
BENELUX COUNTRIES' EXPORTS TO CHINA IN 2020: EXPORT STRUCTURE AND PROSPECTS FOR MODAL SHIFT TO RAIL



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INTRODUCTION

In 2020, China became the main trading partner of the European Union. This fact reflects the increased importance of trade and economic ties between partners, which also affects individual EU countries. The Benelux countries, which include Belgium, the Netherlands and Luxembourg, are the most densely populated part of Europe, are known for their developed industry, high level of urbanization, and high-quality transport infrastructure. It was in the Benelux countries that integration processes began after the First World War, which largely paved the way for European integration.

The Benelux Political, Economic and Customs Union unites economies with a combined [population](#) of almost 30 million people and [GDP](#) of USD 1.7 trillion. As for the mutual trade of the Benelux countries with China, it is characterized by a structural imbalance of flows. The Benelux countries have a [negative balance](#) in trade with China in the amount of USD 45.784 billion. This fact makes it especially important to study ways to increase countries' exports to China, especially from the perspective of a modal shift in favour of rail transport.

Despite the presence of large ports, such as Rotterdam and Ghent, the continental method of delivering goods to China by rail is becoming increasingly popular, especially given the current price situation on the market. In April 2021, the index of continental rail transit traffic in the direction of China-Europe-China (ERA) remained stable, thereby anchoring at USD 2,729 per FEU, while the WCI Drewry maritime transport index reached another peak of USD 5,472 per FEU.

The high quality of the railway infrastructure in the Benelux countries is also important. According to the [2017 BCG Railway Efficiency Index](#), the Netherlands, Luxembourg and Belgium were included in Tier 2 of EU countries for railway efficiency with ratings from 4.6 to 5.3.

This review examines in detail the bilateral trade of the Benelux countries with China, especially exports to China, as well as the current range of goods transported by rail, and categories of goods that are potentially promising in terms of switching to the railway.

GENERAL OVERVIEW OF THE TRADE OF THE BENELUX COUNTRIES AND CHINA IN 2020

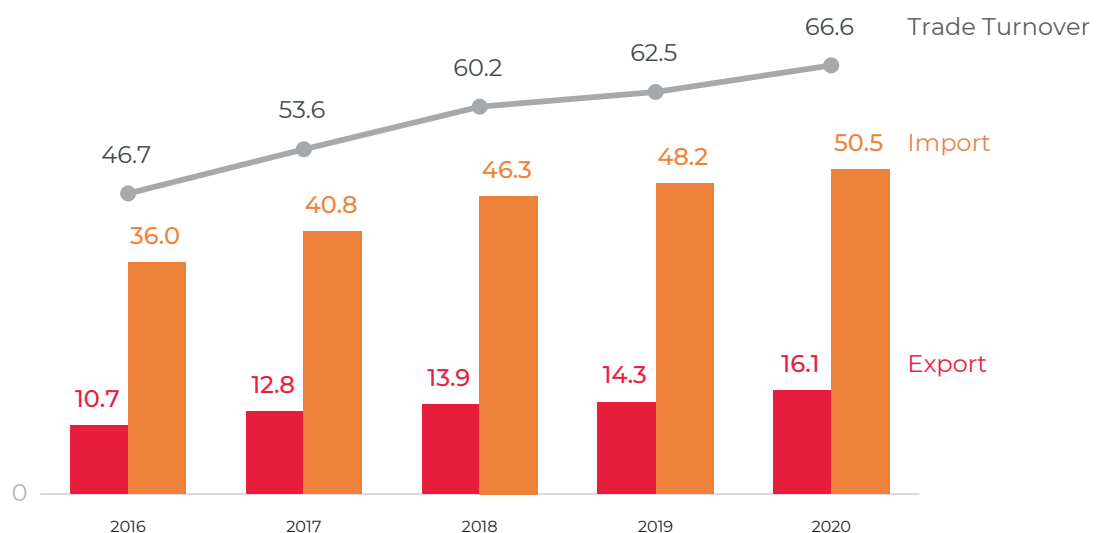
At the end of 2020, the trade turnover between the Benelux countries and China amounted to about **USD 98 billion**, of which USD 26.09 billion accounted for exports to China and USD 71.86 billion - for import. China ranks ninth in the list of export destination countries of the Netherlands and Belgium (the second place among countries outside the EU). In terms of imports of Chinese goods, China is the second trading partner of the Netherlands and the third trading partner of Belgium.

Netherlands' exports to China in 2020

The Netherlands' trade with China is characterized by a constant increase in trade turnover, which in five years from 2016 to 2020 increased by 42.6%, i.e. from USD 46.7 billion to USD 66.6 billion. At the same time, the Netherlands' exports to China grew at a faster pace. The increase in exports was 50.5%, and the increase in imports showed 40.2%. Thus, the Netherlands has a negative trade balance in trade with China in the amount of USD 34.3 billion.

TRADE TURNOVER OF THE NETHERLANDS WITH CHINA

USD billion



Source: authors' calculations based on ITC data.

The Netherlands' exports to China in terms of value from the point of view of the commodity nomenclature appears to be quite diversified. About 28% of the country's exports to China are represented by mechanical equipment, machinery and computers in the amount of USD 4.5 billion in 2020, of which USD 2.5 billion accounted for exports of the HS 8486 category (equipment for the semiconductor industry). This is du/2 TEU were transported along the Eurasian route in 2020. This fact speaks about the leadership of the Eurasian route, but also about the continuing, although already quite used, potential to increase the share of rail transport. In addition, this group can also include electronics in general (HS 85), whose exports amount to USD 916 million.

Optical devices and medical equipment (HS 90) occupy the third place in the nomenclature of the Netherlands' exports. This includes such groups as:

- medical devices and appliances (HS 9018), with exports of USD 665 million (2,500 tons), which mainly includes MRI devices (HS 901813), other instruments for medicine and surgery (HS 901890), as well as catheters and similar products (HS 901839), which are not currently transported along the Eurasian route;
- X-ray equipment (HS 9022), with exports of USD 266 million (1,549 tons), of which 40 tons were transported along the Eurasian route;
- orthopedic devices, artificial body parts (HS 9021), with exports of USD 257 million (172 tons); this product was not transported along the Eurasian route.

Exports of meat and offal from the Netherlands to China in 2020 amounted to USD 1.1 billion. First of all, this category includes pork exports (HS 0203), which amounted to USD 842 million (302,000 tons), with no transportation of this commodity by rail, as well as livestock offal (HS 0206), with exports of USD 235 million (115,000 tons), which was also not transported by rail in 2020.

Thus, we can note a significant potential in the main export areas, primarily in such groups as machines for the production of semiconductors, complex medical equipment, pork and meat offal. At the same time, the share of railway transportation in the segment of baby food is quite noticeable.

NETHERLANDS' EXPORTS TO CHINA IN 2020

USD million



Source: authors' calculations based on ITC data.

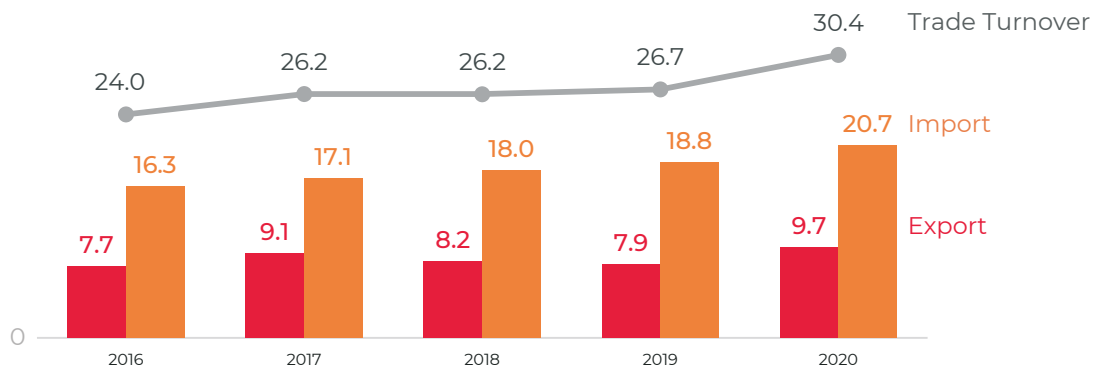
— Belgium's exports to China in 2020

Belgium's trade turnover with China has increased by 26.6% over five years, thereby amounting to USD 30.4 billion in 2020. At the same time, a significant increase in this indicator occurred in 2020. Belgium's exports to China grew unevenly, and even stagnated in 2018 and 2019. Nevertheless, in total for five years from 2016 to 2020, the increase in exports was 26%, and imports - 27%. Belgium has a negative bilateral trade balance of USD 10.9 billion.

Despite the smallness of the population and territory, Luxembourg also does not break out of the trend. In 2020, the country's exports to China reached USD 210 million, and imports from China amounted to USD 672 million. As in the case of the Netherlands and Belgium, the country has a negative trade balance with China in the amount of USD 462 million. At the same time, for the purposes of scientific reductionism, Luxembourg is not considered separately in this chapter.

BELGIUM'S TRADE TURNOVER WITH CHINA

USD billion



Source: authors' calculations based on ITC data.

Belgium's exports to China, like those of the Netherlands, are quite diversified. Nevertheless, when considering the cost structure of exports, it is possible to identify a number of the most important areas and assess the current cargo flow going by rail.

Of USD 9.7 billion of Belgium's exports to China in 2020, 23% (USD 2.2 billion, or 6,300 tons) were pharmaceutical products. Belgium is **the fourth** world's pharmaceutical producer after Germany, Switzerland and the Netherlands. This country accounts for about 7.4% of world exports of medicines, since many multinational pharmaceutical companies have production in the country. Exports to China are represented by two main categories that were not transported by rail in 2020:

- medicines (HS 3004), with exports of USD 1.3 billion, or 5,400 tons; the largest subgroup represented by other packaged medicines (HS 300490), which amounted to USD 926 million of exports;
- immune products, blood (HS 3002), with exports of USD 0.8 billion, or 568 tons; the largest subgroup represented by vaccines for humans (HS 300220), which amounted to USD 762 million, or 530 tons.

Approximately 9% of exports, or USD 901 million, were for mechanical equipment, machinery and computers. The exports of this group are highly diversified by subcategories. However, a number of subgroups can be distinguished on six HS signs by value and quantity:

- weaving machines for weaving fabrics with a width of 30 cm or more (HS 844630), with exports of USD 56 million, or 4,200 tons and no transportation by rail;
- gear and screw gears, gearboxes (HS 848340), with exports of USD 49 million, or 2,700 tons and with about 190 tons (30 TEU) transported along the Eurasian route;
- special machines for mixing, grinding, sorting (HS 847982), with exports of USD 44 million, or 1,000 tons and with 10 tons (3 TEU) transported along the Eurasian route;
- part air pumps (HS 841490), with exports of USD 42 million, or 1,100 tons, and with 97 tons transported by rail (8.26% of exports), of which approximately 30 tons (3 TEU) transported along the Eurasian route;
- other air pumps (HS 841480), with exports of USD 34 million, 1,200 tons, and with 105 tons transported by rail (8.35% of exports), of which approximately 50 tons (8 TEU) transported along the Eurasian route;
- heat exchangers (HS 841950), with exports of USD 44 million, or 2,700 tons, and with approximately 40 tons (14 TEU) transported along the Eurasian route.

The export of plastics and products made from them from Belgium to China in 2020 amounted to USD 761 million. In value terms, the three main groups exported by four HS signs are as follows:

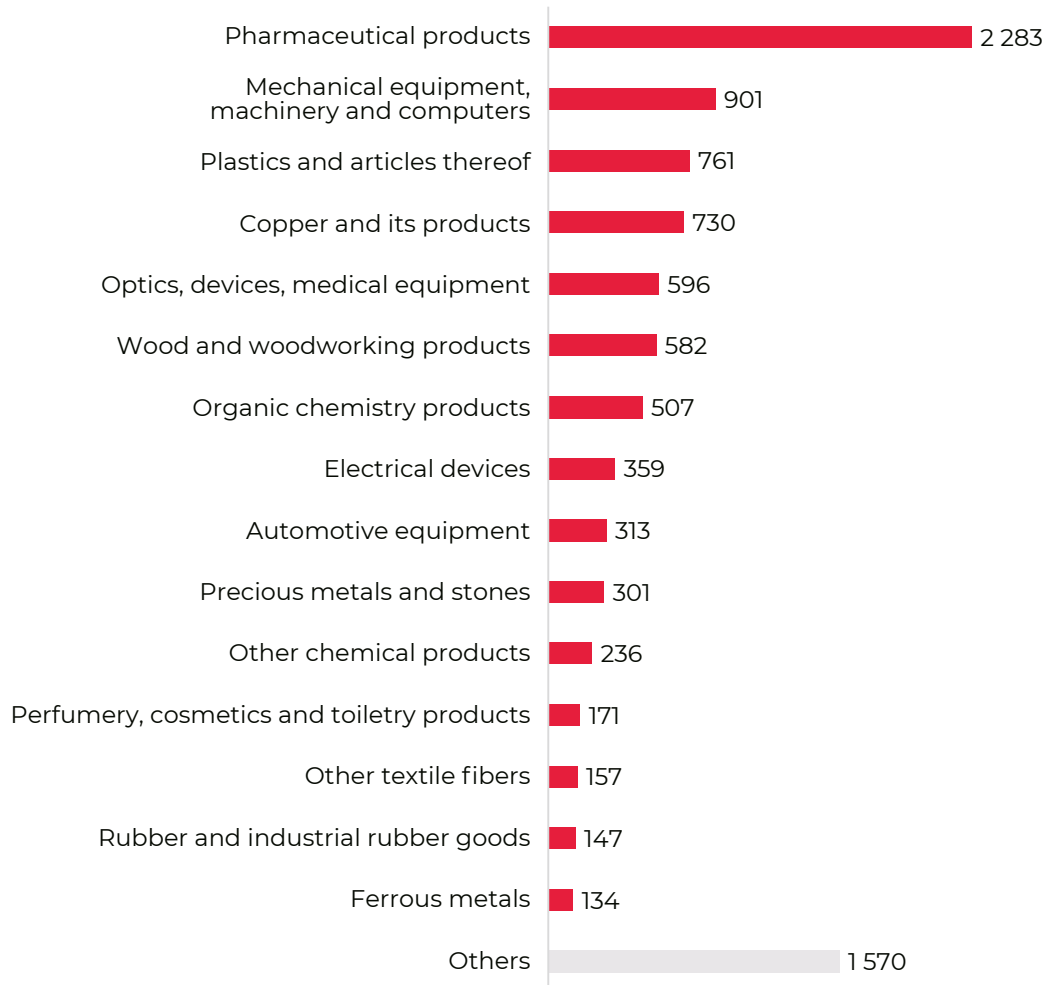
- polyethylene (HS 3901), with exports of USD 232 million, or 189,000 tons, and with 20 tons (2 TEU) transported along the Eurasian route;
- polyamides (HS 3908), with exports of USD 106 million, or 33,000 tons, and with 20 tons (2 TEU) transported along the Eurasian route;
- polypropylene (HS 3902), with exports of USD 102 million, or 62,000 tons, and with 120 tons (19 TEU) transported along the Eurasian route.

Copper and its products are mainly raw materials and therefore, despite the significant volume of exports (USD 730 million), they do not gravitate much to the railway and are not transported on it at present. The same is true for wood and woodworking products (USD 582 million of exports in 2020), most of which is roundwood (HS 4403, USD 518 million of exports).

Finally, an important export position of Belgium to China is medical equipment (HS 90), thereby amounting to USD 596 million. This should include primarily orthopedic devices, artificial body parts (HS 9021), with exports of USD 334 million, or 245 tons, as well as medical devices and devices (HS 9018), with exports of USD 122 million, or 1,200 tons. In 2020, less than 50 tons were transported along both commodity groups by the Eurasian railway route.

BELGIUM'S EXPORTS TO CHINA IN 2020

USD million



Source: authors' calculations based on ITC data.

INDUSTRY STRUCTURE OF BENELUX COUNTRIES' EXPORTS TO CHINA

To select the most promising commodities of potential cargo flow from the Benelux countries to China, the [UN.COMTRADE](#) data on exports of countries in 2020 and 2019 at the level of six HS characters, as well as [Eurostat](#) data on trade in terms of modes of transport and statistics of the Eurasian railway transit route based on the [ERA1](#) index were analysed. For all commodities, absolute (in the number of tons) and relative (as a percentage) export increases were calculated by the end of 2020 compared to 2019.

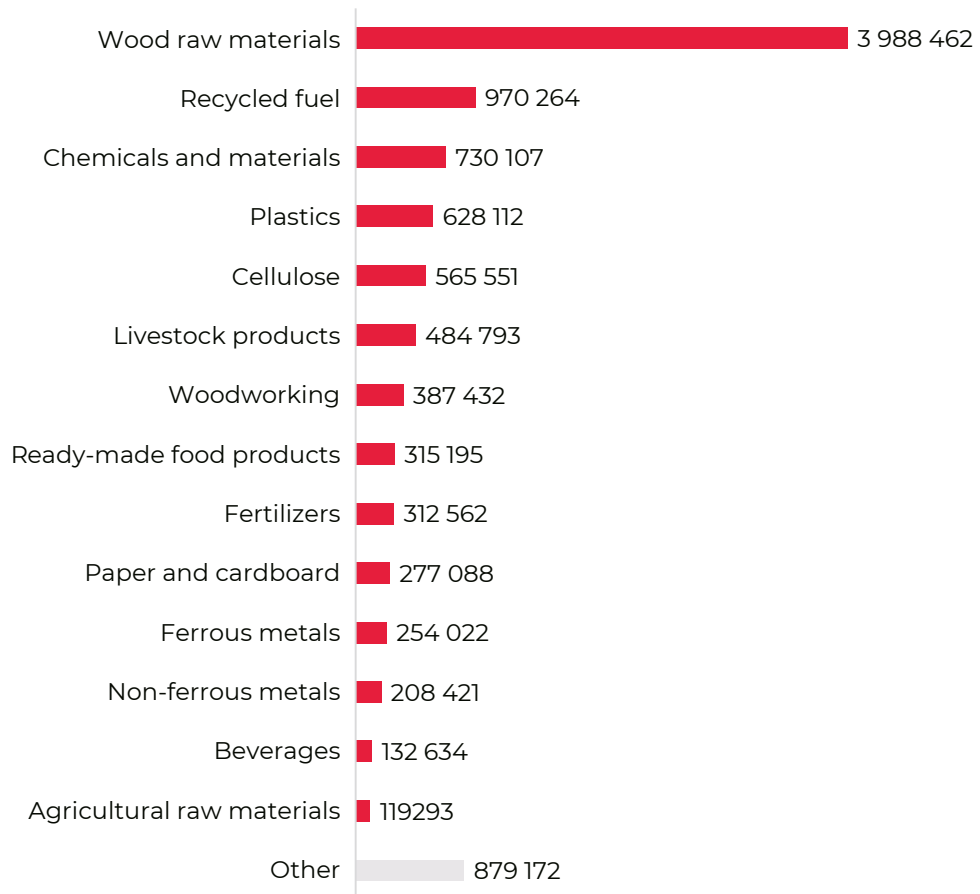
In quantitative terms, wood raw materials dominate in the exports of the Benelux countries to China, i.e. 39% of the tonnage (almost 4 million tons), which is due to the physical characteristics of the product. This is followed by processed fuel with 9% of exports (970,000 tons), chemicals and materials with 7% of exports (730,000 tons), and plastics with 6% of exports (628,000 tons).

Taking into account the physical properties of commodities, it is possible to note a large share of chemical industry products, which can include chemicals, plastics, and cellulose. In addition, the high proportion of recycled fuel is also a consequence of the developed chemical industry. Other distinctive features are a noticeable share of livestock products (5%) and ready-made food (3%), as well as a low share of metals (about 4%).

The structure of Benelux countries' exports to China is markedly different from, for example, the structure of Germany's exports to China. Unlike Germany, the Benelux countries do not supply or supply significantly smaller quantities of automotive equipment, ferrous metals, and energy equipment. At the same time, chemical industry products are sent to the east in large proportions.

BENELUX COUNTRIES' EXPORTS TO CHINA BY INDUSTRY

tons



Source: authors' calculations based on ITC data.

The Benelux countries' exports to China are characterized by a rather low share of cargo traffic going by rail. As can be seen from the statistics¹, the largest share of rail transport is concentrated in segments that tend to containerize. The share of the railway in the transportation of various industrial goods is 2.86%, which is less than the average value for rail transportation in the direction of China-Europe-China. The share of railway transport in the transportation of textile materials (7.55%) and clothing (17.59%, HS 61 and HS 62) is noticeable.

¹ Possible statistical errors should be taken into account when estimating the commodity flow in terms of modes of transport due to the complexity of calculating and overlapping different sources of statistical data.

Table 1.

SHARE OF RAILWAY TRANSPORT IN THE SECTORAL STRUCTURE OF BENELUX COUNTRIES' EXPORTS TO CHINA.

Industry	Quantity, tons	Transported by railway transport, tons	Share of railway transport
Wood raw materials	3,988,462	50	0.00%
Recycled fuel	970,264	63	0.01%
Chemicals and materials	730,107	1,322	0.18%
Plastics	628,112	280	0.04%
Cellulose	565,551	39	0.01%
Livestock products	484,793	155	0.03%
Woodworking products	387,432	154	0.04%
Ready-made food products	315,195	344	0.11%
Fertilizers	312,562	48	0.02%
Paper and cardboard	277,088	200	0.07%
Ferrous metals	254,022	389	0.15%
Non-ferrous metals	208,421	264	0.13%
Beverages	132,634	76	0.06%
Agricultural raw materials	119,293	166	0.14%
Fish and seafood	89,128	438	0.49%
Feed	87,796	52	0.06%
Finished chemical products	81,402	377	0.46%
Fat and oil products	79,297	124	0.16%
Automotive equipment	64,103	122	0.19%
Unclassified products	61,839	2	0.00%
Universal equipment	50,405	441	0.87%
Special industry equipment	48,853	296	0.61%
Non-metallic raw materials	48,330	146	0.30%
Metal products	36,142	450	1.25%
Energy, power and electrical equipment	30,328	302	1.00%
Machine tools	25,392	158	0.62%
Ores and concentrates	23,948	44	0.18%
Grain and milling products	23,919	127	0.53%
Animals and plants	18,560	125	0.67%
Various industrial products	14,993	429	2.86%
Glass	14,698	123	0.84%
Textile materials and products	13,545	1,022	7.55%
Other equipment and devices	12,419	221	1.78%
Pharmaceuticals	10,694	154	1.44%
Fruit and vegetable products	9,109	307	3.37%
Ceramics	8,451	60	0.71%
Instrumentation	7,119	336	4.72%
Mineral products	4,124	104	2.52%
Appliances	2,790	76	2.72%
Clothes	2,450	431	17.59%

Electronics	2,196	50	2.28%
Telecommunications equipment	2,017	89	4.41%
Agricultural machinery	1,772	54	3.05%
Railway equipment	1,583	41	2.59%
Vessels and watercraft	1,064	29	2.73%
Footwear	588	48	8.16%
Aircraft engineering	94	31	32.98%
Products made of precious metals and stones	15	25	Statistical error
Precious metals and stones	9	71	Statistical error
Grand total	10,253,108	10,507	0.10%

Source: authors' calculations based on ITC and Eurostat data.

COMMODITY STRUCTURE OF BENELUX COUNTRIES EXPORTS AND PROSPECTS FOR MODAL SHIFT TO RAIL

In 2020, the Benelux countries exported commodities to China in the amount of 10.2 million tons, which is 3.6 tons more than a year earlier. If the parties' trade was assessed above in terms of value, as well as from the point of view of the industry structure, it is now necessary to identify the categories of commodities (on six HS signs) that showed the best growth dynamics or are leaders in absolute terms.

The cheapest and most mass-produced commodities, including raw materials, for which the time factor is the least important, traditionally tend to sea transportation. At the same time, the most expensive and smallest commodities in terms of volume, for which the time factor is critical, are transported, among other things, by air transport. Therefore, when selecting the leading categories of commodities, the commodities that are least inclined to container rail transportation were excluded from the sample.

The analysis showed that the share of the Eurasian route and the share of rail transport in the direction of China-Europe-China do not differ too much due to the general attraction of bilateral trade to sea transport.

When selecting the 15 leading exports of the Benelux countries to China in absolute terms, chemicals were excluded from the sample (finished chemical products were left), raw materials, including wood and woodworking products, agricultural raw materials, and fertilizers.

Of all the main export goods represented mainly by products of the food industry, animal husbandry and chemical industry, only for certain commodities there is a commodity flow along the Eurasian railway route and the railway as a whole. Despite the fact that the estimated share of the Eurasian railway route in the exports of the Benelux countries to China is 1%, only in one group of commodities, i.e. baby food, the railway has taken over a significant share of the trade of the parties, that is, 26,000 tons, which is 19.87% of the commodity flow. Baby food is the only item with a significant share of the Eurasian railway route in the cargo flow.

It is also possible to note such items as beer and frozen cooked potatoes, for which the share of the Eurasian route, according to the [ERA](#) index, is at the level of 1%. Nevertheless, all the positions considered below can be considered potentially promising for the transition to freight transportation by rail.

Table 2.

TOP 15 COMMODITIES EXPORTED BY THE BENELUX COUNTRIES TO CHINA IN ABSOLUTE TERMS IN 2020 BY SELECTED INDUSTRIES.

	HS code	Product	Exports in 2020, tons	Absolute growth by 2020/2019, tons	Transported via the ERAI Eurasian route, tons	Share of the Eurasian route, %
		Total export	10,253,108	3,615,896	102,590	1.00%
1	020329	Other frozen pork	193,601	43,332	0	0.00%
2	190110	Baby food based on flour or milk	131,033	17,810	26,040	19.87%
3	020649	Edible offal of swine, frozen (excluding livers)	108,017	-624	0	0.00%
4	220300	Beer	98,218	16,067	960	0.98%
5	390120	Polyethylene with a specific weight from 0.94	93,481	10,288	40	0.04%
6	230990	Other ready-made animal feed	82,261	32,253	0	0.00%
7	020322	Pork hams and shoulder blades, raw, frozen	78,753	36,343	0	0.00%
8	390110	Polyethylene with a specific weight of up to 0.94	68,587	25,861	0	0.00%
9	040410	Milk whey	55,648	20,013	40	0.07%
10	390210	Polypropylene	41,776	-4,285	40	0.10%
11	390740	Polycarbonates	41,021	19,486	60	0.15%
12	151499	Other refined rapeseed or mustard oil	39,758	21,093	0	0.00%
13	030368	Frozen whiting	38,572	15,058	0	0.00%
14	390130	Ethylene copolymers with vinyl acetate	32,990	5,390	0	0.00%
15	200410	Frozen cooked potatoes	31,441	4,575	290	0.92%

Source: ITC, ERAI.

If we consider the commodities that showed the highest absolute increase in exports in 2020, excluding wood raw materials, grain products, animals and plants, non-metallic raw materials, fuel, mineral products, agricultural raw materials and chemicals and materials (with the exception of finished chemicals), as well as previously analysed commodities, we can identify a number of other promising commodities for the modal shift. In contrast to the leading products in terms of absolute export volume, among the leading products of absolute growth there are products of the pulp and paper, and fat and oil industries.

Along with baby food, the Eurasian railway route has already taken over a significant share of the cargo flow of polyacetals (plastics, HS 390710), with exports of 5,620 tons, which is 18.28% of exports. In addition, above the average values are the transportation of weaving machines (HS 844520), with exports of 510 tons, or 2.05% of the cargo flow, as well as newsprint (HS 480100), with exports of 720 tons, or 3.35% of the export cargo flow. Promising products for increasing cargo transportation are testliner up to 150 g/m², corrugated paper, and mineral water.

Table 3.

TOP 15 COMMODITIES EXPORTED BY THE BENELUX COUNTRIES TO CHINA BY ABSOLUTE GROWTH IN 2020 BY SELECTED INDUSTRIES.

	HS code	Product	Exports in 2020, tons	Absolute growth by 2020/2019, tons	Transported via the ERAI Eurasian route, tons	Share of the Eurasian route, %
		Total export	10,253,108	3,615,896	102,590	1.00%
1	440712	Spruce and fir lumber	320,124	185,283	0	0.00%
2	720839	Hot rolled steel without drawing and etching up to 3 mm thick in rolls	99,006	98,984	0	0.00%
3	740200	Unrefined copper	64,967	57,304	0	0.00%
4	480524	Testliner up to 150 g/m2	71,290	54,757	300	0.42%
5	390710	Polyacetals	30,750	25,867	5,620	18.28%
6	151411	Raw rapeseed oil with a low content of erucic acid	28,322	25,747	0	0.00%
7	844520	Spinning machines	24,825	24,825	510	2.05%
8	480519	Other paper for corrugation	35,108	24,192	210	0.60%
10	151499	Other refined rapeseed or mustard oil	39,758	21,093	0	0.00%
11	470500	Semi-cellulose	31,755	20,770	0	0.00%
12	740311	Refined copper in cathodes	51,163	17,851	0	0.00%
13	480100	Newsprint	21,523	16,428	720	3.35%
14	220110	Mineral and carbonated water	24,313	16,273	10	0.04%
15	480810	Corrugated paper and cardboard	15,759	15,742	0	0.00%

Source: ITC, ERAI.

Summing up, we can note a rather weak penetration of railways into the export commodity flow from the Benelux countries to China. The total share of the Eurasian railway route is only 1%, which is below the average value. However, it is also possible to note a number of promising areas of development, as well as products where a modal shift is already noticeable.

In general, promising commodity groups for the transition to the railway are represented by products of the chemical and food industries in their expanded understanding. This conclusion is related to the nature of the Benelux countries' exports to China, where the Netherlands' specialization in chemical and food products and Belgium's specialization in pharmaceuticals and woodworking play a role.

CONCLUSION

Despite the relatively small number of people and the size of the territory, the Benelux countries have a developed and highly efficient industry, are distinguished by a high standard of living and the quality of infrastructure, which makes them important objects for analysis from the point of view of cargo traffic in the direction of China-Europe-China. The Benelux countries have a negative balance in trade with China in the amount of USD 45.784 billion. This fact makes it especially important to study ways to increase countries' exports to China, especially from the point of view of the potential for a modal shift in favour of rail transport.

Even despite the presence of a developed port infrastructure in the Benelux countries, the railway alternative has its advantages, especially given the current situation of prices for sea freight with the stability of the cost of transit along the Eurasian route. In April 2021, the index of continental rail transit traffic in the direction of China-Europe-China (ERA1) remained stable, thereby anchoring at USD 2,729 per FEU, while the WCI Drewry maritime transport index reached another peak of USD 5,472 per FEU.

The analysis of the exports of the Benelux countries is divided into the analysis of the trade of the Netherlands and Belgium, since Luxembourg was not studied separately due to low export volumes. The Netherlands' exports to China in value terms appear to be quite diversified. About 28% of exports to China are represented by mechanical equipment, machinery and computers, with exports of USD 4.5 billion in 2020, of which USD 2.5 billion accounts for export of HS 8486 represented by equipment for the semiconductor industry. At the level of six HS signs, USD 2.3 billion of the country's exports accounted for HS 848620 represented by machines for the production of semiconductor devices and integrated circuits.

Of USD 9.7 billion of Belgium's exports to China in 2020, 23% (USD 2.2 billion, or 6,300 tons) were pharmaceutical products. Belgium is the fourth world's pharmaceutical producer after Germany, Switzerland and the Netherlands. This country accounts for about 7.4% of world exports of medicines, since many multinational pharmaceutical companies have production in the country.

The structure of Benelux countries' exports to China is markedly different from, for example, the structure of Germany's exports to China. Unlike Germany, the Benelux countries do not supply or supply significantly smaller quantities of automotive equipment, ferrous metals, and energy equipment. At the same time, chemical industry products are sent to the east in large proportions.

The Benelux countries' exports to China are characterized by a rather low share of cargo traffic going by rail. As can be seen from the statistics, the largest share of rail transport is concentrated in segments that tend to containerize. The share of railway transport in the transportation of various industrial commodities is 2.86%, which is less than the average value for trans-Eurasian railway transport. The share of railway transport in the transportation of textile materials (7.55%) and clothing (17.59%, HS 61 and HS 62) is noticeable.

The analysis showed that the share of the Eurasian route and the share of rail transport in the direction of China-Europe-China do not differ too much due to the general attraction of bilateral trade to sea transport. In general, promising commodity groups for the transition to the railway are represented by products of the chemical and food industries in their expanded understanding.