

# MARKET OBSERVATION FOR DANUBE NAVIGATION: RESULTS IN 2021



DANUBE COMMISSION  
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# **Market Observation for Danube Navigation: Results in 2021**

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## Section 1.

### Overview of the Danube navigation market

#### 1.1 Initial state of the Danube transport market in 2021

The initial state of the Danube transport market in 2021 was formed on the basis of dynamics of the traffic volumes that formed in the first half of 2021<sup>1</sup>, as well as the forecasts of growth of the gross domestic product of the Eurozone countries in 2021 by 4.4 % compared to 2020, and by 4.0% in 2022.

In general, the results of the first quarter, the first half of the year, and 9 months of year 2021 formed a certain positive trend of stabilization or growth of traffic volumes by certain types of cargo and destination.

- Industrial activities in the region began to recover gradually, but unevenly; they are still subject to risks. The recovery of steel demand continued during the entire year 2021. According to the forecast of *Eurofer* (data for August 2021), in 2021, steel consumption in EU countries will increase by 11.2% compared to the results of 2020 due to an increase in production in industry (automotive and mechanical engineering) and construction, which fact, however, does not compensate for its decline in 2020. More moderate growth – by 3.7 % is forecasted for 2022. It has to be noted that world prices for iron ore started to decrease in the second half of 2021.
- The cargo transportation market in the region has already started to respond to the European Union *Fit for 55* Programme, which is aimed at combating climate changes and designed to reduce CO<sub>2</sub> emissions, it is also aimed at the proposed introduction (the transition period is from 2023 to 2025) of a market protection mechanism through the Carbon Border Adjustment Mechanism – CBAM of carbon tariffs on EU imports of products of metallurgical, chemical industry, oil and petroleum products. The carbon tariff is determined by the “carbon footprint”, which refers to the amount of greenhouse gases in terms of carbon dioxide CO<sub>2</sub>, which is emitted during the production of these products. Consequently, this would require radical modernization of production facilities and significant investments in their climate transformation (according to forecasts, new facilities, in particular in “green metallurgy”, will start to be commissioned no earlier than 2026), which may lead to changes in the Danube transportation market for key commodities.
- A certain balance of cargo transport during the first half of 2021 was ensured by transportation of grain cargo, primarily from the ports of the Middle Danube to the delta ports (Constanța). However, in the third quarter a significant decrease of these volumes began, primarily as a market reaction to the increased activity export of grain cargos from the Black Sea basin countries. It should be noted that forecasts of *Strategie Grains*, *Coceral* associations for grain and oil seed harvest in 2022 are optimistic.
- Transportation of food and chemical cargos (fertilizers), as well as oil products was relatively stable.
- Passenger shipping on cruise ships on the Danube with partial relaxation of local restrictions determined by the pandemic situation started as sporadic in June with gradual growth: successively in June – September: 13 - 148 – 330 - 392 passages on the Upper

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<sup>1</sup> Secretariat information on the topic “Market Observation for Danube Navigation: Results in 2021” (AD V.4.1 (2020-2)).

Danube and 2 -47 - 75 - 104 passages in the delta direction with the average load of 105 - 110 passengers. At the same time, at year end, the passenger traffic on the Upper Danube increased, correspondingly, by 2.7 times, and 6.6 time in the direction of the delta compared to 2020.

## **1.2 Dynamics of the transport market in 2021**

1.2.1 The optimistic forecasts for the economic recovery of the Danube basin states starting from the first quarter of 2021 (Q<sub>1</sub> 2021) can generally be considered to have been justified. Absence of river freezing and ice phenomena during the winter period ensured continuous navigation in 2021.

The low water phase that started at the end of August and continued for the next three months proved to be critical in terms of precipitations, especially in certain sections of the Lower Danube; it was accompanied by long stoppages of vessel traffic and reduction of draught of vessels.

1.2.2 Meanwhile, the volumes of cargo transport for 9 months of 2021 comprised:

- in cross-border traffic Germany / Austria (DE/AT): 1,727 thousand tons, or 87.8 % of the volume in the same period of 2020;
- in cross-border traffic Hungary / Slovakia (HU/SK): 3,928 thousand tons, or 100 % of the volume in 2020;
- in cross-border traffic Hungary / Croatia/ Serbia (HU/HR/RS): 4,597 thousand tons, or 99% of the volume in 2020;
- the volume of traffic on the Danube – Black Sea Canal amounted to 13,557 thousand tons, or 111.9% of the volume in 2020.

1.2.3 Cargo capacity of ports for 9 months of 2021

Market conditions in the third quarter (Q<sub>3</sub>) of 2021 were primarily determined by multidirectional changes in cargo turnover in Danube ports as a whole for (Q<sub>1</sub>+Q<sub>2</sub>+Q<sub>3</sub>) of 2021 compared to the same period of 2019 and 2020 (Table 1.1).

Table 1.1

**Cargo capacity of ports of the Danube countries  
for 9 months (Q<sub>1</sub>+ Q<sub>2</sub>+Q<sub>3</sub>) of 2021**

Ports (thousand tons)	2019 Q <sub>1</sub> + Q <sub>2</sub> +Q <sub>3</sub>	2020 Q <sub>1</sub> + Q <sub>2</sub> +Q <sub>3</sub>	2021 Q <sub>1</sub> +Q <sub>2</sub> +Q <sub>3</sub>
Germany	2,791	2,931	2,340
Austria	5,497	5,417	6,437
Slovakia*	1,295	1,174	1,292
Hungary	4,785	5,245	4,288
Croatia	627	635.6	559
Serbia	7,928	5,864	10,675
Bulgaria	4,024	3,871	5,447
Romania	21,724	20,451	21,823
Republic of Moldova	948	867.7	1,200
Ukraine	4,332	3,016	3,867

\* Ports of Bratislava and Komarno.

#### 1.2.4 Passenger shipping

Passenger shipping on cruise ships (Table 1.2) started in June, initially as single trips both on the Upper Danube (Gabcikovo lock data), and to the delta (data of the checkpoint at Mohacs) respecting all announced restrictions on the number of passengers.

Table 1.2

**Dynamics of passenger shipping on cruise ships in 2021  
(in thousands)\***

Lines	2019	2020	2019 Q <sub>1</sub> +Q <sub>2</sub> +Q <sub>3</sub>	2020 Q <sub>1</sub> +Q <sub>2</sub> +Q <sub>3</sub>	2021 Q <sub>1</sub> +Q <sub>2</sub> +Q <sub>3</sub>
Upper Danube	720.8	56.1	270.6	55.1	97.76
To the Danube Delta	135.04	5.15	55	4,91	25. 52

\* Own calculations of the Danube Commission.

Liner transportation of passengers and ship operation for one-day excursions in the main water tourism centres were sporadic.



## Section 2.

### Market observation for Danube navigation: traffic of fleet and cargo

#### 2.1 Navigation conditions on the Danube and water flow in 2021

##### 2.1.1 Navigation conditions in 2021

By the beginning of 2021, the snow reserves in mountain and plain areas in the Danube basin, in basins of rivers that form the flow of the Upper Danube, as well of the Middle and Lower Danube (basins of Drava, Sava and Tisza) were characterized as insignificant, in other words below multi-year average.

During the first and second ten-day periods of **January** 2021, the level of water on the Upper Danube (fig. 1) was below the low navigable water level (LWNL) value in the course of 15 - 18 days, and only starting with the third ten-day period a sharp rise began up to the MWL level with the range that exceeded this value by 2.5 – 3 m. On the Middle Danube (fig. 2) the level of water during the first and the second ten-day periods decreased from the MWL value at the beginning of the month to the LWNL value and below; from the middle of the third ten-day period a rise began and by the end of the month reached the LWNL value and above by 1.2 - 1.3 m. On the Lower Danube, during the first ten-day period, the levels were mostly above the MWL, during the second and third ten-day periods they fluctuated around the MWL values with periodic insignificant drops below this value and sharp rise by the end of the month (the first wave of winter flood).

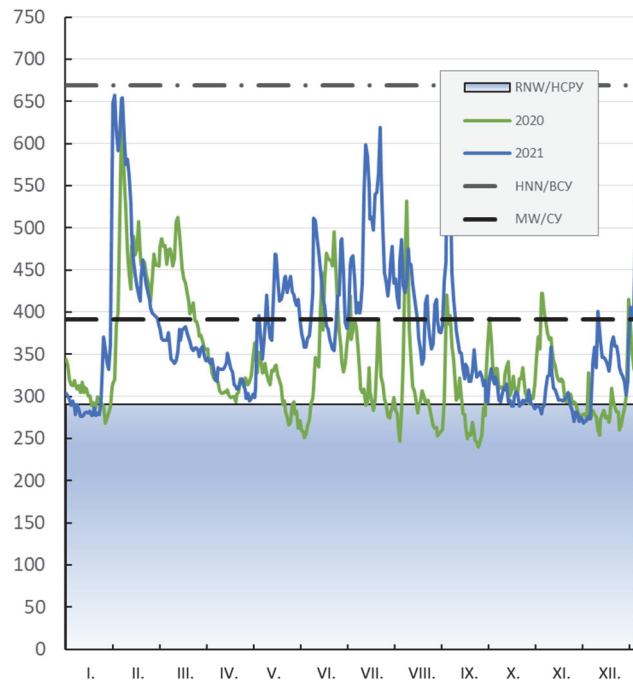
From the first days of **February**, on the Upper Danube, a successive drop in levels from the reached amplitude value began; by the end of the month, this drop reached the MWL value. On the Middle Danube, the beginning of the month was characterised by a sharp rise with the amplitude of about 3 m above the MWL value; from the beginning of the second ten-day period and until the end of the month there was a consistent decline, which however, was not below the MWL. On the Lower Danube, the beginning of the month was characterized by the levels that were above MWL by 1.5 – 2.4 m; during the second ten-day period the second wave of winter flood occurred with amplitudes of 1.9 – 3.1 m, correspondingly, during the entire subsequent period the levels were above MWL.

In **March**, the levels of water on the Upper Danube fluctuated within the range below the MWL values by 50 - 40 cm. On the Middle Danube, from the middle of the first ten-day period, slow decline in the level began and their stabilization below the MWL value with fluctuations within the insignificant (5 - 10 cm per day) range. On the Lower Danube the levels were mostly above the MWL value intermittently (at the end of the second ten-day period) dropping below the MWL values.

In **April**, the levels of water on the Upper Danube fluctuated within the range below the MWL values by 40 - 20 cm; by the end of the third ten-day period the levels approached the LNWL values. On the Middle Danube, during the month, the levels remained steadily below the MWL values by 30 -50 cm. On the Lower Danube the levels fluctuated relative to the MWL value in ranges of 20 - 30 cm above or below.

(a)

Pfelling (2305,530 km)



(b)

Pfelling (2305,530 km)

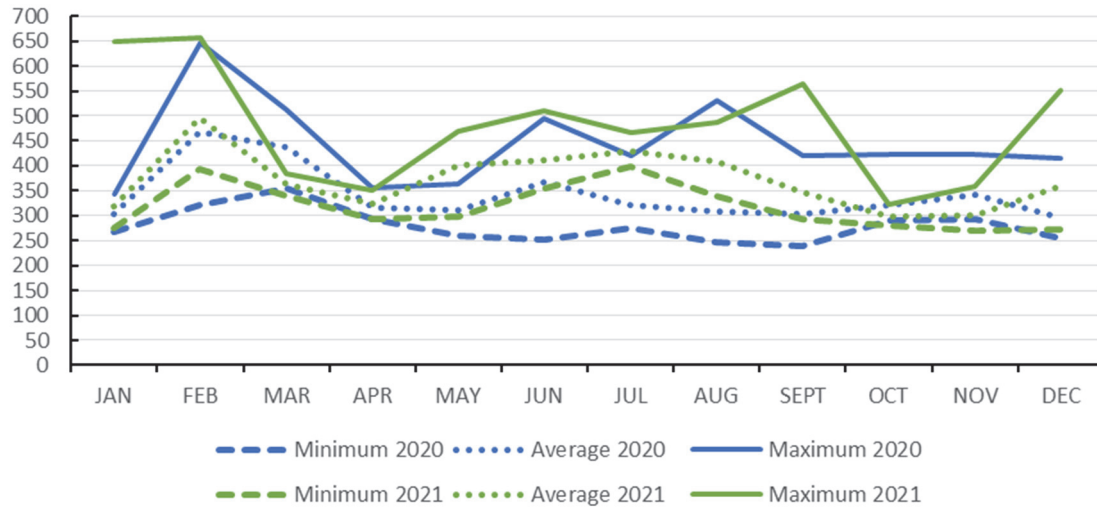


Fig. 1. Daily mean (a) and absolute (b) water levels at the gauging station Pfelling, in cm

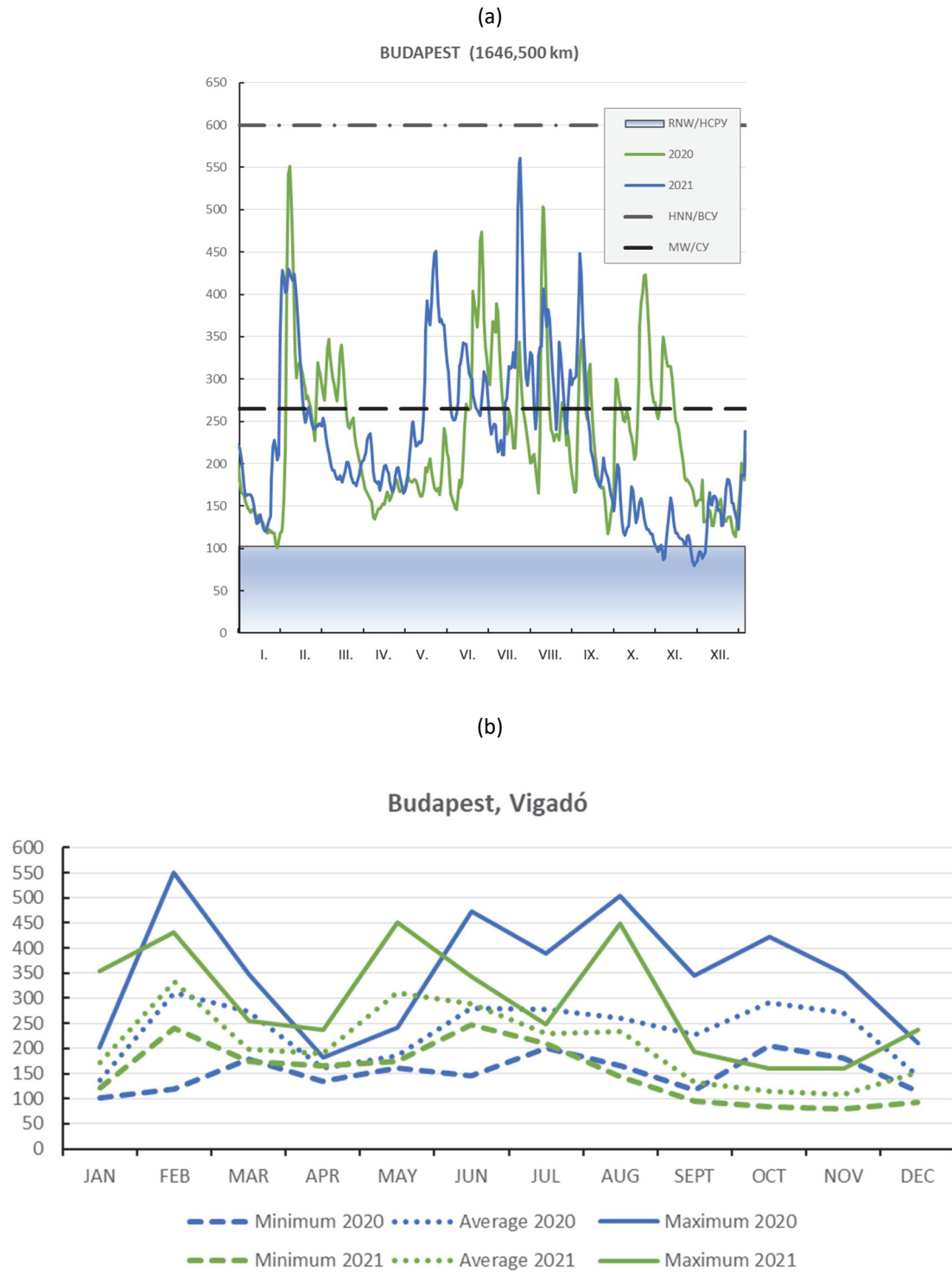


Fig. 2. Daily mean (a) and absolute (b) water levels at the gauging station Budapest Vigadó, in cm

In **May**, water levels on the Upper Danube fluctuated within the range of values below MWL by 40 - 30 cm; from the middle of the second ten-day period the levels steadily remained below the MWL values by 40 - 50 cm; from the middle of the second ten-day period the rise began with the amplitude of 1.6 – 1.8 m with subsequent drop to the MWL level by the end of the month. On the Lower Danube, during the first ten-day period, the levels fluctuated in the range of 20 – 60 cm above or below the MWL level; during the second ten-day period, the levels increased intermittently exceeding the MWL values by 60 - 80 cm, and then decreased by the end of the month.

In **June**, levels of water on the Upper Danube fluctuated in the range of MWL values intermittently exceeding them by 40 - 80 cm. On the Middle Danube, during the month the levels fluctuated around the MWL value with insignificant intermittent increases. On the Lower Danube, the levels fluctuated relative to the MWL value; by the end of the month there was a drop below the MWL value by 50 - 90 cm.

**In July**, on the Upper Danube (fig. 1) levels of water fluctuated within the range above average multi-year MWL values; at the beginning and at the end of the second ten-day period there were two rises with peak values, respectively, 1.5 and 2.25 m, relative to the MWL value with subsequent stabilization of fluctuations by the end of the month around the MWL value.

On the Middle Danube (fig. 2) the levels of water during the first ten-day period fluctuated below the MWL value by 30 - 50 cm. At the beginning of the second ten-day period the levels began to rise, and at the beginning of the third ten-day period reached the peak value above the MWL value – about 2.9 m and then by the end of the month approached the area close to the MWL value.

On the Lower Danube, during the month, water levels were in the range below average multi-year MWL values by 1.3 – 1.8 m.

**In August**, on the Upper Danube, during the entire month, the levels fluctuated around the MWL value intermittently exceeding it by 30 - 60 cm.

On the Middle Danube, at the beginning of the month the levels fluctuated around the MWL value with insignificant intermittent rise at the end of the first ten-day period by 1.4 m. Subsequently, until the end of the month, water levels fluctuated mostly in the area below the MWL value, while no drops to LNWL values were noted.

On the Lower Danube, during the month, water levels were in the range significantly below average multi-year MWL values by 1.2 – 1.5 m, while there were intermittent drops in levels below the LNWL value.

**In September**, on the Upper Danube, from the middle of the first ten-day period, a sharp drop in the levels began compared to the MWL; this condition persisted during the entire month intermittently reaching the LNWL value at the end of the third ten-day period.

On the Middle Danube, during the first ten-day period, the levels fluctuated around the MWL values, but at the beginning of the second ten-day period a sharp drop in levels began with the peak value below the MWL level by 1.1 m; low water levels persisted throughout the entire month.

On the Lower Danube, water levels were mostly within the range of fluctuations around LNWL values with intermittent drops below this level by 40 - 90 cm.

**In October**, on the Upper Danube during the first ten-day period the levels fluctuated in the range of values below MWL by 70 - 100 cm; from the beginning of the second ten-day period and until the end of the month the levels fluctuated close to the LNWL value.

On the Middle Danube, during the first ten-day period and the first half of the second ten-day period, the levels fluctuated in the range below MWL values by 70 - 140 cm; by the end of the third ten-day period the drop in the levels reached the LNWL level.

On the Lower Danube, during the month, the water levels were in the range of LNWL with intermittent increases and mostly drops below LNWL values by 40 - 80 cm.

**In November**, on the Upper Danube during the first and second ten-day periods, levels fluctuated in the range of LNWL values; during the third ten-day period the levels were steadily below LNWL values.

On the Middle Danube, during the first and second ten-day periods, the levels fluctuated in the range of LNWL values; during the third ten-day period the levels were steadily below LNWL values.

On the Lower Danube, during the month, water levels were in the range of LNWL values with intermittent insignificant excesses and mostly with drops below LNWL values.

**In December**, on the Upper Danube, during the first and second ten-day periods, levels fluctuated in the range above LNWL values; at the end of the third ten-day period, the levels increased up to MWL values exceeding MWL values by the end of the month.

On the Middle Danube, during the first and second ten-day periods, the levels fluctuated in the range above LNWL values by 40 - 50 cm; by the end of the third ten-day period, the levels began to rise by 90 - 120 cm compared to LNWL.

On the Lower Danube, from the middle of the first ten-day period during the month, water levels fluctuated in the range of LNWL values with further increase by the end of the month up to MWL values.

### **2.1.2 Water flow and operating draught of vessels**

Absence of freezing on the river and lack of ice phenomena provided for uninterrupted navigation in the first quarter of 2021 and thereafter. Relatively sufficient water flow was ensured only in February – May, which made it possible to load cargo vessels to a draught of 2.5 m during these periods.

The phase of summer shallow waters in 2021 occurred later compared to 2020, meanwhile, in the third and fourth quarters operating vessel draughts were lower compared to 2020. (Table 2.1).

Table 2.1

**Draughts of cargo vessels during navigation in 2021**

Month	Loading, upstream (cm)	Loading, downstream, (cm)
January	230 (230)*	210 (210)
February	250 (250/260)	210/220 (210/220)
March	250 (250/270)	210/220 (220/230)
April	250 (230/240)	210/220 (200/210)
May	250 (210/220)	210/220 (190/200)
June	230 (230)	210/220 (210/220)
July	230 (230)	200/210 (210)
August	210 (230)	190/200 (210)
September	190 (210)	180/190 (200)
October	190 ( 210)	180/190 (200)
November	190 (200)	180/190 ( 200/210)
December	190 ( 210)	180/190 ( 200/210)

\* Operating draughts of cargo vessels are indicated in parenthesis for the relevant period of 2020.

**2.2 Observation of ship traffic and cargo transport in 2021. Overall results****2.2.1 Passenger shipping****2.2.1.1 Shipping on the Upper Danube**

Relatively stable passenger shipping on cruise ships with cabins started in July.

Table 2.2

**Dynamics of passenger shipping<sup>2</sup>  
(in thousands)**

Lines	Year							
	2014	2015	2016	2017	2018	2019	2020	2021
Upper Danube	486	534	564.7	595.5	548.8	720.8	56.1	149.1
To the Danube Delta	89	83	86.9	97.7	103.6	135.04	5.15	34.1

“Short” trips lasting 5, 7 or 8 days on the lines Passau – Vienna – Bratislava – Budapest – Passau, Vienna – Bratislava – Budapest, as well as trips to and from the ports of the Rhine and

<sup>2</sup> As calculated by the Secretariat of the Danube Commission on the basis of Gabcikovo and Mohacs data.

the Main, as well as trips to the Danube Delta made up the major part of passenger transport on cabin ships (Table 2.2):

- Through the locks at Jochenstein (cross-border transport between Austria and Germany (AT/DE)) 1,255 passages were recorded, which represents 287% of the 2020 indicator, out of which 97.2% were in the second half year.
- A total of 1.419 passages were recorded at the Gabčíkovo lock (cross-border transport between Hungary and Slovakia (HU/SK)) (fig. 3) (in 2019 – 5,141, in 2020 - 557), out of which 27.6% were in September and 24.5% - in October.

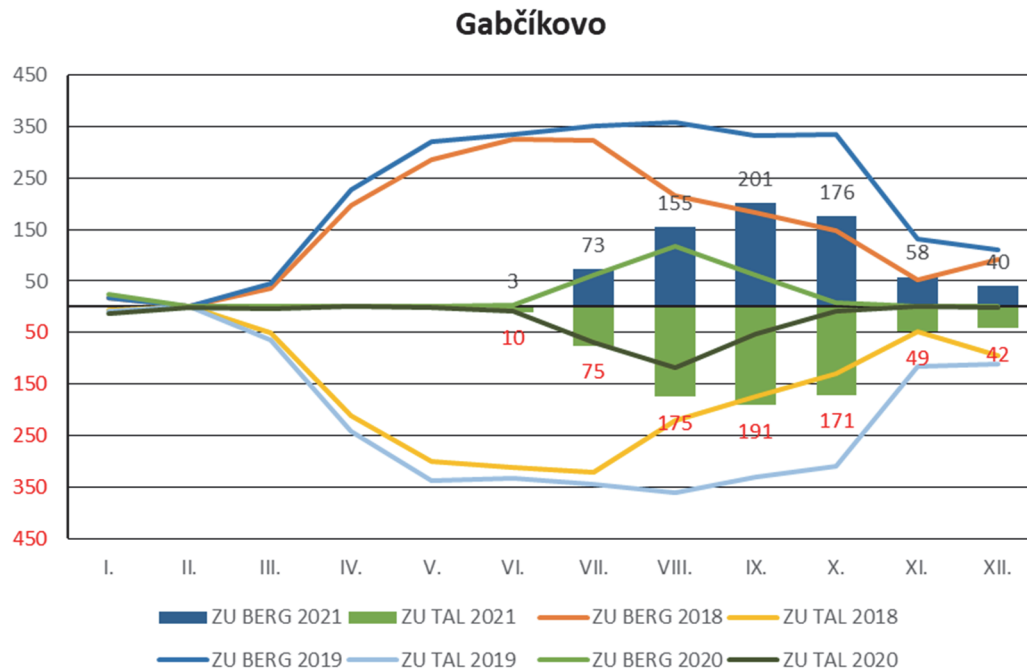


Fig. 3. Passages of passenger cabin ships upstream and downstream on the Danube through the GABCIKOVO lock in 2018 – 2021, by months

- A breakdown of passenger numbers on the Upper Danube by flag states in 2012 - 2019 is shown in Table 2.3.

Table 2.3

**Breakdown of passenger numbers on ships on the Upper Danube by flag states  
(2012 - 2019)**

Flag State	2012	2013	2014	2015	2016	2017	2018	2019
Germany	17%	20%	16.5%	17.4%	15%	18.9%	19.8%	18.1%
Bulgaria	6%	5%	6%	4.3%	6.9%	5.1%	5.3%	5.2%
Ukraine	4.7%	2.5%	2%	1.8%	3.9%	5.0%	4.5%	5.0%
Romania	6.2%	5.3%	3%	1.9%	1.3%	-	-	-
Non-DC member countries	60%	64%	72%	74%	70.5%	68.5%	68.6%	68.9%

In total in 2021, out of 1,419 passages of passenger ships recorded through the Gabčíkovo lock, the following was registered:

- vessels with the length of 110 m: 676 (in 2019 – 1,655, in 2020 - 343) passages;
- vessels with the length of 135 m: 700 (in 2019 – 2,567, in 2020 – 181) passages, out of them 575 vessels flying flags of countries that are not members of the DC.

Average capacity utilization in September was for the vessels with the length of:

- 110 m: 114 - 115 passengers (in 2019 – 130);
- 135 m: 100 - 120 (in 2019 – 158) passengers.

2.2.1.2. Transport on the Middle Danube: cross-border transport between Hungary, Croatia and Serbia (HU/HR/RS) (statistics of the Mohacs checkpoint).

Passenger transport on cabin ships (this transport is based on the lines from Passau and from Vienna towards the Danube delta with duration of 14 – 15 - 16 days). There were 328 passages (in 2019 – 1,017, in 2020 – 58) (fig. 4). 34.1 thousand passengers were transported (table 2.2); the largest number of passages (104) was registered in September.

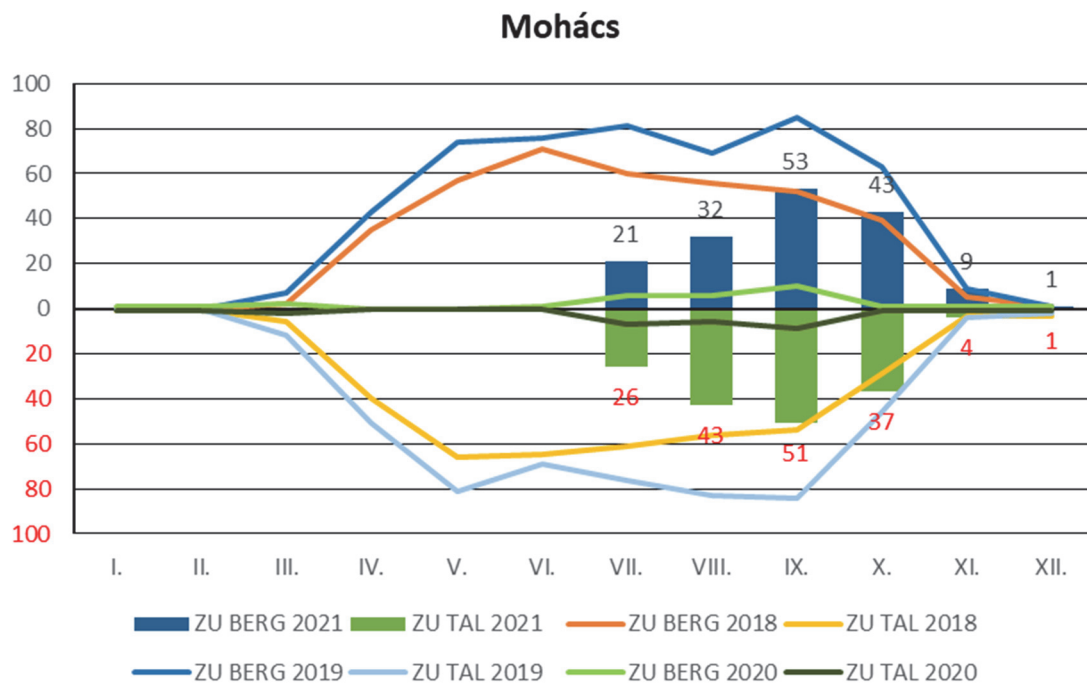


Fig. 4. Passages of passenger ships with cabins upstream / downstream on the Danube through MOHACS in 2018 – 2021, by months



## 2.2.2 Cargo transport

### 2.2.2.1 Transport on the Upper Danube

#### Volume of transportation

- a) The volume of cargo transported through the Jochenstein lock (cross-border transport between Germany and Austria (DE/AT)) in 2021 was 2,221 thousand tons, which is by 4.7% less than in 2020.

At the same time, compared to 2020, there was an increase in the volume of transport downstream (*Talverkehr*) by 10.9% and decrease upstream (*Bergverkehr*) by 12.7%.

The number of passages of loaded vessels in 2021 was 94.2% compared to those in 2020, correspondingly, the average capacity utilization of a conventional group was 1,109 t (in 2020 – 1,096 t).

- b) The volume of registered cargo transported through the Gabčíkovo lock (cross-border transport between Hungary and Slovakia (HU/SK)) in 2021 was 4,944 thousand tons, which is 98.7% compared to the volume of 2020 (fig. 5) and 84.8% compared to the volume of 2019. Upstream transit was around 2,915 thousand tons, or 58.9% of the total volume (in 2012 and in 2013 – 73%, in 2014 – 75%, in 2015 – 66%, in 2016 – 65%, in 2017 – 64.8%, in 2018 – 65%, in 2019 – 63.3%, in 2020 – 65.8%).

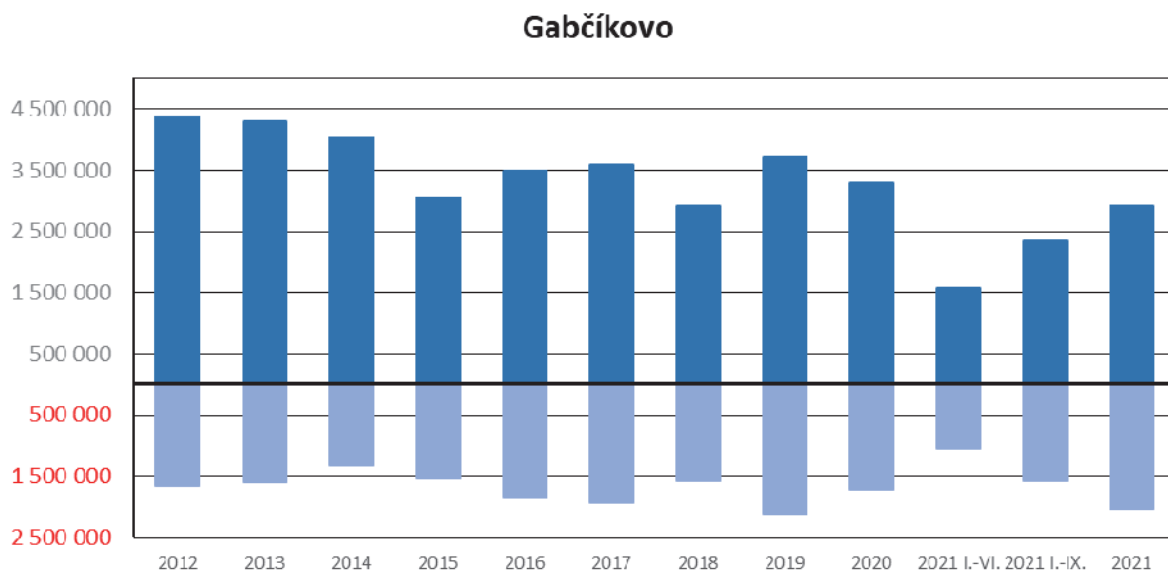


Fig. 5. Volumes of cargo transport upstream and downstream on the Danube through the GABCIKOVO lock by years, in tons

The volume of transported dry cargo (*trocken*) comprised 4,002 thousand tons, out of them:

- upstream (*zu Berg*) – 2,825 thousand tons;
- downstream (*zu Tal*) – 1,177 thousand tons., i.e. at ratio of 2.4: 1 (in 2018 – 2.6 : 1, in 2019 – 2.35 : 1, in 2020 – 2.74 : 1).

Transported liquid cargo (*tank*) comprised 942 thousand tons, out of them:

- upstream – 86.8 thousand tons;
- downstream – 855 thousand tons, i.e. at ratio of 0.1 : 1 (in 2018 – 0.53 : 1, in 2019 – 0.33 : 1, in 2020 – 0.35 : 1).

### Ship traffic

#### Transport by pushed convoys (statistics of the Gabčíkovo lock)

In total, in 2021, pushed convoys carried more than 2,449 thousand tons, which corresponds to approximately 98.7% of the volume transported in 2020 and 49.5% of the total volume of cargo carried through the Gabčíkovo lock, including liquid cargo (in 2014 and in 2015 – 52%, in 2016 - 56%, in 2017 – 58.7%, in 2018 – 58.2%, in 2019 – 59.4%, in 2020 – 49.2%).

a) Pushed convoys carried a total volume of 2,168 thousand tons of dry cargo, including (fig. 6):

- upstream – 1.419 thousand tons, making up 50.2% (in 2014 – 58%, in 2015 – 55%, in 2016 – 58%, in 2017 – 59.7%, in 2018 – 58.8%, in 2019 – 56.4%, in 2020 – 31.8%) of all dry cargo carried upstream;
- downstream – 749 thousand tons, making up 63.6% of all dry cargo carried downstream.

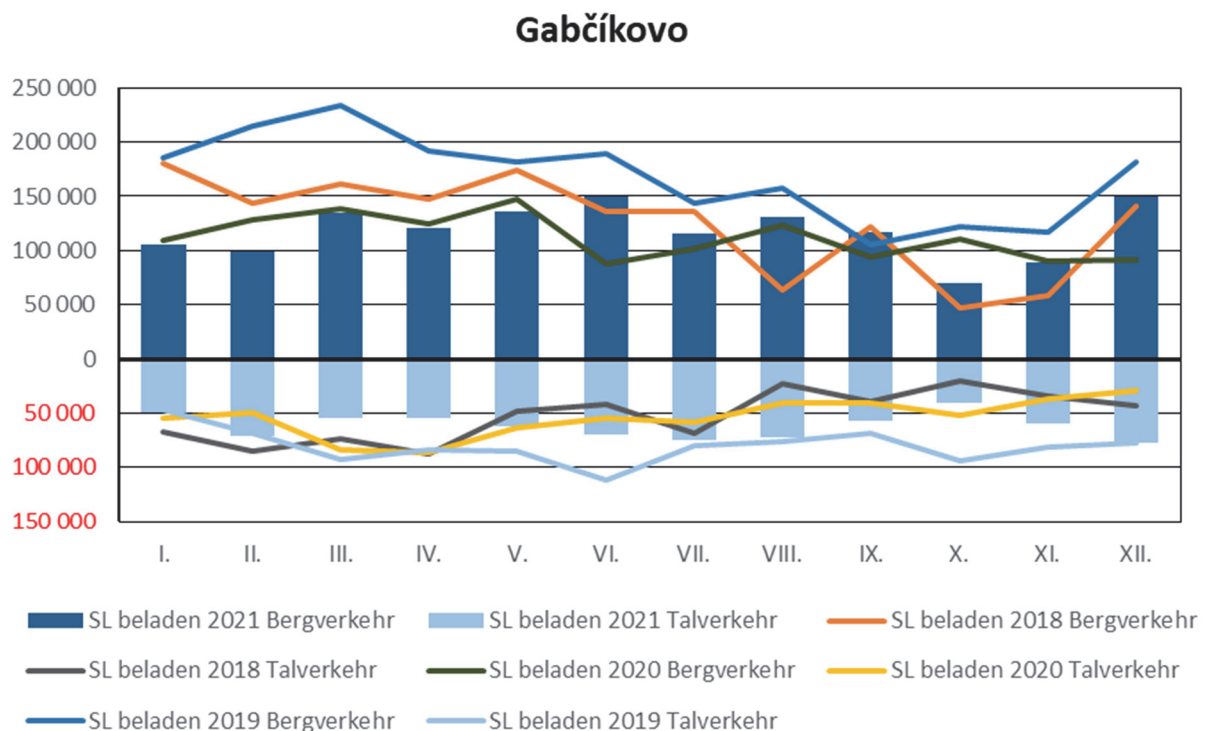


Fig. 6. Volumes of cargo transport by dumb barges upstream and downstream on the Danube through the GABČIKOVO lock in 2018 - 2021, by months, in tons

A total of 1,250 dumb barges in pushed convoys travelled upstream (in 2020 – 1,193), out of them only 6% (in 2014 – 10%, in 2015 – 14%, in 2016 – 17.6%, in 2017 – 17%, in 2018 – 18.9%, in 2019 – 14.6%, in 2020 – 6%) carrying ballast. At the same time, out of 1,251 dumb barges travelling downstream, 31.6% – were ballasted (in 2013 – 63%, in 2014 – 66%, in 2015 – 56%, in 2016 – 45%, in 2017 – 51%, in 2018 – 45%, in 2019 – 33%, in 2020 – 34%), which fact indicates a persistent imbalance of the cargo base for transports by pushed convoy on the Upper Danube.

b) Tank barges in pushed convoys carried a total volume of 283.6 thousand tons of liquid cargo, out of them:

- upstream – 6.2 thousand tons;
- downstream – 277.4 thousand tons.

A total of 11 loaded tank barges and 285 ballasted tank barges travelled upstream in pushed convoys; while 287 loaded tank barges and 5 tank barges carrying ballast travelled downstream.

#### Cargo transport by motorized vessels

In 2021, motorized vessels carried a total of about 2,494.6 thousand tons of cargo, accounting for 50.5% (as compared to 47% in 2012, in 2013 – 51%, in 2014 and in 2015 – 48%, in 2016 – 44%, in 2017 – 41.3%, in 2018 – 41.8%, in 2019 – 40.6%, in 2020 – 50.5%) of the total volume of cargo, and 98.4% as compared to the volumes in 2020.

- upstream – 1,486 thousand tons,
- downstream – 1,008 thousand tons.

a) In total, motorized dry cargo vessels carried 1,834 thousand tons that account for 82% of the volume in 2020, out of them:

- upstream – 1,406 thousand tons;
- downstream – 428 thousand tons.

In total 1,492 motorized dry cargo vessels travelled upstream in 2021 (in 2019 – 1,642, in 2020 – 1,794) (out of them 92% were loaded), downstream – 1,504 (in 2019 – 1,571, in 2020 – 1,875) vessels (out of them 36% were loaded), indicating a balance in motorized dry cargo vessels on the Danube.

Traffic figures (ratio) of motorized dry cargo vessels are shown in Table 2.4 a).

Table 2.4 a)

**Traffic figures (ratio) of motorized dry cargo vessels on the Upper Danube**

Ratio	2014	2015	2016	2017	2018	2019	2020	2021
Loaded upstream / downstream	2:1	2.1:1	2.4:1	2.16:1	2.45:1	2.7:1	2.81:1	2.51:1
Loaded to ballasted upstream	18:1	8.8:1	13.7:1	16.3:1	10.9:1	13.8:1	16.3:1	11.9:1
Loaded to ballasted downstream	0.76:1	0.76:1	0.64:1	0.76:1	0.6:1	0.57:1	0.47:1	0.57:1

Through the Gabčíkovo lock 2,996 motorized dry cargo vessels travelled, out of them:

- vessels with a length of 110 m – 330 loaded units, out of them 101 – upstream, 229 - downstream (in 2019 – 246, in 2020 - 276), which in total carried 402.6 thousand tons;
- vessels with a length of 135 m (a "large European vessel") – 53 loaded units (45 – upstream), which in total carried 64.2 thousand tons, and 50 ballasted units;
- specialised ships (ro-ro ships, container ships, et al.) – 106 vessels in total.

b) Motorized tankers carried in total 664.6 thousand tons in liquid cargo, out of them:

- upstream – 81 thousand tons;
- downstream – 583 thousand tons.

In 2021, in total, 553 motorized tankers travelled upstream, out of them 15.4% were loaded, downstream – 552, out of them 91% were loaded.

Ratios for transport by motorized tankers are shown in table 2.4 b).

Table 2.4 b)

**Ratios for transport by motorized tankers on the Upper Danube**

Ratio	2014	2015	2016	2017	2018	2019	2020	2021
Loaded Upstream to downstream	2:1	0.13:1	0.48:1	0.41:1	0.51:1	0.41:1	0.63:1	0.17:1
Loaded to ballasted upstream	2.3:1	0.1:1	0.48:1	0.44:1	0.56:1	0.48:1	0.90:1	0.18:1
Loaded to ballasted downstream	0.37:1	8.5:1	2.1:1	2.7:1	2.4:1	3.6:1	2.33:1	9.36:1

Transport by groups of goods (statistics of the Gabčíkovo lock):

Food products, iron ore raw materials, liquid cargo and grain cargo, chemical products and metal products accounted for the major part of cargo transport volume through the Gabčíkovo lock (fig. 7). The percentage ratio of cargo volumes in upstream and downstream cargo transport (cross-border transport between Hungary and Slovakia (HU/SK)) is shown in tables 2.5 and 2.6.

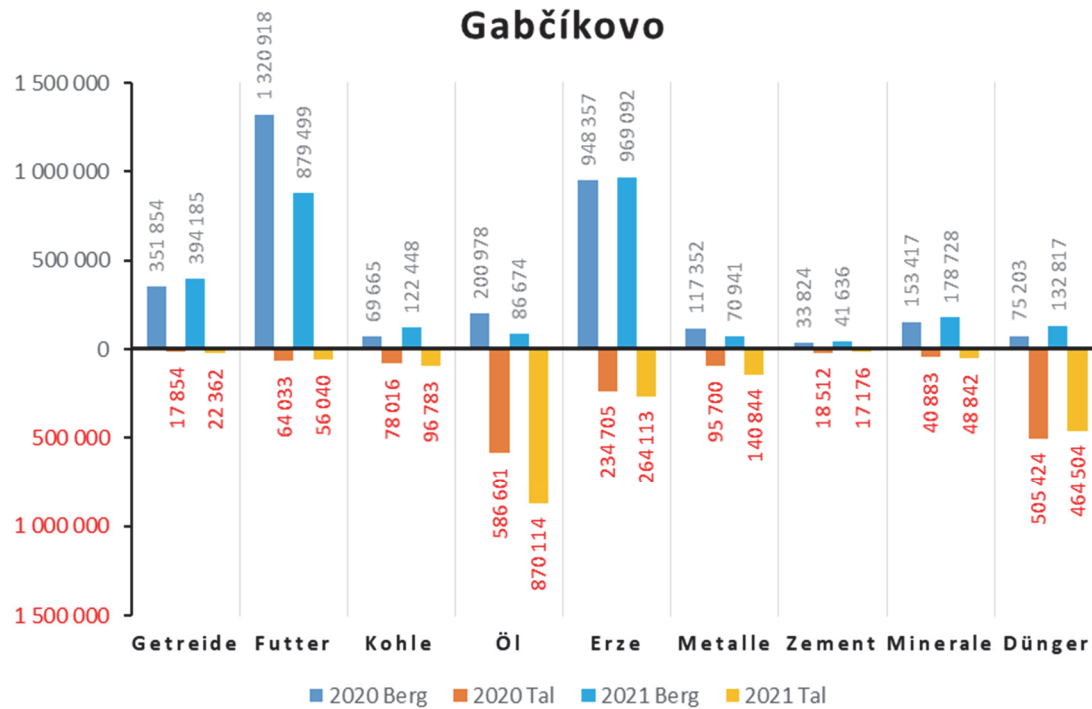


Fig. 7. Cargo transport by groups of goods upstream and downstream on the Danube through the GABCIKOVO lock in 2020 - 2021, in tons

Table 2.5

**Cargo volumes in upstream HU/SK cross-border transport (by groups of goods)**

Year, thousand tons Commodity group	2014	2015	2016	2017	2018	2019	2020	2021
Food products and animal feed	1,440 35%	1,283 42%	1,316 37.8%	1,389 38.7%	1,022 35.1%	1,774 48% <sup>3</sup>	1,321	879
Iron ore raw materials	1,080 26%	749 24.6%	862 24.8%	803 22.3%	669 23%	841 22%	948	969
Grain	206 5%	200 6.5%	298 8.6%	308 8.5%	252 8.6%	271 7.3%	352	394
Metal products	376 9%	358 11.7%	417 12%	473 13.1%	418 14.3%	340 9.2%	117	71
Petroleum products	406 10%	84 2.7%	233 6.7%	286 7.9%	317 10.9%	241 6.5%	212	86.7
Organic and synthetic fertilizers	238 5.8%	171 5.6%	167 4.8%	165 4.6%	86.2 3%	91.5 2.5%	75.2	132.8

Table 2.6

**Cargo volumes in downstream HU/SK cross-border transport (by groups of goods)**

Year, thousand tons Commodity group	2014	2015	2016	2017	2018	2019	2020	2021
Organic and synthetic fertilizers	434 33%	414 26.8%	563 30.5%	513 26.6%	317 20.1%	535 25%	505	464,5
Petroleum products	323 24%	480 31%	530 28.7%	631 32.7%	585 37.1%	671.3 31.4%	578	870
Metal products	290 22%	399 25.8%	493 26.7%	432 22.4%	435 27.6%	380.4 17.8%	96.5	140

#### 2.2.2.2 Transport on the Middle Danube (statistics of the checkpoint at Mohacs), cross-border transport between Hungary, Croatia and Serbia (HU/HR/RS))

##### Volume of transportation

The volume of registered cargo transported through Mohacs in 2021 comprised more than 5,805 thousand tons (fig. 8), or 95% of the volume of cargo transported in 2020, out of them upstream transit – 2,907 thousand tons, that is 50% (in 2012 – 51%, in 2013 – 58%, in 2014 - 51%, in 2015 – 39%, in 2016 – 46%, in 2017 – 47.8%, in 2018 – 57.4%, in 2019 – 59.4%, in 2020 – 42.2%).

<sup>3</sup> In % of total upstream cargo transport volume.

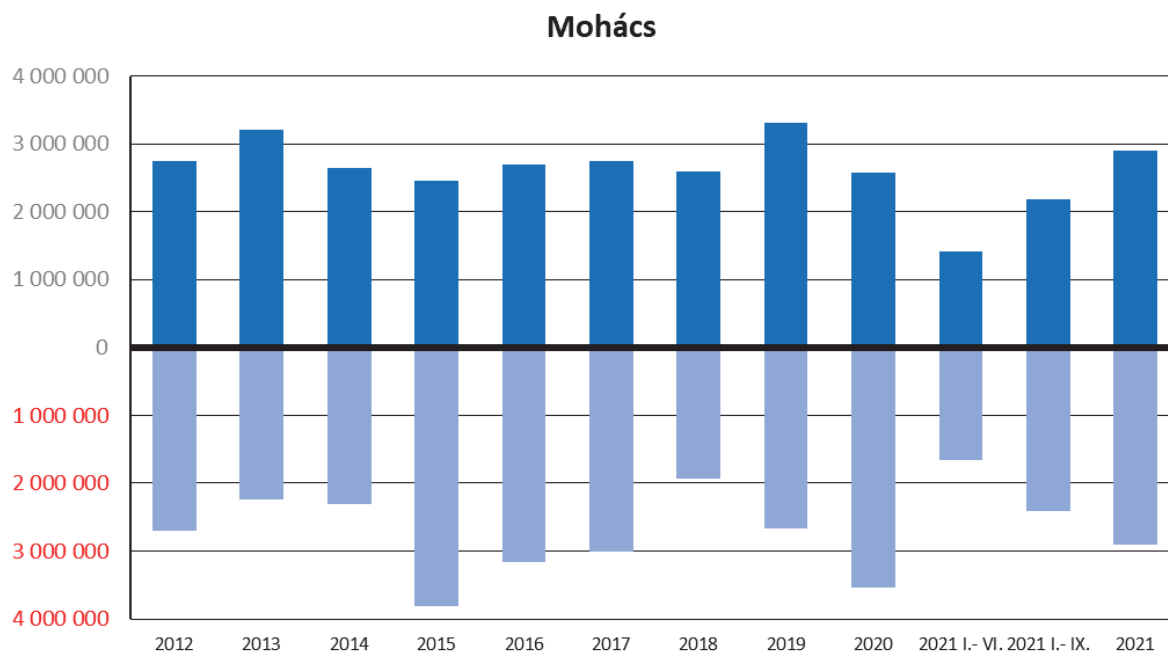


Fig. 8. Volumes of cargo transport upstream and downstream on the Danube through MOHACS, by years, in tons

The volume of transported dry cargo comprised 5,114 thousand tons, out of them:

- upstream – 2,802 thousand tons,
- downstream – 2,312 thousand tons.

Transported liquid cargo comprised 707.6 thousand tons, out of them:

- upstream – 117.3 thousand tons,
- downstream – 590.3 thousand tons.

### Ship traffic

#### Transport by pushed convoys

In total, in 2021, pushed convoys carried more than 4,527 thousand tons through the Mohacs checkpoint, which amounted to 78% of the total volume of cargo, including liquid cargo (in 2013 – 75%, in 2014 – 75%, in 2015 – 81.7%, in 2016 – 79%, in 2017 – 78%, in 2018 – 78.7%, in 2019 – 79.5%, in 2020 – 75.7%).

a) Pushed convoys carried in total 4,306 thousand tons in dry cargo (fig. 9), out of them:

- upstream – 2,335 thousand tons, which makes 83.3% (in 2014 – 86%, in 2015 – 91.4%, in 2016 – 86.5%, in 2018 – 87.7%, in 2019 – 79.5%, in 2020 – 43.9%) of the total volume of dry cargo transported upstream;
- downstream – 1,971 thousand tons, which makes 85.3% (in 2014 – 76%, in 2015 – 85%, in 2016 – 84.4%, in 2018 – 84.8%, in 2019 – 82.3%, in 2020 – 56.1%) of the total volume of dry cargo transported downstream.

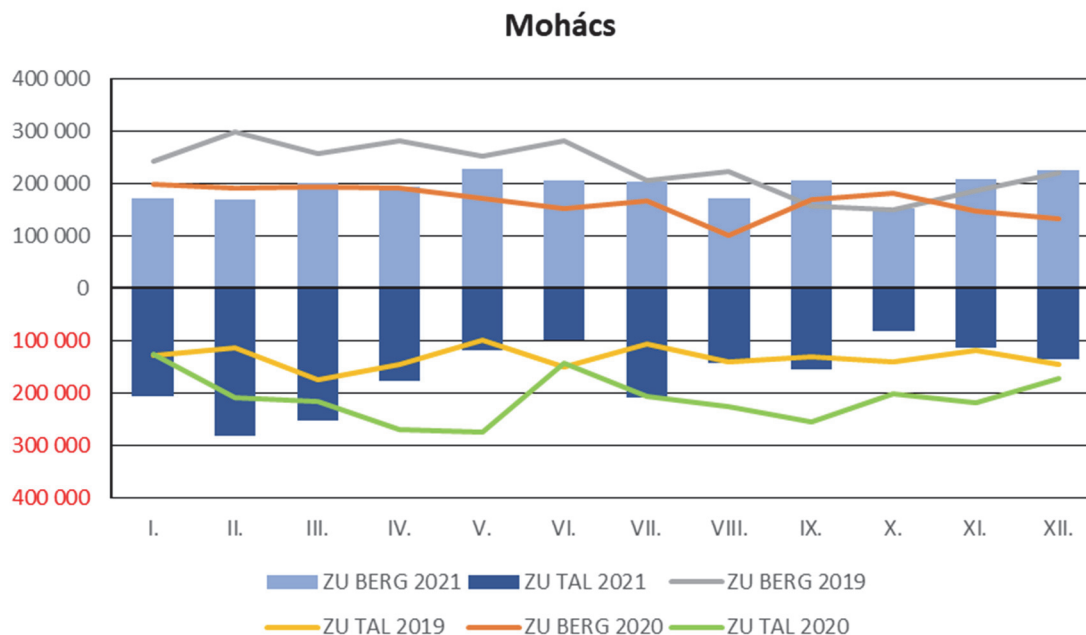


Fig. 9. Volumes of dry cargo transport by pushed convoys upstream and downstream on the Danube through MOHACS, by months, in thousand tons

In total, in 2021, 2,403 dumb barges in pushed convoys travelled upstream (in 2020 - 2,196), out of them 35.4% (in 2014 – 18%, in 2015 – 42.7%, in 2016 - 31%, in 2017 – 27.8%, in 2018 – 15%, in 2019 – 11%, in 2020 – 35.4%) carrying ballast. At the same time, out of 2,271 (in 2020 – 2,460) dumb barges travelling in pushed convoys downstream 20.1% (in 2020 – 10.7%) of units were ballasted.

b) Tank barges in pushed convoys carried a total volume of 228.7 thousand tons in liquid cargo, out of them:

- upstream – 9.4 thousand tons;
- downstream – 219.3 thousand tons.

A total of 172 tank barges travelled upstream in pushed convoys, out of them 6.4% were loaded; while downstream 180 tank barges travelled, out of them 96.7% were loaded.

#### Cargo transport by motorized vessels

In 2020, motorized vessels carried in total 1,278 thousand tons, accounting for 22% (in 2013 – 25%, in 2014 – 24%, in 2015 – 18.3%, in 2016 – 21%, in 2017 – 22%, in 2018 – 21.3%, in 2019 – 20.5%, in 2020 – 24.2%) of the total volume transported through the Mohacs checkpoint, out of them:

- upstream – 575 thousand tons,
- downstream – 703 thousand tons.



- a) Motorized dry cargo vessels (1,122 passages) carried 791 thousand tons, out of them:
- upstream – 467 thousand tons;
  - downstream – 324 thousand tons.
- b) Motorized tank barges (712 passages in total, out of them 61% loaded tank barges) carried 487 thousand tons of liquid cargo (fig. 10), out of them:
- upstream – 108 thousand tons.
  - downstream – 379 thousand tons.

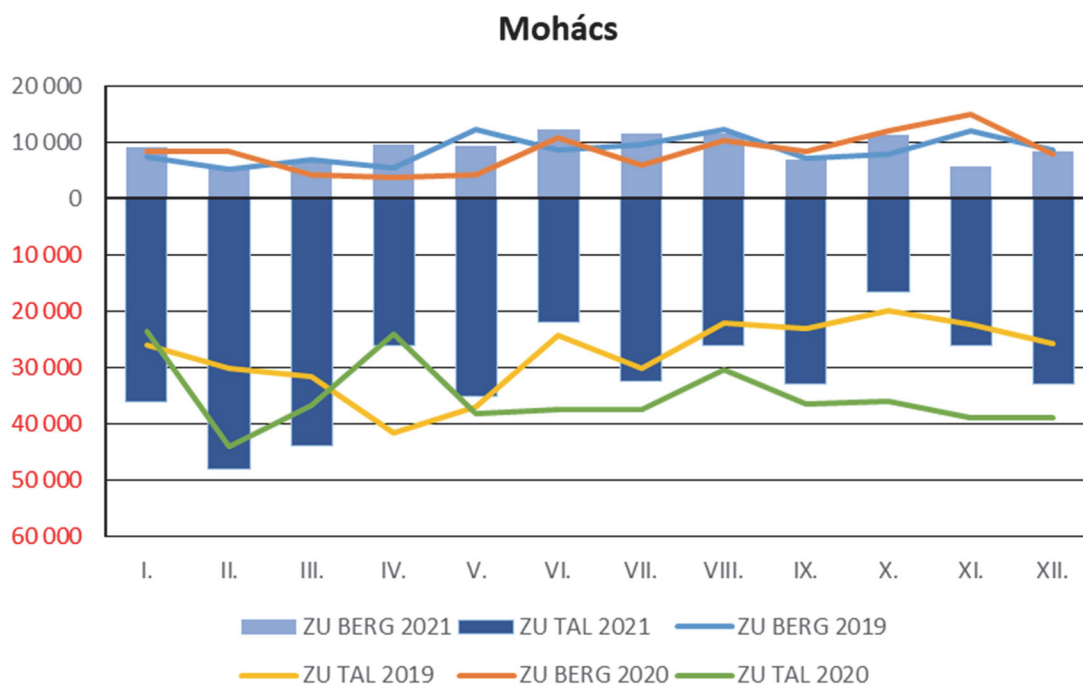


Fig. 10. Volumes of cargo transport by motorized tankers upstream and downstream on the Danube through MOHACS in 2019 – 2021, by months, in tons

#### Transport by groups of goods

Grain cargo – downstream, iron ore raw materials – upstream, liquid cargo – downstream, metallurgical products and chemical products accounted for the major part of cargo transport volume through the checkpoint Mohacs (fig. 11). The percentage ratio of cargo volumes in upstream and downstream transport (cross-border transport between Hungary, Croatia and Serbia HU/HR/RS) is shown in tables 2.7 and 2.8.

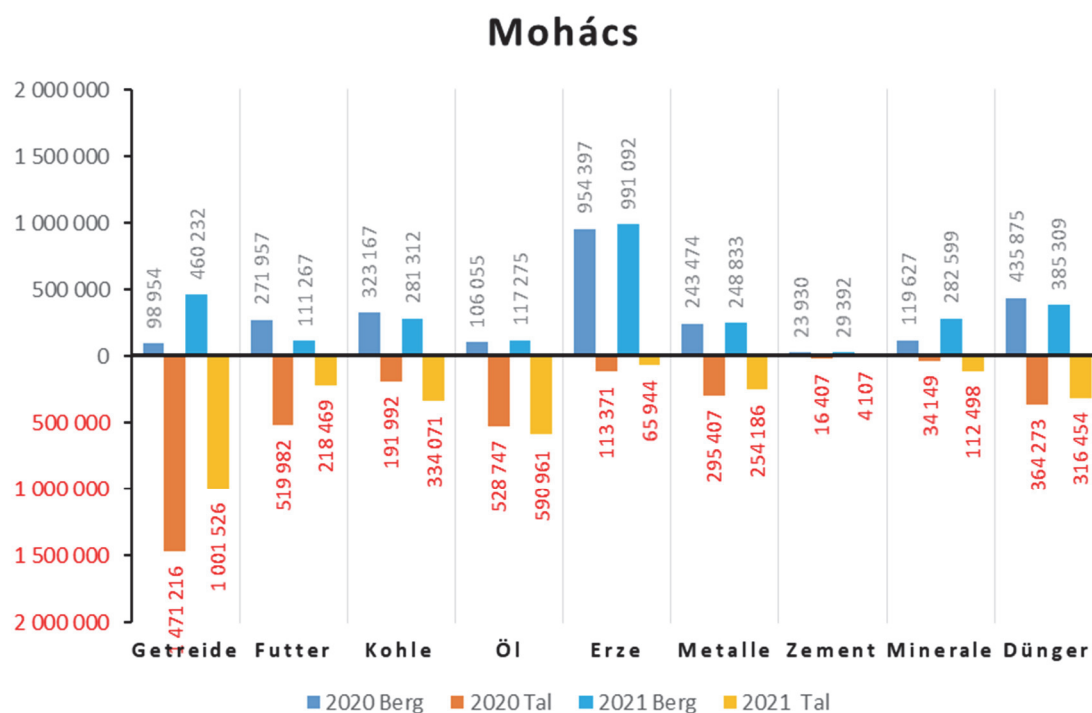


Fig. 11. Volumes of cargo transport upstream and downstream on the Danube through MOHACS checkpoint in 2019 – 2021, in tons

Table 2.7

**Cargo volumes in upstream HU/HR/RS cross-border transport  
(by groups of goods): upstream**

Year, thousand tons Commodity group	2014	2015	2016	2017	2018	2019	2020	2021
Iron ore raw materials	1.010 41%	933 38%	985 36.6%	1,023 37%	1,061 40.8%	1,247 37.6%	954	991
Coal (coke)	600 23%	605 24%	433 16.1%	435 15.7%	369 14.2%	479 14.4%	323	281
Fertilizers	344 13%	395 16%	359 13.3%	354 9.2%	362 13.9%	392 11.8%	436	385
Petroleum products	< 5%	< 5%	200 7.4%	168 6.1%	106 4.1%	109 3.2%	106	117
Metal products	176 6.9%	175 7.1%	264 9.8%	269 9.7%	297 11.4%	270 8.1%	243	249

A special feature of the 2021 market was the increased volume of food products transported upstream – 272 thousand tons (in 2019 – 250 thousand tons).

Table 2.8

**Cargo volumes in downstream HU/HR/RS cross-border transport  
(by groups of goods): downstream**

Year, thousand tons Commodity group	2014	2015	2016	2017	2018	2019	2020	2021
Grain	674 29%	1.700 44.5%	1,249 39.8%	1,028 34.5%	414 21.5%	479 21.1%	1,471	1,002
Petroleum products	520 22.5%	613 16%	465 14.8%	558 18.7%	509 26.4%	428 18.9%	528	591
Metal products	276 12%	389 10%	543 17.3%	454 15.2%	444 23.6%	316 13.9%	295	254
Food products and animal feed	430 18.6%	687 17.2%	257 8.2%	382 12.8%	179 3.3%	203 9%	520	218.5
Fertilizers	182 7.9%	234 6.1%	261 8.3%	255 8.5%	126 6.3%	272 12%	364	316

### 2.2.3 Inter-basin traffic

#### 2.2.3.1 Transport on the Danube – Black Sea Canal

In 2021, the volume of transport on the Danube – Black Sea Canal amounted to 17,289 thousand tons<sup>4</sup>, which makes it 104.7% of the similar period in 2020, out of them:

- international cargo transport: 9,108 thousand tons (corresponding to 85.9% of the volume carried in 2020);
- domestic cargo transport: 8,181 thousand tons (corresponding to 138.4% of the volume carried in 2020).

Dynamics of cargo transport by month is shown on fig. 12; the dynamics of cargo transport by years is shown in table 2.9.

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<sup>4</sup> [www.acn.ro](http://www.acn.ro).

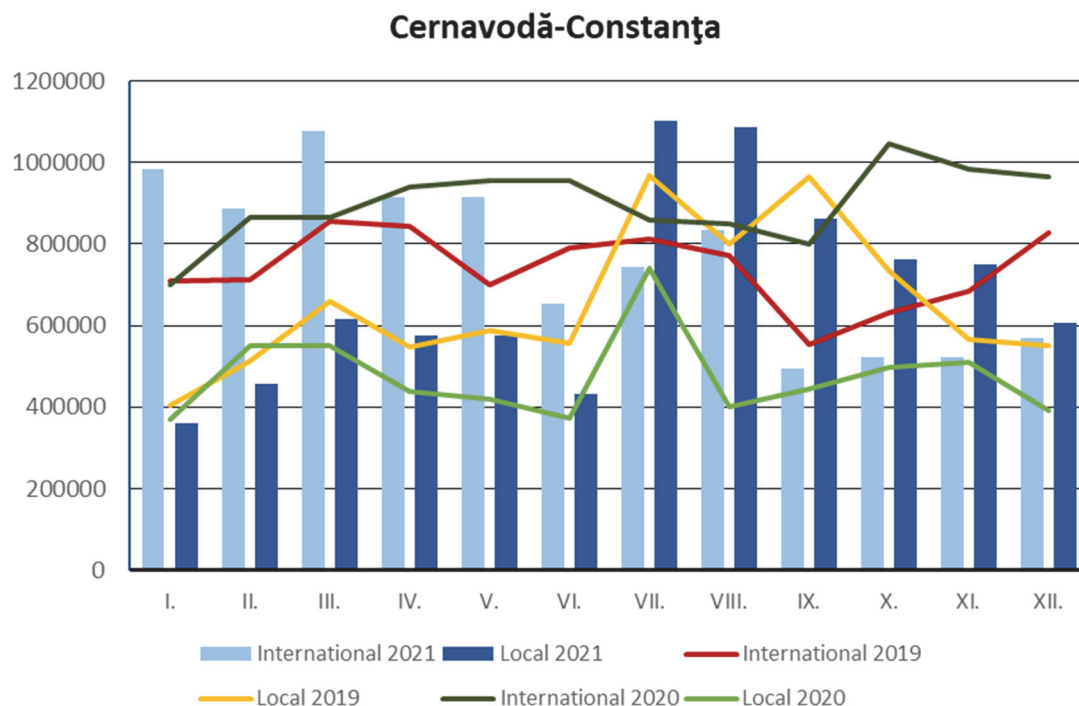


Fig. 12. Volumes of international and national transportation of cargo on the CERNAVODA – CONSTANTA Canal in 2019 – 2021, by months, in tons

Table 2.9

### Volume of cargo transport on the Danube – Black Sea Canal, by years

Year, million tons	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total cargo transport	13.96	14.43	14.02	14.55	13.77	14.12	16.74	16.51	17.29
International cargo transport	8.63	7.90	8.62	8.03	6.91	6.42	8.89	10.60	9.11
Domestic cargo transport	5.33	6.53	5.40	6.52	6.86	7.7	7.85	5.91	8.18

#### 2.2.3.2. Traffic on the Sulina Canal

In 2021, cargo transport on the Sulina Canal<sup>5</sup> comprised only 5,070 thousand tons, which accounts for 111.5% of the similar figure for 2020 (the volume of transport in 2019 was the highest for the last 6 years), at the same time, in the directions: Sea – the Danube and the Danube – Sea, cargo flows varied in different directions (Table 2.10).

<sup>5</sup> www.afdj.ro

Table 2.10

**Volumes of cargo transport on the Sulina Canal, by years**

Year, thousand tons	2014	2015	2016	2017	2018	2019	2020	2021
Cargo turnover	3.668	3.848	3.764	4.307	4.441	5.487	4.549	5.070
the Danube - Sea	3.245	3.263	3.250	3.606	3.670,3	4.331	2.872	3.389
Sea – the Danube	423	585	514	701	770,3	1.156	1.677	1.681

**2.3 Changes in freight rates**

Corresponding to the Rotterdam Platts, the average price for marine gasoil (MGO), the average price of bunker fuel in ports on the Danube was 497.5 USD/t in the first quarter (Q<sub>1</sub>), in the second quarter (Q<sub>2</sub>) it was 524.5 USD/t, in the third quarter (Q<sub>3</sub>) – 547.0 USD/t, and in the fourth quarter (Q<sub>4</sub>) – 577.5 USD/t.

The average price of bunker fuel in the first quarter of 2021 was 589.3 USD/t, in the second quarter – 623.8 USD/t, in the third quarter – 673.4 USD/t, and in the fourth quarter – 695.7 USD/t.

Correspondingly, the price of bunker fuel in 2021 increased compared to the average price in 2020 (370.3 USD/t) by 74%.

In 2021, changes in the freight index for waterway transport by quarters are shown in table 2.11.

Table 2.11

Indices: Q <sub>4</sub> 2020 г. = 100%	Q <sub>1</sub>	Q <sub>2</sub>	Q <sub>3</sub>	Q <sub>4</sub>
Bunker, %	119.7 (88.8)*	126.7 (71.3)	136.7 (66.5)	141.3 (67.9)
Freight rate, %	108.2 (101.7)	100.1 (108.2)	104.6 (102.5)	100.5 (111.3)

\* The figures in parenthesis show similar figures for 2020 compared to the same period of 2019

### Section 3.

#### Overview of cargo handling in Danube ports

##### 3.1 DANUBE PORTS IN GERMANY

3.1.1 The total volume of cargo handled in Germany's Danube ports in 2021<sup>6</sup> amounted to 2,999 thousand tons, or 85.4% of the cargo turnover in 2020 (table 3.1).

Table 3.1

Year (thousand tons)	2014	2015	2016	2017	2018	2019	2020	2021
Cargo turnover	4,031	3,257	2,958	3,314	2,585	3,274	3,511	2,999

3.1.2 Cargo turnover in the main Danube ports of Germany is shown in table 3.2.

Table 3.2

Ports (thousand tons)	Kelheim	Regensburg	Straubing-Sand	Deggendorf	Passau	Other
2016	352.2	1,350	621	217.7	292.4	125.7
2017	347.5	1,502	795	235.5	328	106.7
2018	258	1,169	430	169	369	190
2019	369	1,387	660	216	359	282
2020	361.5	1,553	660.8	144	473	312.6
2021	356.3	1,303	663.4	131.6	250.9	294

Goods in 5 major groups according to NST 2007 accounted for 97.6% of the total volume of cargo turnover, taking into account the ports of Bamberg and Nuremberg (table 3.3).

Table 3.3

Groups (thousand tons)	01	04	08	10	03
Unloaded	498.7	299.4	329.1	207.2	288.8
Loaded	799.9	273.8	29.5	97.2	103.8
2019	1,205	559.5	521	450.7	327
2020	1,504	656.7	418.8	323.6	412.6
2021	1,298	573.2	358.6	304.4	392.6

<sup>6</sup> www.statistik.bayern.de.

### 3.1.3 The largest volumes of cargo by groups:

#### Agricultural products (group 01)

- accepted by ports: Straubing-Sand – 70.6%, Regensburg – 10.2% of the total volume of unloaded cargo of group 01;
- shipped: Regensburg – 37.2%, Straubing-Sand – 6.3%, Passau – 6.3% of the total volume of loaded cargo of group 01.

#### Food products (group 04)

- accepted by ports: Regensburg – 66%, Passau - 5.6%, Kelheim – 10%;
- shipped: Straubing-Sand – 72.3%, Regensburg – 14.4%.

#### Chemical substances and products (group 08)

- accepted by ports: Regensburg – 34%, Kelheim – 18.4%, Straubing-Sand – 12.7%.

#### Finished metal items (group 10)

- accepted by ports: Regensburg – 64.1%, Deggendorf – 20.2%;
- shipped: Regensburg – 95%.

## 3.2 PORTS IN AUSTRIA<sup>7</sup>

3.2.1 The total volume of cargo handled in Austrian ports in 2021<sup>8</sup> amounted only to 6,356 thousand tons, that is 105% of the cargo handled in 2020 (table 3.4).

Table 3.4

Year (thousand tons)	2014	2015	2016	2017	2018	2019	2020	2021
Loaded	2,830	2,444	2,584	2,770	2,053	2,259	2,061	2,425
Unloaded	5,781	5,005	4,909	5,211	4,070	4,193	3,989*	3,931
Cargo volume handled	8,611	7,449	7,493	7,981	6,123	6,452	6,050	6,356

- \* The total volume of cargo handled, carried in domestic transport, comprised 756 thousand tons; it corresponds to 11.9% of the total volume of cargo handled in the ports of the country.

<sup>7</sup> Data for 2021 from competent authorities of Austria were not available to the Secretariat at the time the document was being prepared.

<sup>8</sup> www.statistik.at.

3.2.2 The volumes of cargo handled in main ports in Austria in 2021 are shown in table 3.5.

Table 3.5

Ports (thousand tons)	Vienna	Linz	Krems	Enns
Loaded	747	1,345	77	125
Unloaded	180.1	2,137	209	547
Cargo volume handled in 2019	952	3,280	305	776
Cargo volume handled in 2020	787	3,411	249	616
Cargo volume handled in 2021	927	3,482	286	672

3.2.3 Shipped to ports of other countries (table 3.6):

Table 3.6

Country (thousand tons)	Germany	Hungary	Romania	the Netherlands	Belgium	Serbia
2017	451	560	487	273	297	182
2018	253	647	371	107	200	91
2019	361	784	466	155.5	200.5	135
2020	318.7	731	416	154.8	152.5	145
2021	400	896	413	123.4	256.8	104

- 24.1% of loaded cargo was comprised of: metal products (group 10), out of which 95.9% were loaded in the port of Linz;
- 26.1% - petroleum products (group 07), 100% were loaded in the port of Vienna;
- 28.7% - chemical products (group 08), out of which 87.6% were loaded in the port of Linz.

3.2.4 Received from ports of other countries (table 3.7):

Table 3.7

Country (thousand tons)	Slovakia	The Netherlands	Ukraine	Hungary	Germany	Romania
2017	1,653	763	974	675	331	201
2018	1,233	349	811	735	253	165
2019	1,108	539	832	679	285	215
2020	1,245	423	893	784	261	127
2021	1,225	467	847	574	295	244



- 58.8% of cargo unloaded by the ports in Austria was comprised of iron ore raw materials (group 03) in the amount of 2,310 thousand tons, out of which about 88.8% were accepted by the port of Linz;
- 12.6% were petroleum products (group 07), out of which 26% were accepted by the port of Linz, and 9.7% - by the port of Vienna;
- 33.4% - agricultural products (group 01), out of which 30.9% were accepted by the port of Enns.

### 3.3 PORTS IN SLOVAKIA

3.3.1 The total volume of cargo handled by public ports in Slovakia is mostly (about 96%) determined by the volume of cargo handled by the ports of Bratislava and Komarno (table 3.8), which in 2021 comprised 1,846 thousand tons, or 118.9% of the volume of cargo handled in 2020.

Table 3.8

Year (thousand tons)	2014	2015	2016	2017	2018	2019	2020	2021
Loaded	1,652	1,922	1,879	1,952	1,464	1,515	1,443	1,674
Unloaded	63.4	87.2	89.2	175	78	149	110	172
Volume of cargo handled	1,715	2,009	1,969	2,127	1,542	1,664	1,553	1,846

3.3.2 The main volume of cargo (90.3%) was represented by loaded cargo, out of which:

- about 70% - iron ore raw materials (ore, pellets) to Austria.

### 3.4 PORTS IN HUNGARY

3.4.1 The total volume of cargo handled in the ports in Hungary in 2021<sup>9</sup> comprised 5,715 thousand tons, or 84.8% of the volume handled in 2020 (table 3.9).

Table 3.9

Year (thousand tons)	2014	2015	2016	2017	2018	2019	2020	2021
Loaded	3,917	4,190	3,602	3,692	2,785	3,204	4,489	3,109
Unloaded	1,756	1,788	1,836	2,107	2,415	2,860	2,253	2,606
Volume of cargo handled	5,673	5,978	5,439	5,799	5,200	6,064	6,742	5,715

<sup>9</sup> www.ksh.hu.

In international transport 2,858 thousand tons were loaded, and 2,355 thousand tons were unloaded.

3.4.2 The volumes of cargo handled in main ports in Hungary are shown in table 3.10.

Table 3.10

Ports (thousand tons / year)	Baja	Csepel	Győr - Gönyű	Other
2014	655	758.5	221	4.038
2015	722.5	846.9	336	4,072
2016	506.5	1,045	164.3	3,722
2017	644	1,122	167	3,865
2018	347	918	105.6	3,829
2019	505	1,130	225.4	4,204
2020	845	1,192	280	4,424
2021	581	1,199	266.6	3,668

### 3.5 PORTS IN CROATIA

3.5.1 The total volume of cargo handled in the inland ports in Croatia in 2021<sup>10</sup> was 697.1 thousand tons, which corresponds to 73.5% of the volume of 2020 (table 3.11).

Table 3.11

Year (thousand tons)	2014	2015	2016	2017	2018	2019	2020	2021
Loaded: - export	205.0	346.4	380.5	336	279.3	277	393.3	273.6
Unloaded: - import	236.0	168.4	200.5	181	239.9	472	463.1	394.3
Volume handled, incl. domestic transport	491.0	566.0	677.0	631.6	591.7	814	947.8	697.1

3.5.2 Agricultural products (group 01) accounted for 10.8% of the cargo volume handled in ports, iron ore raw materials (group 03) accounted for 43.3% , hard coal and lignite (group 02) accounted for 10.8% , and metal products (group 10) accounted for 14.4%.

<sup>10</sup> www.dzs.hr.

### 3.6 PORTS IN SERBIA

3.6.1 The total volume of cargo handled in the ports of Serbia<sup>11</sup> in 2021 comprised 13,610 thousand tons, or 166.7% compared to the volume of 2020 (table 3.12).

Table 3.12

Year (thousand tons)	2014	2015	2016	2017	2018	2019	2020	2021
Loaded - export	2,288	1,937	2,451	1,917	2,321	3,593	3,752	3,707
Unloaded - import	2,373	3,195	3,675	3,754	4,020	5,061	3,207	5,182
Domestic cargo transport	1,301	677	1,143	718	1,088	1,081	1,205	4,721
Cargo volume handled	7,263	6,486	8,412	6,390	7,429	9,735	8,164	13,610

- 30.9% of all cargo volumes are represented by construction materials (gravel and sand);
- 10.4% - iron ore raw materials;
- 13.3% - grain;
- 13.4% - oil and petroleum products;
- 15.2% - coal.

3.6.2 The volumes of cargo handled in the major ports of Serbia are shown in table 3.13.

Table 3.13

Ports (thousand tons)	Pancevo	Smederevo	Belgrade	Novi Sad	Prahovo
2015	650	1,813	831	981	450
2016	1,040	2,466	828	1,325	673
2017	1,070	3,163	713	1,180	929
2018	1,390	3,563	160	1,047	1,053
2019	1,517	4,040	196	1,413	1,109
2020	2,051	2,612	167	1,632	1,198
2021 <sup>12</sup>	1,920	3,168	206	1,435	1,044

<sup>11</sup> webrzs.stat.gov.rs

www.rzs.rs.ba

<sup>12</sup> Data was provided by the *Port Governance Agency*, Serbia.

### 3.7 PORTS IN ROMANIA

3.7.1 The following ports contribute to the total volume of cargo handled in the Danube ports of Romania:

- ports located on the maritime Danube,
- ports located on the fluvial Danube;
- ports located on the Danube – Black Sea Canal and the port of Constanta.

3.7.2 The total volumes of cargo handled in the main ports of Romania located on the maritime Danube are shown in table 3.14<sup>13</sup>.

Table 3.14

Ports (thousand tons)	Braila	Tulcea	Galați
Cargo volume handled:			
– Inland waterway vessels			
2015	1,723 (328)	2,540 (1,503)	2,961
2016	352	1,545	3,287
2017	355	1,331	3,150
2018	476	1,748	3,031
2019	397	1,660	3,077
2020	281	1,213	2,831
2021	512	1,329	3,350
– Maritime vessels			
2015	494	9	1,357
2016	490	9	1,248
2017	410	90	1,177
2018	481	56	1,320
2019	835	15	2,061
2020	327	12	2,425
2021	340	3	2,496

The volume of cargo handled for maritime vessels forms the major volume of cargo transport on the Sulina Canal. In 2021, cargo transport on the Sulina Canal comprised 5,070 thousand tons, or 111.5% of the volume transported in 2020.

In 2020, the ports of Romania located on the fluvial section of the Danube (except for Galați, Tulcea and Brăila) provided for cargo handling in the volume of more than 5 million tons.

<sup>13</sup> [www.insse.ro](http://www.insse.ro)

3.7.3 The total volume of cargo handled in the ports of Romania, including cargo carried by inland waterway vessels in the port of Constanta (15,851 thousand tons) amounted to 28,457 thousand tons, or 104.2% of the volume handled in 2020; it is shown in table 3.15.

Table 3.15

Year (thousand tons)	2015	2016	2017	2018	2019	2020	2021
Loaded:							
– International cargo transport	3,861	3469.3	3,872	4,008	5,609	5,112	5,203
– Domestic cargo transport	6,575	6,879	6,835	7,549	8,190	6,602	7,108
Unloaded:							
– International cargo transport	7,355	6,930	5,281	4,532	5,674	8,217	7,121
– Domestic cargo transport	6,671	7,818	7,797	8,591	9,001	7,376	9,025
Cargo volume handled:	24,462	25,096	23,785	24,680	28,474	27,307	28,457

3.7.4 Main groups of goods handled:

- metal ores (group 03) – 45.6% of cargo volume handled, out of them 67% are domestic transport;
- agricultural products (group 01) – 37.2% of the volume of cargo handled, out of them 43.5% are international cargo transport;
- chemical substances (group 08) – 8.4% of the volume of cargo handled, out of them 78.1% - international cargo transport;
- coke and refined petroleum products (group 07) – 6.0% of cargo volume handled, out of them 58.2% - international cargo transport;
- metal products (group 10) – 5.6%, out of them 57.3% - international cargo transport;
- coal and lignite (group 02) – 6.3%, out of them 61.3% - international cargo transport.

3.7.5 Main groups of goods exported through ports (loaded):

- group 08 – 29.5% of the volume of cargo loaded, out of them 71.8% dispatched to Serbia;
- group 07 – 12.7% of the volume of cargo loaded, out of them 25.5% dispatched to Bulgaria and 21.7% to Serbia;
- group 02 – 12.8% of the volume of cargo loaded, out of them 51.6% dispatched to Hungary and 31.4% to Serbia;
- group 03 – 25% of the volume of cargo loaded, out of them 72.2% dispatched to Serbia and 17.6% - to the Republic of Moldova (quarrying products).

### 3.7.6 Main groups of goods imported (unloaded):

- group 01 – 61.2% of the volume of cargo unloaded, out of them 47.2% from Serbia, 34.5% from Hungary, 22.7% from Bulgaria;
- group 03 – 12.5% of the volume of cargo unloaded, out of them 56.6% from Ukraine, 41.1% from Bulgaria;
- group 10 – 5.9% of the volume of cargo unloaded, out of them 35.2% from Austria;
- group 02 – 6.2% of the volume of cargo unloaded, out of them 88.7% from Ukraine.

## 3.8 PORTS IN BULGARIA

3.8.1 In 2021, the total volume of cargo handled in the ports of Bulgaria taking into account all terminals comprised 7,111 thousand tons<sup>14</sup>, which is 131.9% of the volume handled in 2020 (table 3.16).

Table 3.16

Year (thousand tons)	2014	2015	2016	2017	2018	2019	2020	2021
Loaded – Export	1,409	1,159	2,319	2,166	2,142	2,485	2,823	3,707
Unloaded – import	1,689	1,692	3,462	2,312	1,933	1,830	1,799	2,666
– Goods loaded / unloaded in domestic cargo transport	1,412	1,695	1,222	1,092	848	1,070	809	738
Volume of cargo handled	4,510 *	4,547 (6,114)	7,013 **	5,570	4,923	5,385	5,431	7,111

\* Without “ro-ro” transport

\*\* Including ferry traffic

The structure of export:

- granulated goods – 36.1%,
- general cargo – 5.7%,
- liquid goods – 2.3%,
- “ro-ro” cargo transport – 55.9%.

The structure of import:

- granulated goods – 31.2%,
- general cargo – 16.65%,
- liquid goods – 12.24%,
- “ro-ro” cargo transport – 39.9%.

<sup>14</sup> Data by Maritime Administration of Bulgaria.

### 3.9 PORTS IN THE REPUBLIC OF MOLDOVA

3.9.1 In 2021, the total volume of cargo handled in the port of Giurgiulesti comprised 1,819 thousand tons<sup>15</sup>, or 153.5% of cargo volume handled in 2020 (table 3.17).

Table 3.17

Year (thousand tons)	2015	2016	2017	2018	2019	2020	2021
Volume of cargo handled	867.8	886.4	1,591	1,889	1,299	1,185	1,819

3.9.2 Export cargo (grain, vegetable oil) represented 36.9% of the total volume of cargo handled in the port (670.6 thousand tons). While import (1,148 thousand tons) was mostly comprised of petroleum products, sand, crushed stone and coal.

3.9.3 As for groups of goods, they were as follows: grain – 27.7%, sand and crushed stone – 41.3%, petroleum products – 18.5%, coal (coke) – 2.6%, scrap metal – 4.5%, vegetable oil – 4.4%.

### 3.10 PORTS IN UKRAINE

3.10.1 In 2021<sup>16</sup>, the total volume of cargo handled in the Danube ports of Ukraine, including cargo transported by maritime vessels, comprised 5,505 thousand tons, corresponding to 135.7% of the cargo volume handled in 2020 (see table 3.18), out of them:

- export – 56.9%;
- transit – 36.2%.

Table 3.18

Year (thousand tons)	2014	2015	2016	2017	2018	2019	2020	2021
Volume of cargo handled	4,619.3	5,754	6,680	6,277	6,067	5,629	4,055	5,505

In 2020, the bulk of the cargo volumes handled in the ports of Ukraine was dry granulated cargo – 83.5%.

<sup>15</sup> Data by the Water Transport Agency of the Republic of Moldova.

<sup>16</sup> www.uspa.gov.ua.

3.10.2 Volumes of cargo handled in the major Danube ports of Ukraine are shown in table 3.19.

Table 3.19

Ports (thousand tons)	Izmail	Reni
Volume of cargo handled:		
2014	3,093.0	1,464.8
2015	4,825.0	906,9
2016	5,682	972
2017	5,097	1,125
2018	4,683	1,333
2019	4,283	1,275
2020	3,245	786
2021	4,071	1,370

Breakdown of cargo volume handled:

- Port of Izmail – dry granulated goods (ore, pellets) –80.9%;
- Port of Reni – dry granulated goods – 90.7%.

The largest part – 85.6% - of the total volume of cargo dispatched from the port of Izmail consisted of export of iron ore raw materials (ore, pellets).



## Section 4

### Conclusions

- 4.1 Absence of river freezing and ice phenomena during the winter period ensured for uninterrupted navigation during the first quarter of 2022. Sufficient water flow during this period allowed for loading cargo vessels with the draught of 2.5 m, and occasionally for the maximal value of draught of 2.7 m.

During the subsequent period, operating draughts were maintained on a fairly stable level – 2.5/2.3 m.

The low water phase, which started at the end of August and actually continued until the end of the year, led to a sharp decrease of operating draughts to the levels of 1.9/1.8 m; that phase was accompanied by occasional stops of convoys for long periods, which led to a decrease in traffic volumes on the sections controlled by the Market observation for Danube navigation system.

- 4.2 The cargo transportation market continued to be affected by the decline in industrial production in 2020, but certain stabilization trends primarily in metallurgical industry and in construction influenced its further dynamics in the Danube basin and on the inter-basin directions of cargo flows:

- According to the *Eurofer* forecast (data for March 2022), in 2021, consumption of steel in EU states will increase by 13.8 % compared to the results of 2020; increase in the consumption of steel is due to the growth of industrial production. Accordingly, shipments of iron ore raw materials and metal products could be regarded as stable. Forecasts for 2022 could also be considered optimistic.
- In 2020, a certain balance of cargo transport on the Danube was ensured by grain shipments, primarily from the ports of the Middle Danube to the delta ports (Constanța). It is necessary to note a significant growth in the volumes of grain transportation in the first (Q<sub>1</sub>) quarter of 2021 (146.4% compared to Q<sub>1</sub> of 2020), however, starting from September, those volumes dropped significantly (by 40 - 50% compared to August).
- In the current economic conditions, the Danube markets for transportation of petroleum products and chemical products could be recognized as relatively stable.

- 4.3 Accordingly, in 2021, volumes of cargo transport were as follows:

- in cross-border traffic between Germany and Austria (DE/AT): 2,221 thousand tons, or 95.3% of the corresponding volume in 2020;
- in cross-border traffic between Hungary and Slovakia (HU/SK): 4,944 thousand tons, or 98.7% of the corresponding volume in 2020;
- in cross-border traffic between Hungary, Croatia and Serbia (HU/HR/RS): 5,805 thousand tons, or 95% of the corresponding volume in 2020;
- the volume of transport on the Danube – Black Sea Canal amounted to 17,289 thousand tons, or 104.7% of the volume transported in 2020;
- the volume of transport on the Sulina Canal amounted to 5,070 thousand tons, or 111.5% of the volume transported in 2020.

- 4.4 Cargo capacity of ports in 2021 varied multidirectionally (see Section 3).

- 4.5 In passenger shipping, with relaxation of local restrictions in June 2021, occasional trips of main cruise lines were launched, as well as trips on local transport lines.
- 4.6 In July – August, the number of passages and the number of passengers transported on cruise ships increased further. The concept of resuming passenger shipping on cruise ships with cabins would depend primarily on the situation with the pandemic. Several options are possible here: quarantine measures in all Danube countries would be lifted or would be relaxed allowing the restrictions hindering passenger traffic to be lifted.



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