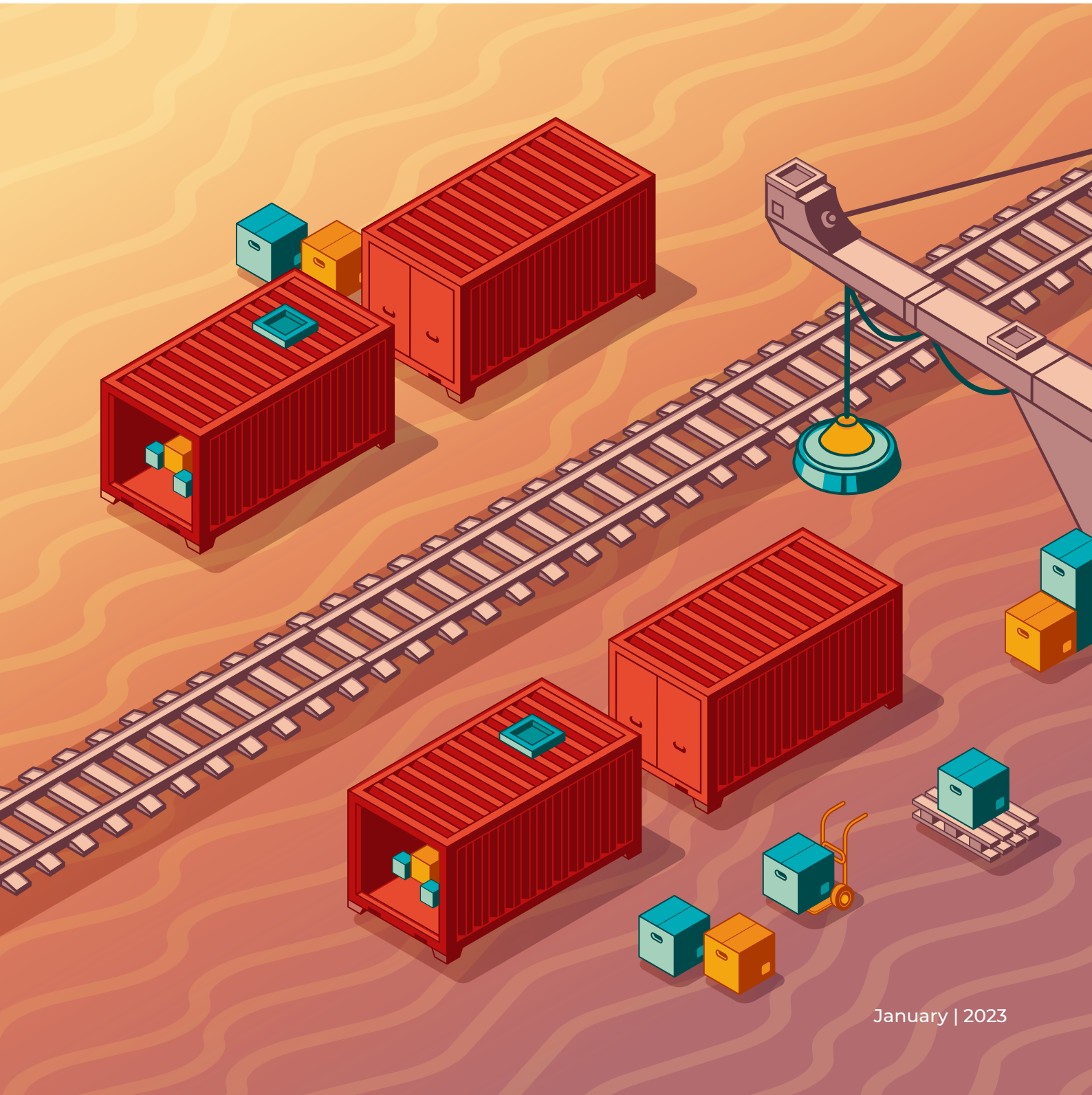
ERAI
Eurasian Rail Alliance Index

Report

RAIL CONTAINER TRANSPORTATION IN THE EURASIAN SPACE IN 2022



January | 2023

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BRIEF REVIEW: ADAPTING TO A NEW REALITY

In 2022, Eurasian rail container transportation faced two main challenges. Firstly, the aggravation of the international political environment, driven by the conflict in Ukraine, has radically increased the risk of sanctions and complicated the operating environment of the Eurasian railway route passing through Belarus, Russia and Kazakhstan. Secondly, circumstances once favorable for the modal shift towards rail, associated with the high cost of sea freight, have come to an end. In November 2022, the composite WCI reading, which illustrating the cost of shipping goods in containers from Southeast Asian countries to Europe, fell below the levels of the ERAI index, an indicator of the cost of transportation by rail across the territory of the EAEU.

Despite extremely turbulent external conditions, the total volume of container traffic along the Eurasian railway route in 2022 amounted to 681,200 TEU, only 1.6% less than last year. The key factor in maintaining volumes was the growth in freight traffic in other relatively new segments, which compensated for a 35% volume drop in the main segment, namely the China — Europe — China transit. Thus, Eurasian container railway transportation has demonstrated the ability to adapt — despite the prevailing circumstances.

The main transportation indicators, such as speed and transit time, the average number of container trains and train occupancy reflect the stable operation of the route. The share of empty containers has also hit its lowest point in the history of the route — an average of 4%. Such data confirms that the expertise accumulated over the years, as well as established transit processes and relationships with key stakeholders, have allowed the Eurasian route to maintain its key competitive advantage — the quality of services provided.

In 2022, the diversification of the cargo base continued. Electronics, mechanical equipment and automotive equipment, the historical cargo backbone in China — Europe — China services, remained the core goods for transportation, but their combined share in container traffic has decreased from 45.2% in 2021 to 39.6% in 2022. However, the continued deterioration of the EU trade balance with China should be noted, which creates difficulties for balancing cargo flows.

In 2022, the Eurasian railway route overcame unique challenges and showed great resilience to stress. Consequently, the share of the route on the China — Europe — China trade surged to 89.3%, showing a rather moderate rate of decline comparatively to other railway corridors that proceed via the borders between Mongolia, Russia and China.

In general, it can be stated that due to the flexibility and ability to adapt to the new reality in which the entire transport and logistics sector of Russia, Kazakhstan and Belarus found itself, the Eurasian railway route has retained its role and importance as the most important land link connecting China, the EAEU and Europe.

SUMMARY

1. Over the past year, 681,2k TEU traveled along the Eurasian railway route, which is 1.6% less than in 2021. At the same time, the volume of China — Europe — China transit traffic decreased by 35%: from 627,8k to 410,6k TEU. Stability in the overall container flow was achieved due to the development of other transit segments in the EAEU.

2. In 2022, the Eurasian rail route transported goods totaling $29.6 billion, accounting for around 3.2% of the total annual trade turnover between China and Europe.

3. Despite maintaining a minimum share of empty containers (4%) and successful balancing of cargo flows, the balance of EU foreign trade with China complicates the operating environment of the route. In Q1-Q3 2022, the share of EU exports in trade with China in value terms decreased by 6 ppt, up 24% compared to the same period last year. At the same time, turnover itself increased by 15%.

4. Over the past year, the WCI ocean freight rate dropped from $9,507 per FEU in January to $2,132 in December, returning to its pre-Covid levels. This circumstance marks the end of the unique situation in which Eurasian rail transport had found itself, it had maintained a price advantage over maritime transport during this period. In turn, the ERAI index remained fixed at around $2,902 per FEU.

5. The average transit time in the China — Europe — China service has decreased to 6.69 days, and the average speed of trains has increased to 816 km/day. Average train occupancy remained at 2021 levels at 117 TEU. The share of loaded containers reached 96%, including 89.4% in China-bound trains. Thus, the Eurasian railway route continues to maintain stable operations, gradually improving the quality component of transportation.

6. The historical cargo backbone in the China — Europe — China service — electronics, mechanical equipment and automotive equipment — remained the core goods for transportation, but their total share in container traffic decreased from 45.2% in 2021 to 39.6% in 2022, which indicates the ongoing diversification of the cargo base.

7. The geography of key rail routes is fairly established and has not undergone significant changes, despite the international political situation. The eastbound route network is a lot more diversified however, the 10 main routes account for 47.3% of container traffic, whereas in China the top 10 routes occupy 77.9%, reflecting concentration in several cargo origination centers, such as Xi'an, Chongqing, Chengdu.

8. The drop in traffic volumes along the Eurasian route in the China-Europe-China segment turned out to be smaller compared to other corridors. In this regard, the share of the Eurasian route using the Dostyk and Altynkol border crossings increased to 89.3% of the transit container flow between China and Europe through the territory of Belarus, Russia and Kazakhstan.

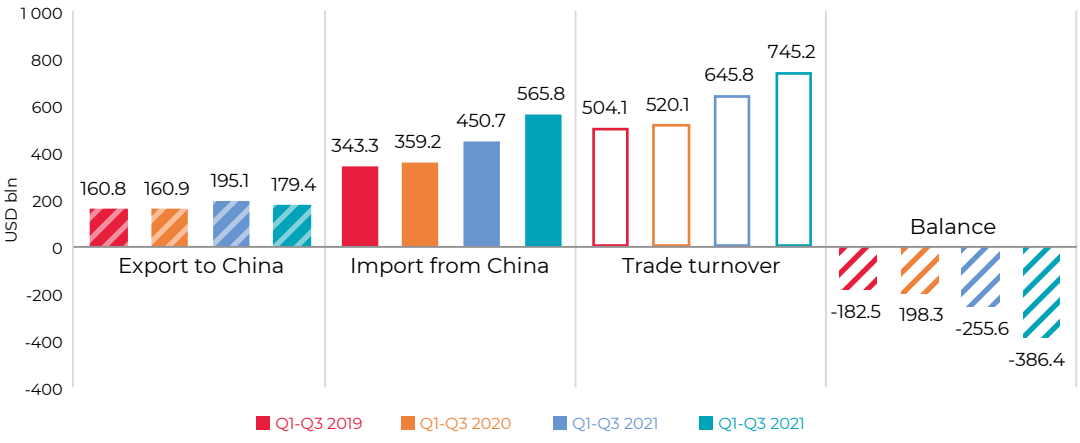
MUTUAL TRADE AND THE STATE OF THE FREIGHT MARKET

Growth in EU-China trade and growing trade disparities

Trade between the European Union and China serves as the central axis of all trans-Eurasian transit and one of the main segments of world trade. Its dynamics determine the cargo base of the Eurasian railway transit route, as well as the balance of cargo flows.

In the first three quarters of 2022, the cumulative turnover in trade between the EU and China amounted to $745.2 billion, thus exceeding the figures for 2021 by $99.4 billion (+15%). EU exports to China amounted to $179.4 billion (-8%) and imports totaled 565.8 (+25%), which led to an increase in the trade surplus in favor of China up to $386.4 billion (+51%). Moreover, the upward trend in the EU trade deficit with China has been observed since 2019 and is only accelerating. Overall, the increase in trade turnover between the countries has had a positive impact on the growth potential of Eurasian rail services.

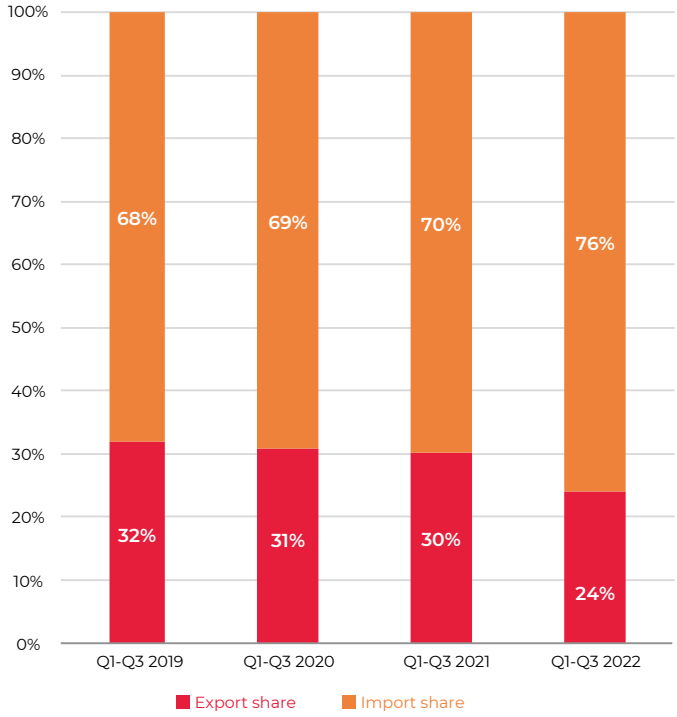
EU-27 MUTUAL TRADE WITH CHINA: Q1 – Q3



Source: Authors' calculations, based on International Trade Center (ITC) data

At the same time, the growing deficit of the EU in trade with China complicates the balancing of the cargo flows due to the dominance of goods going west, that is, from China to Europe. A significant increase in imports and a decrease in EU exports in 2022 led to a decrease in the share of EU exports in trade with China to 24%. If in 2019-2021, according to the results of the first three quarters, the decrease in the share of EU exports in relation to imports amounted to an average of 1 ppt (from 32% to 30%), then for the same period in 2022 the drop was already 6 ppt. This inevitably creates challenges for transport logistics, creating an increased demand for containers heading to Europe and an increase in the share of empty shipments being sent in the other direction.

EU27 EXPORT/IMPORT RATIO IN TRADE WITH CHINA



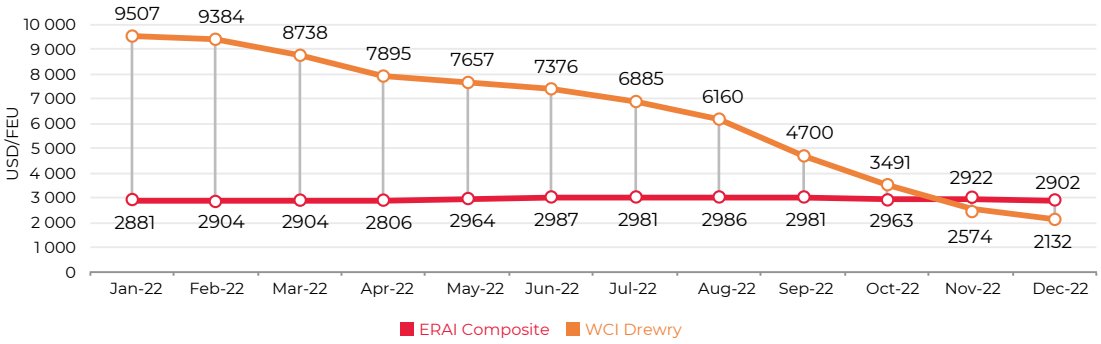
Source: Authors' calculations based on International Trade Center (ITC) data

The drop-in sea freight rates and the return of «pre-Covid» reality

In 2020-2021, the development of continental routes was significantly affected by the situation in other modes of transport, primarily in maritime transport. The sharp increase in sea freight became a driver of the acceleration of the modal shift — the transition of shippers to transportation by rail. However, in 2022, this situation came to an end.

In 2022, the ERAI index, which reflects the cost of transporting a container across the 1520 mm gauge rail network from border to border, showed stable values throughout the year, remaining at a level close to $2.9 thousand per FEU; the average monthly change during this period was no more than 5%. The index peaked in June 2022 at $2,987 per FEU.

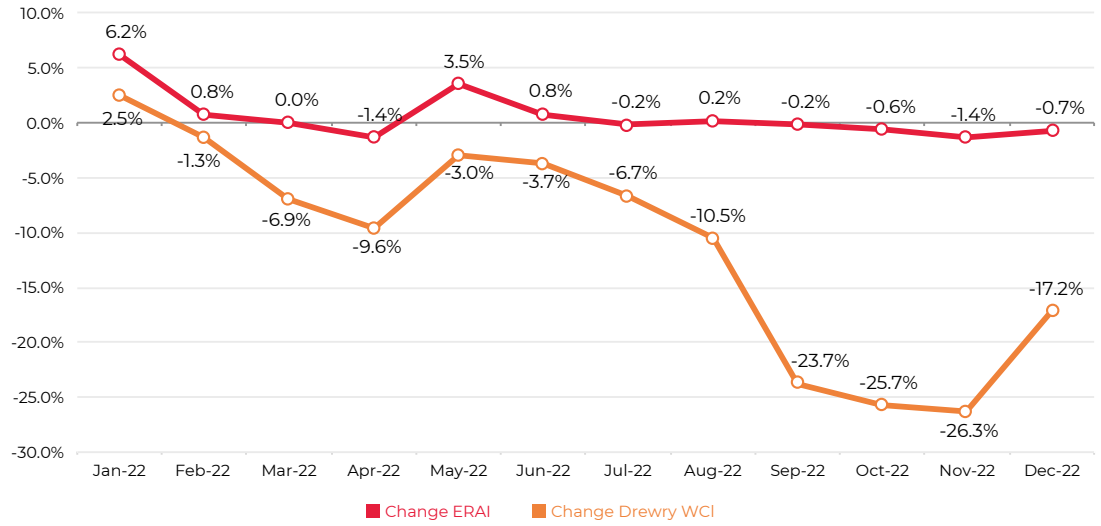
DYNAMICS OF THE ERAI COMPOSITE AND WCI DREWRY INDICES IN 2022



Source: ERAI index portal

At the same time, the WCI shipping index showed significant changes. Over the course of 2022, its average monthly value decreased from $9,507 per FEU in January to $2,132 in December. In November, a significant event took place — exactly two years after, the WCI shipping index showed a lower value than the Eurasian ERAI. Overall, sea freight rates remained volatile, with monthly changes sometimes amounting to as much as 25%. In December 2022, the decline in the WCI index slowed down, which may indicate the beginning of price stabilization at approximately $2,000 per FEU.

DYNAMICS OF ERAI AND WCI DREWRY RATES IN 2022



Source: ERAI index portal

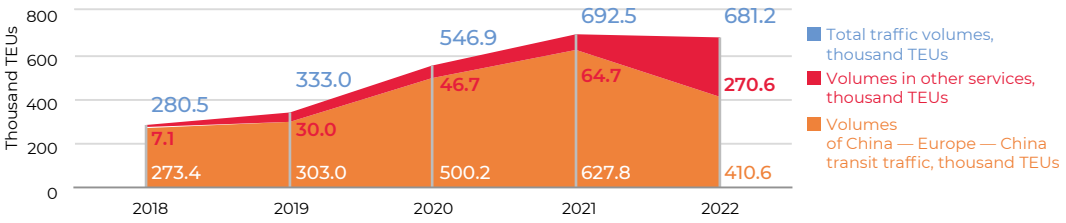
The dynamics of the ERAI index reflect the stability of pricing in the 1520 mm gauge railway network, which provides a competitive advantage to Eurasian railway transit in comparison with other modes of transport. In the context of a rapidly changing political and economic environment, as well as the abolition of anti-Covid restrictions in China, the dynamics of sea freight rates showed dramatic changes. Sea freight began to close the cost gap with rail transit in February 2022 and was able to do so by November. This may have a negative impact on Eurasian railway transit, since it was the sharp increase in rates for maritime transportation that made it possible to draw the attention of shippers to the railway alternative, which has over time proved its reliability and stability. Thus, the high cost of sea freight, most likely, will cease to serve as an additional incentive in accelerating the transition of shippers «to the rail.»

THE STATE OF THE EURASIAN RAILWAY ROUTE IN 2022

Key traffic indicators and maintaining total volumes

Over the past year, 681,2k TEU traveled along the Eurasian railway route, which is 1.6% fewer than in 2021. At the same time, the volume of transit in China — Europe — China traffic decreased by 35%: from 627,8k to 410,6k TEU. The stability of the overall container flow was achieved due to the development of other transportation segments in the EAEU, primarily the export and import services between China and Russia/Belarus.

TOTAL TRAFFIC VOLUMES IN 2022 BY SEGMENT

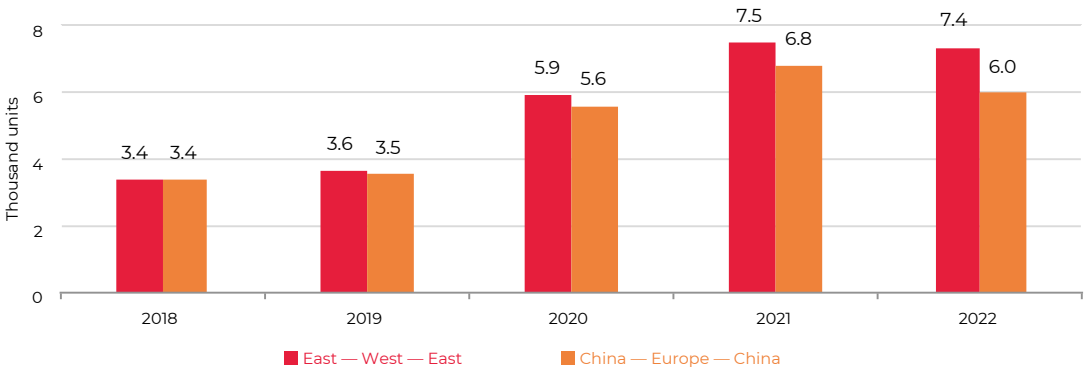


Source: authors' calculations

Despite negative trends in 2022, the total number of container trains remained near its 2021 level, amounting to 7,400 trains. It was possible to maintain such transportation volumes thanks to the launch of additional services in various segments of the Eurasian route. In the key segment for the Eurasian route, China — Europe — China traffic, the number of container trains decreased to 6,000, which is around 800 less than in 2021, but still significantly higher than in 2020.

The dynamics of container trains following through the route reflect the stability of the Eurasian corridor. In addition, despite a certain diversification of services, the activity of the Eurasian railway route is still based on the transit cargo of Chinese and European shippers.

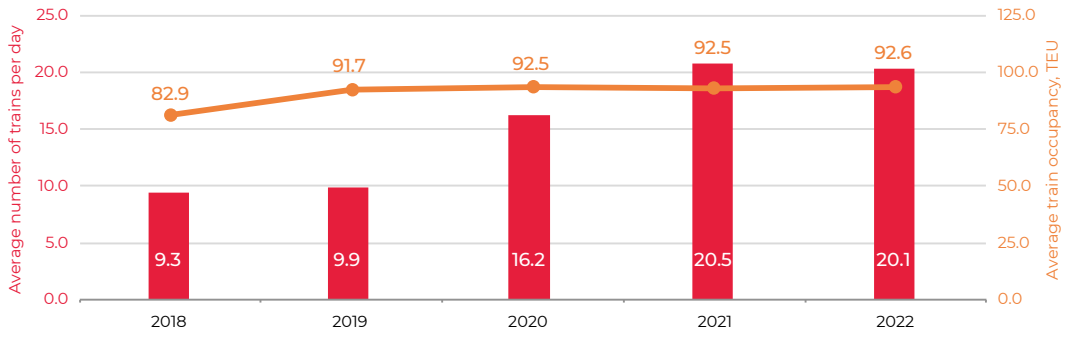
NUMBER OF CONTAINER TRAINS IN 2022



Source: authors' calculations

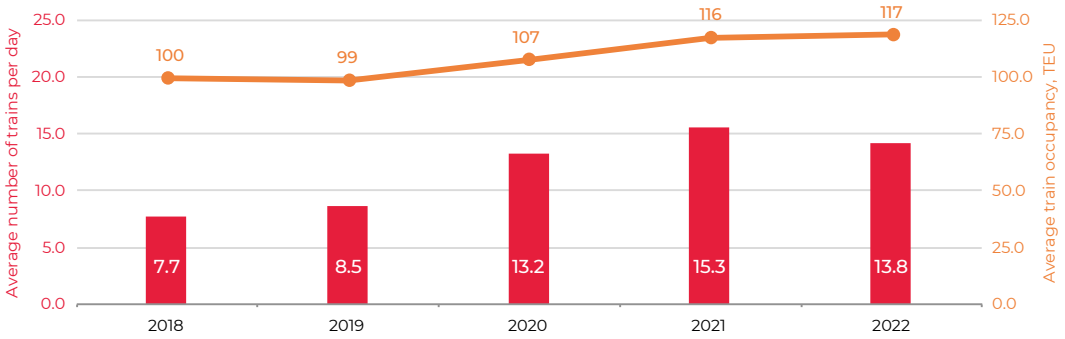
This year the average container train load was comparable to 2021 levels and amounted to 117 TEU. When measuring the average number of trains sent per day, indicators for previous years were recalculated, taking into account additional export and import routes running within the Eurasian corridor. It turned out that this indicator slightly decreased against the background of some reduction in the volume of transported goods. Nevertheless, the dynamics of the average number of trains per day clearly illustrates the growth in the volume of transported goods in recent years. If in 2018 an average of about 9.3 trains were dispatched per day, then in 2022 this figure increased to 20.1.

AVERAGE NUMBER OF TRAINS PER DAY AND THEIR LOAD IN TEU (FORMATION OF TRAINS OUTSIDE THE 1520MM GAUGE NETWORK)



Source: authors' calculations

AVERAGE NUMBER OF TRAINS PER DAY AND THEIR LOAD IN TEU (ERAINS TRAVELING IN THE 1520 MM GAUGE NETWORK, I.E. TAKING INTO ACCOUNT TRAIN AGGREGATION)



Source: authors' calculations

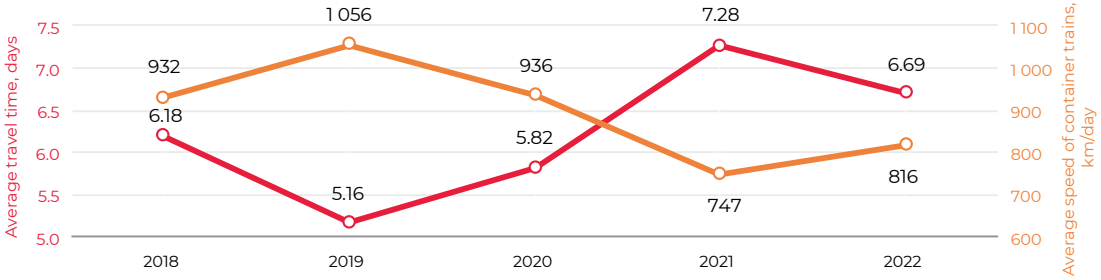
The long-term commitment to the development of the Eurasian route, and the infrastructure capacity utilization trend in 2022, have led to positive changes in the average speed of container trains and the average transit time.

Over the past four years, multidirectional dynamics have been observed: in the 2018-2019 period, there was an acceleration of services: an average daily transit speed of 1056 km/day was achieved. Further on, in 2019-2021, this value decreased to 747 km/day against the backdrop of a sharp increase in volumes transported during the COVID crisis, and the average travel time increased from 5.16 days in 2019 to 7.28 days in 2021. However, 2022 saw success in turning the situation around. The average speed increased to 816 km/day, and the transit time again approached the values of 2018 and amounted to 6.69 days.

The indicators of speed and travel time depend on both the throughput and the volume of goods being transported. The drop in traffic speeds after 2019 was the result of excessive unpredictable workload during the pandemic. The development of border crossing infrastructure by Kazakhstan, the introduction of digital technologies and the improvement of customs procedures will help speed up the movement of trains within the Eurasian route.

In addition, the well-coordinated work of the EAEU member states and national railway administrations in the field of reducing administrative and customs barriers, a general harmonization of legislation and setting common development goals contributes to the improvement of services.

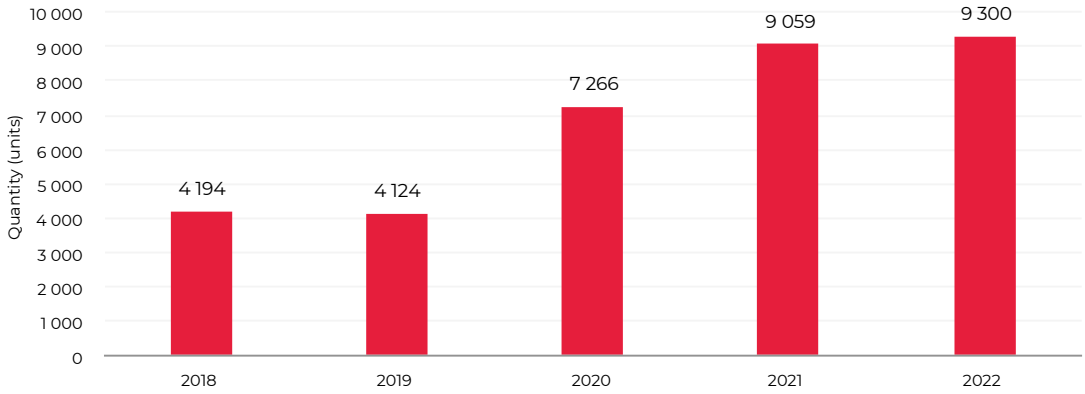
SPEED AND TRANSIT TIME IN THE CHINA — EUROPE — CHINA SERVICES (ONLY 1520 MM GAUGE LEG)



Source: authors' calculations

A consequence of the growth in the volume of transported goods since 2018 has been an increase in the number of wagons in the transit services of the Eurasian railway transit route. If in 2019 there were 4,124 goods wagons on the route, then in 2022 their number was already 9,300. It is noteworthy that the goods wagon fleet increased in 2022, albeit slightly. This circumstance indicates confidence in the prospects for maintaining and increasing the volume of cargo for transportation.

FLEET OF WAGONS IN SERVICES



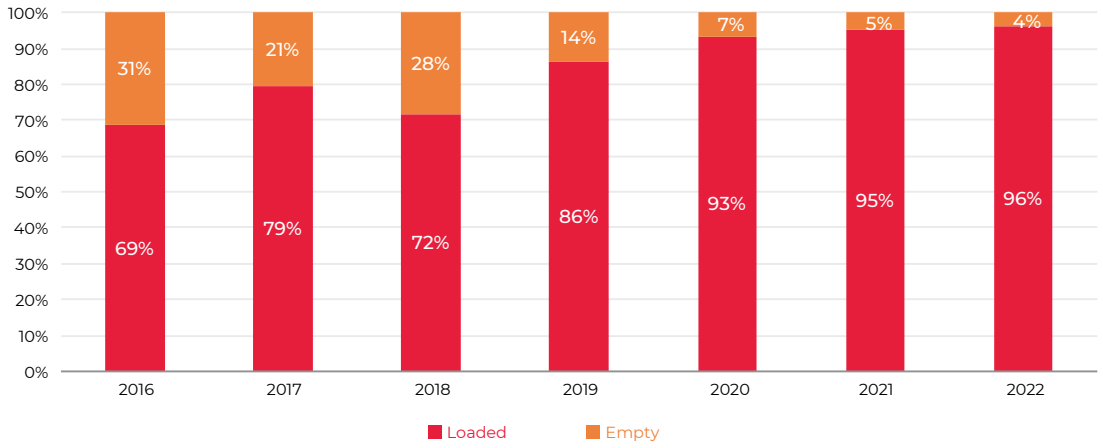
Source: authors' calculations

Cargo base of the route and maintaining the trend towards full load

One of the most important transport and logistics indicators is the ratio of loaded and empty containers. The specificity of container transportation is associated with the need for constant management of the reverse cargo flow in order to prevent the accumulation of containers. The EU's deficit in trade with China poses a problem of disproportions in cargo flows for transport and logistics companies.

As a result of the well-coordinated work of the participants in Eurasian railway transit traffic, the share of empty containers was less than 5% in 2022. There is an improvement in the situation compared to previous years — back in 2018, more than a quarter of containers on the Eurasian railway route were empty. At the end of 2022, the tendency towards full capacity utilization was maintained, despite the international political, economic and other features of the external environment.

THE RATIO OF EMPTY AND LOADED CONTAINERS



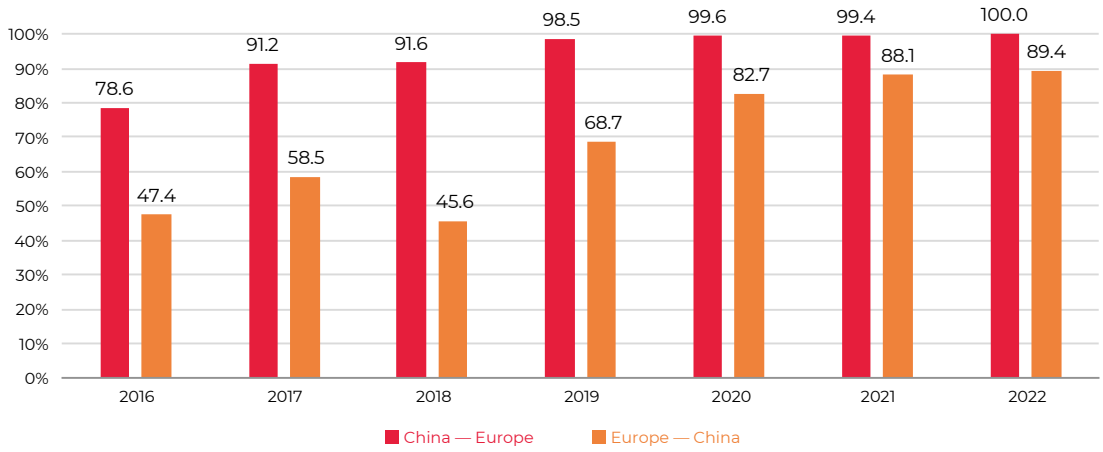
Source: authors' calculations

From the point of view of balancing, transportation eastward, from Europe to China, causes difficulties. This problem is objective due to the peculiarities of the bilateral trade between the EU and China — a serious deficit of more than 385 billion dollars for the 1st-3rd quarter of 2022.

However, when analyzing detailed data on container loading by destination, it should be noted that in 2022, 89.4% of containers en route from Europe to China were loaded. Relative to previous years, an unconditional increase in loading should be noted: in 2021, the share of such containers was 88.1%, and in the pre-pandemic period it ranged from 45.6% in 2018 to 68.7% in 2019.

At the same time, in 2022, the absolute (100%) share of loaded containers was recorded in the China-Europe traffic for the first time. Over the past 5 years on this route, this figure has not fallen below 91.2% (in 2017), and over the past three years it has not been below 99%.

SHARE OF LOADED CONTAINERS IN CARGO TRAFFIC BY DESTINATION



Source: authors' calculations

In 2022, according to the ERAI data, goods belonging to 92 HS-2 classifications proceeded along the Eurasian railway route, the total worth of goods transported totaled $29.6 billion, accounting for 3.2% of total annual turnover between China and Europe.

The range of goods on the route remains stable. Electronics, mechanical equipment and automotive equipment, the traditional main transit cargo in China — Europe — China traffic, remain the core goods for transportation. However, their total share in the container traffic decreased from 45.2% in 2021 to 39.6% in 2022, which speaks of the ongoing diversification of the cargo base.

Compared to last year, the share of electrical devices remained almost at the same level, showing an increase of only 0.1 ppt (17.3% in 2021). However, the share of mechanical equipment decreased immediately by 3.5 ppt (17.4% in 2021), while the share of automotive equipment also fell by 2.2 ppt (8.3% in 2021).

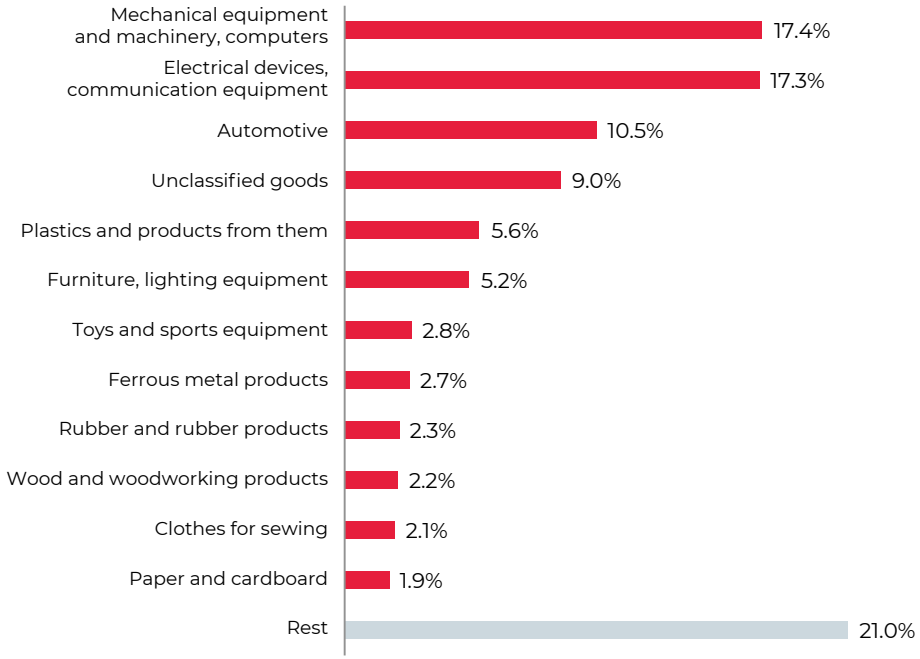
The reasons for such changes include a decrease in the level of auto production after last year's shortage of chips (semiconductors), another wave of isolation from the coronavirus in China (which suspended the work of export sectors of the economy), as well as the transition to other methods of delivering goods from China to Europe.

The next most important category of goods sent as cargo via the Eurasian railway route is plastics (6.8% of transported cargo); followed by furniture and lighting equipment (4.6%). Products from ferrous metals (3.6%), paper and cardboard (2.7%), as well as rubber and rubber products (2.5%) all accounted for a greater share of goods being shipped in 2022.

The opposite was true when it comes to toys and sports equipment (2%), wood and woodworking products (0.7%), as well as garments (1.7%), optics, instruments, medical equipment (1.7%), and finished textile products (1.3%).

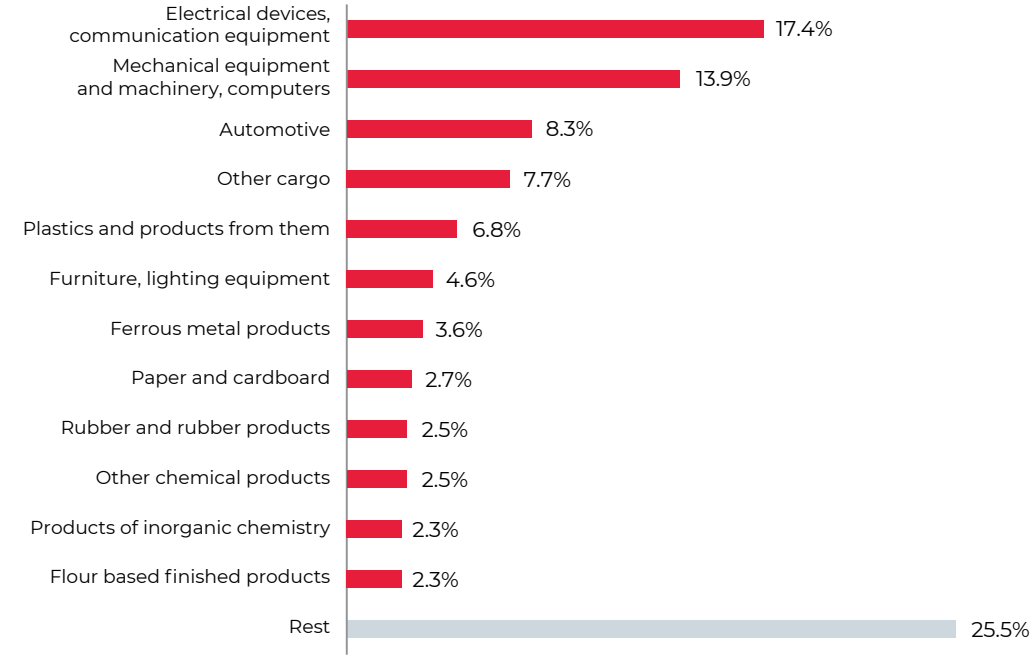
In the east, the cargo base of Eurasian railway cargo transportation is formed by Central China; in the west, Germany is the key country for cargo origination, as well as the countries of Central Europe. Hence, the geography determines the kinds of goods that are to be transported, hence the dominance of industrial goods in transit services. The gradual development of Chinese industrial production in the less developed regions of Central and Eastern China, which is predicted by experts, will lead to the expansion of the cargo base of the route in the long term.

MAIN CARGOES IN THE CHINA — EUROPE — CHINA SERVICES IN 2021



Source: ERAI index portal

MAIN CARGOES IN THE CHINA — EUROPE — CHINA SERVICES IN 2022



Source: ERAI index portal

Geography of transportation

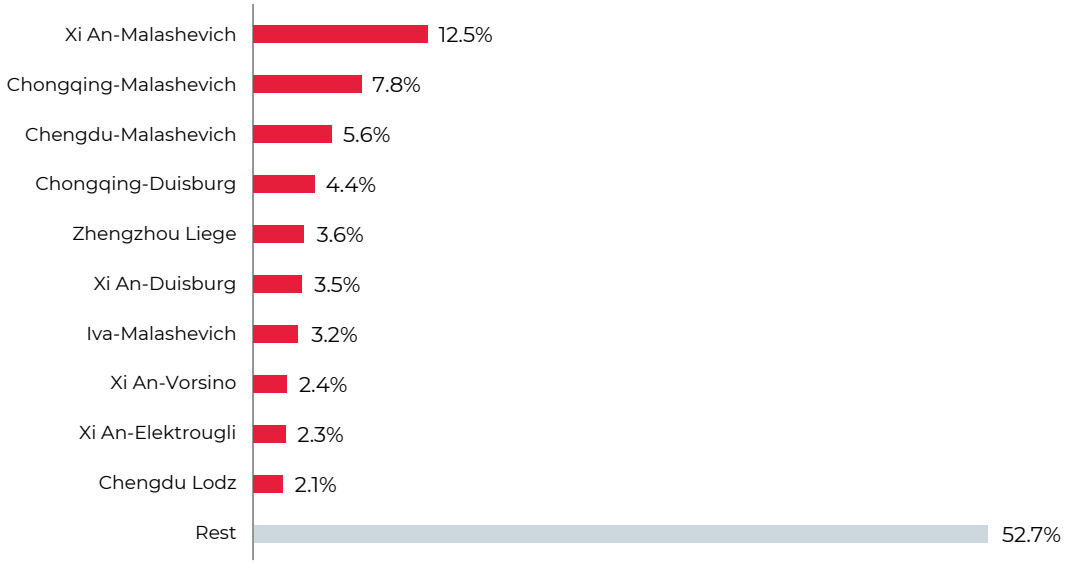
The key transport locations for the Eurasian railway route in Europe are Malaszewicze, a border crossing where the gauge change takes place; the largest German port, Hamburg; the German cities of Mannheim and Duisburg; Tilburg, The Netherlands; and Lodz, Poland. On the Chinese side, the most important points on the route are Xi'an, Chongqing, Chengdu, Zhengzhou and Yiwu.

Compared to the previous years, the course towards diversification of deliveries continues, the share of the main ten routes is decreasing, especially in terms of cargo transportation from China to Europe. So, if in 2020 the routes outside of the top ten in the direction of Europe accounted for 31%, then in 2021 they accounted for 44%, and in 2022 they accounted for 52.7%.

The main routes from China to Europe in 2022 were:

- Xi'an — Malaszewicze (54,8k TEU);
- Chongqing — Malaszewicze (34,2k TEU);
- Chengdu — Malaszewicze (24,6k TEU).

MAIN ROUTES IN THE CHINA-EUROPE SERVICES IN 2022

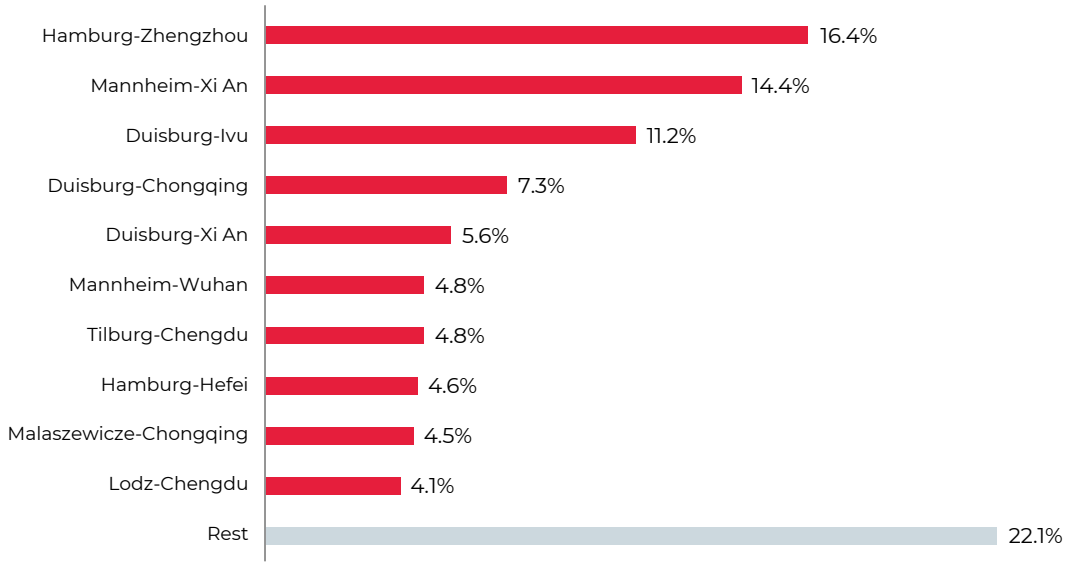


Source: authors' calculations

The main routes from Europe to China in 2022 were:

- Hamburg — Zhengzhou (21.1k TEU);
- Mannheim — Xi'an (18.5k TEU);
- Duisburg — Yiwu (14.4k TEU).

MAIN ROUTES IN THE EUROPE — CHINA SERVICES IN 2022

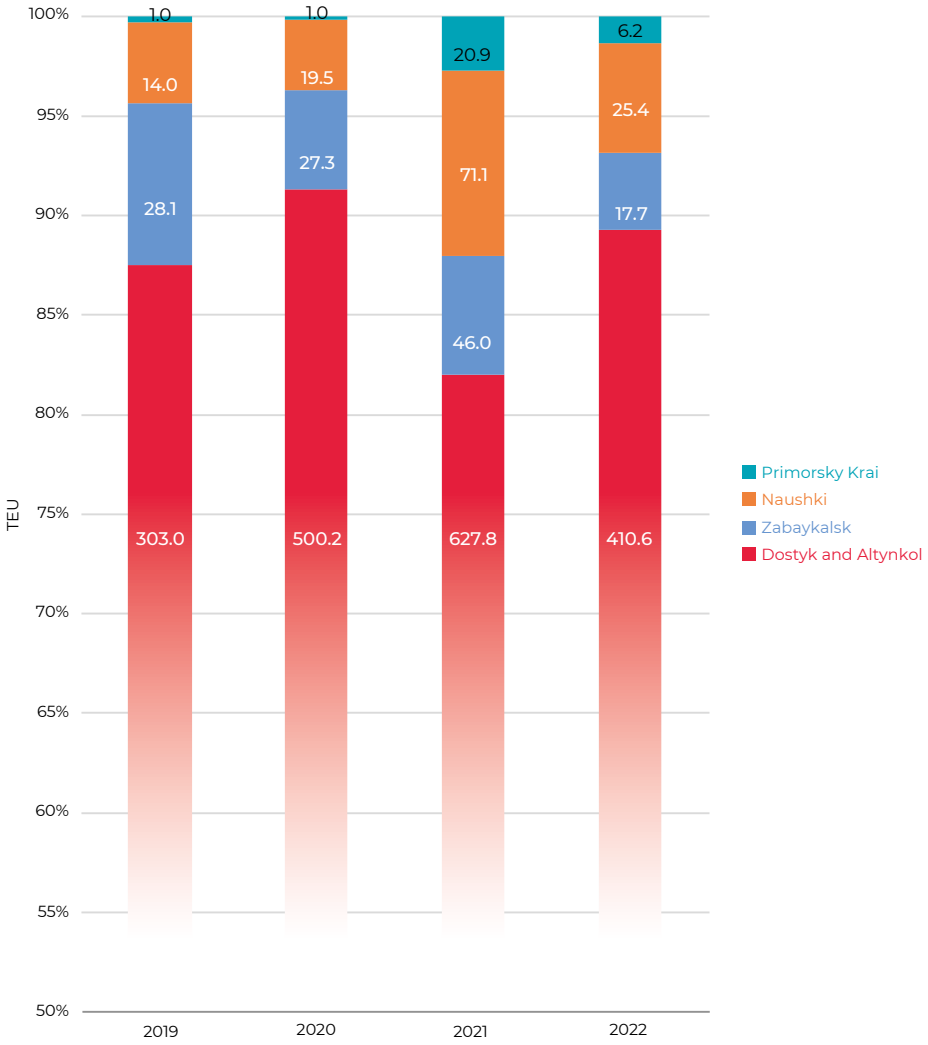


Source: authors' calculations

Compared to alternative China — Europe — China routes, the Eurasian route through Kazakhstan, Russia and Belarus continues to occupy a leading position and strengthened its share from 82,0% to 89.3% in 2022.

Against this background, in 2022 there was a decrease in the volume of trans-Eurasian transit container traffic through the Naushki border crossing (25,3k TEU, down 64.4% year-on-year), which gave way to Zabaykalsk, which also showed a drop in volumes (17,7k TEU, down 61.5% year-on-year). The border crossings of the Russian Far East have finished this year with a result of 6,2k TEU, which is also a low indicator compared to 2021 (down 70.2% year-on-year).

CONTAINER VOLUMES BREAKDOWN BY MAIN CHINA — EUROPE — CHINA RAILWAY ROUTES, TEU



Source: authors' calculations

The Eurasian route, which accounts for 89% of the traffic of transit railway containers in China — Europe — China rail services, remains a benchmark for other routes and competitors in the EAEU. However, routes passing through non-Kazakhstan border crossings are targeting a different cargo base. Thus, North China, Japan and South Korea gravitate towards the Zabaykalsk, Naushki and Far East border crossings or ports of Russia, while the Eurasian route is convenient for shippers from Western and Central China. At the same time, the accelerated development of all routes has increased the attractiveness of trans-Eurasian railway transit and the 1520 mm gauge railway network as an alternative to other modes of transport and routes.

OUTLOOK FOR 2023

In 2022, there were significant changes in the conditions for the operation of Eurasian railway transit cargo transportation. On the one hand, the deterioration of the international political situation, which affected the countries participating in the transportation, had a significantly negative impact on the operation of the route. At the same time, sea container freight rates have regained their pre-pandemic levels, thus depriving Eurasian railway transportation of a competitive advantage in the form of a lower price.

Changes in supply chains affected the redistribution of traffic volumes to other destinations, including China-Russia shipping, which has helped offset the decline in China-Europe-China transit services. Thus, the flexibility intrinsic to rail container transportation has been confirmed, which will contribute to the stable operation of the infrastructure, even amid difficult political and economic conditions, and can also be useful against the background of China's easing of systemic COVID restrictions.

Along with this, there was a change in the cargo composition, where commodity groups which have historically led, such as electronics, mechanical equipment and automotive equipment have retained their positions, but lost in total volume, and the trade balance between the EU and China continued to drift towards increasing disproportions. All this has prompted key industry players to address the new reality in the field of Eurasian railway container transit traffic.

In 2023, the indicated political and opportunistic factors will continue to influence the operation of the Eurasian railway, but will not be decisive. Despite the international political environment, the past year has not made the Eurasian route «toxic» for regular operations. After assessing the risks, those which have shipped in the past have maintained their commitment to an established corridor and rail transport.

Unlike other modes of transport, the Eurasian rail alternative has not come under direct sanctions pressure. In this regard, the reduction of compliance risks against the backdrop of the increased adaptation of shippers to the new reality will continue to smooth out the negative foreign policy background.

Another significant factor for the Eurasian rail seems to be the drastic reduction in the cost of sea freight. However, the price advantage of the railway over maritime transport was a temporary phenomenon during the pandemic, which sooner or later had to come to an end. Thanks to it earlier, the Eurasian railway route received a significant inflow of shippers, who, against the backdrop of prices, opted for the railway.

In 2023, the quality of work and improvement of operations will come to the fore against the backdrop of additional efforts to retain and attract new customers. The advantage of rail is the solid development of the 1520 mm railway network, and adherence to uniform railway standards, which means the possibility of further development through investment in infrastructure and the establishment of interaction between the states participating in transit.

Thus, Eurasian railway container transit, despite a quickly changing environment, has shown its stability and ability to adapt to a unique and serious challenge, perhaps the most serious of all time.