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RESULTS OF EMMA EXTENSION

- Enhancing Inland
Navigation in the Baltic Sea
Region



EMMA Extension 2019-2021

Interreg Baltic Sea Region Programme Project

Flagship project of the EU Strategy for the Baltic
Sea Region



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1 EMMA EXTENSION PROJECT

The EMMA Extension Project (08/2019-06/2021), aims at enhancing inland navigation in the Baltic Sea Region by supporting digitalization in inland waterway transport (IWT) and implementing new logistic concepts in the Baltic Sea Region.

The extension project is based on the results and recommendations of project EMMA (2016-2019), which brought inland navigation to a wider national and European agenda, strengthened its voice and successfully demonstrated feasibility of potential inland waterway transport services in the Baltic Sea Region. The EMMA Extension focuses on next steps towards further market deployment of IWT by capitalizing on the results and partnership of project EMMA and implementing practical IWT solutions.

The project is led by Port of Hamburg Marketing Reg. Assoc. and is implemented together with seven project partners from five Baltic Sea Region countries. The total budget available amounts to EUR 999 thousand of which EUR 778 thousand is co-financed by the Baltic Sea Region Programme (ERDF). It was approved as Flagship of the EU Strategy for the Baltic Sea Region under its Policy Area Transport.

Despite the COVID Pandemic, the EMMA Extension project has been able to support digitalization in inland waterway transport and implement new logistic concepts in the Baltic Sea Region with great success. Some main results are shortly described in the following chapters by country. Links to further information and material/contact persons is provided in each chapter in question.

Further information on EMMA Extension project:

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2 LITHUANIA: FIRST CARGO TRANSPORTATIONS BY IWW- VESSELS FROM KLAIPEDA SEAPORT

During the EMMA Extension project, several pilot sailings by IWW vessels have taken place in Lithuania, where the main inland waterway is river Nemunas and Curonian lagoon from Kaunas to Klaipeda. Before the EMMA Extension, there had not been any cargo transportations by inland waterway vessels from Klaipeda seaport.

The first commercial sailings between Klaipeda-Kaunas-Klaipeda by barge took place in spring 2019 when, in total, 33 containers were delivered. In May 2019, sailings continued with the transportation of 38 containers. At the end of May and early June 2019, 20 more containers were transported. Altogether 91 containers were transported by inland waterways and the total distance travelled was 1400 kilometres.

Following these first test runs, the Lithuanian government has provided funding for improving inland waterways. This includes 2,6 million euros' investments for purchase of machinery for maintenance works in 2020 – 2021 and investments worth 27 million euros for E41 fairway modernisation works in

2021 – 2023, increasing the depth of inland waterway. In addition to containers, the future aim is to move also other type of transportations into inland waterways, including transportations of grain, scrap metal and other bulk cargo.

The fourth sailing in spring 2021 was therefore a huge success as the most powerful autotransformer in the Baltic States was delivered to Lithuania for company Litgrid (Lithuanian electricity transmission system operator). After being assembled and tested, it was transported to the port of Derince by the Sea of Marmara and loaded on the ship which brought the autotransformer to Lithuania after covering more than 7 000 km via the Sea of Marmara, the Mediterranean Sea, the Atlantic Ocean and the Baltic Sea.

Domestic transportation of a huge cargo weighing 164 tons is an unusual event for Lithuania. After the delivery to Klaipeda, the autotransformer was loaded onto a barge at the Klaipeda container terminal. It took three days for the barge of the Inland waterways authority to transport the autotransformer through the Curonian Lagoon and the Nemunas river to Kaunas Marvele Cargo port. In Kaunas, the cargo was transferred to a 39-meter long trailer and special platform assembly, which, assisted by another trailer, was transported to the LitPol Link converter station in Alytus district.



In the media it was stated the arrival of a 164-tonne autotransformer was a crucial step towards energy security, as the transformer will allow power to arrive from neighbouring Poland to Estonia, Latvia, and Lithuania via the LitPol link. (<https://www.lrt.lt/naujienos/lietuvoje/2/1409029/baltics-step-closer-to-leaving-moscow-controlled-power-grid>)

In addition to successful pilots that have gained a great media attention in Lithuania, The EMMA Extension pilot cruises have helped to identify the areas that need to be fixed when it comes to cargo transportation by inland waterway vessels. For instance, in 2021, the Klaipeda seaport will upgrade their

computer systems to include inland waterway vessels for cargo operations. Furthermore, a container distribution terminal will be built in Kaunas and a new barge is expected to be built and commissioned in 2021.

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3 POLAND: CONTAINER TRANSPORT AND RIS PILOT

3.1 First commercial container transport in River Vistula

As part of the EMMA Extension project, the commercial container transport took place on the Vistula River for the first time in history. Containers were transported from the seaport of Gdańsk to one of the factories in the Kujawsko-Pomorskie Region.

On April 6, 2021, the commercial transport of containers with cargo for one of the factories located in the Kujawsko-Pomorskie Region set off from the Port of Gdańsk. After crossing the lock in Przegalina, a barge and a pusher entered the lower Vistula River and after about 15 hours of cruise reached Chełmno. On April 8th, on the Vistula wharf in Chełmno, cargo was transhipped. Import containers were placed on trucks, while goods intended for export were loaded onto a barge. After 10 hours, the barge with pusher returned to the Port of Gdańsk, from where the containers were transported to sea vessels. The entire operation, during which 12 containers (approx. 300 tons of goods) were transported, took 4 days.

The main goals of the pilot were to promote inland waterway transport in Poland as the most economical, safe and environmentally friendly mode of transport, to increase knowledge on the use of inland navigation services and infrastructure among cargo owners and shipping companies, and to promote activities related to the planned construction of the Bydgoszcz logistics hub and recognition of it as a hub of the TEN-T core network. One important goal was the practical verification of water transport possibilities and reloading goods that go from seaports into the interior of the country as an alternative to road or rail transport. In this case, inland waterway transport can be included in the supply chain, which in the future could run through the logistics center in the heart of the Kujawsko-Pomorskie Region - the Bydgoszcz Logistics Hub. Thanks to studies prepared by the voivodeship self-government, such as [A location study for the multimodal platform Bydgoszcz-Solec Kujawski](#) and [The Last Mile Concept for the Bydgoszcz Logistics Hub](#), the parameters of the future port have been determined and the needs of economic entities from the region have been identified in terms of optimization of logistics operations and the use of inland navigation.

The organization of EMMA Extension cruise fitted perfectly into the national transport policy and the activities carried out by the Ministry of Infrastructure to promote the use of alternative modes of transport and the transfer of some cargo from road to rail and water transport as well as building modern inter- and multimodal terminals that will improve the existing supply chains. This issue is also important in the context of the planned revision of the TEN-T Network and the possibility of including international

waterways and the Bydgoszcz Logistics Hub. In addition, the promotion of water transport will also indirectly justify the necessity and legitimacy of developing strategic programs for the Vistula and the Oder River.



KUJAWY POMORZE



CONTAINER TRANSPORTATION ALONG THE LOWER VISTULA

6TH-9TH OF APRIL

Day 1. (06.04)

- loading of the barge at the Port of Gdańsk
- 12:00 – start of the cruise
- abt 3:00 – passage through the Przegalina lock
- technical night break near Tczew

Day 2. (07.04)

- continuation of the cruise
- the barge reaching the quay of Chełmno

Day 3. (08.04)

- 10:00 – press release
- start of transshipment – reloading import containers onto trucks and loading new export containers onto the barge
- abt 6:00 – start of return transportation

Day 4 (09.04)

- reaching the Port of Gdańsk
- unloading and reallocation of containers to sea export terminals






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wistacargo.kujawsko-pomorskie.pl



Organizator:



Patronat:



Partnerzy:

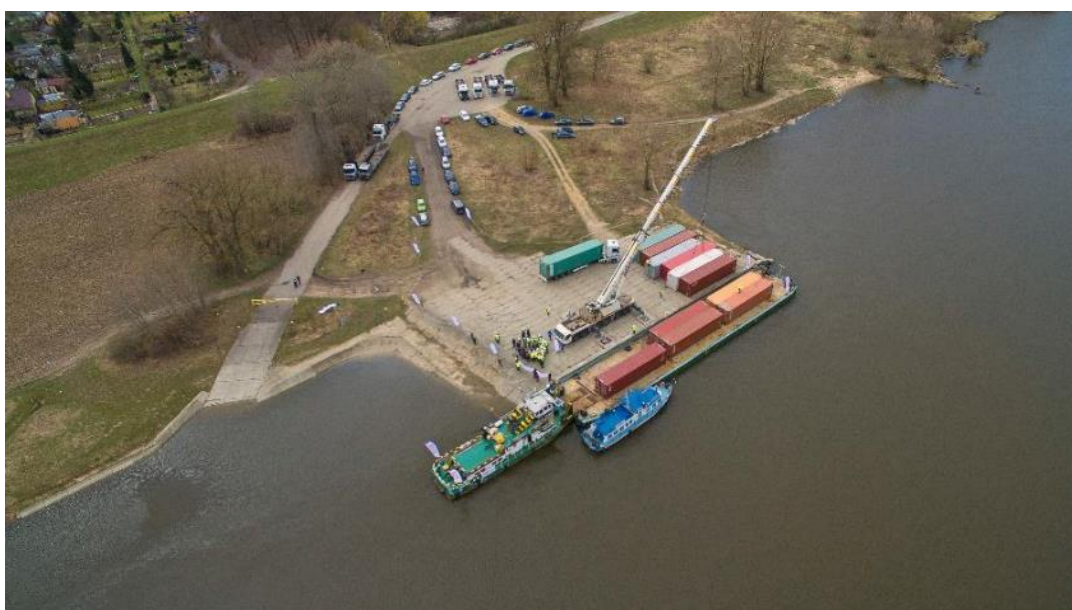


Along with wide media coverage ([read more here](#)), the cruise resulted in very good feedback from many actors interested in regular inland navigation. The key argument for customers to participate in the pilot was the environmental dimension of this form of goods transport and its innovation on the local market.

The efficiency of the set consisting of, for example, two barges carrying 30 containers weighing 24 tons, is much greater than that of transporting cargo by trucks (see table below):

Cargo transportation of 30 containers (720 tons) route: Gdańsk-Chełmno (150 km) and back	
INLAND WATERWAY TRANSPORT	TRUCK TRANSPORT
Transport of cargo by 1 set consisting of a pusher and 2 barges	Transport of cargo by at least 30 trucks
1 captain and 1 crew member	The need to employ 30 drivers
Fuel consumption on the route Gdańsk-Chełmno- approx. 750 liters	Fuel consumption on the route Gdańsk-Chełmno-1,575 liters (with the average fuel consumption of a truck 35 l / 100 km)
Average fuel consumption per one 40-foot container on the Gdańsk-Chełmno route - 25 liters (including the operation of the aggregate)	Average fuel consumption per one 40-foot container on the Gdańsk-Chełmno route - 52.5 liters
Fuel consumption during the return way Chełmno-Gdańsk - approx. 216 liters	Fuel consumption on the Chełmno-Gdańsk return way - 1575 liters
Average fuel consumption per one 40-foot container on the way back - 7.2 liters	Average fuel consumption per one 40-foot container on the way back - 52.5 liters

The potential of this solution raised the interest among domestic and foreign shipowners and representatives of the industry as well as entrepreneurs operating in the Kujawsko-Pomorskie Region.



FACTS ABOUT THE PILOT CRUISE:



Emma Extension pilot - Vistula Cargo

EMMA Extension project partner: *Kujawsko-Pomorskie Region*

Dates: April 6th-9th, 2021

Cruise patronage: *Ministry of Infrastructure, Polish Waters*

Partners: *Port of Gdansk, Polish Regions Association of Baltic-Adriatic Corridor, Polish Regions Associated along E70 waterway*

The cruise in numbers:

- Total distance: 300 km
- Volume: approx. 300 tons
- Number of 40-foot containers transported: 12
- Container reloading time in Chełmno: approx. 2 hours
- Fuel consumption:
 - during upstream cruise on the Gdańsk-Chełmno distance (set consisting of the Tur pusher* and the Galar 2 barge, 150 tons of cargo - six 40-foot containers) - 850 litres, including the operation of the aggregate at stops
 - on the way back (downstream) with a similar load - 270 litres
- Average fuel consumption during the whole cruise - approx. 42 litres / hour.
- Possible time of reaching the barge from the Port of Gdańsk to Chełmno:
 - upstream 15 hours,
 - downstream 8 hours.
- Load: medical, furniture, food sector

*According to the registration document of the Tur W-01 pusher, it can push barges with a total capacity of up to 2,000 tons. The amount of fuel used with a larger load and the number of barges pushed does not change significantly.

Following conclusions and next steps were written down after the pilot:

Conclusions:

- The launch of regular inland shipping on the lower Vistula River would be a real boost to the economic potential of the Kujawsko-Pomorskie Region - mainly in the context of the planned construction of the Bydgoszcz Logistics Hub.
- Inland water transport is the cheapest, most efficient and environmentally friendly branch of transport, which according to EU regulations and guidelines should be developed to complement the country's transport system.
- In the short-term policy, consultations should be held with vessel operators and the Regional Water Management Board regarding the effectiveness of dredging and regular maintenance of the waterway to maintain the minimum required parameters for the sustainability of inland navigation. The regulatory buildings on the lower section of the Vistula (groynes) should be rebuilt and "bottlenecks", i.e. places which are troublesome for navigation (rapids, shoals) should be removed.
- Once the technical conditions of the trail are ensured, it should be fully marked by setting up shore and floating signs, introducing radar navigation, introducing signs informing about clearances under bridges, as well as adapting the waterway for night navigation.
- Future loading and unloading should take place directly at the main container terminals of the Tricity Ports, i.e.: DCT Gdansk, BCT and GCT Gdynia.
- In order to ensure regular transshipment at the wharves in the Kujawsko-Pomorskie Region, adequate wharf length and height must be provided to guarantee the safety of mooring the river sets.
- In addition, a permanent self-propelled port crane should be provided - which will affect the lack of need to mobilize and set up a crane and the versatility of handling (containers, bulk cargo, conventional cargo). A reachstacker truck should be provided as a supplement.
- It is necessary to improve the organization of local facilities of container transporters without the need to mobilize and commute to the transshipment terminal and to create an effective storage and warehousing facility with the possibility of consolidation and picking of cargo (containers, bulk cargo, conventional cargo).
- Media interest in the topic of inland waterway transport has been very high. Promotion and information activities on the benefits of economic use of rivers should be continued with the involvement of competent institutions and authorities.

Next steps:

- Sending the report to the authorities responsible for transport infrastructure and water management, i.e., the Ministry of Infrastructure and the State Water Management Authority Polish Waters, in order to include the results in the Programme for the Vistula River.

- Disseminate the report to all parties interested in the economic use of the potential of Polish rivers and lobby for an increased share of inland shipping in the national transport system (companies from the region, logistics operators, forwarders, seaports in Gdansk and Gdynia, etc.).
- Lobbying for the construction in the Kujawsko-Pomorskie Region of a modern logistics center capable of handling inland shipping - the Bydgoszcz Logistics Hub.
- Establishing a Council of Stakeholders interested in the establishment of the Bydgoszcz Logistics Hub
- Establishing a Project Team responsible for the construction of the Bydgoszcz Logistics Hub - and ultimately a special purpose vehicle with a majority share of the Voivodeship, with the participation of other self-governments interested in the establishment of the hub.

Further information:

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3.2 Installation of bridge clearance applications in Oder River

Another Polish EMMA Extension pilot implemented automatic readings of safe clearances under bridges across the Oder River in Szczecin. Measurement and telemetric sensors and information boards were installed on two selected bridges to safeguard a very accurate measurement of clearance under bridges and to indicate the current value of the clearance to skippers in real time.

Due to often limited clearance under bridges in the operation area of the RIS-ODER system, the clearance is particularly important information for captains of inland vessels, allowing them to make the right decision on passing under the bridge. Thanks to the information boards that will display the current value of a clearance under a bridge, the navigation safety will increase significantly. Another key element is the logistics aspect as it will allow to shorten the passage time of a vessel. The knowledge of the current clearance may also aid the ship's loading process and help to adapt the height of the cargo. In the long run this will lower the cost and make the transport more profitable for the operators.

River Information Services (RIS) stand for the harmonised information services which support traffic and transport management in inland navigation including interfaces with other modes of transport. RIS-ODER consist of location of sensors in the RIS area (including CCTV cameras, AIS stations, hydro-meteorological stations) serving as the primary source of information; operation of the RIS Center, where information is processed; free provision of electronic navigation charts for inland navigation (IENC); issuing messages for captains (NtS); as well as vessel tracking and tracing (VTT). The implementation of automatic readings of safe clearances under bridges across Oder River as part of the EMMA Extension project improved navigation safety in the area covered by the RIS system. Even though the investments were implemented in the Szczecin area, it will have an influence on the route planning for cross-border shipments and operations between the Polish and German inland waterway systems.

Watch the video about the EMMA Extension's "Bridge Clearance Devices" pilot activity here:
<https://www.youtube.com/watch?v=xorTfD5xOho&t=4s>

Further information:

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4 FINLAND: IMPLEMENTING SMART FAIRWAY IN SAIMAA

The project EMMA showed that central European RIS applications will not be the solution for Finnish IWT. Finnish systems used are VTS and smart fairway solutions and another system is not feasible to install. EMMA proved that functional extensions could support the increase of safety in navigation and simplify transport management solutions. The aim of the EMMA Extension pilot in Finland was thus to install a smart fairway solution in Saimaa.

As a part of the EMMA Extension project, 34 smart buoys were installed in the Saimaa deep fairway, which is Finland's most important inland waterway for commercial shipping. The implementation took place in class 2 fairway number 6795 in Haukivesi-Joensuu deep-water fairway section which is the fairway used for commercial shipping purposes and is connecting North Karelia to other inland waterway sections in Saimaa area and to Saimaa Canal - which is the only link to the Baltic Sea area and Motorways of the Seas (MoS)

The technology inside the buoys, produced at Meritaito's factory in Joensuu, makes shipping safer and maintaining of fairway easier. Remote-controlled signs send information about, among other things, the functionality of the light and the condition of the power supply, and the actual location of the sign. All this information improves the navigability of the fairway and increases maritime safety.





The maintainer of the fairway receives information on the location of the buoys, which reduces the risk of an accident if ice or log bundles move the signs. In addition, the buoys communicate with each other, making it easier for ship pilots and captains to observe the fairway. Their lights are adjusted according to the lighting conditions, so they would not distract other traffic. Changing the lighting power of signs brings a whole new element to the development of fairways. Safety is enhanced in particular by the fact that the pilots and VTS center can adjust the light output of beacons and the rhythm of lights in real time to support the navigation of vessels in poor visibility and weather conditions. When the ship arrives, the lighting can be enhanced. In future, these buoys might also function as 5G base stations.

In addition, modern technology reduces the carbon footprint, while location inspections of signs can be done more efficiently.

Read more about the Finnish pilot project at EMMA Extension Smart Fairway Implementation Report: <http://www.project-emma.eu/sites/default/files/2020.10.20.%20Smart%20Fairway%20Implementation%20Report.pdf>

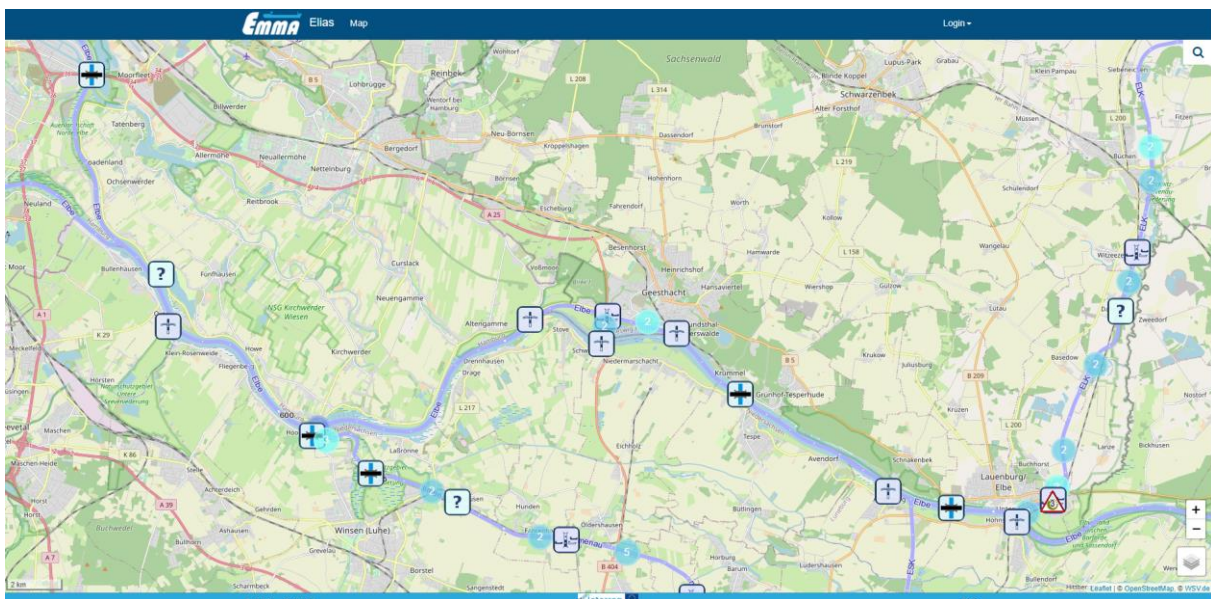
An EMMA Extension video about the pilot that improves the navigability of the fairway and increases maritime safety in the Saimaa deep fairway can be watched here: <https://www.youtube.com/watch?v=rh3twF1K4J0>

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5 GERMANY: EXTENDING SERVICE PORTFOLIO OF GEOFENCED RIS SERVICES

The software prototype ELIAS is the result of a long series of research and implementation projects in several different programmes, including the EMMA project. It builds on the technical basis of the RIS standards while at the same time generating a new user experience. Its goal is to maximize usability by collecting and combining distributed information and generating added value by applying modern data science techniques on the available data.



EMMA Extension partner, Institute of Shipping Economics and Logistics (ISL), and Lead Partner, Port of Hamburg Marketing (HHM), supported the Polish RIS pilot with technical knowledge and consultancy linked to common standardised interfaces to connect new digitalised data services and functionalities to external systems like ELIAS, such as real-time data regarding bridge clearance. Regarding the Polish bridge clearance pilot, the interface between the actual bridge clearance service and ELIAS was implemented. This will enhance the capabilities of the ship operators and freight forwarders to carry out their route planning.

The ELIAS Inland Waterway Information System is accessible by following the link: <https://elias.isl.org/index.xhtml>

Further information:

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6 SWEDEN: NEW FAIRWAY SIMULATION

The Swedish EMMA Extension activity on new fairway simulation testing the extended IWW-area will be finished in June 2021. The Swedish Maritime Administration is directly involved in this activity and has high interests in the results. They will be used to potentially open a new IWT zone in Sweden and by that, enable new IWT business and logistic solutions in the area.

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