

# IWT AFFINE INDUSTRIES IN THE BALTIC SEA REGION

## INDUSTRIES, CUSTOMER NEEDS AND TRANSPORT REQUIREMENTS – SUMMARY REPORT

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## ABBREVIATIONS

BSR	Baltic Sea region
EC	European Commission
EMMA	project “Enhancing freight Mobility and logistics in the BSR by strengthening inland waterway and river sea transport and proMoting new internAtional shipping services”
IWT	Inland waterway transportation
IWW	Inland waterway
WP	Work package

## 1 INTRODUCTION

For several reasons, IWT is not considered as an alternative to road and rail transportation by all industries and companies. This has to do with general transport requirements like transport times or volumes as well as individual logistic processes on the industrial area. Also limited knowledge about IWT and its integration into international transport chains play a role. IWT is seen as too complicated and too risky. In consequence IWT does not exploit its full potential.

The EMMA project aims at enhancing inland navigation in the BSR. In WP 4 the partners are working together to make the market more acquainted with the potentials of IWT in the BSR. The aim of EMMA activity 4.2 is to identify companies, who have the potential to move cargo from road or rail to inland waterways and together with them, set-up new IWT transport chains. The report on hand summarizes the individual steps and gives an overview about IWT affine industries in the BSR, customer needs and estimated volumes. Identified potential new IWT services will be sketched.

For having a real potential to move cargo from road/rail to IWT, companies should be located in the catchment area of a river (about 50 km distance maximum). For this activity the term “companies” is not limited to headquarters. A company might be located away from the water, but have storage facilities at the waterfront and thus might be a potential customer.

The EMMA project covers partners from Finland, Germany, Lithuania, Poland and Sweden. In the project preparation phase, these countries appeared as those having the highest potential in developing sustainable and effective IWT structures in the BSR. In this activity, the partners focused on certain areas of these countries, based on main rivers and the area covered by the Interreg Baltic Sea Region Programme. The report is based on the input of EMMA and their cooperation with the industry. Based on the importance of IWT and the development level, the input received slightly differs. Focus topics, structure and answers have to be considered in the light of this background.

## 2 METHODOLOGY

The methodology of this EMMA activity was already defined in the EMMA application and work plans. It consists of four consecutive steps:

- Step 1: Identification of relevant industries
- Step 2: Survey in selected industries
- Step 3: Personal meetings with relevant industries to discuss outcomes
- Step 4: Identification of possible new services

### **Step 1: Identification of relevant industries**

For all EMMA countries, industries and companies were identified having a potential of transporting their goods by inland waterways. They were selected regarding their location in the catchment area of rivers or lakes (max. 50 km) and the type of their cargo. Lists of potential companies, their location, cargo and contact details were prepared as basis for step 2. For this EMMA activity, no fully comprehensive lists were made, but the most promising data was collected, as the final aim was to set-up new services. The potential and number of IWT relevant industries varies amongst the areas considered.

### **Step 2: Survey in selected industries**

The collection of companies and contact details was be the basis for a survey amongst the industry, about their needs, interests and willingness to talk about strengthening inland navigation. The potential and number of IWT relevant industries varies amongst the areas considered.

A questionnaire was set-up (ref. annex 1). After a pre-test in all countries, the modified survey started in all countries. The questionnaire was available as online and paper version and in Finnish, German, Polish, Lithuanian and English (used in Sweden) language.

### **Step 3: Personal meetings with relevant industries to discuss outcomes**

Based on the companies' willingness of having a personal interview with the EMMA project, the partners agreed meetings. In personal talks more details about the potential of the company for using IWT and their individual pro's and con's for IWT were discussed. The aim was to further promote IWT, to reveal potential and communicate the advantages of IWT, to agree on a further cooperation between the company and the EMMA partner and to identify possible new services (step 4).

### **Step 4: Identification of possible new services**

Based on Step 1 to 3, a first choice of possibly new IWT service routes in the BSR was made. Selected services were then transferred to EMMA activity 4.3 being business plans for Sweden, Poland and Lithuania.

In the following the results are summarized for all countries, structured by the steps explained above.

### 3 FINLAND

In Finland, the mills around the lake Saimaa have the biggest potential of transport via IWW. The mills belong to forest, construction and chemical industry. Amongst the companies are UPM, Stora Enso, Versowood, Nordkalk and SP-minerals.

**Table 1: Statistical basis for Finland**

Activity	Number
Identified industries/ companies in catchment area of waterways	15
Questionnaires sent out	88
Answers received	20
Personal interviews	3

#### Customer needs and requirements

The decision-making process regarding the transport mode is based on the criteria cost-efficiency and customer needs (7 answers each), time restrictions and bottlenecks on other transport modes (5 answers each), followed by goods restrictions (weight or size) (4 answers). Goods restrictions (dangerous cargo) or requirements (e.g. cooling) as well as environmental aspects play a minor role (1 or 2 answers each).

Several reasons not to use inland waterway transportation were identified from the survey.

- 1) No need to use inland waterways for transporting goods for instance due to short distances or because customers handle transportation,
- 2) small volumes (it is assumed that due to small volumes there will be negative effect on price if transported in large containers),
- 3) price (inland waterway transport is assumed to be expensive),
- 4) not considered even an option (no existing inland waterway connections) or trucks were seen as the only option there is and
- 5) the respondent did not expect inland waterway transportation to add effectiveness. One of the respondents reported looking into the opportunity to utilise inland waterway transportation.

Generally, inland navigation is not seen as very important for the competitiveness of the companies. The dominating and only transport mode is truck. IWT was rated as not important (13 answers), less important (5 answers) and only two answers were “very important”.

To increase the share of inland navigation the cargo volumes upstream should be significantly larger than what they currently are. Shipments for instance from Russia should be thousands of cubic meters and this would require other users as well as storage space in a port. There would be room for much higher volumes if industrial partners saw more value in using inland waterway transportation. It is the lack of interest from the industry that is limiting increasing cargo volumes.

Another important limiting factor is Finnish climate. One of the respondents stated using inland waterway transportation, but only during summer. Due to winter goods cannot be shipped through lake Saimaa and this decreases sales in the market area. Therefore, the company needs to compensate cargo costs in winter. Thus, the time Saimaa connection cannot be used in winter should be shortened.

Also, it should be remembered that cargo is mainly transported from north to south, i.e. from the source (wood from forests) to the production sites. This means that most of the ships travel empty to the north where the cargo is loaded and then transported to south. And this affects the cost structure of transportation in a negative way.

Lastly, the changes in law concerning working hours imposed by the EC is seen a big challenge in Saimaa.

Bit of a wild idea arising from the discussion was that Finland could build a canal from Vuosaari harbour to Lahti. This would mean that not all cargo (coming from EU and Russia) would need to be handled in Helsinki. Instead the ships could continue to Lahti. And from Lahti there are inland waterway connections to Saimaa (Eastern Finland) as well as Jyväskylä (Central Finland).

### **Potential new services**

Due to the low levels of cargo currently transported and the specific conditions, the ideas for potential new services are lacking. One thing that has been brought up in the discussions is the need for a facilitator or coordinator of potential cargo from south to north. As mentioned above, ships often travel empty upstream towards north. It could make some difference if there was an actor combining small cargo of several companies and organizing the transport using IWW (instead of road). There is no evidence of how enthusiastic the companies could be of such a service. But it is an idea that should be investigated more and maybe even piloted. It is unlikely that a private entity would be willing to run the pilot since the economic benefits are not evident.

The possible new service should be piloted first. At this phase it is difficult to envision the scope or format of the service. Currently such service does not exist. However, there are several companies in the area that use road and rail for transport. And one reason is, because there has not been an

economic option on IWW. If there was an actor collecting the needs and combining the needs with IWW transports, some companies might be willing to consider this option.

**Table 2: Potential new service Finland - Framework**

<b>SERVICE ORIGIN-DESTINATION</b>	Lappeenranta – Joensuu (or possibly even Kuopio)
<b>KIND OF GOODS TRANSPORTED</b>	Agricultural products, raw materials (small volumes)
<b>ESTIMATED VOLUME</b>	N/A
<b>SERVICE SCHEDULE (HOW OFTEN)</b>	In the pilot phase only a few times a month, but the schedule needs to be adjusted according to demand (which may alter)
<b>POSSIBLE CUSTOMER</b>	Companies in the area involved e.g. in manufacturing, agriculture or forestry that might have goods / cargo to be shipped on the water.
<b>POSSIBLE BARGE OPERATOR</b>	N/A – should be identified with relevant authorities and other actors in the area
<b>REQUIREMENTS FOR THE SERVICE TO START OPERATION</b>	Pilot project plan, approved funding for the pilot, an actor running the pilot

**Source: LADEC / Ramboll**



## 4 GERMANY

In the north-eastern part of Germany, which covers the Länder Berlin, Brandenburg, Hamburg, Lower Saxony, Mecklenburg-Western Pomerania, Saxony, Saxony-Anhalt and Schleswig-Holstein there are more than 20 inland ports, which are connecting the hinterland with the sea ports. Furthermore there are many industries with the potential of using waterway transport. Many industries are located nearby the waterway in Germany, which is mainly historical. The German government tries to support the ports as there is an economical need to do it: “The ports connect German enterprises to the global markets, safeguard Germany's position as a production site, provide low-cost services for German enterprises and are an advertisement for German competitiveness in the global economy.” (ref. National Strategy for Sea and Inland Ports. Federal Ministry of Transport and Digital Infrastructure. 2016. p. 7). Based on the scope of the EMMA project, the waterways examined are the federal waterways Elbe and the Oder and their linkages.

**Table 3: Statistical basis for Germany**

Activity	Number
Identified industries/ companies in catchment area of waterways	67
Questionnaires sent out	300
Answers received	35
Personal interviews	5

Of the random chosen industries, the industry branch building materials and steel industry are dominating. Industries of the sectors ports, production, trade and engineering are using waterways, too. Berlin, as the German capital, has direct linkages to the river Elbe and Oder and is causing a huge potential to shift the transport mode from the rail and road to the waterway.

Furthermore, the different waterways have different conditions and several bottlenecks. This is the reason why many industries and companies are deciding for a transport via road and railways.

### Customer needs and requirements

The decision making process regarding the transport mode is based on the criteria cost-efficiency (20 responses), special customer needs (19 answers), time as well as goods restrictions (weight or size) (both 11 answers), bottlenecks on other transport modes (9 answers) and environmental aspects (8 answers). Goods restrictions (e.g. dangerous cargo) or requirements (e.g. cooling), regulatory restrictions play a minor role (answers <3).

The dominating mode of the responding companies is truck transportation (30 answers), followed by railway (12 answers) and inland navigation (10 answers).



The dominating barriers regarding using IWT are water levels (17 answers), locks (e.g. time, wide, length) (16 answers), customer needs (14 answers), missing political willingness (12 answers), availability of transshipment points and inland vessels (9 answers each), bridges (e.g. to low) (7 answers) and environmental aspects (4 answers).

Customer needs and wishes play an important role. With more than 300 km of transport, the barge is always offering an alternative to road and rail, however customers often decide for trucks, as in their eyes this is the most flexible solution. Individual information for companies is one of the requirements, claimed by transport companies. Customers have to be informed e.g. that fewer accidents happen and the ship is reliable, the media should report in a more balanced way about the advantages and disadvantages of the modes of transport in order to inform the civilian population. Information should also cover temporal and environmental aspect. Barge is most economical for logisticians but needs to be more actively supported by politics. Due to the current driver and fleet shortage in the truck sector, a modal shift would also be beneficial for the transport companies.

Removing infrastructure bottlenecks (locks) and extending the inland waterway vessel fleet and infrastructure (access for clients to waterways and appropriate storage for goods at transshipment points) would further reveal a high potential. Also an improved information system by administration (water levels, closing times of locks) would be appreciated to increase planning security. The latter one is currently worked on by the EMMA project (ref. EMMA Elias system).

If IWT could cover an additional container shuttle service, it would be more economical for many companies to use this transport mode compared to truck or rail. IWT services in Germany are quite well developed. Nevertheless, it is necessary to eliminate infrastructural bottlenecks.

If all of the mentioned barriers would be removed, 23 companies would integrate inland navigation in their transport chains, 7 wouldn't and 3 don't know. This shows a high potential when working towards better conditions for inland navigation in the area! Furthermore, 10 out of 34 companies are willing to support EMMA in the future and to start a closer cooperation.

### **Potential new services**

IWT can only be competitive in the North-Eastern part of Germany, if it would be more economical and ecological compared to truck and railway. A container barge shuttle service between the goods locations of origin and destination would allow it. A container barge could shuttle from the companies' location to any other sea or inland port or factory port within the German waterway network or even within the whole European waterway network.

Example 1: A Company is loading its goods in Port A. The goods are transported to Port B. Near to Port B, there is an origin location of raw material for the production of the goods of the company, which is located nearby Port B. The raw material is loaded in Port B and transported to Port A. The Company can start the production of its good.

Example 2: Company A wants its goods to be transported by barge from Port A to Port B Company B wants its goods transported from Port B to Port A. If Company A und Company B would use a joint

container barge shuttle, if they want to transport similar goods there would be a cost reduction and IWT would be the most economical and ecological transport mode.

Several companies in North-Eastern Germany are located near to a waterway or even a public or industrial port. If companies would use container barge shuttle services together, there would be a cost reduction for the transport service. Mostly the barges are empty on their way back to the company's location to reload goods there. This is an unnecessary power consumption. If a container barge shuttle service would be implemented, the sea and inland ports in the area would benefit, as the ports must offer warehouses, which could be rented to several companies furthermore it would have a great ecological effect.

**Table 4: Potential new service Germany - Framework**

<b>SERVICE ORIGIN-DESTINATION</b>	Industrial Port and Public port in Eberswalde, located at HOW Waterway.
<b>KIND OF GOODS TRANSPORTED</b>	Metal goods, scrap metal, agricultural products, oversize and heavy cargo
<b>ESTIMATED VOLUME</b>	n/a
<b>SERVICE SCHEDULE (HOW OFTEN)</b>	On demand
<b>POSSIBLE CUSTOMER</b>	Companies in the area
<b>POSSIBLE BARGE OPERATOR</b>	Companies of the area often decided on their own, which operator should work for them or even have their own logistic department.
<b>REQUIREMENTS FOR THE SERVICE TO START OPERATION</b>	Finalization of the ship lift Niederfinow in 2019 to guarantee the passing of bigger barges, elimination of bottlenecks on the HOW in the Szczecin direction (which is often the location of origin and destination of goods), mostly dredging the Klützer Querfahrt and the Hohensaaten-Friedrichsthaler-Waterway and bridges, and elimination of infrastructural bottlenecks to the Mittellandkanal.

**Source: IHK Ostbrandenburg**

## 5 LITHUANIA

The Lithuanian IWW network that is used and could be further developed for freight transport is covers the Kursiu lagoon and the river Nemunas. This area has a length of about 260 km of IWW. The cities of Kaunas, Jurbarkas and Klaipeda are located in close distance to these waterways. Around the city of Kaunas several big chemical plants are located (e.g. LIFOSA in Kedainiai and ACHEMA in Jonava). They are located about 30-50 km to the inland port of Kaunas. Also some construction companies are located in Kaunas as well as energy industry. They have the potential of shifting mainly their oversize cargo to IWT, e.g. spear parts for energy plants renovation. In Jurbarkas big construction materials plants are located (sand, gravel). Construction materials are already traditionally transported by IWW from Jurbarkas to the Port of Klaipeda. So this sector would need to be strengthened only.

**Table 5: Statistical basis for Lithuania**

Activity	Number
Identified industries/ companies in catchment area of waterways	6
Questionnaires sent out	12
Answers received	6
Personal interviews	4

In Lithuania the energy and chemical industry are rapidly developing. It needs good transport connections to energy and chemical plants spear parts or final construction sites (oversize cargo). Transporting oversize cargo by barge is in many cases faster than by road and needs less preparatory work.

Most chemical and energy industry locations are located within a radius of up to 100 km from the Lithuanian inland waterway network. This means while the main transport leg can be carried out by barge, the last mile will always be on rail or road. This requires loading and unloading possibilities at intermodal inland ports.

Improving the Lithuanian intermodal network would also improve cross order transport chains of the country to the North-East of Poland. Barges could serve the part up to Kaunas area and the further connection could be done by Via Baltica or Real Baltica road or railway solutions. In North-East of the Poland new industry and energy companies are developing, like wind power stations.

### Customer needs and requirements

Major modes are road and rail transport. The main factors for the choice of transport modes are time restrictions, cost-efficiency and customer needs (6 answers of 6). Also goods restrictions (weight, size, dangerous cargo) play a role (4-5 answers), followed by regulatory restrictions (4 answers), goods restrictions (e.g. cooling), bottlenecks on other modes (2 answers) and environmental aspects (1 answer).

The reason why companies do not use IWT are caused by a lack of infrastructure and IWW transport units, missing experience and knowledge about IWT and competitive prices.

To increase the share of IWT in Lithuania large-scale investments in IWT infrastructure would be needed (loading places). The same applies for the service of inland navigation (operators, barges).

### Potential new service

Resting on the investigation of the economic and environmental potential possibilities of the Lithuanian IWW, two main types of the cargo can be transported by barge. These are oversize and mass cargo, like construction materials (sand, gravel), grain, wood and fertilizers. Today only small quantities of mass and oversize cargo are transported by IWT between Klaipeda and Kaunas or Jurbarkas. Potential new services would follow the recommendation of the EU regarding green transportation. They should meet the requirements of the potential users, being grain terminals, construction materials suppliers, and energy and chemical industry companies. Inland waterway operators should work together with chemical plant owners to create a reliable business basis, but also with respective authorities (national and regional administrations). Especially during the initial phase, administrative hurdles should be removed such as reasonable dues and tariffs but also support for new buildings to set up the needed barge fleet. The development of the Lithuanian inland waterway network and fleet should be coordinated with the development of inland ports and/or loading places as well as suitable last mile solutions from the terminal to the factories and good storage facilities.

**Table 6: Potential new service Lithuania - Framework**

<b>SERVICE ORIGIN-DESTINATION</b>	Klaipeda port – locations on Nemunas river up to Kaunas, in future Neris river up to Jonava, as well used link with European IWW system via Konigsberg (Kaliningrad) region and visa-versa
<b>KIND OF GOODS TRANSPORTED</b>	Oversize and overweight goods, as well bulk cargo like grain from Kaunas to Klaipeda port and fertilisers from Jonava to Klaipeda port, constructions materials (sand) from Jurbarkas to Klaipeda
<b>ESTIMATED VOLUME</b>	Oversize and overweight cargo up to 1000 units per navigational period (from April to November, in average 200 days per year) in 2026. Grain up to 2 mill t per year, fertilizers up to 1 mill t per year, constructions materials up to 1,5 mill t per year (navigational period)
<b>SERVICE SCHEDULE (HOW OFTEN)</b>	Oversize and overweight cargo – 2 – 3 times per week, grain during August – November – daily, fertilizers during navigational period – daily, construction materials during navigational period - daily
<b>POSSIBLE CUSTOMER</b>	Klaipeda port stevedoring companies, JC “Kauno grudai”, JC “Achema”, Jurbarkas construction materials manufacturers

<b>POSSIBLE BARGE OPERATOR</b>	Lithuanian IWW Administration, private operators
<b>REQUIREMENTS FOR THE SERVICE TO START OPERATION</b>	<p>In Lithuania governmental support is needed for the improvement of the IWW, especially loading and unloading places, good logistics services organized by forwarding companies, reasonable price policy on basis governmental support.</p> <p>To link the Lithuanian IWW with the European IWW system it is necessary to wait for better political environment between Russia and other countries, because IWW link goes via Konigsberg (Kaliningrad) region.</p>

**Source: Klaipeda Shipping Research Center**

## 6 POLAND

The present approach of decision makers on national level, of the **Polish** Ministry of Maritime Economy and Inland Navigation and the politicians in the Polish Parliament are very favourable towards revitalisation of Polish inland waterways and also enhancement of the navigation. The most promising rivers are the Oder River E30, the Vistula River (E40) on the part from Warsaw to Gdańsk and the International Waterway E70. Along these waterways production and logistics companies are located as well as chemical and paper industry, tools production, heavy engineering, petrochemical manufacturers and fuel distributors. The highest potential of exploiting the IWW network is in oversize cargo, bulk, the chemical industry and the enterprises specializing in the manufacture of packaging made of synthetic materials, the petrochemical industry.

**Table 7: Statistical basis for Poland**

Activity	Number
Identified industries/ companies in catchment area of waterways	52
Questionnaires sent out	10
Answers received	10
Personal interviews	4

### Customer needs and requirements

Like for the other countries, cost-efficiency is the key criteria for the choice of transport mode (7 answers). It is followed by goods restrictions in terms of weight or size and customer needs (5 answers each) as well as bottlenecks on other transport modes (4 answers). Goods requirements (e.g. cooling), environmental aspects and regulatory restrictions play a minor role (1 answer each). Time restrictions and goods restrictions (dangerous cargo) play no role (0 answers).

Truck is the dominating transport mode. The reasons why companies do not use inland navigation are:

- No possibilities because of unregulated riverbed. Low navigation possibilities.
- Water level on Vistula river is too low
- Not enough ports/docks amount. No loading/unloading/transshipment possibilities.
- No suppliers on Inland Waterway area.
- Inland Waterways locks don't work on Bydgoszcz Canal

Only when the river conditions would be improved and IWT would be offered at a low price level, the potential of IWT could be increased. The AGN implementation will be crucial to make Polish inland waterway to minimum IV class (International Waterways E-30, E-40, E-70).

### Potential new services

In Poland most of the goods are transported by trucks and by railroads. Road transport is the dominating mode what is unfriendly for the environment. Therefore, the potential of the Vistula river might be a chance to develop new inland navigation service.

During personal interviews, Polish companies claimed demand for transportation of corn, grain, sand and construction materials along the Vistula river if the inland waterway navigation could be possible in regular periods. The potential volume for the new service is about 30.000 – 40.000 TEU p.a.

Requirements for full IWW exploitation is: multimodal ports/container terminals locations alongside the Vistula River – first stage in a distance 200 km from Seaport of Gdansk (in Bydgoszcz/Solec Kujawski cities), development of storage facilities, increase of competitiveness barge operators. Now, OT LOGISTICS SA play a main role in the Vistula navigation.

**Table 8: Potential new service Poland - Framework**

<b>SERVICE ORIGIN-DESTINATION</b>	Vistula River: form Port of Gdansk to Warsaw and from Warsaw to Gdansk
<b>KIND OF GOODS TRANSPORTED</b>	Potential customers requested demand for bulk cargo like corn, grain, sand, construction materials but the origin destinations are not identified yet.
<b>ESTIMATED VOLUME</b>	Cargo volumes are estimated between 30.000 – 40.000 TEU p.a.
<b>SERVICE SCHEDULE (HOW OFTEN)</b>	1. Corn, grain: during August – November - daily, 2. Sand and construction materials – during navigational period – possible daily regular transport.
<b>POSSIBLE CUSTOMER</b>	Different production companies located alongside the Vistula river for instance: ANVIL SA (Wloclawek), PROJPRZEM MAKRUM S.A. (Bydgoszcz), Solbet Ltd. (Solec Kujawski), Glencore Polska Ltd. (Gdansk), Flextronics International Poland (Tczew)
<b>POSSIBLE BARGE OPERATOR</b>	OT Logistics SA (Żegluga Bydgoska Sp. z o. o.)
<b>REQUIREMENTS FOR THE SERVICE TO START OPERATION</b>	1. Government support in revitalisation of Polish inland waterways (especially Vistula river) is needed, revitalisation of locks, 2. Creation of new inland waterway multimodal ports 3. Increase of suppliers on Inland Waterway area

**Source: City of Bydgoszcz**



## 7 SWEDEN

Sweden implemented EU regulations for IWW in December 2014 and looking at this short time perspective the market for IWT is still under the startup phase. By implementing the new regulations, it is the Swedish governments desire to move cargo to the IWW in order to facility accessibility in the road and railway networks. Since IWT is a new mode of transportation the Swedish industries are unfamiliar with this new opportunity and a heavy marketing concerning new IWT logistics are needed. Looking at the geographic areas of the three appointed IWW zones, Lake Vänern, Göta Älv and Lake Mälaren, the potential for moving cargo to IWW differs between the areas looking at consuming areas, industry production sites, congestion and environmental impacts. Around Lake Vänern, with a low population density is today road and rail the dominating way of transportation. The potential for IWT is within the basic industries, such as the forest and petroleum industry, which present has own waterway access to the lake. Most of the industries transport their cargo by short sea bulk vessels while the container segment is quite poor within the Vänern area. Lake Vänern is classified as IWW zone 1 and this is a limitation since there is no existing barges of that type available on the European market, however it can be possible to operate with a zone 2 barge undertaken weather restrictions. Göta Älv, which is a zone 3 area has a future potential for container transports by IWT. New warehouses and logistics hotspots are planned along the river and a container feeder by barge to/from port of Gothenburg could become an alternative to road and rail transportation. City of Göteborg suffers of the growing congestion and a regular barge container service could relive the road and rail systems. The area with biggest potential for moving cargo to IWW is around Lake Mälaren that is rapidly growing with the highest population density in Sweden. In this area the potential is in cargo segments such as, recycling, liquid fuels, building logistics and city logistics for retailers. An advantage is that Lake Mälaren is classified as IWW zone 3 and this gives many opportunities to find suitable barges within the European cluster. The hurdle in the Mälaren region, especially in Stockholm city, is lack of empty spaces close to the lake side due to the heavy development of new housing areas. This is something that needs to be considered as a strategic political decision for the future.

**Table 9: Statistical basis for Sweden**

Activity	Number
Identified industries/ companies in catchment area of waterways	16
Questionnaires sent out	66
Answers received	17
Personal interviews	6

### Customer needs and requirements

The decision making process regarding the transport mode is based on the criteria cost-efficiency (18 answers), time restrictions (16 answers) and customer needs (6 answers). The dominating mode of the responding companies is truck transportation followed by rail. Shipping is used mainly for export. One company is using barges, but no inland barges. The key requirement for an extended use

of IWT is to meet the customers' needs. A better integration into intermodal transport chains will be the first step, also to reduce the cost due to the extra handling.

Especially in metropolitan areas such as Stockholm companies start to get worried about the dense traffic situation on the roads. Here alternatives and discussions about the potential of barge transportation are welcome and will be followed-up to be mature as soon as volumes will be increasing.

Generally speaking the industry is open for inland navigation options as long as these are reliable solutions without interruption or delays of the deliveries. Here ice problems have to be considered, the EMMA partners are already working on (ref. ice study). Also further test shippings might be carried out to test and prove the reliability of the Swedish inland navigation network.

### Potential new services

AVATAR Logistics is working on a container barge shuttle project between Göteborg and Vänersborg. On this route container volumes are growing. While the transport is still organized by truck only, there is the requirement for sustainable transport solutions, like a barge service. The potential customers have responded positive to a new barge service that in case of start will become the first one ever in Sweden. The intention is to operate a liner service with a modern inland barge with high environmental standard. The target is to develop an intermodal hub in the existing river berth in Trollhättan and the main objective is to create a possibility for modal shift between inland navigation, rail & road transportation. Being linked to export and import business via the container terminal in Port of Gothenburg, the potential volume for this new service is about 25,000 TEU p.a. The idea is sketched in table 4 and will be followed-up in EMMA activity 4.3.

**Table 10: Potential new service Sweden - Framework**

<b>SERVICE ORIGIN-DESTINATION</b>	Göteborg-Vänersborg (on Göta Älv river)
<b>KIND OF GOODS TRANSPORTED</b>	Containers (light 40' container, heavy 20' container, mixed container sizes), Project cargos.
<b>ESTIMATED VOLUME</b>	25.000 TEU p.a.
<b>SERVICE SCHEDULE (HOW OFTEN)</b>	Service scheduled for minimum 3 times per week during the first start up year. The plan is to increase the number of sailings when the volumes grows.
<b>POSSIBLE CUSTOMER</b>	Varner Group, Vargön Alloys, NEVS, FraktService, Katoen Natie
<b>POSSIBLE BARGE OPERATOR</b>	AVATAR Logistics

<b>REQUIREMENTS FOR THE SERVICE TO START OPERATION</b>	<p>A cost efficient barge with high environmental standard</p> <p>Reasonable pilot and fairway dues and positive political decisions.</p> <p>A new container port is under investigation in the city of Trollhättan.</p> <p>A container IT-system linked to the major ocean carrier's standards.</p>
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Source: AVATAR Logistics AB

## 8 SUMMARY AND OUTLOOK

The development status of inland navigation and its modal share differ amongst the BSR countries. This has to do with river and weather conditions, but also with political decisions and knowledge amongst the industry. It's a typical chicken-and-egg situation: economically feasible services will only be set up if high and stable volumes can be guaranteed by the industry. Starting a business needs high investment cost in barges, but also in transshipment points. However if no inland waterway company exist, running a reliable service, no company will shift its goods from the flexible truck to a complicated and cost intensive barge. Cooperation amongst all actors will be needed to discuss all requirements, needs and expectations regarding new and sustainable barge services. These needs to be followed by political guarantees and long term business contracts to pave the way for secure investments and launch business.

Infrastructure development is needed to ensure access to the inland navigation network. This includes innovative last mile solutions, inland ports and transshipment points but also storage facilities. The long-term assurance of a good navigation status of the rivers is key to extend the operation time of services and to provide reliable planning.

Environmental aspects play a minor role regarding the choice of transport modes. To reach the European environmental goals, policy and administration have to work together with the industry to make IWT more competitive. Then the envisaged modal shift from rail and road to the more environmentally friendly inland waterway transport will happen.

For each country observations were made on how a new inland navigation service could look like. The analysis will be taken further for Lithuania, Sweden and Poland in EMMA activity 4.3. Business plans for the potential new services will be developed.

As for EMMA, the results illustrates once again the importance of the project's activities. Efforts regarding reliable planning (Elias system), communication about the potential of IWT and an exchange of experiences regarding, infrastructure development, barge designs, cooperation, transport policies come at the right moment.