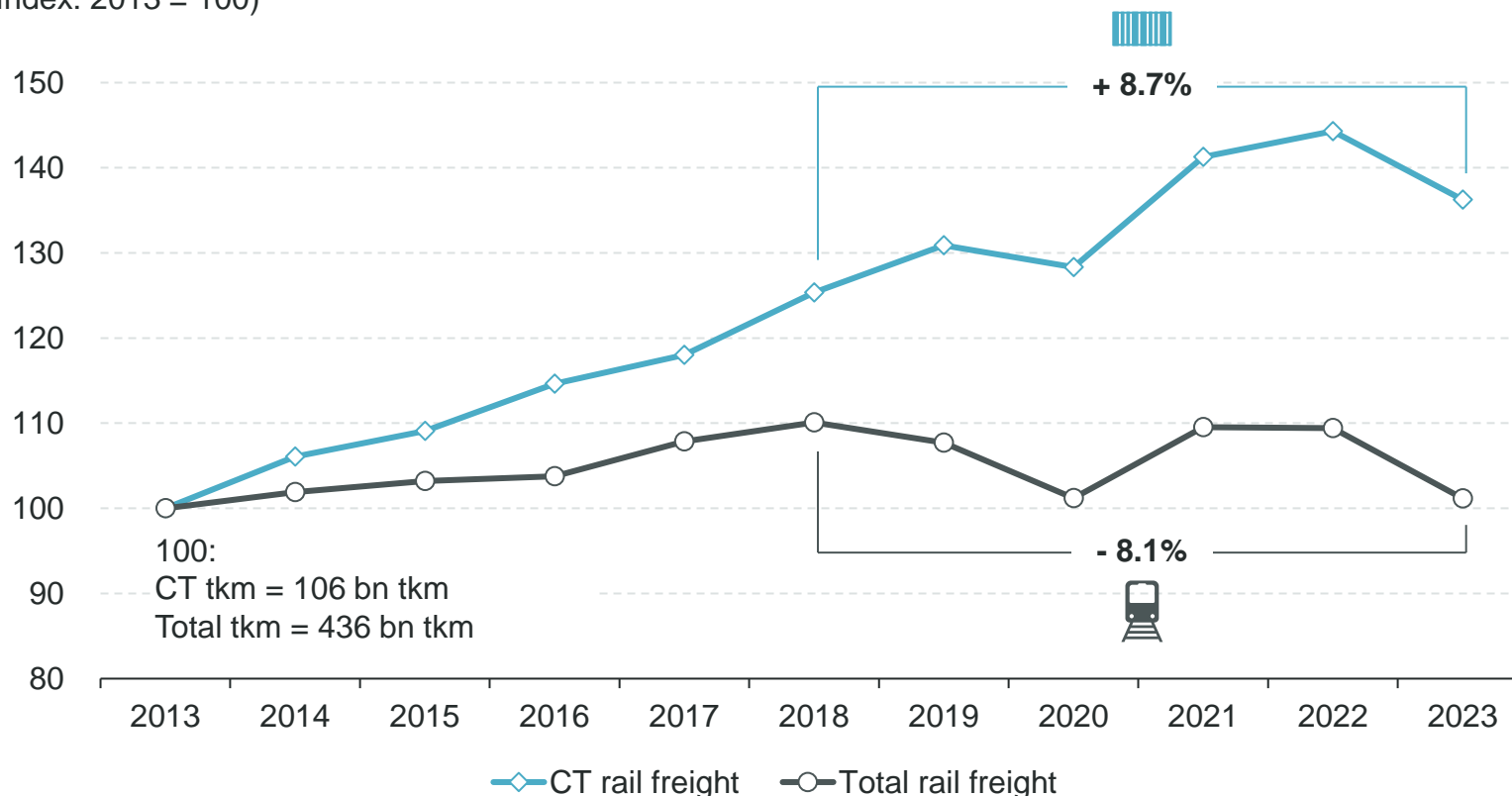
- The European Union has set ambitious targets to increase the rail share to 30% by 2030 as part of its climate goals. **It will be challenging to reach this target** without substantial changes and improvements to the current transport system – and a substantial shift from road to rail.
- After a slight decline from 2013 to 2020, **the share of rail freight in the European transport market has stabilised ever since, thanks to Combined Transport growth.** However, at 17%, only half of the 2030 target has been reached in 2022, indicating a need for further action.
- At the same time, **inland waterway navigation (IWW) lost market share.** This was caused by a decline in absolute terms, which started after the 2018 drought on the Rhine. IWW did not recover in the aftermath, resulting in a decrease for IWW from 7% to 5%.

Source: Eurostat tran\_hv\_frmod as of 15/4/2024

## Combined Transport grew by almost 9% between 2018 and 2023, while total rail freight transport decreased by over 8% in the same period

### Development of CT and total rail freight transport performance

(Index: 2013 = 100)

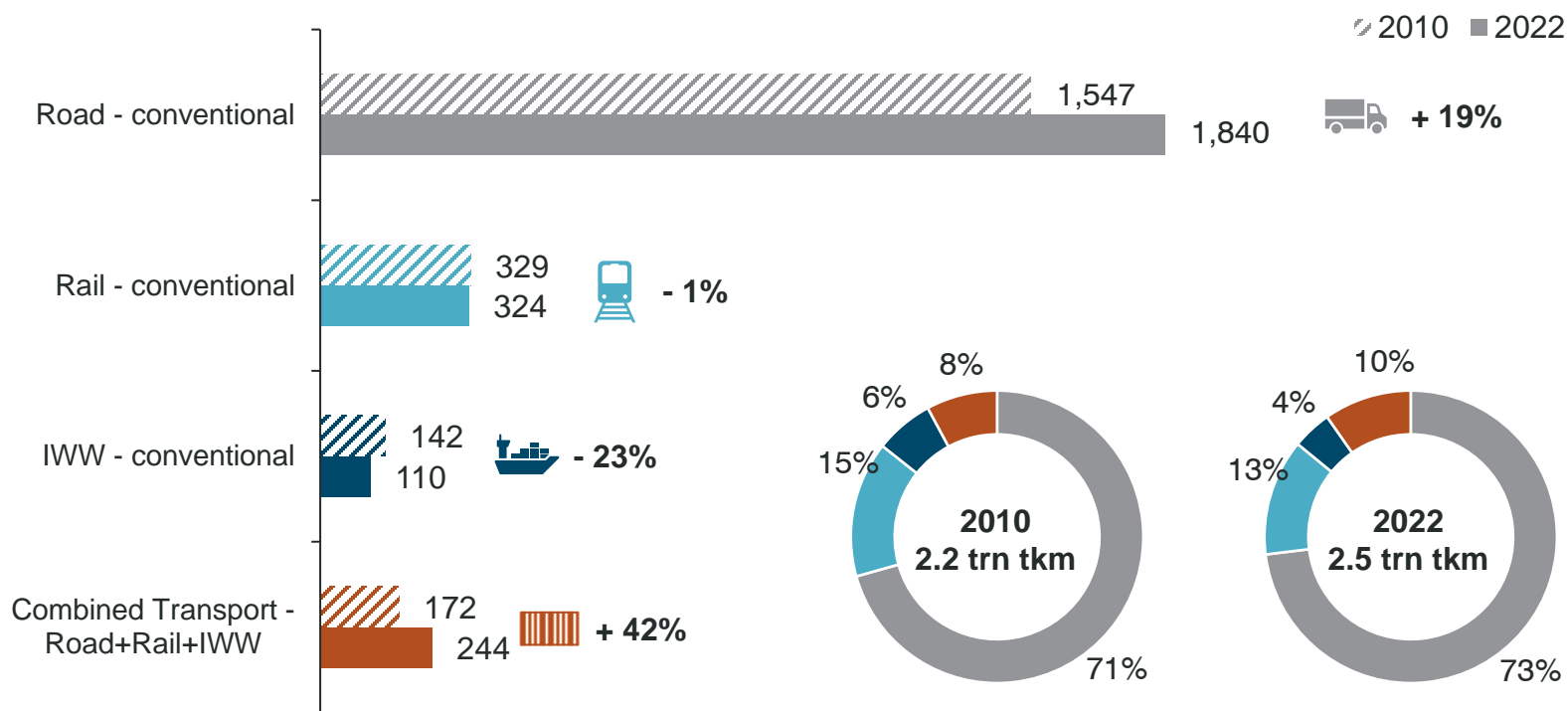


- **Total rail freight transport performance grew by 10% in absolute terms between 2013 and 2018.** After a small decline in 2019, rail freight transport was severely hit during the first year of the Covid-19 pandemic, only to immediately bounce back in 2021. However, in 2023 transport volumes decreased substantially again, mostly due to the combination of price hikes and a slowing economy. Both factors were caused by the energy crisis that emerged in the aftermath of the Russian invasion of Ukraine. Further contributing factors were the closure of the Fréjus rail tunnel between France and Italy due to a landslide, and strikes in France.
- **At the same time, Combined Transport by rail grew by 25% between 2013 and 2018** and grew further until 2022 with only a slight decline in 2020. Despite a sharp decrease of -8% in 2023, due to the same factors that affected the overall rail freight sector, the segment still managed to grow by 8.7% between 2018 and 2023 and increased its share of total rail freight by 33%.

Source: Eurostat rail\_go\_grpgood as of 4/7/2024; SCI Multiclient Study "The European Rail Freight Transport Market 2023"

# Combined Transport was the key factor to keep rail freight competitive with road transport

Development of modal split of Combined Transport and total European freight transport (billion tkm)

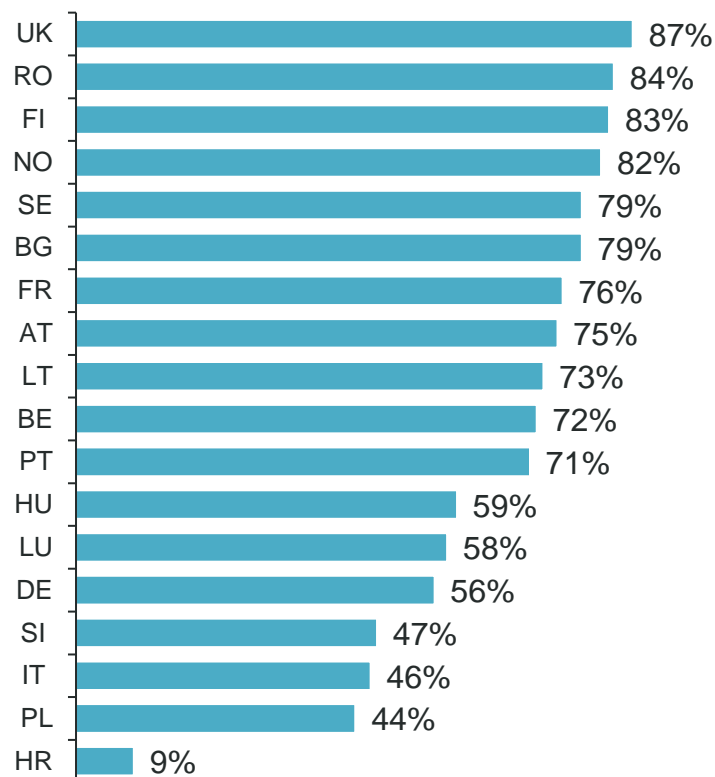


- **Combined Transport showed the highest growth of all transport modes with over 40%.** This is more than twice as much as road transport, while transport performances stalled for conventional rail and decreased for IWW.
- **Without this growth for the CT segment, the non-road sector would have slipped further behind road transport,** as conventional rail and IWW were not able to add more transport volume compared to 2010, despite a growing transport market.
- This is caused by differences in the markets, with road transport driven by on-time logistics of small shipments, whereas **conventional rail and IWW depend on bulk logistics of heavy goods, like coal and petroleum** which will be phased out in coming years.
- **CT combines the advantages of small shipment sizes with the cost advantages of bulk transport,** providing an alternative to road transport over longer distances.

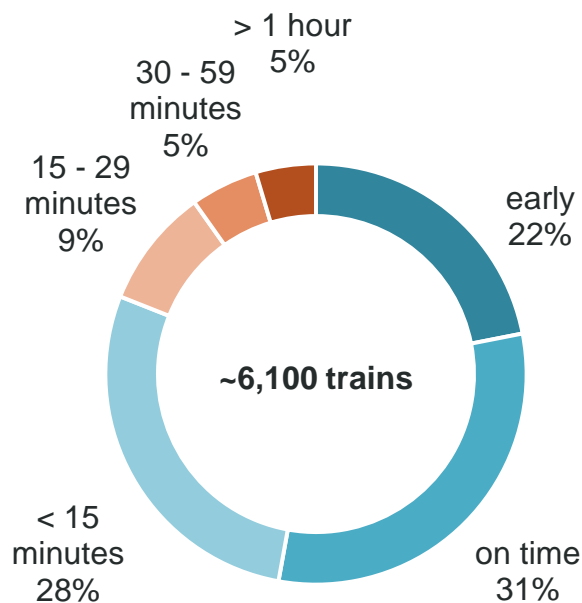
Source: SCI Verkehr based on Eurostat rail\_go\_grpgood as of 4/7/2024; Eurostat iww\_go\_atygo as of 19/7/2024; Eurostat iww\_go\_actygo as of 19/7/2024; Eurostat road\_go\_ta\_tott as of 6/8/2024; Eurostat tran\_im\_uroad as of 22/3/2024; SCI Multiclient Study "The European Rail Freight Transport Market 2023"

According to an RNE data sample, 80% of Combined Transport trains reach their destination within 15 minutes of the scheduled time of arrival, with a significant number of trains being severely delayed

**Punctuality of freight trains by country in 2022**  
(trains with < 15 min delay as % of all trains)



**Delayed CT trains by time group**  
(% of CT trains<sup>1</sup>)



- The **data accuracy is to be further analysed** to ensure a picture for the whole CT market.
- In 2022, the United Kingdom had the highest punctuality in Europe with 87% of all freight trains reaching their destination within 15 minutes of the scheduled time of arrival. In general, less crowded networks tend to have higher punctuality rates due to more generous buffer times. **Differences in time-table discipline also influence punctuality:** While Germany, with a punctuality rate below 60%, is very lenient regarding delays on the point of origin (the train path is reserved for up to 20 hours), France and the United Kingdom have tighter regimes regarding departures.
- The On-Time Delivery Rate for CT trains is supposedly higher: 81% of all CT trains in the RNE sample data of a single week in September 2023 reach their destination within 15 minutes of the scheduled time of arrival. However, because of the high number of CT trains in Europe, in this sample alone **over 300 trains were delayed by more than an hour.**

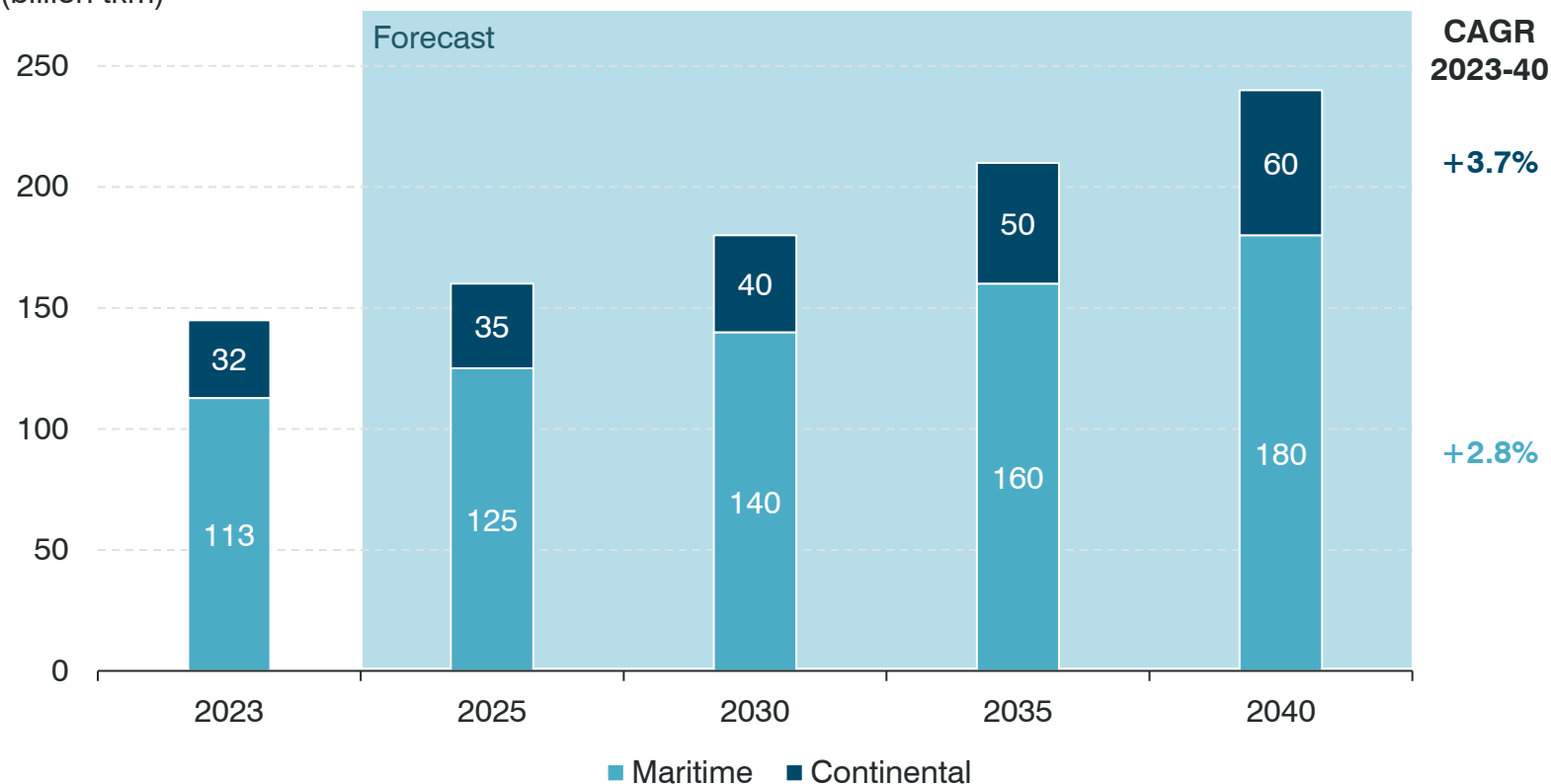
Sources: SCI Verkehr based on IRG-rail 12th Annual Market Monitoring Report 2024 and train information data provided by RNE

1) CT connections operating in Europe 12-18/9/2023. Due to methodological reasons, the data presented only represents a subsample of all CT connections in Europe in the sample week and may exclude existing connections. See also page 116.

## The market for Combined Transport by rail is forecast to grow by 3% p.a. until 2040

### Development of unaccompanied CT rail transport performance by transportation type

(billion tkm)



- SCI Verkehr expects further growth of unaccompanied Combined Transport by rail until 2040. **In 2040, the market will be around two thirds bigger than in 2023.**
- With a compound annual growth rate of 3.7% between 2023 and 2040, **continental transport should grow at a higher rate than the overall market** and almost double by 2040. This development should be mainly driven by the currently planned and further expected expansion of the continental network, especially in markets like Spain, France and Poland. In 2040, continental transport's share of the Combined Transport market will be 25% compared to 22% in 2023.

Combined Transport is an evolving market that can realise its full potential in the coming years, once remaining bottlenecks are addressed

### Short term

- EU legislation:
  - Weights and Dimensions Directive
  - Combined Transport Directive
  - Train Driver Directive
  - Land and Multimodal Transport (LMT) Guidelines
  - Regulation on Capacity Management
- Availability of rolling stock
- Economic development
- Cost structures

### Mid term

- EU legislation:
  - Reindustrialisation of Europe
  - Policy measures for more resilient supply chains
- Climate change
- Driver shortages
- Electrification of road transport
- Changes in transport market structure
- War in Ukraine

### Long term

- EU legislation:
  - Electronic freight transport information (eFTI) Regulation
  - CountEmissionsEU Initiative
  - Energy Taxation Directive
- Reduction of average load sizes
- Infrastructure capacity
- Development outside of the EU (New Silk Road)
- Incompatibility of loading units with Combined Transport

## Influencing factors for the market development of Combined Transport



# European Combined Transport Market

## Facts and Figures

# Combined Transport refers to a specific form of intermodal transport and can be divided into different market segments

**Definition of Combined Transport according to Council Directive 92/106/EEC of 7 December 1992 on the establishment of common rules for certain types of combined transport of goods between Member States**

“For the purposes of this Directive, ‘combined transport’ means **the transport of goods between Member States where the lorry, trailer, semi-trailer, with or without tractor unit, swap body or container of 20 feet or more uses the road on the initial or final leg of the journey and, on the other leg, rail or inland waterway or maritime services where this section exceeds 100 km as the crow flies** and make the initial or final road transport leg of the journey;  
 - between the point where the goods are loaded and the nearest suitable rail loading station for the initial leg, and between the nearest suitable rail unloading station and the point where the goods are unloaded for the final leg, or;  
 - within a radius not exceeding 150 km as the crow flies from the inland waterway port or seaport of loading or unloading.”

**Note:** For this report, ‘Combined Transport’, ‘Intermodal (rail) (freight) Transport’ have the same meaning and are therefore substitutable.

## Segmentation of Combined Transport services

	<b>Unaccompanied Combined Transport</b> <i>Transshipment of the loading unit independently from road vehicle and driver</i>	<b>Accompanied Combined Transport</b> <i>Transshipment of the loading unit together with road vehicle and driver (RoLa)</i>
<b>Maritime Combined Transport</b> <i>Transport of ISO containers, usually as part of intercontinental transport chains</i>	✓	✗
<b>Continental Combined Transport</b> <i>Transport of swap bodies, semi-trailers and lorries, usually as part of intra-European transport chains</i>	✓	✓

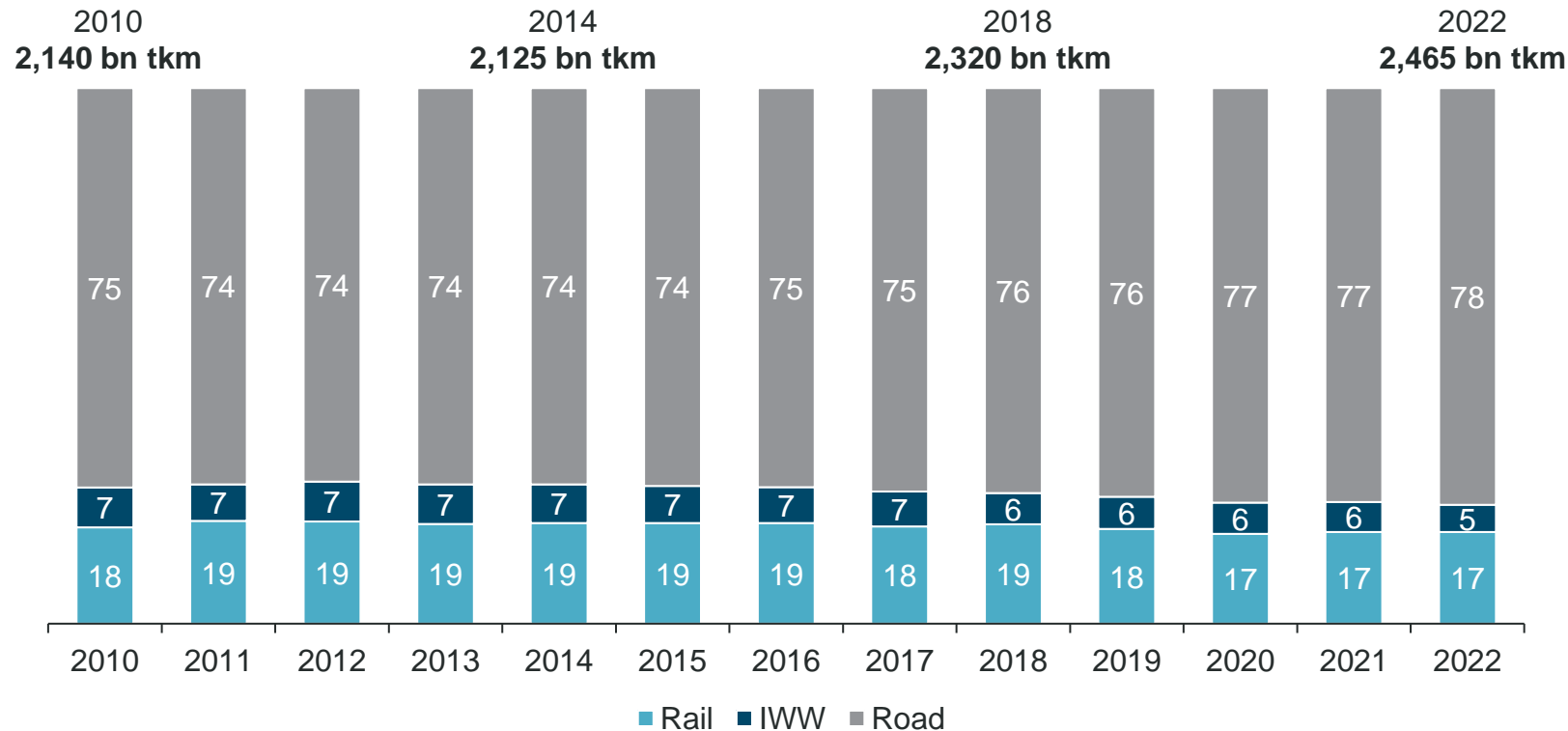
*All segments can be further differentiated into **cross-border** and **domestic** services. For this report, all rail and IWW legs with the same origin and destination country are considered domestic services, regardless of origin or destination of the first and last leg on road.*

# 01

## The European Freight Transport Market

The modal share of rail freight stabilised thanks to the growth of Combined Transport but needs further action to reach the 30% target of the European Union

**Development of modal split of European freight transport**  
(% of tkm)



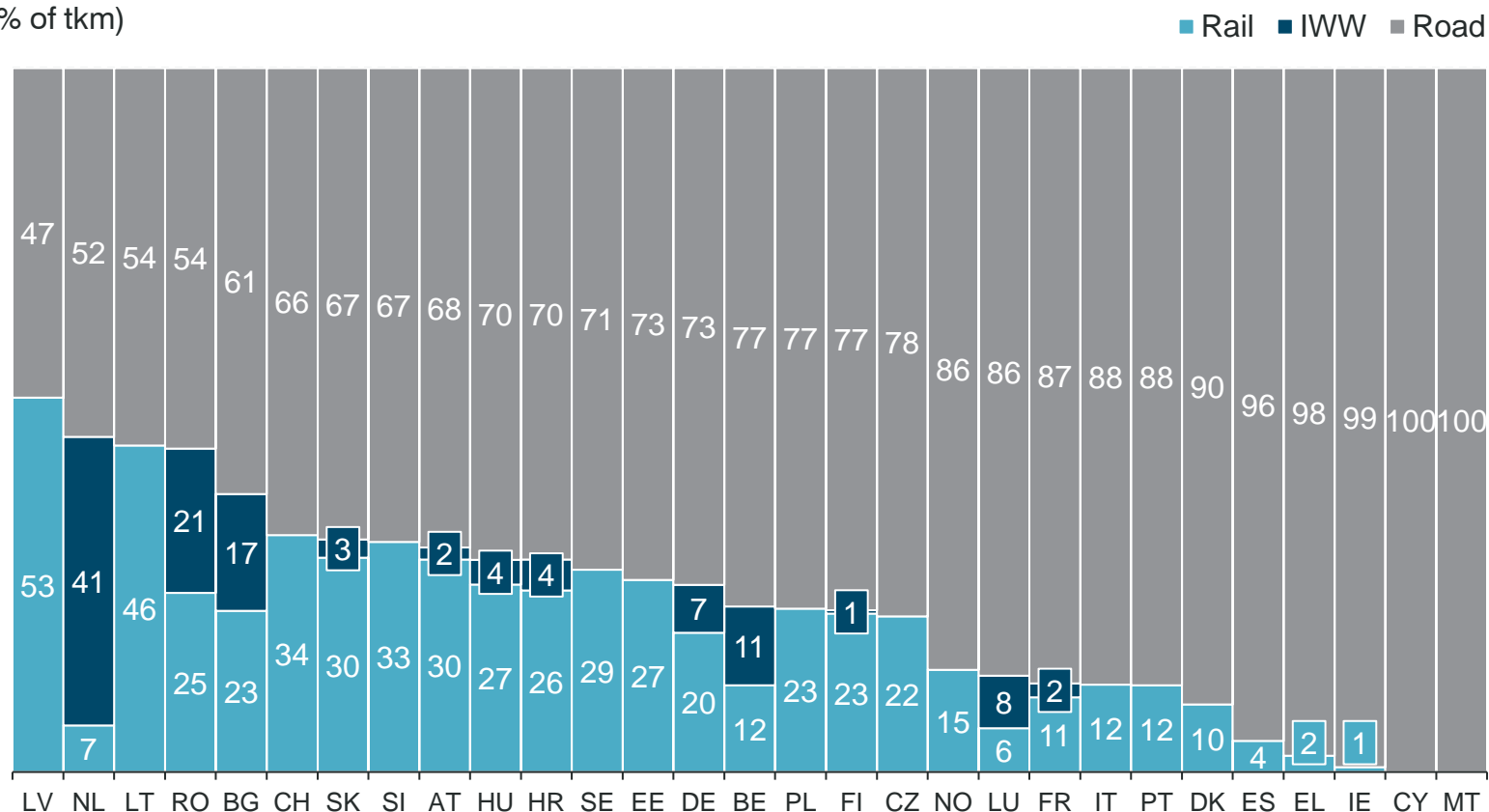
- The European Union has set ambitious targets to increase the rail share to 30% by 2030 as part of its climate goals. **It will be challenging to reach this target** without substantial changes and improvements to the current transport system – and a substantial shift from road to rail.
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Source: Eurostat tran\_hv\_frmod as of 15/4/2024

## Five Member States and Switzerland have already reached the 30% modal share goal for rail freight transport

### Modal split in 2022 by country

(% of tkm)

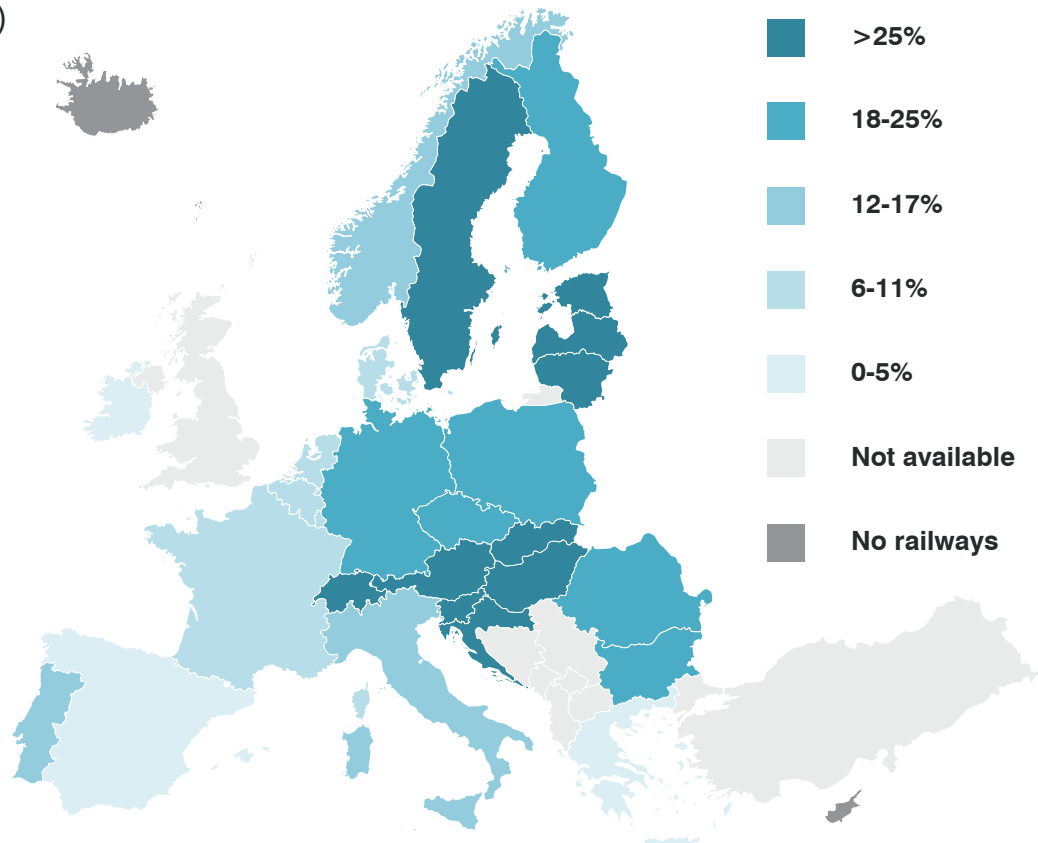


Source: Eurostat tran\_hv\_frmod as of 15/4/2024

- **The top three rail countries by rail modal share are Latvia (53%), Lithuania (46%) and Switzerland (34%).** However, all three countries have seen a decline in rail share since 2013. While Latvia and Lithuania were impacted by the sanctions against Russia after the invasion of Ukraine, the Swiss transalpine rail transit is negatively affected by the lack of high-capacity feeder lines in Germany and Italy.
- Only six countries had IWW modal shares over 5%, with the Netherlands reporting by far the biggest share with 41%, followed by Romania (21%) and Bulgaria (17%). **None of the six top IWW countries was among the top 10 countries by rail share.**
- **The modal share of IWW declined in all countries except Finland.** On the one hand, a change in the goods mix negatively affected the bulk transport of coal and ores. On the other, increasingly unreliable water levels, especially on the Rhine river, had a negative impact on IWW transport.

## The modal share of rail freight transport is highest in Northern and Central Eastern Europe

**Map of rail modal split of freight transport in Europe by country in 2022**  
(% of total inland freight tkm)



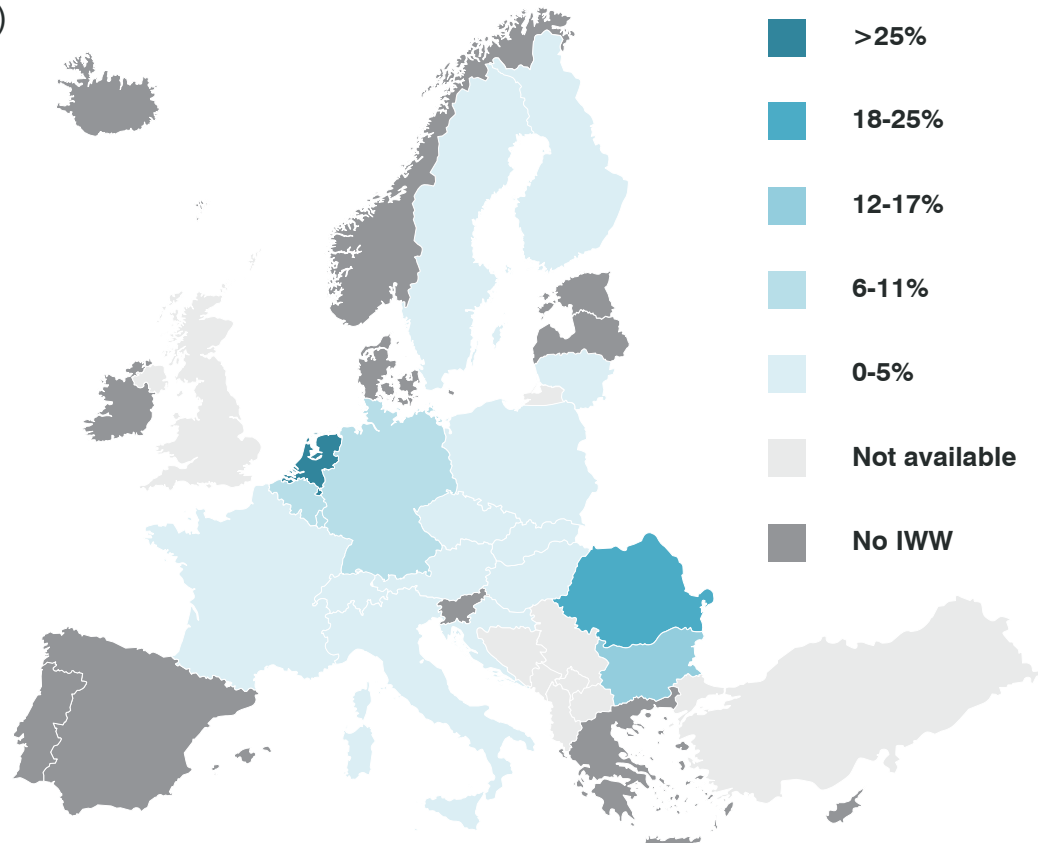
- **The modal share of rail freight is generally higher in Northern and Eastern Europe** compared to Western and Southern Europe.
- The Baltic states (Estonia, Latvia and Lithuania) in particular have historically had a high share of rail freight transport due to transit connections with Russia. As a result, **the Baltics were hit especially hard after the Russian invasion of Ukraine**. Similarly, Finland saw a decrease in cross-border rail transport with Russia.
- The **EU Member States with the lowest shares for rail freight transport** (Spain, Greece and Ireland) have relatively **low-density networks of single-track railway lines**, usually combined with a low industrial base and a well-developed road freight sector. This impedes the development of a competitive rail freight sector.

Source: SCI Verkehr based on Eurostat tran\_hv\_frmod as of 15/4/2024



# The Netherlands has the highest modal share for inland waterway navigation with 41%

**Map of IWW modal split of freight transport in Europe by country in 2022**  
(% of total inland freight tkm)

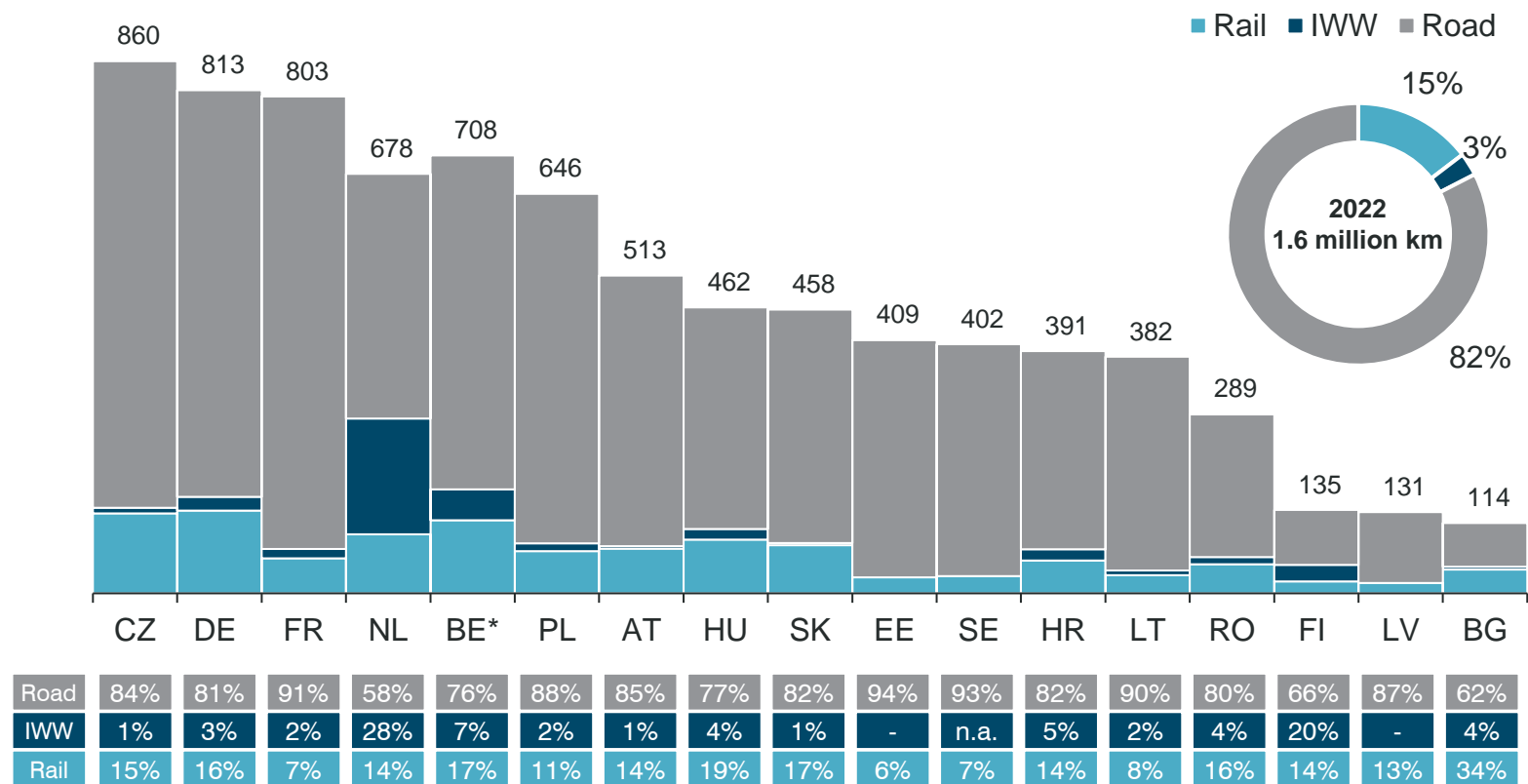


- In general, the modal share of IWW is very low all over Europe. **IWW is mostly concentrated on the Rhine river and its tributaries as well as on the lower Danube.**
- **Four countries have IWW modal shares above 10%:** The Netherlands (41%), Romania (21%), Bulgaria (17%) and Belgium (11%). All four countries use big natural waterways (Rhine, Danube and Schelde) as the backbone of their IWW systems.
- Due to the necessary fluvial and canal systems, **IWW infrastructure is far less common than rail infrastructure in Europe**, contributing to its overall smaller modal share. While only two EU Member States have no rail systems (Malta and Cyprus), ten have no IWW infrastructure in use.
- For **Belgium**, the institutional context is relevant as well. IWW is regionalised, which has provided access to important financial resources for upgrading the entire fluvial system (almost all bridges were heightened) and which the federal rail sector is lacking.

Source: SCI Verkehr based on Eurostat tran\_hv\_fmrod as of 15/4/2024

# Rail infrastructure in Europe is more efficient compared to road infrastructure

**Network density and share by transport mode in 2022**  
(network km per 1,000 km<sup>2</sup> of land area; % of km)



- The European rail network has a length of over 245,000 km. **Germany alone accounts for roughly a fifth of the total network with 47,000 km.** This is the largest national infrastructure in Europe, followed by France with 31,000 km (13%).
- While the absolute network length tends to be correlated with the overall size of countries, the **network density is highest in the Czech Republic** with 860 km of transport infrastructure per 1,000 km<sup>2</sup> of land area, followed by Germany with 813 km. This reflects the role of both countries as European transit and logistics hubs.
- Bulgaria has the highest share of rail infrastructure with 34%, followed by Hungary with 19% and Belgium with 18%. On average, 15% of all transport infrastructure is rail infrastructure. This is below the current modal share of rail freight transport, resulting in a **higher performance per network km for rail compared to road.**

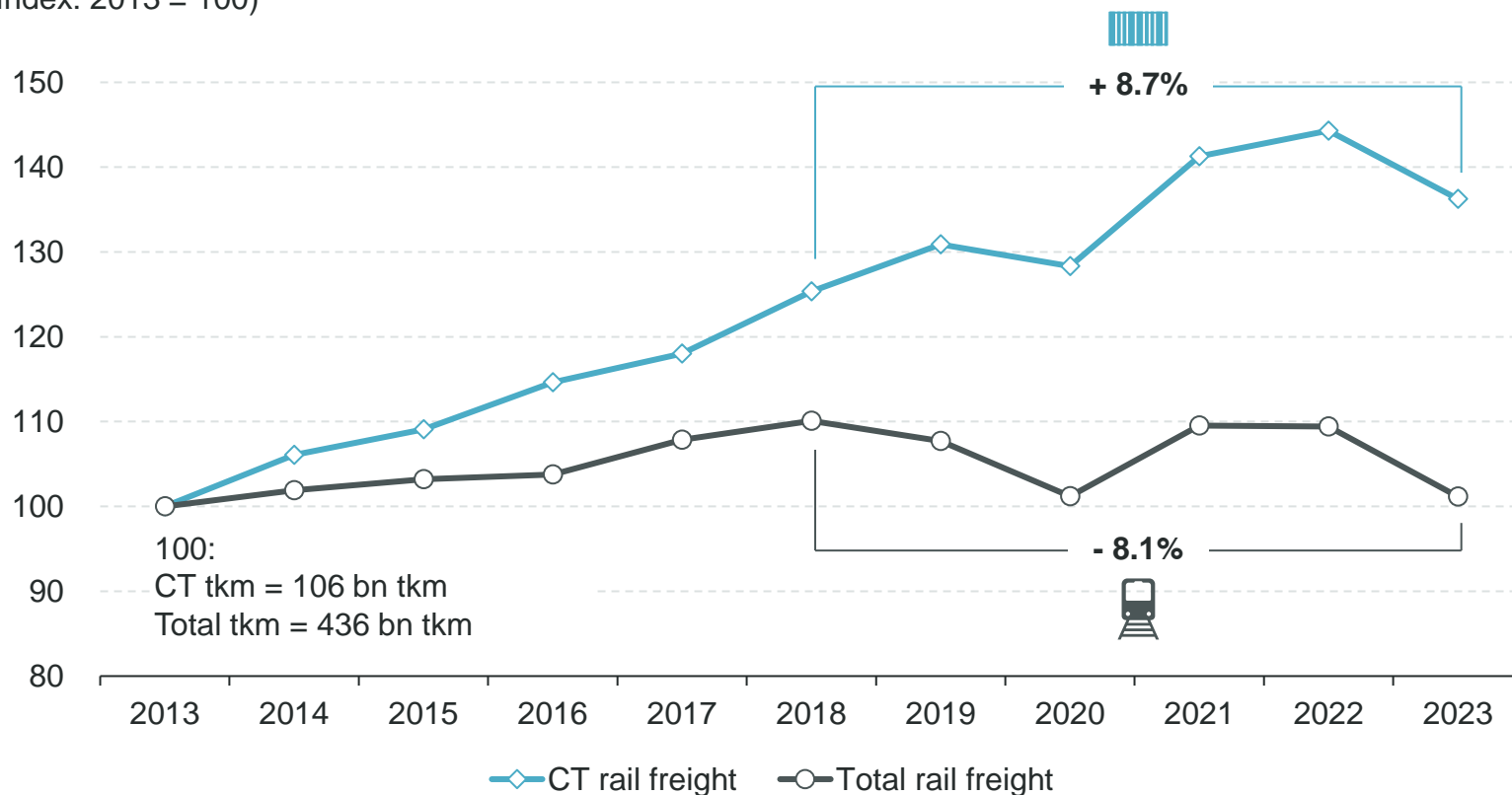
Source: Eurostat iww\_if\_infrastr as of 5/8/2024; SCI Multiclient Study "Railway Track Systems – Global Market Trends 2023"; UIRR country fact sheets

\* IWW infrastructure figures from 2008

## Combined Transport grew by almost 9% between 2018 and 2023, while total rail freight transport decreased by over 8% in the same period

### Development of CT and total rail freight transport performance

(Index: 2013 = 100)

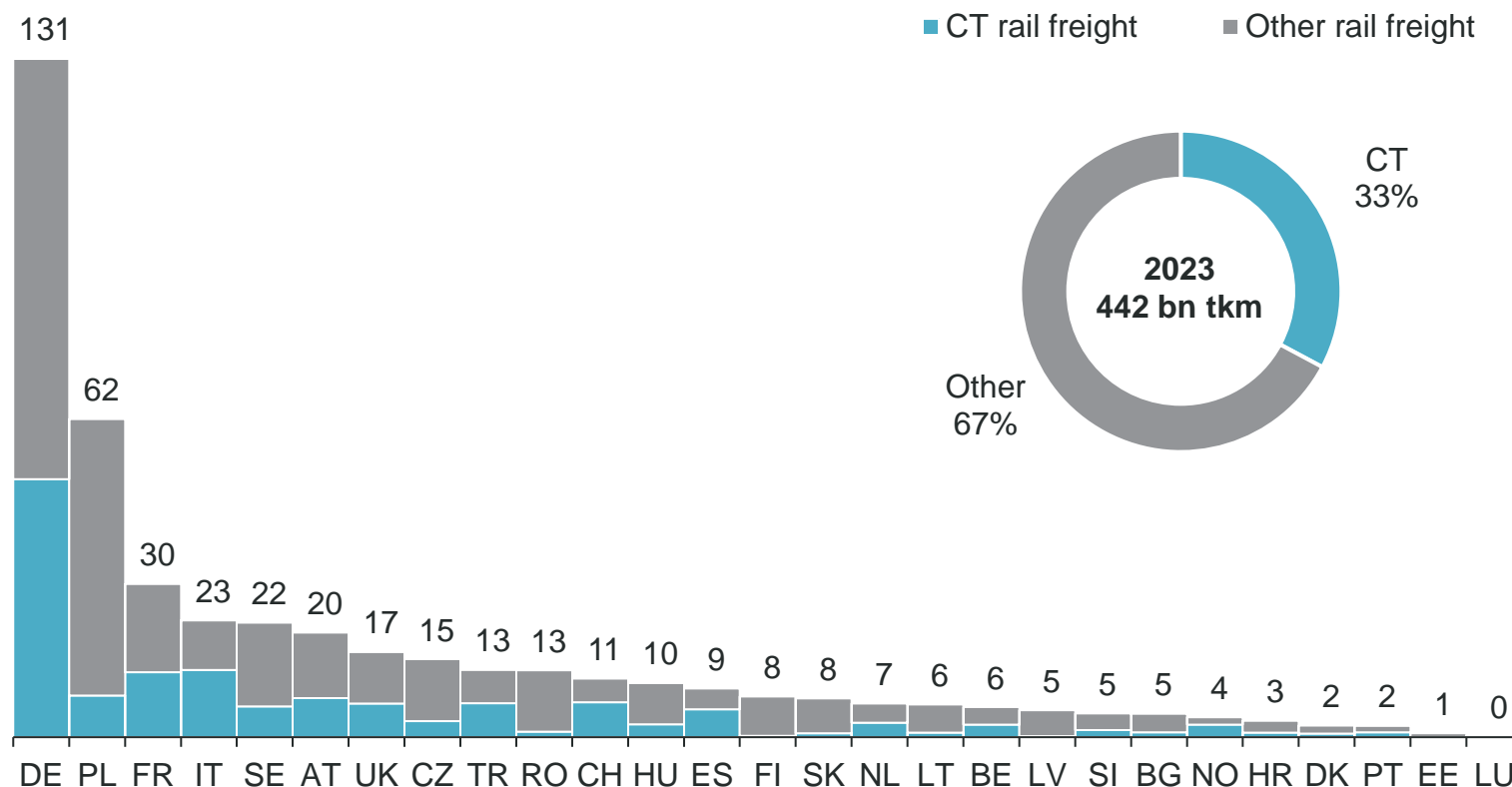


- **Total rail freight transport performance grew by 10% in absolute terms between 2013 and 2018.** After a small decline in 2019, rail freight transport was severely hit during the first year of the Covid-19 pandemic, only to immediately bounce back in 2021. However, in 2023 transport volumes decreased substantially again, mostly due to the combination of price hikes and a slowing economy. Both factors were caused by the energy crisis that emerged in the aftermath of the Russian invasion of Ukraine. Further contributing factors were the closure of the Fréjus rail tunnel between France and Italy due to a landslide, and strikes in France.
- **At the same time, Combined Transport by rail grew by 25% between 2013 and 2018** and grew further until 2022 with only a slight decline in 2020. Despite a sharp decrease of -8% in 2023, due to the same factors that affected the overall rail freight sector, the segment still managed to grow by 8.7% between 2018 and 2023 and increased its share of total rail freight by 33%.

Source: Eurostat rail\_go\_grpgood as of 4/7/2024; SCI Multiclient Study "The European Rail Freight Transport Market 2023"

According to Eurostat figures, Combined Transport accounts for at least one in three tonne-kilometres of rail freight transport

**Rail CT and other freight transport performance in 2023 by country**  
(billion tkm)



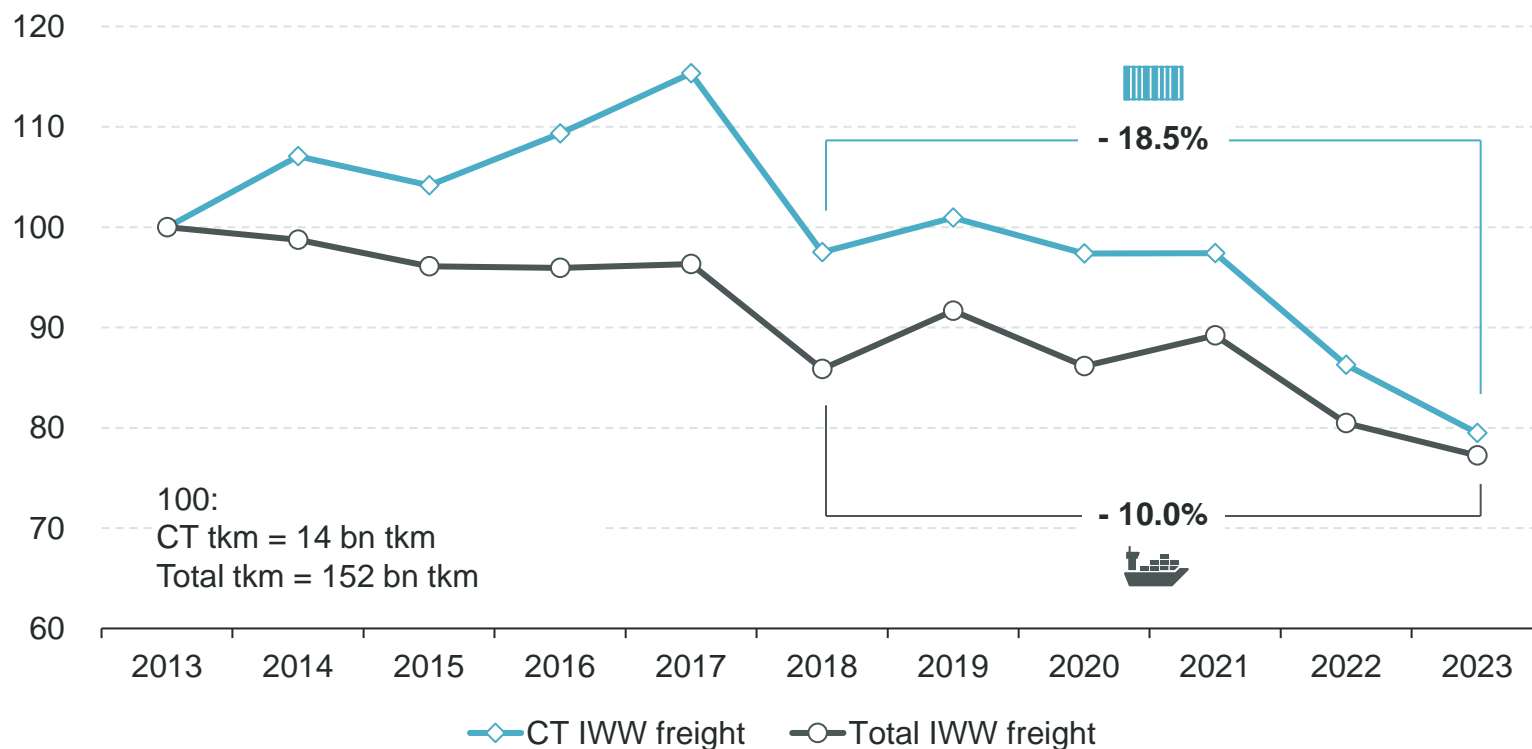
- According to Eurostat figures, Combined Transport accounts for at least one in three tonne-kilometres of rail freight transport. The market analysis, however, estimates the **actual share to be around 50%**.
- **Germany is by far the most important rail freight market in Europe** in absolute terms, due to the size of the economy and its position in the centre of Europe. The second largest market, Poland, is less than half Germany's size and the third largest market, France, is less than a quarter its size.
- Since 2013, the growth of the rail freight market has been primarily driven by Poland (+32%) and Germany (+11%). However, **the biggest growth was reported in Bulgaria (+76%)**.
- At country level, **the highest shares are reported in Norway (63%), Switzerland (60%) and Italy (58%)**. With only a 3% market share, Finland has the smallest CT sector in Europe in relation to the rail freight market.

Source: Eurostat rail\_go\_grpgood as of 4/7/2024; SCI Multiclient Study "The European Rail Freight Transport Market 2023"

## Water-level related disruptions on the Rhine accelerated the decline of inland waterway navigation

### Development of CT and total IWW freight transport performance

(Index: 2013 = 100)

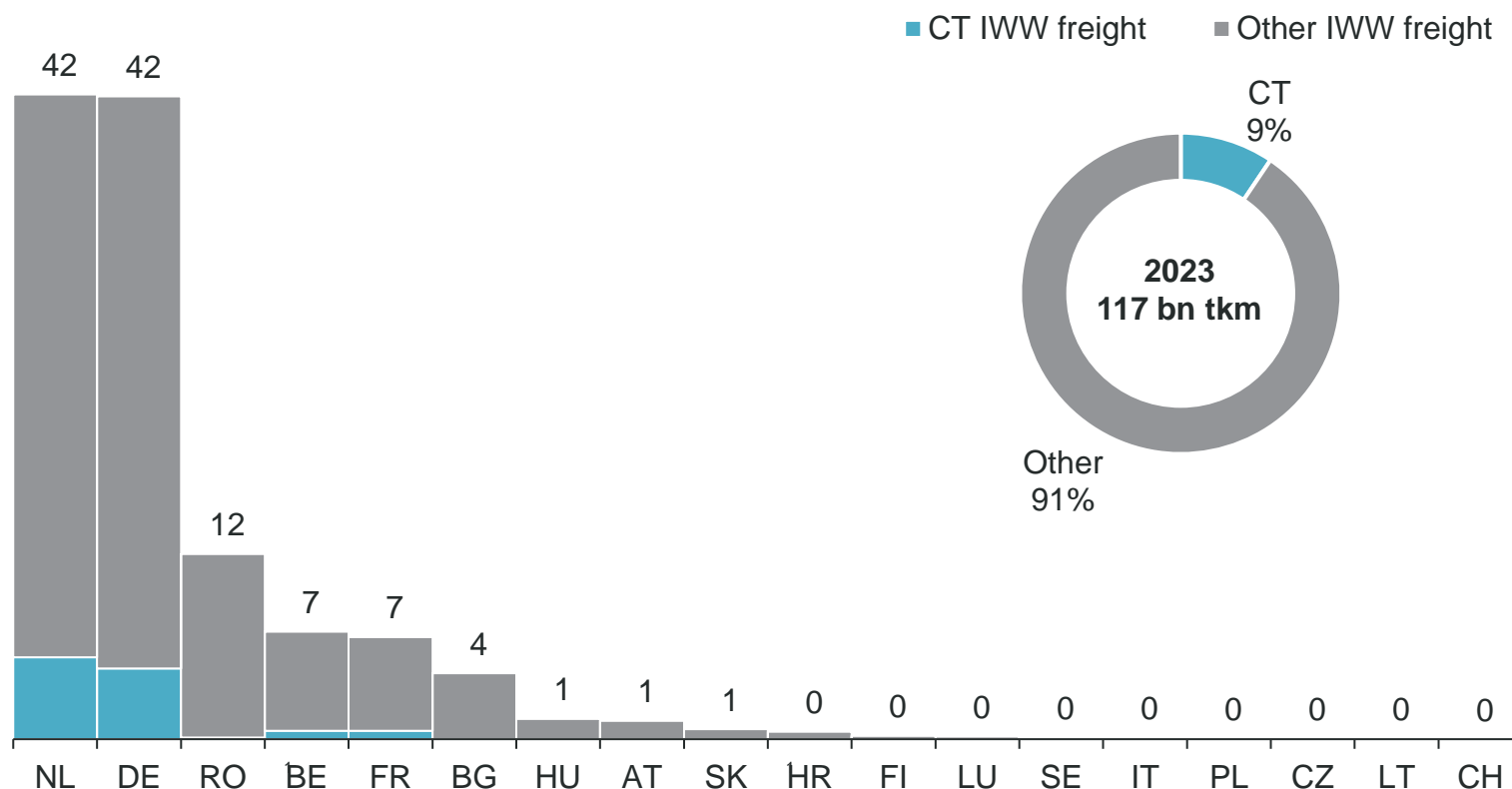


- **IWW transport performance was severely hit by the extreme low-water period on the Rhine in 2018 and has not recovered since.** In fact, IWW performance fell by another 10% between 2018 and 2023, partially due to decreasing coal and liquid bulk transports and water-level related disruptions.
- Combined Transport performance grew between 2013 and 2017, but fell below the 2013 level during the massive disruptions in 2018. Since then, its performance is roughly in lockstep with the overall market. However, **with a fall of -18.5% between 2018 and 2023, CT has experienced a more unfavourable trend than the market as a whole.**

Source: Eurostat iww\_go\_atygo as of 19.07.2024; Eurostat iww\_go\_actygo as of 19.07.2024

## The Rhine is the backbone of the European inland waterway Combined Transport system

**IWW CT and other freight transport performance in 2023 by country**  
(billion tkm)



Source: Eurostat iww\_go\_atygo as of 19/7/2024; Eurostat iww\_go\_actygo as of 19/7/2024; 1) Figures from 2022

- **IWW is mostly restricted to a few European countries** which have access to big navigable rivers like the Rhine and its tributaries, the Scheldt/Meuse system, the Danube or the Seine, that form the backbone of modernised secondary canal systems.
- In absolute numbers, **the Netherlands and Germany have comparable IWW transport markets in size**. Together, both countries account for over 70% of the European IWW transport performance.
- Overall, **Combined Transport has a 9% market share of IWW transport in Europe**. It is exclusively used for unaccompanied maritime units and mostly concentrated along the Rhine, to and from the ports in Rotterdam and Antwerp.
- The only major IWW players not surrounding the Rhine are **Romania** and, to a lesser extent, **Bulgaria**. Neither of these two countries reported significant IWW Combined Transport volumes in 2023.

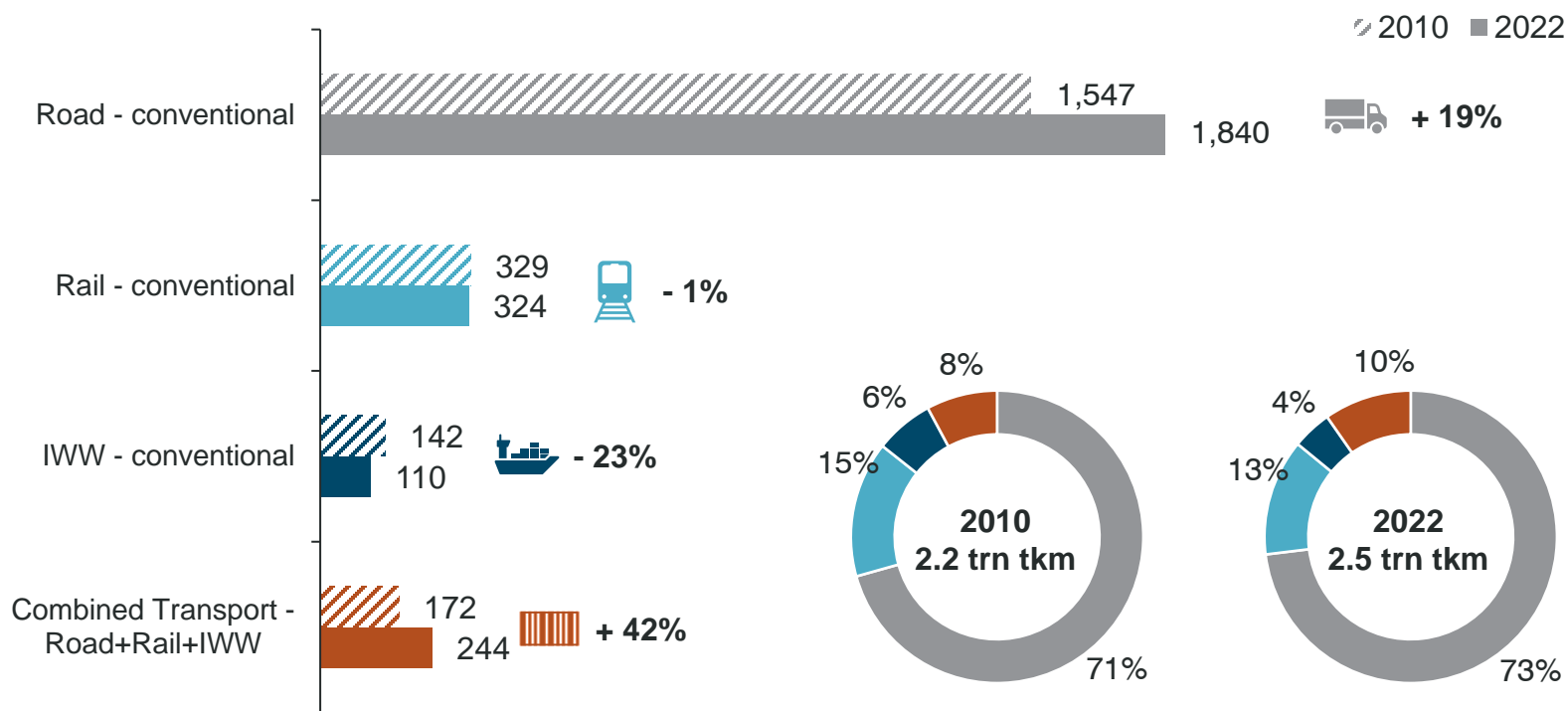


# 02

## Combined Transport Performance in the European Transport System

# Combined Transport was the key factor to keep rail freight competitive with road transport

Development of modal split of Combined Transport and total European freight transport (billion tkm)

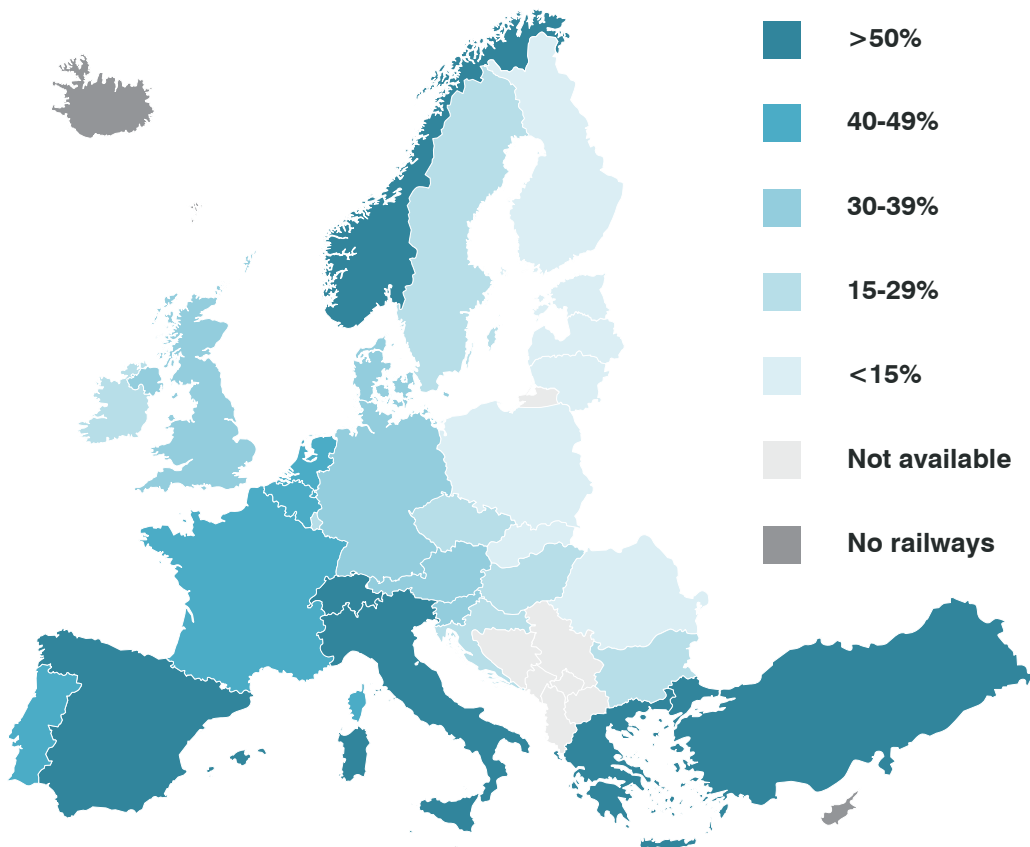


- **Combined Transport showed the highest growth of all transport modes with over 40%.** This is more than twice as much as road transport, while transport performances stalled for conventional rail and decreased for IWW.
- **Without this growth for the CT segment, the non-road sector would have slipped further behind road transport,** as conventional rail and IWW were not able to add more transport volume compared to 2010, despite a growing transport market.
- This is caused by differences in the markets, with road transport driven by on-time logistics of small shipments, whereas **conventional rail and IWW depend on bulk logistics of heavy goods, like coal and petroleum** which will be phased out in coming years.
- **CT combines the advantages of small shipment sizes with the cost advantages of bulk transport,** providing an alternative to road transport over longer distances.

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## Combined Transport accounts for over half of all rail freight tonne-kilometres in six European countries

**Map of CT share of rail freight transport in Europe by country in 2022**  
(% of total inland freight tkm)

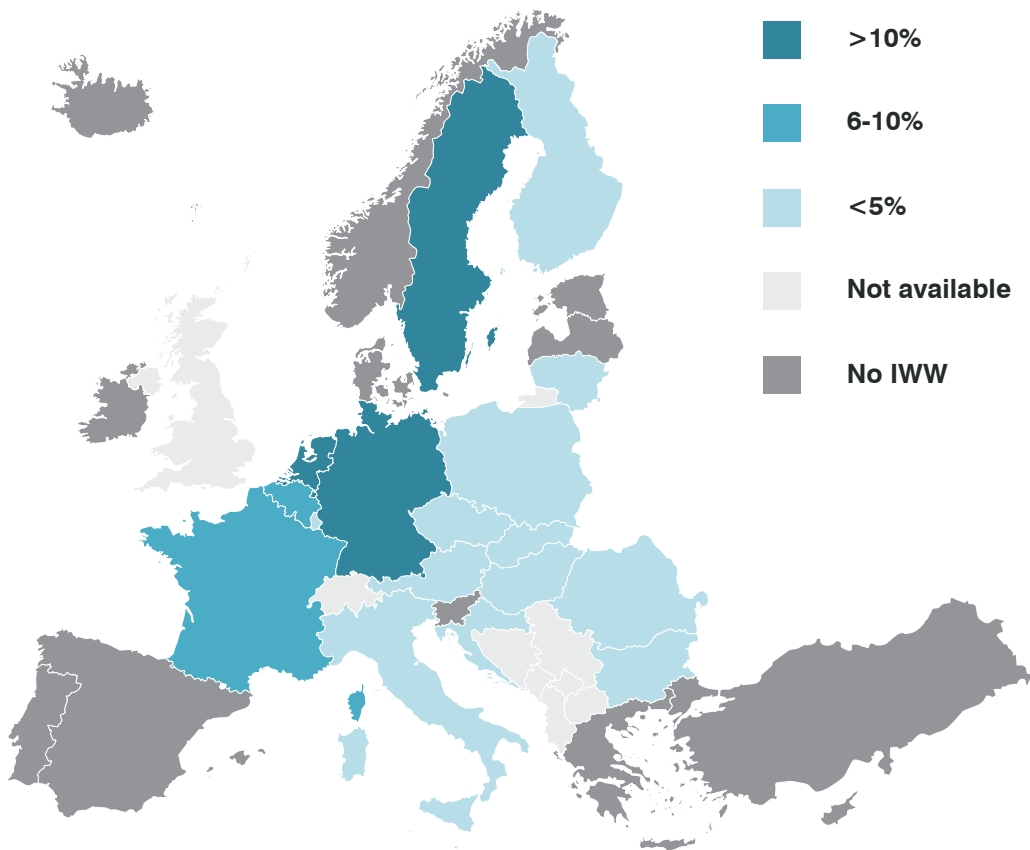


- **While Combined Transport plays a significant role in most rail freight markets, it is especially important in Southern Europe** (Spain, Italy, Greece and Turkey). However, except for Italy, these markets tend to be smaller in size than markets in Central Europe. It is worth noting that the highest shares are found in Norway (63%) and Switzerland (60%).
- **In Eastern Europe, the share of CT is generally lower due to the historically bulk-centred rail freight systems** that were designed for the transport of coal, ores and timber. Following the integration into the European Single Market, the structure of the rail freight market in Eastern Europe has increasingly tilted towards CT.
- Due to the importance of CT for port hinterland transport, **smaller Member States with large container ports like the Netherlands or Belgium also report higher CT market shares** than neighbouring countries.

Source: Eurostat rail\_go\_grpgood as of 4/7/2024; SCI Multiclient Study "The European Rail Freight Transport Market 2023"

## Inland waterways: Combined Transport is mostly used for hinterland traffic from North Sea ports

**Map of CT share of IWW freight transport in Europe by country in 2023**  
(% of total inland freight tkm)



- **In all countries with IWW transport, Combined Transport is of moderate to low importance.** The sector is mostly concentrated along the Rhine and its tributaries and supporting canals. It is mainly used to connect the ports of Rotterdam and Antwerp with hinterland hubs like Duisburg, Neuss, Mannheim or Strasbourg. The majority of IWW transport in Europe still consists of dry and liquid bulk.
- **The countries with the highest shares of CT are Sweden (14%), the Netherlands (13%) and Germany (11%).** However, in absolute numbers, CT in Sweden is insignificant with 20 million tkm or less than 0.2% of all CT transport on inland waterways in Europe.

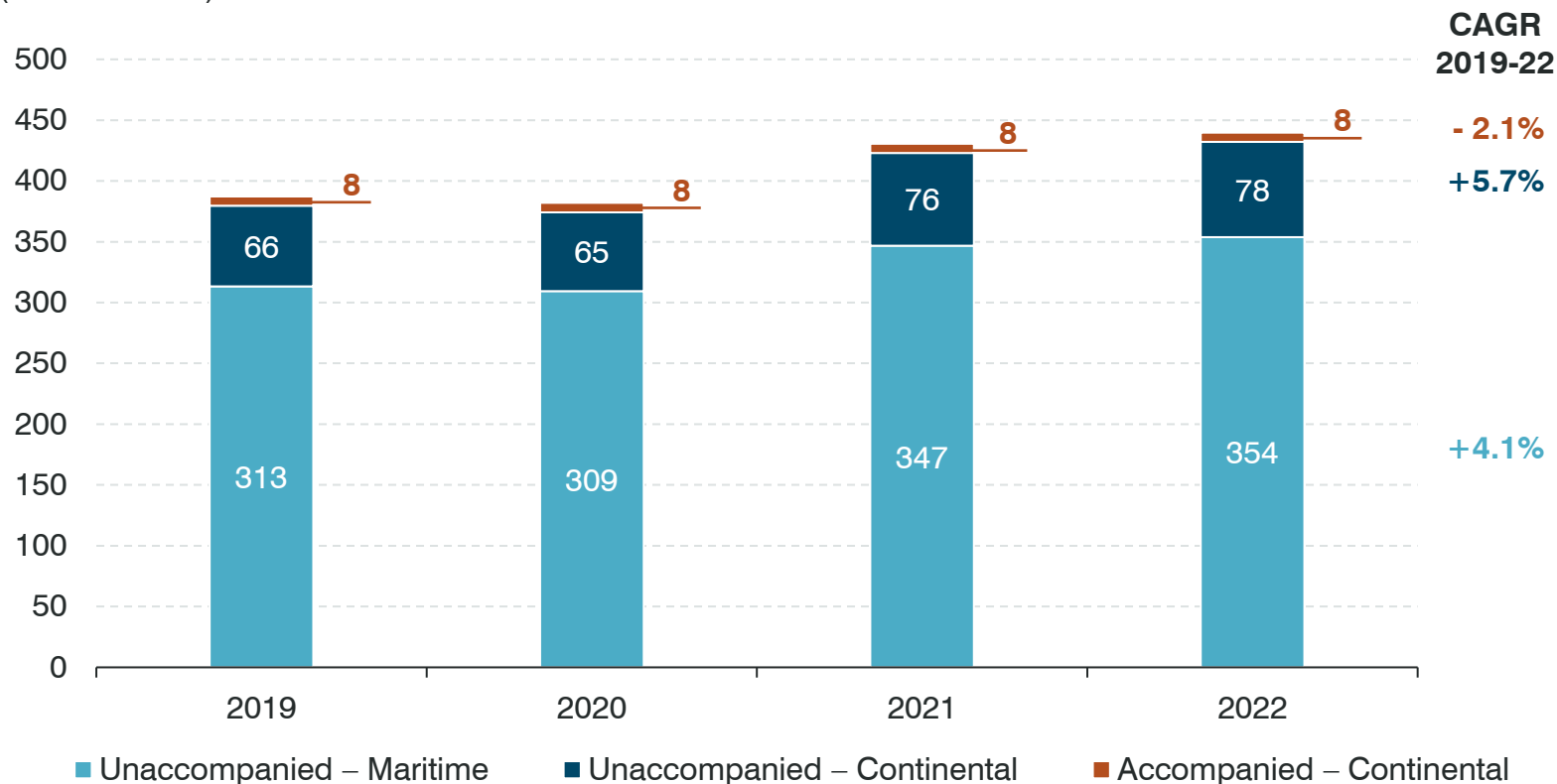
Source: Eurostat iww\_go\_atygo as of 19/9/2024; for Italy figures of 2022

# 03

## Transport Volumes in Road-Rail Combined Transport

## All unaccompanied Combined Transport segments grew between 2019 and 2022

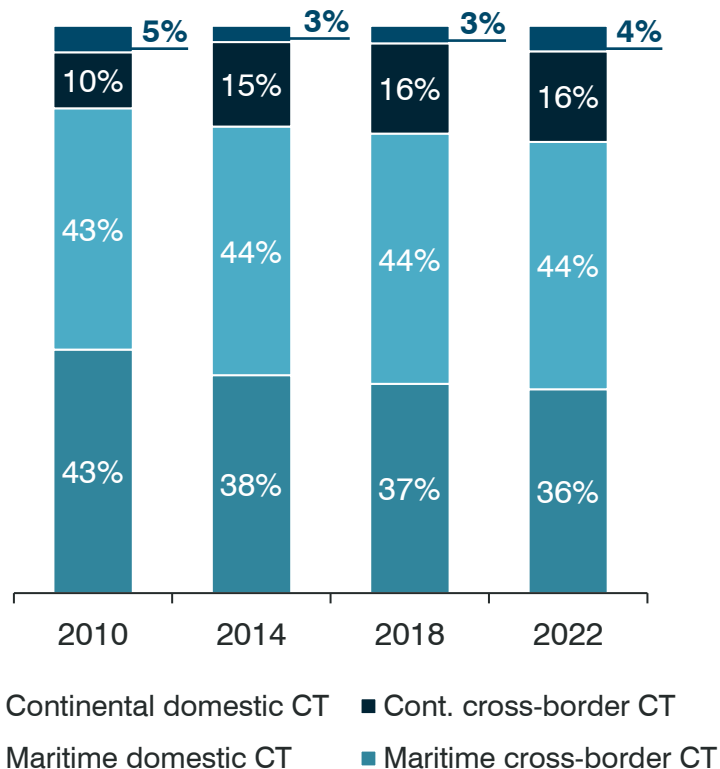
**Development of CT volumes by segment**  
(million tonnes)



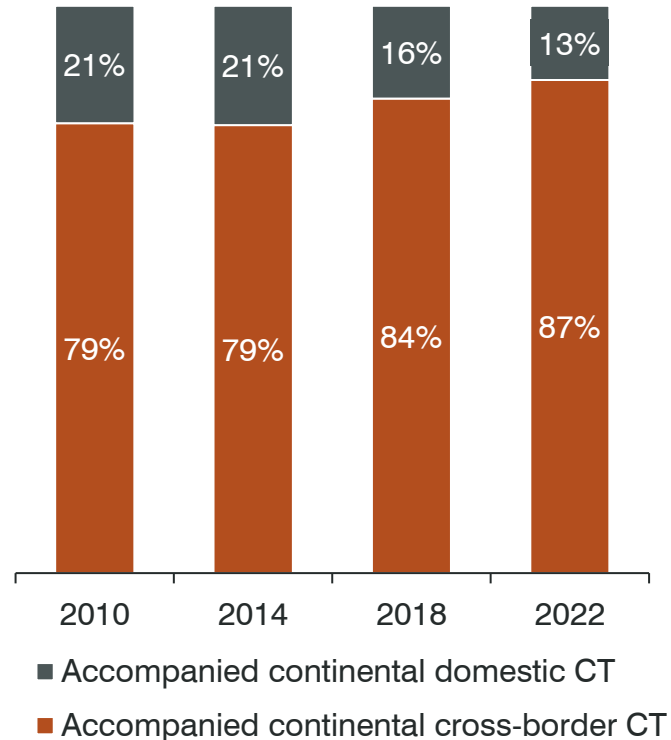
- **The biggest segment in Europe is unaccompanied maritime CT**, which consists of the transport of standardised sea containers (20 ft, 30 ft, 40 ft or 45 ft) between ports and hinterland hubs and terminals. In 2022, almost 80% of CT volume by weight was part of this segment.
- **Unaccompanied continental CT**, which consists of the transport of semi-trailers and swap bodies, is the second-most important segment and **grew faster than unaccompanied maritime CT** between 2019 and 2022.
- **Accompanied continental CT is the only segment that lost volume between 2019 and 2022.** However, the segment remains marginal with less than 1% market share. It encompasses mostly transalpine connections on so-called rolling motorways.

## Over 50% of all Combined Transport in Europe is produced on cross-border connections

Share of unaccompanied CT transport performance by type (% of tkm)



Share of accompanied CT transport performance by type (% of tkm)



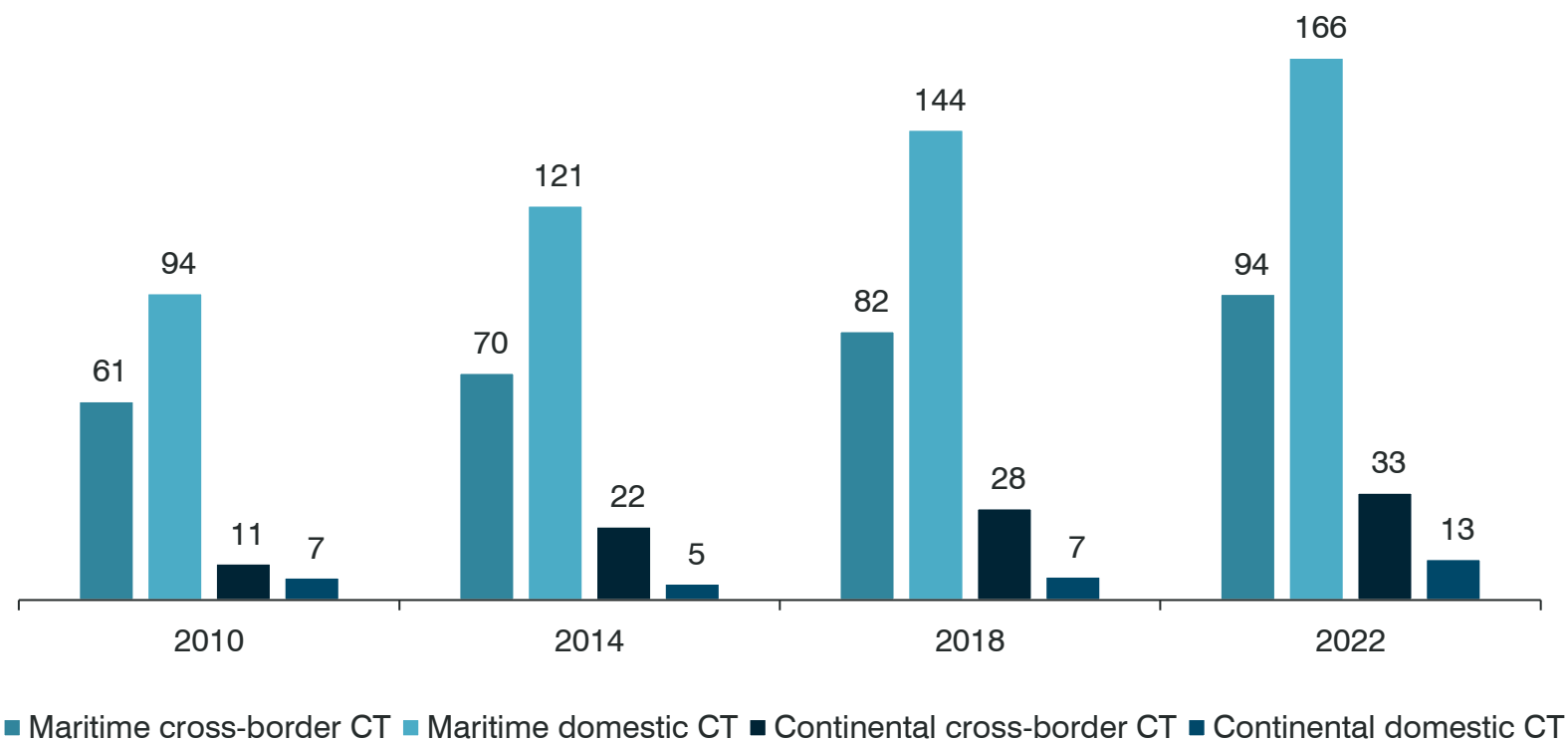
- The share of cross-border connections for unaccompanied Combined Transport remains stable, at between 50 and 55%, but **cross-border continental CT gained compared to cross-border maritime CT**. This is due to the expansion of continental CT over longer international distances, for example from the Adriatic to Belgium or from Benelux countries to Poland.
- Conversely, **the shares of domestic CT stayed stable and hardly changed**, with maritime domestic CT benefitting from better domestic hinterland services in countries such as Spain or Poland.
- **Currently, accompanied CT is mostly operated on cross-border connections.** Domestic transport lost importance outside of Austria. The main remaining domestic connection is between Wörgl and the Brenner pass.

Source: SCI Verkehr based on Eurostat rail\_go\_contwgt as of 19/7/2024 and UIRR Statistics



## Unaccompanied Combined Transport volumes are mostly driven by growth in domestic maritime and cross-border continental connections

**Development of unaccompanied CT transport volume by geographical and transportation type**  
(million tonnes)

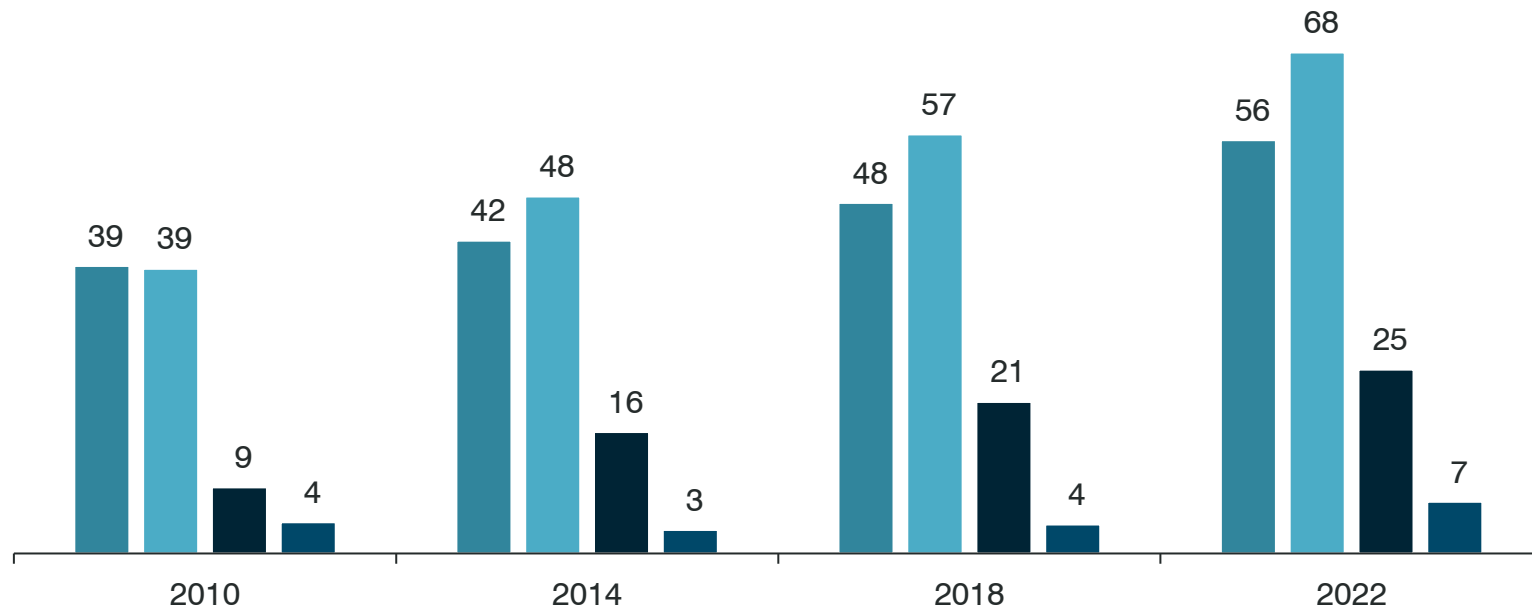


- **Unaccompanied maritime domestic Combined Transport volume grew faster than unaccompanied maritime cross-border CT** due to better hinterland connections in countries like Spain and Poland, whose ports have also gained more direct international connections with East Asia since 2010. The expansion of the hinterland terminal network allowed for more domestic connections in the bigger European markets as well.
- **The volume of unaccompanied continental CT grew mostly on cross-border connections**, as North-South traffic along transalpine corridors was facilitated by the establishment of Rail Freight Corridors. Recently, East-West connections have also increased in importance.
- **Intercontinental CT** largely contributed to the growth of maritime cross-border CT after 2014, with increasing volumes mostly to and from China. Due to the war in Ukraine, volumes were partly lost after 2022.

Source: SCI Verkehr based on Eurostat rail\_go\_contwgt as of 19/7/2024

## Unaccompanied domestic Combined Transport performance is growing, but cross-border connections are still ahead

Development of unaccompanied CT transport performance by geographical and transportation type (billion tkm)

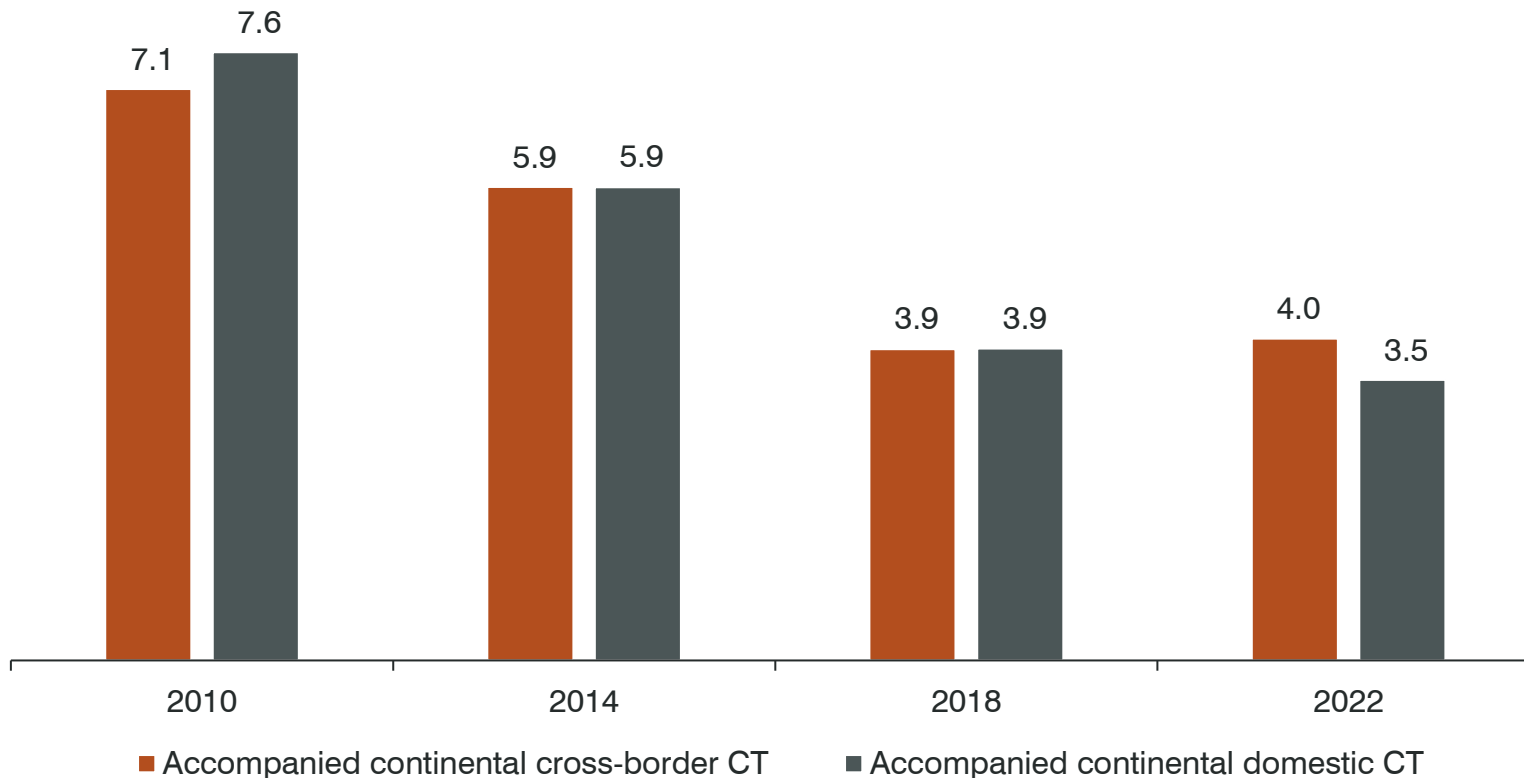


■ Maritime cross-border CT ■ Maritime domestic CT ■ Continental cross-border CT ■ Continental domestic CT

- The transport performance of unaccompanied maritime domestic Combined Transport grew faster than the transport performance of unaccompanied maritime cross-border CT. While both segments had the same transport performance in 2010, the domestic segment is now about 20% bigger. However, the difference is smaller than for transport volume due to the shorter distances on domestic connections.
- While unaccompanied continental cross-border CT provided most of the absolute growth, unaccompanied continental domestic CT grew more dynamically between 2018 and 2022. In the coming years, the domestic segment should gain further market share as **new domestic connections are introduced**, for example in Spain.

## Accompanied Combined Transport lost volume after 2010 as services were discontinued

**Development of accompanied CT volume by geographical and transportation type**  
(million tonnes)

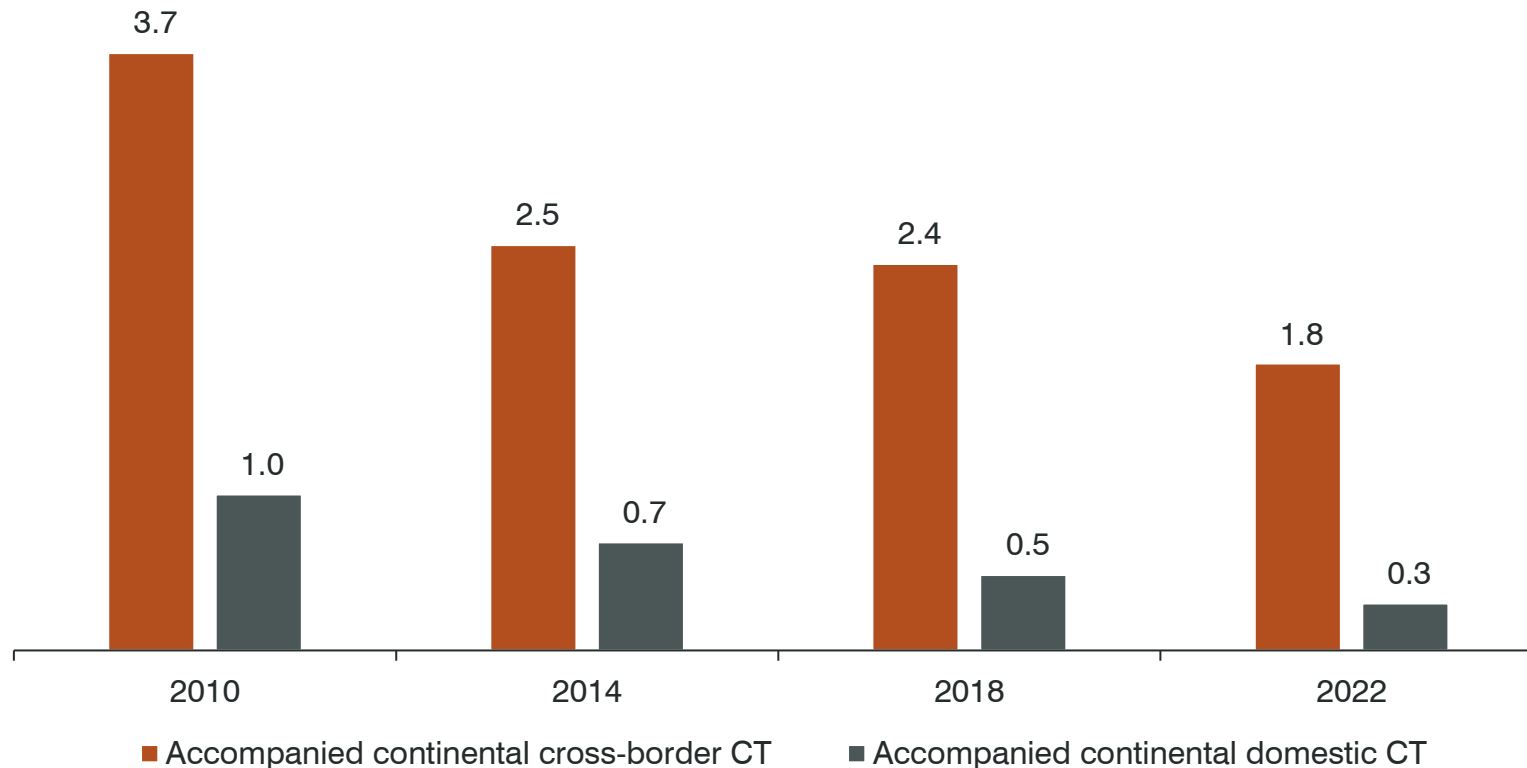


- Accompanied Combined Transport volumes decreased over all segments, but **the cross-border segment suffered less** despite a -63% contraction between 2010 and 2022. This was caused by a discontinuation of several cross-border rolling motorways and a reduction of services on other connections.
- Although accompanied domestic CT is now mostly confined to Austria and its neighbouring countries, **transport volumes for cross-border and domestic connections are very balanced** and move more or less in lockstep. This can be explained as all connections are part of the transalpine transport market and therefore exposed to similar market conditions.

Source: SCI Verkehr based on Eurostat rail\_go\_contwgt as of 19/7/2024 and UIRR Statistics

## Accompanied Combined Transport performance is mostly performed on cross-border connections

**Development of accompanied CT transport performance by geographical and transportation type**  
(billion tkm)

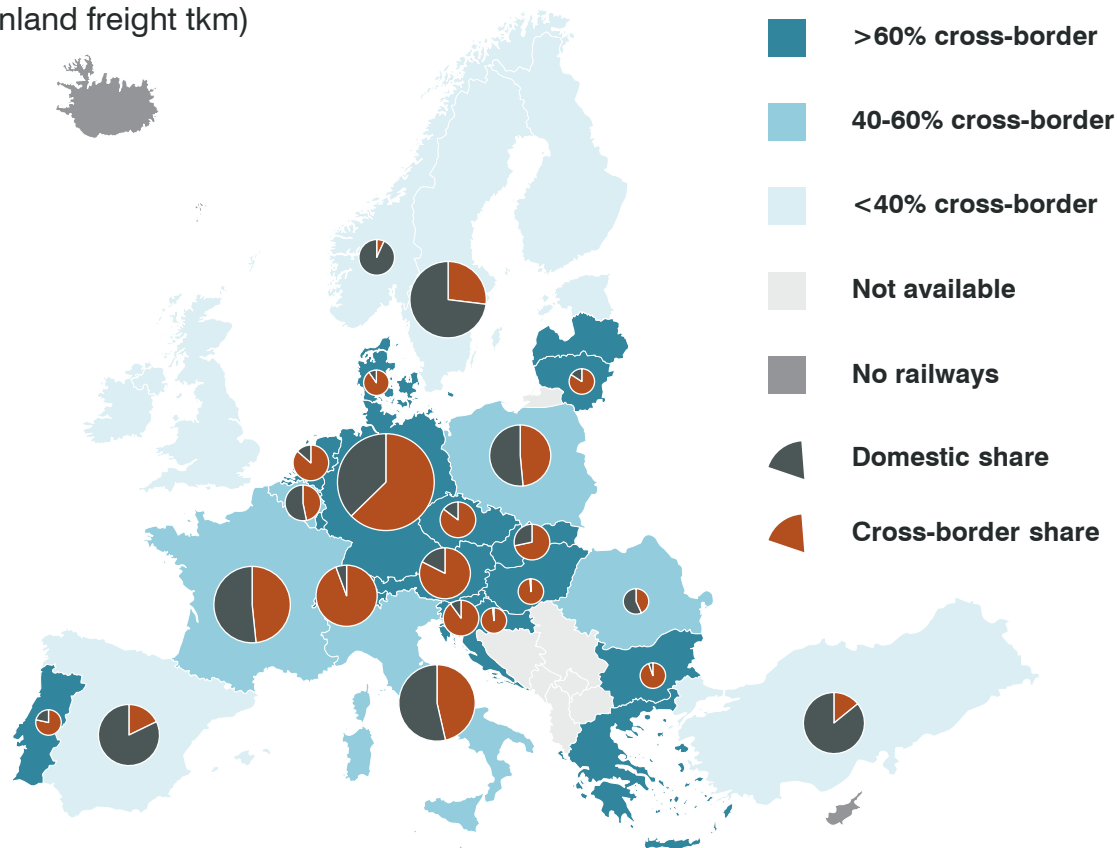


- Compared to transported volumes, the transport performance share of accompanied domestic Combined Transport is even smaller. In 2022, **the domestic segment accounted for about 45% of the transported volume, but only around 15% of the transport performance.**
- This reflects the **shorter distances covered by domestic shuttle connections**. As an example, the shuttle between Wörgl and the Brenner pass only covers around 100 kilometres.

Source: SCI Verkehr based on Eurostat rail\_go\_contwgt as of 19/7/2024 and UIRR Statistics

The European Combined Transport market is fully integrated with a high importance of cross-border connections for most national markets

Map of share of CT transport performance on cross-border connections by country in 2022 (% of total inland freight tkm)

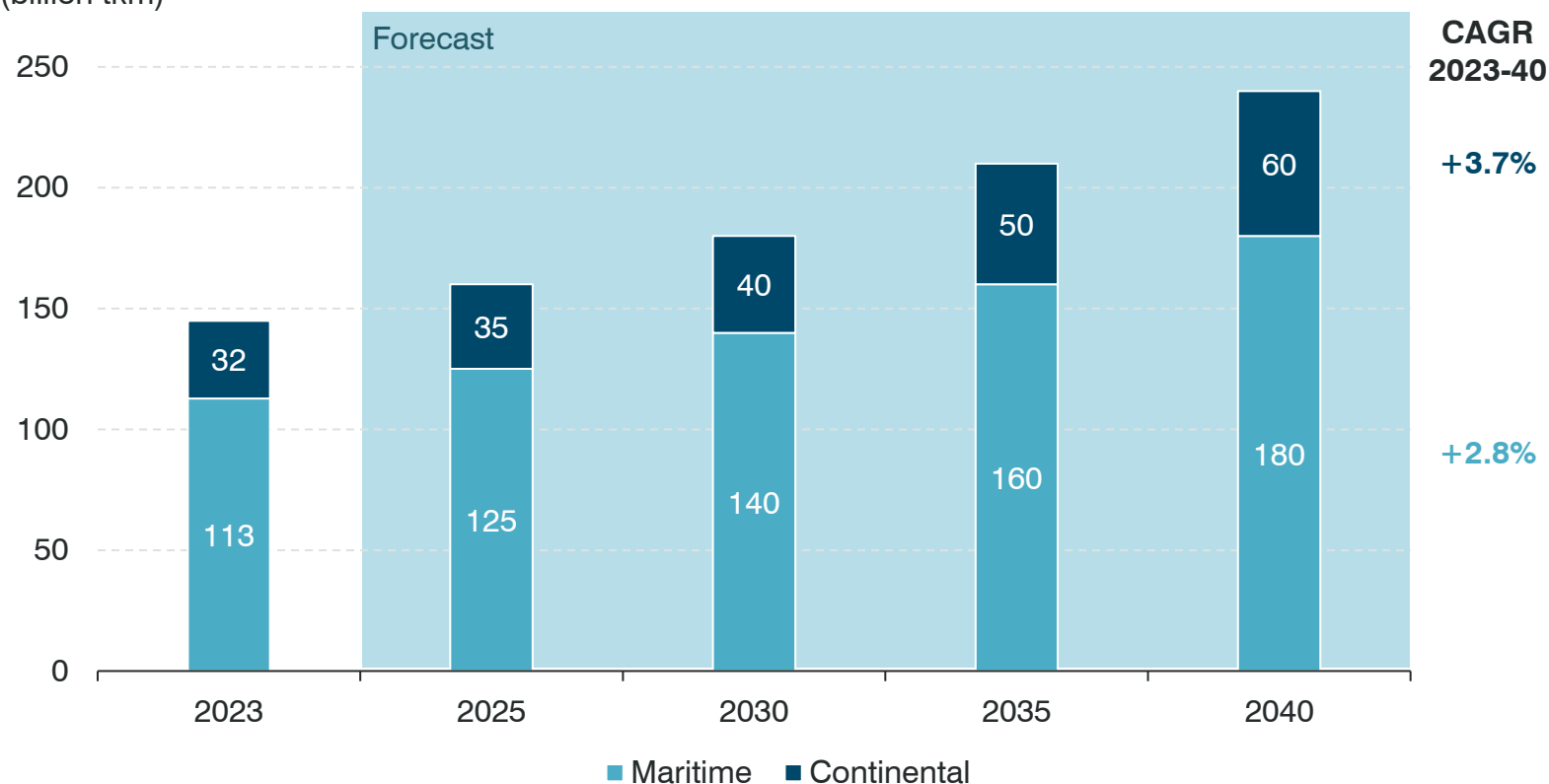


- In most countries, **cross-border connections are important for the national Combined Transport market**, with shares of around 50% and more.
- Cross-border connections are **especially important for smaller rail freight markets** with a limited requirement for domestic connections, like Hungary or Denmark. But smaller countries with major ports, such as Croatia, Slovenia or the Netherlands, or important transit countries like Switzerland or Germany also have higher shares of cross-border connections.
- Conversely, **markets with the highest shares of domestic transport are all countries on the periphery of Europe**, isolated from the European core network by gauge (Spain, Estonia and Finland) or infrastructure bottlenecks (Sweden, Norway and Turkey).

## The market for Combined Transport by rail is forecast to grow by 3% p.a. until 2040

### Development of unaccompanied CT rail transport performance by transportation type

(billion tkm)



- SCI Verkehr expects further growth of unaccompanied Combined Transport by rail until 2040. **In 2040, the market will be around two thirds bigger than in 2023.**
- With a compound annual growth rate of 3.7% between 2023 and 2040, **continental transport should grow at a higher rate than the overall market** and almost double by 2040. This development should be mainly driven by the currently planned and further expected expansion of the continental network, especially in markets like Spain, France and Poland. In 2040, continental transport's share of the Combined Transport market will be 25% compared to 22% in 2023.

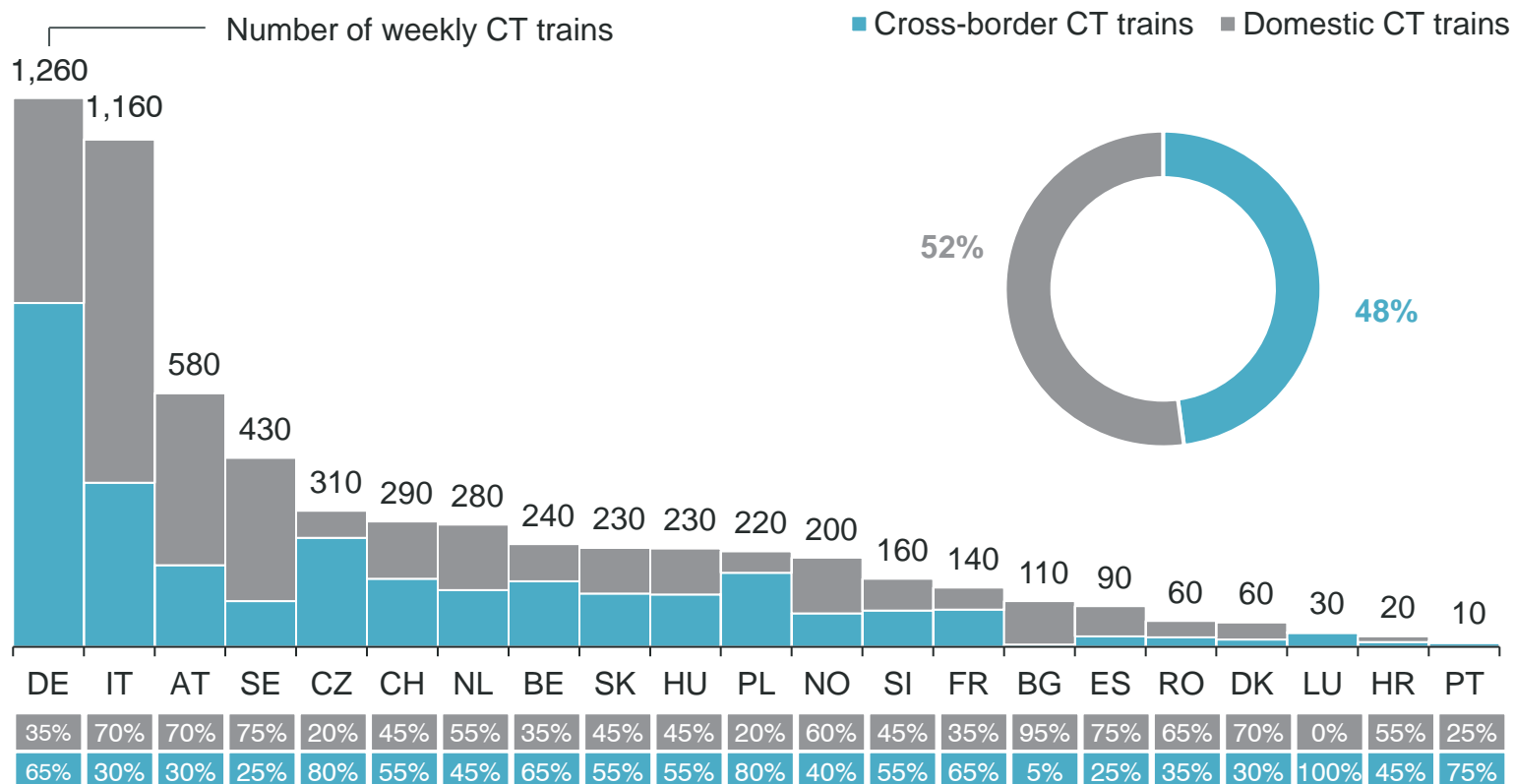
# 04

## Corridors and Trade Lanes



While domestic and cross-border train runs are very balanced at European level, there is considerable diversity between Member States.

**Split of domestic and cross-border CT trains at Member State level**  
 (% of all CT connections operating in Europe 12-18/9/2023<sup>1</sup>)



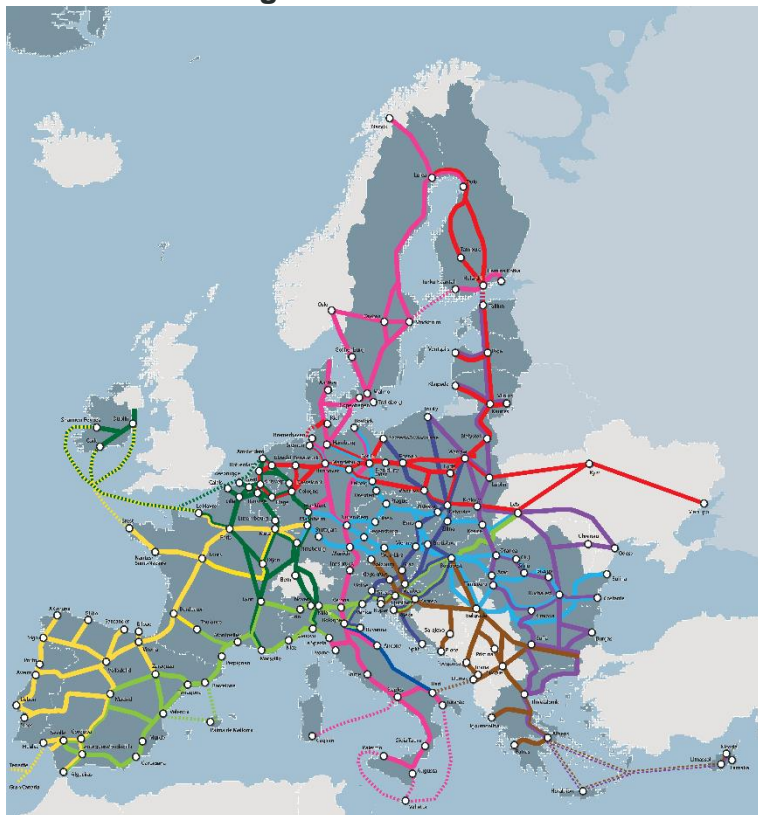
- In Europe, **just over half of all Combined Transport trains are domestic trains.** However, there are big variations between countries, from only cross-border runs in Luxembourg to 5% in Bulgaria.
- These differences reflect market structures:
  - The use of different train protection and energy systems and the resulting costs for locomotive homologation gives a financial incentive to use local traction suppliers in some **smaller CT markets** with fewer train runs, such as Denmark or Bulgaria, resulting in more domestic trains in these countries.
  - Due to topography, **Italy** and **Sweden** have extensive national feeder networks, leading to fewer cross-border connections.
  - **Smaller countries with few CT terminals** lack domestic networks, which leads to higher shares of cross-border connections.

Source: SCI Verkehr based on train information data provided by RNE








1) Due to methodological reasons, the data presented only represents a subsample of all CT connections in Europe in the sample week and may exclude existing connections. See also page 116.

# The TEN-T corridor network provides the backbone for cross-border Combined Transport in Europe

Map of the core TEN-T network as proposed for the revised TEN-T regulation



## Rail KPIs for the TEN-T network

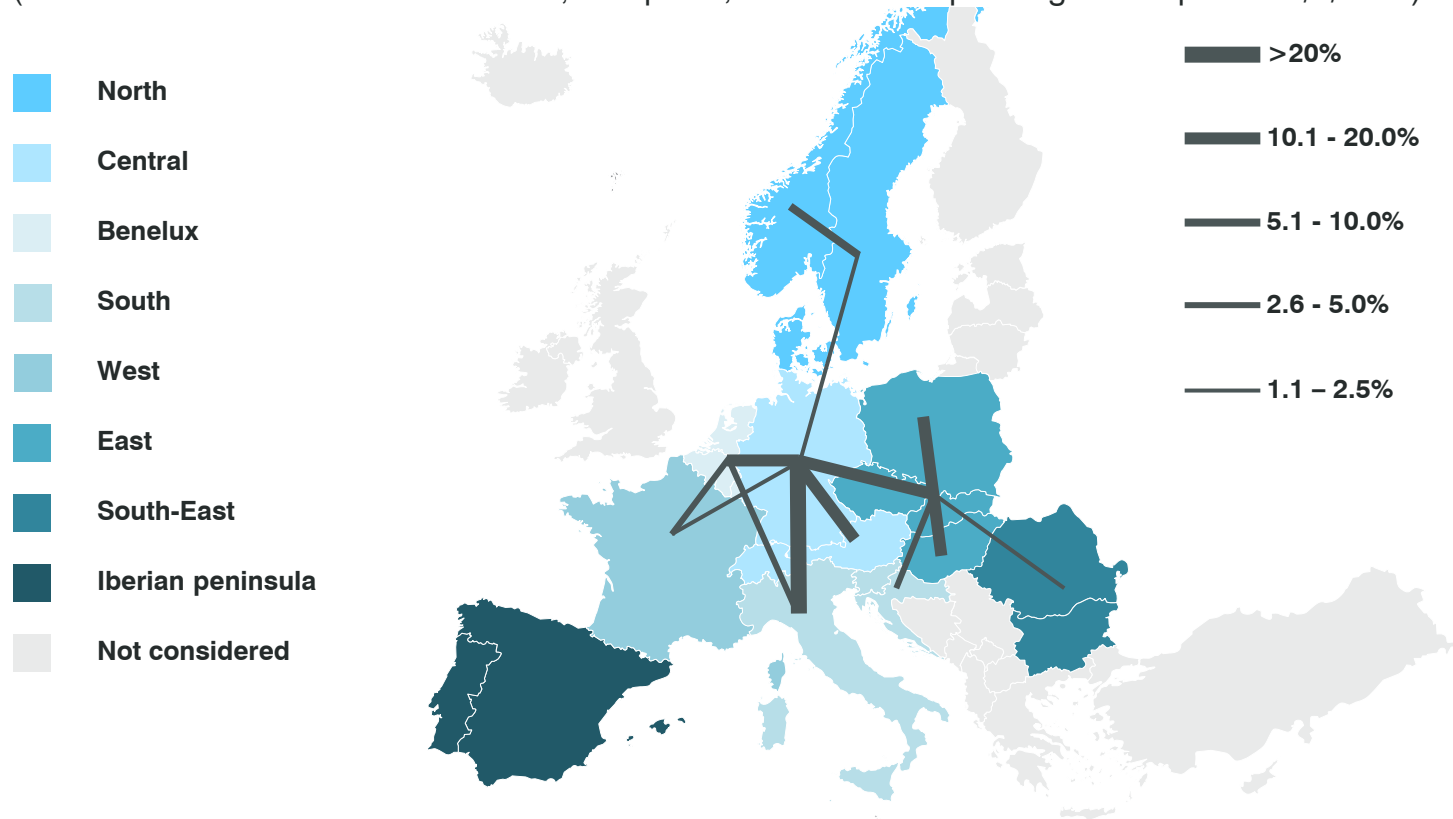
- ERTMS deployment 
-  Track gauge 1,435 mm
- Electrification 
-  Intermodal gauge P/C 400
- Line speed  $\geq 100$  km/h 
-  Axle load  $\geq 22.5$  t
- Train length  $\geq 740$  m 

- The TEN-T corridor network **standardises transport infrastructure** along main transport links in the EU and neighbouring countries. By 2030, all corridors must comply with set standards, including for rail infrastructure.
- Combined Transport will specifically profit from the **adaption of intermodal gauge P/C 400**, which allows for the transport of intermodal units with a height of 400 cm. However, other measures, including a line speed of at least 100 km/h, axle loads of 22.5 t and train lengths of 740 m, will support CT through more efficient train operations.
- The **European Rail Traffic Management System (ERTMS)** will be deployed across the entire TEN-T network. National systems will be phased out.
- By assuring the deployment of standard gauge, **cross-border CT with Spain or the Baltic countries** will be facilitated.

Source: Directorate-General for Mobility and Transport, European Commission

# One in four cross-border Combined Transport connections is transalpine, but corridors to and from Eastern Europe are gaining in importance

**Map of cross-border CT flows<sup>1</sup> in Europe by route between European regions in 2023**  
(% of number of international CT trains; Sample: 2,919 CT trains operating in Europe 12-18/9/2023)



- **All three top Combined Transport corridors in Europe connect the Central region** (AT, CH and DE): Central – South (22% of all CT trains), Central – East (16%) and Central – Benelux (13%). This shows the high importance of the German market for the European CT network.
- In total, **66% of all trains run within the Central region**. The region with the second highest share, East (CZ, HU, PL, SK), reaches 33%. South (HR, IT, SI) is in third spot with 29%.
- Until now, the **Iberian peninsula** has only had a small share of cross-border connections, due to the difference in gauge with the rest of continental Europe (Iberian broad gauge). However, Spain is currently upgrading its rail infrastructure along TEN-T corridors to standard gauge. Once implemented, this will facilitate interconnection between Spain and the rest of Europe.

Source: SCI Verkehr based on train information data provided by RNE

1) Share of other cross-border CT flows not depicted here: 5.2%. Due to methodological reasons, the data presented only represents a subsample of all CT connections in Europe in the sample week and may exclude existing connections. See also page 116.

## On average, over 55 Combined Transport trains run on transalpine connections between Italy and Germany each day

### Most important CT trade lanes (% of CT trains<sup>1</sup>)

Origin	Destination	Weekly trains	Share
Italy	Germany	203	7.0%
Germany	Italy	189	6.5%
Germany	Czech Rep.	118	4.0%
Czech Rep.	Germany	90	3.1%
Poland	Czech Rep.	85	2.9%
Germany	Switzerland	84	2.9%
Czech Rep.	Poland	84	2.9%
Netherlands	Germany	83	2.8%
Switzerland	Germany	82	2.8%
Germany	Netherlands	81	2.8%
Norway	Sweden	77	2.6%
Sweden	Norway	72	2.5%

Source: SCI Verkehr based on train information data provided by RNE

### Cross-border routes with most CT train pairs (Weekly CT trains<sup>1</sup>)

Train pairs <sup>2</sup>	Weekly trains
Narvik (NO) – Kiruna (SE)	47
Novara (IT) – Freiburg (DE)	31
Le Boulou (FR) – Bettembourg (LU)	14
Freilassing (DE) – Trieste (IT)	14
Kaldenkirchen (DE) – Domodossola (IT)	13
Prague (CZ) – Hamburg (DE)	12
Bohumin (CZ) – Chalupki (PL)	12
Dunajska Streda (SK) – Ceska Trebova (CZ)	10
Bremerhaven (DE) – Melnik (CZ)	9
Koper (SI) – Karlsdorf (AT)	8
Maribor (SI) – Wels (AT)	6
Trento (IT) – Wörgl (AT)	6

1) CT connections operating in Europe 12-18/9/2023. Due to methodological reasons, the data presented only represents a subsample of all CT connections in Europe in the sample week and may exclude existing connections. See also page 116.

2) Connections with a counterpart in the other direction.

- Bidirectional transalpine **Combined Transport between Germany and Italy is by far the most important cross-border trade lane in Europe.** Trains in both directions account for 13.5% of all European CT trains in an average week.
- In general, trade lanes are very balanced, with a similar number of trains going in both directions. **The biggest imbalance can be found between Germany and the Czech Republic**, with 28 more trains going to the Czech Republic than vice versa. This shows the importance of German ports for Czech import flows.
- While many CT trains run uninterrupted between terminals, there are also cross-border routes that show **breaks in train runs due to the switch of traction** at suitable stations near borders between countries or Infrastructure Managers, e.g. in Kiruna, Freilassing or Chalupki.

## The Rhine is the most important trading lane for cross-border inland waterway Combined Transport

Import and export volume of IWW CT by country in 2023 (1,000 TEU)

		Importing country					
		BE	CH	DE	FR	NL	Other
Exporting country	BE		23	220	32	256	5
	CH	41		2	0	21	0
	DE	327	4		7	379	1
	FR	60	0	2		13	0
	NL	383	37	456	46		0
	Other	5	0	1	0	0	23

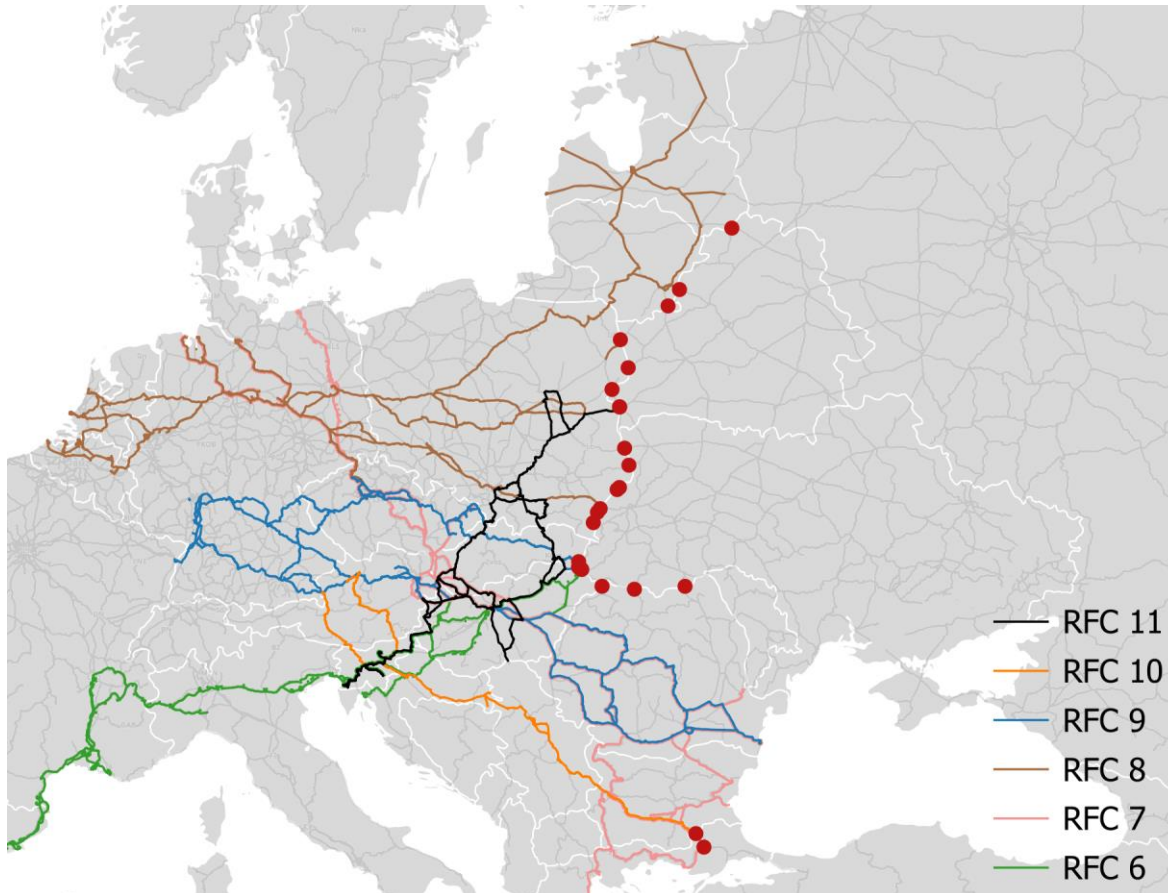
Import and export performance of IWW CT by country in 2023 (million TEU-km)

		Importing country					
		BE	CH	DE	FR	NL	Other
Exporting country	BE		22	115	15	30	7
	CH	39		1	0	16	0
	DE	174	1		3	133	0
	FR	28	0	0		10	0
	NL	49	33	147	17		0
	Other	7	0	0	0	0	6

- Cross-border Combined Transport by IWW is **concentrated across Belgium, France, Germany, the Netherlands and Switzerland**. The five countries are connected by canals and the Rhine river system and use IWW for hinterland transport with North Range ports.
- Cross-border Combined Transport by IWW outside these five countries accounts for **less than 1.5% of volume and less than 2.5% of performance**. The most important flow outside the Rhine region is currently between Romania and Ukraine.
- While the highest volume for IWW Combined Transport is reported between the Netherlands and Germany, the highest performance is reported between Germany and Belgium. This reflects the **relatively long average distance of over 500 km for IWW between the port of Antwerp and the German hinterland**.



## Rail freight links with non-EU states to the East are expanding Combined Transport beyond Europe but are challenged by the war in Ukraine

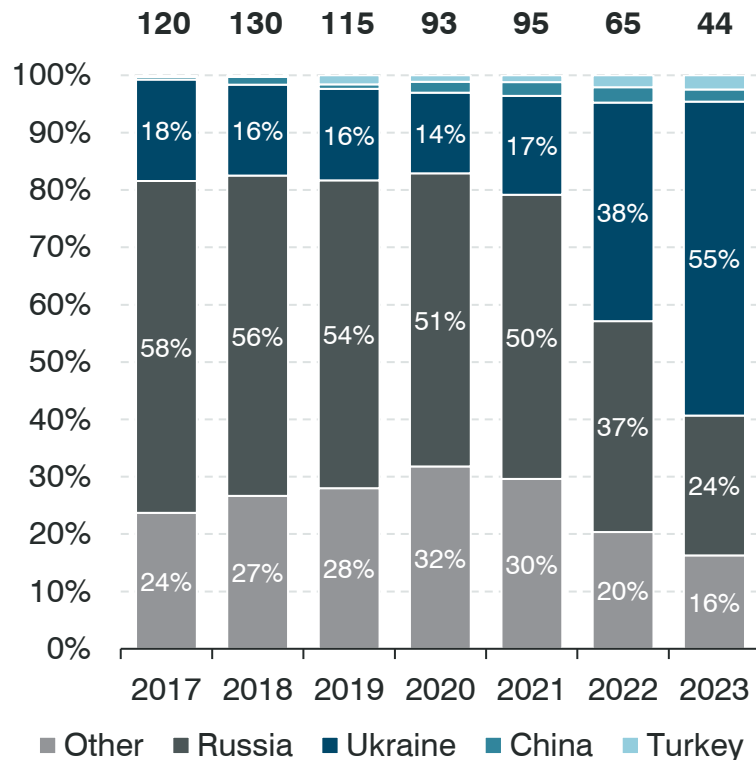


Source: SCI Verkehr based on infrastructure data provided by RNE

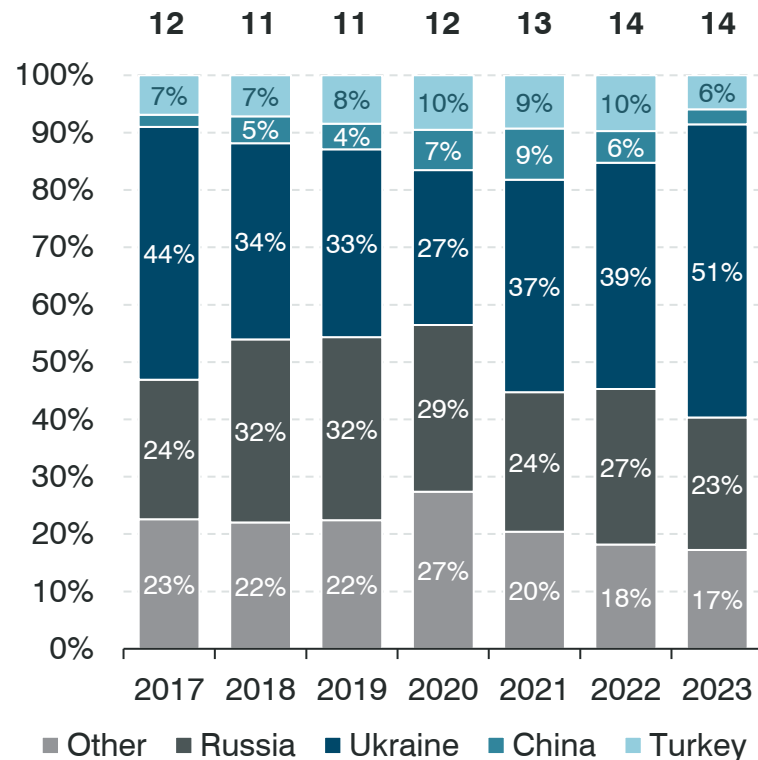
- Transcontinental rail freight transport is possible with Asia via direct rail links. Currently, **the New Silk Road via Central Asia is the most important transcontinental connection**. Connections to the Middle East and India via Turkey are currently not viable, but in consideration.
- **The war in Ukraine has had a negative impact on transcontinental rail freight**. Several trade links between Russia and the Baltics and Finland were lost and transport along the Northern Corridor of the New Silk Road via Russia declined. At the same time, the Middle Corridor, which provides access to Europe via Turkey, gained in relative importance.
- **Belarus is the main transit land for connections with Russia and China**. Rail freight to and from Belarus was therefore impacted by the war-imposed decline on the Northern Corridor. The most important border crossings are in Brest (with Poland) and Loshva (with Lithuania).
- **Regarding trade with Ukraine, CT gained in importance when it comes to absolute numbers** (especially on the broad-gauge connection to Slawkow in Poland), but grain transport is of even bigger importance. In the future, integration with the European standard-gauge network is planned. Ukraine has important rail border crossings with Poland, Slovakia, Hungary and Romania.
- Despite direct access through the Middle Corridor, **rail freight transport to and from Turkey** is still mostly related to trade with Europe via the rail border crossing with Bulgaria. Maritime CT is the most important segment by far.

## Rail transport to China reached almost 10% of all EU rail exports in 2021, but declined after the Russian invasion in Ukraine

Intercontinental EU rail freight import by country of origin (million tonnes)



Intercontinental EU rail freight export by country of destination (million tonnes)



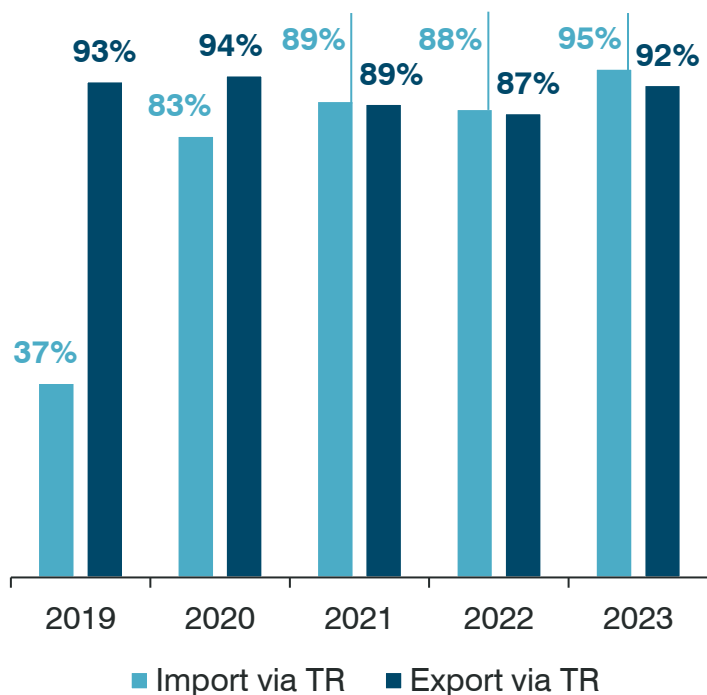
- Despite the growth of rail freight trade relations, imports from China only represent a small share of overall **rail freight imports** from outside the EU so far. The maximum share was 3% in 2021, when over 400,000 TEU were transported by rail between China and Europe. Since then, the share has decreased to 2%, despite an **overall reduction of -63% of transport volumes**, mostly in trade with Russia.
- **Rail freight exports** represented 10% of import volumes in 2019 but **the share has grown since then by +19%**, mostly thanks to trade with Ukraine. Rail freight exports to China reached their peak in 2021, when over 200,000 TEU were transported, achieving a market share of 9%. Since then, transport volume has decreased due to a mix of sanctions against Russian entities, lower maritime shipping prices and reduced demand in China.
- Since the beginning of the war in Ukraine, **grain is increasingly transported by maritime container** out of Ukraine thanks to the eased transshipment from broad to standard gauge.

Source: Eurostat rail\_go\_intgong as of 5/9/2024; Eurostat rail\_go\_intcmgn as of 5/9/2024; Eurasian Rail Alliance Index Statistics as of 20/9/2024

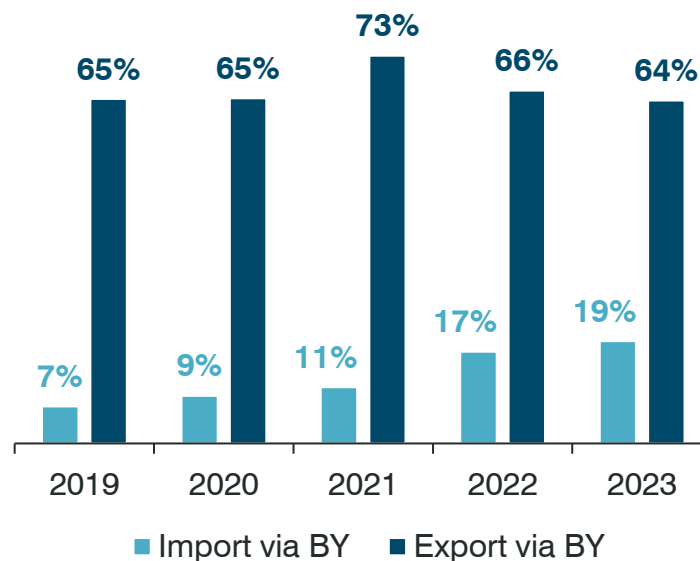


## Up to 95% of import and export flows into the European Union are containerised

Share of maritime CT for rail freight transport via Turkey (% of total volume in tonnes<sup>1</sup>)



Share of maritime CT for rail freight transport via Belarus (% of total volume in tonnes)



- Both rail freight imports and exports via **Turkey** have a high share of maritime Combined Transport. On average, **around 90% of flows in recent years were CT**. Since the beginning of the war in Ukraine and the reopening of the Kars – Tblissi – Baku railway in May 2024, Turkey is increasingly gaining importance as a transit country for the Middle Corridor to China via the Caspian Sea.
- In **Belarus**, maritime CT commands a share of around two thirds of exports. For imports, the share is rising but still remains below 20%, even despite the increased trade with China, which relies exclusively on maritime CT. Despite the sanctions against Russian entities, **bulk transport of mineral oil products and natural gas from Russia remains more important**.

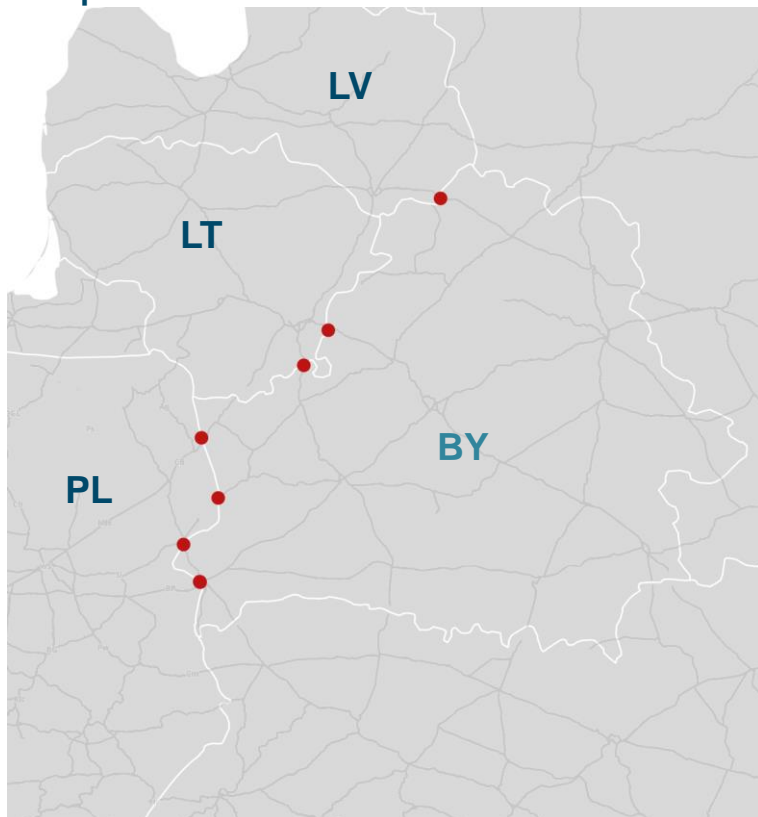
Source: Eurostat rail\_go\_intgong as of 5/9/2024; Eurostat rail\_go\_intcmgn as of 5/9/2024; Eurostat rail\_go\_contwgt as of 5/9/2024; Eurasian Rail Alliance Index Statistics as of 20/9/2024

1) Import in 2019: Misreporting of flows with Sweden likely

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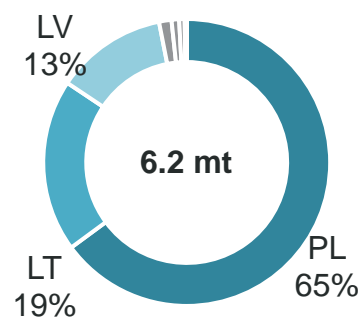
Combined Transport is more important for exports via Belarus, as imports are still dominated by mineral oil products and natural gas from Russia

Rail border crossings between Belarus and the European Union

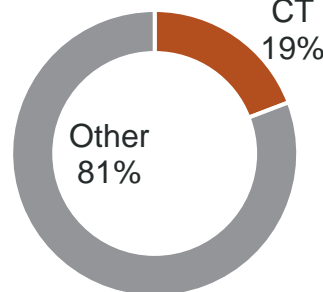


Rail freight imports via Belarus (2023)

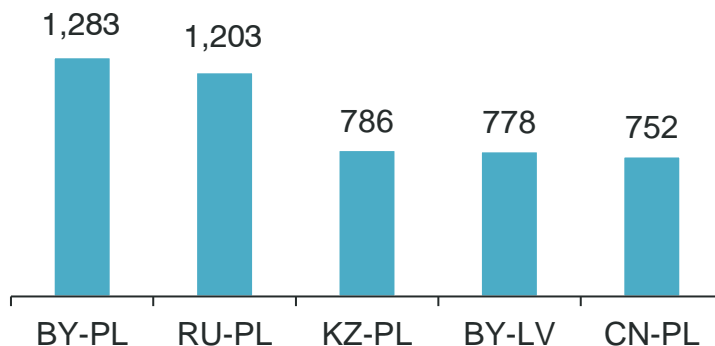
Destination within EU



Share of Combined Transport

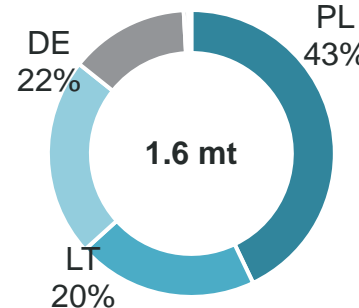


Top connections (1,000 t)

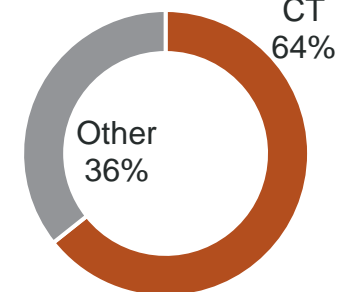


Rail freight exports via Belarus (2023)

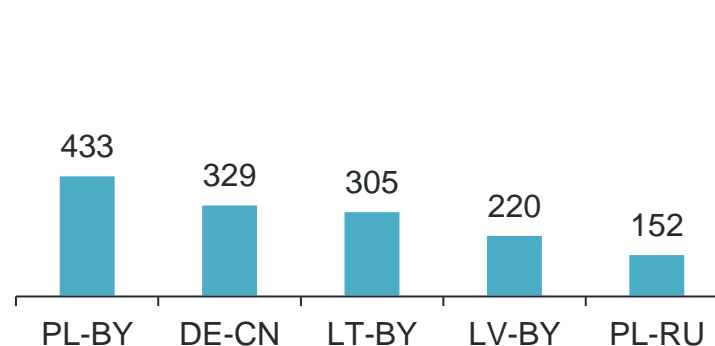
Destination within EU



Share of Combined Transport



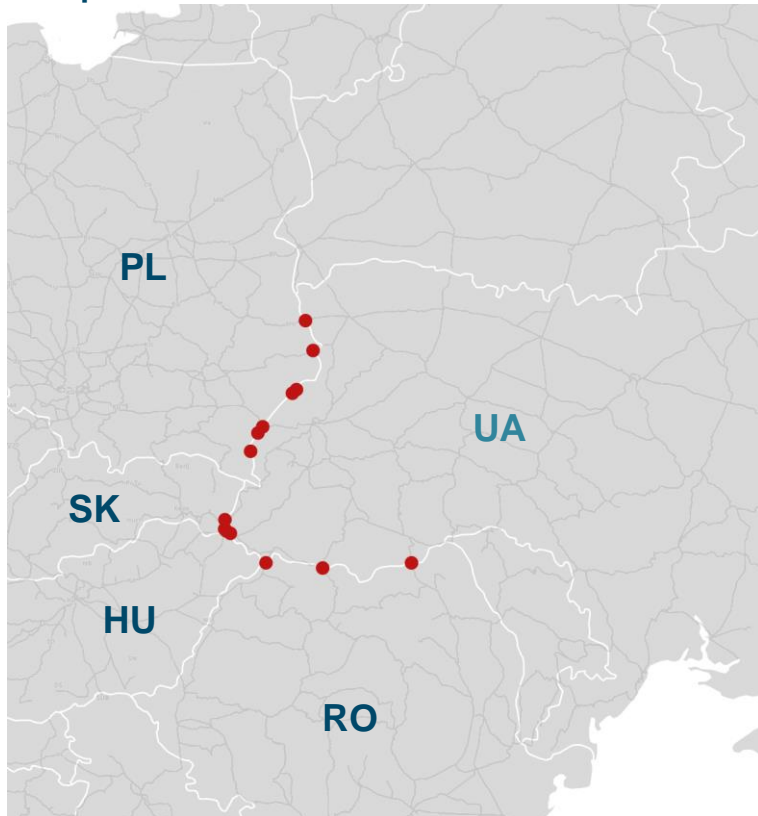
Top connections (1,000 t)



Sources: SCI Verkehr based on infrastructure data provided by RNE; Eurostat rail\_go\_intgong as of 5/9/2024; Eurostat rail\_go\_intcmgn as of 5/9/2024; Eurasian Rail Alliance Index Statistics as of 20/9/2024

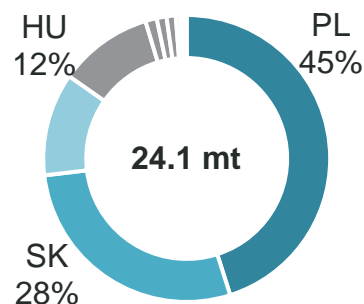
# Import volume by rail from Ukraine is three times its export volume due to flows of grain, ores and coal to the European Union

Rail border crossings between **Ukraine** and the **European Union**

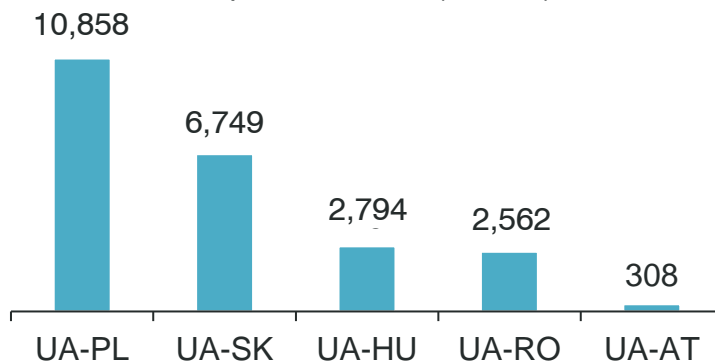


Rail freight imports from Ukraine (2023)

Destination within EU

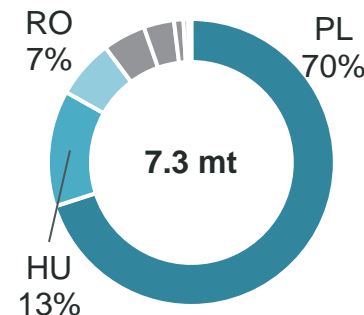


Top connections (1,000 t)

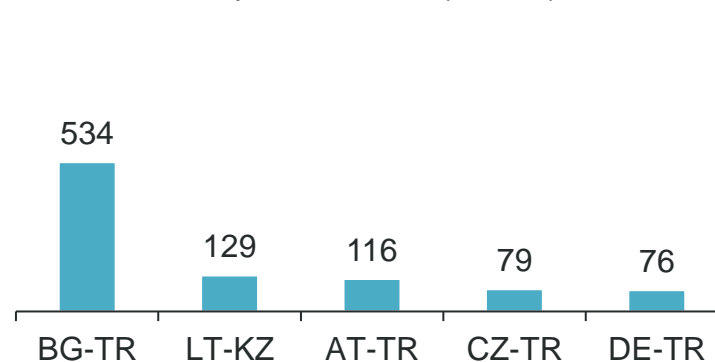


Rail freight exports to Ukraine (2023)

Destination within EU



Top connections (1,000 t)



Sources: SCI Verkehr based on infrastructure data provided by RNE; Eurostat rail\_go\_intgong as of 5/9/2024; Eurostat rail\_go\_intcmgn as of 5/9/2024

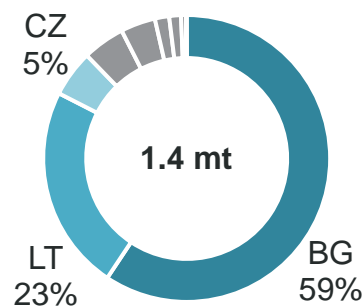
Combined Transport is important for rail freight transport to and from Turkey due to over 90% market share in cross-border connections

Rail border crossings between Turkey and the European Union

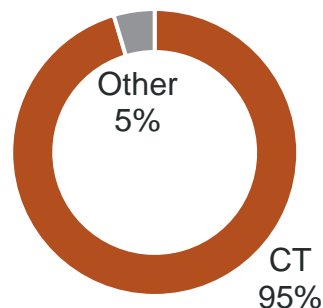


Rail freight imports via Turkey (2023)

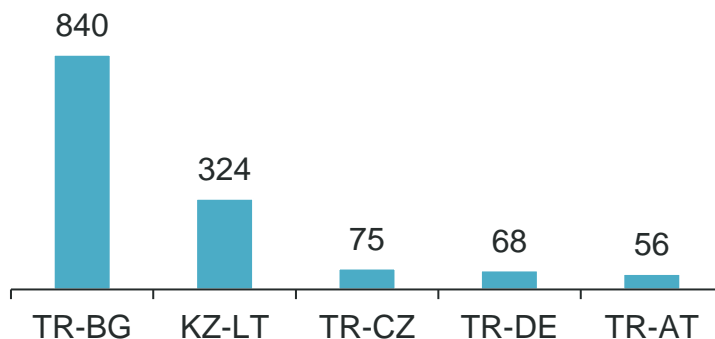
Destination within EU



Share of Combined Transport

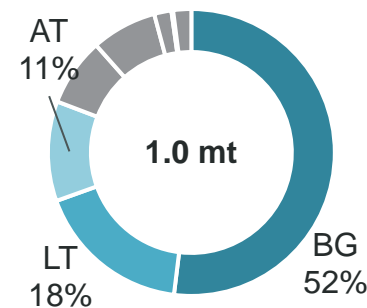


Top connections (1,000 t)

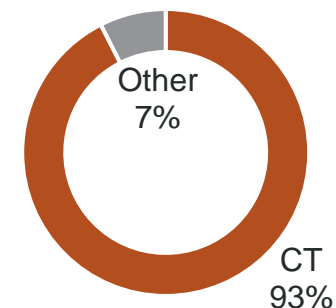


Rail freight exports via Turkey (2023)

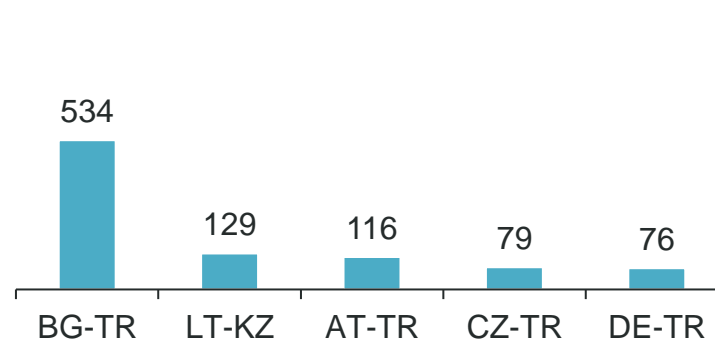
Destination within EU



Share of Combined Transport



Top connections (1,000 t)



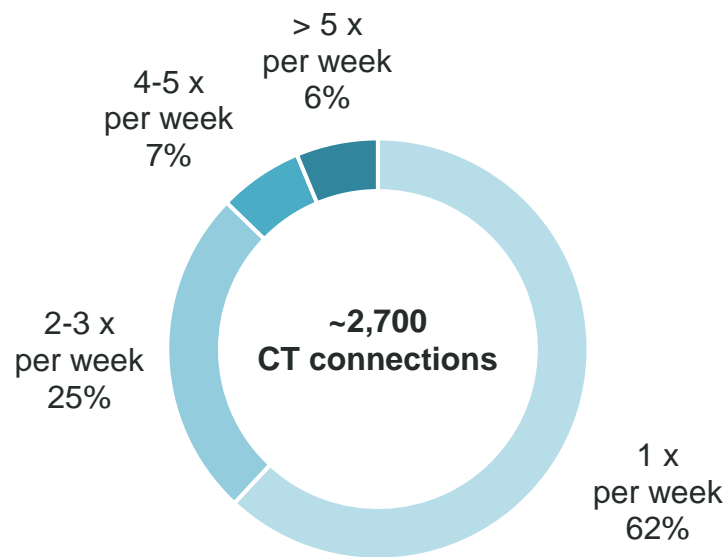
Sources: SCI Verkehr based on infrastructure data provided by RNE; Eurostat rail\_go\_intgong as of 5/9/2024; Eurostat rail\_go\_intcmgn as of 5/9/2024; Eurostat rail\_go\_contwgt as of 5/9/2024

# 05

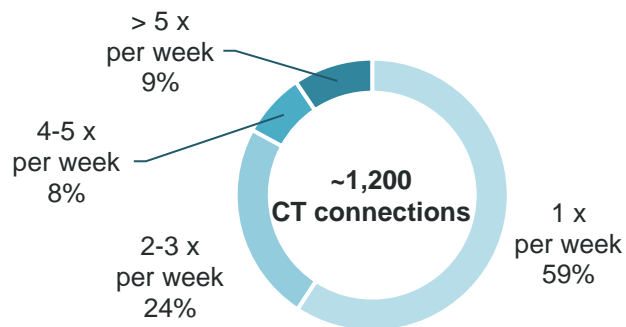
## Operational Parameters

According to the RNE sample data, one in eight Combined Transport connections in Europe offers services on each weekday

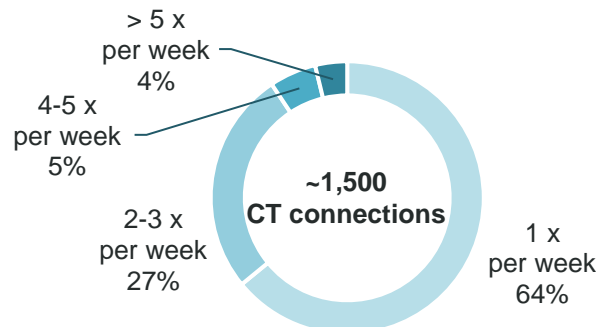
**Distribution of total CT connections by services per week (% of CT trains<sup>1</sup>)**



**Distribution of domestic CT connections by services per week (% of CT trains<sup>1</sup>)**



**Distribution of cross-border CT connections by services per week (% of CT trains<sup>1</sup>)**



- While most Combined Transport connections are served once a week, **13% of all connections offer at least four departures per week**. A further 25% offer 2-3 departures per week.
- **Over 100 domestic CT connections are served daily all over Europe**. This shows the high attractiveness of overnight connections between industrial and commercial areas on a national level for distribution networks.
- Cross-border CT connections operate with a lower frequency than domestic CT connections. Still, **over 500 cross-border connections offer more than one departure per week**.
- The high share of connections served once per week is a sign that **Combined Transport is commercially attractive even in cases of small demand** as long as regular flows can be expected.

Source: SCI Verkehr based on train information data provided by RNE 1) CT connections operating in Europe 12-18/9/2023. Due to methodological reasons, the data presented only represents a subsample of all CT connections in Europe in the sample week and may exclude existing connections. See also page 116.

## The analysed RNE sample data shows that cross-border Combined Transport trains are fast, especially in Scandinavia

### Average distances, transit times, speeds and transit delays by corridor

(Sample: CT connections operating in Europe 12-18/9/2023<sup>1</sup>)

Corridor	Trains	Av. distance (km)	Av. transit time	Av. speed (km/h)
Central – South	650	525	11h:00min	48
Central – East	470	530	12h:45min	42
Central – Benelux	380	545	6h:40min	46
Eastern	335	170	6h:40min	26
Central	305	595	11h:10min	53
Northern	170	230	2h:45min	80
South – East	125	660	21h:15min	31
Benelux – West	100	410	11h:05min	37
Benelux – South	80	1,080	26h:25min	41
Central – North	65	815	9h:45min	84
Central – West	50	490	11h:45min	42
East – South-East	40	345	24h:45min	14

- The **average transit time** varies between corridors. While trains on the Northern corridor reach their destination on average within 3 hours, Benelux – South and East – South-East connections need on average more than a day.
- The highest **average speeds** are reached on the Northern and Central – North corridors with over 80 km/h each, as the network in Scandinavia has less nodal points like stations than in other regions, reducing waiting times in crowded waypoints. The lowest average speeds can be found on the Eastern and East – South-East corridors due to long idling times.

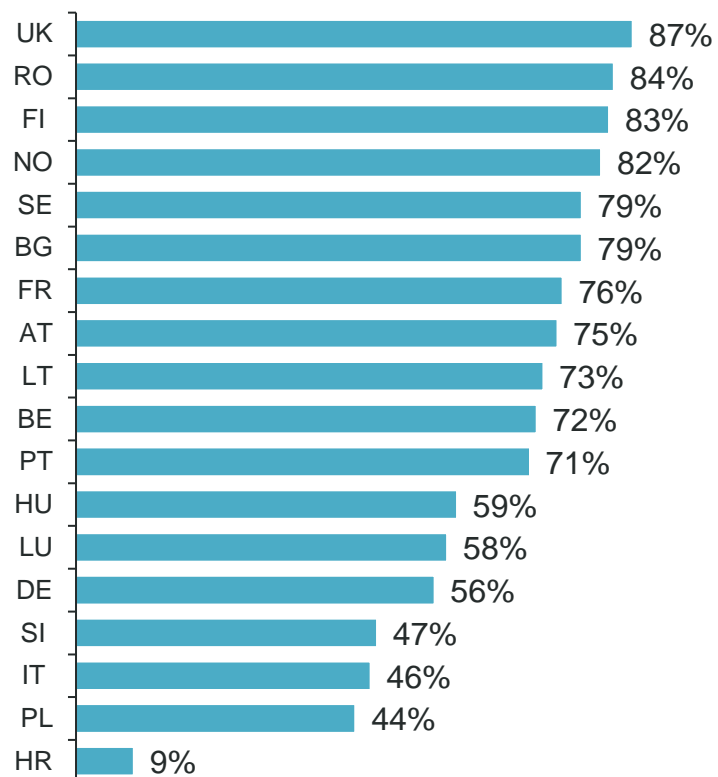
Source: SCI Verkehr based on train information data provided by RNE 1) Due to methodological reasons, the data presented only represents a subsample of all CT connections in Europe in the sample week and may exclude existing connections.



According to an RNE data sample, 80% of Combined Transport trains reach their destination within 15 minutes of the scheduled time of arrival, with a significant number of trains being severely delayed

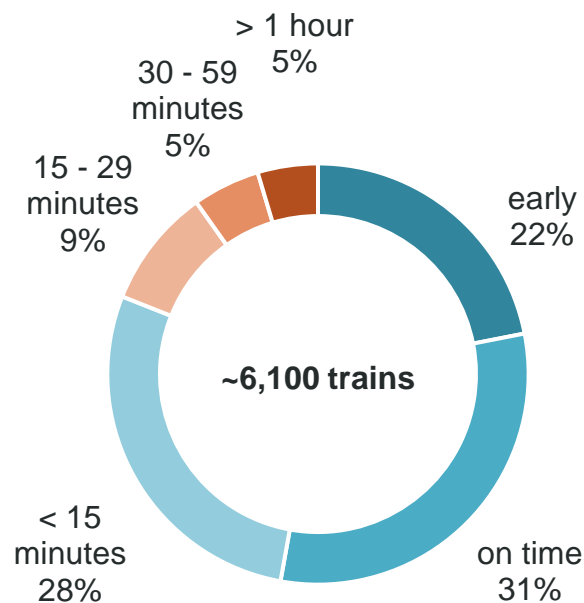
### Punctuality of freight trains by country in 2022

(trains with < 15 min delay as % of all trains)



### Delayed CT trains by time group

(% of CT trains<sup>1</sup>)



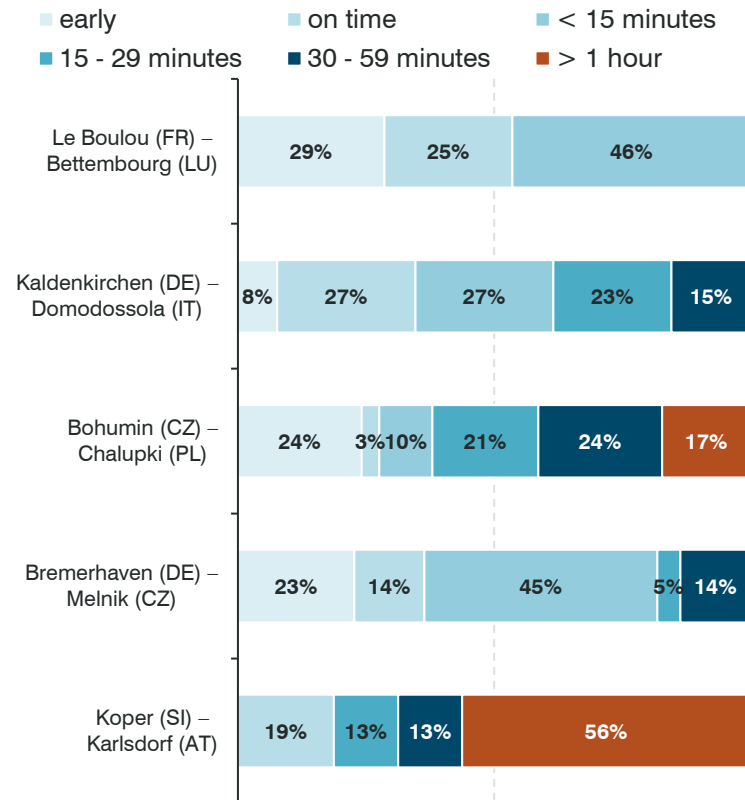
- The **data accuracy is to be further analysed** to ensure a picture for the whole CT market.
- In 2022, the United Kingdom had the highest punctuality in Europe with 87% of all freight trains reaching their destination within 15 minutes of the scheduled time of arrival. In general, less crowded networks tend to have higher punctuality rates due to more generous buffer times. **Differences in time-table discipline also influence punctuality:** While Germany, with a punctuality rate below 60%, is very lenient regarding delays on the point of origin (the train path is reserved for up to 20 hours), France and the United Kingdom have tighter regimes regarding departures.
- The On-Time Delivery Rate for CT trains is supposedly higher: 81% of all CT trains in the RNE sample data of a single week in September 2023 reach their destination within 15 minutes of the scheduled time of arrival. However, because of the high number of CT trains in Europe, in this sample alone **over 300 trains were delayed by more than an hour.**

Sources: SCI Verkehr based on IRG-rail 12th Annual Market Monitoring Report 2024 and train information data provided by RNE

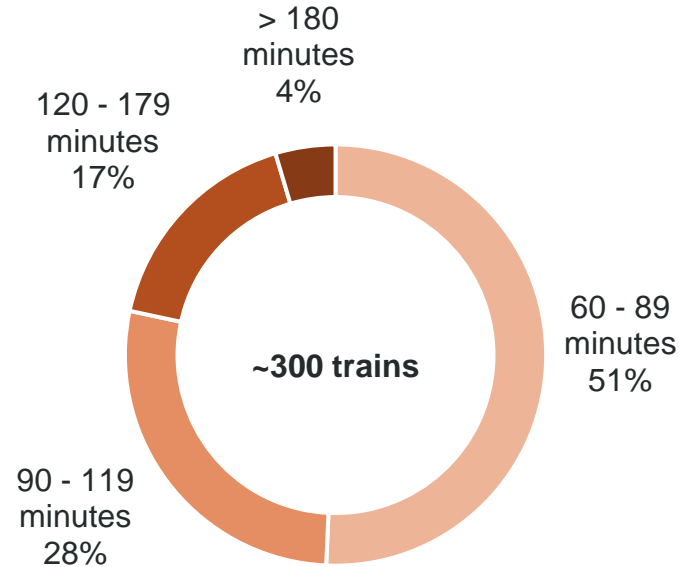
1) CT connections operating in Europe 12-18/9/2023. Due to methodological reasons, the data presented only represents a subsample of all CT connections in Europe in the sample week and may exclude existing connections. See also page 116.

The RNE data demonstrates that the high variance of delays on single connections, paired with occasional massive delays, has a negative impact on the reliability of CT connections for clients

**Delay of selected cross-border CT train pairs by time group (% of CT trains<sup>1</sup>)**



**Very delayed CT trains by time group (% of CT trains<sup>1</sup>)**



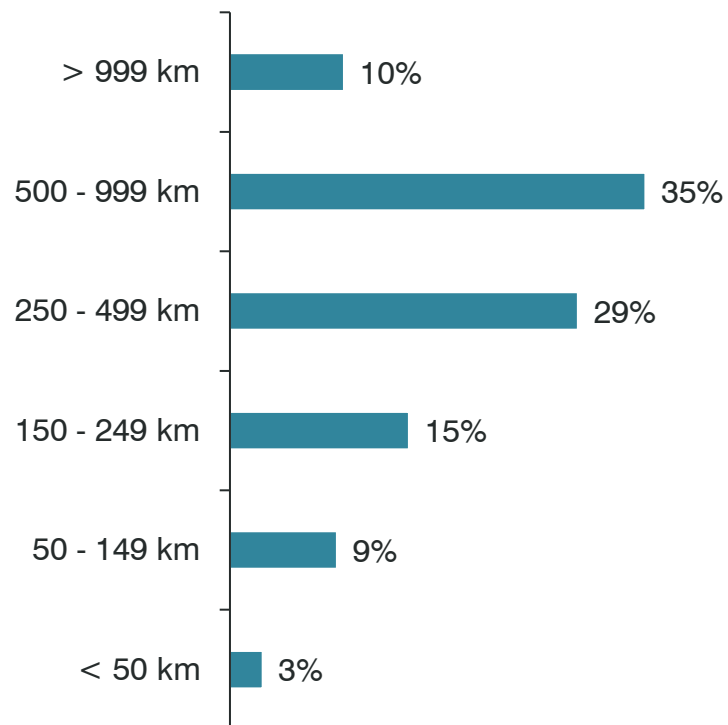
- **Delays can have a high variance on a single Combined Transport (CT) connection.** Within the sample week in September 2023, a quarter of all trains between Bohumin and Chalupki were early, while 17% had a delay of over an hour. Between Koper and Karlsdorf, not a single train was on time, with over 50% delayed by more than 60 minutes. At the same time, all trains between Le Bolou and Bettembourg reached their destination within 15 minutes of the planned time during the sample week.
- Time-table data also shows a long tail of severely delayed trains. In the sample week alone, which was chosen to exclude most interfering outside factors and therefore represents a mostly stable operational environment, two trains per day were delayed by more than three hours on average. Although these outliers are only a small percentage of the overall CT volume, each one of these **affects the reliability of CT connections negatively** for clients.

Sources: SCI Verkehr based on train information data provided by RNE 1) CT connections operating in Europe 12-18/9/2023. Due to methodological reasons, the data presented only represents a subsample of all CT connections in Europe in the sample week and may exclude existing connections. See also page 116.

## Open railway markets allow for uninterrupted train runs on cross-border Combined Transport operations, but missing harmonisation still leads to unnecessary interruptions

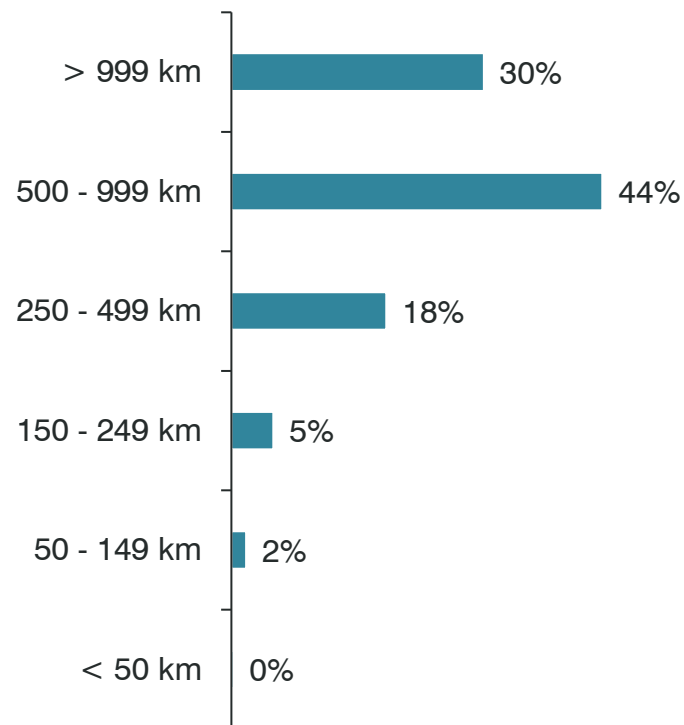
### Share of weekly domestic CT performance by distance group

(% of tkm<sup>1</sup>; 0.7 billion tkm)



### Share of weekly cross-border CT performance by distance group

(% of tkm<sup>1</sup>; 1.6 billion tkm)

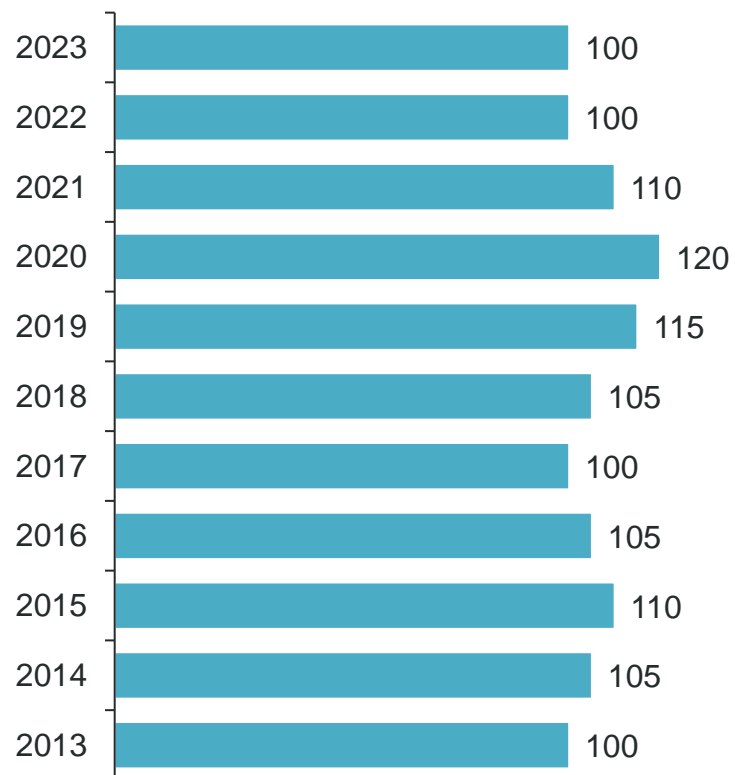


- **Almost half of all domestic Combined Transport (CT) performance is realised on planned distances above 500 km.** About 12% of CT performance is notionally realized on distances below 150 km. However, this might be due to the operational effects of switching traction suppliers at border crossings independently of a whole transport chain defined as Combined Transport under Council directive 92/106/EEC, resulting in notionally domestic connections over short distances.
- **Almost a third of cross-border CT performance is realized on planned distances over 1,000 km,** reflecting the longer distances on cross-border connections.
- **The harmonisation of train protection and energy systems within the EU** would effectively reduce homologation costs for locomotives and allow for even more and longer cross-border runs with the same asset, reducing the number of operational stops for the change of traction.

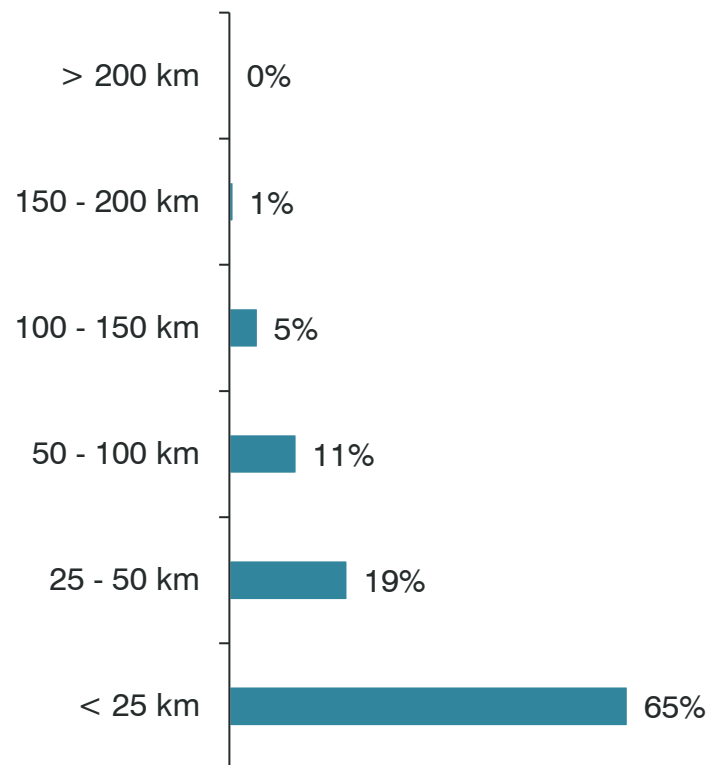
Source: SCI Verkehr based on train information data provided by RNE 1) CT connections operating in Europe 12-18/9/2023. Due to methodological reasons, the data presented only represents a subsample of all CT connections in Europe in the sample week and may exclude existing connections. See also page 116.

## Almost two thirds of road legs in Switzerland are shorter than 25 kilometres

Average road distances for road-rail Combined Transport in Germany (km)



Road distances for container transport within Switzerland (% of transport volume; 2022)



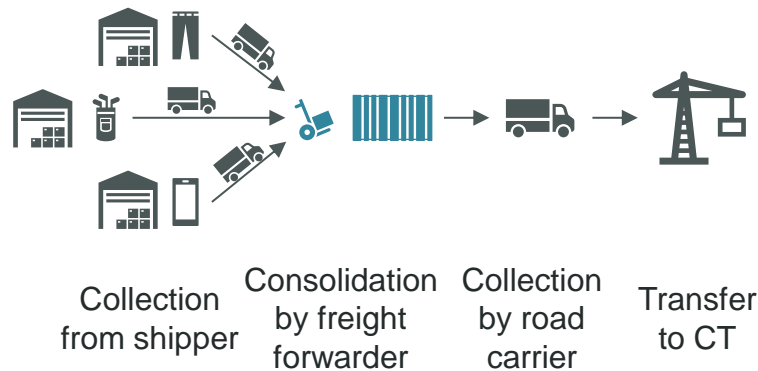
- **Road distances in Combined Transport chains depend largely on national circumstances.** While in Switzerland almost two thirds of all container transports by road have a distance of less than 25 km, the average distance of road legs for road-rail CT in Germany is between 100 and 120 km, depending on the year.
- However, the two examples demonstrate the **importance of a dense terminal network with connections that are suitable for regional logistics demands.** Despite the relatively high number of CT terminals in Germany, road carriers on average have to drive for over an hour to reach a suitable terminal with appropriate connections for clients.

Sources: SCI Verkehr based on Federal Statistical Office Switzerland "Transportgut nach Frachtart und Distanzklasse - 2022" and Federal Motor Transport Authority Germany VD 1, Übersicht 11

## Despite higher complexity, Less than Truck Load logistics provide a significant share of revenue for Combined Transport logistics

### Differences in organisation between LTL and FTL

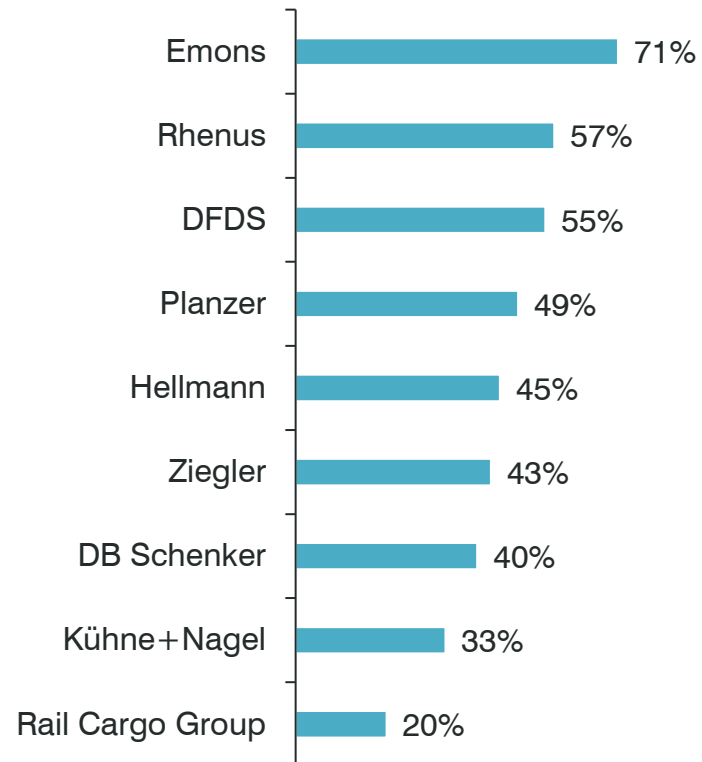
#### Less than Truck Load (LTL)



#### Full Truck Load (FTL)



### LTL share for selected freight forwarders and rail carriers (% of all FTL/LTL revenue; 2020)



- By its nature, Combined Transport is an FTL business, as **whole loading units are transported**. However, the loading unit itself can either be organised as a FTL shipment or contain several LTL shipments.
- **LTL logistics are far more complex than FTL logistics**, as shipments from various shippers in the region of origin have to be consolidated by the organising freight forwarder before transport to the destination region. Once there, the shipment has to be deconsolidated and distributed by road to various recipients.
- Because of this added complexity, some freight forwarders active in CT operations, such as LKW Walter, specialise in FTL logistics. However, **many freight forwarders and carriers active in CT offer LTL solutions**, with some companies reaching shares of over 50% of revenue in this segment.

## Transshipment systems for non-craneable semi-trailer facilitate access to Combined Transport (1/2)

### Nikrasa



Nikrasa technology utilises standard pocket wagons with an additional module that allows for the vertical handling of semi-trailers. Currently, TX Logistik operates and maintains about 100 units.



Nikrasa features a vertical handling technology attached to a horizontally accessible platform for semi-trailers with a loading and unloading time of just 3 minutes per unit.



Nikrasa can be implemented at standard terminals with minimal modification, as it does not require special adaptations to terminals, trailers or wagons.



Nikrasa is operational on several routes managed by TX Logistik.

### R2L



The R2L solution features a fully galvanised platform that allows non-craneable semi-trailers to be lifted vertically into and out of double-pocket wagons.



The R2L Connector enables the direct loading of non-craneable semi-trailers onto rail wagons by cranes or reach stackers. The loading operation is completed in just a few minutes, supported by laser measurement technology for precision.



R2L technology requires no specialised terminals to handle the R2L Connector system. It eliminates the need for ramps and other loading infrastructure.



R2L's system has been successfully tested on the Vienna–Kyiv route, with a test train transporting non-craneable semi-trailers with construction materials from Kyiv to BILK terminal in Hungary.

### Tatravagonka



The Sdggmrss wagon with its integrated basket system is built to transport non-craneable semi-trailers, ISO containers and swap bodies. It supports up to 40 tonnes per trailer.



Loading of non-craneable semi-trailer is done vertically with the help of the integrated basket. The Sdggmrss further simplifies the loading and unloading process for non-craneable semi-trailers by using a kingpin locking system, eliminating the need for wheel chocks.



Transshipment requires regular terminals equipped with cranes or reach stackers. Consequently, the technology can be implemented at standard terminals with minimal modification.



MFD Rail is set to launch Tatravagónka's Sdggmrss wagon across European routes at the turn of the year 2024/2025.

## Transshipment systems for non-craneable semi-trailer facilitate access to Combined Transport (2/2)

### Modalohr



Modalohr uses Lohr UIC 1-3 wagons for transporting non-craneable semi-trailers, with a low loading height that accommodates trailers up to four metres tall.



Modalohr allows for efficient loading and unloading of a full train of 32 semi-trailers in approximately 256 minutes, or about 4 minutes per trailer.



Modalohr requires specialised terminals with hydraulic floor systems.



Modalohr operates mainly in France, but is also used for cross-border connections between France and Italy, France and Luxembourg, and Luxembourg and Poland.

### Helrom



Helrom's Megaswing wagon allows for the transport of semi-trailers without cranes. It features a swivelling pocket for loading and unloading.



Helrom's technology allows for loading by swivelling the trailer pocket to the side, eliminating the need for cranes and reducing handling complexity.



Helrom integrates into existing rail infrastructure. It operates without requiring specialised facilities, needing only accessible track sides and a 15-metre-wide tarmac strip along the track.



Helrom currently operates trains between Germany, Austria and Hungary, partly as dedicated company trains.

### CargoBeamer



CargoBeamer technology employs specialised Sdkmss pocket wagons to transport non-craneable semi-trailers. The system relies on unique wagons and terminals to facilitate efficient Combined Transport.



CargoBeamer's Baskets enable the horizontal loading and unloading of semi-trailers using horizontal transshipment in automated terminals and vertical transshipment in conventional terminals. In Calais, an automated terminal is operative.



CargoBeamer requires specialised terminals for full automation of loading and unloading processes. While the system is compatible with existing terminals, it is less competitive compared to fully automated setups.



CargoBeamer operates on routes between and within Germany, Italy and France. The system is approved for use in Germany, Switzerland, Italy and France.



## Over 250 Combined Transport connections per week offer horizontal transshipment all over Europe

### Availability of horizontal transshipment and RoLa services on cross-border connections

(number and % of CT trains<sup>1</sup>)

Corridor	Weekly trains	Connections with horizontal trans.
Central – South	645	<b>105 (16%)</b>
Benelux – West	100	<b>30 (30%)</b>
Benelux – South	80	<b>10 (11%)</b>
Central	305	<b>10 (4%)</b>
Central – Benelux	380	<b>5 (2%)</b>
Central – East	470	<b>5 (1%)</b>
Eastern	335	<b>0 (0%)</b>
Northern	170	<b>0 (0%)</b>
South – East	125	<b>0 (0%)</b>
Other	305	<b>20 (7%)</b>
<b>Total</b>	<b>2,915</b>	<b>185 (6%)</b>

### Availability of horizontal transshipment and RoLa services on domestic connections

(number and % of CT trains<sup>1</sup>)

Country	Weekly trains	Connections with horizontal trans.
Austria	395	<b>65 (16%)</b>
France	160	<b>20 (13%)</b>
Italy	785	<b>5 (1%)</b>
Other	1,945	<b>0 (0%)</b>
<b>Total</b>	<b>3,285</b>	<b>90 (3%)</b>

- There are **more cross-border connections** that offer horizontal transshipment or RoLa services than domestic connections, both in absolute terms as well as relative to the total number of connections.
- On the **Central – South corridor**, over 100 connections per week offer horizontal transshipment technologies, most of them between Germany and Italy. However, the highest share is reached on the **Benelux – West corridor** with 30%, mostly connecting Luxembourg and France.
- **Austria** has the highest number of domestic connections with 16% due to the RoLa to the Brenner Pass. **France** also has a 13% availability share on domestic routes due to the network of Modalohr terminals.
- Several connections were offered in the past along the **West – South corridor**. However, due to the closure of the Fréjus Rail Tunnel, these connections are currently halted.

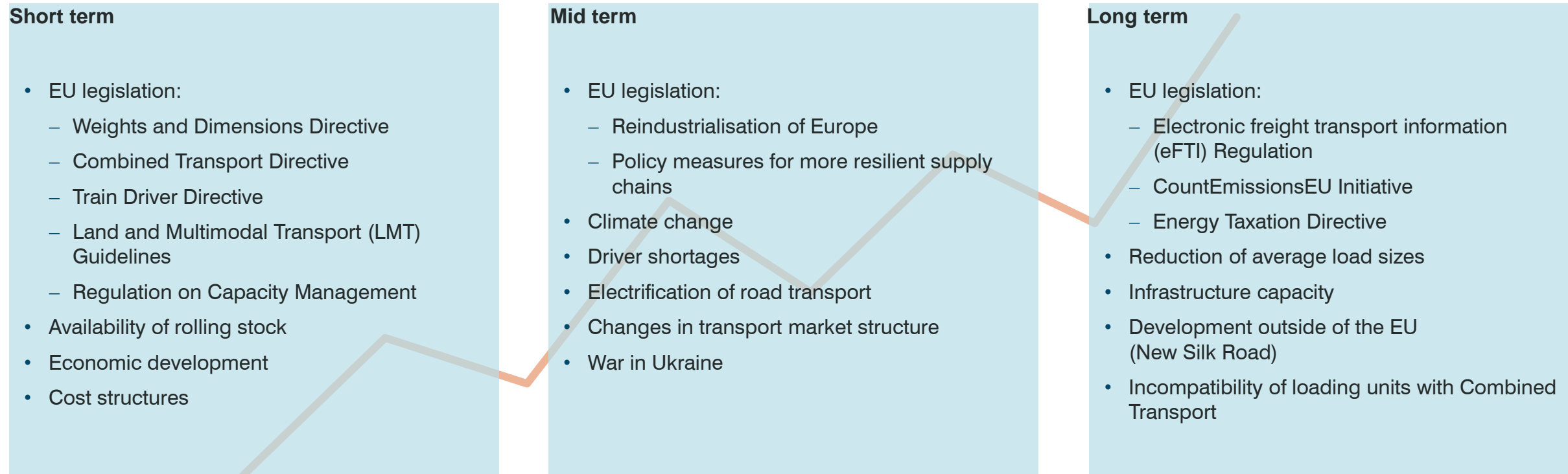


# General Framework and Key Elements of Combined Transport in Europe

# 06

## Market Environment

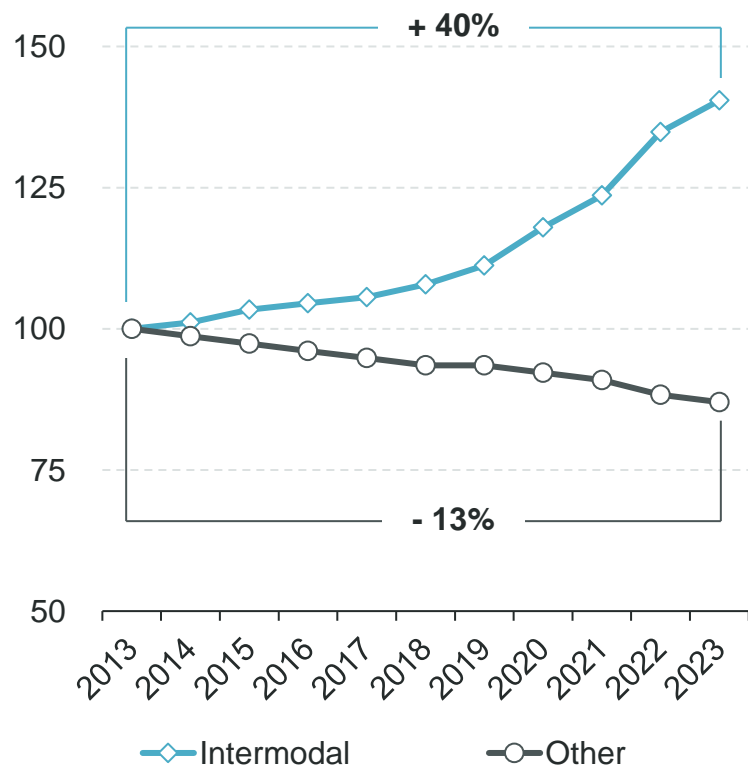
Combined Transport is an evolving market that can realise its full potential in the coming years, once remaining bottlenecks are addressed



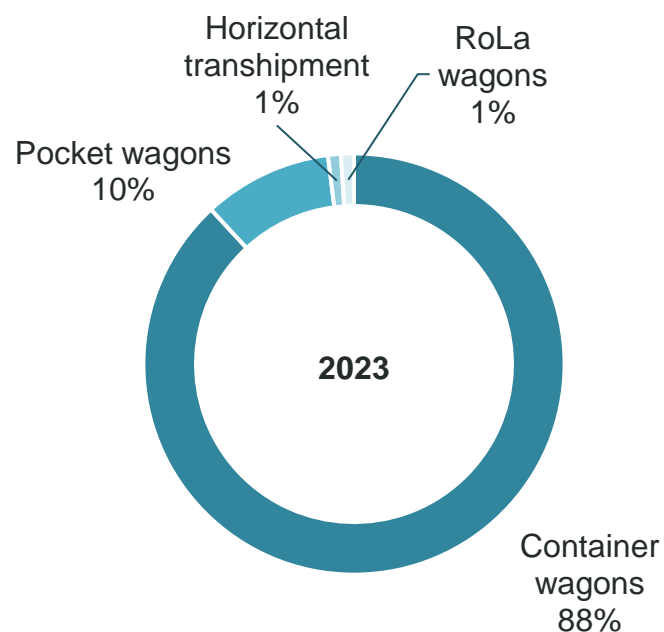
## Influencing factors for the market development of Combined Transport

## Combined Transport benefits from a modern wagon fleet that has grown significantly in recent years

Development of intermodal and other freight wagon fleet (Index: 2013 = 100)



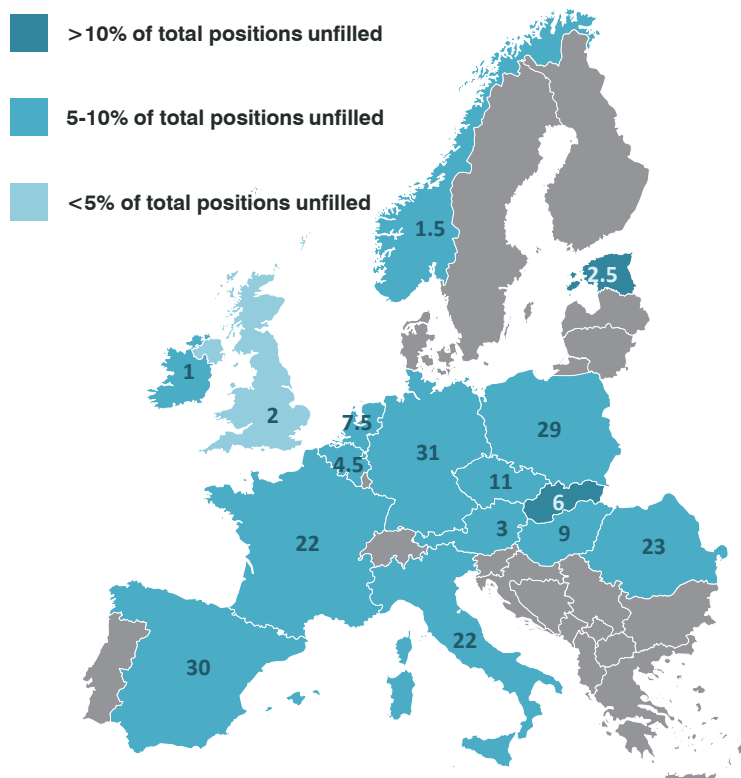
Intermodal freight wagon fleet by type of wagon (% of wagons)



- Between 2013 and 2023, **the intermodal wagon fleet in Europe grew by 40%**, while the fleet of other wagon types shrank by 13%. Most of this growth happened in the last 5 years. As a result, Combined Transport is well-supplied with a modern fleet able to cope with growing demand.
- Within the intermodal wagon fleet, **almost 90% of all wagons are fit for the transport of maritime containers** and swap bodies, reflecting the higher share of this segment within the CT market.
- Most of the remaining fleet are pocket wagons for the transport of semi-trailers for the continental CT market (which can also be used for the transport of containers and swap bodies). **RoLa wagons and wagons suited for horizontal transshipment represent only 1% of the wagon fleet respectively**, due to the small role of these segments in the overall market.

# An extension of the continental Combined Transport network helps European trucking companies tackle the increasing driver shortage

## Estimated lorry driver shortage by country (1,000 unfilled lorry driver positions, 2023)



## To move 80 TEU you need...

1 train driver



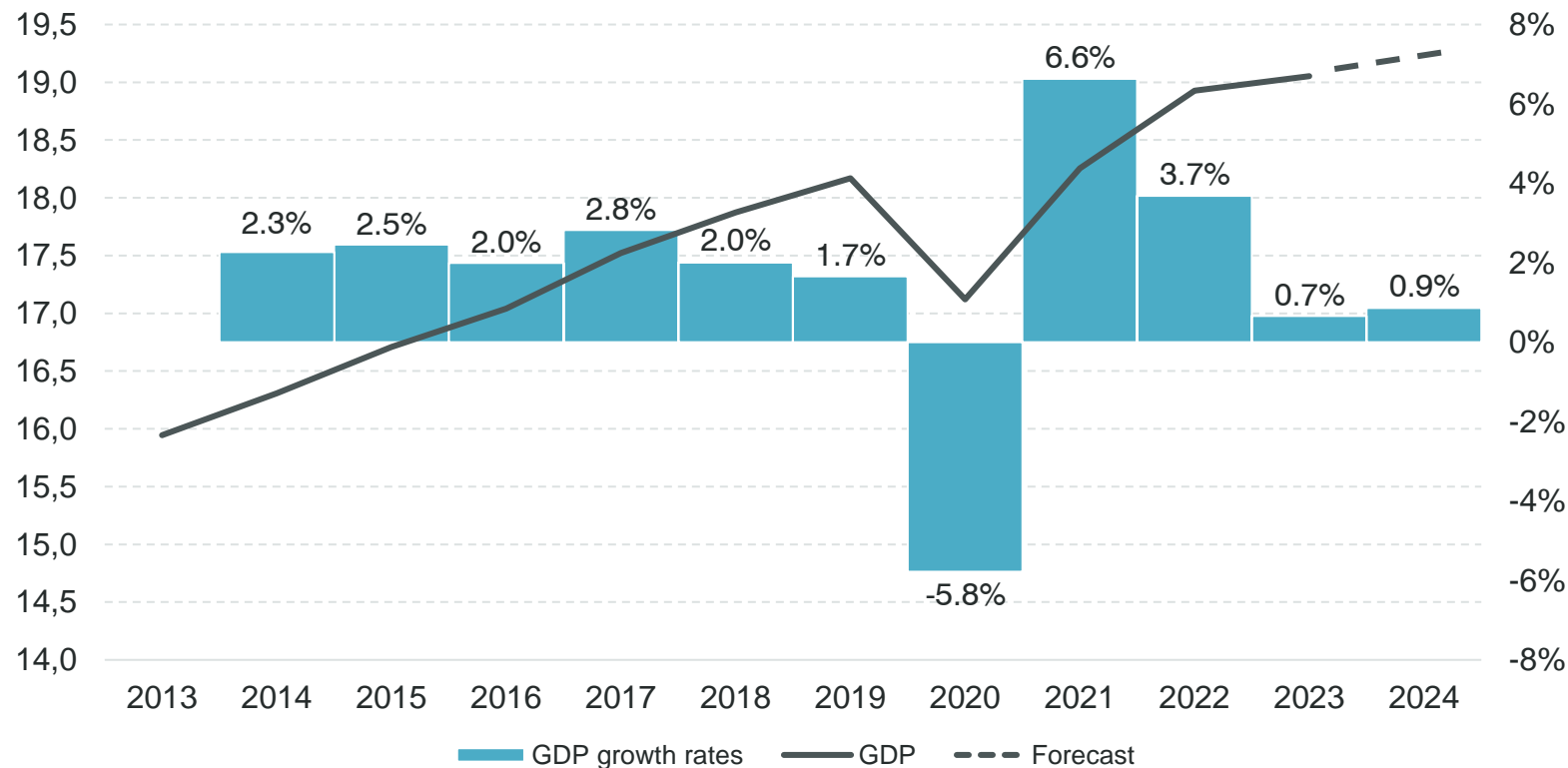
40 lorry drivers



- According to the International Road Transport Union (IRU), **233,000 positions for lorry drivers remained open in Europe** in 2023. This represents 7% of all driver jobs.
- The IRU reports that due to the driver shortage:
  - **Over half of all European road transport companies are unable to expand their business;**
  - Almost 40% of all companies saw a decline in revenue.
- The situation is unlikely to change as **one third of European lorry drivers are older than 55** and expected to retire in the next ten years, while less than 5% are under 25.
- **A further expansion of the continental Combined Transport network facilitates the shift to rail for longer distances**, allowing trucking companies to concentrate on short-distance transports with lower driver demand.

## Combined Transport is affected by a slowing economy in Europe, but less than conventional rail freight

**Total European GDP development – April 2024**  
(EUR trillion)

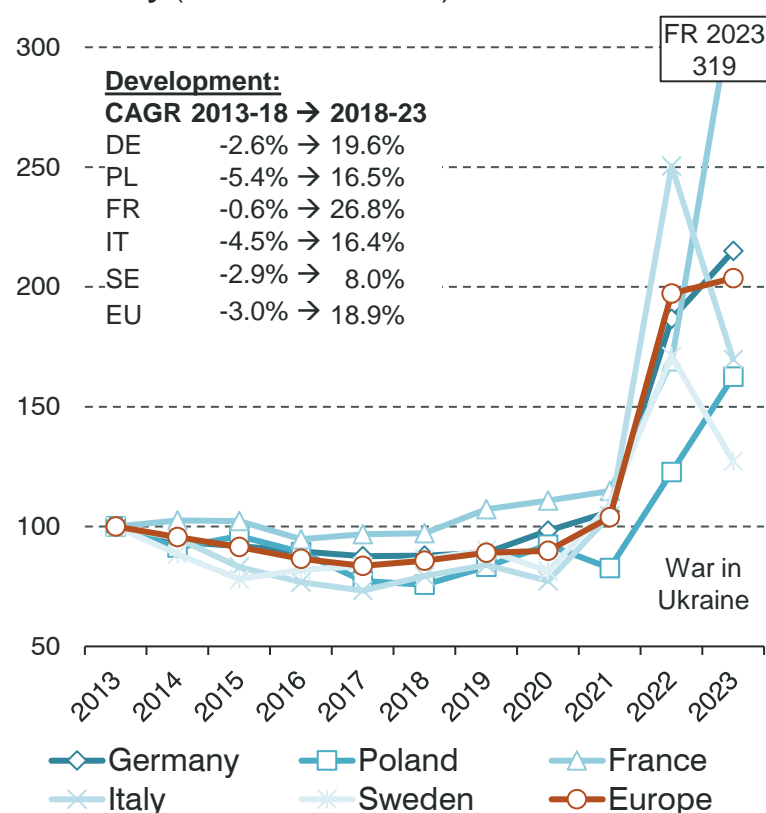


Source: IMF World Economic Outlook, Apr. 2024

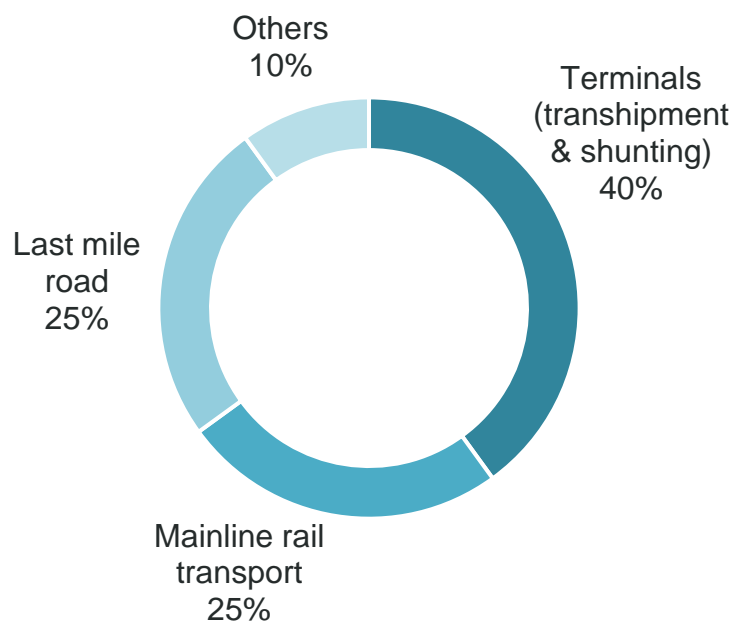
- Several factors are currently affecting economic development, reducing demand for transport services:
  - After a pandemic-related swing in growth rates, economic development cooled down from 2022 onwards due to the impact of China's Zero Covid policy which caused **interruptions in supply chains**.
  - This was further amplified by a **hike in energy prices** after the Russian invasion of Ukraine in March 2022.
- Furthermore, some industries that suffer from high energy price, such as the **chemical or automotive industry, are also important customers for Combined Transport services**. With reduced demand from these industries, some services have been cut back due to lack of demand.
- However, **Combined Transport was less affected by the economic downturn than conventional rail**, showing the growing importance of the segment for the economy.

# Higher energy costs increase prices for Combined Transport all over Europe

**Non-household consumer price indexation for electricity (Index: 2013 = 100)**



**Combined Transport cost structure for forwarders and customers (% of total costs in EUR, 2021)**



- Rail freight suffered from the impact of higher electricity prices after the Russian invasion of Ukraine, with some rail operators even shifting back to diesel locomotives or refusing additional traction services.
- The higher energy prices hit the three biggest cost factors for Combined Transport simultaneously:
  - Terminal operations have a high energy demand for transshipment equipment;
  - Rail transport was affected by an increase in electricity prices of up to 1,000%;
  - First and last mile road services were affected by increased diesel prices.

Source: Eurostat nrg\_pc\_205 as of 22/8/2024; expert interviews



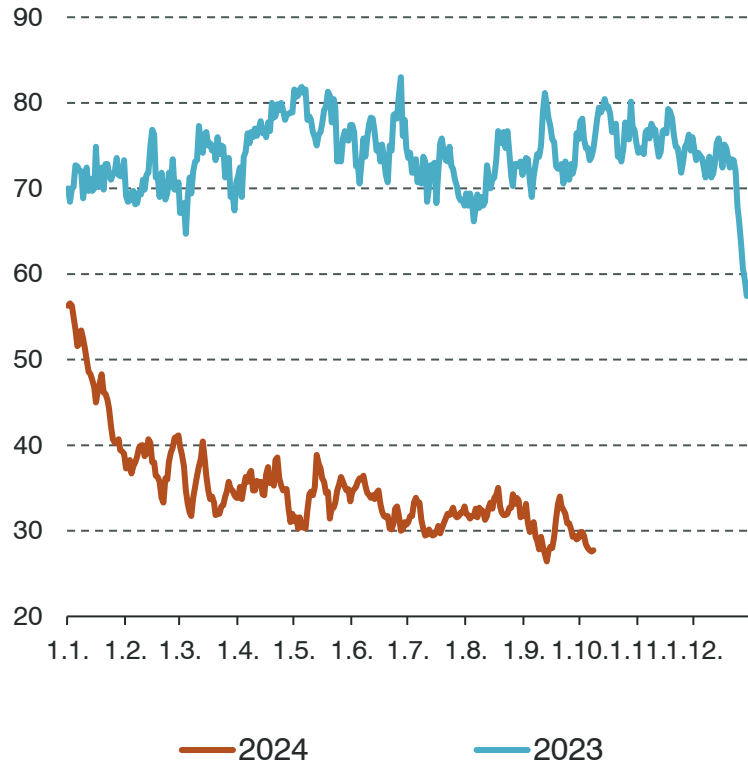
## Rerouting of maritime trade around the Cape of Good Hope increased prices and travel times

**Drewry World Container Index – Costs per TEU**  
(Index: January 2019 = 100)



Sources: Drewry; IMF PortWatch

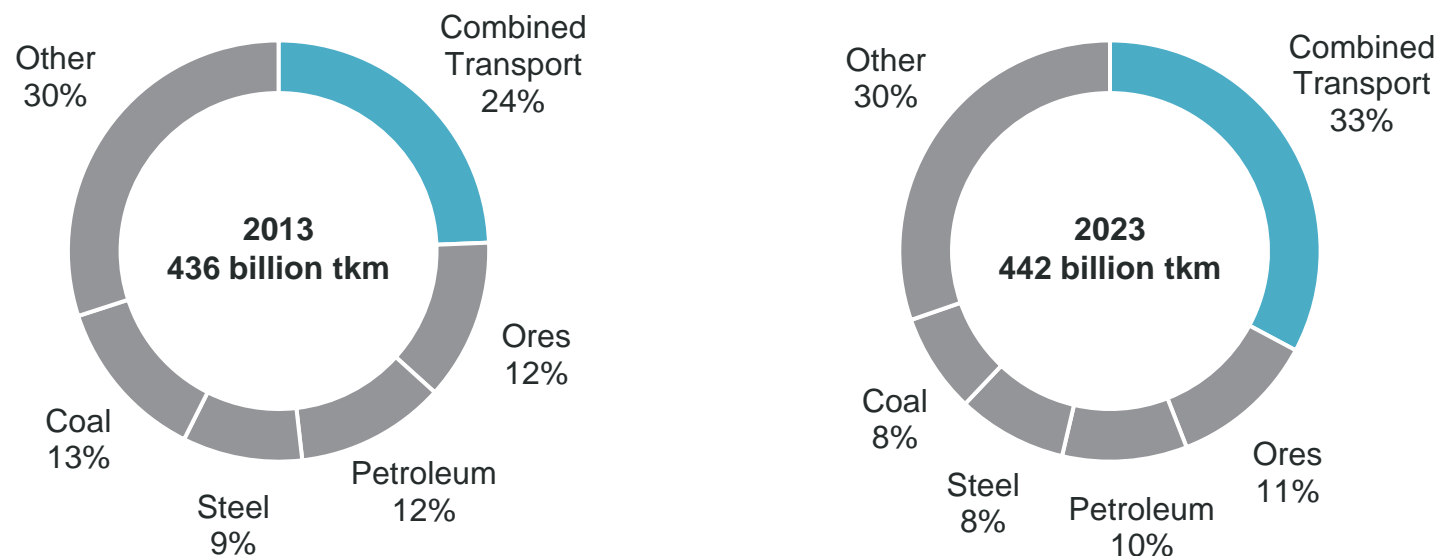
**Suez Canal: Daily Transit Calls**  
(7-day moving average)



- The attacks on ships along the Bab al-Mandab Strait since December 2023 has led to the rerouting of container ships around the Cape of Good Hope instead of the shorter route through the Suez Canal. **This adds about one week to trips between East Asia and Europe.**
- The longer travel times resulted in a container shortage in East Asia as the duration of round trips for maritime containers increased accordingly. This situation was less acute in Europe due to the imbalance in trade. As a result, the **prices for sea transport reached almost half the level of the price hikes caused by the Covid-19 pandemic in 2021/22.**
- **Prices are expected to fall again in the coming months** as new ships and containers are added to the existing fleet, reducing the capacity restraints in the market.
- Due to the longer shipping times and higher prices, **rail freight transport between East Asia and Europe along the New Silk Road increased in volume compared to 2023.**

## Combined Transport helps rail freight transport profit from the shift to individual logistics solutions

**Commodity mix of European rail freight by group of goods in 2013 and 2023**  
(% of tkm)

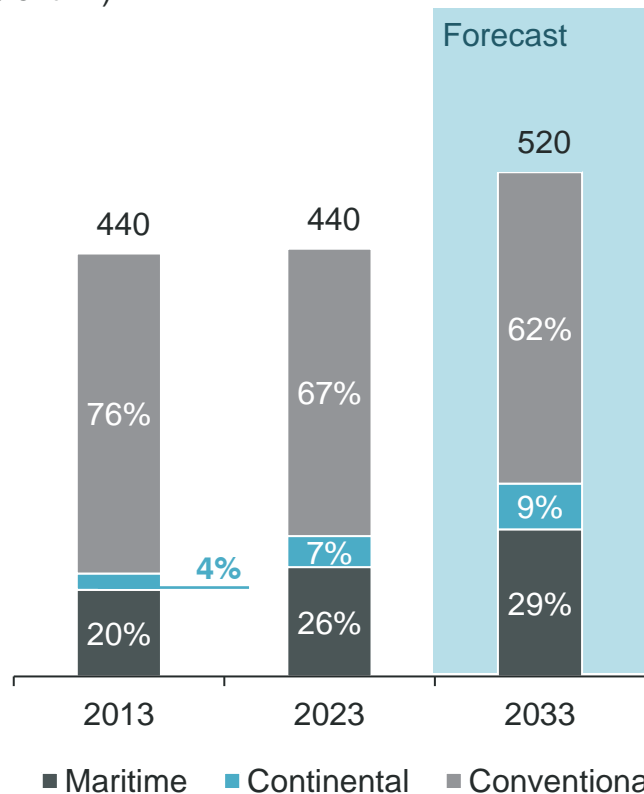


- For decades, **block trains for heavy bulk like coal, ores and petroleum were the backbone of the European rail freight network.** Due to de-industrialisation and the shift to a green economy, these segments are increasingly losing volume.
- Meanwhile, the growth of the consumer market and increasing sourcing from overseas are driving demand for individual, small volume logistics solutions. **Single Wagon Load, the classic rail freight product for small volumes, has a cost disadvantage compared to road and struggles to attract these goods.**
- **Combined Transport is a cost and time-effective alternative** by enabling tailor-made transport of standardised equipment by rail, road, inland waterways and sea from origin to destination.
- As a consequence, **CT was able to increase its market share between 2013 and 2023 in a growing rail freight market** and is expected to further gain market share.

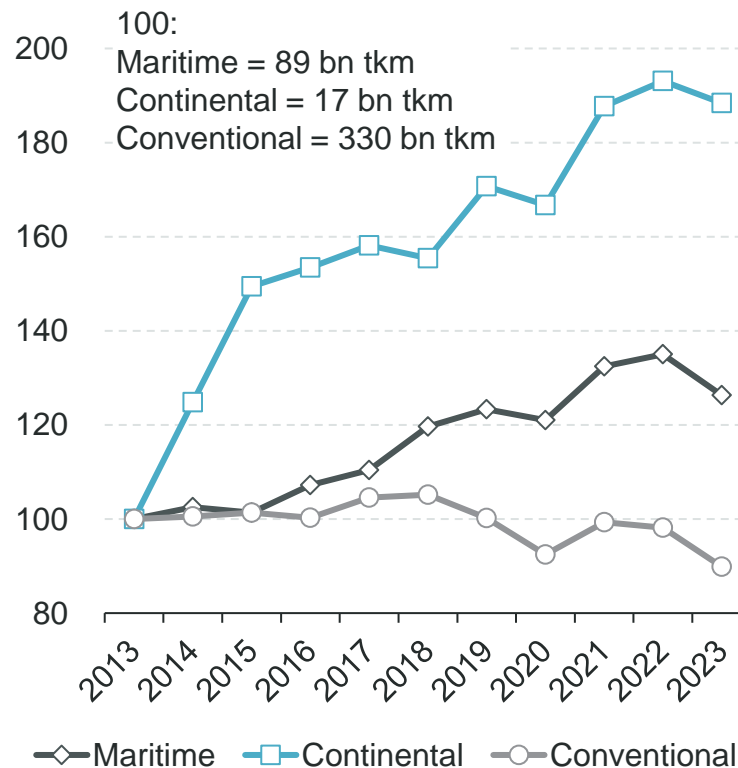
Source: SCI Multiclient Study "The European Rail Freight Transport Market 2023"

## Continental Combined Transport gains importance for rail freight operations

Development of CT rail share of total rail freight (% of tkm)



Development of CT and total rail freight transport performance (Index: 2013 = 100)

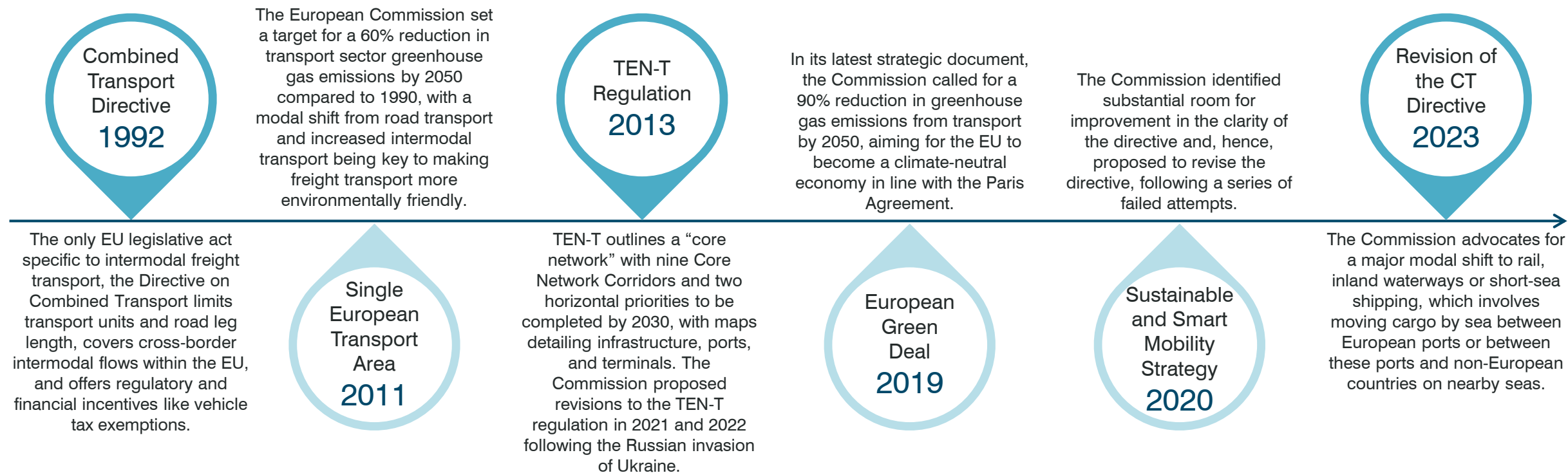


- **Continental Combined Transport is gaining in importance in rail freight and grew by 88% between 2013 and 2023**, outperforming maritime CT – despite a substantial decline in 2023.
- The main drivers were the **improvement of suitable terminal infrastructure** as well as the introduction of new loading units, such as the 45-ft high-cube pallet-wide container.
- The **increasing shortage of lorry drivers** and the lower maintenance costs for semi-trailers used in Combined Transport compared to exclusively road haulage are also driving this development.
- **For the coming years, an expansion of the continental CT network is expected.** Spain alone wants to inaugurate five new national lines before 2026, and is investigating the feasibility of seven further connections.

Source: SCI Verkehr Rail Freight Market Forecast; SCI Multiclient Study “The European Rail Freight Transport Market 2023”

Over the past 30 years, the EU regulatory framework for Combined Transport has evolved to define policy and implementation responsibilities, enhancing cross-border logistics and sustainability

### European Policy Framework

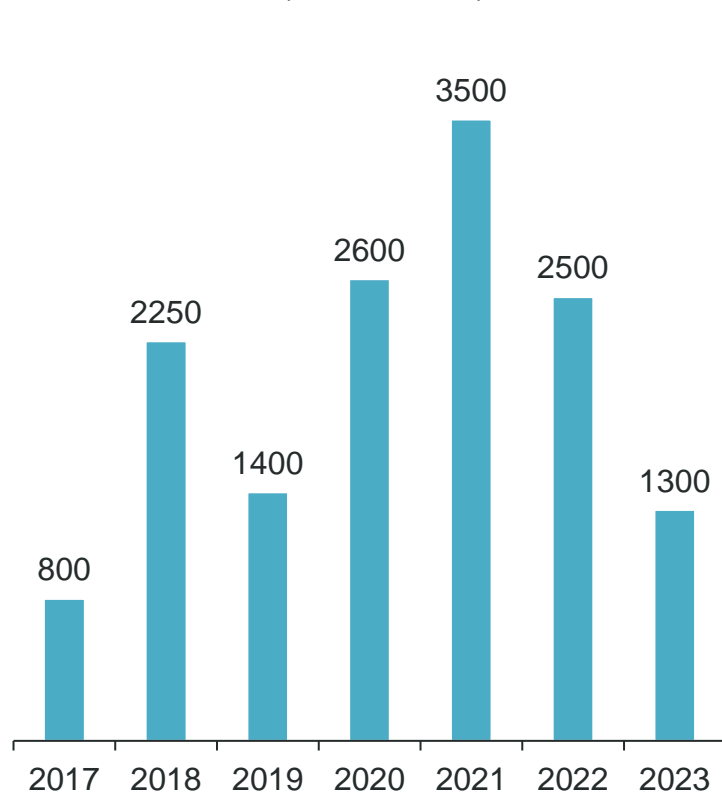


### EU Initiatives

Source: Council Directive 92/106/EEC, Commission White Paper 2011, Regulation (EU) No 1315/2013, Commission Mobility Strategy COM/2020/789, Revision Council Directive 92/106/EEC

## Since the war in Ukraine started, maritime container transport to and from China via Russia has declined

### Development of rail freight transport volume on Northern Corridor (1,000 tonnes)



Source: Eurasian Rail Alliance Index Statistics as of 20/9/2024; expert interviews

### Competitive disadvantages of the New Silk Road

Sanctions and war-caused disruptions in Russia make Northern Corridor less attractive.

Middle Corridor is slow and unreliable due to shipping via Caspian Sea.

Competitiveness is largely dependent on current prices for maritime transport.

2021 levels of demand affected reliability due to congestion in key terminals.

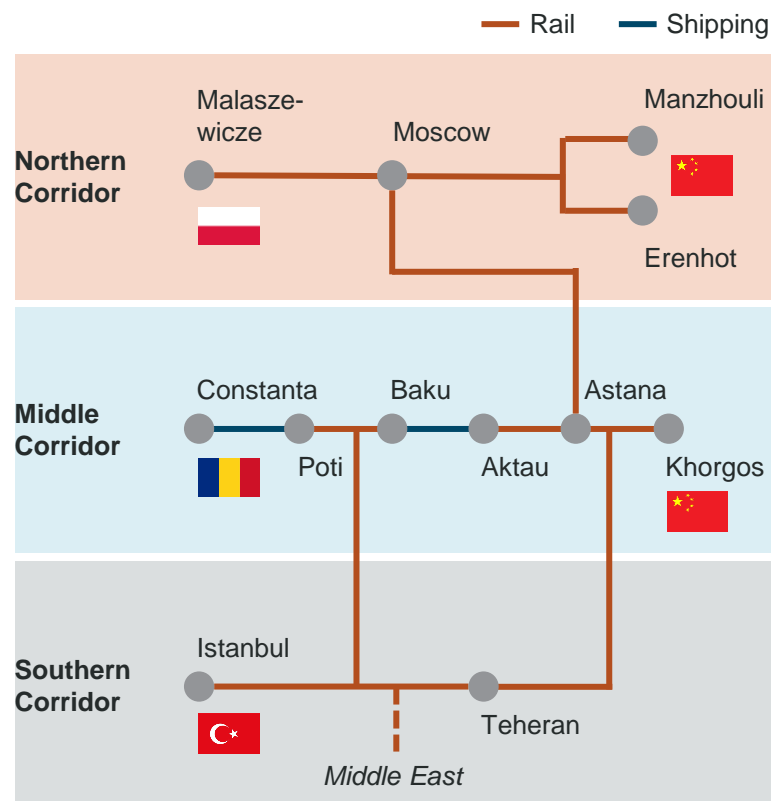
Air transport is five times faster for only twice the price.

Rising tensions in trade with China negatively affect growth perspectives.

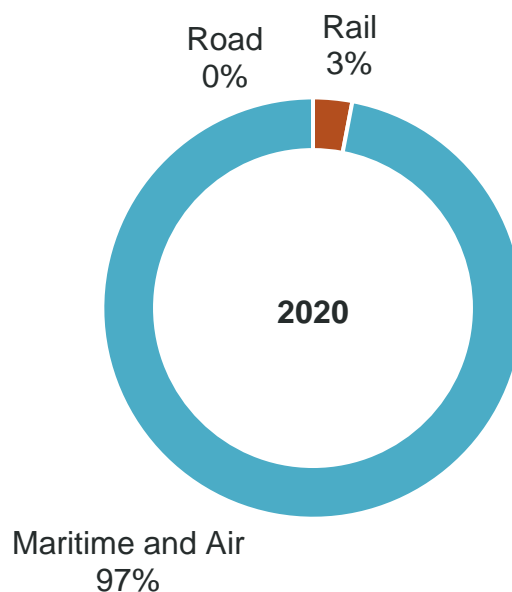
- After the Russian invasion in Ukraine, the volumes transported along the New Silk Road via Russia (Northern Corridor) declined significantly. Overall, **the route has lost over 60% since its peak in 2021**. This is partly due to the avoidance of Russian territory to steer clear of sanctions, but also caused by lower shipping rates for maritime transport in 2023.
- Kazakhstan, Azerbaijan and Georgia promote a route via the Black and Caspian Seas, known as the Middle Corridor. However, this route takes significantly longer than that via Russia. Besides, it is more complex due to several transshipments in ports. **While Kazakhstan announces growth along the Middle Corridor, this is partly due to rerouted traffic flows to and from Central Asia.**
- Even before the invasion **capacity restraints at critical infrastructure nodes along the corridors** had already become obvious, and these still need to be addressed if the New Silk Road is to grow beyond 2021 levels.

## Improved railway infrastructure between Europe and East Asia might help shift additional volumes from air and maritime transport

### Main corridors of New Silk Road



### Modal split for Europe-East Asia trade (% of tonnes)

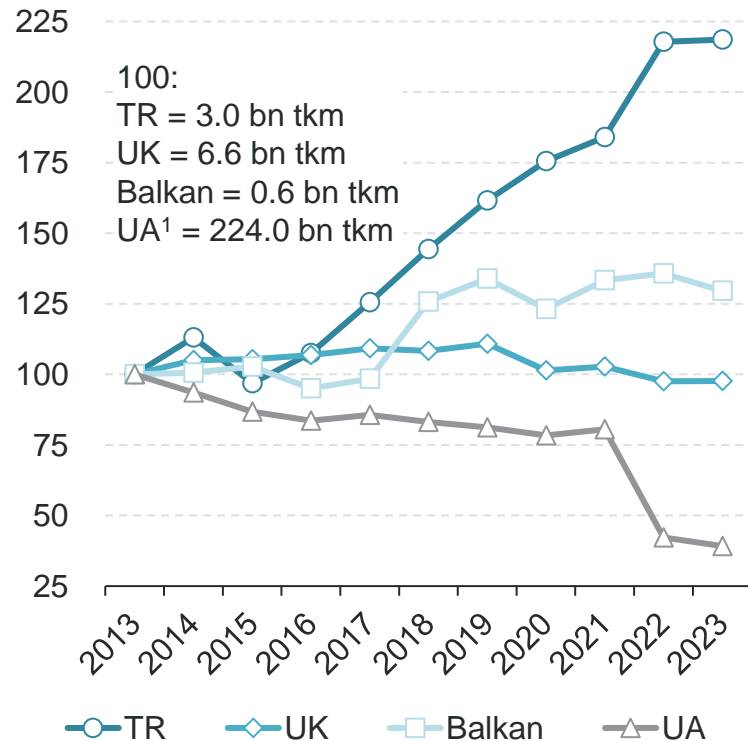


- Regardless of the ongoing war in Ukraine, Central Asia and the Caucasus are further developing their railway infrastructure:
  - **Kazakhstan started the construction of a third railway link with China** and is improving rail links to the Caspian port of Aktau.
  - In May 2024, the **Kars – Tbilisi – Baku railway** line that connects the Caspian Sea and Europe via Turkey was reopened after modernisation works.
  - Azerbaijan announced the modernisation of two railway lines as part of the **International North-South Transport Corridor (INSTC)** from Russia via Iran to India.
  - In 2024, **China, Kyrgyzstan and Uzbekistan agreed the construction of a new rail link** between the three countries.

Source: Eurasian Rail Alliance Index Statistics as of 20/9/2024; Eurostat mar\_go\_qm\_c2020 as of 4/7/2024; Eurostat avia\_goexcc as of 29/8/2024; Suez Canal Authority Navigation Statistics; SCI Raildata

## The development of Combined Transport outside of the Single Market is positive for the European rail freight market

### Development of CT rail freight outside the EU single market (Index: 2013 = 100)



### Planned and recently opened terminals in Non-EU member states

Location	Country	Opening date
Highland Spring	UK	2022
Railport Istanbul-Kartepe	TR	2024
Northampton Logistics Park	UK	2024
Container Terminal Vinnytsia	UA	2024
Hlyboka	UA	2025
Bozuyuk Logistics Center	TR	2026
Bow Goods Yard London	UK	2030
West Midlands Freight Interchange	UK	2034

- The rail freight market for Combined Transport is developing positively in countries neighbouring the European Union. **Turkey, in particular, doubled its Combined Transport market between 2013 and 2023.** This reflects the growing importance of Turkey as a logistics centre.
- The Balkan countries have also developed positively since 2018, profiting from hinterland connections from the port of Piraeus and **the establishment of RFC 10, Alpine-Western Balkan.**
- While **Combined Transport grew in the United Kingdom between 2013 and 2019 by 11%**, the sector was not yet able to regain the losses suffered during the Covid-19 pandemic. Current volumes are similar to 2013.
- Rail freight transport in Ukraine was severely hit by the Russian invasion**, despite efforts to shift maritime grain transports to rail and increasing rail traffic with Poland and Romania.

Source: Eurostat rail\_go\_grpgood as of 4/7/2024; SCI Verkehr Rail Freight Market Forecast; SCI Verkehr Multiclient Study "The European Intermodal Rail Freight Transport Market 2023"

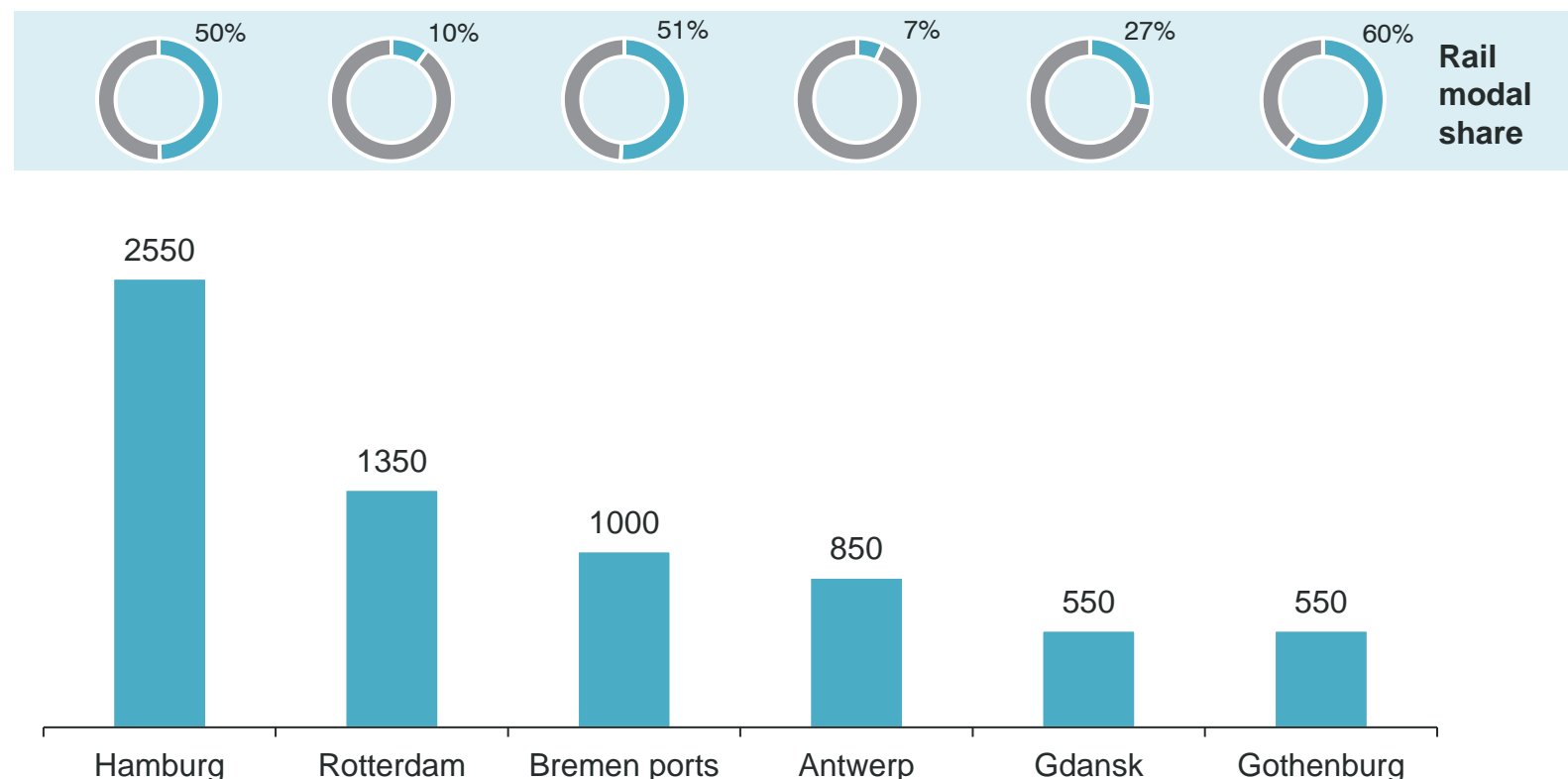
1) Total rail freight transport performance, as no CT segmentation is available.

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## European ports have robust rail hinterland modal shares compared to other world regions, but there is still room for improvement

Container hinterland transportation via rail and rail modal share at selected European ports in 2023  
(1,000 TEU; % of TEU)

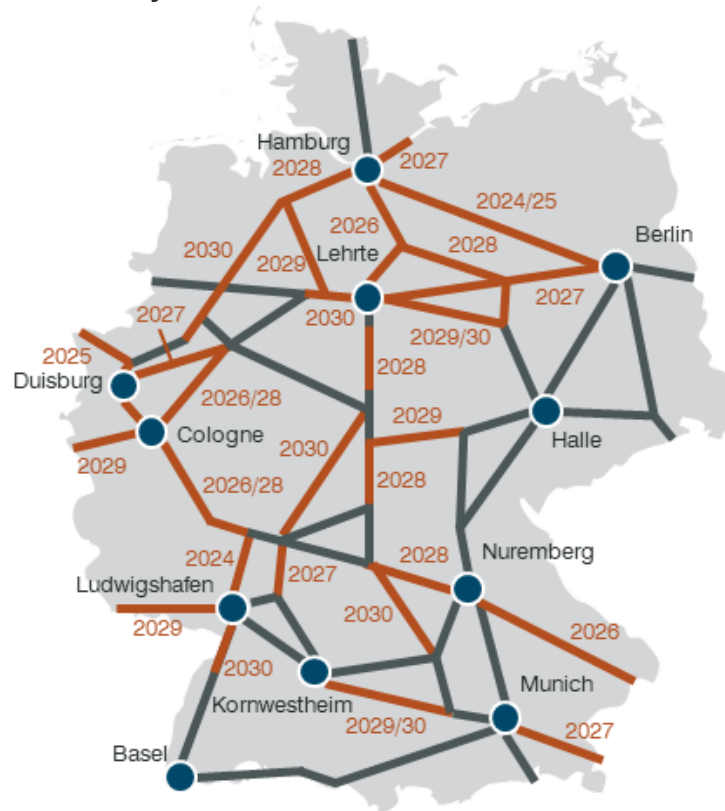


- **Hamburg is the leading European port in hinterland rail performance with a throughput of over 2.5 million TEU in 2023.** For global comparison, only the combination of the two ports of Los Angeles and Long Beach would put more containers on rail.
- The current modal share for rail freight in Rotterdam is less than 10%. However, in absolute terms this still represents over 1 million TEUs, making it one of the most important nodes for maritime Combined Transport in Europe. **The Rotterdam port authority has further stated its ambition to increase the market share of rail at the port to 20% by 2030.** Similarly, the Port of Antwerp wants to increase its rail modal share to 15% in the same year.
- The biggest European port with no regular rail hinterland connections is currently Gioia Tauro in the south of Italy. At the same time, **Gothenburg has one of the highest rail hinterland modal shares worldwide with 60%.**

Source: Multiclient Study "The European Intermodal Rail Freight Transport Market 2023"; SCI Multiclient Study "The European Rail Freight Transport Market 2023"; websites of port authorities

## Maintenance and construction works reduce network capacities along important routes for Combined Transport, and risk shifting rail freight volumes back to road

### Planned closures of corridor segments in Germany until 2030



Sources: DB InfraGO; SCI Verkehr database

### Major infrastructure bottlenecks in Europe

Countries	Project	Planned finalisation
FR/IT	Re-opening Fréjus tunnel	2025
DE	3 <sup>rd</sup> track Emmerich - Oberhausen	2026
SI	Second rail link to Port of Koper	2026
BG/RS	Modernisation Niš - Dimitrovgrad	2027
DK/DE	Fehmarn Belt Fixed Link (FBFL) + feeder lines	2029
PL/LT/LV/EE	Rail Baltica	2030
AT/IT/DE	Brenner Base Tunnel (BBT) + feeder lines	2032
CH	Double track expansion Lötschberg Base Tunnel	2034
DE	4-track expansion Karlsruhe - Basel	2042

- Frequent line closures and capacity restrictions on main rail freight corridors affect Combined Transport rail operations. **15-20% of all planned freight trains on RFC 1 are cancelled**, often at short notice. Due to the lack of suitable rerouting options for main corridors, this negatively affects the pricing and reliability of CT.
- Many infrastructure bottlenecks negatively affect cross-border connections. Several infrastructure projects will address these bottlenecks within the next decade. However, one of the most pressing issues is the **ongoing closure of the Fréjus rail tunnel**, the main rail freight connection between France and Italy, due to a landslide in 2023.
- German infrastructure manager DB InfraGO plans to fully close 40 highly stressed railway lines for six-month intervals over the coming years for general repairs and maintenance. This will **reduce the capacity along Rail Freight Corridors and proposed alternative routes**, hampering the growth of CT.

## Solutions to address the 90% non-craneable European semi-trailer fleet should be supported

### Share of European road freight market



~80%



~15%



~5%

### Selected support measures to shift semi-trailers to Combined Transport

DE

- **Fleet Renewal Programme for Heavy Commercial Vehicles:** EUR 257m funding programme for intelligent trailer technologies, CO<sub>2</sub> reduction measures and upgrades to craneability (until December 2025)
- **Horizontal transshipment:** EUR 15m funding for Helrom (terminals and Megaswing wagons)

ES

- **Funding programme for craneable trailers:** EUR 2.5m funding programme co-financed by the European Commission's Recovery & Resilience Fund
- **Pocket wagons:** EUR 17.3m funding for Ermewa Ibécato for purchase of 50 pocket wagons, among others

PL

- **Direct grants:** EUR 180m support programme by the European Commission for domestic Combined Transport, covering up to 50% of eligible costs (until end of June 2026)

- The conventional transshipment of semi-trailers for continental Combined Transport involves the vertical loading of the trailer by a crane or a reach stacker. However, **over 90% of the European semi-trailer fleet are non-craneable** as they are not equipped with the necessary grapple pockets.
- **Semi-trailer trips of more than 300 km account for over 40% of total road transport performance** in Europe. They represent a prime potential market for CT companies.
- Several support programmes exist at Member State level to **facilitate the shift of semi-trailers from road to rail**, for example by the funding of craneable trailers and rolling stock or subsidies for new CT connections. However, in many Member States there are currently no support programmes for Combined Transport specifically addressing semi-trailers.
- **New supporting measures** could be the construction of mixed terminals (vertical and horizontal) and the support of alternative transshipment technologies.

# 07

## Policy Framework

## The ongoing legislative process in the transport sector will shape Combined Transport for decades

### Relevant EU railway packages

#### 2001 First railway package

- Enabled non-discriminatory access to the trans-European network for railway undertakings.

#### 2004 Second railway package

- Improved safety, interoperability and the opening of the rail freight market.
- Establishment of the European Railway Agency (ERA).

#### 2016 Fourth railway package

- Vehicle authorisations and safety certificates, valid throughout the EU.
- Interoperability of the European Rail Traffic Management System (ERTMS).

### Current EU legislative processes with relevance for Combined Transport

#### Revisions:

- TSI Regulation
- TEN-T Guidelines Regulation
- Combined Transport Directive
- Weights and Dimensions Directive

#### New:

- CountEmissionsEU Regulation
- Rail Infrastructure Capacity Regulation
- Green Claims Directive
- Track Access Charging Guidelines *(to be published)*
- Transport State Aid Block Exemption Guidelines Regulation (TBER)

Greening Freight  
Transport Package

- As part of the **Greening Freight Transport Package**, the Combined Transport Directive and the Weight and Dimensions Directive are under revision, while new CountEmissionsEU and Rail Infrastructure Capacity regulations will be introduced.
- Further **new legislative packages** that will influence the Combined Transport sector in coming years are:
  - **Green Claims Directive**, which regulates the use of environmental claims and labels like CO<sub>2</sub> emission savings;
  - **Track Access Charging Guidelines**, which regulate the principles for the calculation of TACs by infrastructure managers;
  - **Transport State Aid Block Exemption Guidelines Regulation**, which defines state aid compatible with the internal market and exempts it from approval by the Commission.

## The definition of Combined Transport will be revised

### Proposed definition by the European Commission

“A combined transport operation shall meet the following conditions:

- a) except for operations referred to in point b), **the operation produces at least 40% less external costs than the alternative unimodal road transport operation;**
- b) in the case of connections between an island and the mainland without a road alternative, the operation produces at least 40% less external costs than the alternative maritime intermodal operation;
- c) the intermodal loading unit in unaccompanied transport has a unique reference in accordance with the identification and marking regime established pursuant to the up-to-date versions of international standards ISO 6346 or EN 13044.”

### Recommendations by the sector to ensure a smooth implementation of a new definition

**Cost-awareness:** The cost of the burden of proof is kept as low as possible.

**Cleverness:** Calculation alternatives that offer similar results and are easy to implement like a distance-based approach are considered.

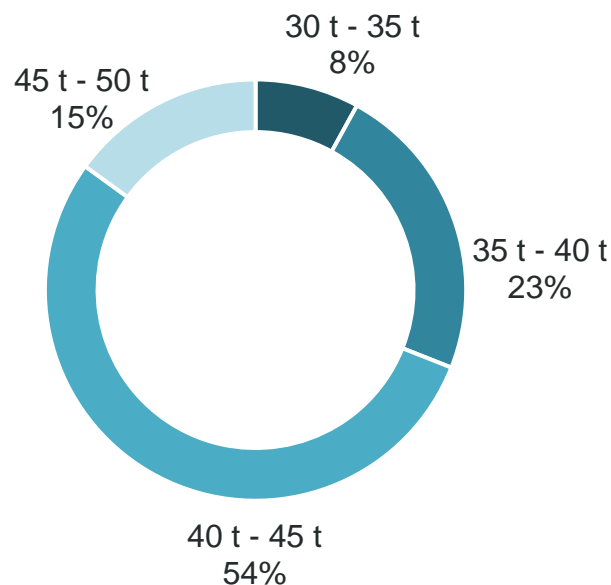
**Continuity:** The new definition does not exclude parts of the intermodal transport currently defined as Combined Transport.

**Clarity:** The end-result does not add further complexity to the identification of Combined Transport connections.

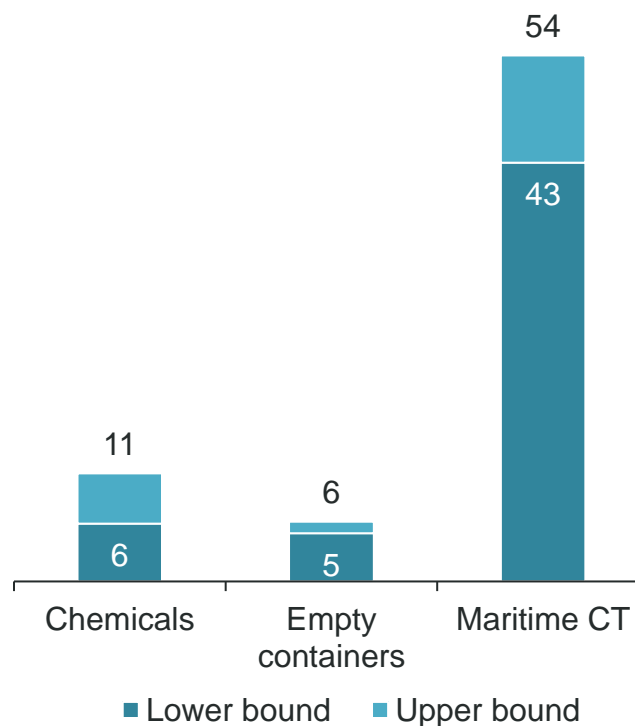
- The **Combined Transport Directive** defines what transport chains are considered to be Combined Transport. The CT definition is relevant for support measures granted like tax rebates and higher gross vehicle weights on the road leg.
- In the draft of the revised directive, the European Commission proposes a **definition based on the calculations of external costs**. To qualify as Combined Transport, an intermodal connection needs to reduce external costs at least by 40% compared to alternative unimodal road transport.
- Following this definition, a calculation needs to be done for each consignment to decide whether it qualifies as Combined Transport or not. This would be possible by the setting up of **digital exchange platforms** as prescribed by the eFTI Regulation.

## The revised Weights and Dimensions Directive risks undermining Combined Transport

**Distribution of weight restrictions for terminals due to equipment (% of terminals)**



**Reverse modal shift volume in 2050 if the revised Weights and Dimensions Directive is adopted (billion tkm)**

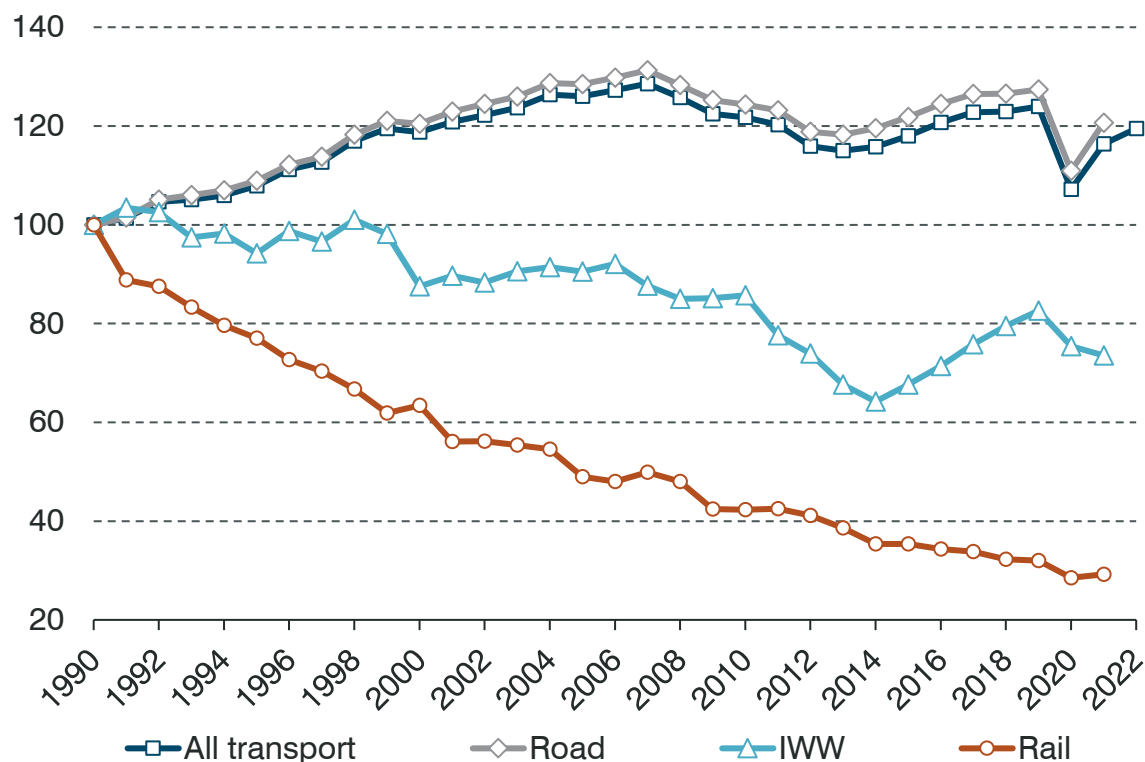


- The additional gross weight for zero-emission vehicles and cross-border circulation of longer vehicles proposed in the revision of the **Weights and Dimensions Directive** risks undermining Combined Transport, as current rolling stock and handling equipment is not suited for heavier and longer vehicles.
- Possible opportunities for CT due to the allowance of additional weight and dimensions are outweighed by **compatibility risks**, an undermining of standards and greater complexity.
- Most **extended semi-trailers are technically not compatible with CT assets** and for those that are, only about half of the existing fleet of intermodal pocket wagons is compatible.
- In addition, the objective of 40% cost reduction to be awarded to the road sector by Member States opens serious concerns for a **reverse modal shift**, whereby 16% of CT freight would return back to the road.



## Combined Transport contributes to Europe's sustainable prosperity and competitiveness

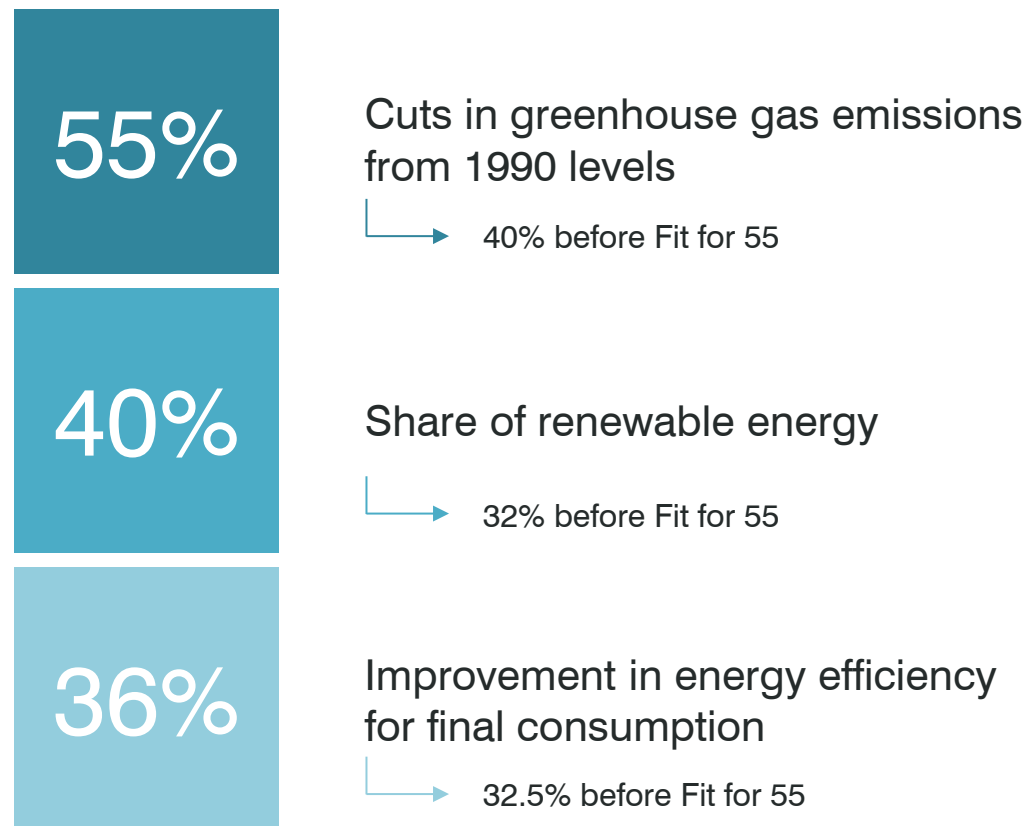
Change in greenhouse gas (GHG) emission levels in the transport sector 1990-2022



- European Commission President-elect Ursula von der Leyen presented **new political guidelines** for the next European Commission to the European Parliament on 18 July 2024, including a new European Prosperity Plan and the need to strengthen our societies and our social model.
- Combined Transport contributes to these goals by:
  - **deepening the Single Market** with cross-border connections between Member States;
  - **decarbonising transport chains** with lower greenhouse gas emissions compared to road transport;
  - **boosting productivity** with standards and digitised data flows for stakeholders;
  - **increasing sustainable competitiveness** with the development of solutions for globally used logistics standards;
  - **providing regional quality jobs** that cannot be deployed overseas.

## Combined Transport actively supports the European Green Deal

### Fit for 55 – Climate and energy framework 2030



- The **European Green Deal** is designed to transform the EU into a modern, resource-efficient and competitive economy. Its core principles are:
  - No net emissions of greenhouse gases by 2050
  - Economic growth decoupled from resource use
  - No person and no place left behind
- As a first step, the EU introduced a legislative package to reduce greenhouse gas emissions by at least 55% by 2030. The **Fit for 55 legislation**, now fully adopted, is designed to put the EU on a path to reach its climate targets by 2030 in a fair, cost-effective and competitive way. However, these goals are very ambitious and put a lot of pressure on the transport sector.
- To achieve the ambitious goals, Combined Transport is a well-suited solution as it actively supports the goal of Fit for 55 and the European Green Deal:
  - **Up to 90% lower greenhouse gas emissions** compared to road transport;
  - **Over 50% share of renewable energy sources** already reached for mainline operations in several markets, including Germany (68%) and Switzerland (92%);
  - **Up to 71% less energy consumption** compared to road transport.

Source: European Commission; d-fine Study on CO<sub>2</sub> emissions in door-to-door combined transport 2021; DB AG Integrated Report 2023; Verband Schweizerischer Elektrizitätsunternehmen

## Combined Transport is well-suited for long-term EU rail policy goals

### The EU vision for rail freight 2050

**Growth of rail freight performance by 87% (+360 billion tkm) compared to 2050**

**Shift of more than 50% of road freight along transport distances over 300 km to rail and IWW, with 30% shift before 2030**

**Connection of all seaports to the rail freight network**

**Establishment of Rail Freight Corridors (RFC) as the backbone of the EU freight transport system**

**Introduction of the European Rail Traffic Management System (ERTMS) in the European railway network**

- To strengthen **EU rail policy**, the EU has adopted four railway packages since 2001, aiming to:
  - open the railway market to **competition**;
  - increase the **interoperability** of national railway systems;
  - define a framework for a **single European railway area**.
- Furthermore, the EU vision for rail freight 2050 foresees ambitious growth goals, **a shift of long-distance road transport to rail**, and the connection of all seaports.
- The market structure of Combined Transport with
  - its **highly competitive market environment**,
  - **standardised assets and processes**, and
  - **high importance of cross-border transport chains**is well-suited to support these mid- and long-term goals.

# The European Court of Auditors recommends action to provide Combined Transport with a level playing field compared to road transport

## Recommendations to the European Commission to improve effectiveness of support on intermodal freight transport by the European Court of Auditors

### 1. Set targets regarding the modal share along the Core Network Corridors and report on them

- Specification of targets regarding the modal share of freight traffic and intermodal flows for Core Network Corridors in cooperation with Member States.
- Requirement for Corridor Coordinators to report on achievements and needed investments.
- Improvement of the collection of data on intermodal freight transport at the national level in cooperation with Eurostat and national statistical offices, if needed by means of a legislative act.

### 2. Prepare regulatory changes to improve the competitiveness of intermodal transport

- Revision of the regulatory framework for rail, in particular provisions on capacity management for freight services and interoperational standards.
- Revision of the regulatory framework for road-only and Combined Transport to enlarge its scope to intermodal transport and harmonise the implementations by Member States, provide the digitalisation of information flows, and reinforce the incentives for intermodal transport in comparison with road-only transport.

### 3. Lay the groundwork for a coordinated assessment by Member States of intermodal terminal needs

- Provision to Member States of clear guidelines on how to perform the market study for intermodal transport and how to draw up a terminal development plan.

### 4. Assess the modal shift potential in cost-benefit analyses for EU-funded projects

- Requirement for certain beneficiaries of European funds to include quantified estimates of modal shift potentials generated by their project in their cost-benefit analysis.

- The European Court of Auditors concluded in a Special Report from 2023 that “the EU’s regulatory and financial support on intermodal freight transport was not sufficiently effective as there was **still no level playing field between unimodal road haulage and intermodal freight transport** in the EU due to regulatory and infrastructure barriers”. As a result, “intermodal freight transport can still not compete on equal grounds with road transport.”
- The criticisms directed at the European Commission included:
  - The outdated provisions of the **Combined Transport Directive**;
  - **Lack of coordination** with Member States;
  - **Lack of data** on terminal infrastructure.
- The European Court of Auditors concludes that a “modal shift in transport away from roads and **an increased use of intermodal transport can play a key role in making freight transport in Europe more environmentally friendly.**”

# EU and national funding programmes support Combined Transport to accelerate the modal shift to rail

## Support programmes

European Regional Development Fund	Connecting Europe Facility	Cohesion Fund
Recovery Resilience Facility		
RRF in Germany	RRF in France	RRF in Poland
Italian support package	Austrian support package	Swiss support package

## Description

Several EU programmes ensure constant support for the financing of infrastructure by the EC and Member States, while the CEF is managed directly by the projects. ERDF and CF are managed jointly by the EC (DG MOVE).

As a temporary instrument, RRF supports EU Member States with reforms and investments through to 2026, requiring at least 37% of funds for green measures and 20% for digital measures.

As part of the green transition, support is granted in Germany for alternative propulsion systems in rail transport, in France for the general modernisation of the rail network, and in Poland for intermodal terminals and rail vehicles for intermodal transport.

Italy's Mare & Ferro bonus programmes offer incentives for intermodal transport; Austria supports track access charge reductions and funds Combined Transport and RoLa services; while Switzerland funds unaccompanied CT.

## Financial framework conditions

2021-27 funds for intermodal transport projects:

- EUR 514 million from CEF
- EUR 429 million from CF
- EUR 175 million from ERDF

2021-26 funds<sup>1</sup> to invest in reforms and projects:

- EUR 357 billion in grants
- EUR 291 billion in loans

2021-26 funds for (intermodal) railway projects:

- EUR 227 million for Germany
- Up to EUR 4,400 million in France<sup>2</sup>
- EUR 175 million in Poland

National support measures for intermodal rail freight:

- EUR 50 million for Italy
- EUR 32 billion in Austria
- EUR 86 million in Switzerland

Source: Regulation (EU) No 2021/241; Recovery Resilience Facility Country documents; European Court of Auditors Special Report on Intermodal Freight Transport 2023

1) At 2022 prices. 2) Total sum for all railway projects.

## Several Member States support Combined Transport with various measures

### Overview of selected European subsidies for Combined Transport

	Description	Time frame	Amount (p.a.)
AT	15% reduction in monthly motor vehicle tax	2014-today	n/a
	Support for railway undertakings	2018-2027	288 EUR million
	Aid calculated per intermodal transport unit	2022-today	n/a
BE	Financing of railway infrastructure charges	2022-2025	13 EUR million
CH	Operating subsidies	2006-2023	n/a
	Grant for operators of unaccompanied CT	2024-2026	86 EUR million
	Financial aid for terminal owners or operators	n/a	n/a
CZ	Subsidy for the purchase of intermodal transport units	2018-2023	16 EUR million

	Description	Time frame	Amount (p.a.)
DE	Partial financing of track access charges	2018-2024	200-350 EUR million
	Promotion of transshipment facilities	2022-2026	n/a
ES	Support for modal shift to rail (all goods except coal)	2022-2024	60 EUR million
FR	Payment per intermodal transport unit	2016-2022	n/a
	Promotion of single wagon and CT	2021-2024	20 EUR million
HR	Reduction of annual road charges	2016-2023	n/a
IT	Support for terminal modernisation	2022-2026	55 EUR million
	Aid calculated per train-km	2023-2027	22 EUR million

	Description	Time frame	Amount (p.a.)
NL	Top-Sector Logistics	2022-2026	n/a
	Aid calculated per intermodal transport unit	2023-2025	~7.5 EUR million
SI	Development of intermodal transport routes	2022-2027	30 EUR million
PL	Financing of railway infrastructure charges	2024-2028	~12 EUR million
SK	Aid calculated per transport leg or intermodal transport unit	2023-2027	6 EUR million
RO	Support for terminal modernisation	2021-2027	n/a

Sources: Ministries of Transport and state budgets of the respective countries; European Commission

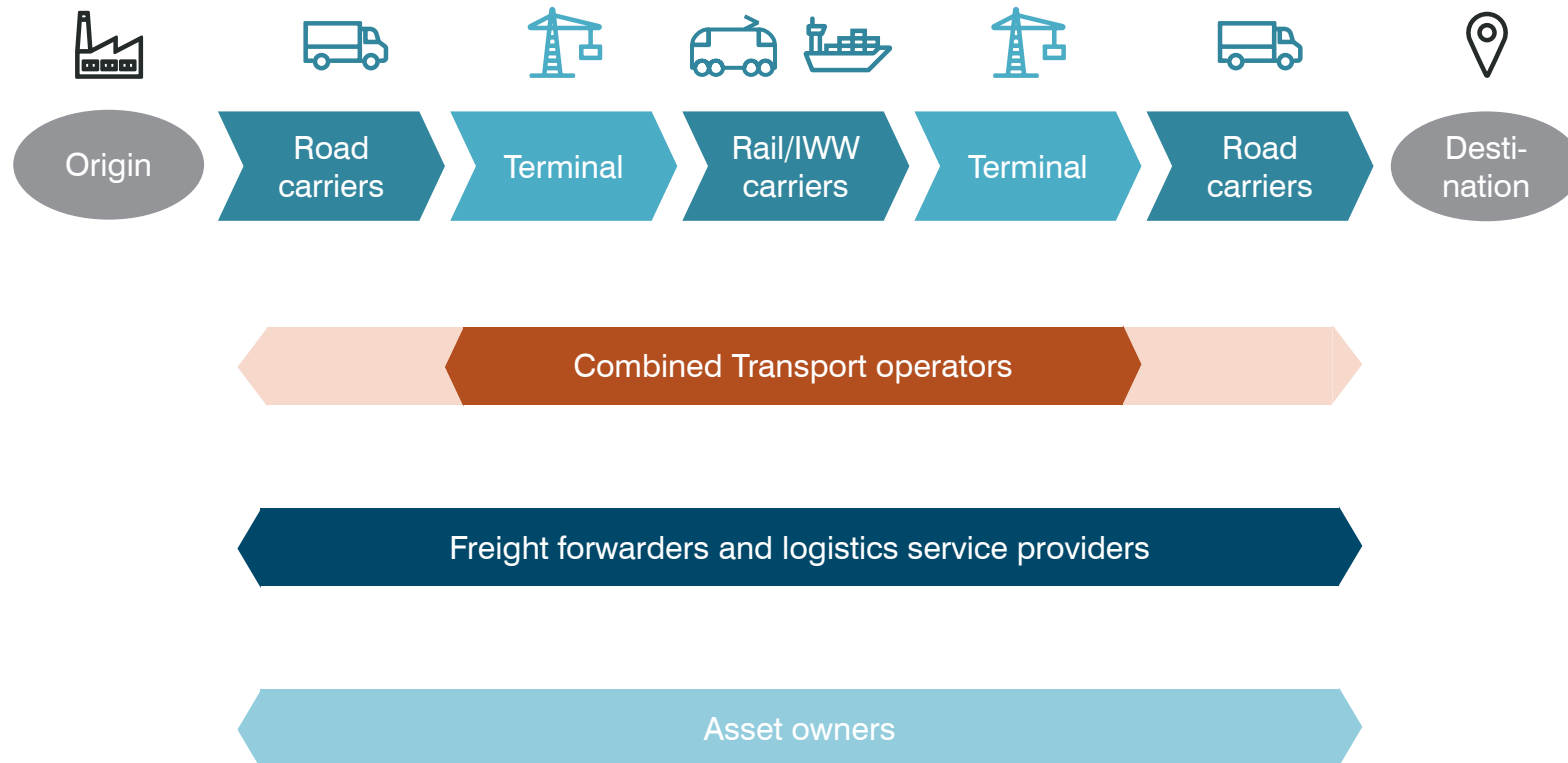
# 08

## Stakeholders



## A diverse set of stakeholders is involved in Combined Transport chains

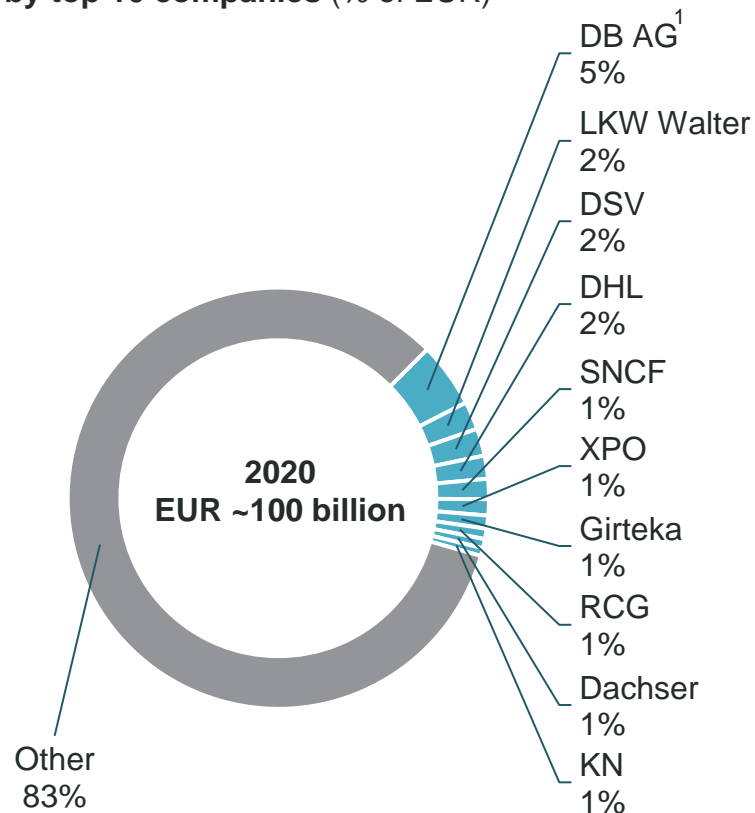
### Stakeholders along the Combined Transport value chain



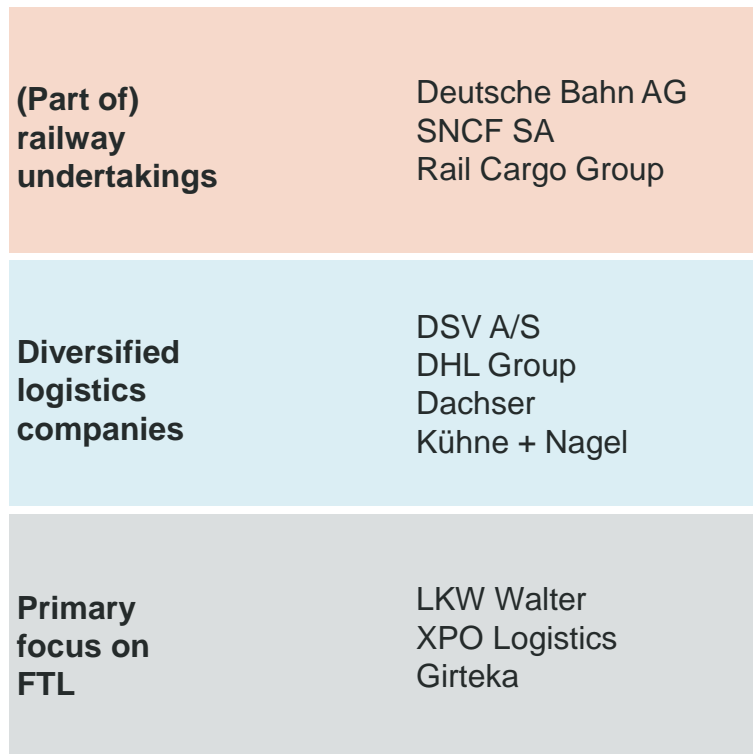
- Combined Transport integrates a host of different and specialised service providers:
  - **Freight forwarders and logistics service providers** organise the transport from origin to destination.
  - **CT operators** organise the intermodal transport chain from terminal to terminal or origin to destination.
  - **Terminal operators** organise transshipment between road, rail and IWW.
  - **Carriers** provide the transport of goods by road, rail or IWW.
  - **Asset owners** provide rolling stock and loading units for transport services.
- While some CT stakeholders have a concentrated business, others assume **several roles at the same time**. As an example, a company may act as a CT operator but also operate terminals and offer IWW and road carrier services, for which the company owns dedicated assets.

# Freight forwarding in Europe is highly competitive with a low market concentration

General FTL provider landscape in Europe by top 10 companies (% of EUR)



Classification of companies based on their focus within the value chain

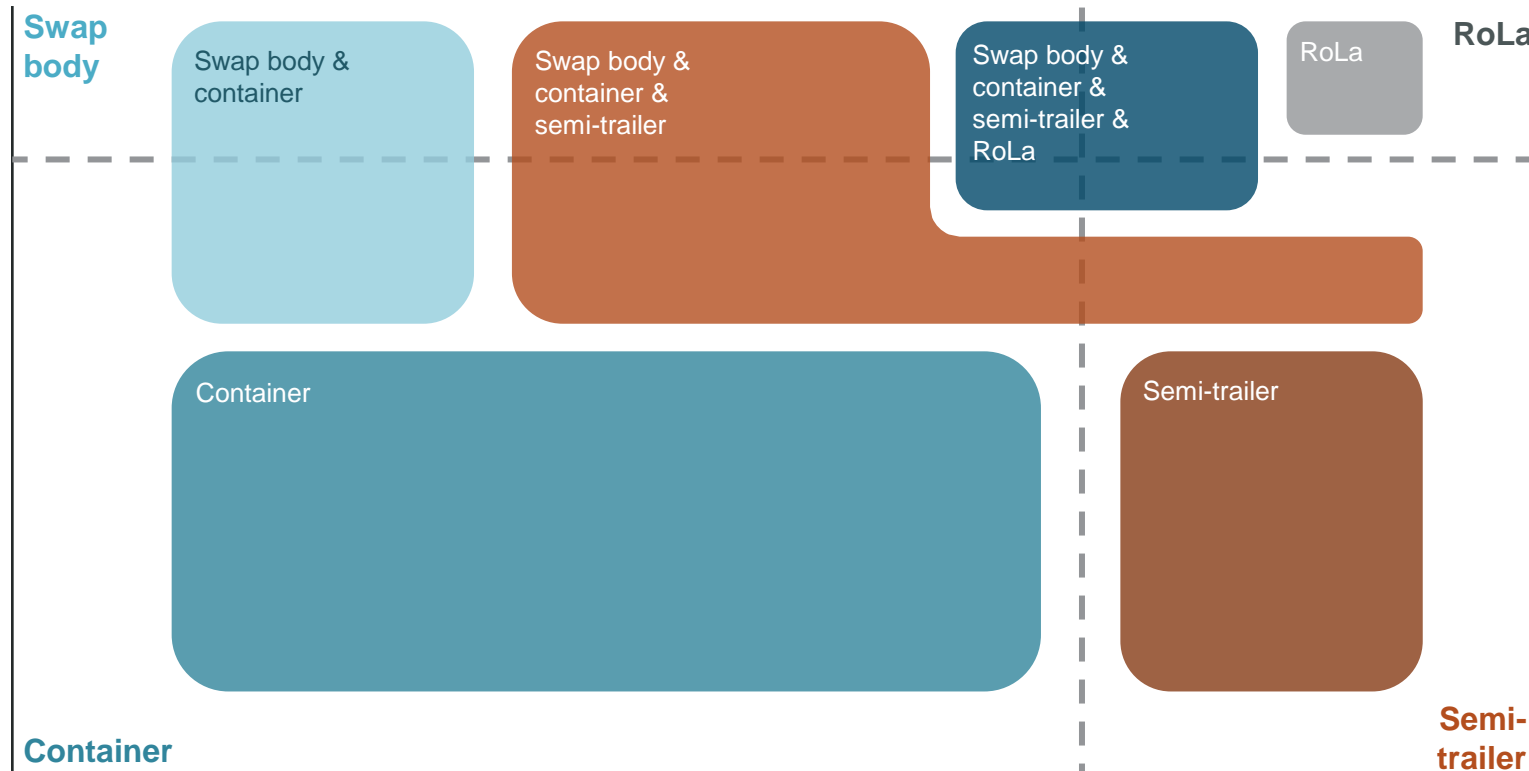


- The market for freight forwarding in Europe has a very low market concentration. **The top 10 Full Truck Load (FTL) providers have a market share of less than 20% combined.** For the top 10 Less than Truck Load (LTL) providers, the combined market share is 30%, while it is about 15% for the top 10 Ocean Cargo Logistics providers.
- Due to the compartmentalised nature of the market, a high share of the added value of freight forwarding remains in Europe. XPO Logistics is the **only non-European company among the top freight forwarders in the EU.**
- Freight forwarders come from different backgrounds:
  - **Full-service logistics companies**, which also offer warehousing or contract logistics.
  - **Railway undertakings** that have expanded their portfolio over the years.
  - **FTL specialists** with a focus on lorry operations.

Source: Companies' annual reports; 1) Includes DB Schenker (3.5%) and DB Cargo (1.5%)

## Combined Transport operators offer both highly specialised and a broad range of services

### Business models of European CT operators differentiated by handled loading units



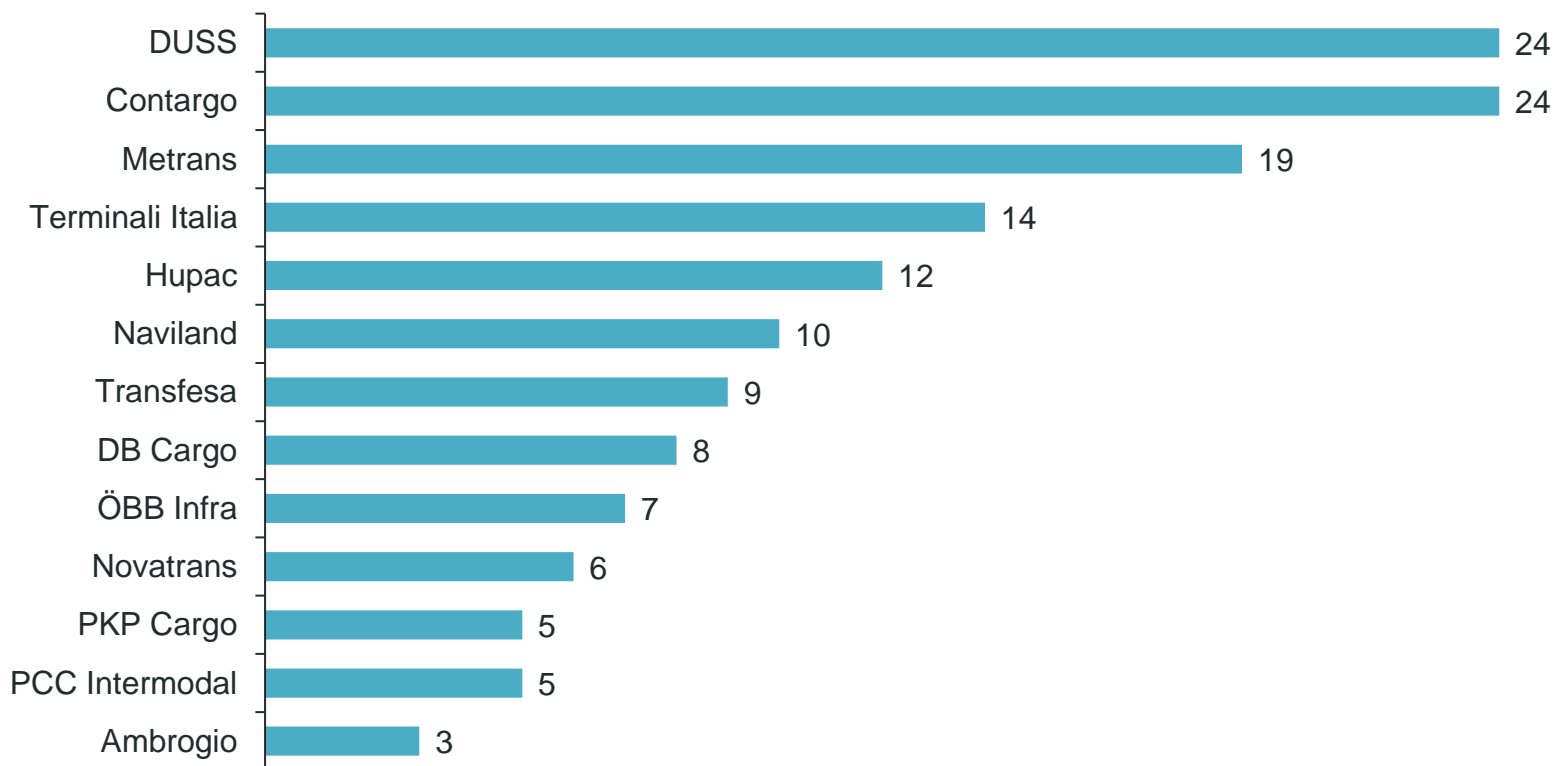
Source: Companies' websites

- As the Combined Transport market is distinguished by different loading units, **CT operators can decide to either focus on certain subsegments of the CT market or to provide CT solutions for all segments**. While a focused approach allows for more standardised processes, it narrows the possibilities to seize growth opportunities.
- While only a few CT operators concentrate exclusively on continental CT (swap bodies, semi-trailers, RoLa), several CT operators only offer maritime CT (containers). However, **most CT operators offer services for more than one transport type**.
- A special case is the **RoLa** operator Ralpin, which only operates connections between Freiburg in Germany and Novara in Italy. It is subsidised by Switzerland until 2026 with the purpose of shifting lorries on transit connections from road to rail.

## The European Combined Transport terminal landscape is diversified with many local operators

### Terminals operated by selected hinterland CT terminal operators

(number)

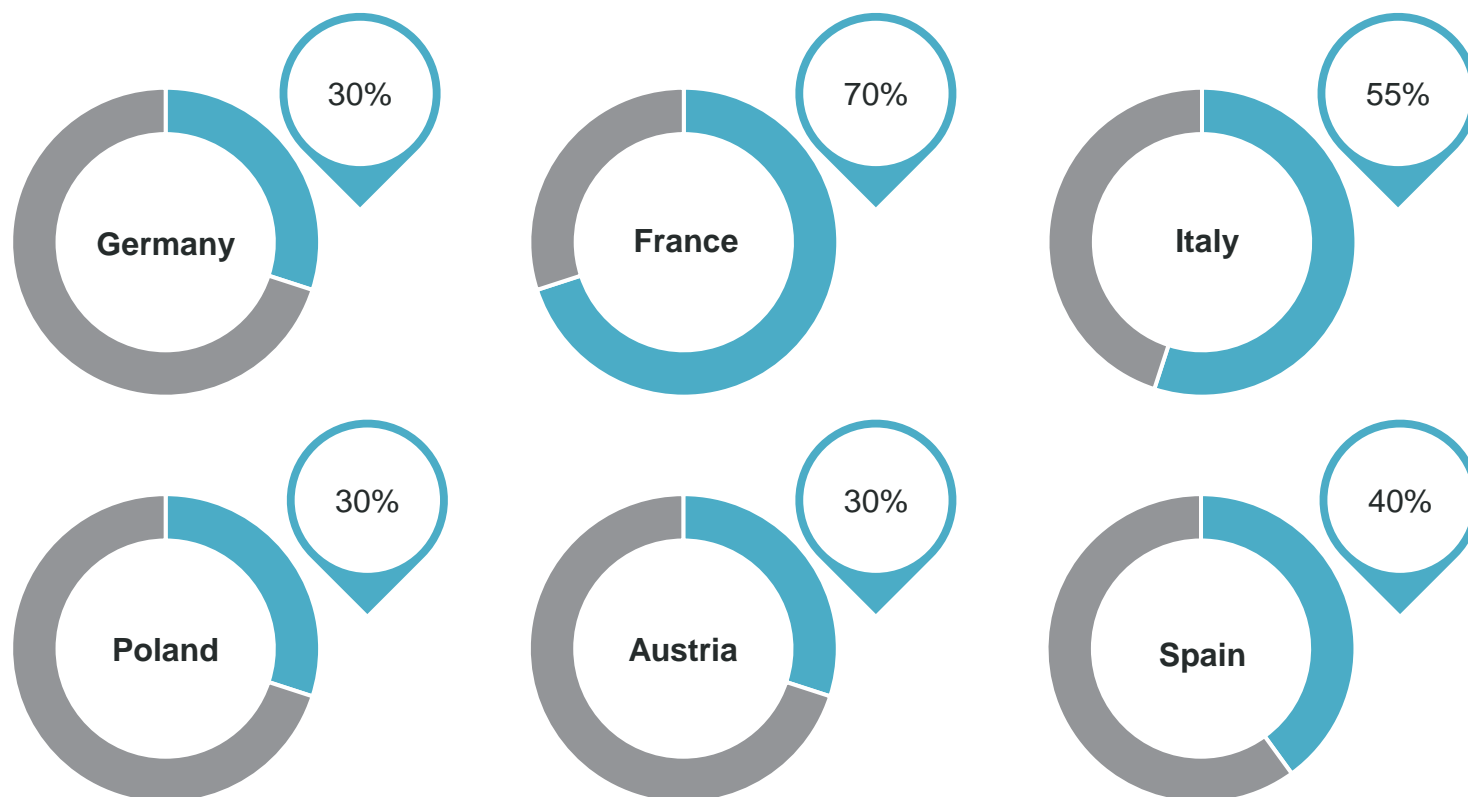


- The hinterland Combined Transport terminal landscape in Europe is built around big terminals in Central Europe, which often function as **hubs for intermodal networks**. Smaller terminals in between and at the periphery of Europe have feeder functions that connect their regions with these networks.
- CT terminal operations represent a **very fragmented business**, with many terminals not part of bigger business networks.
- **DUSS** is the biggest CT terminal operator with 24 terminal locations currently in operation in Germany. This represents less than 3% of all hinterland terminals in Europe.
- Measured by directly controlled handling capacity, **Metrans** is the most important CT rail terminal operator in Europe due to several hub terminals in Central Eastern Europe.
- **Contargo** is concentrated along the Rhine valley, offering access to rail and IWW CT networks.

Source: SCI Multiclient Study "The European Intermodal Rail Freight Transport Market 2023"; Companies' websites

## The liberalisation of the European railway market sparks competition for Combined Transport services

Incumbent share for CT rail transport in 2022 for selected countries  
(% of tkm)

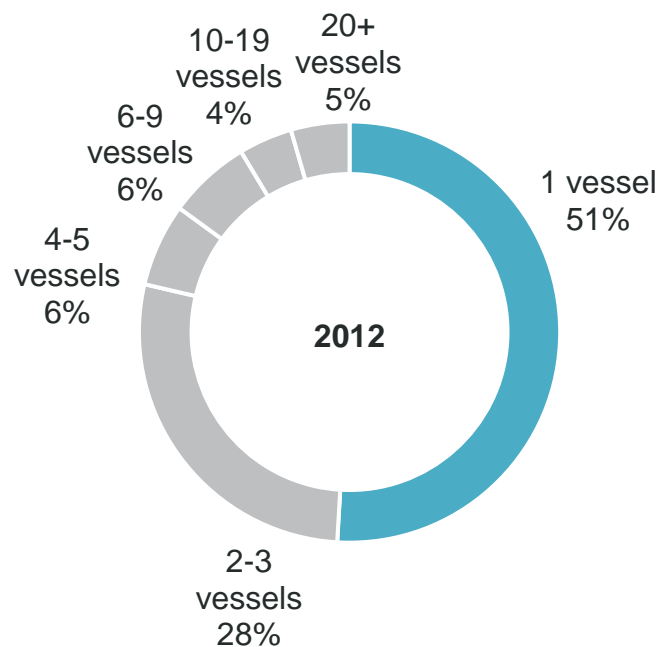


Source: SCI Multiclient Study "The European Intermodal Rail Freight Transport Market 2023"

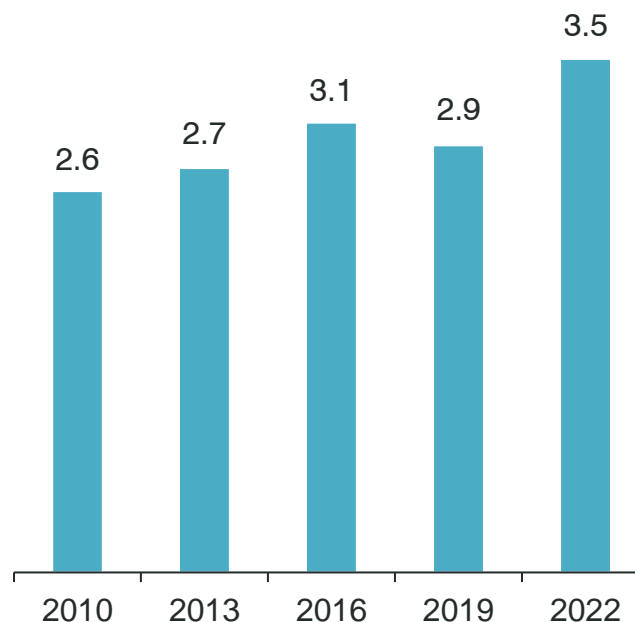
- European **incumbents** have **lost significant market shares for Combined Transport since the liberalisation of rail infrastructure access**. Based on the current market outlook, this development is likely to continue.
- In France, local incumbent **Fret SNCF had to give up all CT operations**, which were worth around 20% of its revenues, following an order from the EU Commission. This will open the door for other railway undertakings in the French market, which so far remained the biggest rail freight market with a market share of over 50% for the incumbent.
- A relevant subsegment of railway operation in the European CT market is **shunting in terminals**, especially in ports. This is very often carried out by specialised service providers, who operate small shunting fleets. While some terminals operate as open-access models allowing a free choice of service providers, other terminals include shunting services in their service fees.

## Combined Transport inland waterway hinterland networks need sizeable fleets to provide reliable and regular services

Number of vessels per IWW company for selected European countries<sup>1</sup> (% of all companies)



Average number of vessels per IWW company in Germany (number of vessels)



- The average IWW service provider usually owns a low number of ships, as **many vessel owners are self-employed** and offer charter transports for freight forwarders or bigger companies.
- Due to this market situation, companies like Contargo or HGK, who own fleets of more than 50 vessels and offer Combined Transport along the Rhine, are **important catalysts for the CT hinterland network** as they are capable of organising reliable and regularly scheduled services.
- Due to market consolidation and the loss of independent shippers (retiring due to old age and/or economic pressure caused by a declining transport volume), **the average fleet size in Germany is slowly growing over time.**

Sources: Eurostat iww\_ec\_ent\_n as of 2/3/2015; DESTATIS Table 46311-0001 as of 18/9/2024

1) BG, FI, HR, PL, SK and UK.

## The biggest service provider focused on Full Truck Load transport in Europe is a Combined Transport specialist

### Overview of largest road transport companies by revenue size and share of FTL services (2020)

FTL share	FTL revenue > EUR 1,000 million	FTL revenue EUR 500-1,000 million	FTL revenue < EUR 500 million
> 67 %	LKW Walter	Girteka Logistics Hegelmann Express	Waberer's International
33-67 %	-	-	Gruber Logistics Fercam Ewals Cargo Care NTG Nordic Duvenbeck
< 33 %	DB Schenker DSV DHL Group XPO Logistics	Dachser Kühne + Nagel E.L.V.I.S Bollere Holding	Hermes Germany Rhenus BLG Logistics Hellmann Worldwide Gebrüder Weiss

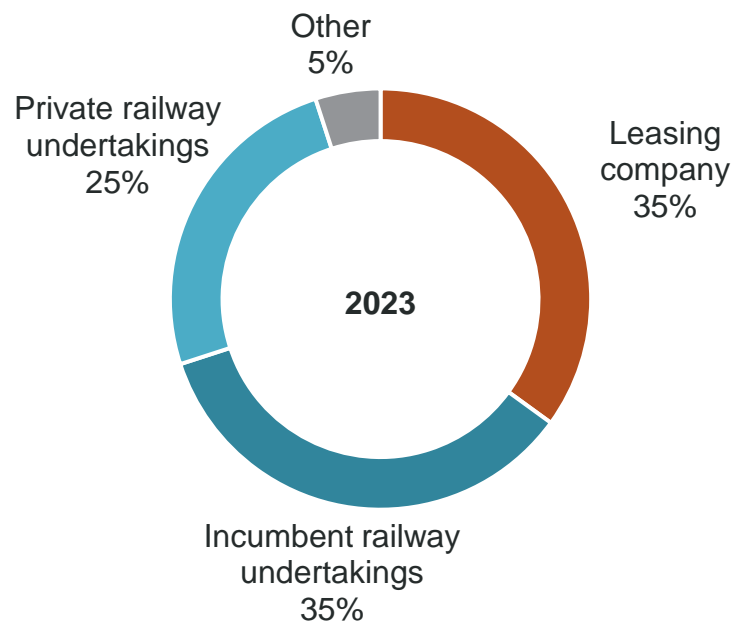
- The road legs of Combined Transport chains are part of the European Full Truck Load (FTL) market, which is **mostly serviced by specialised SMEs**.
- **Companies with FTL revenues over EUR 50 million per year are usually not solely focused on road transport** but provide a host of logistics services. Big road fleet operators like Girteka, Hegelmann and Waberer's are noteworthy exceptions. However, Waberer's recently changed strategy and aims to become a full-service logistics provider.
- The biggest company concentrated on the FTL market by revenue in Europe is **LKW Walter**, a Combined Transport specialist that operates the biggest fleet of craneable trailers in Europe.

Source: Companies' annual reports

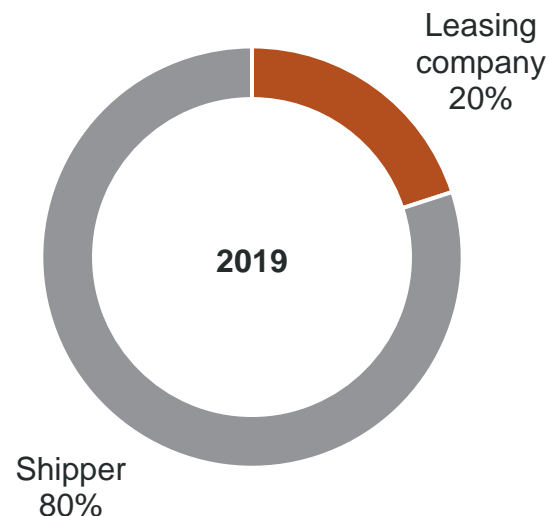


## Leasing companies are increasingly playing an important role in the supply of Combined Transport assets

**Intermodal wagon fleet by type of owner**  
(% of wagons)



**Swap body fleet by type of owner**  
(% of swap bodies)



- The strong push Combined Transport received before the current crisis led to an increased interest of investors in the business. While railway undertakings still hold 60% of the overall fleet of intermodal wagons, **leasing companies already own as many intermodal wagons as all incumbents in Europe together.**
- **The share of leasing companies is expected to further increase.** This will be driven by leasing companies continuing to expand their fleets, while incumbents and private operators rely more and more on leasing options to expand their operations.
- The growing importance of leasing companies can also be seen in other assets needed for Combined Transport, such as swap bodies and containers, as **around a fifth of all swap bodies are owned by leasing companies.**

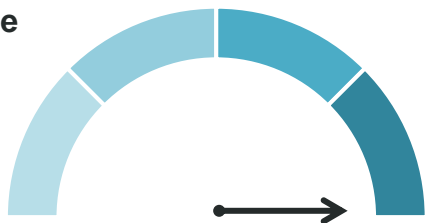
# 09

## Economics of Combined Transport

Key buying factors for customers of Combined Transport are price-sensitivity and quality-orientation, while CO<sub>2</sub> emission savings will play a more important role in the future

### Price

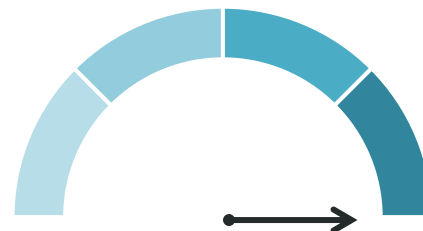
#### Importance for clients



- Road freight transport is a highly competitive market, resulting in very high cost awareness on the side of clients. In most cases, Combined Transport operations are only competitive if the costs for the total transport chain are below the costs for road transport only.
- CT offers competitive prices on long-distance routes; the advantage for rail will grow with increasing road producer prices.
- **Future rising prices for diesel, including consideration of CO<sub>2</sub> pricing, and toll increases are leading to rising prices for road transport.**

Source: Expert interviews

### Speed and reliability



- Road freight operators usually operate on tight schedules in just-in-time supply chains, resulting in a need for fast and reliable connections.
- **CT eliminates the need for law-mandated breaks for drivers, resulting in shorter transport times.**
- **Longer train handling times in terminals compared to road traffic become increasingly less relevant the longer the total distance.**

### CO<sub>2</sub> emission savings



- Growing commitments by companies to reduce carbon emissions over the next decades puts forwarders and road freight operators under pressure to cut transport-related CO<sub>2</sub> emissions.
- **Combined Transport allows clients to reduce CO<sub>2</sub> emissions without cost increases for end consumers, as rail transport is considered low emitting by EU regulation, whereas clients must actively decide to offset emissions when choosing road transport, resulting in higher costs.**

## Combined Transport and terminal operators were able to expand business between 2019 and 2022

Revenues and EBIT margin of selected European Combined Transport and terminal operators 2019-2022  
(EUR million; %)

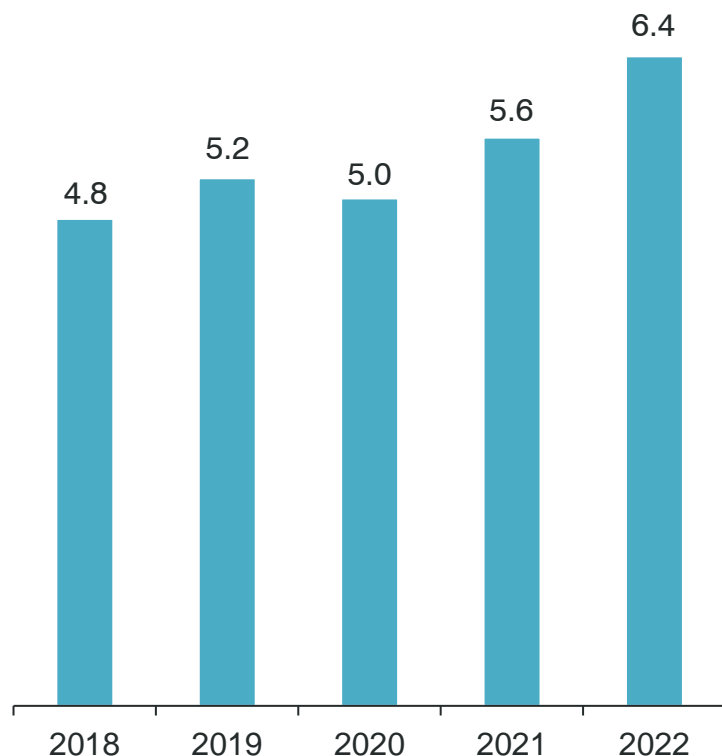
Operator	Main focus	Revenue			EBIT		
		2019	2022	CAGR 2019-22	2019	2022	CAGR 2019-22
HHLA (incl. Metrans)	CT operation	487	595	+6.9%	99.2	104.3	+1.7%
	Terminal	800	864	+2.6%	141.3	157.3	+3.6%
Hupac <sup>1</sup>	Both	611	669	+3.1%	11.0	14.0	+8.4%
Eurogate	Terminal	565	690	+6.9%	52.0	76.0	+13.5%
Contargo	Both	534	654	+7.0%	<i>Not available</i>		
Kombiverkehr	Both	411	463	+4.1%	0.3	0.4	+10.1%
DUSS	Terminal	76	88	+5.0%	6.0	10.0	+18.6%
CTS <sup>2</sup>	Terminal	32	37	+5.0%	1.1	1.9	+20.0%
KTL <sup>3</sup>	Terminal	21	29	+11.4%	0.5	3.9	+98.3%

- **Between 2019 and 2022, Combined Transport and terminal operators were able to grow their revenues and EBIT margins** due to the increased demand for CT. Terminal operators in particular benefitted from the high demand for maritime container shipping.
- Most profit margins for companies in the CT sector range between less than 1% and over 20% at the extremes, with most companies posting a **profit below or around 10%**.

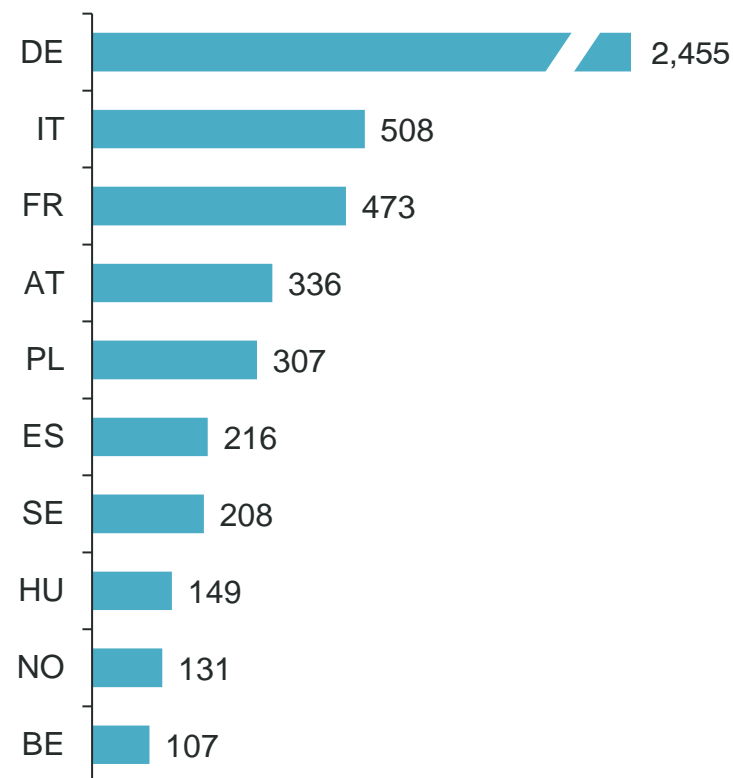
Sources: Companies' annual reports; 1) CHF million. 2) CTS Container-Terminal Cologne. 3) Kombi-Terminal Ludwigshafen.

## Rail carriers' revenues from Combined Transport trains grew by 33% between 2018 and 2022

European rail carriers' total revenues from CT trains (billion EUR)



Top 10 markets by revenue from CT trains (2022, million EUR)



- Due to increasing average revenues per tkm, rail carriers increased revenues from Combined Transport train operations by a third from 2018 and 2022. At the same time, transport performance grew by only 15%. This means that **about half of the increase was realised by higher prices** for transport services. Reasons for the price hike, especially in 2022, were increasing operational costs caused by higher energy prices, but also general inflation, salary growth and higher Track Access Charges in various member states.
- Due to its sheer size, **Germany is the top market by revenue from CT trains**. However, due to relatively high average revenues per tkm compared to other markets, the market is bigger than the CT rail freight performance implies. Similarly, Italy, Austria and Hungary outperform other countries with higher CT rail freight performance if market size is expressed in revenue.

Source: SCI Verkehr based on IRG-rail 12<sup>th</sup> Annual Market Monitoring Report 2024 and Eurostat rail\_go\_contwgt as of 19/7/2024

# 10

## Contributions to EU Policy Goals

# Combined Transport is a climate-friendly and sustainable solution that contributes to EU priorities and policy goals

## Energy & Climate policy goals

### Energy efficiency:

Reduction of energy consumption of long-distance transport chains by up to 70%.

### Energy independence:

Reduction of Europe's dependency on imported energy due to electrification of transport chains.

### Zero-Carbon Europe:

Reduction of freight transport's carbon footprint by up to 90%.

## Economy & Health policy goals

### Competitiveness:

Reduction of costs for shippers, especially for heavy loads and dangerous goods.

### Employment:

Creation of high-productivity and high-quality local jobs.

### Health:

Reduction of noise and air pollution for European citizens.

## Infrastructure & Safety policy goals

### Maintenance:

Reduction of degradation of road infrastructure by shift of road freight transport to rail.

### Capacity:

Reduction of road congestion by shift of road freight transport to rail.

### Safety and security:

Reduction of road accidents and cargo theft by shift of road freight transport to rail.



## The addition of rail and inland waterways to transport chains reduces the amount of road freight transport performance needed to complete transport services

### Addressable challenges:

- A 55% cut in greenhouse gas emissions from 1990 levels by 2030.
- A 40% share of renewable energy by 2030.
- A 36% improvement in energy efficiency for final consumption by 2030.

### Reduction of energy consumption of long-distance transport chains by up to 70%

Compared to a modern lorry adhering to emission standard Euro 6 or Euro 7, door-to-door Combined Transport offers an effective, affordable and low-risk path to improving energy efficiency by up to 70%, depending on the route.

### Reduction of Europe's dependency on imported energy due to electrification of transport chains

Depending on the mix of energy sources, Combined Transport directly uses non-fossil electricity and profits immediately from the addition of more renewable energy sources to the grid.

### Reduction of freight transport's carbon footprint by up to 90%

Combined Transport is an established and proven means to transform non-fossil electricity into transport services on an industrial scale at a competitive price for clients.

## Combined Transport increases productivity and reduces pressure from the lorry driver shortage while improving quality of life for all stakeholders

### Addressable challenges:

- Europe's competitiveness is weakened by its lower productivity compared to its direct global competitors.
- 7% of all positions for lorry drivers are unfilled in Europe.
- 98% of Europeans breathe air polluted beyond the WHO thresholds.
- 150 million Europeans are subjected to harmful levels of road noise.

### Reduction of costs for shippers, especially for heavy loads and dangerous goods

Transporting cargo in stackable, intermodal loading units like containers provides low-cost temporary storage, creates more robust supply chains and rationalises factory layouts.

### Creation of high-productivity and high-quality local jobs

Door-to-door Combined Transport replaces long-distance road freight transport with day-trucking and high productivity transshipment jobs, creating a better work/life balance for workers.

### Reduction of noise and air pollution for European citizens

Combined Transport emits less noise pollution than road transport as it often avoids the use of combustion engines and uses technologies such as low-noise wagons to reduce noise exposure for one in three European citizens.

Unlike roads, railways are built for the safe handling of heavy loads, while inland waterways are natural carriers of heavy cargo

Addressable challenges:

- Heavy goods vehicle axles are the leading cause of road and bridge degradation.
- Zero-emission vehicles cause the same amount of road congestion as diesel vehicles.
- Vision Zero: Reduction of road deaths to zero by 2050.

#### Reduction of degradation of road infrastructure by shift of road freight transport to rail

Rail infrastructure is built to support 22.5-tonne axles, ideal for heavy loads. In contrast, only 2% of all road vehicles have the highest axle load of 11.5 t and already contribute to accelerated road deterioration.

#### Reduction of road congestion by shift of road freight transport to rail

A three-fold increase in Combined Transport performance would avoid 350 million road vehicle-hours, reducing road congestion for all stakeholders.

#### Reduction of road accidents and cargo theft by shift of road freight transport to rail

Rail transport is safer than road transport as there are fewer accidents due to fail-safe train control systems and reduced risks of cargo theft.

The European Union needs to support the Combined Transport sector to facilitate the realisation of the sector's contributions to EU policy goals

## Investments

- **EUR 16.5 billion of annual investment** into rail infrastructure to establish the harmonised TEN-T parameters, including a 4-metre loading gauge, 22.5-t axle load and 740-m train length.
- **EUR 1.5 billion of annual investment** into intermodal assets like terminals, loading units, intermodal wagons, skeleton trailers and digitalisation from the sector.

## Legislative support

- **The creation of a supportive regulatory environment** that allocates the appropriate quality and quantity of train paths to intermodal freight trains.
- **TEN-T Regulation Revision** should ensure that all lines used by freight trains offer equal technical parameters, including 22.5-t axle load, 740-m train length, 4-m clearance and electrification.
- **The new Rail Capacity Management Regulation** should establish European rules on capacity allocation during timetabling and when circumventing maintenance works and standardised traffic priority rules that give priority to freight trains in the event of interruptions.

Achieving the required doubling of the rail freight market share depends on a 5% annual increase of door-to-door Combined Transport in total long distance inland freight transport – at least until 2050!

# Methodology and Definitions

# 11

## Abbreviations and Definitions

# Abbreviations

## Abbreviations used in the report

<b>CAGR</b>	Compound Annual Growth Rate	<b>n.a.</b>	not available
<b>CO<sub>2</sub>e</b>	CO <sub>2</sub> equivalent	<b>NUTS</b>	Nomenclature of Territorial Units for Statistics (French: “Nomenclature des Unités Territoriales Statistiques”)
<b>CT</b>	Combined Transport	<b>OTN</b>	Operational Train Number
<b>EBIT</b>	Earnings Before Interest and Taxes	<b>PLC</b>	Primary Location Code
<b>ERTMS</b>	European Rail Traffic Management System	<b>RFC</b>	Rail Freight Corridor
<b>EUR</b>	Euro	<b>RoLa</b>	Rolling motorways (German: “Rollende Landstraße”)
<b>FTL</b>	Full Truck Load	<b>RU</b>	Railway Undertaking
<b>GDP</b>	Gross Domestic Product	<b>SME</b>	Small and Medium Enterprise
<b>GHG</b>	Greenhouse gas	<b>TEN-T</b>	Trans-European Transport Network
<b>IM</b>	Infrastructure Manager	<b>TEU</b>	Twenty-foot Equivalent Unit
<b>IWW</b>	Inland Waterway	<b>tkm</b>	Tonne-kilometre
<b>LTL</b>	Less than Truck Load	<b>TAC</b>	Track Access Charge
<b>MS</b>	Member State		
<b>mt</b>	megatonne		

## Country codes

<b>AT</b>	Austria	<b>IE</b>	Ireland	<b>UA</b>	Ukraine
<b>BE</b>	Belgium	<b>IT</b>	Italy	<b>UK</b>	United Kingdom
<b>BG</b>	Bulgaria	<b>KZ</b>	Kazakhstan		
<b>BY</b>	Belarus	<b>LT</b>	Lithuania		
<b>CH</b>	Switzerland	<b>LU</b>	Luxembourg		
<b>CN</b>	China	<b>LV</b>	Latvia		
<b>CZ</b>	Czech Republic	<b>NL</b>	Netherlands		
<b>DE</b>	Germany	<b>NO</b>	Norway		
<b>DK</b>	Denmark	<b>PL</b>	Poland		
<b>EE</b>	Estonia	<b>PT</b>	Portugal		
<b>EL</b>	Greece	<b>RO</b>	Romania		
<b>ES</b>	Spain	<b>RU</b>	Russia		
<b>FI</b>	Finland	<b>SE</b>	Sweden		
<b>FR</b>	France	<b>SI</b>	Slovenia		
<b>HR</b>	Croatia	<b>SK</b>	Slovakia		
<b>HU</b>	Hungary	<b>TR</b>	Turkey		



# Definitions of technical terms

<b>Accompanied Combined Transport</b>	Transshipment of the loading unit together with road vehicle and driver from road to rail or IWW ("RoLa").	<b>Rail Freight Corridor (RFC)</b>	transport. A specified route over which EU Member States must facilitate international rail freight.
<b>Compound Annual Growth Rate (CAGR)</b>	The mean annualised growth rate for compounding values over a given period.	<b>Railway Undertaking (RU)</b>	Any public or private undertaking which provides services for the transport of goods and/or passengers by rail.
<b>Continental Combined Transport</b>	Combined Transport of swap bodies, semi-trailers and lorries by rail or IWW, usually as part of intra-European transport chains.	<b>Rolling motorways (RoLa)</b>	A form of Combined Transport involving the conveying of road vehicles (e.g. lorries, tractors with or without semi-trailer attached) by rail. Not to be confused with "Autopista Ferroviaria", a Spanish programme for the promotion of continental Combined Transport in Spain.
<b>CO<sub>2</sub> equivalent (CO<sub>2</sub>e)</b>	Metric measure used to compare the emissions from various greenhouse gases.	<b>Shunting</b>	Pushing or pulling a train or a part of a train from the main line to a siding or inside a railyard or terminal.
<b>Full Truck Load (FTL)</b>	Transport of a single shipment by lorry. Does not necessarily indicate that the lorry is fully loaded.	<b>Tonne-kilometre (tkm)</b>	A performance measure for freight transport. Product of the weight of the transported goods and the transport distance.
<b>Horizontal transshipment</b>	Transshipment of non-craneable semi-trailers from road to rail. Can be achieved either with craneable loading platforms, special wagons and/or specific terminal infrastructure.	<b>Track Access Charge (TAC)</b>	All charges paid by train operating companies according to track access contracts.
<b>Incumbent</b>	Publicly owned Railway Undertaking that developed out of a former state monopoly (e.g. DB Cargo, PKP Cargo).	<b>(TEN-T) Trans-European Transport Network</b>	A planned network of roads, railways, airports and water infrastructure in the European Union for coordinated improvements of primary roads, railways, inland waterways, airports, seaports, inland ports and traffic management systems to facilitate integrated and intermodal long-distance, high-speed transport connections.
<b>Infrastructure Manager (IM)</b>	A rail company responsible for maintaining and operating railway infrastructure.	<b>Twenty-foot Equivalent Unit (TEU)</b>	A measure for containerised units. All containerised units are expressed as a factor of twenty feet, the smallest standard container size for maritime transport.
<b>Intermodal transport</b>	Transport of a loading unit by various means of transport during a single transport chain.	<b>Unaccompanied Combined Transport</b>	Transshipment of the loading unit from road to rail or IWW independently from road vehicle and driver.
<b>Less than Truck Load (LTL)</b>	Transport of several bundled shipments in the same lorry. Does not necessarily indicate that the lorry is only partially loaded.	<b>Vertical transshipment</b>	Transshipment from road to rail by lifting a loading unit from the ground, either with a crane or a reach stacker.
<b>Maritime Combined Transport</b>	Combined Transport of ISO containers by rail or IWW, usually as part of intercontinental transport chains.		
<b>Modal split / Modal share</b>	Measure of the distribution of transport volume or performance by modes. "Modal split" refers to the distribution over all considered means of transport, whereas "modal share" refers to the share of a specific mode of		

# 12

## Methodology

## Approach to data collection

This report was compiled with the goal of giving a factual, complete and data-supported overview of the Combined Transport sector in Europe. However, as outlined on the next page, there are several gaps in the data landscape, so that a report relying on one single data source is not possible.

As an industry insider, SCI Verkehr (the compiler) has taken up the challenge of developing a market analysis and forecasting method which provides valid statements about current market volumes and the short- to long-term market development, even if data is not publicly available. Therefore, SCI Verkehr uses the tried and tested combination of bottom-up and top-down approaches for analyses and forecasts.

The basis of SCI Verkehr's information is a regular analysis of all relevant data sources worldwide. These include:

- Official government news reports and statistics
- Press releases and business reports from transport companies

- Trade journals and daily press in over 15 languages
  - The conclusions from conferences and symposia
- SCI Verkehr then evaluates and organises this originally unstructured and unverified data.

In spirit of the brief and to allow for continuity with former iterations of this report, data has been mostly collected from **Eurostat**. In cases where Eurostat had gaps in rail statistics (e.g. because of missing data from Member States), SCI Verkehr used its long-running in-house database to fill the gaps. This database is consistent with Eurostat data, regularly updated and is validated by industry stakeholders via multiple consulting projects that include this data.

Wherever Eurostat has not provided relevant data, other **publicly available information** has been used instead. Besides statistical data from organisations other than Eurostat, this also includes company data via annual reports and websites,

as well as studies and reports published in recent years.

Only if public data was not available, has proprietary data been used. Besides data provided by the commissioners of the report and the compiler, the most important proprietary data source was a data delivery from **train information data compiled by RailNetEurope (RNE)**. Please refer to page 116 for more information on this data source.

The data was faithfully taken from the sources indicated on each page and listed on page 117. Wherever data has been processed in any way, this is documented on pages 113-114.

## Data availability: A short overview of gaps in Combined Transport statistics

- There are numerous legal texts that deal with transport in the European Union and its statistical recording. None of them currently refer directly to Combined Transport. However, the individual modes of transport address elements that are specific to CT, such as the type of loading units and goods.
- To create a catalogue of current existing statistical methodologies for intermodal statistics, the Horizon Europe project ReMuNet “Resilient Multimodal Freight Transport Network” carried out a metadata analysis.
- As intended, EU requirements mean that the Member States have very similar methodological characteristics when it comes to data collection. However, the scope and level of detail in the published data differ from country to country.
- The metadata analysis identified gaps in current CT statistics and gave recommendations on how to streamline CT data collection.

### Identified gaps in current CT statistics

- **Inconsistent legal requirements:** No legal requirement for Combined Transport data collection at European level.
- **Lack of standardised methods:** Varying methods for data collection can lead to inconsistencies.
- **Lack of standardised parameters and units:** Various parameters are used by different entities to collect and publish data.
- **Inadequate coverage:** Some modes of transport, in particular road freight transport, may not be adequately covered.
- **Spatial resolution:** It is not completely transparent which data is actually available at a fine spatial level below NUTS 0.
- **Periodicity variance:** There may be delays or different rhythms and completion times in individual countries.

### Recommendations

- **Harmonised legal frameworks:** Further harmonisation within EU and national regulations for data collection.
- **Standardised data collection methods:** Standardised collection of “must have” statistics for CT across all (European) countries.
- **Standardised data parameters and data integrity:** Standardised and uniform unit of measurement for CT performance parameters over all modes of transport.
- **Improved coverage:** Streamline data collection processes to minimise the burden while maximising the detail and frequency of data collection.
- **Enhanced data timeliness:** Implementation of efficient data processing systems that can expedite the transition from data collection to publication.

## Calculations and data analysis approaches used for the report (1/2)

- **Page 19:** Combination of values from different sources:
  - **Length road infrastructure:** UIRR country fact sheets
  - **Length rail infrastructure:** SCI Multiclient Study “Railway Track Systems – Global Market Trends 2023”
  - **Length IWW infrastructure:** Eurostat dataset iww\_if\_infrastr “Length of navigable inland waterways by waterway type”
- **Page 25:** Combination of values from different sources:
  - **Combined Transport:** Sum of CT rail performance from SCI Multiclient Study “The European Rail Freight Transport Market 2023” + CT IWW performance from Eurostat dataset iww\_go\_actygo “Container transport by type of goods and coverage (from 2007 onwards)” + CT road performance from Eurostat dataset tran\_im\_umod “Unitisation in road freight transport – tonne-kilometre for gross weight of goods”
  - **Rail freight performance (conventional):** Difference of Eurostat dataset Eurostat rail\_go\_grpgood “Goods transported by group of goods – from 2008 onwards based on NST 2007” (gaps filled with data from SCI Multiclient Study “The European Rail Freight Transport Market 2023”) – CT rail performance
  - **IWW freight performance (conventional):** Difference of Eurostat dataset iww\_go\_atygo “Transport by type of good (from 2007 onwards with NST2007)” – CT IWW performance
- **Road freight performance (conventional):** Difference of Eurostat dataset road\_go\_ta\_tott “Road freight transport by type of operation and type of transport (t, tkm, vehicle-km) – annual data” – CT road performance
- **Page 29, 30, 33, 34: Accompanied continental CT:** Based on Eurostat dataset rail\_go\_contwgt “Goods transported in intermodal transport units” (Road vehicles (accompanied)), validated and complemented by UIRR annual statistics based on input provided by members
- **Page 29, 31, 33: Cross-border transport volume:** Based on Eurostat dataset rail\_go\_contwgt “Goods transported in intermodal transport units” (International transport) divided by 2 to counteract double-counting (once in country of loading and once in country of unloading)
- **Page 36, 69:** For methodology of **SCI Verkehr Rail Freight** Market Forecast, please refer to page 115
- **Page 38, 41, 50, 51, 53, 54 :** Analysis of RNE train information dataset (please refer to page 116) for week of 12 to 18 September 2023 based on the parameters `origin_country`, `origin_timetable_time`, `origin_delta`, `destination_country`, `destination_timetable_time`, `destination_delta`, `section_planned_distance` and `section_actual_distance` of observed train runs
- **Page 40, 59: Corridor data:** Based on analysis of RNE train information dataset (please refer to page 116) for week of 12 to 18 September 2023 based on the parameters `origin_country` and `destination_country` of observed train runs
- **Page 44, 46: Transport flows with China:** Based on Eurostat dataset rail\_go\_intgong “International transport of goods from the reporting country to the unloading country” and Eurostat dataset rail\_go\_intcmgn “International transport of goods from the loading country to the reporting country”, validated and complemented by Eurasian Rail Alliance Index (ERAI) Statistics for finer split at Member State level. If ERAI volumes were higher than total trade volumes according to Eurostat, the difference was subtracted from trade flows with Belarus on the assumption that transshipment from standard to broad gauge happened in Belarus
- **Page 45, 46: Share of CT for rail freight transport via Belarus:**
  - **Import:** Sum of all transport flows from China + 5% of transport flows from Kazakhstan + 5% of transport flows from Belarus + 5% of transport flows from Russia divided by total imports from non-EU members excluding Balkans and EFTA countries based on Eurostat dataset rail\_go\_intcmgn “International transport of goods from the loading country to the reporting country”
  - **Export:** Sum of all transport flows to Asia + 50% of transport flows to Belarus + 50% of transport flows to Russia divided by total exports to non-EU members excluding Balkans and EFTA countries based on Eurostat dataset rail\_go\_intgong “International transport of goods from the reporting country to the unloading country”

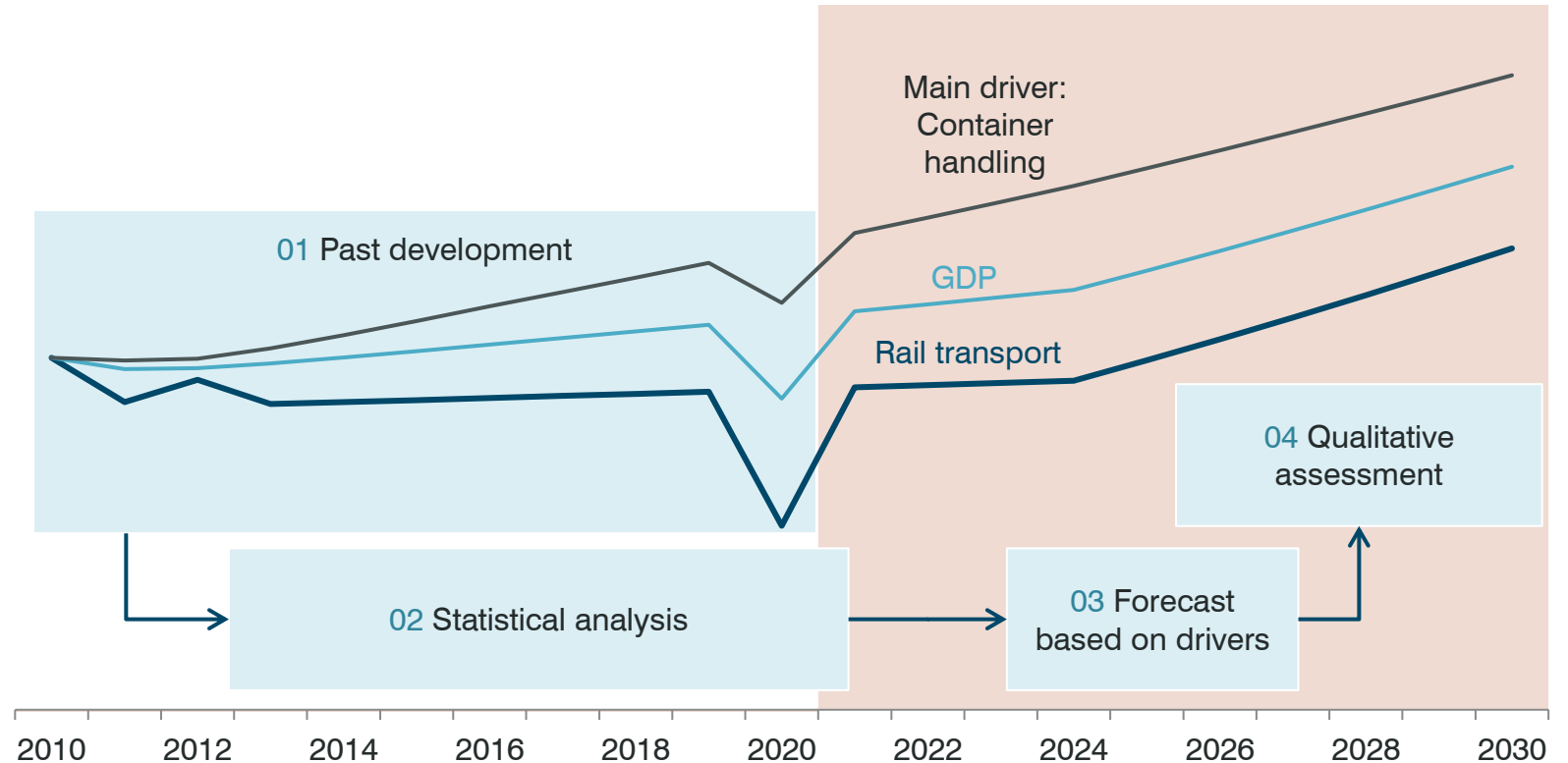
## Calculations and data analysis approaches used for the report (2/2)

- **Page 45, 48: Share of CT for rail freight transport via Turkey:**
  - **Import:** Quotient of Eurostat dataset rail\_go\_contwgt “Goods transported in intermodal transport units” (International transport – outgoing) / Eurostat dataset rail\_go\_intcmgn “International transport of goods from the loading country to the reporting country”
  - **Export:** Quotient of Eurostat dataset rail\_go\_contwgt “Goods transported in intermodal transport units” (International transport – incoming) / Eurostat dataset rail\_go\_intgong “International transport of goods from the reporting country to the unloading country”
- **Page 52, 53: Delayed CT trains by time group** based on analysis of RNE train information dataset (please refer to page 116) for week of 12-18 September 2023 based on parameters destination\_timetable\_time and destination\_delta of observed train runs
- **Page 53: Delay of selected cross-border CT train pairs by time group** based on analysis of RNE train information dataset (please refer to page 116) for week of 12 to 18 September 2023 based on parameters origin\_timetable\_time, origin\_delta, destination\_timetable\_time and destination\_delta, of observed train runs
- **Page 54: CT performance** calculated as product of train run distance based on analysis of RNE train information dataset (please refer to page 116) parameters section\_planned\_distance and section\_actual\_distance of observed train runs for week of 12-18 September 2023 \* 1,087 tonne (average weight of CT train in the Netherlands in 2023)
- **Page 55:**
  - **Average road distances for road-rail CT in Germany:** Quotient of Federal Motor Transport Authority Germany statistical publication VD 1 “Verkehr Deutscher Lastkraftfahrzeuge – Verkehrsaufkommen”, Übersicht 11 “Verkehrsaufkommen – Kombiniertes Verkehr” (Lastfahrten - Zurückgelegte Distanz) / (Lastfahrten - Anzahl)
  - **Road distances for container transport within Switzerland:** Own calculation of shares based on Federal Statistical Office Switzerland dataset “Transportgut nach Frachttart und Distanzklasse” (Grosscontainer und andere grosse Behälter)
- **Page 59:** Connections with horizontal transshipment calculated by adding up all RoLa connections and all connections offering transshipment with CargoBeamer, Megaswing, Modalohr, Nikrasa or R2L technologies advertised by CargoBeamer, CFL Intermodal, Helrom, TX Logistik, Rail Cargo Operator, Ralpin and VIRA within a standard week
- **Page 72: Modal split for Europe-East Asia trade:** Calculated based on different sources:
  - **Maritime and Air:** Estimation based on volumes given in Eurostat dataset mar\_go\_qm\_c2020 “Volume of containers transported to/from main ports – quarterly data (2019 to 2020)”, Eurostat dataset avia\_goexcc “International extra-EU freight and mail air transport by reporting country and partner world region and countries” and Suez Canal Authority Navigation Statistics
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- **Page 76: Share of road-freight market for semi-trailers and lorries** estimated based on Eurostat dataset road\_eqs\_lorrea “Lorries and road tractors by age and type of vehicle”
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- **Page 93: Average number of IWW vessels per IWW company in Germany** calculated as quotient of “Schiffe” / “Unternehmen”

# SCI Verkehr forecast methodology focuses on main drivers and qualitative assessment of further influencing factors

## Development of drivers for the SCI forecast of rail freight performance

- 01 Past development of rail transport and its drivers
- 02 Calculating a model that fits this development (linear regression)
- 03 Forecasting transport development based on development of drivers
  - External sources: IMF, World Bank, UN, Eurostat, etc.
- 04 Assessing results qualitatively
  - Infrastructure development
  - Perspectives for countries and segments



Source: SCI Verkehr



## RNE train information data

- RailNetEurope (RNE) provided the compilers with an excerpt of train information data from the Train Information System (TIS) for 2022 and 2023.
- The data excerpt was compiled to enable the analysis of real-world operational data from Combined Transport trains regarding travel distances, travel times, frequencies of service and delays.
- To avoid any effects of holidays, the data excerpt contained all trains between 12 and 18 September for each year, as this week does not contain any national holidays which could affect timetables.
- The data was processed and analysed in-house by the compilers of this report.

### Identification of Combined Transport trains

Trains were identified as Combined Transport trains if at least one of the following conditions was met:

1. Train starts anywhere and has a reference Operational Train Number (OTN) between 40000 and 43999;
2. Train starts at a Primary Location Code (PLC) that is identified with a terminal from the UIRR terminal reference list and ends at an PLC that is identified with a terminal from the UIRR terminal reference list;
3. Trains starts in Belgium and has a reference OTN between 3###70 and 3###99.

This approach is conservative and likely to underreport existing CT connections, especially between ports and on domestic connections. Therefore, the data presented only represents a subsample of all CT connections in Europe in a given week.

### Data attributes provided by RNE

- train\_id
- reference\_ot
- type
- origin\_country
- origin
- origin\_plc
- origin\_latitude
- origin\_longitude
- origin\_timetable\_time
- origin\_running\_time
- origin\_delta
- destination\_country
- destination\_timetable\_time
- destination\_running\_time
- destination\_delta
- destination
- destination\_plc
- destination\_latitude
- destination\_longitude
- train\_section\_id
- section\_country
- planned\_distance\_group
- actual\_distance\_group
- section\_planned\_distance
- section\_actual\_distance
- otn\_str



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