

# Market Observation for Danube Navigation: Results of the First Quarter of 2023

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## 1. Initial State of the Market

- 1.1 The initial state of the main sectors of the Danube shipping market, by the beginning of 2023, was determined by the dynamics of the third (Q3) - fourth (Q4) quarter of 2022, and the overall results of 2022, as well as forecasts regarding the fall in the gross domestic product of the Member States of the European Union and the Eurozone, compared to 2022.
- 1.2 Russia's full-scale military invasion of Ukraine, which began in February 2022, led to additional risks in the Danube shipping market, to a decrease in steel consumption in certain industries (especially in construction and automotive manufacturing), an increase in prices for energy resources and iron ore, and restrictions on export of grain and other food related products.

In connection with the blockade of Ukrainian seaports, the creation and support of new logistics schemes for the export of Ukrainian products of the agricultural sector, as well as the import of goods needed by Ukraine through Danube ports in Ukraine, the Republic of Moldova and Romania, as well as canals between the Danube and the Black Sea, has acquired particular importance.

The Danube Commission actively contributed in solving this problem within the framework of the *Danube Solidarity Lane EU-Ukraine* initiative adopted in May 2022, European Union's solidarity measures for Ukraine.

- 1.3 Navigation conditions on the Danube in 2022 should be considered extremely unfavourable: the low water phase, which began at the end of June, was a hydrological emergency caused by high air temperatures and lack of precipitation in the Danube basin and inflowing river basins. This led to a sharp decrease in water levels throughout the Danube and, accordingly, to a significant decrease in in operating draft of vessels.

During this period, at some of critical sections of the Danube, there were occasional long stops of convoys, organisation of special passage for barges, lightering of vessels to operating drafts, which contributed to a decrease in traffic volumes along the entire Danube.

- 1.4 As a result, the volume of cargo transport in 2022 comprised:
- in cross-border traffic Germany/Austria (DE/AT): 2,166 thousand tonnes, or 97.5% of the volume in 2021;
  - in cross-border traffic Hungary/Slovakia (HU/SK): 4,342 thousand tonnes, or 87.8% of the volume in 2021;
  - in cross-border traffic Hungary/Croatia/Serbia (HU/HR/RS): 3,972 thousand tonnes, or 68.4% of volumes in 2021, with the main drop in volumes observed in the transportation of iron ore up the Danube (a decrease of 35 %); grain (by 4.2 times) and food products (by 3.4 times) in the direction of the Black Sea;
  - traffic volumes through the Danube-Black Sea Canal came to 17,265 thousand tonnes, or 99.8% of the volumes in 2021;
  - traffic volumes through the Sulina Canal amounted to 10,508 thousand tonnes, or 208.4% of the volumes in 2021; at the same time, the volume of traffic in the direction of the Black Sea came to 213%, and in the direction of the Danube 199.3% of the corresponding indicators in 2021.
- 1.5 In the passenger transport market, main cruise lines resumed in March 2022; in the following months, there was a further increase in voyages, while the growth in passenger traffic in 2022 compared to 2021 amounted to:
- on the lines of the Upper Danube - 315%;
  - on lines in the direction of the Danube delta – 217%.
- 1.6 The total cargo turnover of the Danube ports in 2022 reached 76,484 thousand tonnes (for details see Table 1.1) and amounted to 103.3% of the volumes in 2021, while Ukrainian ports on the Danube provided 21.6% of the cargo turnover.
- 1.7 The cargo capacity of the Danube ports of Ukraine in 2022 in relation to the indicators in 2021 were:
- Port of Izmail: 218%;
  - Port of Reni: 500%;
  - Port of Ust-Dunaysk: growth by 12 times.
- 1.8 During the last ten years, 14 - 16 Danube ports, including the port of Constanța, traditionally had a cargo turnover of over 1.0 million tonnes (see Table 1.2 for details). The largest cargo turnover was noted in the ports operating in the transshipment of raw materials (ore, pellet, coal), finished products of ferrous metallurgy and grain cargo.

**Table 1.1 Cargo capacity of the Danube Ports in 2019-2022**

Ports (thousand tonnes)	2019	2020	2021	2022
Germany	3.274	3.511	2.999	2.410
Austria	6.452	6.050	6.356	5.363
Slovakia	1.664	1.553	1.846	1.934
Hungary	6.064	6.742	5.715	4.063
Croatia	814	948	697	582
Serbia	9.735	8.164	13.610	12.023
Bulgaria	5.385	5.431	7.111	7.104
Romania	28.474	27.307	28.457	24.355
Republic of Moldova	1.299	1.185	1.819	2.144
Ukraine	5.629	4.055	5.505	16.505

**Table 1.2 Cargo turnover in individual ports of the Danube countries  
in 2019-2022 (thousand tonnes)**

Port	2019	2020	2021	2022
Constanța*	14.555	14.505	15.851	15.393
Regensburg	1.387	1.553	1.303	1.083
Linz	3.280	3.411	3.482	2.929
Bratislava	1.663	1.553	1.773	1.910
Budapest-Csepel	1.130	1.192	1.199	985
Smederevo	4.040	2.612	3.168	3.053
Pancevo	1.517	2.051	1.920	1.589
Novi Sad	1.413	1.632	1.435	979
Prahovo	1.109	1.198	1.044	933
Tulcea**	1.675	1.225	1.332	489
Galati**	5.138	5.256	5.846	5.173
Giurgiuilesti**	1.299	1.185	1.819	2.144
Izmail**	4.283	3.245	4.071	8.893
Reni**	1.275	790	1.370	6.826

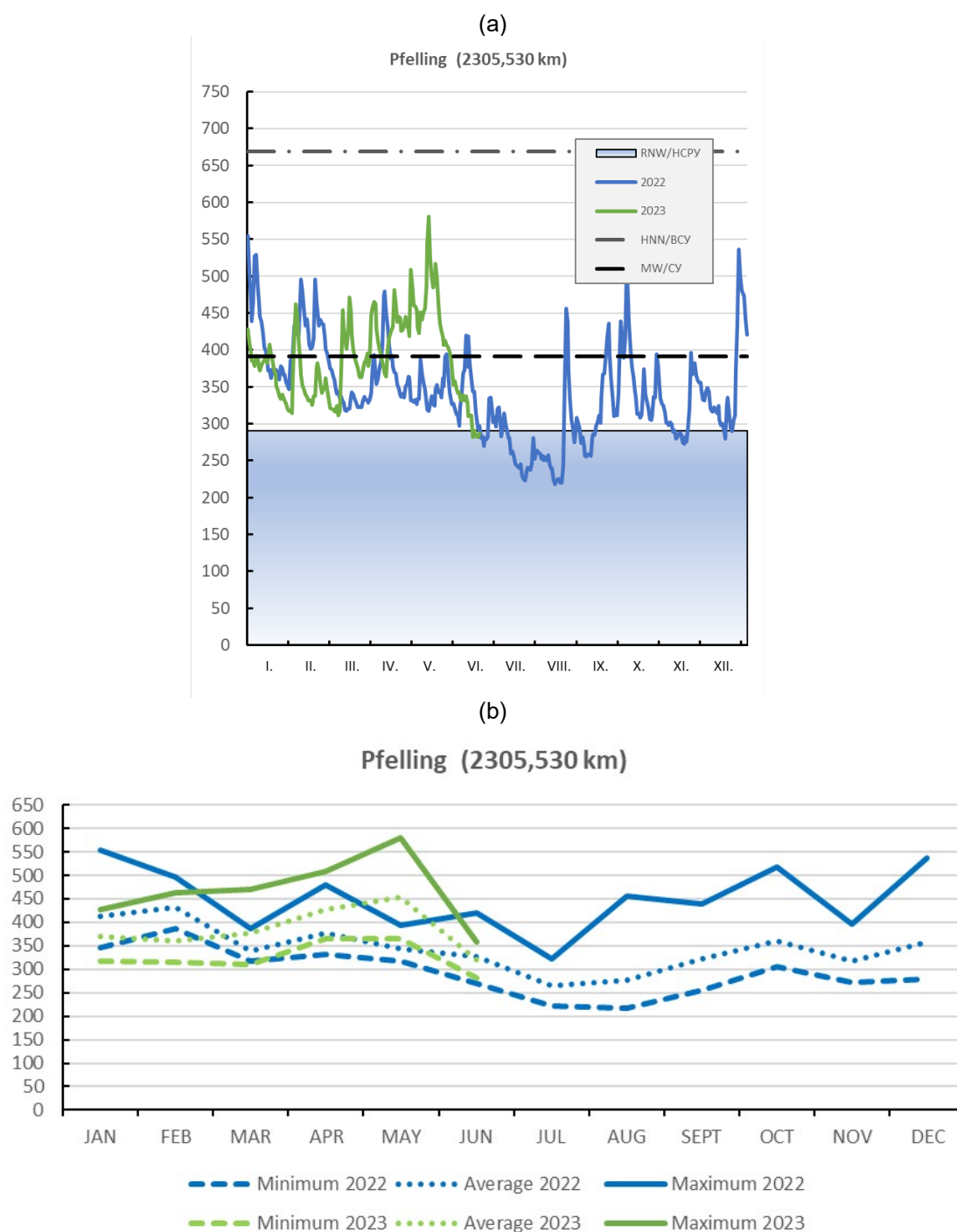
\* Cargo turnover by river vessels

\*\* Cargo turnover by river and sea vessels

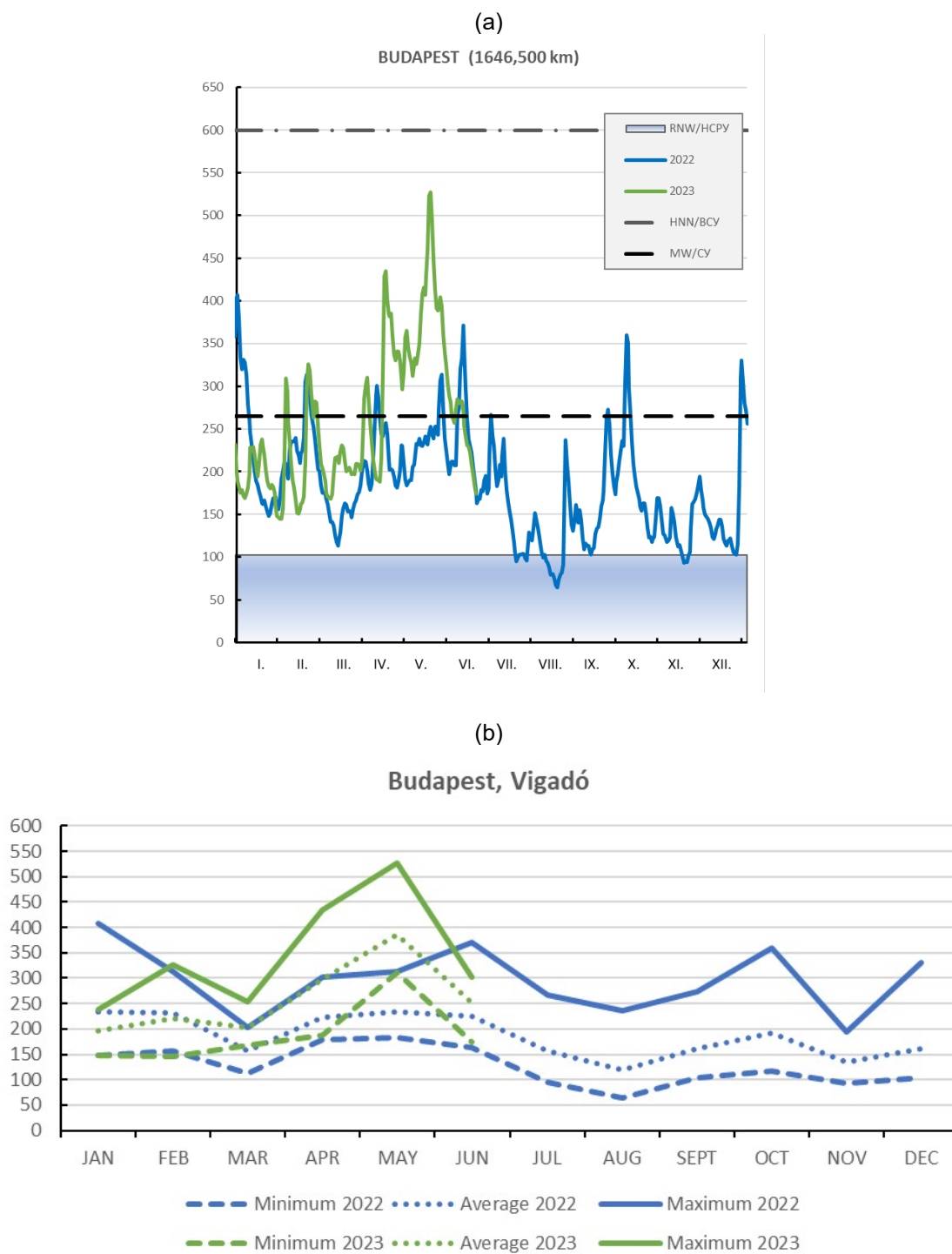
## 2. Assessment of Navigation Conditions on the Danube in 2023

Snow accumulation at the beginning of 2023, in the mountain areas of the Danube basin, were estimated to be below the long-term averages, but exceeded those of early 2022. Under these conditions, the maximum water levels during the spring floods at the Danube were also close to the long-term averages.

- 2.1. In **January** 2023, the water levels on the Upper Danube (Pfelling gauge in Fig. 1) fluctuated in the range of 30-70 cm from the mean water level (MWL) values. On the Middle Danube (water gauge Budapest in Fig. 2), the water levels at the beginning of the first decade were 30-80 cm lower than the MWL values; further during the month, two successive rises in levels were observed with amplitude values of 40-60 cm above MWL followed by a fall below MWL by the end of the month. On the Lower Danube in January, the water levels were 2.5-3.2 m above MWL in the first decade, then 2.6-4.2 m higher until the end of the month.
- 2.2. In the middle of the first ten days of **February**, on the Upper Danube there was a short-term rise in water levels by 50-60 cm above the MWL, followed by a fall below the SS (MW) until the end of the month. On the Middle Danube, the water levels during the month were consistently below MWL with episodic excess by 35-45 cm at the beginning of the third decade. On the Lower Danube, during the whole month, the water levels were 2.5-3.2 m above the MWL.
- 2.3. In the second decade of **March**, the water levels on the Upper Danube were 70-80 cm higher than the MWL values, then until the end of the month they fluctuated in the range of 60-90 cm below the MWL value. On the Middle Danube, during the month, the water levels were constantly 40-80 cm below the MWL value. On the Lower Danube, water levels during the first ten days were 2.5-3.3 m above SS (MW) with subsequent excess of MWL by 3.5-4.0 m.
- 2.4. In **April**, the water levels on the Upper Danube fluctuated in the range of MWL values with episodic excess at the beginning of the first decade and a sharp increase above MWL from the middle of the second decade. On the Middle Danube, during the first decade, water levels fluctuated around MWL; from the middle of the second decade, a sharp increase was observed with an amplitude value of 1.6-1.7 m above MWL and followed by a fall to the level of MWL by the end of the month. On the Lower Danube, water levels were 3.2-4.2 m above MWL throughout the month.
- 2.5. In **May**, the water levels on the Upper Danube fluctuated in the range above the value of MWL with episodic maximum excess of 1.5-1.8 m in the second decade; by the end of the third decade, a decline to the level of MWL began. On the Middle Danube, the levels stably remained above MWL with episodic maximum excess by 2.0-2.4 m in the second decade; by the end of the third decade, a decline to the level of MWL began. On the Lower Danube, water levels were 3.5-4.2 m above MWL throughout the month.



**Fig. 1.** Average daily (a) and absolute (b) values of water levels for the Pfelling water gauge, in cm



**Fig. 2.** Average daily (a) and absolute (b) values of water levels for the Budapest Vigado gauging station, in cm

### 3. The state of the market for the transportation of goods and passengers in the first quarter of 2023

#### 3.1 Water content and provision of operating draft of ships

The lack of freezing of the river and ice phenomena ensured continuous navigation in the first quarter of 2023. Stable water flow for efficient navigation was ensured for 5 months, which allowed ships to be loaded to a maximum draft of 2.5-2.7 m (for details, see Table 3.1).

**Table 3.1 Drafts of cargo vessels during navigation in 2023**

Month	Loaded, going upstream (cm)	Loaded, going downstream (cm)
January	250 (230 *)	220/230 (200/210 *)
February	270 (230 *)	230 (200/210 *)
March	270 (230/250 *)	230/240 (210/220 *)
April	270 (250 *)	230/240 (220/230 *)
May	270 (250 *)	230/240 (230 *)

\* Operating drafts of cargo vessels are indicated in parenthesis for the relevant period of 2022.

#### 3.2 Traffic volumes, nomenclature of goods and port cargo turnover in the first quarter of 2023

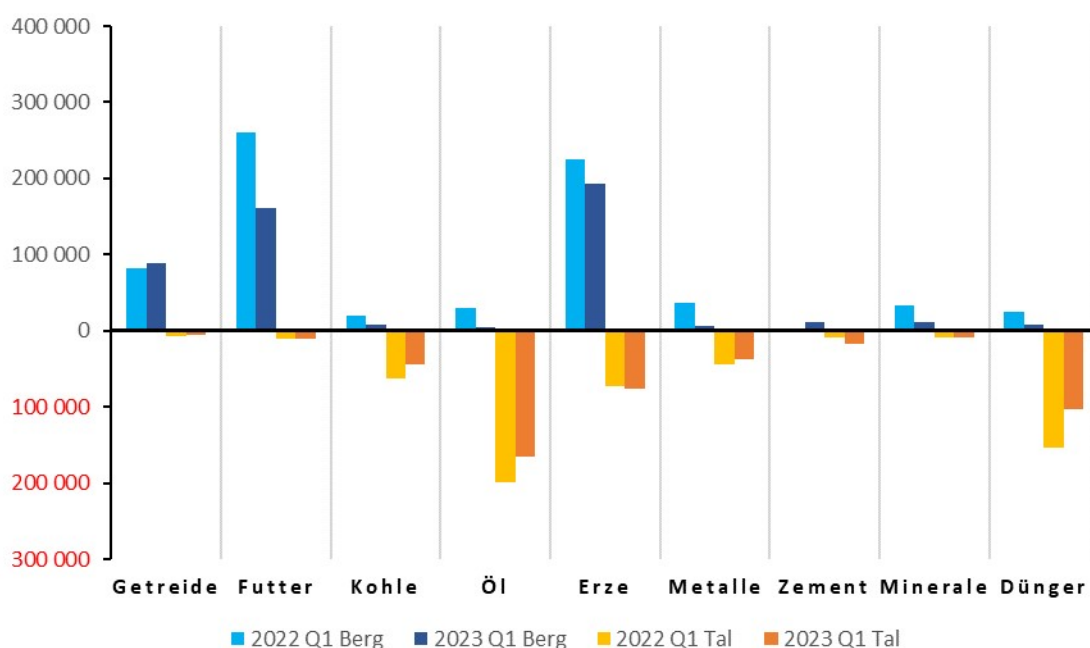
The state of the cargo transportation market on the Danube in the first quarter (Q1) of 2023 was formed under the influence of the main factors listed in Chapter 1 and the ongoing negative impact of Russian aggression on the main industries and the agricultural sector of the economy in the Danube and adjacent basins.

##### 3.2.1 In cross-border transport Hungary/Slovakia (HU/SK):

- the volume of cargo transportation through the Gabčíkovo dam (cross-border traffic Hungary/Slovakia) in Q1 2023 amounted to 985.2 thousand tonnes (75.4% of the volumes in Q1 2022). The main reduction in volumes in Q1 2023 in relation to the volumes of traffic on this section of the Danube in 2022 is due to the transport of food cargo and iron ore up the Danube, as well as fertilizers towards the river delta.
- the volumes of transported goods according to the nomenclature in Q1 2022 and 2023 are shown in Fig. 3, for 2019-2023 - in Tables 3.2 and 3.3.



## Gabčíkovo



**Fig. 3.** Upstream and downstream cargo transport volume through the GABČIKOVO lock in tonnes by groups of goods in 2022 - 2023

**Table 3.2** Cargo volumes in upstream HU/SK cross-border transport (by nomenclature)

Year, thousand tonnes Commodity group	2019	2020	2021	2022	2022 Q <sub>1</sub>	2023 Q <sub>1</sub>
Food products and animal feed	1.774 48% <sup>1</sup>	1.321	879	783	259,8	161
Iron ore raw materials	841 22%	948	969	735	225,1	193,2
Grain	271 7,3%	352	394	416	82	88,1
Metal products	340 9,2%	117	71	101	35,7	5,5
Petroleum products	241 6,5%	212	86,7	92,1	30,1	4,8
Organic and synthetic fertilizers	91,5 2,5%	75,2	132,8	74,5	24,8	7,5

<sup>1</sup> Here and below, as a percentage of the total volume of goods transported upstream/downstream.

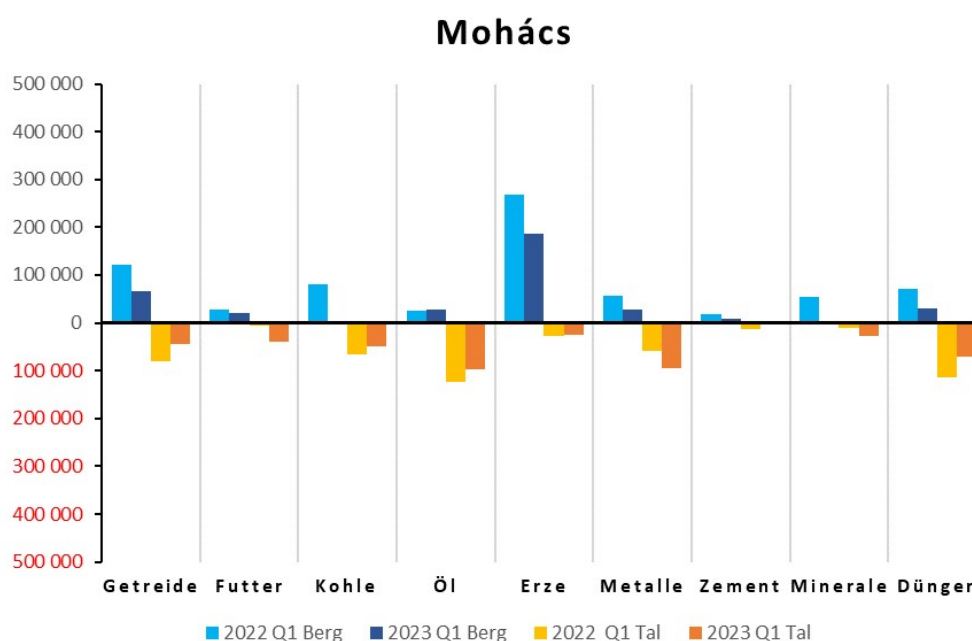


**Table 3.3 Cargo volumes in downstream HU/SK cross-border transport  
(by nomenclature)**

Year, thousand tonnes Commodity group	2019	2020	2021	2022	2022 Q1	2023 Q1
Organic and synthetic fertilizers	535 25%	505	464,5	444,9	153,2	103,4
Petroleum products	671,3 31,4%	578	870	642	199,3	164,7
Metal products	380,4 17,8%	96,5	140	173	43,7	36,8

### 3.2.2 In cross-border transport Hungary/Croatia/Serbia (HU/HR/RS):

- the volume of cargo transport through Mohacs (cross-border traffic Hungary/Croatia/Serbia), in Q1 2023, was 882.8 thousand tonnes, or 67.3% of the volume of cargo transported in Q1 2022. The main reduction in volumes in Q1 2023 in relation to the volume of traffic on this section of the Danube in 2022 is due to the transportation of coal (practically not carried) and iron ore up the Danube, as well as grain cargo towards the river delta (this trend has been observed since 2022 of the year);
- the volumes of transported goods according to the nomenclature in Q1 2022 and 2023 are shown in fig. 4, for 2019-2023 - in Tables 3.4 and 3.5.



**Fig. 4. International and domestic cargo transport volume  
through MOHACH in 2022-2023, in tonnes**

**Table 3.4 Cargo volumes in upstream HU/HR/RS cross-border transport  
(by nomenclature)**

Year, thousand tonnes Commodity group	2019	2020	2021	2022	2022 Q <sub>1</sub>	2023 Q <sub>1</sub>
Iron ore raw materials	1.247 37,6%	954	991	741	267,4	186,7
Coal (coke)	479 14,4%	323	281	199,5	81,5	0
Fertilizers	392 11,8%	436	385	255,6	70,2	31,3
Petroleum products	109 3,2%	106	117	251,9	24,8	28,8
Metal products	270 8,1%	243	249	205	55,6	26,8

**Table 3.5 Cargo volumes in downstream HU/HR/RS cross-border transport  
(by nomenclature)**

Year, thousand tonnes Commodity group	2019	2020	2021	2022	2022 Q <sub>1</sub>	2023 Q <sub>1</sub>
Grain	479 21,1%	1.471	1.002	238,9	81,4	45,3
Petroleum products	428 18,9%	528	591	322,3	124,7	96,5
Metal products	316 13,9%	295	254	310	58,9	95,8
Food products and animal feed	203 9%	520	218,5	65	5,7	40,5
Fertilizers	272 12%	364	316	315,5	112,9	71,2

### 3.2.3 Transport via the Danube - Black Sea Canal

The volume of traffic through the Danube - Black Sea Canal in Q1 2023 reached 5,132 thousand tonnes (132.4% compared to the same indicator in Q1 2022), of which:

- international transport: 4,474 thousand tonnes, which is 210% by Q1 2022;
- domestic transport: 658 thousand tonnes, which is 37.7% by Q1 2022.

3.2.4 The cargo turnover of ports in the first quarter of 2019-2023 changed in different directions (for details, see Table 3.6).

**Table 3.6 Cargo turnover of the ports of the Danube countries  
in the first quarter (Q1) 2019-2023**

Ports (thousand tonnes)	2019 Q <sub>1</sub>	2020 Q <sub>1</sub>	2021 Q <sub>1</sub>	2022 Q <sub>1</sub>	2023 Q <sub>1</sub>
Germany	899	765,4	821	615	453
Austria	2.016	1.709	2.050	1.669	1.232
Slovakia	533,1	390	443	502	370,8
Hungary	1.526	1.597	1.540	1.222	840
Croatia	137,2	210,5	175	180	79,6
Serbia	2.655	1.843	3.703	3.055	3.426
Bulgaria	1.192	1.212	1.374	1.724	2.001
Romania	6.212	6.668	6.553	6.096	6.012
Republic of Moldova	284	296,4	239	486,2	610,8
Ukraine	1.569	1.281	1.047	1.431	8.806

The cargo turnover of the port of Constanța by river vessels amounted to 4,568 thousand tonnes, or 128.8% of the cargo turnover in Q1 2022; at the same time, 440 thousand tonnes were loaded in Constanța, in the direction to the Danube ports in Ukraine, 2,281 thousand tonnes of cargo received from the ports in Ukraine were unloaded (263 thousand tonnes in Q1 2022).

### 3.3 Passenger traffic

3.3.1 On the Upper Danube (the Gabčíkovo lock statistics), passenger traffic on cruise ships with cabins at the beginning of 2023 showed the following dynamics:

Table 4.1.

Month 2023	Number of lockages (upstream/downstream)	Number of passengers (thousands)
March	97 (90*)	9,5 (6,82*)
April	395 (377*)	54,6 (39,2*)
May	488 (513*)	68,9 (57,25*)

\* For comparison, figures for the corresponding month of 2022 are indicated in brackets.

3.3.2 In the direction of the Danube delta (Statistics of the Port of Mohacs), movement of passenger vessels with cabins resumed in March; at the same time, in March-May 2023, 83 ship passes were made (upstream/downstream of the river) and

13.4 thousand passengers were transported. (in April-May 2022, 19.4 thousand passengers were transported).

## 4. Conclusions

- 4.1. In the first quarter of 2023, the impact of full-scale Russian aggression against Ukraine has exacerbated the risks in the Danube shipping market, which has affected almost all major market sectors. As a result, despite the rather favourable navigation conditions, there was a significant reduction in the volume of cargo transportation on the Upper and Middle Danube.
- 4.2. The trend towards a reduction in the volume of cargo transportation continued in the first five months of 2023, and, for the first time during the period of monitoring the Danube shipping market in the Secretariat of the Danube Commission, there is an excess of cargo volumes transported on the Upper Danube (the Gabčíkovo lock statistics) over the volume of cargo registered in Mohacs: 1.713 thousand tonnes and 1.326 thousand tonnes, respectively.
- 4.3. Special measures taken by the Danube Commission within the framework of the *Danube Solidarity Lane EU-Ukraine* initiative adopted in May 2022 in support of the solidarity measures of the European Union for Ukraine contributed to the formation of special logistics systems for the transportation of export products of the agricultural sector of Ukraine, as well as the stabilization of the operation of ports and canals between the Danube and the Black Sea.
- 4.4. The Danube Commission continues to actively contribute to solving emerging problems, carrying out accompanying coordination activities to increase the use of the transport potential of the Danube waterway in traffic from the Danube ports of Ukraine, as well as implementing priority actions within the framework of joint projects with the European Commission to stabilize the market in the short term.