INLAND NAVIGATION IN THE BALTIC SEA REGION

A BEST PRACTICE REPORT

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ABBREVIATIONS

BSR	Baltic Sea Region
FTIP	(German) Federal Transportation Improvement Program
IWT	Inland waterway transport
SSS	Short Sea Shipping

1 INTRODUCTION

Inland waterway transport (IWT) is important for serving transportation needs in Europe, especially in the Baltic Sea Region (BSR). With growing transport volumes between East and West and its insufficient road and rail infrastructure, it needs innovative and pragmatic solutions to cope with future requirements on transport facilities. Rivers, canals and also the Baltic Sea have huge capacity reserves, whereas road and rail infrastructure already is - in some parts of the BSR - overloaded.

IWT is characterised by its reliability, energy efficiency, environmental friendliness and major capacity for increased exploitation. However, IWT still does not play an adequate role in the transport system and is often not even considered as transport alternative by many forwarders and stakeholders in the sector. The question that needs to be answered is how the modal share of IWT can be increased in the BSR countries. The implementation of pilot activities, their promotion for wider acceptance and information that addresses the specific target groups is required and therefore part of the EMMA project with 20 partners from Finland, Germany, Lithuania, Poland and Sweden.

This report on IWT in BSR presents three selected best practice cases:

- heavy goods on the Elbe,
- container transport on the Rhine and
- cellulose on Saimaa Canal.

It summarizes the individual reports. For all cases using inland waterway transport in supply chains has created true added value for the shippers by saving costs, implementing environmental protection measures, dissolving bottlenecks and preserving local businesses of inland shipping companies. Each case also highlights solutions for individual challenges of involved companies.

The three best practice cases are based on reliable data collected in stakeholder interviews.

2 BEST PRACTICES TO ADDRESS IWT CHALLENGES IN THE BSR SUCCESSFULLY

2.1 General IWT challenges in BSR

The challenges for IWT in the BSR are as diverse as area itself.

In Finland, for example, there is hardly any intermodality due to a shortage of people and in Sweden there is a lack of terminals. These regional circumstances need to be considered in the long term planning. Furthermore, inland navigation in Sweden is new, so there is no integration between inland navigation and the other modes of transportation.

The most common IWT challenges[1] in BSR region are:

- Physical bottlenecks and problems caused by locks and ship lifts,

[1] For more information about specific bottlenecks, refer EMMA activity and reports 2.2.

- Insufficient fairway conditions caused by poor maintenance, limiting length, widths and draught of ships.

Special IWT challenges in the Nordic countries:

- Weather conditions (ice),
- Smaller transport volumes,
- Less dense IWT network,
- Insufficient River Information System applications (Sweden),
- Limited coverage of the area classified as inland wateways - in Sweden only the two lakes of Mälaren and Vänern, including the river from the high bridge at the entrance to Gothenburg to lake, up to Lake Vänern.

Special IWT challenges in central Europe:

- Partially low water levels and occasional periods of even more shallow water in rivers,
- Clearance height restrictions of relatively low bridges causing bottlenecks especially at high water level,
- Lack of new business locations for ports and terminals close to the water front,
- Competition for land.

2.2 Case study selection

This report on IWT in BSR presents three selected best practice cases – heavy goods on the Elbe, container transport on the Rhine and cellulose on Saimaa Canal – where using inland waterway transport in supply chains has proven to be successful.

The case study "**Heavy goods on the Elbe"** highlights three individual business models for transport of heavy goods on the river Elbe. The challenges are based on increasing dimensions and weight of cargo, exceeding the road capacities. An example is the trend among European manufacturers of plant and machinery elements that are growing ever more powerful and accordingly even larger and/or heavier. For the manufacturers along the Upper Elbe, IWT plays a major role in freight transport. By finding a way to ship the goods by barge, the companies were in a position to remain in their region and consequently the regional added-value and jobs were secured. Whereas project and heavy-lift shipments by road often require traffic lights to be uprooted, crash barriers dismantled, or sign bridges lifted, the transport of e.g. gigantic turbines, generators or elements for wind power units often proves simpler on the Elbe.

Container transport on the Rhine over the last decades is mainly influenced by external developments and conditions defined by as well nature as positive political decisions. The transport model cannot simply be transferred to other regions but it can serve as a prime example on how industry and politics work together in order to improve the conditions for IWT.

Using **IWT to ship cellulose on the Saimaa Canal** shows the advantages of using IWT to improve and innovate material handling. The benefits of investing in IWT are supported by a flexible and fast supply chain, efficient and customer oriented services and continuous development and dialogue with the stakeholders. This best practice example can therefore be seen as proof that connecting different transportation modes by using their main advantages can lead to superior advantages for every stakeholder involved in the supply chain.

3 DESCRIPTION OF CASE STUDIES

3.1 Heavy goods on the Elbe

3.1.1 Details and challenges

Units according to waterway classification Va - in terms of length and width of the inland barge - can be used on the whole river Elbe (free-flowing and regulated area). Pushing units according to class Vb (max. 185 m) can be operated (without uncoupling the formations) between Geesthacht and the Usti nad Labem (Czech Republic). In the lower river section, pushing units of class VI can also be used. However, these conditions are subjected to strongly changing maximum loading capacities. Water levels are highly dependent on the season and rainfall and they often reach levels making navigation on the waterway economically impossible, or even come to a complete standstill.

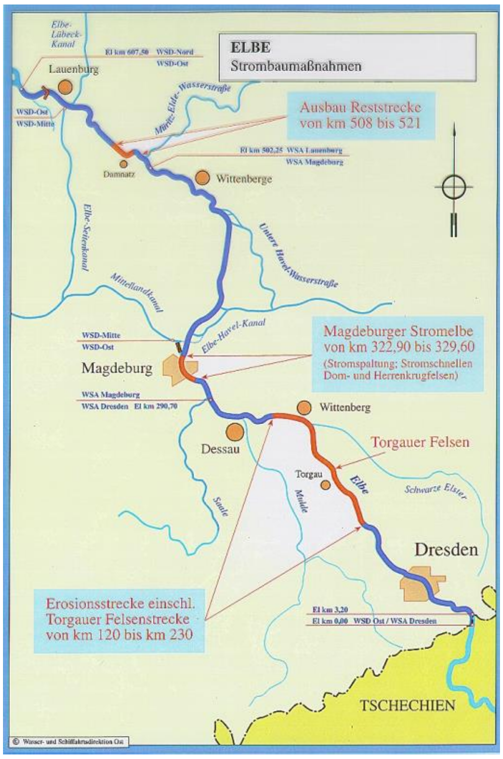

Figure 1: Deficiencies of the Elbe[2]

Source: Wasser- und Schifffahrtsdirektion Ost[3]

[2] Of the roughly 600 km from the German-Czech border up to Hamburg, 470 km offer satisfactory, navigable conditions. Left are the so called residual waterway sections. Apart from the 13 km long section between Dömitz and Hitzacker, where the groyne construction was not finished, the 110 km long residual waterway section between Mühlberg and Coswig is particularly concerned. In this section the sandy riverbed grows by about one cm in height per year, which leads to the river Elbe having buried itself by more than one meter.

The Elbe-Lateral-Canal plays an especially important role in the hinterland traffic of the Port of Hamburg aside the Elbe River itself. Given its status as a waterway class Vb, there are no further extension plans. The ship lift in Lüneburg-Scharnebeck however, is turning more and more into a bottleneck as it is starting to limit the efficiency of the entire Elbe-Lateral-Canal. By building an additional ship lift, the effectiveness of the hinterland traffic via this waterway connection would be improved immensely, as this would allow all vessel sizes to navigate on the canal. The new construction of the ship lift in Lüneburg-Scharnebeck is defined as priority project in the Federal Transport Infrastructure Plan (FTIP, period till 2030).

In the first and second best practice cases, two different manufacturers developed new types of oversized gas and steam turbines for power generation. Although these innovations gave both companies a competitive edge, they also led to a more complicated logistic chain. Main problems that occurred were the turbines' bigger dimensions and weight as well as increased handling costs due to:

- impossibility of using road transport to sea ports and
- weight restriction on bridges.

The first factory is situated in an industrial zone in the vicinity of a residential area in Berlin. The distance to the next inland port – BEHALA Berlin – is only 9 km. The transport route includes a bridge over train tracks. But the bridge only allows transport crossing with a maximum weight of about 250 t. The following parameters define the framework of the challenge of transporting the turbines to the German seaports:

- In the factory area, handling of the turbines is only possible by truck.
- The distance between the factory and the next waterway (Charlottenburger connection channel) is only approx. 500 m – and there are no bridges.
- Along this waterway there is no possibility for handling of goods.
- The loading draught of the Charlottenburger connection channel is 50 cm lower than the Westhafen channel.

The BEHALA Berlin (Westhafen) is able to handle goods up to 500 t. The connection of the port with the European waterways is outstanding and allows transport to all seaports in Northern Europe.

The second company is located in Görlitz close to the Polish-German-border. Their turbines have larger dimensions and a heavier weight: width 6 m, height 6 m, length 10 m, weight 280 t. The new generation of steam turbines with a rising of weight from 200 t to 280 t requires another size of mobile cranes with approximately 30% higher costs. Further, the transport from factory to seaports (Hamburg, Antwerp or Bremen) is not possible by truck. Even reaching the next inland port in Dresden is nearly impossible. The main challenge is the restricted capacity of the highway from Görlitz to Dresden (esp. bridges and loading gauge). Due to bridge clearance, cargo transports of these dimensions are not possible. The heavy weight also leads to higher handling costs in the Port of Dresden.

In general, the market for transport of heavy cargo is limited. Only few customers are producing goods with a weight above 100 t, a width above 3.60 m or a height above 4.00 m. Permanent permissions

[3] Cf. Wasser- und Schifffahrtsdirektion Ost / Presentation: Bundesministerium für Verkehr, Reststrecken Elbe (residual waterway sections Elbe River), principles for the functional statement on the maintenance of the Elbe River between Czech Republic and Geesthacht with explanations, May 2005.

exist for road transports with a width till 3.00 m (and on defined routes till 3.20 m) in Germany. Smaller or lighter goods can be transported without special requirements on road. The market for these smaller goods is substantially larger. This is mainly due to the history of mechanical engineering and plant construction industry in the Elbe region. However, the modal shift of these goods from road to water is difficult. Transport by truck is usually more favourable. The quantity and size of goods often does not fill a complete ship, leading to the challenge of operation below capacity and high handling costs. The basic idea of the third best practice case on Elbe River is to reduce cost per unit by combining different kinds of goods.

3.1.2 Solutions

In **Berlin** the port operator developed a transport solution from the factory to the port, which enables the deliveries in accordance to the requirements of both customers and authorities.

The current solution has the following components:

- Defined road route for heavy cargo (short distance, low restrictions);
- Construction of a special designed RoRo-Ramp on the channel by the port authorities;
- Construction and building of a new type of the RoRo-Barge called URSUS:
    - Admission for transports in zone II
    - Dimension: length 64,50 m, width 9,50 m
    - Draught max. 2.56 m (zone 2), 3.06 m (zone 3)
    - Bearing capacity 1,200 t
    - 8 tanks for 800 tons ballast (ballast pumps with a capacity of 200 m3/h)
    - Crane on board with 25 t capacity (for mobile ramp)
    - Bow-thruster 265 kW, two gas oil generators (74 kW + 400 kW)
    - Sonic deep finders (stern/bow)

The new transport concept in Berlin allows the shipper to develop his product range without limitations. This secures the maintenance of the production side in Berlin and corresponding jobs. The port operator BEHALA becomes an important part in the shipper’s logistic chain and ensures the utilization of the existing equipment for heavy cargo. Based on long-term contracts, this solution brought a win-win-situation for the shipper and logistic provider, high customer loyalty and reliable reinvestment opportunities.

Figure 2: Barge “URSUS” with turbine on the trip from ramp to port

Source: BEHALA

The team working on the second best practise case in **Görlitz/Dresden** developed a two-step solution:

1. Improvement of road conditions (between Görlitz and Dresden)
2. Investment in Port of Dresden

The road transport between Görlitz and Dresden was made possible by simplifying the process of obtaining permissions, standardizing the equipment and defining a fixed route free of physical bottlenecks. The gas turbines are transported in three parts (stator in two pieces and rotor as one piece).

The turbine segments have to be assembled on arrival at the inland port. Afterwards a test run of the turbine has to be done to verify the quality of the product. For this, the complete turbine has to be transported to the designated place for handling. In order to meet these necessities, an assembly hall with high floor loading capacity, heating, an indoor crane (wrecking crane with a capacity of 16 t) and tracks for lifting gear had to be constructed by the port operator. As a result, the turbine can be delivered in good quality to the oversea customers.

Figure 3: RoRo-Ramp in Dresden with turbine on truck

Source: HHM/ S. Kunze

As for the third best practice case, **different kinds of goods were combined** to reduce cost per unit. When combining different types of cargo, the following conditions have to be considered: closing time of the sea port, the destination terminal and the difference in storage charges between sea ports as these are normally higher than in the inland ports. To combine project cargo with bulk or break bulk, also the characteristics of the different cargo types are important. It is necessary to protect the goods from damages, but also from dust and other harmful materials. Logistic providers organize transports of heavy cargo as "groupage freight". The combination takes place in three variations:

1. Combination of different project cargo
2. Combination of project cargo with other goods (bulk, break bulk)
3. Transport of project cargo in regular shipping services

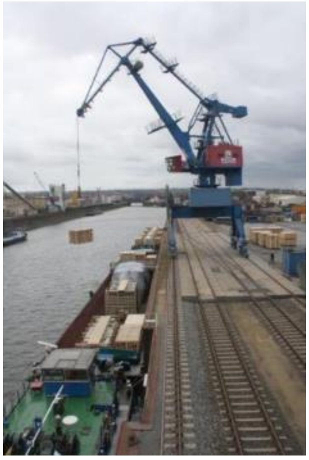

Figure 4: Combination of different project cargo in the port of Dresden

Source: Sächsische Binnenhäfen Oberelbe GmbH

The combination of project cargo allows a high utilization of transport means and thereby a reduction of transport costs. That leads to inland navigation becoming more competitive to road transport. Installing a regular line service may be the best solution if a reliable quantity of goods and waterway network are given.

3.2 Container transport on the Rhine

3.2.1 Details and challenges

Container transport on the Rhine grew dramatically since the early 1980´s. This resulted from general developments in the international container industry as well as favourable waterway conditions on the Rhine itself.

The depths of the Rhine River differ in the regions Upper-Rhine, Middle-Rhine and Lower-Rhine due to natural conditions. According to the European Agreement on Main Inland Waterways of International Importance (AGN Agreement), the largest possible vessels can be used on the Rhine are the large Rhine Vessel and large barge combinations the Extra-long Large Motor Vessel Type 3 (135 m long, up to 340 TEU) and the Pushed-convoy (270 m long, up to 540 TEU). Several ports along the Rhine are available for loading and unloading of goods and are located in a good strategic and navigable position as they have direct access to the river. Every year around 330 million tons are transported on the Rhine from Switzerland to its confluence with the North Sea. The Rhine axis is thus responsible for approximately 2/3 of European inland waterway transport.

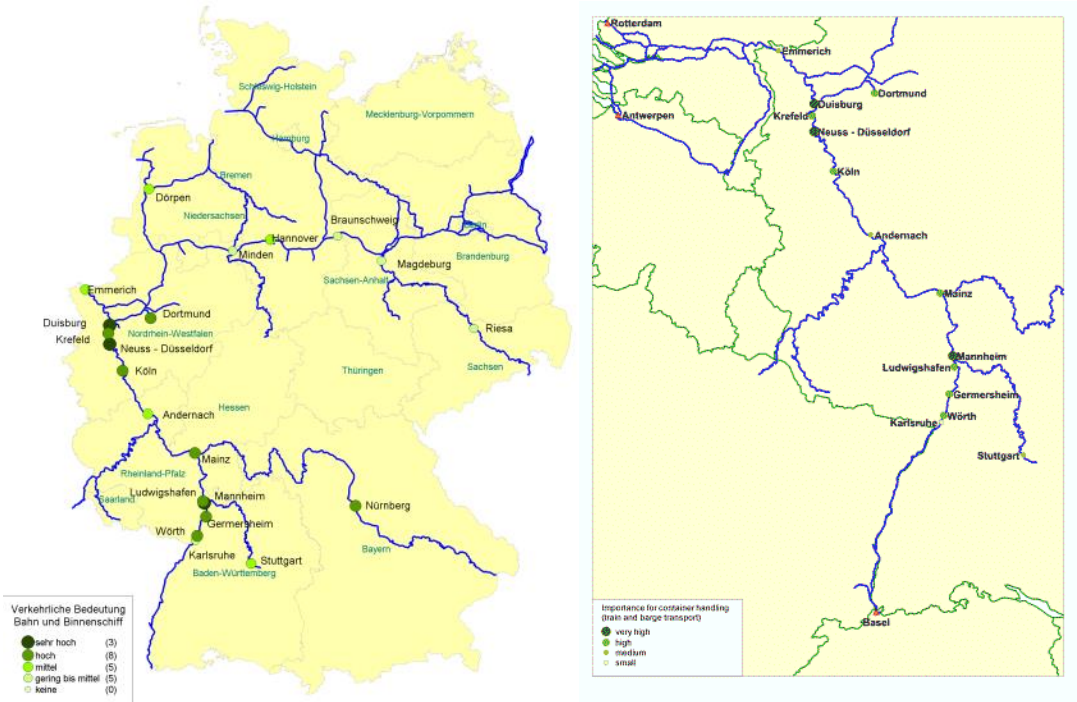

Figure 5: The network of the river Rhine

Source: PLANCO Consulting GmbH

In the 1990´s the size of barges increased very fast leading to enhanced efficiency, lower rates and a higher demand in IWT. The increase in container traffic opened new business opportunities for barge operators as well as private railway operators. In reaction to increased volumes hinterland terminals had to be expanded.

The early 2000's brought even bigger barges and container volumes. Linking rail transport and IWT became even more significant. New opportunities of data management and web connectivity lead to the establishment of intelligent and complex logistical system. Stakeholder recognized even more the locational advantage of the Rhine due to favourable transport connections.

3.2.2 Solutions

Not only the condition of the Rhine as a waterway and the development of economical hot spots along its shores led to an increasing demand in IWT, but also massive investments in strategically located terminals caused by the German Funding Scheme for not-state-owned Combined Transport-Terminals (Richtlinie zur Förderung von Umschlaganlagen des Kombinierten Verkehrs nicht bundeseigener Unternehmen).[4]

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[4] http://www.bmvi.de/SharedDocs/DE/Anlage/VerkehrUndMobilitaet/Schiene/foerderrichtlinie-von-umschlaganlagen-des-kombinierten-verkehrs.pdf?__blob=publicationFile (German)

Inland ports invested in (container) storage and handling equipment or let areas for industrial and logistical developments enabling shippers to build facilities close to intermodal terminals with a short last/ first mile. Some terminals now offer services as customs declaration, repairing, trucking, and packing to their customers. Networks of IWT terminals build up business models dedicated to the same goals leading to strong but fair competition on the Rhine with an overall increase in productivity, reliability and economy of scale.

Today only a few business locations are left between Bonn and the Netherlands. Development projects for terminals and logistic areas often conflict with NGOs and residential areas due to the popularity of real estate close to the waterfront. This can lead to emission restrictions for the surrounding manufacturers. Furthermore, inland ports do not necessary receive prioritized treatment in the urban planning process.

Inland ports along the Rhine used the opportunities provided by the German funding programme for intermodal terminals and adapted to the general trends in container business by adding new business models for container handling.

3.3 Cellulose on Saimaa Canal

3.3.1 Details and challenges

The Saimaa Canal connects Lake Saimaa with Gulf of Finland near Vyborg, on the Russian side of the border. It extends 42.9 km, of which 23.3 km are running through Finland. Finland administers the entire canal and is in charge of leasing the Russian side of the canal as well. The vessel size is limited due to the capacity of the Saimaa canal locks: max. length 82.5 m, max. width 12.6m; max. height 24.5 m.

In Saimaa there are nine main ports and a few smaller ports that handle random shipments. Main goods are raw wood, cellulose, paper rolls, wood pellets, metal products, fertilizers and bulk materials (e.g. cement, salt and talc).

Figure 6: Main cargo ports in Saimaa

Source: Saimaa Terminals Oy

Because of weather (ice) conditions and annually scheduled one month maintenance period of the locks, Saimaa is open for vessel traffic approximately 300 days per year.

Figure 7: Icebreaking in Saimaa

Source: RCNK/ J.Hasu

The Company that uses IWT trough Port of Joensuu exporting cellulose via Saimaa Canal is StoraEnso Enocell situated in Uimaharju (approximately 50 km north from Joensuu). Their mill produces high quality cellulose and their main market areas for export products are central and western Europe as well as Asia. Cellulose units are of standardized size and designed especially for efficient transportation and material handling purposes. In Port of Joensuu the material handling and shipping operation is done by the logistic operator Joensuun Laivaus Oy. From mill to port cellulose comes 60% by trucks and 40% by train.

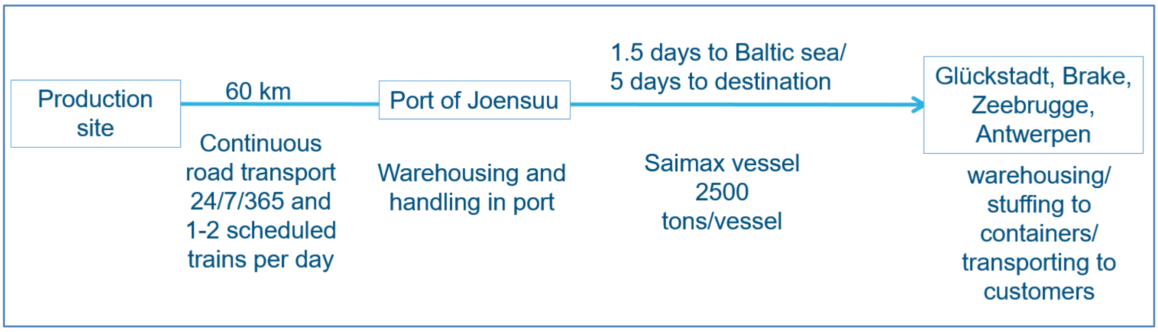

Figure 8: Cellulose from North Karelia to Germany/Belgium

Challenges for IWT in Saimaa include:

- Small operating fleet (approximately 20 to 30 ships – Saimax vessels)
- Unfavourable natural conditions (ice)
- High costs for pilotage
- Regular annual maintenance time of locks
- Cargo limitations to 2500 t due to a maximum draft of 4.35 m
- No liner traffic
- No feeder traffic

- No availability of container or mobile cranes at Saimaa ports
- No combination of cargo from different shipping businesses

3.3.2 Solutions

In IWT Enocell uses mainly Saimax type vessels which can carry approximately 2,500 t of cargo. Since the mill site is very close to the inland port, reaction time is very short and the factory can produce and deliver cargo in short notice. The usual amount of departures of cellulose shipments from Port of Joensuu is approximately one vessel every two weeks.

Operational tasks have been divided clearly so that every actor is in charge of certain tasks in the whole supply chain: StoraEnso has their own centralized logistic department being in charge of vessel booking, the Enocell mill produces and delivers the pulp to the port, whose Supply Chain Department handles delivering the product to the customer. Vessels are used on an on-demand basis and special handling equipment has been set up at the port (e.g. hydraulic harbour crane that can handle pulp up to 600 t/h, automatic loading equipment that can easily crab pulp units from the rounding wires, pulp bale clamps that can carry six units (12 t) from storage with one grab).

Figure 9: Semi-automatic loading equipment and dissolving pulp bales

Source: RCNK/ J.Hasu

There are several reasons, why choosing IWT in this pilot case is a good option:

- Cargo hold of Saimax type of vessel is optimal for transporting cellulose
- Close proximity to the Port of Joensuu making shipping orders under a week's notice possible
- Reliability of IWT shipping schedules
- Safety and eco-friendliness of IWT
- Cost efficient door-to-door transport solutions
- Flexible and fast supply chain

4 CONCLUSIONS

As IWT in Central Europe differs significantly from the northern regions, the chosen best practise cases each illustrate a different aspect of utilizing inland barges to optimize businesses.

	SAIMAA	ELBE	RHINE
CONTAINER TRAFFIC	NO	YES	YES
HEAVY PROJECT CARGO	SMALL SCALE	YES	YES
FEEDER VESSELS TO SEA PORTS	NO	YES	YES
TIME SCHEDULED VESSEL TRAFFIC	NO	YES	YES
DIRECT CUSTOMER SHIPMENTS	YES	(YES)	(YES)

Figure 10: Different dynamic situation in waterways in best practise cases

Waterways in the BSR mostly do not provide the same favourable conditions for inland navigation as the Rhine. Developing large vessels the same size as the Large Rhine Vessel and accumulating a massive terminal capacity is not realistic. But the development of IWT on the Rhine is based on strategic investments into intermodal facilities, mainly in inland ports, and on enabling these ports to reinvest their profits. The German Funding Scheme for not-state-owned Combined Transport-Terminals has been copied in several other European countries and is also a reference for today's TEN-T funding.

The best practise case **Container transport on the Rhine** shows the necessity of ports to be in charge of infrastructural development. Financial independence was gained by renting or leasing land and profits were redirected into terminal infrastructure.

The best practise case **Cellulose on Saimaa Canal** shows continuous improvement and innovations in material handling by using IWT. The solution approach is unique and it is specially designed to the industry located in Saimaa area (e.g. the Saimax class vessel). An ideal solution was found for customers situated in a suitable operational distance by combining this short first-mile advantage with vessels operating in seaport hinterland traffic. This results in minimizing logistical costs, the possibility of door-to-door transport to customers and reducing handling time. Cargo is transported directly from the lake area to customers located near inland waterways in Europe, passing sea ports in Finland and also in Europe. Therefore, this mode of transportation competes directly with vessel traffic from sea ports.

The best practise case covering the **Elbe** clearly highlights project and heavy-lift cargo transport on inland waterways having its advantages due to high transport capacities, environmental friendliness and reasonable rates in relation to ton-kilometre performance. Even if it is not in every case possible without trucks, IWT contributes to relieving roads and bridges as far as the next transhipment hubs on important traffic networks. Trucks are only the very last mile solution.

Project and heavy-lift cargo transport on the Elbe is feasible but with some limitations. While shipments of high-volume goods with heights of up to 8.0 m between Dresden and Hamburg are possible almost throughout the year, further conditions need to be met. Low water levels repeatedly cause bottlenecks on shipments for port operators and shipping companies. The new Elbe Masterplan (Gesamtkonzept Elbe[5]), approved in January 2017, will support reliable and economically viable shipping on the upper reaches of the Elbe.[6]

Common advantages in all three best practise cases:

- Cost advantage from the shortest possible first and last mile transfer
- Prevention of problems caused by physical bottlenecks in other transport modes
- Generating added value in transport chain
- Lower storage and handling costs for inland ports and terminals
- Minimizing disadvantages of transport caused by noise, emissions, congestion, accidents and wear and tear of roads and tracks)
- Local jobs securement

This report described physical and organizational challenges as well as best practices for IWT, aiming at showing the feasibility of this mode if small efforts are made. However the areas reveal also further IWT related best practices in the broader sense, as described by the Interreg project TransBaltic's report[7] of 2011. In there the author describes IWT software to calculate CO2 emissions for combined transport, Economic and ecological operation of inland barges with flow meters, the German ELWIS-Notices to Skippers system, the German integrated planning law as well as the interdisciplinary research programme on climate change KLIWAS.

Transport volumes in the BSR are expected to grow significantly in the next decades. Still, road transport is the fastest growing segment which creates growing problems: insufficient road capacities, increased congestion, pollution, accidents and noise burden. The EMMA project acts as counterbalance to this trend, focusing on lifting inland waterway and river-sea transport (IWT) potentials in the BSR.

In some BSR countries (DE, SE, PL, FI, LT) IWT has a potential to reduce the challenges described. In all countries infrastructure bottlenecks (depth/width of waterways limit the size of usable ships and by that the competitiveness of IWT to other modes of transport) hamper IWT development - innovative concepts like the three best practise cases presented in this report are needed.

[5] More information on the Elbe Masterplan: www.gesamtkonzept-elbe.bund.de
[6] HHM (2016) Port of Hamburg magazine 3.16, heavy cargo
[7] TransBaltic (2011): http://www.transbaltic.eu/wp-content/uploads/2011/08/Inland-transport-in-the-BSR-Transport-System.pdf

5 THE VOICE OF THE INDUSTRY

> *"Economic Order Quantity, optimal transport frequency and knowhow in material handling are the key success factors why the Inland water way is good way of transporting. Also the cost of first and last mile is benefits for Inland water way transport (…)."*
>
> Ari Mononen, Managing Director, Scanpole/Iivari Mononen Group

Scanpole is one of the leading pole producers in Europe. The brand combines the strengths of two forerunner companies: Burt Boulton & Haywood Ltd – the longest established timber preservation company in the world and Iivari Mononen Oy – a Finnish family business globally known for high quality poles from Scandinavian pine forests. Scanpole products are sold worldwide, with the main export areas being the Middle East, Northern Africa, and Western Europe. Production plants are situated in Finland, UK and Norway. In addition, Scanpole has a sales company in Sweden. Scanpole is a part of the Iivari Mononen Group. The other members of the family company are PrimaTimber Oy (impregnated sawn and planed timber products) and Exsane Oy (service operations).

> *"Scheduling of vessels has been very easy, because vessel that operates in Inland water transport is easy to get. Advantage compared to sea ports is that there is always free space in inland port were unload the cargo. That means no waiting and demurrage costs for the shipper. This means excellent supply certainty for our customers. (…)"*
>
> Risto Kuittinen , Logistic Manager, Embra Oy/CEMEX

CEMEX is the leading importer of cement in the Nordic countries. Embra OY has been part of CEMEX since 2005. EMBRA OY is Finland's largest importer of bulk cement. Their products are used in Finland by the ready-mix concrete, concrete product, concrete element and dry product industries.

> *"For our company Lake Saimaa inland water way transport is not seen as separate transport mode but considered as equal shipping mode to our sea port shipments. When the plant is situated at the lakeside, shipping via Lake Saimaa is the natural, most efficient and environmentally friendly mode of transport. Direct shipments from our inland plant to our customer's terminals reduce the number of handling of our cargoes preserving the cargo quality and keeping the intermediate handling and storage costs down."*
>
> Anna Näsi, Maritime Transport Manager, Yara Finland Oy

Yara Finland Oy is a subsidiary of Yara International ASA. Yara Finland produces special tailor-made fertilizers, industrial chemicals and products used in the protection of the environment. The company has four production plants in Finland: Siilinjärvi, Uusikaupunki, Harjavalta and Kokkola. In addition, Yara has a phosphate mine at Siilinjärvi and Research station in Vihti. Yara employs about 1 300 people in Finland.

“For certain combined transports, there is a maximum total weight of 44 t for trucks transporting goods to the nearest rail station on inland port. This should be valid for all kinds of goods as it would lead to a significant shift potential.”

Authorized representative Jes-Christian Hansen, HaBeMa Futtermittel GmbH & Co KG

“Shippers with smaller transport volumes that do not fill a complete barge, benefit of a regular shipping service for project and bulk cargo. The combination of heavy and high volume goods leads to an optimized vessel utilization.”

Sales manager Annett Hütter, Imperial Baris GmbH, branch Dresden