### Transport Volume

<table>
<thead>
<tr>
<th>Type</th>
<th>Volume (in millions of tons)</th>
<th>Change (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Import</td>
<td>5.6</td>
<td>-10.3</td>
</tr>
<tr>
<td>Export</td>
<td>1.5</td>
<td>-7.3</td>
</tr>
<tr>
<td>Transit</td>
<td>2.3</td>
<td>-16.8</td>
</tr>
<tr>
<td>Domestic</td>
<td>0.6</td>
<td>+23.8</td>
</tr>
</tbody>
</table>

### Transport Performance

<table>
<thead>
<tr>
<th>Type</th>
<th>Volume (in billions of tkm)</th>
<th>Change (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within Austria</td>
<td>2.1</td>
<td>-10.6</td>
</tr>
<tr>
<td>Outside Austria</td>
<td>7.5</td>
<td>-17.6</td>
</tr>
</tbody>
</table>

### Water Transport at Austrian Ports and Transport Sites

<table>
<thead>
<tr>
<th>Type</th>
<th>Volume (in millions of tons)</th>
<th>Change (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ores and metal waste</td>
<td>2.9</td>
<td>-16.0</td>
</tr>
<tr>
<td>Petroleum products</td>
<td>2.3</td>
<td>-0.4</td>
</tr>
<tr>
<td>Fertilisers</td>
<td>0.8</td>
<td>-0.6</td>
</tr>
<tr>
<td>Agricultural and forestry products</td>
<td>0.7</td>
<td>+41.9</td>
</tr>
<tr>
<td>Metal products</td>
<td>0.5</td>
<td>-8.6</td>
</tr>
<tr>
<td>Other goods</td>
<td>1.0</td>
<td>-10.4</td>
</tr>
</tbody>
</table>

### Vessel Units Locked Through Austrian Danube Locks

<table>
<thead>
<tr>
<th>Type</th>
<th>Volume (in thousands of vessel units)</th>
<th>Change (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freight transport</td>
<td>34,244</td>
<td>+6.5</td>
</tr>
<tr>
<td>Passenger transport</td>
<td>63,792</td>
<td>-4.9</td>
</tr>
</tbody>
</table>

### Passenger Transport (incl. Estimation)

<table>
<thead>
<tr>
<th>Type</th>
<th>Volume (in millions of passengers)</th>
<th>Change (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liner services</td>
<td>700,000</td>
<td>+2.3</td>
</tr>
<tr>
<td>River cruises</td>
<td>270,000</td>
<td>+10.2</td>
</tr>
<tr>
<td>Non-scheduled services</td>
<td>120,000</td>
<td>+6.1</td>
</tr>
</tbody>
</table>

### Accidents

- 21 traffic accidents with damage
  - Fatal injuries: 0 dead, 0 slightly injured
  - Damage to property: 6 vessel-vessel, 0 grounding incidents, 15 incidents with damage to bank and facilities

### Availability of the Waterway

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Duration</th>
<th>Change (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer</td>
<td>361 days</td>
<td></td>
</tr>
<tr>
<td>15-year average</td>
<td>359 days</td>
<td>Closing due to high waters: 6 days, Closing due to low levels: 3 days</td>
</tr>
</tbody>
</table>

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**Source:** Statistics Austria; Supreme Navigation Authority at the Federal Ministry for Transport, Innovation and Technology; Federal Office of Transport; diverse companies active in passenger transport
AN EVENTFUL YEAR
NEW CHALLENGES

For via donau as a waterway infrastructure operator, 2011 was both an eventful and challenging year. On the one hand, we succeeded in fully establishing a customer-oriented waterway management in the company, on the other, fairway conditions proved extremely difficult for navigation – low water levels prevailed on the Danube in spring and late autumn, and a sunken dredging barge created an additional obstacle to navigation east of Vienna. Together with difficult overall conditions affecting European economies, these factors resulted in a decrease of the volume of goods transported on the Austrian Danube.

On the plus side, the implementation of the European Danube Region Strategy began in 2011 as well. The priority area Danube navigation included in this strategy is coordinated by the Federal Ministry for Transport, Innovation and Technology together with via donau and the Romanian Ministry of Transport. Another highlight was the launch of the Bad Deutsch-Altenburg pilot project east of Vienna in late 2011. This project will help generate important insights with regard to ecologically-oriented hydraulic engineering.

DANUBE NAVIGATION IS THE FUTURE
HUGE COMMERCIAL POTENTIAL

The Danube connects ten countries and shapes one of Europe’s major living and economic environments. The Danube has always been inseparably linked to the history of our country and of Europe and has become a popular recreational area, a provider of clean energy as well as a major international transport route today. And, what’s more, Danube navigation is an environmentally friendly and energy-efficient mode of transport which my Ministry is devoting particular attention to.

Almost 10 million tons of goods were transported on the Danube in Austria in 2011 despite challenging overall conditions. This Annual Report has been prepared to give you an overview over the figures, facts and initiatives regarding Austria’s Danube navigation. It also illustrates the high commercial importance of environmentally friendly inland navigation for Austria as a business location. Together with via donau, the Federal Ministry for Transport, Innovation and Technology is therefore striving to increase the Danube’s usefulness as a transport route in harmony with the environment. Making use of environmentally friendly inland navigation while at the same time ensuring and improving the ecological condition of the Danube region as both a social and natural environment by means of targeted measures is a special concern for me.
Once the European economy had somewhat recovered in 2010 from previous year’s crisis, the Euro debt crisis hit and dominated 2011. On top of the general economic development, other exacerbating factors were several substantial low-water periods in the second half of 2011, even leading to a total disruption of traffic on the lower Danube.

Due to these unfavourable overall conditions, transport volumes on the Austrian section of the Danube dropped in almost every commodity group over 2010. In 2011, about 9.9 million tons of goods were transported on the Austrian Danube, corresponding to a decrease of 10.0% or 1.1 million tons as compared to 2010. This figure is higher by only 6.7% or 621,478 tons than the results achieved in the crisis year of 2009.

Accordingly, transport performance within Austria’s borders shrank by 10.6% to 2.1 billion ton-kilometres over 2010. Total transport performance decreased by 16.2% to 9.6 billion ton-kilometres. The number of loaded journeys undertaken on the Austrian section of the Danube, however, only sank by 0.6% to 10,325. The average transport distance per ton was 938 kilometres for imports, 793 kilometres for exports, 1,351 kilometres for transit transports and 155 kilometres for domestic shipping.

As far as imports were concerned, transport volumes decreased by 10.3% or 635,648 tons to 5.6 million tons, with 78% of the goods reaching Austrian territory from the east. The largest quantitative drop in imported goods volumes was observed in the commodity groups ores and metal waste (-526,633 tons) as well as petroleum products (-156,824 tons).

In exports, 1.5 million tons of goods were transported by inland vessels in 2011, corresponding to a reduction by 7.3% or 122,083 tons over 2010. In this transport segment, 49% of the goods crossed the eastern border and 51% crossed the western border of the Austrian territory. Here, the sharpest decline was in crude and manufactured minerals and building materials (-77,740 tons) and petroleum products (-46,658 tons).

In 2011, the most extreme slump in transport volumes on the Austrian Danube was seen in transit transport: In this segment, the quantity of transported goods sank by 16.8% or 459,615 tons to 2.3 million tons, with 82% of the goods being carried upstream and 18% downstream. The transport volume reported for transit journeys represents an extrapolated figure since Statistics Austria uses an estimation model to compensate for the current underreporting of transit traffic.

Finally, domestic freight traffic on the Austrian section of the Danube waterway increased by 23.8% or 108,555 tons to 565,187 tons. These transports, however, involve almost exclusively intra-company or stock-transfer haulage without any commercial effects.

The shares of the individual transport segments in total waterway freight transport in 2011 are as follows (changes over 2010 are indicated as percentages in brackets): 56.0% imports (-0.1%), 22.8% transit transport (-1.9%), 15.5% exports (+0.4%) and 5.7% domestic traffic (+1.6%).

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Import</th>
<th>Export</th>
<th>Transit*</th>
<th>Domestic</th>
<th>Transport Volume (Tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>9,943,288</td>
<td>5,564,222</td>
<td>1,545,722</td>
<td>2,268,157</td>
<td>565,187</td>
<td>5,604,222</td>
</tr>
<tr>
<td>2010</td>
<td>11,052,080</td>
<td>6,199,870</td>
<td>1,667,805</td>
<td>2,727,772</td>
<td>456,632</td>
<td>6,414,870</td>
</tr>
<tr>
<td>2009</td>
<td>9,321,912</td>
<td>4,945,292</td>
<td>1,581,387</td>
<td>2,405,668</td>
<td>329,455</td>
<td>4,647,292</td>
</tr>
<tr>
<td>2008</td>
<td>11,208,711</td>
<td>5,730,621</td>
<td>2,166,354</td>
<td>2,809,508</td>
<td>502,228</td>
<td>5,940,621</td>
</tr>
<tr>
<td>2007</td>
<td>12,106,540</td>
<td>6,254,069</td>
<td>1,547,234</td>
<td>3,323,081</td>
<td>972,156</td>
<td>6,407,069</td>
</tr>
</tbody>
</table>

*) Due to a lack of statutory resources, there are no complete records for transit data for the years 2004 and 2005.

Since 2005 figures have been extrapolated by Statistics Austria.

Source: Statistics Austria; chart and table created by via donau
The overall economic conditions as well as the unfavourable fairway conditions prevailing on the entire Danube in the second half of 2011 also had a negative effect on the water transhipment of goods in Austrian ports and transhipment sites: In total, approximately 8.2 million tons of goods were transhipped at waterside loading and unloading facilities on the Austrian section of the Danube, corresponding to a downturn of 6.2% or 540,621 tons over 2010.

With handling figures amounting to 3.3 million tons, the private corporate port of voestalpine in Linz remains Austria’s most important Danube port in terms of waterside handling of goods. In spite of a decrease in water transhipment of 16.2% or 635,471 tons compared to 2010, this port holds a 40.0% share of the water transhipment activities of all ports and transhipment sites located on the Austrian section of the Danube.

Other Austrian ports and transhipment sites (including Aschach, the Linz heavy cargo port, Wallsee, Ribis, Mürzzuschlag, Pischelsdorf and Korneuburg) were able to increase water transhipment figures by 10.5% or 150,926 tons to 1.6 million tons. In sum, they boasted a share of 19.3% of the entire water transhipment of all Austrian transhipment sites. (Regrettably, a more detailed description of the waterside handling of goods of these ports and transhipment sites is not possible due to statutory data privacy provisions).

In 2011, the port of Krems recorded a large increase in transhipment percentages over 2010, with a plus of 23.9% or 83,811 tons compared to the previous year and thus reaching water transhipment volumes amounting to 434,029 tons. These numbers, however, include 93,856 tons of gravel from high-water compensation dredging of the Danube riverbed which were unloaded at the Krems port. In addition to the private corporate port of voestalpine in Linz, the ports in Enns and Vienna were able to further reduce losses in 2011. While water transhipment at the Vienna port reached 1.1 million tons, equalling a drop of 71,186 tons, 608,265 tons were transhipped at the port of Enns, which amounts to a decrease of 8.8% or 58,666 tons. Water transhipment at the ports of Linz AG remained almost stable when compared to 2010, reaching 1.2 million tons and suffering a slight decrease of 0.8% or 10,015 tons.

In total, the four public Danube ports in Linz, Enns, Krems and Vienna handled about 40% of all goods transhipped at Austrian waterside facilities in 2011. In addition to the 40.0% share of the voestalpine Linz port and the 19.3% share of the group of other ports and transhipment sites in the total water transhipment volume recorded by Austrian Danube ports and transhipment sites in 2011, the quantitative shares achieved by the remaining ports and transhipment sites are as follows: 15.1% Linz AG, 12.9% Vienna, 7.4% Enns and 5.3% Krems.

**DISTRIBUTION OF WATER TRANSHIPMENT AT AUSTRIAN DANUBE PORTS AND TRANSHIPMENT SITES 2011**

<table>
<thead>
<tr>
<th>Port Transhipment</th>
<th>2011 Transhipment (tons)</th>
<th>Share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Krems</td>
<td>434,029 (+23.9%)</td>
<td>40.0%</td>
</tr>
<tr>
<td>Enns</td>
<td>608,265 (-8.8%)</td>
<td>19.3%</td>
</tr>
<tr>
<td>Hafen Wien</td>
<td>1,066,603 (-6.3%)</td>
<td>15.1%</td>
</tr>
<tr>
<td>Linz AG</td>
<td>1,243,568 (-0.8%)</td>
<td>12.9%</td>
</tr>
<tr>
<td>Others</td>
<td>1,592,523 (+10.5%)</td>
<td>7.4%</td>
</tr>
</tbody>
</table>

**TOTAL:** 8,240,319 tons

Source: Statistics Austria; chart created by via donau

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1) Including water transhipment at the transhipment facility of Industrie logistik Linz GmbH
2) The figures for the Linz site combine the transhipment volumes of the commercial port and the oil port.
3) The figures for the Vienna site combine the transhipment volumes of the three ports of Freudenau, Albern and the Lobau oil port.
4) Other ports and transhipment sites: Aschach, Linz heavy cargo port, Wallsee, Ribis, Mödrath, Mürzzuschlag, Pischelsdorf and Korneuburg

**PORT TRANSHIPMENT DECLINE OF ABOUT 6.2% SLIGHT INCREASE FOR PRIVATE PORTS**
The year 2011 saw a decline in almost every group of commodities carried on the Austrian section of the Danube. Only the fertiliser NST/r group (NST/r = Standard goods classification for Transport Statistics/Revised) showed an increased transport volume over 2010.

The amount of agricultural and forestry products transported sank by 8.0% or 143,066 tons over 2010, most of which are still transit shipments. With a total of 1.6 million tons transported in 2011, agricultural and forestry products took the third-largest share in the total volume of transports on the Austrian Danube.

As in previous years, the 2.9 million tons of ores and metal waste hauled in 2011 accounted for the largest share (approximately 30%) of the entire volume of goods transported on the Austrian stretch of the Danube. Nevertheless, this group of commodities suffered a downswing of 16.2% or 567,512 tons as compared to 2010. 99% of these ores and metal waste were imports to Austria.

Similar percentage losses occurred in the NST/r group of crude and manufactured minerals and building materials: A reduction by 16.2% meant a decline by 76,763 tons to 395,927 tons of goods which were predominantly imports. There was also a marked drop of solid fuels amounting to 15.4% or 33,429 tons, reducing these transports to a total of 183,138 tons in 2011. Only the commodity group fertilisers showed an increase in transport volume in 2011, making fertilisers the fourth largest group of commodities transported on the Austrian section of the Danube thanks to an increase of 10.7% or 114,136 tons, amounting to a total of 1.2 million tons. While some of these goods were carried in transit transport, most of them were exports.

Despite a loss of approximately 7.3% or 158,176 tons over 2010, petroleum products continued to remain the second-largest commodity group on the Austrian Danube, reaching a transport volume of 2.0 million tons. The majority of these transports were imports to Austria, followed by domestic transport and exports.

In relative terms, the 51.5% decline in the group of chemical products in 2011 marked the largest drop in transport volume, although in absolute terms only corresponding to a moderate decrease by 55,404 tons over 2010.

There was also a decrease in the NST/r commodity groups of metal products amounting to -8.6% or 82,345 tons (2011: 877,691 tons) and foodstuffs and animal fodder amounting to -18.8% or 89,968 tons (2011: 388,115 tons).

Transport volumes in the group of machinery, vehicles and other articles fell by 5.3% or 16,265 tons as compared to 2010. This group of commodities also includes intermodal transports, mainly consisting of roll-on roll-off transports of vehicles, agricultural machinery and loaded trailers as well as of empty containers. With 289,608 tons of goods transported, this group accounted for a share of about 3% in the total volume of transports carried on the Austrian section of the Danube.
New River Cruise Record
1.1 Million Danube Passengers

In sum, 1.1 million passengers travelled on the Austrian Danube in 2011, corresponding to a plus of 4.6% or approximately 48,000 passengers compared to 2010. The majority of them were about 700,000 persons carried on liner services (+2.3% over 2010). Cabin vessels carried about 270,000 cruise passengers, marking a striking increase by 10.2% in this segment when compared to 2010. Some 120,000 casual passengers enjoyed theme voyages, special trips and charter voyages (+6.1%).

In 2011, a total of 124 cabin vessels with an overall capacity of 19,300 passengers operated on the Austrian section of the Danube, corresponding to an increase of 10.7% or 12 vessels over 2010. While three cabin vessels which are normally travelling on Western European waterways were also operating on the Austrian Danube, nine newly built vessels were put into service as well. 2011 river cruises accounted for 3,635 journeys (+9.5% over 2010) carrying a total of about 270,000 passengers (+10.2%). Seen from a long-term perspective, this means an increase in passenger numbers by an impressive 127% since 2002.

In 2011, liner services on the Austrian Danube involved a total of 26 vessels with an overall capacity of 8,400 passengers. DDSG Blue Danube reported 223,000 passengers (+8.3% over 2010) travelling on its liner services in the Wachau region and in Vienna. The two Twin City liners carried 139,031 passengers (+10.6%) on the route between Vienna and Bratislava. Donau-Touristik reported that it had carried 48,958 passengers on its liner services (-3.6%). Slovakian and Hungarian hydrofoils recorded 35,425 passengers (-14.1%), while Bavarian operator Wurm + Köck carried a total of 31,000 passengers (-11.4%) on its liner services on the Linz-Schlägen-Linz and Linz-Vienna-Linz routes in 2011.

Non-scheduled services were carried out by 41 passenger vessels (including vessels primarily operated on liner services) with a total capacity of about 12,000 passengers. DDSG Blue Danube transported 67,000 casual passengers (+3.1%) on non-scheduled voyages. Other operators of non-scheduled voyages included schnittART Linz–Donau with 13,000 passengers, Donau-Touristik with 10,065 passengers, the steamship Schörbenau with approximately 4,000 passengers, Nostalgie Tours Wachau (Kremnitz) with 3,606 passengers and the MS Stadt Wien (Tulln) with 1,472 passengers carried. Finally, Slovakian and Hungarian hydrofoils recorded 2,221 passengers travelling on non-scheduled voyages on the Austrian Danube in 2011.

No figures regarding other companies operating liner services or organising non-scheduled voyages on the Austrian Danube are available for the period under review. Due to a change in legislation, passenger transport data on the Danube in Austria ceased to be statistically recorded in 2003. As a result, the figures for liner services and non-scheduled voyages given above also include estimates based on an average capacity utilisation of 40% on passenger vessel journeys.

In times of extreme weather conditions such as high water or extensive ice formation on the Danube, all river navigation may be shut down by the authorities. High water conditions mostly arise in early spring as a result of rapid snow melts or due to heavy rainfall in midsummer. Extensive ice formation may occur due to long periods of low temperatures well below freezing point. As a rule, obstructions owing to ice formation arise in the months of January and/or February.

During such official weather-related closings, navigation on the Danube is prohibited on affected sections of the Austrian Danube waterway. There are no closings in low-water conditions; cargo vessels, however, can sometimes use the waterway only to a very limited degree in terms of economic efficiency during such periods. The relationship between the potential capacity utilisation of cargo vessels and available fairway depths is described in greater detail in the following chapter entitled «Fairway Conditions».

In the 15 year period between 1996 and 2011, average navigability on the Austrian section of the Danube waterway has been 98.2% of days or 359 days per year. 2011 saw no obstruction of river traffic due to ice formation, although the Danube waterway had to be closed by the authorities for four days due to unseasonally high water levels in mid-January. As a consequence, the Austrian Danube was navigable on 361 days or 98.9% of 2011.

Transports to and from the West not only depend on the Austrian and German sections of the Danube waterway but also rely heavily on the navigability of the Main-Danube Canal linking the Danube with the Main and the Rhine waterways. In 2011, the canal had to be closed for ten days due to ice but was nevertheless navigable for 93.6% of the year or 342 days. Additionally, maintenance works were performed in April, forcing the authorities to close the canal for 13 days.
Due to unusual hydrological conditions, fairway conditions in the free-flowing stretches of the Austrian Danube (Wachau and east of Vienna) were slightly below the long-term statistical average in 2011. In the winter months of 2011 (January, February and December), a period usually characterised by low water levels from a statistical point of view, as well as in the summer months between June and August, favourable fairway conditions prevailed. During these months, however, water levels at the Wildungsmauer gauge (gauge of reference for the river stretch east of Vienna) exceeded the medium (i.e. 316 cm) navigable water mark on only about 18% of all days.

When comparing the unusually low water levels of the Danube in the months between October and December, it must be said that the mean daily water levels at the Wildungsmauer gauge of reference were lower by a remarkable 24 cm in 2011 when compared to 2010. The main reason for this was an extreme low-water period in November and in the beginning of December 2011, with Danube water levels plunging under LNW 96 by more than half a metre on single days during these months.

Hydrologically speaking, shorter low-water periods in the spring months of March and May as well as in the autumn months of October and November caused more than half a metre on single days during these months. This means that there is a direct relationship between fairway conditions and the load factor of vessels. The general rule is that if relatively large draughts loaded can be achieved, the average load factor of vessels increases and vessel operators require fewer trips to transport the same volume of goods. This correlation can be clearly seen from the second diagram: in January 2011, the average load factor was at a favourable 54.8% (2010: 64.2%; 2009: 60.0%; 2008: 61.3%). This value reflects the Danube’s low discharge in the months between March and May as well as between September and November when an average load factor of merely 54.8% (2010: 64.8%) was recorded.

With inland waterway transport, it is mostly the available fairway depth which determines the draught loaded of a vessel and hence the quantity of goods which can be loaded. Higher transport quantities per vessel or convoy also improve the relation between freight revenues and costs and thus general Danube navigation competitiveness. When loading their vessels, ship operators often have to estimate available fairway depths at critical river stretches for days in advance before passing them by means of so-called reference gauges. The Wildungsmauer gauge shown in the graph is the decisive indicator for fairway conditions in the free-flowing stretch of the Austrian Danube between Vienna and Bratislava. This means that there is a direct relationship between fairway conditions and the load factor of vessels. The general rule is that if relatively large draughts loaded can be achieved, the average load factor of vessels increases and vessel operators require fewer trips to transport the same volume of goods. This correlation can be clearly seen from the second diagram: in January 2011, the average load factor was at a favourable 70.4%, with 622 journeys being required to convey some 705,000 tons of goods. In November, however, the average load factor per vessel was only 42.7%; in this month, a total of 851 journeys were made to transport approximately 560,000 tons of goods.
For both free-flowing stretches of the Austrian Danube (Wachau and east of Vienna), the lowest fairway depths were calculated for 2011 (figures for the periods between measurement dates were interpolated) based on all hydrographic measurements of the riverbed and evaluated in combination with the respective gauge hydrographs (mean daily water levels at the Kienstock and Wildungsmauer gauges of reference). The reference for these calculations was a deep channel located inside the fairway representing the required fairway width for a four-unit pushed convoy travelling downstream without encountering other vessels; the width of the fairway depending on the river bend radii involved.

For six months in 2011, fairway depths exceeding 2.50 m over the deep channel prevailed during the whole month (January, February, April and June to August). Extremely low water levels in November 2011 led to fairway depths of less than 2.50 m in both free-flowing stretches of the Austrian Danube over the whole month.

Seen from the perspective of the entire year 2011, a minimum fairway depth of 2.50 m was reached in the Wachau stretch (between river kilometres 1,998 and 2,038) in the deep channel on 315 days or 86% of the year; on 50 days, it was less than 2.50 m. The Kienstock gauge at river kilometre 2,015.21 is used as the gauge of reference for this free-flowing stretch of the Danube.

In the river stretch east of Vienna (i.e. between river kilometres 1,872.70 and 1,921), a minimum fairway depth of 2.50 m was detected in the deep channel on 252 days or 69% of the year; on 113 days, fairway depths of less than 2.50 m in the deep channel prevailed in this free-flowing stretch of the Danube. The Wildungsmauer gauge at river kilometre 1,894.72 is used as the gauge of reference here.

In addition to the low water levels observed in the spring and autumn of 2011 (see preceding double page), a dredging barge that had sunk in May within the fairway at river kilometre 1,898.30 and could not be salvaged by the end of 2011 due to unfavourable water levels as well as engineering issues posed another aggravating factor for the free-flowing stretch east of Vienna. This accident made it necessary to relocate the fairway route at Regelsbrunn. Owing to local hydromorphological conditions, only a fairway depth of 2.20 m at low navigable water level (LNWL 96) could be maintained. 15 multi-beam sonar measurements were performed between late July and late December in order to be able to take urgent measures for maintaining the temporary fairway in case the situation should deteriorate.

*Based on the required fairway width for a four-unit pushed convoy travelling downstream without encountering other vessels. Fairway width depends on the river bend radii involved. Source: via danau

**MINIMUM CONTINUOUSLY NAVIGABLE FAIRWAY DEPTHS ON THE FREE-FLOWING STRETCHES OF THE DANUBE IN 2011 IN DAYS**

**FAIRWAY DEPTHS**

2.50 METRES DURING 69% OF THE YEAR

EXTREME SITUATION IN AUTUMN
In 2011, a total of 9.9 million tons of goods were carried on the Austrian section of the Danube waterway spanning a length of 350.51 km in total. Total transport volumes by segment ranged from 4.3 million tons (-15% over 2010) in the Upper Austrian segment between the German-Austrian border and Linz, to 7.4 million tons (-11%) in the free-flowing stretch between Vienna and the Austrian-Slovakian border. Because it boasts by far the largest water transshipment location on the Austrian Danube, the industrial port of the voestalpine steelworks in Linz stands out among all other ports and transhipment sites due to its quantity of goods handled on the waterside. Import statistics reveal that voestalpine obtained 2.5 million tons of ores from Eastern Europe in 2011, mainly from Slovakia (Bratislava port) and the Ukraine (ports of Izmail and Reni). The largest quantities imported from Western Europe were once again dominated by the ports of Linz (voestalpine and Linz AG). 0.6 million tons were transported upstream and 0.2 million tons downstream from these ports, while 0.4 million tons of goods were carried from Vienna (Lobau port) downstream.

As far as transit transports were concerned, a comparison of transport flows by transport direction shows a ratio of 4.5:1 (upstream/downstream); in 2010, this ratio amounted to 5.3:1 and was as high as 6.3:1 in 2009. On the stretch between Linz and the Austrian-German border, transit transport accounted for 53% of the overall transport volume (-10% over 2010). The volume of transported goods per day amounted to 17.493 tons (-9.9% or -1,915 tons against 2010) for all cross sections. In the most heavily used cross section (compared to average Austrian figures) of the free-flowing Danube stretch east of Vienna, an average of 20.206 tons of goods were transported per day in 2011, i.e. the equivalent of 888 fully loaded lorries (25 net tons per vehicle) or 505 railway wagons (40 net tons per car) or close to 25 block trains. Over the total length of the Austrian section of the Danube, an average of 17.327 tons of goods were carried per kilometre in 2011 (-10.6% or -2,052 tons against 2010).

### Transport Density

#### 350 Kilometres of Waterway About 10 Million Tons of Goods

<table>
<thead>
<tr>
<th>SEGMENT</th>
<th>Length in km</th>
<th>Import</th>
<th>Export</th>
<th>Domestic</th>
<th>Transit</th>
<th>Total</th>
<th>In sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>DE/AT border – Linz</td>
<td>94.51</td>
<td>24</td>
<td>1,197</td>
<td>785</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>Linz – Enns</td>
<td>16.87</td>
<td>2,937</td>
<td>720</td>
<td>114</td>
<td>170</td>
<td>393</td>
<td>410</td>
</tr>
<tr>
<td>Enns – Krems</td>
<td>113.83</td>
<td>3,071</td>
<td>155</td>
<td>80</td>
<td>277</td>
<td>393</td>
<td>1,859</td>
</tr>
<tr>
<td>Krems – Pischelsdorf</td>
<td>26.30</td>
<td>3,230</td>
<td>280</td>
<td>66</td>
<td>251</td>
<td>30</td>
<td>1,859</td>
</tr>
<tr>
<td>Pischelsdorf – Kremsaburg</td>
<td>29.62</td>
<td>3,548</td>
<td>27</td>
<td>35</td>
<td>347</td>
<td>394</td>
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</tr>
<tr>
<td>Kremsaburg – Wien</td>
<td>23.64</td>
<td>4,215</td>
<td>27</td>
<td>35</td>
<td>351</td>
<td>394</td>
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<tr>
<td>Wien – AT/SK border</td>
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<td>4,347</td>
<td>0</td>
<td>0</td>
<td>780</td>
<td>0</td>
<td>1,859</td>
</tr>
</tbody>
</table>

Transport quantities in 1,000 tons

Source: Statistics Austria; chart and table created by via donau
In 2011, a total of 98,036 cargo and passenger vessel units were locked through the nine Austrian Danube locks (excluding the Jochenstein power station on the Austro-German border) upstream and downstream. 43,021 of these units were motor cargo vessels and motor tankers (-4.5% compared to 2010), 20,771 were pushers (-5.9%) and 34,244 were passenger vessels (+6.5%). 51,180 cargo and tank lighters or barges (-2.7%) were locked through as part of convoys. In sum, the total number of locked-through vessel units in freight and passenger transport including all types of vessels and convoys suffered a decrease of 1.2%.

Compared to 2010, the number of cargo vessel units that passed through the locks on the Austrian section of the Danube sank by 4.9%, while the number of locked-through passenger vessels rose by 6.5%. The number of locked-through passenger vessels has steadily increased over the last ten years (2002–2011), which means that a substantial increase by about 70% or 14,000 locked-through vessel units could be observed. In 2011, freight traffic accounted for 65.1% (-2.5% over 2010) and passenger traffic for 34.9% (+2.5%) of the total vessel volume.

Over the whole of 2011, the average volume of vessels passing through an Austrian lock reached 10,893 convoys and individual vessels (a decline by 137 vessel units over 2010). This amounts to 908 (-11) shipping movements per month and an average of almost 30 locked-through units per day and lock.

The highest shipping volume in 2011 was again recorded at the Freudenau lock in Vienna with 13,830 vessel units passing through (-1.3% over 2010), followed by the Abwinden lock with 11,061 and the Greifenstein lock with 10,930 units. The lowest volume, i.e. 9,646 vessel units (-0.6%), was again reported by the Aschach lock, the westernmost Danube lock in Austria.

As far as vessel configurations were concerned, freight transport passing through the Freudenau lock, the Austrian lock with the largest number of vessels locked through, showed a ratio of 46% to 54% between individual vessels and convoys in 2011 (3,744 and 4,392 journeys respectively). The ratio for the overall sizes of vessel units (number of cargo-carrying units) was 29% to 71% (individual vessels to convoys). The majority of the locked-through pushed convoys (pushers + lighters) were two-unit convoys (74%); 16% of the pushed convoys included one lighter, 8% comprised four lighters and 2% consisted of three lighters. The figures for coupled formations (motor cargo vessel or motor tanker + lighters) show that 92% travelled with one lighter, 5% with three lighters and 3% with two lighters. Apart from freight and passenger transport vessel units passing through locks on the Austrian Danube in 2011, 9,617 small sports and leisure vessels as well as 1,052 other vessel units such as official and emergency vessels were locked through. These vessels are not included in this analysis which solely focuses on freight and passenger transport.

**Vessel units in freight and passenger transport locked through Austrian Danube locks 2011**

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Freight transport</th>
<th>Passenger transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>98,036</td>
<td>63,792</td>
<td>34,244</td>
</tr>
<tr>
<td>2010</td>
<td>99,267</td>
<td>67,114</td>
<td>32,153</td>
</tr>
<tr>
<td>2009</td>
<td>95,948</td>
<td>64,220</td>
<td>31,728</td>
</tr>
<tr>
<td>2008</td>
<td>99,445</td>
<td>68,388</td>
<td>31,057</td>
</tr>
<tr>
<td>2007</td>
<td>104,053</td>
<td>75,769</td>
<td>28,284</td>
</tr>
</tbody>
</table>

**YEAR**
- Jan
- Feb
- Mar
- Apr
- May
- Jun
- Jul
- Aug
- Sep
- Oct
- Nov
- Dec

**Vessel units**
- Freight transport
- Passenger transport

**% over previous year**
- Freight transport
- Passenger transport
- Total

**More than 98,000 lockages plus in passenger transport once again**
Longer closing periods only in winter
Average capacity utilisation at 15%

As locks are large-scale installations, the nine Austrian Danube locks need to be serviced and maintained regularly to ensure operational functionality and safety and thus also navigational fluidity. These so-called lock revisions as well as necessary large-scale repairs accounted for approximately 74% of all closing days of lock chambers in 2011. Revisions and large-scale repairs were required at the Aschach (both lock chambers), Wallsee, Melk, Altenwörth and Freudenau locks. On average, revisions took about 140 days per chamber. Since 2008, revisions of locks on the Austrian Danube have only been performed in the low-traffic season between November and March according to an agreement between power plant operator Verbund Hydro Power AG and the Federal Ministry for Transport, Innovation and Technology in order to prevent long waiting times at locks during the high-traffic summer months.

Other causes for lock closings include short-term repairs in the course of the year due to technical defects or damage to facilities caused by vessels which accounted for 9% of all closing days in 2011. Beyond that, 7% of all closing days could be attributed to high water in mid-January 2011, while the remaining 10% of the total number of closing days were the result of renovation and maintenance works, fairway maintenance dredging and the like.

In the months between April and October, a time when river traffic is at its busiest due to passenger, sports and leisure navigation, all 18 lock chambers of the nine Austrian Danube locks (double chambers) were continuously available with only a few exceptions. While individual chambers had to be closed for short periods only, as a rule for six hours on average and mainly due to technical defects and dredging, the left chamber of the Persenbeug lock suffered the longest closing period and was inoperative for more than five days as a result of a defect. An average of three lock chambers remained closed simultaneously in the low-traffic winter months between November and March, mostly due to revisions and large-scale repairs. Such longer repairs of individual chambers were recorded during these months at the Ottensheim lock (closed for 16 days in November), the Wallsee lock (closed for 58 days in February/March) and the Freudenau lock (closed for 16 days in November/December). Additionally, sand-blasting work had to be carried out at the Wallsee lock, forcing operators to shut down both locks in turns for 20-odd days.

In 2011, the average capacity utilisation of all 18 lock chambers of the nine Danube locks was close to 15%. The highest utilisation rate of 30% was recorded by the Freudenau lock in the month of August, while the lowest rate of 9% was observed at the Ottensheim lock in January. In this context, the capacity utilisation rate of a lock chamber refers to the time the chamber is occupied, i.e. the entire period between the first vessel jointly being locked through and the last jointly locked-through vessel exiting the chamber, always assuming a maximum lock chamber operability of 24 hours a day and seven days a week. Accordingly, the utilisation rates given here neither include the lock closings described above nor the "rate of occupancy" of a lock chamber during the locking-through process, i.e. the number of locked-through vessels with relation to the possible maximum occupancy of a given lock chamber.
Transport volumes in the Austrian Danube corridor have increased rapidly since the mid-1990s. In 2011, they amounted to approximately 74 million tons, which is equivalent to a massive growth of 68% observed over the last 15 years (1997–2011). (Official data on road transport for 2011 is based on estimates by the Austrian Institute for Regional Studies and Spatial Planning and is still pending.) Compared to 2010, transport volumes in the corridor increased by 3.4% or 2.4 million tons in 2011 but, with a total amount of about 74 million tons, clearly failed to reach the volume of goods transported in the pre-crisis year 2008 which totalled approximately 79 million tons.

The chart shows the cross-border transport volume (net tons) for the three transport modes of rail, road and waterway in the Danube corridor between Passau and Hainburg according to traffic type (import, export and transit). A look at the figures for all transport modes reveals that the quantity of goods transported to and from the west was significantly higher than the volume of goods crossing the eastern border of Austria: In 2011, about 53 million tons of goods including transit transport passed the western border of the Austrian Danube corridor (+4.7% or +2.4 million tons over 2010) while on the eastern border approximately 38 million tons (+2.2% or +0.8 million tons) were recorded, corresponding to a ratio of 1.4 to 1.

At about 57 million tons, the level of bilateral transport (western and eastern borders taken together) was still considerably higher in 2011 than transit transports with 17 million tons. However, transit transport has increased considerably over the last 15 years; today, its volume is 1.8 times higher than in 1997. Transit road transport has even increased by a factor of approximately 2.9. Accordingly, road transport holds the largest modal-split share (66%) when it comes to downstream transit transports through Austria.

Despite the dominant position of road transport, Danube navigation plays an important part in transports passing through the corridor. Its significance is particularly reflected in 2011 upstream transport volumes; Danube navigation held an impressive share of 35% in the import sector and 21% in transit, whereas the modal-split share of road transport has remained roughly stable. Conversely, rail transport was able to improve its modal-split share in imports to the west by approximately ten percentage points at the cost of transport on the Danube.

Transport volumes in the Austrian Danube corridor have increased rapidly since the mid-1990s. In 2011, they amounted to approximately 74 million tons, which is equivalent to a massive growth of 68% observed over the last 15 years (1997–2011). (Official data on road transport for 2011 is based on estimates by the Austrian Institute for Regional Studies and Spatial Planning and is still pending.) Compared to 2010, transport volumes in the corridor increased by 3.4% or 2.4 million tons in 2011 but, with a total amount of about 74 million tons, clearly failed to reach the volume of goods transported in the pre-crisis year 2008 which totalled approximately 79 million tons.

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Road transport dominated the modal split in the Danube corridor with a share of approximately 56%. This means that the quantity of goods transported on the road was higher than the volume of goods carried by the other two transport modes combined. Over the past 15 years, rail transport has lost large import volumes to road transport at the eastern border of the corridor, with losses in export volumes reaching even higher, whereas the modal-split share of Danube navigation has remained roughly stable. Conversely, rail transport was able to improve its modal-split share in exports to the west by approximately ten percentage points at the cost of transport on the Danube.

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MODAL SPLIT

SHARE OF DANUBE AT 13%
CLEAR DOMINATION OF ROAD TRANSPORT
A WATERWAY FOR EUROPE
43 MILLION TONS IN 2010

On its navigable total length of 2,414 km reaching from Germany to the Black Sea, the Danube waterway connects ten Danube riparian states. The most current available figures regarding total freight transport volumes on inland waterways in the Danube region date back to 2010. In total, more than 43 million tons of goods were carried on the Danube waterway and its tributaries that year, an increase of 21.7% or about 7.8 million tons compared to the 2009 crisis year. These figures as well as all other of the following data include both transports on inland vessels and river-sea traffic on the maritime Danube (Sulina and Kilia branches) up to the Romanian port of Braşov (river kilometre 170) as well as on the Danube-Black Sea Canal.

In 2010, the largest transport volume by far was achieved by Romania, amounting to 21.6 million tons (+38.4% over 2009), followed by Serbia and Austria with 14.3 million tons (+23.6%) and 11.3 million tons (+19.5%) respectively. The largest exporter on the Danube was once again the Ukraine, with a total of 6.8 million tons having been shipped from that country in 2010. This figure includes 1.2 million tons of ores delivered to the voestalpine steelworks in Linz by inland vessel. With a transport volume of 4.7 million tons, Hungary was the second largest exporting country on the Danube, followed by Slovakia with 3.6 million tons. With 7.1 million tons of goods, Romania accounted for the largest import volume of all Danube riparian states in 2010, the bulk of which came from Hungary, Serbia and the Ukraine. The second strongest importing country on the Danube was Austria, taking delivery of 6.3 million tons of goods. Serbia took third place with imports amounting to 4.1 million tons of goods. The largest volume in transit transports carried out on the Danube were recorded in Bulgaria (7.6 million tons), followed by Serbia with 2.2 million tons. On the Danube-Black Sea Canal linking the sea port of Constanţa with the Danube river as well as on its northern branch, 12.4 million tons were conveyed in 2010 (including river-sea traffic amounting to approximately 0.3 million tons), representing a plus of 33.3% or 3.1 million tons over 2009. Regarding transports to the Main-Danube Canal from the Danube and vice versa, the Kelheim lock recorded a total volume of 5.2 million tons (+9.6% or 0.5 million tons over 2009), 2.6 million tons of which were carried downstream towards the Danube (+22.9%) and 2.6 million tons upstream towards the Rhine (-1.3%). In 2010, maritime traffic, i.e. transports by river-sea ships or by sea-going vessels, on the Danube accounted for a total of 4.8 million tons (+25.4% or 1.0 million tons over 2009). Most of this volume (2.9 million tons) of transported goods was carried via the Romanian Sulina Canal, while 1.6 million tons were conveyed on the Ukrainian Bistros and Kilia branches.

FREIGHT TRANSPORT ON THE ENTIRE DANUBE IN 2010

Source: Eurostat, national transport statistics, via donau; diagram and table prepared by via donau

<table>
<thead>
<tr>
<th>Million tons</th>
<th>DE</th>
<th>AT</th>
<th>SK</th>
<th>HU</th>
<th>HR</th>
<th>BA</th>
<th>RS</th>
<th>BG</th>
<th>RO</th>
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<th>UA</th>
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</thead>
<tbody>
<tr>
<td>Export</td>
<td>1.12</td>
<td>1.67</td>
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</tr>
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<tr>
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<tr>
<td>Domestic</td>
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<td>0.00</td>
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<tr>
<td>Total</td>
<td>7.11</td>
<td>11.32</td>
<td>9.85</td>
<td>11.25</td>
<td>8.15</td>
<td>0.07</td>
<td>14.30</td>
<td>8.82</td>
<td>21.55</td>
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<td>7.14</td>
</tr>
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</table>
PROJECTS AND ACTIVITIES
In 2011, the realisation of the European Union Strategy for the Danube Region began. The implementation of its eleven strategic priority areas is ensured by coordinators, with Austria and Romania jointly coordinating Priority Area 1a – To improve mobility and multimodality: Inland waterways. In Austria, the Federal Ministry for Transport, Innovation and Technology is responsible for the coordinating part while the operative realisation is the task of a Joint Technical Secretariat run by via donau and the Romanian Ministry of Transport.

At the core of the Strategy for the Danube Region lies an Action Plan defining fields of action and respective measures for all priority areas. As far as inland navigation is concerned, the following measures will be taken:

- Improvement of waterway infrastructure of the Danube and its navigable tributaries
- Integrated and internationally coordinated waterway management
- Development of ports into multimodal logistics nodes
- Modernisation of the Danube fleet and improvement of its environmental performance
- Development of ports into multimodal logistics nodes
- Promotion of sustainable inter- and multimodal freight transport
- Implementation of harmonised River Information Services (RIS) on the Danube and its navigable tributaries and ensure the international exchange of RIS data preferably by 2015
- Basic and advanced training of qualified Danube navigation personnel (nautics & logistics)
- Development strategies for promoting inland navigation in the Danube region

The Strategy for the Danube Region aims at improving the overall conditions for Danube navigation.

In order to realise these fields of action, the following five targets agreed between the Danube riparian states and the European Commission are hoped to be achieved: Increase the cargo transport on the river by 20% by 2020 compared to 2010; solve obstacles to navigability, taking into account the specific characteristics of each section of the Danube and its navigable tributaries and establish effective waterway infrastructure management by 2015; develop efficient multimodal terminals at river ports along the Danube and its navigable tributaries to connect inland waterways with rail and road transport by 2020; implement harmonised River Information Services (RIS) on the Danube and its navigable tributaries and ensure the international exchange of RIS data preferably by 2015; solve the shortage of qualified personnel and harmonise education standards in inland navigation in the Danube region by 2020, taking duly into account the social dimension of the respective measures.

Five thematic Working Groups as well as a Steering Group were established in the first year, charged with accompanying the implementation of these measures. The Steering Group is composed of representatives of the ministries of transport of all 14 Danube countries, the European Commission, the river commissions as well as of other major international organisations. Over 90 projects to improve Danube navigation were identified in 2011, with some of them already under way.
In the realm of transnational cooperation in the Danube region, a great many results were achieved in projects included in the South East Europe Programme co-financed by the EU in 2011 in which Via Donau is participating.

For example, cooperation between Danube waterway management authorities was successfully continued in the NEWSADA project. As a part of this project, national strategies for an optimisation of waterway infrastructure maintenance were developed and a Danube-wide information portal for navigation was implemented (www.danubeportal.com), amongst other things.

In the field of education and knowledge transfer, the NELI project achieved its aim of establishing a cooperation network of institutions for basic and advanced training in subjects related to inland navigation along the Danube and of creating specialised training courses and teaching materials. Furthermore, four Danube Information and Training Centres were established along the waterway in Enns (Austria), Budapest (Hungary), Sisak (Croatia) and Galaţi (Romania).

As part of the WANDA project, pilot activities regarding the collection and disposal of ship borne waste on the Danube were successfully realised. In Austria, Hungary, Bulgaria and Romania, for example, waste oil and bilge water was collected and disposed of on a cross-border level free of charge, with a mobile waste collection vessel operating on the upper Danube.

The European Commission set the course for a relaunch of the European Action Programme for Inland Waterway Transport (NAIADeS) in 2011. To this end, a public hearing and consultation of all participating and interested organisations took place in July 2011. Among other measures, a special «Good Practices» online database (www.naiades.info/good-practices) was set up as a part of the Platform for the Implementation of NAIADeS (PlATINA) which is coordinated by Via Donau. The database is aimed at introducing the general public to the benefits and manifold practical applications of inland navigation.

In the field of River Information Services (RIS), the IRIS Europe II project launched in 2009 was successfully completed in 2011. This project helped to expand RIS in the Danube and Rhine riparian countries both functionally and geographically. Many services such as a water surface model or the tracking of pushed lighters could be put into operation successfully. The project also produced valuable new insights regarding the operation and standardisation of RIS, a requirement for the development of future international services. An associated follow-up project was successfully submitted for funding approval in 2011 and is expected to seamlessly build on work already begun in the past.

DANUBE REGION
SUCCESSFUL COOPERATION
INTERNATIONAL DANUBE PROJECTS

FURTHER INFORMATION
www.naiades.eu
www.naiades.info
www.naiades.info/platina
www.iris-europe.net
In 2011, a working group especially established for these purposes extensively discussed the core tasks of via donau’s Customer-Oriented Waterway Management (KWSM) project – i.e. observing, planning, carrying out and finally providing information – with a view to increasing the benefits for its clients. By the end of the year, a strategy report approved by the Supreme Navigation Authority (OSB) at the Federal Ministry for Transport, Innovation and Technology had been finalised which will form the basis for optimised waterway infrastructure maintenance on the Austrian stretch of the Danube.

Apart from the biannual surveying of the riverbed in both free-flowing sections of the Austrian Danube (east of Vienna and in the Wachau region), all shallow sections marked on the digital ECDis map as «caution areas» are now also being surveyed in July, preferably using multi-beam sonar equipment. These measurements formed the basis for the dredging briefing first held in the beginning of August 2011 in the course of which a priority list defining dredging areas for 2011/2012 was prepared in collaboration with the Supreme Navigation Authority. Thanks to this pro-active dredging interventions, planners hope to create optimum infrastructure conditions for navigation as early as the beginning of the low-water period in autumn.

Hydrographic measurements of the dredging and dumping zones are carried out shortly before and after dredging in order to monitor the success of these measures and to preserve technical evidence.

In the online shallow sections reports published on the DorIS website, information regarding measured minimum fairway depths at low navigable water level has been supplemented by minimum fairway depth data related to the current water levels at the respective gauges of reference. Additionally, vessel operators will find it easier to plan their transports thanks to a 24-hour fairway depth forecast.

In cooperation with the Supreme Navigation Authority at the Austrian Federal Ministry for Transport, Innovation and Technology, the fairway in the common border sections of the waterway was harmonised with the neighbouring states of Germany and Slovakia in 2011. Several significant improvements were made in 2011 with regard to the Electronic Navigational Charts (the so-called Inland ENC)s published by via donau. The biannual depth data for the two free-flowing sections of the Austrian Danube were integrated into the charts, and depth data for several reservoirs of hydroelectric power stations have been updated as well. Many new objects (Danube ferries, high-voltage power lines, bridges and groynes) were integrated into the topographical data, and riverbank lines were adjusted according to the latest aerial photographs. Finally, Waterway Police information was updated as well.

Notices to Skippers advise vessel operators as to closings, traffic limitations, delays and other events relevant to navigation and thus make a significant contribution to transport safety and improved travel planning. In 2011, these Notices were completely revised and have been online since March 2011. The new version has a more user-friendly and clearer search mask as well as better e-mail subscriber management.

In the online shallow sections reports published on the DorIS website, information regarding measured minimum fairway depths at low navigable water level has been supplemented by minimum fairway depth data related to the current water levels at the respective gauges of reference.
via donau has become a trailblazer in ecologically oriented hydraulic engineering on navigable rivers and has gained the required experience and competency regarding the improvement of ecological conditions as a result of numerous projects accomplished over the past years.

Seen against this background, the Bad Deutsch-Altenburg pilot project is a unique milestone. This EU co-funded project has been designed to test hydraulic engineering measures on a project stretch about three kilometres long which are scheduled to be implemented along the entire section of the Danube between the Freudenau power station and the Slovakian border at a later date:

- **Restoration of river banks:** the removal of stone reinforcements on a stretch approximately 1.2 kilometres long will allow the Danube to form natural banks once again.
- **Lowering of bank structures:** this measure will make it easier for Danube water to flow into the Stopfenreuth floodplain at higher water levels.
- **Reconnection of sidearms:** in this section of the Danube, the over 1.3 kilometre long Johler branch will become the first sidearm through which water will flow through almost all year long.
- **Optimisation of low-water regulation:** all in all, 19 groynes will be completely removed, four will be lowered and ten new ones will be built, including the testing of declining and crescent-shaped structures.
- **Granulometric riverbed improvement for stabilising the Danube’s riverbed:** coarse gravel will be used to cover lower riverbed zones which are particularly exposed to the river’s current while fords will remain untouched by this measure.

Thanks to integrated planning, this project will allow both the environment and navigation to profit from these measures. The accompanying scientific monitoring of this project will ensure that a maximum amount of insights can be gained for follow-up projects.

In 2011, the required approval procedures were successfully completed while a sufficient number of contracts for construction services was awarded to be able to press ahead with actual construction works in 2012. Periods that are ecologically sensitive for animal and plant life were taken into consideration when designing the timelines and the manner of implementation of construction works. A special supervisory body will ensure the project’s low-impact, ecological realisation.

At the Christian Doppler Laboratory «Im Fluss» founded by the Vienna University of Natural Resources and Life Sciences and via donau in the summer of 2010, researchers are trying to ensure more precise forecasts concerning the effects of river engineering measures and to develop innovative hydraulic engineering methods for improving navigation, flood control and the environment. The results of these advanced river engineering methods will be incorporated both in the surveying and maintenance as well as into the continuous ecological monitoring performed by via donau. Insights gained through these efforts will also be included in the Bad Deutsch-Altenburg pilot project.

**FURTHER INFORMATION**
- [www.donau.bmvit.gv.at/en](http://www.donau.bmvit.gv.at/en)
- [cdlabor-imfluss.boku.ac.at](http://cdlabor-imfluss.boku.ac.at)
- [www.donauauen.at](http://www.donauauen.at)
What are the effects of climate change and extreme weather events on inland navigation? In order to answer this question, VIA DONAU is participating in several international research projects.

Coming to grips with climate change by means of international research projects is an important concern for VIA DONAU as it may have an effect on the Danube’s discharge regime. Results from investigations conducted in 2011 concerning the Austrian and German sections of the Danube indicate that in the medium term (2021–2050) climate change could well have a beneficial effect on inland navigation by favourably balancing the river’s discharge conditions throughout the year. Similarly, ice conditions affecting inland navigation have improved, both due to global warming and anthropogenic action.

The ECCONET project is investigating the impact of climate change on inland navigation in Europe with an emphasis on the Rhine-Main-Danube corridor. The project involves both the evaluation of already existing research data and the carrying-out of new meteorological as well as hydrological calculations and trend analyses. Based on their results, appropriate adaptation measures are being investigated and identified in the fields of vessel operation, vessel technology, river engineering measures and methods for forecasting water conditions.

The EWENT project is studying the consequences of extreme weather conditions for the EU’s transport system. Its objectives are to identify potential weather-related risks and consequences for the transport sector and estimate their cost effects. Initial measures for the improved management of extreme weather events have already been developed and recommendations for courses of action formulated for decision-makers in the fields of commerce, infrastructure operations and politics.

The purpose of the SUPERGREEN project is to analyse a number of representative European transport corridors in terms of measures to improve the environmental friendliness of the European transport system. Selected corridors were subjected to a benchmarking analysis addressing environmental aspects, infrastructure parameters, exhaust gas emissions as well as external and internal costs. After investigating CO₂ emission levels in relation to transport performance, inland navigation emerged as clearly superior when compared to road transport. Accordingly, the application of ‘green’ technologies within the selected transport corridors will be analysed in greater detail.

A project titled LDS – LNG Propulsion Systems for Danube Inland Navigation which had been developed by VIA DONAU in cooperation with the Vienna University of Technology and Salzburg AG has been successfully completed. The project investigated the sustainable reduction of carbon dioxide, particulate matter and nitrogen dioxide emissions via the use of LNG (liquefied natural methane and biomethane) in Danube navigation. As part of its policy of making inland navigation an integral part of Austria’s climate change policy, VIA DONAU has been actively participating in the development of a national Climate Change Adaptation Strategy, specialising in the area of transport infrastructure. Appropriate recommendations for action are expected to be published in 2012.

**Further Information**
- www.ecconet.eu
- virtual.vtt.fi/virtual/ewent/index.htm
- www.supergreenproject.eu
- www.klimawandelanpassung.at
- www.via-donau.org/en/company/projects/project_database
hazardous goods can be transported most safely by inland vessel

navigation safety can be improved even further by means of innovative technologies

up-to-date water level information can be an electronic navigational chart

Compared to other modes of inland transport, the safety record of inland navigation is unbeaten: In 2011, a mere 21 traffic accidents involving damage occurred on the Austrian section of the Danube without a single case of personal injury or death. Of these, 18 cases involved damage to cargo vessels and 6 involved passenger ships. When split into accident types, 6 incidents were vessel collisions while the remaining 15 involved damage to riverbanks or facilities or vessels touching ground.

With the aim of making a significant contribution to the modernisation of the existing inland navigation fleet and thus raising transport safety on European waterways, the Mov e IT! project (Modernisation of Vessels for Inland Waterway Freight Transport) funded by the EU’s Seventh Framework Programme for Research was launched. The project focuses, amongst other things, on the adaptation of the existing inland navigation fleet to the regulatory requirements of dangerous goods transport (as stipulated in the ADN – the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways). This goal can be reached by measures including appropriate design and materials technology. The project also focuses on improving inland waterway transport in terms of energy efficiency, environmental friendliness, the use of alternative fuels instead of diesel and on the development of new markets.

In the course of enhancing existing River Information Services, activities started in 2009 to further increase waterway transport safety have been completed as part of the IRIS Europe II project co-funded by the EU. Amongst other things, a study was carried out investigating the use of more cost-efficient ship compasses for the exact determination of a vessel’s orientation. The pilot operation stage of the electronic system for reporting the transport of hazardous goods was also launched in 2011. Compared to the present conventional reporting by fax, the advantage of this electronic system is that in the case of an accident, the authorities as well as rescue organisation are supplied with all the data concerning cargo, voyage and vessel in digital form. These data can then be used to plan rescue missions more precisely and to perform them more swiftly. Additionally, a water surface model was established in the free-flowing Wachau section displaying highly accurate current water level information on onboard electronic navigational charts and automatically calculating the clearance height for bridges.

Other national and European projects investigating the safety-related aspects of navigation systems and promoting the development of assistance systems were continued in 2011 as well. These projects include a concept study for a navigation support system that will assist ship crews when navigating critical sections of a waterway (NAVWAT) as well as the development of a collision avoidance system using 3D modelling of vessel dimensions and high-risk zones (ARIADNA). Using innovative technologies, both applications are designed to facilitate the more safe and efficient handling of typical navigation situations on inland waterways.

further information

www.iris-europe.net

www.teleconsult-austria.at/navwat

www.ariadna-fp7.eu

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reaching destinations safe and sound

innovations across the waters

safety
In 2011, the European Commission charged via donau to conduct an expert survey focussing on Danube navigation. Decision makers from the manufacturing industry and the logistics sector were interviewed to determine their needs with regard to subjects such as infrastructure, fleet, personnel and training, River Information Services (RIS), political framework conditions and other topics and services. The results of this survey will be used to set priorities in the EU’s NARADES II action programme for promoting inland waterway transport which will significantly determine inland navigation policy in the years to come.

Just like in previous years, via donau was represented at the transport logistic exhibition held every two years in Munich in 2011 as well. For the first time, via donau shared an exhibition stand with the four public Austrian Danube ports of Linz, Enns, Krems and Vienna (incl. WienCont) to emphasise the presence of public infrastructure operators in the field of Danube logistics. In this way, all exhibition attendees were able to gain an overview over the logistics services offered in Austria. Apart from the presentation of information provided by all exhibition partners, the stand also featured a show programme focussing on such varied subjects as the Danube region Strategy and high & heavy transports on inland vessels. River Dating by VNF (Voies navigables de France) is an innovative concept for business-to-business talks in the field of inland navigation. via donau attended such an event together with other partners in Paris in December 2011 to represent the Danube. Starting in 2012, similar events labelled «Danube Business Dating» will be organised regularly in the Danube region in order to optimise networking between potential Danube navigation customers and the navigation industry.

The continued development and expansion of ports plays an important part in reinforcing inland navigation competitiveness in Europe. As a participant in the international port development project INWAPO (Upgrading of Inland Waterway and Sea Ports), via donau is therefore contributing its own professional expertise and reliable Danube navigation data. This project aims at developing and expanding the infrastructure and logistics of participating ports, in particular focussing on the Danube region. The DaHaR project (Danube Inland Harbour Development) investigates the ports of small and medium-sized towns along the Danube as to their multi-modal logistics potential. It also emphasises the further development of River Information Services to benefit logistics planning. In this project, via donau supports the port of Enns with technical expertise as an associated partner.

Multimodal transport and logistics chains can be improved by means of intelligent traffic information. River Information Services (RIS) also offer actors active in the transport and logistics industries a commercial edge as well as numerous benefits for their own operative processes. As a part of the EU-funded RISING project, new RIS were developed in collaboration with business operators from the Austrian and European inland navigation sector in 2011 which can now be tested and used.

COMMERCE

NETWORKING THE SECTOR
FOCUS ON DANUBE NAVIGATION
Danube waterway

- **UN/ECE Classes**: VII, VIA, b, c, VIa, b
- **Ports**: Major, Other
- **Cities**: Capital, Other
- **Countries**: European Union, Other, National border
- **Charnage (River km)**

The map illustrates the Danube waterway, showing major cities, ports, and other relevant locations along the river's course from the source to the Black Sea. The map also highlights the Danube-Black Sea Canal and the Main-Danube Canal, which connect the Danube River system to the Black Sea and the Adriatic Sea, respectively. The map is annotated with various symbols and colors to denote different classes, countries, and other important features along the waterway.