

UKRAINIAN IRON & STEEL INDUSTRY NEEDS UNBLOCKING OF SEA PORTS



20
22

The study of logistic issues
of Ukrainian iron & steel
companies amid the war

GMK Center

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INTRODUCTION

Dear friends,

I am proud to be a part of the Ukrainian iron & steel industry, which is the focus of the consulting company GMK Center. Resilience and dedication showed up in every Ukrainian after the start of the Russian invasion on February 24th. The Ukrainian iron & steel industry continues to operate and support communities, suffered people and defenders of Ukraine despite the number of challenges. Logistics is one of the main ones.

The blocked Black Sea ports, the overloaded railway limited the export and output volumes of steelmakers and iron ore companies, complicated the import of raw materials. Only the hostilities had a greater impact on the steel sector than logistics.

At various international events or in communication with clients, I get asked the same questions. How do companies export their products? What is the real potential of Ukrainian exports? Have the logistics issues been resolved?

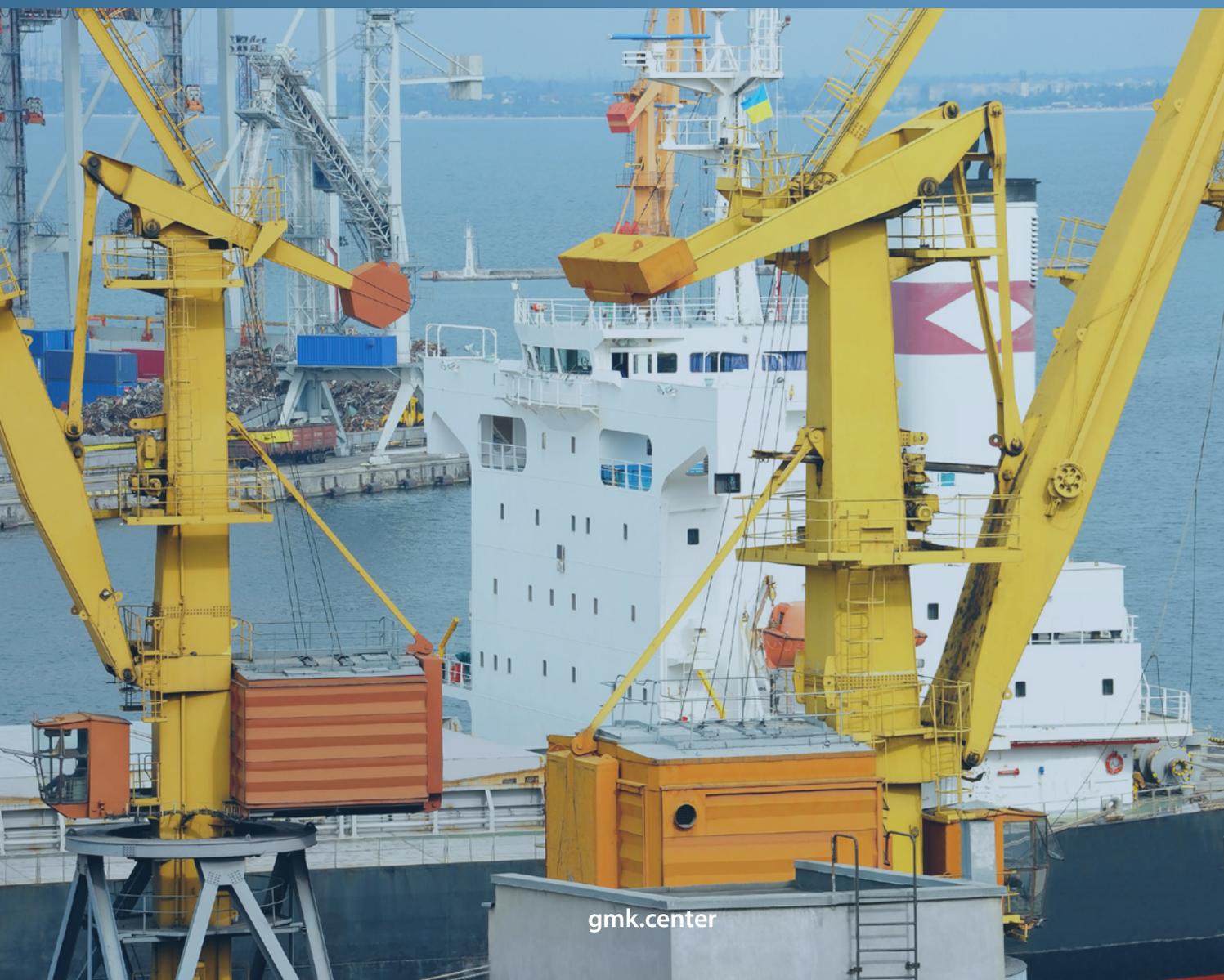
GMK Center has prepared this study to show how companies have been able to cope with the challenges, what is the situation with export logistics today, what logistics decisions are being made, whether there are positive developments in overcoming logistics challenges.



Stanislav Zinchenko
CEO of GMK Center

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SUMMARY

Ukrainian iron & steel industry has been significantly affected by the blockade of the Black Sea by the Russian navy, as maritime transport was the main route for export. Share of sea transport in export of iron ore was 60% pre-war, pig iron & steel – 80%.

With the start of the war the entire volume of exports of goods from Ukraine began to be sent to Europe. Iron & steel products are transported to the EU by railway (55% as of October 2022) and by sea from Izmail port (45%). At the beginning of the war, the share of the railway shipments was higher.

Railway transportation is possible through 13 railway border crossings with European countries: Poland, Slovakia, Hungary, Romania and through Moldova to Romania. Poland and Romania are transit hubs for Ukrainian products, that are sent from seaports of Constanta, Gdansk, Szczecin and other. Also, through Slovakia, Ukrainian iron & steel products continue their journey by rail to the Czechia and Austria.

Five crossings are the most actively used for the export of iron & steel products: Chop-Cierna and Uzhgorod to Slovakia, Izov and Mostyska-2 – to Poland, Batevo – to Hungary. In total, they account for 94% of exports by railway.

The peak pressure on the Ukrainian railway system was in April-May. At that time, grain cargoes began to be actively transported to the EU. The total maximum shipped volume of all cargoes was about 3 mln tons in April.

With the growth of traffic volumes at the border, the queue of wagons began to grow, reaching its peak in June - more than 40 thousand wagons. The wagons were piling up and queue delays were up to 60 days during that period, according to local steel companies.

The bottleneck was at the border crossings, and the main problem was the different gauges in Ukraine and Europe. According to the National railway operator Ukrzaliznytsya (UZ) the main reason of queues at the border was the inability to accept the required amount of cargo from the EU railway companies. Queues of wagons at European ports that don't have enough free capacities to process declared volume of cargoes from Ukraine, deficit of wagons from European railway carriers, limited capacity of certain rail sections of European railways, duplicate control procedures in Ukraine and European countries are among the impacting factors.

The total nominal capacity of all border crossings is more than 3,400 wagons per day, according to UZ. We estimate actual capacity in 1,800 wagons per day, as the maximum achieved daily traffic processed, that accounts all limiting factors. It also

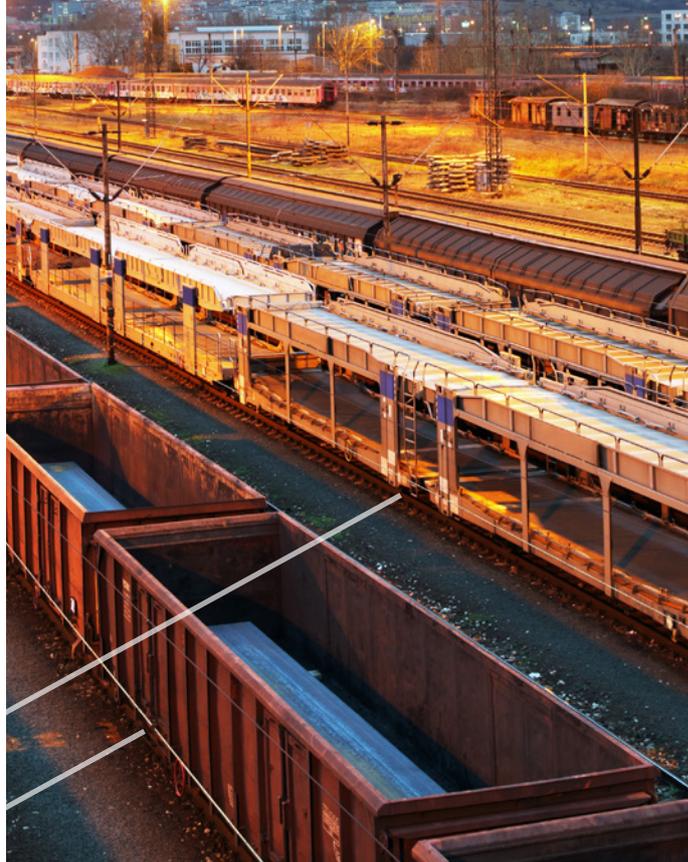
means that the maximum volume of transportation to European countries by railway is about 3.0 million tons per month. It's the current export potential from Ukraine to Europe.

UZ introduced 16 conventions for the transportation of iron & steel products from May to September 2022 in order to ease queues at the border. Also, UZ has raised railway cargo tariffs by 70% since July 1, 2022.

Ukrainian iron & steel companies report 330% growth in railway transportation costs to Europe, compared to pre-war. Along with the deterioration of the market situation, the growth of transportation costs led to the losses of the iron ore business with a further stop of a number of facilities. As a result, the volume of iron ore traffic through the border crossings to European countries decreased by 2.5 times in September compared to the maximum in April.

The decrease in the volume of railway traffic has improved the situation with the utilization of border crossings. Delay time at the border has decreased to 11 days. As of November, total Ukrainian iron & steel products are delivered to European customers in 18 days, according to the companies.





Reducing of delays at border crossings is the result of a decline in traffic volume. The export potential from Ukraine via railway has not changed during the war. The potential for traffic growth from the level of September is about 1 million tons.

The problem of throughput capacity at the border will rise again with the improvement of the situation on global commodity markets and increasing demand for railway transportations.

Blocked seaports lead to significant exports losses in iron & steel industry of Ukraine. According to our estimations, monthly value of such losses reaches \$420 mln. Monthly Ukraine could not produce and export 1.3 mln tons of iron ore, 151 ths tons of pig iron, 192 ths tons of semi-finished products and 218 ths tons of finished steel products.

Ukrainian iron & steel companies exporters had to redirect cargo flows to EU seaports, in particularly in Romania (Constanta), Bulgaria (Burgas), Poland (Gdynia, Gdansk, Szczecin, Swinoujscie), Croatia (Rijeka, Ploce), Germany (Hamburg, Bremerhaven, Bremen). As a result, average distance to dispatch port for Ukrainian exporters increased by five times and shipping costs to port of destination raised by 3-4 times in average.

Izmail (Danube port in Ukraine) became the main route for exports of iron & steel products: 45% of iron & steel products are exported through this port in October 2022. The main shipment destinations from Izmail are port of Constanta, Burgas (Bulgaria) and transportation along the Danube.

Constanta is the main seaport for Ukrainian iron & steel exports now. Polish seaports were used in test export shipments from Ukraine. In general, EU seaports has relatively small capacities. They cannot handle all Ukrainian cargo, that is why railcars stay in queue at Ukraine-EU borders. In fact, EU seaports cannot replace Ukrainian ones. Since the beginning of the war, Ukraine decreased monthly iron & steel exports through seaports by 79%.

“Grain deal”, signed in July 2022, unblocked the export of grain and other food products from three Ukrainian ports: Odessa, Chornomorsk, Pivdennyi. It allowed Ukraine to export 11 million tons of food through ports. “Grain agreement” limited the flow of grains cargo to the railway, so Ukraine prevented the total collapse of the transport system.

Road transport is not widely used for shipment of iron & steel products. It allows the transportation of relatively small batches of high value-added

products. Currently, automobile checkpoints are operating at the borders with Poland, Hungary, Slovakia, Romania, and Moldova (with the exception of the so-called Transnistrian Republic).

Most of the cargo goes through Poland since this country is a transit point for delivery to most countries in northern and western Europe. Trucks stay at checkpoints for 2 to 5 days, and the average delivery time to EU countries is 8-12 days. Since the beginning of the war transportation costs by road almost doubled.

The main problems of companies using road transport to export their products refer to lack of carriers providing logistics services. Number of carriers significantly decreased and not all carriers agree to send a car for loading if enterprise-shipper are located near area of active hostilities.

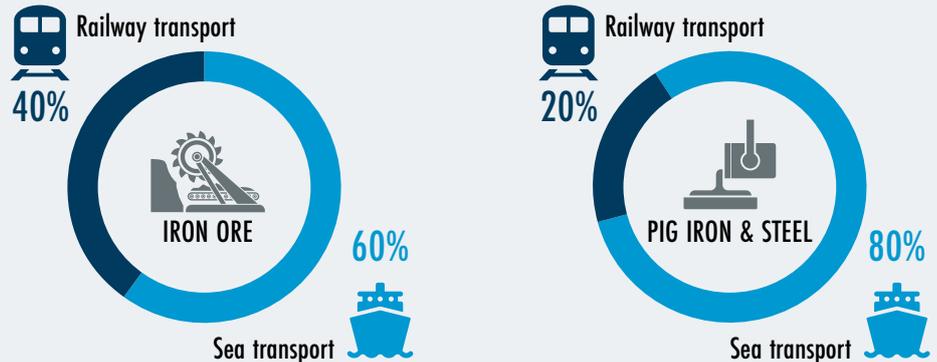
All opportunities for Ukraine to increase production and export of iron & steel products are associated with access to ports. Even during the war 60% of iron & steel products from Ukraine is shipped to end customers by sea. EU seaports do not have free capacities to handle all Ukrainian cargo. So rising output and utilization of Ukrainian iron & steel companies, restart idled facilities, growth of exports are possible only with unblocking of Ukrainian Black Sea seaports.

INTRODUCTION:

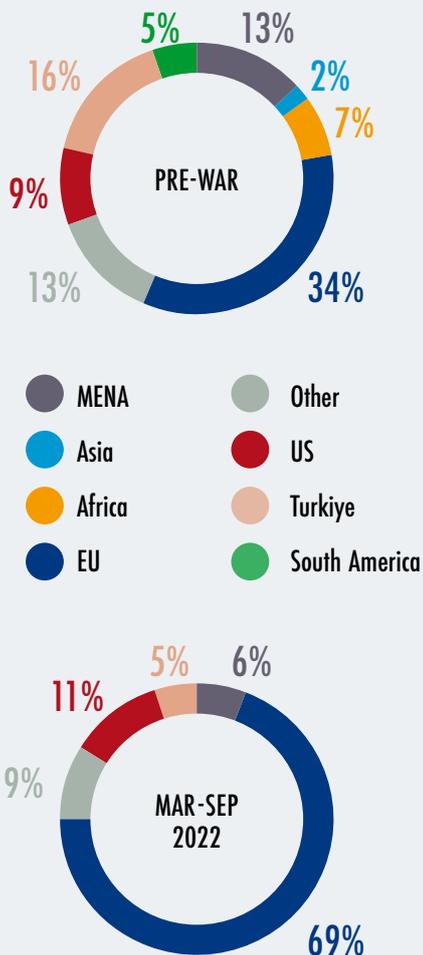
Logistic issues became the most impacting on iron & steel sector

The iron & steel industry is the backbone of the Ukrainian economy and accounted for about 10% of GDP and 33% of exports before the Russian invasion. Domestic iron & steel industry is export-oriented and has been significantly affected by the blockade of the Black Sea by the Russian navy, as maritime transport was the main route for export. In fact, this meant that almost all exports were possible only by railway, which led to overloads and delays in delivery.

Iron & steel export by transport type in 2021



Pig iron & steel export by region



Another major impact is the change in the exports flows. The supply of iron ore to China has become impossible, as well as pig iron to the United States, Italy or Turkey. The entire volume of exports was redirected to the EU, both to end customers and for transit. The share of the EU countries in the export of pig iron and steel increased from 34% to 69% in April-September 2022. In the supply of iron ore, all 100% of exports fall on European countries, although before the war – only 45%.

As we see, Ukrainian companies were able to adapt. Poland, Romania and Slovakia became the main directions for export. These countries are used as transit hubs for further shipping by sea or railway. Therefore, we can see Ukrainian pig iron in the US or other regions. This is the result of a certain change in the situation in the last few months. Export routes have changed, delays at the railway border crossings to European countries have been reduced.



RAILWAY TRANSPORT:

Problems calmed down for a while

Railway transportation is possible through 13 railway border crossings with European countries. These border crossings provide export to Poland, Slovakia, Hungary and Romania, as well as through Moldova to Romania, totaled 55% of iron & steel export in October 2022.

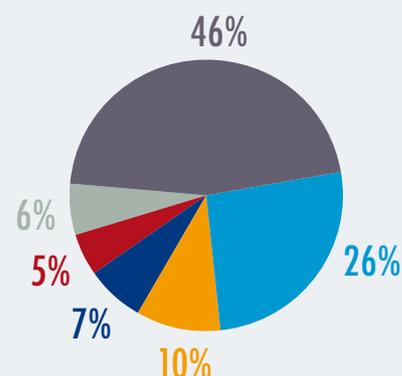
But the geography of exports is wider than these countries only. Poland and Romania are transit hubs for Ukrainian products, that are sent from seaports of Constanta, Gdansk, Szczecin and other. Also, through Slovakia, Ukrainian iron & steel products continue their journey by rail to the Czechia and Austria.

Five crossings are the most actively

used for the export of iron & steel products: Chop-Cierna and Uzhgorod to Slovakia, Izov and Mostyska-2 – to Poland, Batevo – to Hungary. In total, they account for 94% of exports by railway. The direction to Slovakia is the main one, since the integrated plants of Slovakia (US Steel Kosice), Czechia (Liberty Ostrava, Trinecke Zelezarny) and Austria (Voestalpine plants in Linz and Donawitz) are supplied with iron ore through it.

We estimate the share of railway transport in exports to end consumer at 40% as of October 2022, given that part of cargoes, exported by rail and delivered to the end customer by sea through European ports.

The most used border crossings for iron & steel exports from Ukraine, as of October 2022

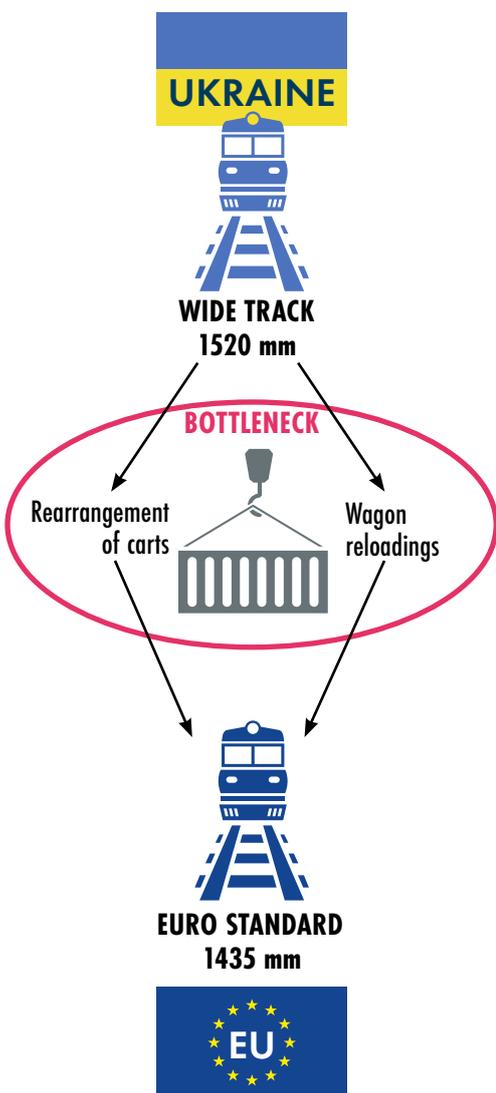


The map of railway border crossings with European countries

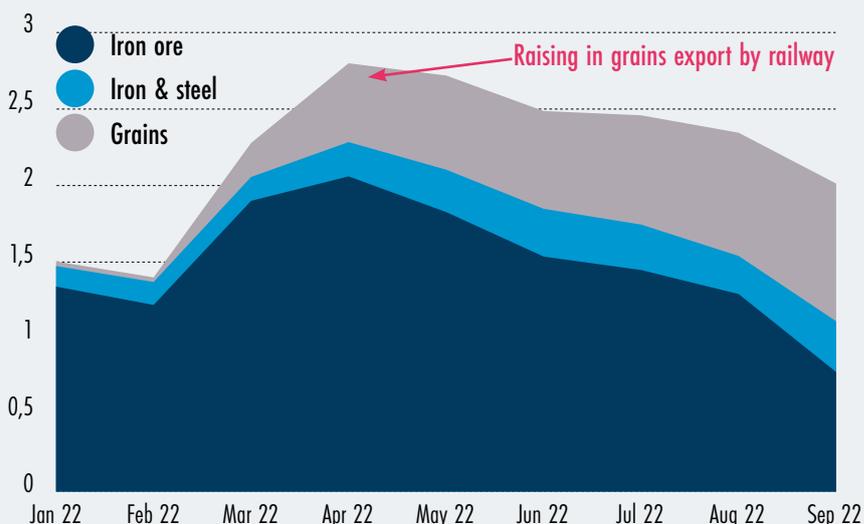


The only provider of railway cargo transport services in Ukraine is Ukrzaliznytsya (UZ). Railway transport was traditional for iron ore export to EU and rarely used for exports of other products. The share of iron ore in exports by railway before the war was 80-85%. With the start of the war the major volume of exports of goods from Ukraine began to be sent to Europe by rail. Problems arose. The peak pressure on the Ukrainian railway system was in April-May. At that time, grain cargoes began to be actively transported to the EU. Logistic constraints have become an important factor limiting the output of the Ukrainian iron & steel industry in April-May 2022.

With the growth of traffic volumes at the border, the queue of wagons began to grow, reaching its peak in June - more than 40 thousand wagons. The wagons were piling up and queue delays were up to 60 days during that period, according to local steel companies. The problem was not UZ's ability to transport cargoes. The bottleneck was at the border crossings, and the main problem was the different gauges in Ukraine and Europe.

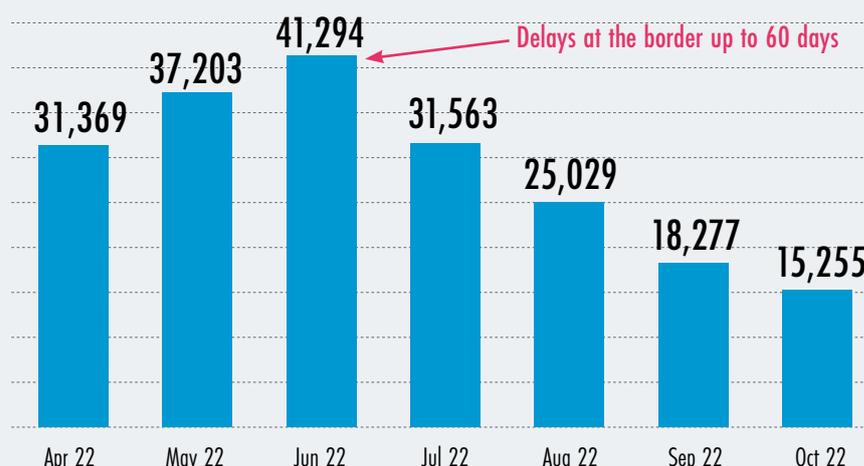


The volume of railway transportation from Ukraine to the EU via Western border crossings, mln tons



Data source: UZ

Number of wagons in queue on border crossings to European countries



Data source: UZ

In the Ukrainian railway system, the gauge is wider than in Europe - 1520 mm vs 1435 mm. For transportation, it means moving wagons to new carts or reloading of cargo. The exception is the direction of Chop-Kosice (Slovakia), where the gauge meets the standard of Ukraine. A large integrated US Steel Kosice plant is located in Kosice, where iron ore from Ukraine was actively exported.

The number of wagon carts owned by UZ was 300 pieces at the beginning of the war and has been increased by 10 times to 2,900 as of August 2022. But half of the entire fleet of wagon carts is available only at the Vadul-Siret point to the direction of Romania for the port of Constanta. Therefore, the problem with lack of wagon carts remains.

2,900

number of wagon carts for the European gauge standard in UZ ownership as of August 2022

3,400
wagons per day

nominal capacity of railway border crossings with European countries, according to UZ

The lack of reloading capacity is also a bottleneck, which limits the transport capabilities of border crossings. The total nominal capacity of all UZ border crossings is more than 3,400 wagons per day. But actual capacity amounts to 1,800 wagons per day, taking into account the deficit in reloading, as well as restrictions on the European side of the border. Exactly 1,800 wagons is the maximum processed delivery reached in June against the backdrop of a sharp increase in the queue at the border.

It also means that the maximum volume of transportation to European countries by railway is about 3.0 million tons per month. It`s the current export potential from Ukraine to Europe.

The current capacity of railway border crossings is limited by a number of factors. The inability to accept the required amount of cargo from the EU railway companies is the main one, according to UZ.

Factors that reduce the nominal capacity of railway border crossings:

- Queues of wagons at European ports that don`t have enough free

- capacities to process declared volume of cargoes from Ukraine
- Deficit of wagons from European railway carriers
- Lack of reloading capacity at the border
- Limited capacity of certain rail sections of European railways
- Duplicate control procedures in Ukraine and European countries.

Queues at the border could paralyze the work of UZ in summer months. The company`s first response was to introduce transport conventions. The conventions provided for a ban on transportation for individual companies, cargo, border crossings. UZ introduced 16 conventions for the transportation of iron & steel products from May to September 2022, 7 conventions - in the direction of the border crossings with European countries. Two of them are in place as of November 2022. The conventions affected shipments of iron ore, stronger than other cargoes, as iron ore was the most massive cargo.

The practice of conventions did not affect the volume of supplies, companies found another routes. But

3.0 mln tons

the maximum possible volume of railway transportations through the border crossings with European countries, according to GMK Center calculations

conventions had significant impact on business as they increased the uncertainty of delivery times. It negatively affected the relationship between steelmakers and customers and raised transportation costs. Therefore, Ukrainian companies were forced to maintain increased inventories in Europe. Sometimes delays in delivery times led to the loss of contracted volumes.

Another response of UZ was a record increase in transportation tariffs. From July 1, 2022, tariffs have been increased by 70%. This measure was tough for iron ore companies. Transportation costs for exports have risen by more than 3 times compared to pre-war, according to steel companies. These estimates include both tariff increases and increased shipping times.

Along with the deterioration of the market situation, the growth of transportation costs led to the losses of the iron ore business with a further stop of a number of facilities. As a result, the volume of iron ore traffic through the border crossings to European countries decreased by 2.5 times in September compared to the maximum in April. The share of iron ore in exports by railway dropped to 39% in September. At the same time, the growth in transportation costs did not have a significant impact on the volume of exports of iron & steel.

The decrease in the volume of railway traffic has improved the situation with the utilization of border crossings. The level of utilization as of October does

+330%

growth of transportation costs for the export of iron ore from Ukraine by rail in February-October 2022

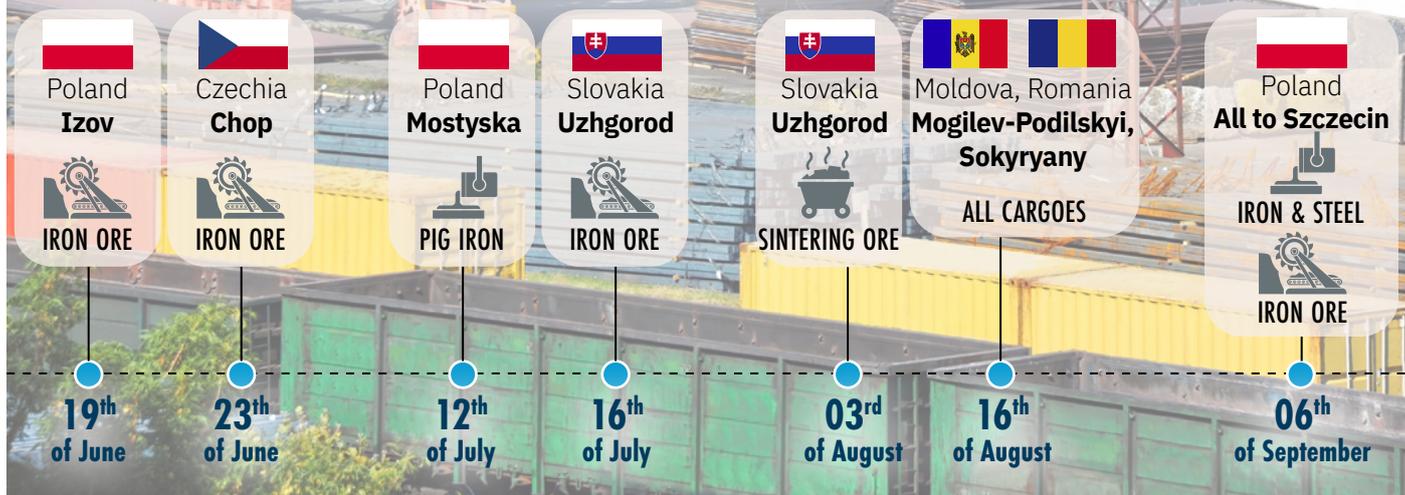
Nominal and actual capacity of railway border crossings, number of wagons per day

Countries	Cross-border point	Nominal capacity *	Actual capacity **
 Poland	Yagodyn	200	152
	Izov	600	402
	Rava-Ruska	150	n/a
	Mostyska-2	306	175
 Romania	Vadul-Siret	180	136
	Dyakovo	120	67
 Slovakia	Chop-Cierna	490	294
	Uzhgorod	500	102
 Hungary	Chop-Zahony	30	n/a
	Batevo	420	191
 Moldova	Sokyryany	86	n/a
	Mogilev-Podilskyi	140	57
 Romania/  Moldova	Reni	200	n/a
TOTAL		3,422	1,800

* UZ data

** Maximum achieved daily traffic, GMK Center estimations

Introduction of conventions by UZ for the transportation of iron & steel products to European countries in June-September 2022



not exceed 90%, and the delay time at the border has decreased to 11 days. As of November, total Ukrainian iron & steel products are delivered to European customers in 18 days, according to the companies.

But even today, the level of utilization of some crossings is close to critical. This is especially true for points that are most used for iron & steel transportation. For example, utilization of Izov and Chop-Cierna is close to 90%. The delay on the last one is 21 days.

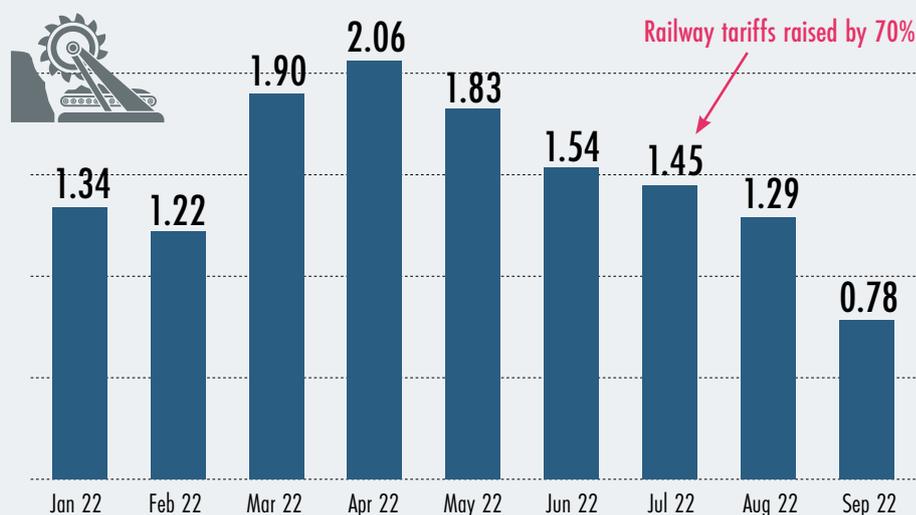
UZ notes the problem of uneven loading of border crossings. As we indicated earlier, the direction to Slovakia is the main and busiest, while the crossings to Poland are relatively free of queues.

It should be taken into account that the decreasing of delays at border crossings was not achieved due to the expansion of capacities. We do not have specific information about investment projects for the construction of reloading complexes. The same is true in terms of expanding the infrastructure of the European partners. The corresponding investment projects do not find support, since their future demand is not guaranteed.

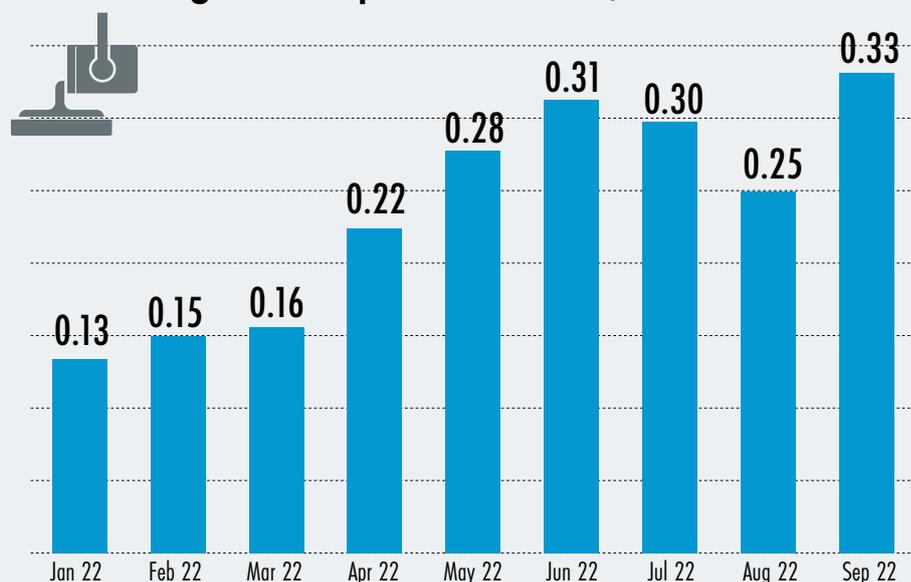
18 days

average shipping time for iron & steel products from Ukraine to the EU countries by rail, as of November 2022

Transportation of iron ore through the border crossings to European countries, mln tons



Transportation of pig iron and steel products through the crossings to European countries, mln tons



Data source: UZ

So, decreasing of delays at border crossings is the result of a decline in traffic volume. It happened for two reasons: economic, due to deteriorating market conditions, as well as the «grain deal», which allows the export of grain from the Ukrainian Black Sea ports.

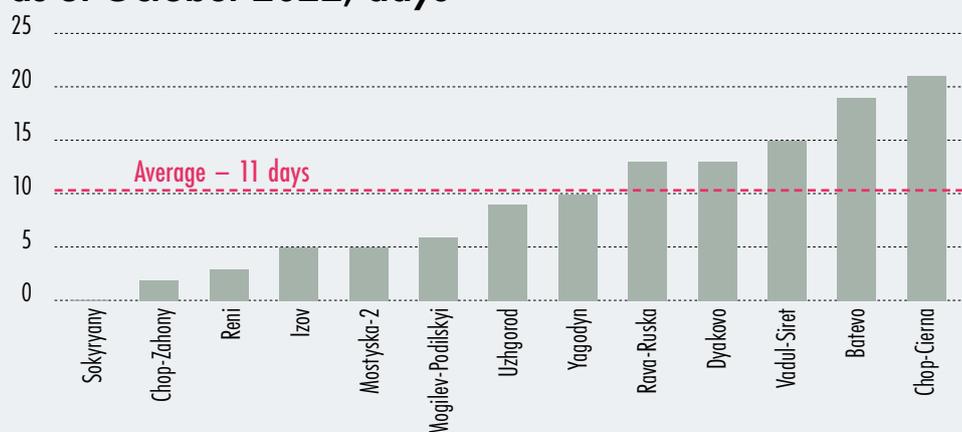
In other words, the export potential from Ukraine through the Western border crossings has not changed and is about 3.0 mln tons. Ukrainian business does not expect changes in this regard. The potential for traffic growth from the level of September is about 1 million tons.

With the improvement of the situation on global commodity markets, the demand for railway transportations will increase. The problem of throughput capacity of border crossings and reloading complexes will rise again.

Level of utilization of border crossings as of October 2022*

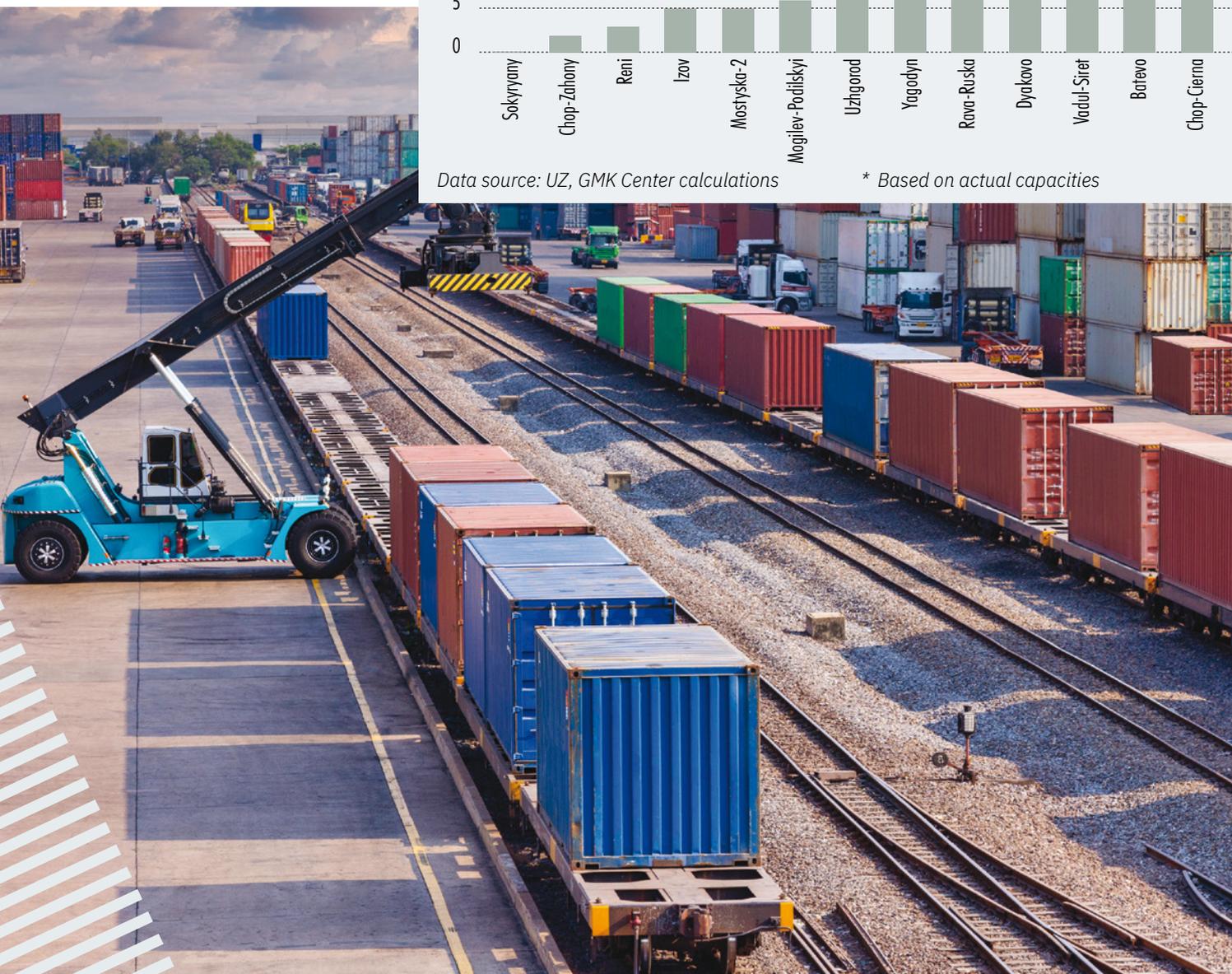


Average delay at border crossings as of October 2022, days



Data source: UZ, GMK Center calculations

* Based on actual capacities

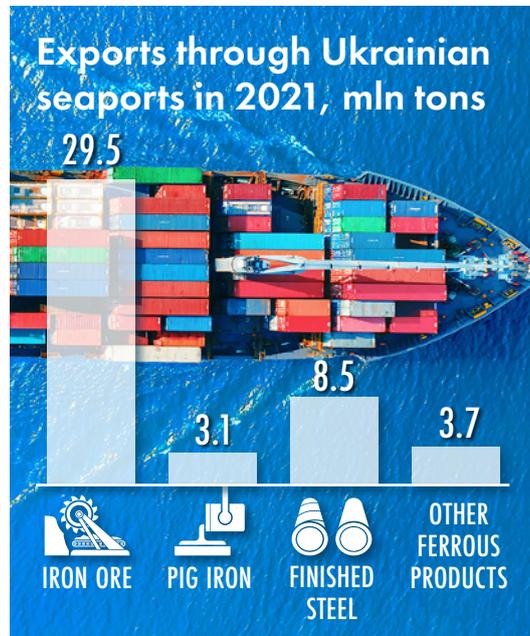


SEA TRANSPORT:

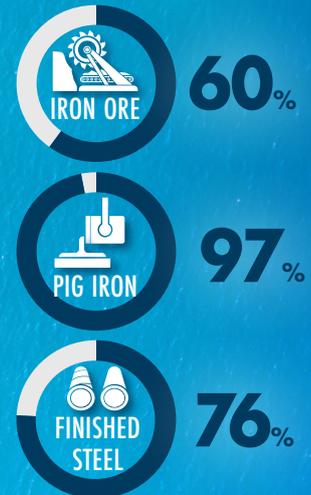
Ukrainian seaports can't be replaced by EU ports

There were 13 operating seaports in Ukraine in 2021, excluding ports in Crimea. Before the war Ukrainian seaports were the main logistics hub for exports. Export by sea ensured low logistics costs and competitiveness of Ukrainian products on the global market. Seaports were the basis for Ukrainian export potential. Iron & steel sector exported more than 60% of products through seaports. Almost all pig iron was exported from Ukraine by sea transport. Seaports were implementing investment projects focused on the construction of new terminals and expansion of transshipment capacities. However, these projects were interrupted by the war.

Ukrainian seaports transhipped 44.8 mln tons of cargoes related to iron & steel industry last year. The biggest seaport in terms of cargo transshipments was Pivdennyi – it handled 27.4 mln tons of iron & steel cargoes in 2021, including 26.6 mln tons of iron ore.



Share of exports through seaports in 2021



Pig iron was shipped from Mykolaiv (1.2 mln tons in 2021), Odessa (0.7 mln tons), Mariupol (0.6 mln tons), Pivdennyi (0.5 mln tons). The biggest exports of finished steel products were registered from Odessa (3.6 mln tons), Mykolaiv (1.7 mln tons), Mariupol (1.6 mln tons).

Since the beginning of the war

Ukrainian seaports have been closed due to mine danger, as well as because of the threat from the Black Sea Fleet of the Russian Federation. At the beginning of the war, shelling of ships and even cases of their capture by the Russian armed forces were recorded.

As for now only Danube ports

Main Ukrainian seaports for exports of iron & steel products



* Exports of iron & steel products (incl. iron ore, pig iron, finished steel, other ferrous products.) in 2021.

Monthly iron & steel exports through seaports, mln tons



x5 times

distance to dispatch port for Ukrainian exporters

x3-4 times

shipping costs to destination port for Ukrainian exporters since the beginning of the war

continue to operate in Ukraine. These ports have relatively small capacities. Before the war Danube ports handled about 6% of iron & steel exports only. So now Danube ports cannot solve all logistical problems.

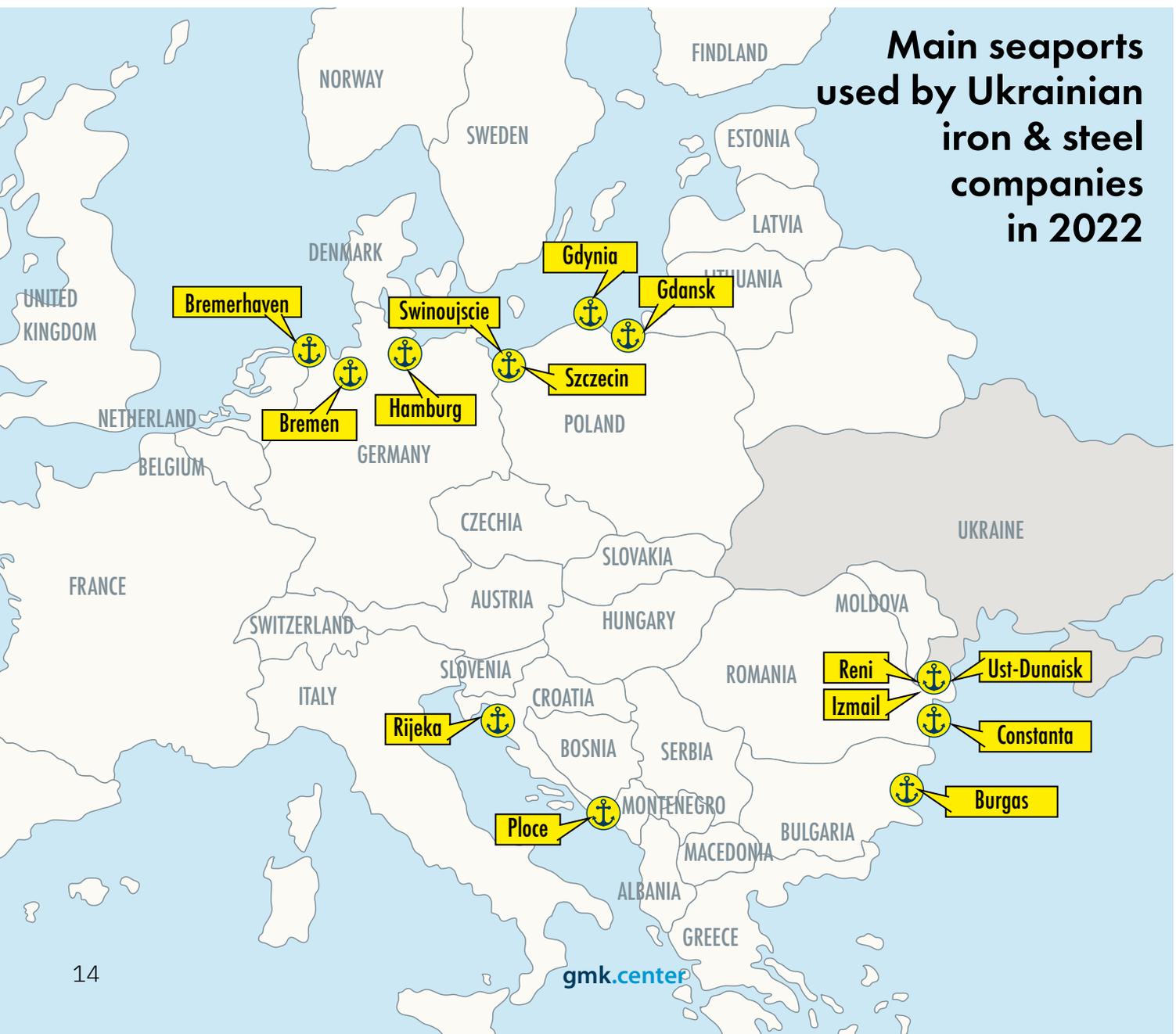
During the war Ukrainian exporters

had to redirect cargo flows to EU seaports, in particularly in Romania (Constanta), Bulgaria (Burgas), Poland (Gdynia, Gdansk, Szczecin, Swinoujscie), Croatia (Rijeka, Ploce), Germany (Hamburg, Bremerhaven, Bremen). As a result, average distance to dispatch port

for Ukrainian exporters increased 5 times and shipping costs to port of destination raised 3-4 times in average. Monthly iron & steel exports from Ukraine through seaports decreased by 79%.

Before the war, the Danube ports did not cover any significant share

Main seaports used by Ukrainian iron & steel companies in 2022





6.2%

share of Danube ports in Ukrainian iron & steel exports through seaports in 2021

45.0%

of iron & steel products was exported through Izmail port in October 2022

of the total Ukrainian port cargo turnover. Share of Danube ports in total Ukraine's cargo shipment in 2018-2021 was 2.5-4.2%, or 4-6 million tons of cargo, from which iron & steel products – 3 mln tons. These ports were used by a rather narrow list of shippers, when it was necessary to deliver goods to customers along the Danube. Iron & steel companies mainly used Izmail port, which handled 2.5 mln tons of iron ore and 0.2 mln tons of finished steel products in 2021.

During the war Danube ports were forced to partially reorient their work to coastal navigation for offshore transshipment in the port of Constanta (Romania). Now Izmail is the main route for exports of iron & steel products: 45% of iron & steel products are exported through this port in October 2022. The main shipment destinations from Izmail are port of Constanta, Burgas (Bulgaria) and transportation along

the Danube towards Austria (for iron ore).

Total capacities of Danube ports amount to 20.5 mln tons of cargoes. In reality, they cannot be fully used for the following reasons: limitations in existing infrastructure, insufficient depths, slow navigation on the Romanian side, often low water in the Danube.

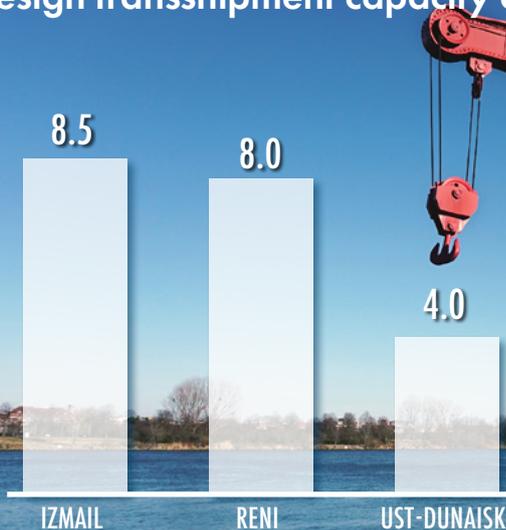
The Ministry of Infrastructure intends to increase the annual throughput of ports up to 25 million tons of cargo. To achieve this goal, it is necessary to modernize the port infrastructure, build new terminals, carry out dredging, modernize the railway infrastructure, build new ships, and repair the existing fleet. Investments for the implementation of this project are estimated at **\$200 mln**.

It is also possible to use the Danube ports for transporting products upstream the Danube. In October 2022 Ukrainian Danube Shipping

Company sent the first barge caravan with iron cargoes from Izmail to the Middle Danube. But we understand that throughput capacities of this route are also limited. Ukrainian Danube Shipping Company has already increased number of ships and doubled shipments. But it is insufficient to solve problems of export logistics.

After the beginning of the war, Constanta became one of the main ports for Ukrainian exports. Ukrainian goods arrive in Constanta by road, rail and barge from the Ukrainian Danube ports of Reni and Izmail. Export of iron ore through the port of Constanta began in May 2022. Logistics are complicated by problems with the railway infrastructure and low water level on the Danube after several weeks of drought, which prevented barges from taking their full loads. To solve problems with Constanta's infrastructure,

Design transshipment capacity of Danube ports, mln tons



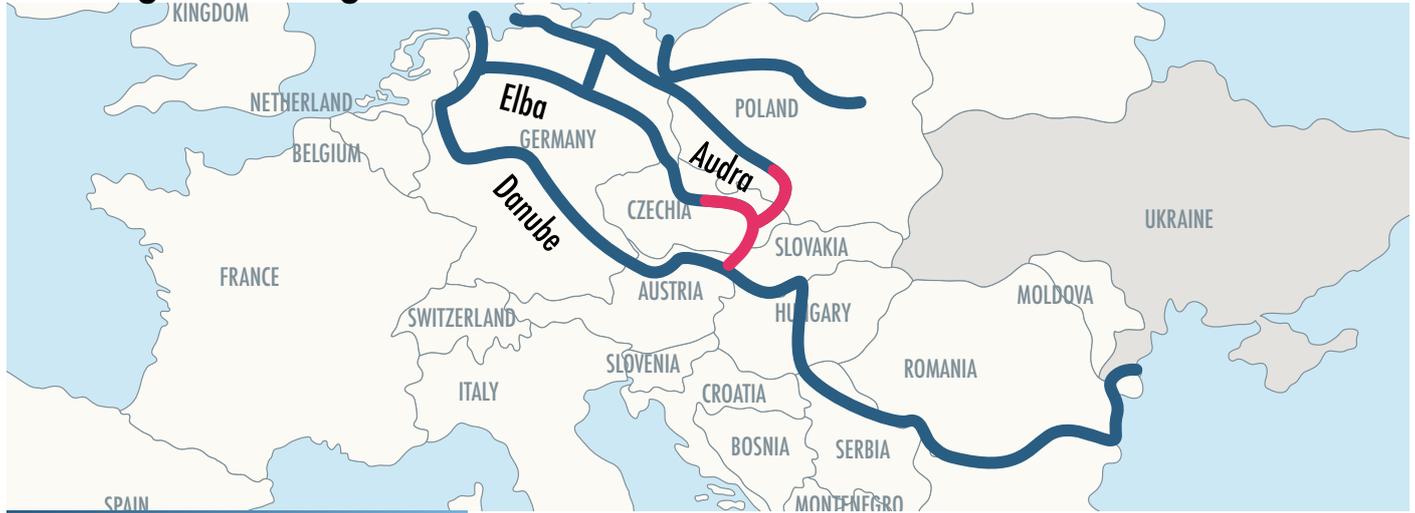
26.8%

capacity utilization of Danube ports in 2021

\$200 mln

needed investments to restore design capacity of Danube seaports in Ukraine

River logistics through Danube



200 ths tons

of cargo were shipped by Ukrainian Danube Shipping Company in June 2022, it is twice more than in March 2022

Romanian government approved 4-year investment plan. It provides \$39 mln for the modernization of roads and the railway.

Romania also repaired broad gauge railway line between the village of Giurgiulesti (Moldova) and Romanian port of Galati.

Thanks to this route, Ukraine can ship and receive cargo through Moldova and the port of Galati without transferring railcars to narrow wheelsets. The advantage of the Galati port is the ability to load both river and sea vessels.

Polish seaports were used in test

Constanta and Galati – ports in Romania

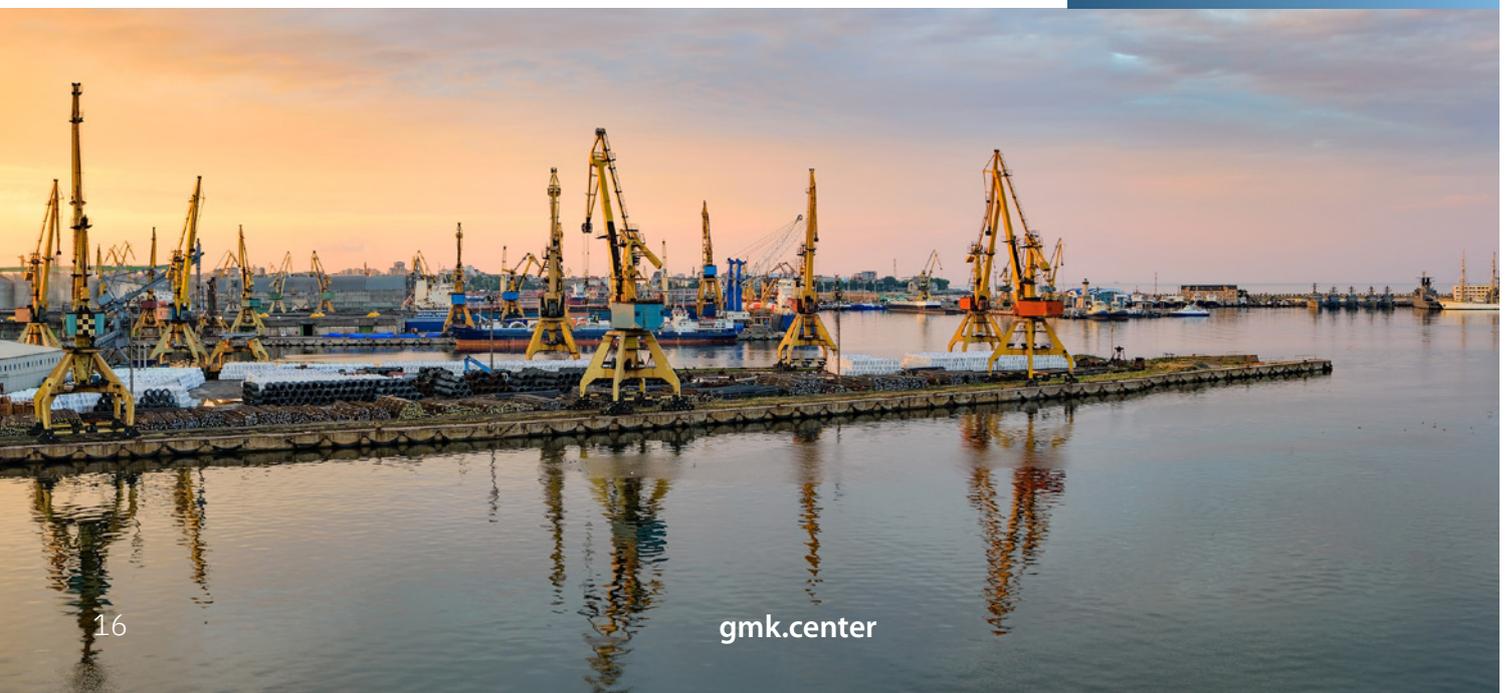


800 ths tons

of iron ore from Ukraine were handled in the Port of Constanta in May-July 2022

\$39 mln

were allocated by Romanian government into modernization of Constanta



Seaports in Poland



100 mln tons

annual handling capacities of Polish seaports

+29.9% y/y

transshipment of iron ore in the port complex Szczecin- Swinoujscie

export shipments from Ukraine. For example, in May 2022 Ukraine exported test batch of iron ore through the port of Swinoujscie. Gdansk opened internet form, with which Ukrainian companies can submit requests for the possibility of exporting or importing goods. At the same time, we know that in 2021 Polish ports handled 113 mln tons of cargo. So, their capacities were fully used.

According to some market estimations, Constanta and Polish seaports (Szczecin-Swinoujscie, Gdansk, Gdynia) have approximately 20-30 mln t of free handling capacities. It is not sufficient to restore pre-war exports from Ukraine: in 2021 Ukrainian seaports handled 118 mln t of cargo.

Certain hopes were associated with deliveries through the ports of Lithuania, in particular Klaipeda. However, they did not materialize. To deliver railcars to Lithuania through Poland, rail bogies will

have to be changed twice, because Poland has narrow rail track and Lithuania – wide one.

There are two possible solutions to the problem: construction of wide rail track in Poland to connect borders of Ukraine and Lithuania and creation of a platform for setting railcars on narrow bogies in Lithuania. Poland does not want to build 300 km of wide rail track, while Lithuania did not construct necessary platform.

In general, we see that EU seaports has relatively small capacities. According to market opinions, they do not have potential to handle Ukrainian exports. EU seaports do not have enough free capacities, they can not handle all Ukrainian cargo, that is why railcars stay in queue at Ukraine-EU borders.

On July 22, 2022, Ukraine signed so called “grain agreement” with UN and Turkiye. Russia signed a mirror agreement with the UN and Turkiye.

This action allowed unblocking the export of grain and other food products from three Ukrainian ports: Odessa, Chornomorsk, Pivdennyi. Thanks to the grain agreement, Ukraine was able to export 11 million tons of food through ports. On November 17, 2022 “grain” agreement was extended till March 2023.

If we look at shipment statistics, the grain deal did not free up the railway capacity for iron & steel cargo. Iron ore shipment decreased due to worsening market conditions in the EU. At the same time grain cargo shipment by rail peaked in September 2022 after harvest. Grain deal limited the flow of food cargo to the railway – it allows Ukraine to prevent the total collapse of the transport system.

During the war maximum rail transportation to EU was recorded in April-May 2022 – 3 mln tons per month. If we take that as a maximum of possibilities, then

20-30 mln tons

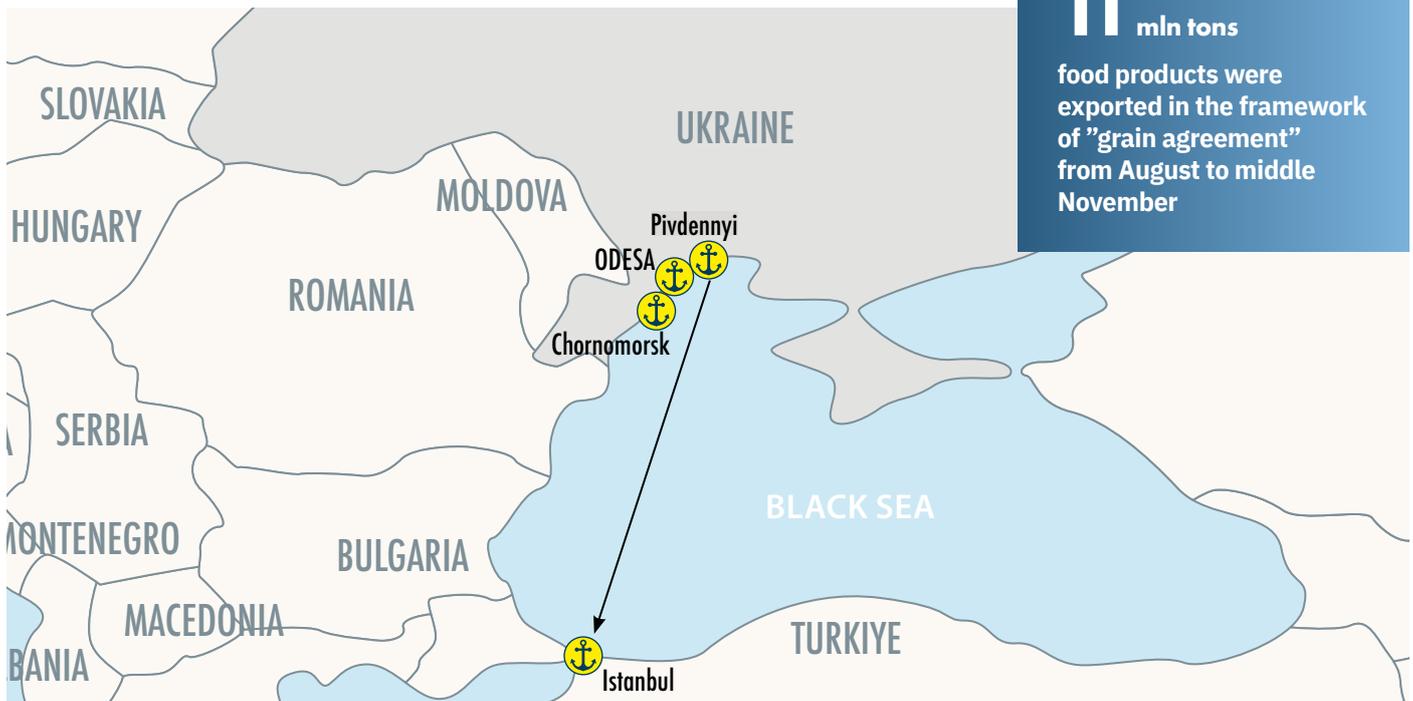
hypothetical free transshipment capacities of Constanta and Polish seaports

118 mln tons

exports through Ukrainian seaports in 2021



Sea way for "grain agreement"



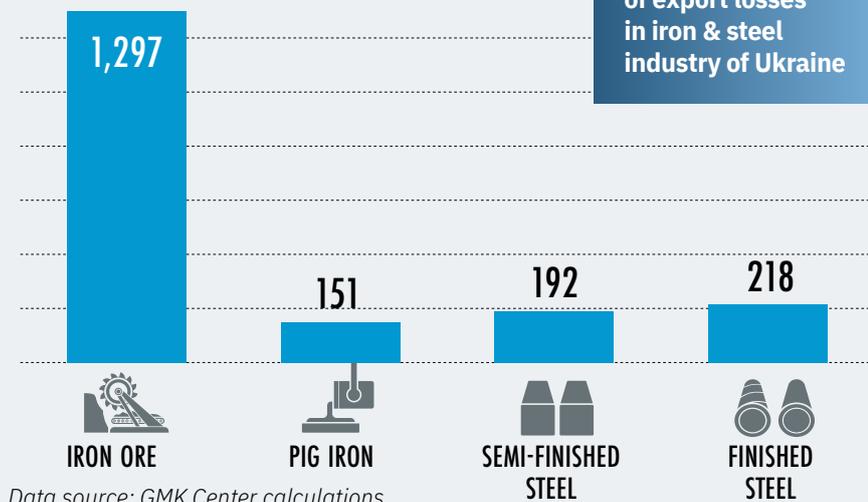
11 mln tons

food products were exported in the framework of "grain agreement" from August to middle November

Monthly export losses for Ukraine because of blocked seaports, ths tons

\$420 mln

monthly value of export losses in iron & steel industry of Ukraine



Data source: GMK Center calculations

today after grain agreement we have a potential for transporting about 1 million tons of cargo.

In fact, even during the war, most of the iron & steel cargo is exported through ports. About 60% of iron & steel products from Ukraine is shipped to end customers by sea. But all opportunities for Ukraine to increase production and export of iron & steel products are associated with access to ports. EU seaports are not able to handle additional cargo from Ukraine, so, unfortunately, Ukraine do not have possibility to increase iron & steel production now. Development of the industry, the restart of idled facilities (for example, blast furnaces or iron ore mines) is possible only if Ukrainian ports are unblocked.

ROAD TRANSPORT:

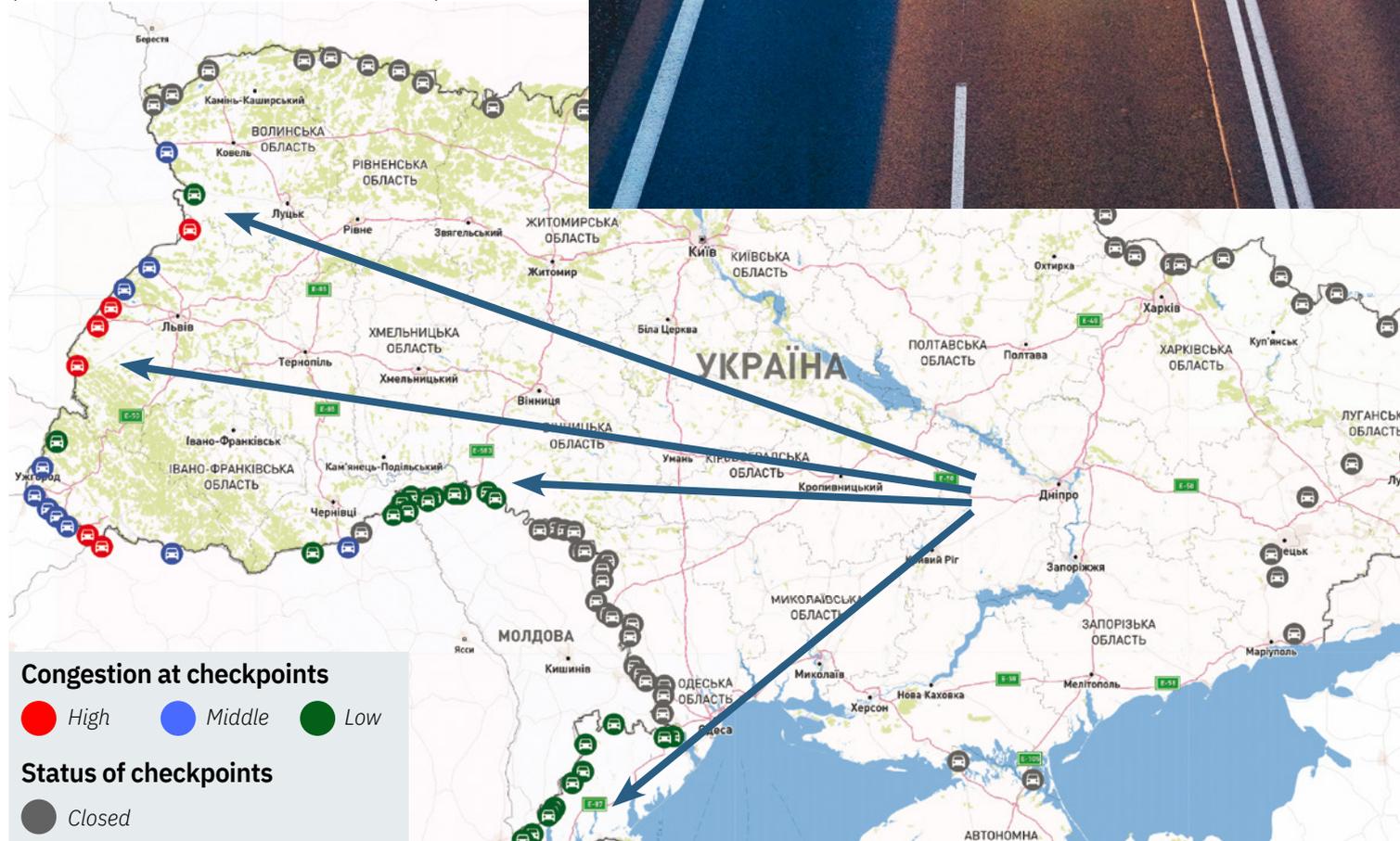
Trucks continue to deliver HVA

Before the war road transport was not widely used for shipment of iron & steel products. Road transport allows the transportation of relatively small batches of high value-added products (HVA) such as seamless pipes or stainless products. Most of the checkpoints were closed after the start of the war. Currently, automobile crossings are operating at the borders with Poland, Hungary, Slovakia, Romania, and Moldova (with the exception of the so-called Transnistrian Republic).

For export, next checkpoints are mainly used: Yagodin – Dorogusk (Poland), Rava-Ruska – Hrebenne (Poland), Krakivets – Korchova (Poland), Sheghini – Medyka (Poland), Chop (Tysa) – Zahon (Hungary), Uzhgorod - Vyshne-Neemetske (Slovakia).



Map of car border checkpoints in Ukraine (as of November 16, 2022)



Actual capacity of some car border crossings

Countries	Cross-border point	Actual capacity, number of trucks per day
 Poland	Yagodin – Dorogusk	300
	Rava-Ruska – Hrebenne	130
 Hungary	Chop (Tysa) – Zahon	150
 Slovakia	Uzhgorod – Vyshne-Neemetske	300

+100%

growth in transportation costs by road since the beginning of the year

Most of the cargo goes through Poland, since this country is a transit point for delivery to most countries in northern and western Europe. Through Moldova and Romania cargoes go in the direction of Bulgaria, Turkiye and Serbia. Slovak and Hungarian checkpoints allow exports to Italy, Slovenia, Croatia, Austria and the Czech Republic. Trucks stay at checkpoints for 2 to 5 days, and the average delivery time to EU countries is 8-12 days.

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Ukrainian companies using road transport to export their products faced the following challenges during the war:

- increase in transportation costs by almost twice;
- reduction in the number of companies providing necessary logistics services. The biggest problems were in the beginning of the war, Ukrainian drivers could not go abroad (under martial law, men aged 18-60 are not allowed to leave Ukraine). However, the issue of truck drivers was subsequently resolved;
- the refusal of carriers to send a car for loading for an enterprise located near the war zone.



ECONOMIC IMPACT OF IRON & STEEL INDUSTRY OF UKRAINE

GDP

9.5%
contributed
by the iron & steel sector
to GDP of Ukraine
in 2020

* contribution of all supply chain including household spending by employees of iron & steel industry and its suppliers

Employment

530
thousand people
employed
in the iron & steel sector
and related industries
in 2020



1
steelmaker creates
4.1
jobs in other sectors



Export

\$22.2 bln

the value
of iron & steel
exports in 2021

32.6%
contributed
by the iron & steel
sector to export
of goods



CAPEX

\$2.0 bln

the value
of CAPEX in the
iron & steel
sector in 2021

29.4%
the share
in total CAPEX
of industrial
sectors

Supply chain



38.0%

of the total
rail freight
was from
iron & steel
companies in 2021



37.4%

of the total freight
handled at Ukrainian
sea ports was from
iron & steel
companies in 2021



18.7%

the share of
iron & steel industry
in electricity
consumption
in Ukraine in 2021



8.8%

of machinery orders
in Ukraine
was made
by the iron & steel
sector in 2020

Taxes

\$3.5 bln

taxes paid
by the iron & steel
sector in 2021

Regional development

38.4%

the share
of the iron & steel sector
in GRP of iron & steel
regions in 2020



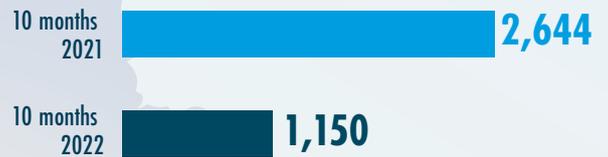
IRON & STEEL EXPORT FROM UKRAINE AFTER 8 MONTHS OF THE WAR, ths tons



Iron ore



Pig iron



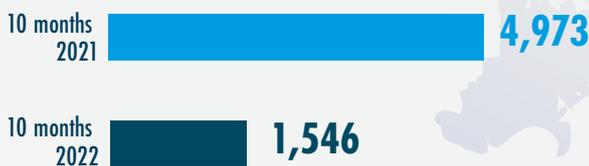
Semi-finished products



Long products



Flat products



Ferroalloys



Pipes



Scrap



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