



**Buck
Consultants
International**

**ILDE Hungary
Market potential for inland
shipping**

Commissioned by:
Waterwegen en Zeekanaal NV

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Background

Inland navigation is a sustainable means of transport which is both cost and emission-efficient per ton freight transported. The European Union therefore promotes the use of this means of transport as much as possible.

The ILDE project (2006-2008) funded by the Flemish Government in partnership with the Port of Baja, strived for the improved integration of inland navigation in the transport chains between Flanders / Belgium and some Danube countries. The project identified the market potential of inland navigation, in Hungary for instance, and came to the conclusion that, given the still existing infrastructural and nautical bottlenecks, a direct link to Northwest Europe is not feasible for containers. Bulk flows, both dry and wet, would be possible to be delivered directly. The lead partner for ILDE was Waterwegen en Zeekanaal NV. Due to the financial and economic crisis of 2008 ILDE was put on hold.

In 2013, Waterwegen en Zeekanaal NV was asked by the inland navigation sector to reactivate the ILDE project because the inland navigation entrepreneurs saw many opportunities on the Danube and more specifically with Hungary. Buck Consultants International was appointed to update the 2008 market potential study.

To do this update the trade volumes between Belgium, the Netherlands and Hungary must be analysed. The reason is that due to this wider geographical area, the volumes become larger and the probability of empty sailing is reduced.

Waterwegen en Zeekanaal NV will together with the Port of Baja examine how a concrete pilot can be started based on the results of the study.

Overview of the transport market between Belgium, the Netherlands and Hungary

Methodological comments

This study makes use of two different databases. The first one is Eurostat and this is used in relation to the freight transport data. The second one is Comtrade and this is used for the trade data. Both databases apply their own definitions to determine the different product categories. Obviously, this has an impact on the comparability of the data although overall it would appear that any negative effects are negligible.

Although Eurostat's Concepts and Definitions Database¹ states in relation to rail freight that transshipment or change of tractive vehicle does not imply a statistical cut between the loading and unloading country, we have observed unrealistic small train volumes on the corridor between Belgium, the Netherlands and Hungary. The only possible explanation for this is that block trains that make a stop in Germany are considered as being unloaded.

¹ Eurostat's Concepts and Definitions Database: "Unlike in road and inland waterway transport, transshipments from one railway vehicle directly to another and change of tractive vehicle are not regarded as unloading/loading. However, if the goods are unloaded from a railway vehicle, loaded on another mode of transport and, again loaded on another railway vehicle, this is considered as unloading from the first railway vehicle followed by loading on the second railway vehicle."
http://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=DSP_GLOSSARY_NOM_DTL_VIEW&StrNom=CODED2&StrLanguageCode=EN&IntKey=16558885&RdoSearch=CONTAIN&TxtSearch=loading&CboTheme=&IsTer=&IntCurrentPage=1&ter_valid=0

Chapter 2

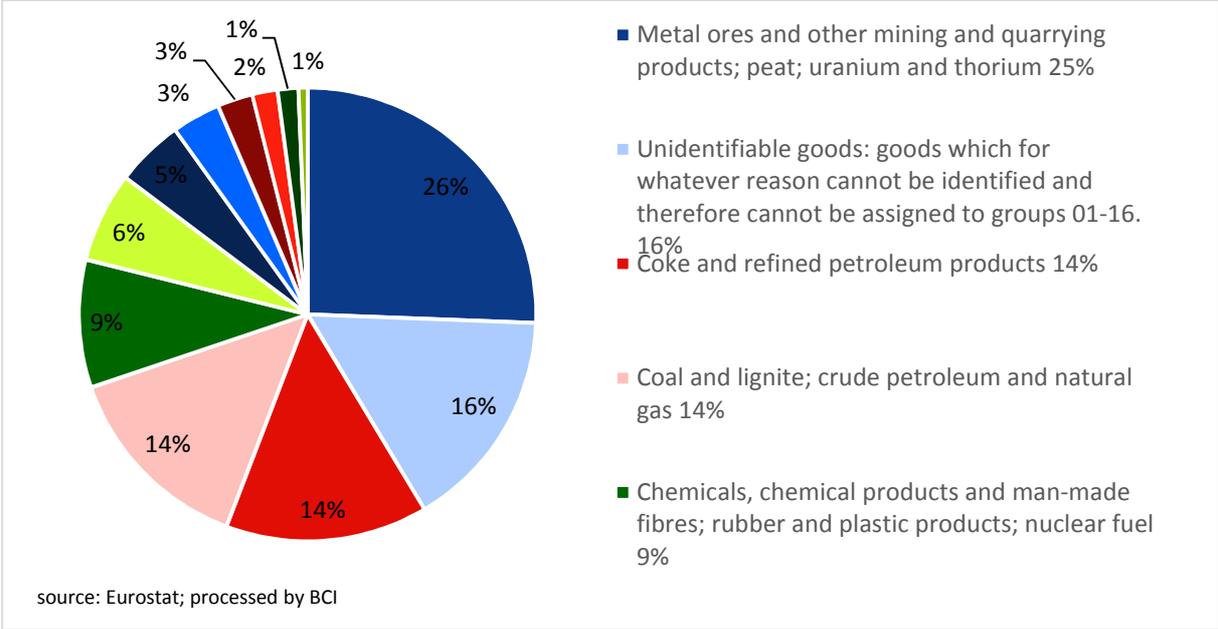
Inland shipping in the EU

Before examining the role of inland shipping in the trade relation between Belgium and the Netherlands, on the one hand, and Hungary on the other, it is useful to look at the EU-level.

Figure 2.1 illustrates the mix of goods that are typically transported by inland shipping. Later on we will use the product shares to compare them with the composition of actual inland shipping flows between Belgium, the Netherlands and Hungary.

At least 60% of the volumes consist of either dry or wet bulk, while Agriculture and Food account for almost 10%. We will also see later on that Agriculture and Food are very important for inland shipping between Belgium, the Netherlands and Hungary, with a share of 9% (exported to Hungary) and 70% (imported from Hungary).

Figure 2.1 Product mix transported by inland shipping EU 28 (2013)



Source: Eurostat; processed by BCI

In Figure 2.1, the product category “Metal ores and other mining” accounts for 25% of all inland waterway transport. Meanwhile, the first five categories together account for almost 80% of the inland waterway transport.

Table 2.1 *Inland Waterway Transport 2013 (EU 28)*

	%	Cumulative %
Metal ores and other mining and quarrying products; peat; uranium and thorium	25%	25%
Unidentifiable goods: goods which for whatever reason cannot be identified and therefore cannot be assigned to groups 01-16.	16%	41%
Coke and refined petroleum products	14%	55%
Coal and lignite; crude petroleum and natural gas	14%	69%
Chemicals, chemical products and man-made fibres; rubber and plastic products; nuclear fuel	9%	78%
Products of agriculture, hunting, and forestry; fish and other fishing products	6%	85%
Basic metals; fabricated metal products, except machinery and equipment	5%	89%
Food products, beverages and tobacco	3%	93%
Secondary raw materials; municipal wastes and other wastes	2%	95%
Other non-metallic mineral products	2%	97%
Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products; printed matter and recorded media	1%	98%
Equipment and material utilised in the transport of goods	1%	99%
Transport equipment	0%	99%
Machinery and equipment n.e.c. ² ; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks	0%	100%
Grouped goods: a mixture of types of goods which are transported together	0%	100%
Other goods n.e.c.	0%	100%
Textiles and textile products; leather and leather products	0%	100%
Furniture; other manufactured goods n.e.c.	0%	100%
Goods moved in the course of household and office removals; baggage and articles accompanying travellers; motor vehicles being moved for repair; other non-market goods n.e.c.	0%	100%

Source: Eurostat; processed by BCI

In conclusion, inland shipping mainly involves the transportation of bulky products. Not surprisingly, table 2.1 illustrates also that most of the inland shipping transport is non-containerised. This suggests that containerised transport continues to represent a substantial opportunity for inland shipping as the containerisation of freight is still progressing.

Table 2.2 *EU 28 (international waterway transport)*

	2013	
	X 1,000 tonnes	%
Goods in containers	27,179	10%
Goods not in containers and empty containers	248,753	90%
Total	275,933	100%

Source: Eurostat; processed by BCI

² Not elsewhere classified

2.1 Overview of the modal split in the EU and the share of inland shipping

As mentioned earlier it is difficult to calculate the actual modal split of the transported volume on the corridors between the Netherlands, Belgium and Hungary due to the lack of accurate rail data. To remedy this lack of data we decided to use the European Union figures on modal share as a benchmark. Whilst we understand that each transport relation/corridor has specific modal shares there is actually no alternative if we want to calculate modal shares on the trade relationship with Hungary.

The calculation of the European modal split is based on the concept of tonne-kilometre (tkm)³ and therefore serves as an approach for calculating the shares of the different modes. Tables 2.3 and 2.4 illustrate the findings of recent work carried out by Eurostat (Eurostat, 2014, Freight transport statistics - modal split⁴).

Table 2.3 Modal Split in EU 28

Modal Split (EU 28)	2012 (%)
Road	74.5%
Rail	18.6%
Inland Waterways	6.9%

Source: Eurostat

Table 2.4 illustrates the modal split (based on tkm) for the countries in this study and gives us a different view. As far as the Netherlands is concerned inland shipping and road have an almost equal share and diverge substantially from the European modal split. Meanwhile, Belgium and Hungary are more in line with the European standard, especially in terms of road freight transport. However, for inland shipping the Belgian share is much larger than the European share.

Table 2.4 Modal Split (EU 28) 2012 (%)

	Belgium	The Netherlands	Hungary
Road	70.6%	47.5%	63.6%
Rail	12.3%	6.0%	30.0%
Inland Waterways	17.1%	46.5%	6.4%

Source: Eurostat

³ A tonne-kilometre, abbreviated as tkm, is a unit of measurement of freight transport which represents the transportation of one tonne of goods (including packaging and tare weights of intermodal transport units) by a given transport mode (road, rail, air, sea, inland waterways, pipeline etc.) over a distance of one kilometre. Only the distance on the national territory of the reporting country is taken into account for national, international and transit transport.

http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Freight_transport_statistics_-_modal_split#Further_Eurostat_information

The figures in Table 2.4 pertain to national and international transport alike. They do not make any distinction between containerised and non-containerised transport. However, when looking at the potential of inland shipping, these parameters are very important (see Tables 2.5 and 2.6).

Table 2.5 Modal Split (EU 28) 2012 (%) – share of national and international transport in total inland shipping

	Belgium	The Netherlands	Hungary
National	44%	31%	0%
International	56%	69%	100%

Source: Eurostat

Table 2.6 Modal Split (EU 28) 2012 (%) – share of containers in international inland shipping

	Belgium	The Netherlands	Hungary
Goods in containers	11%	8%	0%

Source: Eurostat

The information from Tables 2.5 and 2.6 will be useful in terms of reducing the modal split shares to realistic proportions once we have calculated the potential for inland waterway transport.

Facts and figures on the trade relationship between Belgium, the Netherlands and Hungary

3.1 Trade relation Belgium-Hungary

Figure 3.1 Exportation to Hungary

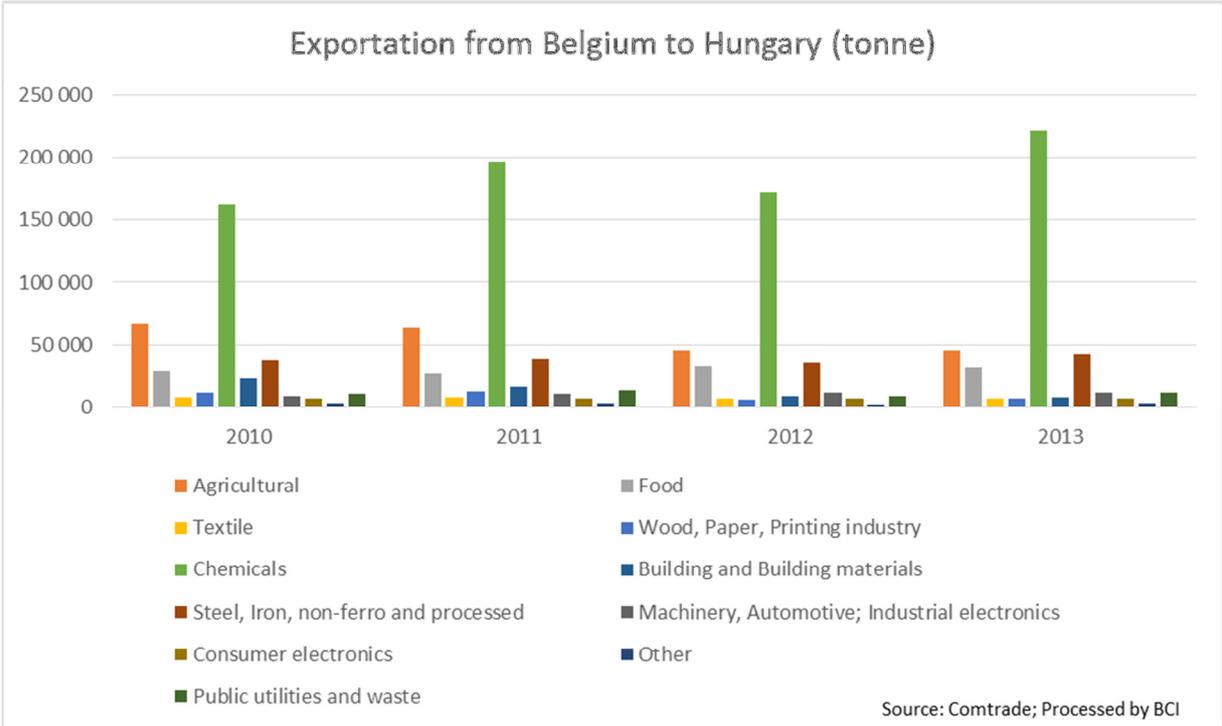
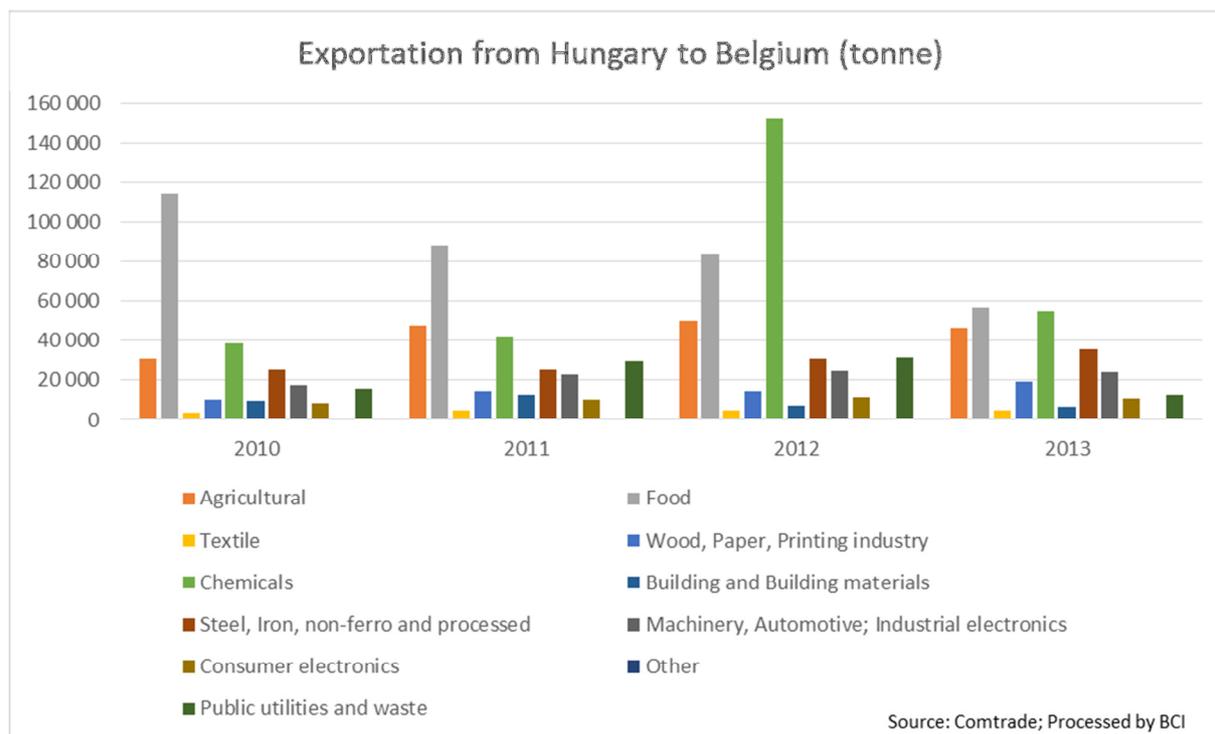


Figure 3.2 Importation from Hungary



Figures 3.1 and 3.2 show that Belgium predominantly exports chemicals, agricultural products, food and steel to Hungary. Imports from Hungary are dominated by food and agricultural products and this is then followed by chemicals and steel. We can observe substantial volumes in almost all categories and can conclude that the imports from Hungary are more heterogenic than the exports. A general observation, especially as regards the imports, is that freight volumes are decreasing. Attachment 1 illustrates that only the volumes are decreasing and the trade measured in EUROS has been quite stable over the last four years.

Table 3.1 Trade between Belgium-Hungary

	2013		2013	
	Export (tonne)	Import (tonne)	Export (%)	Import (%)
Belgium-Hungary				
Agricultural	45,687	46,265	11%	17%
Food	32,264	56,717	8%	21%
Textile	7,027	4,531	2%	2%
Wood, paper, printing industry	6,801	19,115	2%	7%
Chemicals	221,477	54,710	56%	20%
Building and building materials	8,040	6,886	2%	3%
Steel, iron, non-ferro and processed	42,534	35,608	11%	13%
Machinery, automotive; Industrial electronics	11,674	24,342	3%	9%
Consumer electronics	7,153	10,629	2%	4%
Other	3,199	645	1%	0%
Public utilities and waste	12,256	12,882	3%	5%
Total	398,112	272,330	100%	100%

Source: Comtrade; Processed by BCI

The main objective of this analysis is to identify the market potential of inland shipping in the trade between Hungary and Belgium and the Netherlands. Large volumes in a sector are by definition interesting for every transport mode and especially for inland shipping.

We can see that there is an imbalance in trade and Belgian exports are more voluminous than their imports. Later on we will see that the balance between the Netherlands and Hungary is in favour of Hungary, although traded volumes are much higher. Therefore, the Netherlands exports twice as much to Hungary as Belgium and imports as much as four times the volume that Belgium imports from Hungary.

Agricultural

In general, the trade in the category of agricultural products is balanced. Exports are dominated by “edible fruit”, while the second category is “meat”. Meanwhile, the most important import category is “oil seeds and oleaginous fruits”.

An imbalance between comparable categories is found in fruit and vegetables. Other potential categories are “oil seeds and oleaginous fruits” and the different categories with products of animal origin.

Food

The trade in the category of food is imbalanced with imports being almost twice as large as exports. The top three imported products are “Animal or vegetable fats and oils”, “Preparations of vegetables, fruit” and “Cereals”.

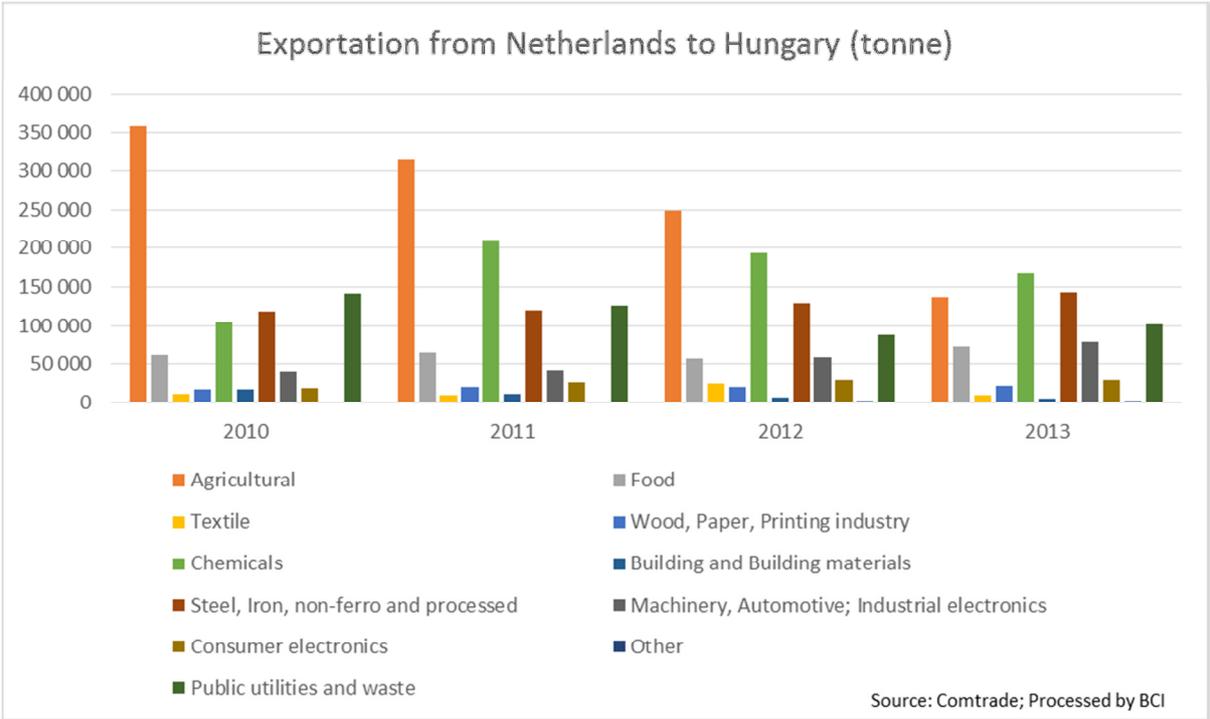
On the export side we face the same product categories to some extent, although in far smaller volumes. “Cocoa and cocoa preparations” and “Preparations of cereals, flour” are number three and four respectively in the list of exports.

Chemicals

As regards chemicals we observed the opposite trend. Exports are four times larger than imports with “Plastics and plastic products” being number one on both sides. For Belgium, “Fertilisers” and “Organic chemicals” complete the top three. Conversely, on the import side the second and third categories are “Organic chemicals” and “Soaps” respectively. Please note here that we are looking at volumes. The same table in euros results in a different distribution.

3.2 Trade relationship the Netherlands-Hungary

Figure 3.3 Exportation to Hungary



Looking at the trade between the Netherlands and Hungary, we can observe intensive trade in agricultural products and chemicals in terms of exports to Hungary. However, volumes are decreasing and in 2013 the main export sectors were Agricultural Products & Food, Chemicals, Steel and Public Utilities & Waste. The imports are more homogenous with a very large share of foodstuffs. Machinery and Agricultural Products respectively are the second and third most important sectors.

Figure 3.4 Importation from Hungary

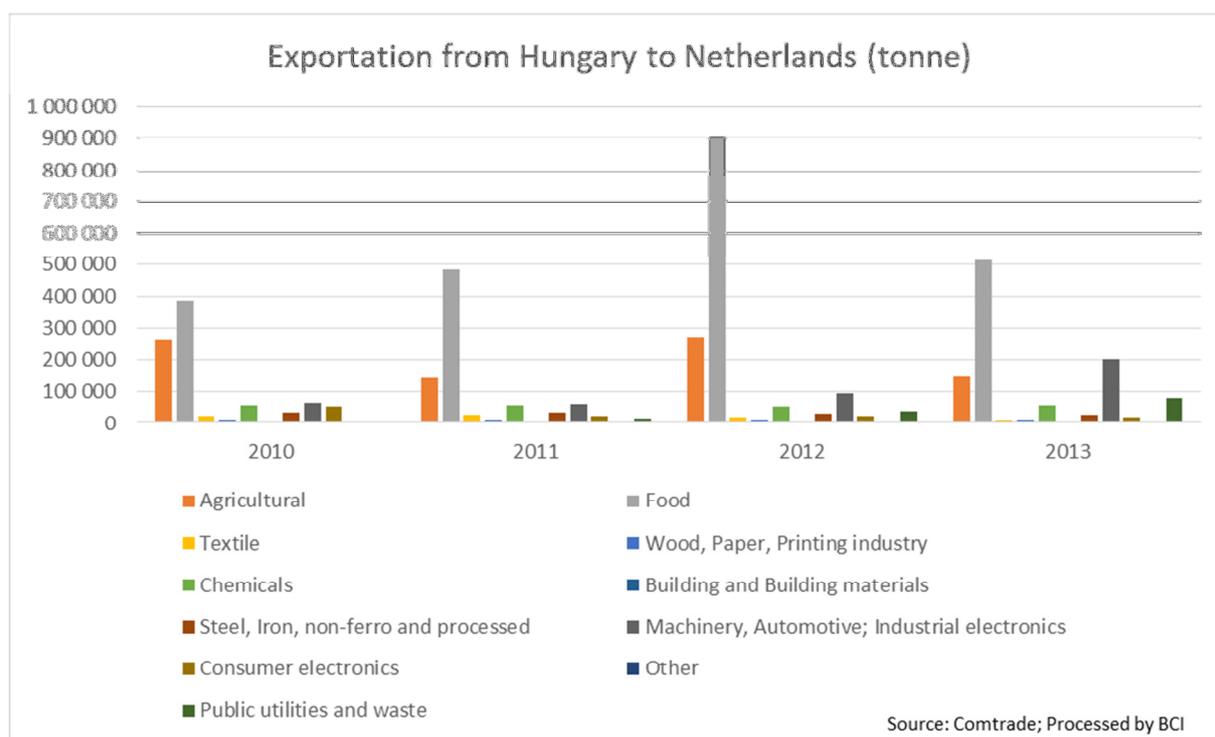


Table 3.2 illustrates the situation in the last available year. Imports are much larger than exports although half of the imports consist of food. The three most important imported products (Agricultural, Machinery and Food) account for more than 80% of all imports. Indeed, Food alone accounts for almost half of the imports.

Table 3.2 Trade between the Netherlands-Hungary

	2013		2013	
	Export (tonne)	Import (tonne)	Export (%)	Import (%)
Netherlands-Hungary				
Agricultural	137,311	146,768	18%	14%
Food	72,833	515,010	9%	48%
Textile	10,525	7,570	1%	1%
Wood, paper, printing industry	22,843	10,829	3%	1%
Chemicals	167,089	55,500	22%	5%
Building and building materials	6,256	339	1%	0%
Steel, iron, non-ferro and processed	142,956	27,624	19%	3%
Machinery, automotive; Industrial electronics	78,820	201,755	10%	19%
Consumer electronics	30,068	17,409	4%	2%
Other	2,502	65	0%	0%
Public utilities and waste	101,434	79,533	13%	7%
Total	772,637	1,062 402	100%	100%

Source: Comtrade; Processed by BCI

Exports to Hungary are heterogenic and as mentioned previously the trade volume between the Netherlands and Hungary is 2.7 times that of the trade volume between Belgium and Hungary.

Food

In the Food category the most important product groups are “Cereals” (56%), “Animal and vegetable fats and oils” (31%) and “Beverages, spirits” (10%). Together, these account for 97% of the food imports.

Agricultural

The trade in Agricultural Products is more in equilibrium. On the import side we see a quasi-monopolistic share (86%) for “Oil seeds and oleaginous fruits; miscellaneous grain” while the export mix is more heterogenic.

Machinery

The importation and exportation is largely dominated by the category “Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof” while on the import side 91% of the volume also comes from this category. The exports consist of 34% of this category. The remainder (64%) falls into the category “Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof”.

3.3 Aggregation of Belgian and Dutch volumes

At this stage it is useful to aggregate the figures from Belgium and the Netherlands. Table 3.3 provides an insight into this aggregated volume.

Table 3.3 Trade Belgium & the Netherlands-Hungary

	2013		2013	
	Export (tonne)	Import (tonne)	Export (%)	Import (%)
Belgium & Netherlands-Hungary				
Agricultural	182,998	193,033	16%	14%
Food	105,097	571,727	9%	43%
Textile	17,552	12,101	1%	1%
Wood, paper, printing industry	29,644	29,944	3%	2%
Chemicals	388,566	110,210	33%	8%
Building and building materials	14,296	7,225	1%	1%
Steel, iron, non-ferro and processed	185,490	63,232	16%	5%
Machinery, automotive; Industrial electronics	90,494	226,097	8%	17%

	2013		2013	
	Export (tonne)	Import (tonne)	Export (%)	Import (%)
Consumer electronics	37,221	28,038	3%	2%
Other	5,701	710	0%	0%
Public utilities and waste	113,690	92,415	10%	7%
Total	1,170,749	1,334,732	100%	100%

Source: Comtrade; Processed by BCI

For further analysis, we are only concentrating on the most important categories. These can be defined by a share of at least 10% in at least one direction. Table 3.4 outlines these groups.

Table 3.4 Trade Belgium & the Netherlands-Hungary; important categories (%)

	2013	
	Export (tonne)	Import (tonne)
Belgium & Netherlands-Hungary		
Agricultural	16%	14%
Food	9%	43%
Chemicals	33%	8%
Steel, iron, non-ferro and processed	16%	5%
Machinery, automotive; Industrial electronics	8%	17%
Public utilities and waste	10%	7%

Source: Comtrade; Processed by BCI

The trade between Hungary and the Netherlands and Belgium respectively is dominated by the following six product groups: Chemicals, Agricultural Products, Steel products, Food, Public Utilities & Waste and Machinery.

The trade in “Public utilities & waste” is only significant for the trade between the Netherlands and Hungary. Machinery is important as a Hungarian export product.

By splitting the product groups to their components and keeping the most important product categories, nineteen product categories remain. Table 3.5 shows the volume per 1,000 tonnes and the corresponding share in the defined group. For the nineteen product categories we can observe that they account for 76% of the exports and 87% of the imports. Later on we will identify the categories that are interesting for inland shipping and compare them with actual inland shipping statistics.

On the export side “Plastics” (18%) are the most important product, followed by “Residues and waste” (13% and this is only from the Netherlands) and “Aluminium” (8%) and “Fertilisers” (8%). In total, they account for almost half of the exports to Hungary in the defined group. Compared to the total exports the share decreases to 35%.

The imports are more homogeneous and consist for 25% of “Cereals” while “Nuclear reactors” account for 17%, “Animal or vegetable fats and oils” for 15% and “Oil seeds and oleaginous fruits” for 14%. These four product categories have an overall share of 72% in the defined group and 62% in relation to the total imports.

Table 3.5 Trade Belgium & the Netherlands-Hungary; important subcategories

	2013		2013	
	Export (tonne)	Import (tonne)	Export (%)	Import (%)
Belgium & Netherlands-Hungary				
01 Live animals	27,090	4,072	3%	0%
02 Meat and edible meat offal	41,143	15,385	5%	1%
07 Edible vegetables and certain roots and tubers	32,719	9,302	4%	1%
08 Edible fruit and nuts; peel of citrus fruits or melons	39,521	1,615	4%	0%
12 Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medical plants; straw and fodder	21,632	158,483	2%	14%
10 Cereals	2,100	303,857	0%	26%
15 Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes	30,441	176,277	3%	15%
22 Beverages, spirits and vinegar	9,967	53,115	1%	5%
72 Iron and steel	66,291	35,993	7%	3%
73 Articles of iron or steel	14,540	14,131	2%	1%
76 Aluminium and articles thereof	68,533	9,150	8%	1%
83 Miscellaneous articles of base metal	27,136	2,710	3%	0%
27 Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes	18,519	12,662	2%	1%
29 Organic chemicals	60,323	18,900	7%	2%
31 Fertilisers	75,976	128	8%	0%
39 Plastics and plastic products	156,532	32,086	18%	3%
84 Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	35,955	193,358	4%	17%
87 Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof	52,862	25,896	6%	2%
23 Residues and waste from the food industries; prepared animal fodder	113,134	92,044	13%	8%
Total	894,414	1,159,164	76%	87%
General total	1,170,749	1,334,732	100%	100%

Source: Comtrade; Processed by BCI

3.4 Opportunities for inland shipping

Trade volume versus inland shipping volume

Table 3.6 provides an insight into the trade volume transported by inland shipping. We have once again aggregated the data of the Netherlands and Belgium. Before comparing the trade volume data with the inland shipping data it is important to keep in mind that both sets of data come from different databases. Consequently, some definitions of product categories will differ between the two databases. As mentioned in the methodological comments, the trade data originates from the Comtrade database while the inland shipping data comes from Eurostat. For the latter it is crucial to recall that transshipment from one vessel to another, as well as changing from a tug, counts as an end point and starting point. On several corridors this can imply that the data represents an underestimation of the actual transported volume.

When we compare the trade volume figures with the data provided for inland shipping, the first thing that attracts attention is the huge difference between both volumes.

Exports

Digging a little deeper in the exports table we can observe that chemicals are confirmed as the most important export product (group). The second largest product group in the inland shipping figures is “Basic metals”. Meanwhile, the fourth⁵ group for inland shipping is “Food products”. As mentioned above the inland shipping volumes are remarkably lower than trade volumes. This certainly means that inland shipping has a significant opportunity to grow.

Another opportunity can be found in the transportation of waste. Waste accounts for 10% or 113,690,000 tonnes of the exports in the trade data. Conversely, for inland shipping that figure shrinks to just 12,000 tonnes.

Imports

Looking at the imports by inland shipping, more than half of the imported goods are agricultural products. In the trade figures “Food” was the dominant product group. However, in the inland shipping data “Food” comes in third place after the “Other goods n.e.c” category. In relation to trade the second most important import product group was “Machinery”. However, in this instance “Machinery” comes in eighth place with a share below 0.5%. “Basic metals” is the fourth most important product group when looking at the inland shipping figures. Meanwhile, “Chemicals” end up in eleventh position, although they are rather important in the trade data. This is surprising because “Chemicals” seems to be a perfect fit for inland shipping and is quite an important import category from Hungary. This could suggest an opportunity for growth. Besides, this accounts for most of the imported products. The trade volume is much larger than the volume transported by vessel.

⁵ The third group consists of non-defined other goods and is therefore not useful for our analysis.

Considering the total of imported and exported volumes by inland shipping it becomes clear that inland shipping is stronger (by a factor of 1.7) on the import side. In terms of return freight this once again represents an opportunity. We can observe an imbalance for “Agricultural products;”, “Chemicals”, “Basic Metals” and “Food”. There could be an opportunity for return freight for all of these product groups.

Table 3.6 Overview of inland shipping

Inland shipping from Belgium and the Netherlands to Hungary (x 1,000 tonnes)			Inland shipping from Hungary to Belgium and the Netherlands (x 1,000 tonnes)		
	2013			2013	
Chemicals, chemical products, and man-made fibres; rubber and plastic products ; nuclear fuel	430	33%	Products of agriculture, hunting, and forestry; fish and other fishing products	1,256	56%
Basic metals; fabricated metal products, except machinery and equipment	410	31%	Other goods n.e.c.	445	20%
Other goods n.e.c.	281	21%	Food products, beverages and tobacco	318	14%
Food products, beverages and tobacco	105	8%	Basic metals; fabricated metal products, except machinery and equipment	129	6%
Metal ores and other mining and quarrying products; peat; uranium and thorium	33	3%	Unidentifiable goods: goods which for whatever reason cannot be identified and therefore cannot be assigned to groups 01-16.	46	2%
Unidentifiable goods: goods which for whatever reason cannot be identified and therefore cannot be assigned to groups 01-16.	13	1%	Grouped goods: a mixture of types of goods which are transported together	18	1%
Secondary raw materials; municipal wastes and other wastes	12	1%	Other non-metallic mineral products	8	0%
Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products; printed matter and recorded media	9	1%	Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks	7	0%
Products of agriculture, hunting, and forestry; fish and other fishing products	7	1%	Coal and lignite; crude petroleum and natural gas	3	0%
Other non-metallic mineral products	5	0%	Metal ores and other mining and quarrying products; peat; uranium and thorium	3	0%
Grouped goods: a mixture of types of goods which are transported together	5	0%	Chemicals, chemical products, and man-made fibres; rubber and plastic products ; nuclear fuel	3	0%
Total transported goods	1,308	100%	Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products; printed matter and recorded media	1	0%
			Goods moved in the course of household and office removals; baggage and articles accompanying travellers; motor vehicles being moved for repair; other non-market goods n.e.c.	1	0%
			Total transported goods	2,236	100%

Source: Eurostat; processed by BCI

Comparison with the European product mix

Figure 3.5 shows that the four most important product groups in the European inland shipping mix⁶, which together account for almost 70% of the total, are hardly represented in the figures for Belgium & the Netherlands and Hungary.

Figure 3.5 Inland shipping (comparison with European Union) (2013)

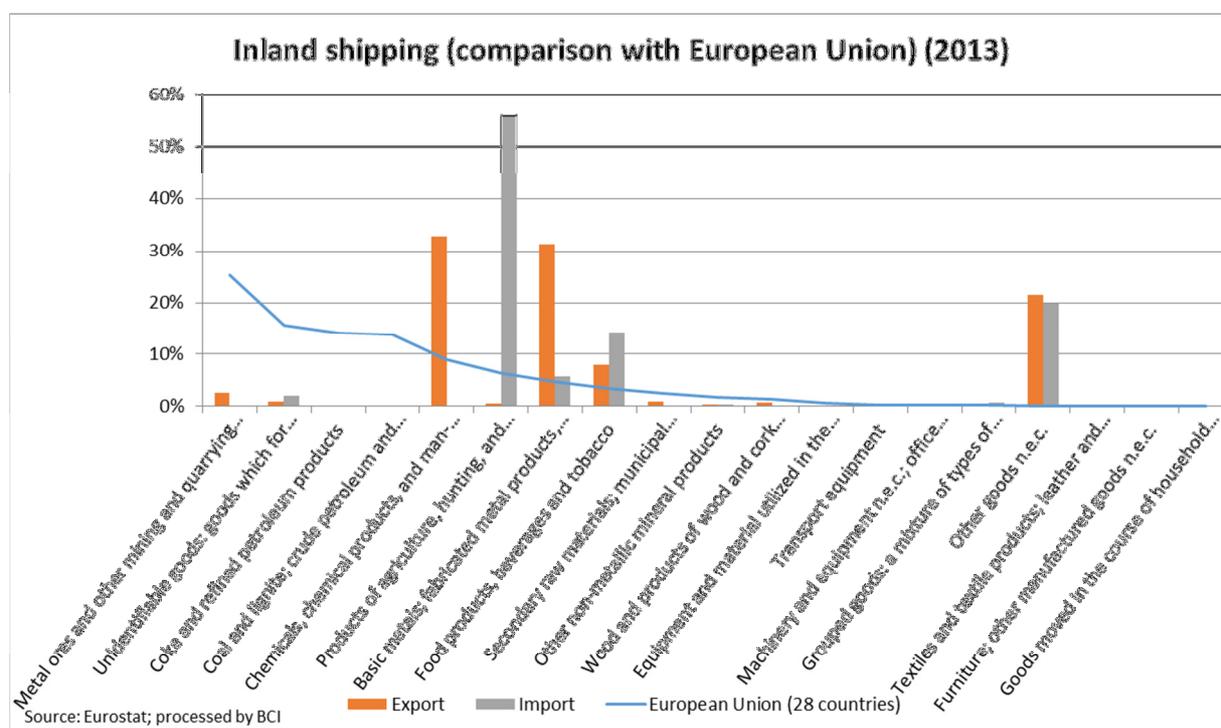


Table 3.7 Overview of inland shipping

Inland shipping (comparison with European Union) (2013)	European Union (28 countries)
Metal ores other mining and quarrying products; peat; uranium and thorium	25%
Unidentifiable goods: goods which for any reason cannot be assigned to groups 01-16	16%
Coke and refined petroleum products	14%
Coal and lignite; crude petroleum and natural gas	14%

Source: Eurostat processed by BCI

As every trade relationship is obviously unique it would be rather imprudent to transpose the general data to the individual relationships. However, it is reasonable to use the European data as a benchmark for opportunities as they are a good indicator of the typical inland shipping product categories.

We observed that the first four categories of the inland shipping product mix are not represented in the trade data. In this instance it would clearly be wrong to talk about an opportunity for these product groups as there is not any significant trade. However, looking beyond the first four product groups in the European product mix the shares for inland shipping fall in line with the European shares.

This means that the opportunities for inland shipping are situated in the following groups:

- Chemicals (organic chemicals, fertilisers, plastics).
- Metals (aluminium, steel, iron).
- Food (cereals, animal and vegetable fats and oils and their cleavage products).
- Agricultural products.
- Waste.

3.5 The potential of inland shipping

In order to determine the potential of inland shipping we looked at the most important transport categories and calculated the potential of inland shipping based on the modal shares of the countries (see Table 2.4). This was mitigated by the following two ratios:

- The share of international inland shipping (see Table 2.5).
- The share of non-containerised goods (see Table 2.6). This is because the operation of a regular container service is not possible under the current conditions.

All in all the potential for inland shipping is a total of almost 270,000 tonnes (see table 3.8). This potential can only be fully realised in the mid-term (5 to 10 years) once some of the bottlenecks on the Danube are solved.

This potential cannot be attributed to one port but concerns the combined inland waterways capacity of the three countries.

The location of sender/receiver in the proximity of a loading infrastructure also plays a role. The imbalance between export and import is substantial. To reduce empty returns, trade flows from Austria (and Germany) could be taken into account.

Table 3.8 The calculated potential for inland shipping in the trade between the Netherlands, Belgium and Hungary

Potential for inland shipping Mid-term (5-10 years)	Belgium-Hungary		The Netherlands- Hungary		Belgium and the Netherlands-Hungary	
	Export (tonne)	Imports (tonne)	Exports (tonne)	Imports (tonne)	Exports (tonne)	Imports (tonne)
Agricultural	3,713	2,629	34,668	8,210	38,401	10,839
Food	898	1,788	9,349	28,816	10,247	30,605
Textile	0	0	0	0	0	0
Wood, paper, printing industry	0	0	0	0	0	0
Chemicals	14,795	2,057	40,919	1,603	55,714	3,660
Building and building materials	0	0	0	0	0	0
Steel, iron, non-ferro and processed	3,445	2,016	39,774	1,541	43,218	3,557
Machinery, automotive; industrial electronics	978	1,375	22,547	11,209	23,525	12,584
Consumer electronics	0	0	0	0	0	0
Other	0	0	0	0	0	0
Public utilities and waste	1,048	726	29,384	4,556	30,432	5,283
Total	24,877	10,593	176,661	55,935	201,538	66,528

Source: Comtrade, processed by BCI

To get a better idea of the concrete products, the main product groups are broken down into their constituent parts (see table 3.9).

Table 3.9 The calculated potential for inland shipping in the trade between the Netherlands, Belgium and Hungary on product level

Potential for inland shipping Mid-term (5-10 years)	Belgium-Hungary		The Netherlands- Hungary		Belgium and the Netherlands-Hungary	
	Export (tonne)	Imports (tonne)	Exports (tonne)	Imports (tonne)	Exports (tonne)	Imports (tonne)
01 Live animals	2	1	7,871	232	7,873	234
02 Meat and edible meat offal	574	222	10,039	661	10,613	883
07 Edible vegetables and certain roots and tubers	447	448	8,016	86	8,463	534
08 Edible fruit and nuts; peel of citrus fruits or melons	2,539	69	2,978	24	5,517	93
12 Oil seeds and oleaginous fruits, miscellaneous grains seeds and fruit; industrial of medical plants; straw and fodder	151	1,889	5,784	7,207	5,935	9,096
10 Cereals	147	821	116	16,618	264	17,439
15 Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes	751	967	6,335	9,150	7,085	10,117
22 Beverages, spirits and vinegar	0	0	2,898	3,048	2,898	3,048
72 Iron and steel	1,913	1,255	12,862	811	14,775	2,066
73 Articles of iron or steel	525	360	2,469	451	2,993	811
76 Aluminium and articles thereof	987	260	16,620	266	17,606	525
83 Miscellaneous articles of base metal	20	142	7,823	13	7,843	156
27 Mineral fuels, mineral oils and products of their distillation; bituminous substances, mineral waxes	1,261	93	1,157	633	2,418	727

Potential for inland shipping Mid-term (5-10 years)	Belgium-Hungary		The Netherlands- Hungary		Belgium and the Netherlands-Hungary	
	Export (tonne)	Imports (tonne)	Exports (tonne)	Imports (tonne)	Exports (tonne)	Imports (tonne)
29 Organic chemicals	2,854	619	7,968	465	10,823	1,085
31 Fertilizers	3,203	7	11,353	0	14,555	7
39 Plastics and plastic products	7,478	1,337	20,440	504	27,918	1,842
84 Nuclear reactors, boilers, machinery and mechanical appliances, parts thereof	761	575	7,905	10,522	8,665	11,097
87 Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof	218	799	14,642	687	14,860	1,486
23 Residues and waste from the food industries; prepared animal fodder	1,048	726	29,384	4,556	30,432	5,293
Total	24,877	10,593	176,661	55,935	201,538	66,528

Source: Comtrade, processed by BCI

As can be seen in table 3.9. Some of these products need investment in handling equipment or modification of the loading bays of the barges. This will only be possible on mid-term. To determine the **immediate** potential of inland navigation we have excluded these categories. The results can be seen in Table 3.10.

Table 3.10 The calculated potential for inland shipping in the trade between the Netherlands, Belgium and Hungary on product level on product level excluding products which are not immediately transportable by inland shipping

Potential for inland shipping (taking into account current modal share of inland shipping in respective countries)	Belgium-Hungary		The Netherlands- Hungary		Belgium and the Netherlands-Hungary	
	Export (tonne)	Imports (tonne)	Exports (tonne)	Imports (tonne)	Exports (tonne)	Imports (tonne)
10 Cereals	147	821	116	16,618	264	17,439
15 Animal or vegetable fats and oils and their cleavage products; prepared edible fats; or vegetable waxes	751	967	6,335	9,150	7,085	10,117
72 Iron and steel	1,913	1,255	12,862	811	14,775	2,066
73 Articles of iron or steel	525	360	2,469	451	2,993	811
76 Aluminium and articles of base metal	987	260	16,620	266	17,606	525
83 Miscellaneous articles of base metal	20	142	7,823	13	7,843	156
27 Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes	1,261	93	1,157	633	2,418	727
29 Organic chemicals	2,854	619	7,968	465	10,823	1,085
31 Fertilizers	3,203	7	11,353	0	14,555	7
39 Plastics and plastic products	7,478	1,337	20,440	504	27,918	1,842
23 Residues and waste from the food industries; prepared animal fodder	1,048	726	29,384	4,556	30,432	5,283
Total	20,186	6,588	116,527	33,468	136,713	40,057

When we amalgamate Belgium and the Netherlands the largest potential can be found on the export side and waste appears to be a product category with the highest potential (30,432 tonnes), particularly in the trade between the Netherlands and Hungary, followed by plastics and aluminium. The Top 5 is completed by fertilisers and iron & steel.

On the import side we can observe a high potential for cereals and animal or vegetable fats and oils. The same applies to waste and this is particularly the case as there is already a large outgoing potential.

The total calculated potential is 136,713 tonnes in the direction of Hungary. Meanwhile, in the other direction it is calculated at 40,057 tonnes. This means that the overall immediate potential for inland shipping exceeds 176,000 tonnes. It is evident that achieving the full potential is not realistic. Some products are more suited to transportation by other modes. However, even an effective realisation of just 5% of the total potential would represent an enormous opportunity for the sector.

Results of a small scale survey with companies in Belgium, Hungary and the Netherlands

The results of a survey on the market potential for short sea shipping provide an insight into actual volumes and in particular into transportation habits.

The survey was conducted with ten Hungarian companies, which in total represent 862 employees. 50% of the companies surveyed are active in transportation and storage, while 25% work in manufacturing. The final 25% can be equally divided between inland shipping, construction and wholesale, retail and trade.

The companies in the survey reported that 10% of the incoming goods come from countries in the North-western part of Europe⁷. In the other direction, 33% of the outgoing goods go to the countries in the North-western part of Europe.

Table 4.1 shows the importance of the different product categories, not in terms of tonnes, but as the number of companies that focus on the respective product groups. “Agricultural goods, food” is once again an important category, followed by “Other manufactured goods”, “Machinery” and “Chemicals”.

Table 4.1 Number of companies (as a share of the sample) that treat specific product groups

	Inbound	Outbound
Agricultural goods, food, drinks and tobacco	70%	50%
Raw materials	50%	10%
Mineral fuels	20%	10%
Chemicals and related products	40%	30%
Other manufactured goods	50%	50%
Machinery and transport equipment	40%	30%

Source: Survey by Port of Baja

⁷ Belgium, the Netherlands, Luxemburg, northern regions of France, western regions of Germany

Looking at Table 4.2, we can observe the divergence between ingoing and outgoing modal shift. It is clear on the inbound side that inland shipping is intensively used. However, road transport maintains a substantial share in the modal split and is quite dominant for the exports.

Table 4.2 Modal split

	Incoming	Outgoing
Modal split	38%	68%
Rail	12%	16%
IWW	50%	17%
Short sea	0%	0%

Source: Survey by Port of Baja

The survey also questioned the motivation and bottlenecks for the use of intermodal transport. On the issue regarding what prevents a company from using intermodal transport, the competition from road transport appears to be crucial. The underperforming business links within the intermodal chain and geographical distance are also considered to be important. The lack of intermodal capacities or distribution and warehousing capacities are clearly not an issue (see Table 4.3).

Table 4.3 Bottlenecks on intermodal transport

	Not Important or Low	Small to Average	Average	Important	Very Important/High
Lack of intermodal capacities	2	1	1	0	0
Lack of adequate transport infrastructure	1	0	1	2	0
Lack of adequate combined transport capacities	1	1	0	2	0
Lack of distribution and warehousing capacities	2	1	1	0	0
Lack of interest of customers/shippers to participate in intermodal transport	1	1	2	1	0
Suppliers' geographical distance	0	2	1	1	2
Lack of sophisticated IT for information sharing	0	2	1	1	1
Competition from other means of transport (Road)	0	0	0	2	4
Underperforming business links within the intermodal chain	0	1	0	5	0

Source: Survey by Port of Baja

On the other hand the respondents were asked what might trigger them to change to intermodal transport. Table 4.4 provides an insight into their answers. Lead time and price structure are the most important reasons although congestion is also seen as a critical factor.

Table 4.4 Critical factors for changing to intermodal transport

	Not Important or Low	Small to average	Average	Important	Very Important/ High
Price structure	0	0	1	4	1
Lead time	0	0	2	0	4
Environmental issues	1	3	1	1	1
Congestion	1	1	3	2	0
Safety reasons	2	3	2	0	0
Not applicable for the type of goods transported	3	0	2	1	0

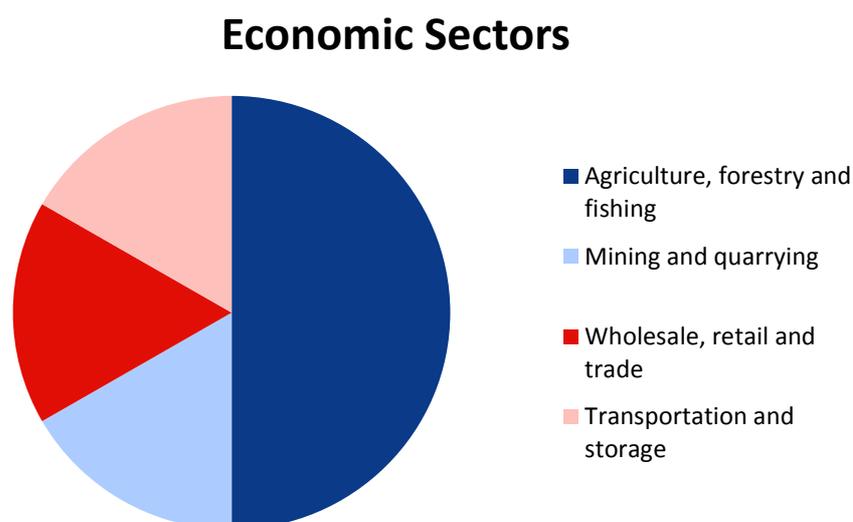
Source: Survey by Port of Baja

4.1 Results of the survey with Belgian/Dutch companies

In addition to the surveys carried out in Hungary, six Belgian and Dutch companies were contacted to illustrate the market potential in the North-western part of Europe. These companies were asked similar questions to their Hungarian counterparts, i.e. regarding volumes and types of transported goods, the modal splits and possible drivers for choices of these modalities.

The majority of these companies (67%) are active in (animal) food production and retail. They fall into the categories of the economic sectors “agriculture, forestry and fishing” and “wholesale, retail and trade”. The remaining companies are active in the sectors of “mining and quarrying” and “transportation and storage”.

Figure 4.1 Economic Sectors



This distribution somewhat differs from the distribution of the Hungarian companies. Nevertheless, it provides an indication regarding companies in the North-western part of Europe that are internationally focussed and have to make choices in terms of multimodal transport.

The volumes of transported goods - both incoming and outgoing - differ considerably between the companies and range from less than one tonne up to thousands of tonnes per week. In addition, in half of the cases the inbound exceeds the outbound and in 34% of the cases the flows are equal.

The type of goods of incoming and outgoing transport is comparable: they predominantly consist of agricultural products, which is in line with the activities of most of the companies. Furthermore, we have manufactured goods, raw materials, chemicals and machinery and transport equipment, as shown in Table 4.5.

Table 4.5 Number of companies (as a share of the sample) in specific product groups

	Inbound	Outbound
Agricultural goods, food, drinks and tobacco	50%	50%
Raw materials	33%	17%
Mineral fuels	0%	0%
Chemicals and related products	33%	17%
Other manufactured goods	33%	33%
Machinery and transport equipment	17%	17%

Source: Survey by BCI

The goods are generally being transported as dry bulk. Break bulk and packaged goods are also mentioned, as are liquid bulk and transport by containers.

Table 4.6 shows the modal split for the interviewed companies. Road is the preferred mode for 60% of incoming transport and for over 80% of outgoing transport.

Table 4.6 Table 4.6 Modal split

	Incoming	Outgoing
Road	60%	82%
Rail	15%	14%
IWW	25%	4%

Source: Survey by BCI

At first glance, the type of activities of the companies could offer an explanation: (agricultural) food products are often to be delivered at the premises of clients which are not in the proximity of inland waterways or railroads.

Moreover, only 17% of the respondents indicated that they had considered a possible switch from road transport to inland navigation or rail (approximately 5% of the current

volumes). One of the respondents also clarified that his company actually investigated the possibility of moving volumes to other modalities. However, the business case ultimately proved to be unprofitable.

The questions regarding motivation and bottlenecks for the use of intermodal transport offer further insights. Table 4.7 considers the average scores on the question of whether the given issue prevents the company from using the full extent of intermodal transport. The competition from the road and the suppliers' geographical distance seem to be important drivers. These issues were also mentioned in the Hungarian survey. Furthermore, a lack of adequate combined transport capacities and insufficient adequate transport infrastructure seem to have higher importance.

Table 4.7 Bottlenecks on intermodal transport

	Average score (1=not important, 5=very important)
Lack of intermodal capacities	1,6
Lack of adequate transport infrastructure	2,2
Lack of adequate combined transport capacities	2,4
Lack of distribution and warehousing capacities	1,4
Lack of interest of customers/shippers to participate in intermodal transport	1,8
Suppliers' geographical distance	2,0
Lack of sophisticated IT for information sharing	1,4
Competition from other means of transport (Road)	2,8
Underperforming business links within the intermodal chain	1,0

Source: Survey by BCI

Table 4.8 considers the critical factors behind changing to intermodal transport. The price structure of modalities and the lead time are considered to be the most important factors and this corresponds to the Hungarian survey. However, the issue of congestion seems to be less important.

Table 4.8 Critical factors behind changing to intermodal transport

	Average score (1=not important, 5=very important)
Price structure	3,6
Lead time	3,4
Environmental issues	2,2
Congestion	1,4
Safety reasons	1,6
Not applicable for the type of goods transported	1,0

Source: Survey by BCI

4.2 Conclusion

Sixteen companies in Belgium, the Netherlands and Hungary were contacted to provide an insight into actual volumes and types of transported goods, the modal splits and possible drivers for choices of these modalities.

The profiles of the companies were diverse: the Belgian and Dutch companies were mainly food producers and retailers, whereas the Hungarian companies were mostly active in transport and storage and manufacturing. The type of imported and exported goods was similar in the Hungarian and Belgian/Dutch surveys. In addition, they were comparable with the product groups of the trade flows in Chapter 3, which meant that the companies were more representative in terms of involved transport activities.

The modal split of the companies surveyed shows that road transport is still considered to be one of the most important modalities as regards organising transport. This is in line with the data from Chapter 2. Inland navigation seems to be quite common for the Hungarian companies for incoming transport in contrast to the Belgian and Dutch companies, which matches less with the previous data. However, this is connected to the specific activities of the Belgian and Hungarian companies that were surveyed, which might somewhat distort the overall picture.

Few respondents saw potential for a shift from road transport to rail or inland navigation transport. As confirmed in the previous chapter this can partly be explained by the nature of the activities and type of products.

More importantly, the surveys enabled us to provide an overview of the reasons why companies choose a certain modality based on their experiences. The surveys revealed that price structure and lead times are the most critical factors in the choice of modalities. Companies also mentioned the significance of environmental issues and congestion but these factors were of less importance compared to the first two factors.

Table 4.9 Critical factors for changing to intermodal transport: aggregation

	Average score Belgian/Dutch (1=not important, 5=very important)	Average score Hungarian (1=not important, 5=very important)	Aggregated (1=not important, 5=very important)
Price structure	3,6	4,0	3,8
Lead time	3,4	4,3	3,9
Environmental issues	2,2	2,3	2,3
Congestion	1,4	2,8	2,2
Safety reasons	1,6	2,0	1,8
Not applicable for the type of goods transported	1,0	2,2	1,6

Source: Survey by Port of Baja and BCI

The companies consider transport by road to be the most competitive alternative which is the main reason for them not switching to other modalities. Furthermore, they experience the following bottlenecks: the current transport infrastructure and possibilities of combining transport capacities as well as the geographical distance of the suppliers, the availability of supporting IT systems and the lack of interest of customers/shippers to participate in intermodal transport. However, these last two issues are of less importance for Belgian/Dutch companies.

Table 4.10 Bottlenecks of intermodal transport: aggregation

	Average score Belgian/Dutch (1=not important, 5=very important)	Average score Hungarian (1=not important, 5=very important)	Aggregated (1=not important, 5=very important)
Lack of intermodal capacities	1,6	1,8	1,7
Lack of adequate transport infrastructure	2,2	3,0	2,6
Lack of adequate combined transport capacities	2,4	2,8	2,6
Lack of distribution and warehousing capacities	1,4	1,8	1,6
Lack of interest of customers/shippers to participate in intermodal transport	1,8	2,6	2,2
Suppliers' geographical distance	2,0	3,5	2,8
Lack of sophisticated IT for information sharing	1,4	3,2	2,3
Competition from other means of transport (road)	2,8	4,7	3,8
Underperforming business links within the intermodal chain	1,0	3,7	2,6

Source: Survey by Port of Baja and BCI

It is important to appreciate that the results are the perceptions of the companies based on individual experiences. These critical factors and perceived bottlenecks are the main drivers behind choosing a certain modality. Therefore, it is advisable to focus on these aspects when approaching companies and attempting to convince them to participate in an intermodal project.

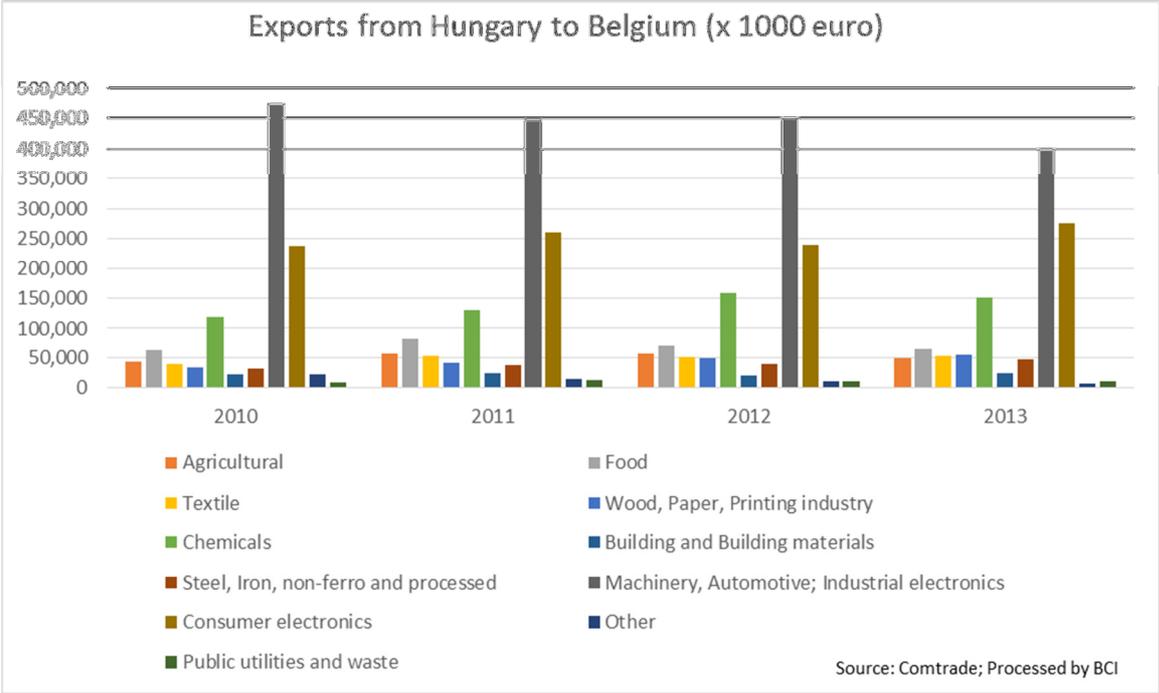
As price structure and lead times are the most critical perceived factors, the project will have to clarify the benefits in terms of these two factors. This means that the benefits will primordially have to be of a financial nature. In order to achieve this objective, it would be practical to investigate as to whether the perceived bottlenecks are actual bottlenecks (for example the lack of available transport infrastructure) and if they can be resolved in a cost-benefit efficient way, taking into account long term cost as well as benefits. A key factor will be to convince the companies that perception is not everything and that competitive possibilities are available.

The analysis clearly shows that sufficient freight volume is present between Belgium, the Netherlands and Hungary to work towards a sustainable inland navigation connection. This should be developed in co-operation with a number of shippers and inland navigation companies from Belgium, the Netherlands and Hungary. Therefore, the following is recommended:

- In the short term the concrete flows eligible to be shifted to inland navigation must be identified. In order to do this:
 - A business case must be prepared, which provides insight into the financial and economic impact of such a connection for the different types of goods. We think especially of price and rotation speed. The survey has shown that these factors are considered crucial by shippers for the use of inland navigation.
 - An information campaign should be launched to make the new inland navigation connection known.
- There is a huge imbalance between the flows to and from Hungary. About three times more goods leave from Belgium and the Netherlands to Hungary than the other way around. Finding return flows is therefore a must. This can be done by extending the geographical scope. The Hungarian exports should possibly be included together with Austrian and possibly German export. But also Belgium and the Netherlands would be best expanded with northern France and the Ruhr region. These bigger service areas anyway make it easier to reduce or avoid empty navigation.
- As there is currently little inland navigation traffic between North-West Europe and Central and Eastern Europe, there are also no specialized freight forwarders. To run this traffic truly sustainably and successfully specialist freight forwarders are needed. It therefore seems appropriate to engage interested freight forwarders in the above information campaign.
- Conducting a pilot for several months is a necessary requirement to demonstrate the importance and potential Ilde-inland navigation connection to market actors. A limited number of interested ship-owners and shippers should be found for this purpose.
- To fund this pilot and the mentioned information campaign, an EU co-funding seems necessary. Interreg Europe Life could be considered for example. The Motorways of the Seas framework also offers opportunities but still is mainly based on alternative fuels such as LNG. The possible co-funding frameworks must be further investigated in terms of their potential for Ilde.

Attachment 1

Figure 1 Exportation from Hungary to Belgium in value



Attachment 2

Table 1 Survey: Hungarian companies

Company name	Location
Fluvius Kft	Budapest
Tett Kft	Baja
MAHART Container Center Kft	Budapest
Euro Beffracting AG	Regensburg, Prinz Ludwig stt. 9
Első Pesti Malom Zrt	Dunaharaszti
Centroport Kft	Dunaújváros
AXIÁL Kft	Baja
Áti Depo Zrt	Baja
Agro-Handel Hungária Kft.	Baja
Lignum Europe Kft	Székesfehérvár

Source: Survey by Port of Baja

Table 2 Survey: Belgian/Dutch companies

Company name	Location
Versteijnen Logistics	Tilburg (NL)
Versele Laga	Deinze
Vanden Avenne	Ooigem
Sibelco nv	Dessel
Revor	Meulebeke
Mars Belgium	Olen

Source: Survey by BCI