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ACTION PLAN FOR THE IMPLEMENTATION OF ENVIRONMENTALLY FRIENDLY SOLUTIONS IN FREIGHT TRANSPORT OF SZCZECIN AND ŚWINOUJŚCIE MULTIMODAL NODE AND TRANSPORT CONNECTIONS

ENERGY EFFICIENCY SOLUTIONS

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Executive summary

This document will present the *“The Action plan for the implementation of environmentally friendly solutions in freight transport of Szczecin and Świnoujście multimodal node and transport connections”*.

The Action Plan constitutes a part of the CE10 44 TalkNET Project – Transport and Logistics Stakeholders NetWork, which in turn is a part of the European Territorial Cooperation Programme – INTERREG CENTRAL EUROPE 2014-2020, with the participation of the European Regional Development Fund.

The TalkNET project was created as an answer to the need to develop harmonized cooperation mechanisms between freight transport stakeholders. The project is designed to contribute to the strengthening of a friendly environment for multimodal transport in Europe, as well as to improve the coordination of links in the multimodal transport chain, i.e. parties participating in it (ports, transport operators, terminals). The TalkNET project, as an EU project, aims at shaping the right strategies and policies concerning the development of multimodal and sustainable freight transport in the light of the goals of the Europe 2020 strategy. This project is also expected to contribute to establish a long-term policy and a harmonized structure, enabling the implementation of environmentally friendly solutions in freight transport.

Transport operations, in general, have an impact on air quality and greenhouse gas emissions. Each means of transport has its own emission parameters. For example, for the same amount of goods being transported, maritime transport produces three times less CO₂ than the train and ten times less than the truck. The sustainable development of transportation chains is aimed at minimizing the environmental burden of transport operations, with benefits to both nature and society, by effective structuring of transportation operations inter alia by introduction of environment friendly solutions in fields of transport organization, energy sources and consumption, innovative IT solutions.

The transportation multimodal node consisting of the closely situated and aptly connected with the use of road, rail and inland waterways means of transport towns of Szczecin and Świnoujście with their the two city transport systems, two sea ports, one airport and a number of industry activities situated within the town area, port areas, and in their close vicinity require a apt development of its transportation system utilizing best solutions in terms of energy and environmental efficiency.

The Szczecin and Świnoujście Seaports Authority SA (PP11) and the Westpomeranian Region (PP10) are committed to implementation of environmentally friendly solutions in freight (and also passenger) transport and thus decreasing **the environmental impact of transport-related operations and improving their energy efficiency**.

Having the above in mind Szczecin and Świnoujście Seaports Authority SA and the West Pomerania Region have elaborated SWOT analysis for the Szczecin and Świnoujście multimodal node and its connections.



STRENGTHS	WEAKNESSES
SECA legislation in force;	Present non-decisive, if any, cost competitiveness of the LNG fuel towards maritime light diesel fuels (the ones with the acceptable sulphur content) refraining ship owners/operators from justifying /taking numerous LNG propelled ship investment decisions;
“Guidance on LNG Bunkering to Port Authorities and Administration” published by EMSA in September 2017;	The nonexistence of any true demand for LNG (or any other alternative fuels) deliveries to ships within the South-Western Baltic Region;
The existing LNG importing terminal operating in the Świnoujście port offers possibility to load LNG fuel onto road tanks	The nonexistence of any <u>local</u> supplier who is experienced (by practice) in LNG (or any other alternative fuels) deliveries to ships;
Szczecin And Świnoujście Seaports Authority [SSSPA] commissioned the development of the organization and procedures for LNG fuel deliveries to ferries at the ferry terminal in Świnoujście; the task was completed by the Maritime Academy in Szczecin and was supported by the TEN-T “motorways of the sea” funds;	the nonexistence of any <u>local</u> supplier who has LNG barges at its disposal;
The experience of the SSSPA’s staff with regards to the subject of LNG and other alternative fuels for maritime ships gained during a number of international research-and-development projects;	except for the LNG there is <u>no visible real</u> interest in any other alternative fuels for ships;
Favourable natural conditions and good market position of regional and smart specialization industries, especially those based on the green and blue economy;	the local stevedoring companies are not interested in the introduction of transshipment equipment fuelled by LNG or any other alternative fuels;



Potential of maritime economy - seaports as elements of multimodal transport and energy networks;	the regulations controlling LNG or other alternative fuels are several: international directives and conventions, as well as national laws and local regulations. Finding and involving the relevant authority responsible for LNG is sometimes difficult;
Experience and good practice of ferry operators in using OPS	Depreciation by the government of the region importance as an international transport and logistics node;
	Nonexistence of commonly accessible network of charging stations for electric cars
	Little interest of actors in introduction of innovative energy effective solutions
OPPORTUNITIES	THREATS
IMO 2020 global sulphur limit will enter into force;	Persistence of the non-decisive cost competitiveness of the LNG fuel (or other alternative fuels) towards maritime light diesel fuels resulting in further refrain from introduction of LNG propelled ships;
Under the EU Alternative Fuels Infrastructure Directive, LNG bunkering facilities and On-shore Power Supply should be provided to ports of the TEN-T core network by 2025;	Nonappearance of a local LNG supplier who has LNG barges at its disposal;
Polish Government has started the procedure of developing a directive referring to the “Law on electro mobility and alternative fuels” dated 11th January 2018; the Maritime Office in Szczecin chairs the working group for the development of LNG bunkering regulations for the directive. The directive will also induce respective changes in a number of other	Prolonged process of the certification of the „Organization And Procedures of LNG deliveries to ferries at the ferry terminal in Świnoujście” and/or of the development of the Polish LNG bunkering regulations and of their official introduction by a directive to the “Law on electro mobility and alternative fuels” dated 11th January 2018;



related laws and directives which will introduce, among others, tax and other non-financial incentives and encouragements to invest in clean energy means of transportation (mainly in road transport) as well as simplifications in alternative fuels trade;	
There are concrete plans to expand the LNG terminal in Świnoujście to perform exporting operations which will include loading LNG fuel onto bunker barges;	Ferry operators resigning from (or postponing) their plans to introduce LNG propelled vessels;
Ferry operators on the lines operating from the ferry terminal in Świnoujście have plans to introduce LNG propelled ferries into their fleets by the year 2020;	Technological progress resulting in construction and wider introduction of fuel-efficient engine solutions;
Polish companies Gaz System (LNG terminal and grid owner-operator) and PGNiG (LNG importer) consider purchasing/building LNG fuel bunkering barges by the year 2021;	Lack of economic development and reduction in the investment attractiveness of Poland and West Pomerania
Possible insufficient availability of low sulphur fossil fuels combined with their increasing prices after 2020;	Significant reduction in EU and national funds flowing into the region;
Concentration of activities in the areas of regional and smart specializations, in particular in the blue and green economy;	
Development of inland transport based on the Oder Waterway;	

Cluster 5: Energy efficiency solutions: overview of needs and good practices in cooperation with Stakeholders to develop the action plan

In line with the flagship initiative "A Resource Efficient Europe" established under the Europe 2020 Strategy, the overarching goal of European transport policy is to help create a system that offers high quality mobility services with sustainable use of resources. In practice, this means that transport must consume less energy, use green energy and make better use of modern infrastructure.



Currently, coordinated actions are undertaken within the European Union to reduce the harmful impact of transport through the integration of transport policy with environmental policy. The EU monitoring projects on sustainable development show continuous increase in energy consumption in transport. At present, the most energy, approx. 80%, is used by road transport and accompanying infrastructure. To promote sustainable development of transport, the aim is to reduce the negative impact of transport, in particular the emission of pollutants into the atmosphere, which cause damage to the environment, human health and also have an impact on climate change. Environmental protection requirements are also included in the process of defining and implementing Community policies in all areas of life. Sustainable transport development and environmental protection are areas of special interest that are associated with shaping pro-ecological habits among EU residents. For many years the EU documents on the common transport and transport policy have shown goals, priorities and corresponding activities aimed at ensuring sustainable development in this area.

Strengthening ecology in transport is a trend understood in Poland, but it still requires a lot of activities in the field of organization, law, infrastructure, R&D, as well as education and promotion. During the survey conducted by the contracted experts, the entities involved in the improvement of ecology in transport indicated the need for innovation, development of energy efficiency solutions, efficient organization of transportation chains (eg. wide introduction of intermodal transport).

A number of good practices collected from the stakeholders involved in the operation of the Scandinavia – Szczecin/Świnoujście – Poland/Central Europe transportation route is presented in the table below.

Good practice	Form of implementation
<p>PNDS AT THE FERRY TERMINAL IN ŚWINOUJŚCIE</p> <p>Working towards efficiency of ferry berthing operations, especially during adverse visibility conditions (fog, heavy rain, heavy snowfall) this pilot action will contribute not only to increased safety of the berthing operations but it will also shorten their durations and thus decrease the use of maritime fuel resulting in lesser hindrance to the natural environment.</p>	<p>Pilot action introducing a port docking-navigation system at the berth no. 1 at the Ferry Terminal in Świnoujście</p>



<p>CARGO CAPACITY UPGRADE AND LNG BUNKERING ON THE ŚWINOUJŚCIE – YSTAD MARITIME LINK</p> <p>The aim of the project is:</p> <ul style="list-style-type: none"> • Reduction of the negative impact of maritime transport on the environment, reduction of SOx, NOx, CO2 emissions by equipping the new ferry on the Świnoujście-Ystad route with an LNG propulsion system, • Securing the possibility of LNG bunkering in the port of Świnoujście (construction of an LNG bunker), • Contributing to the development of the LNG bunkering network in the Baltic Sea region (LNG bunker), • Supporting the use of LNG as ship fuel on a larger scale by developing an LNG bunkering network (LNG bunker). 	<p>Construction of an LNG bunkering barge serving the demand for LNG fuel in Świnoujście, as well as in other major ports of the South Baltic Region</p> <p>The main parameters of the bunker barge:</p> <p>length - 84.7 m, width - 16.8 m, draft - 5.5 m, DWT 1400 tons, GT 3900, LNG tank capacity 3000 m³ (4 type C tanks, 750 m³ each).</p>
<p>OPS IN TRELLEBORG</p> <p>The use of shore side electricity results in the avoidance of CO₂, SO_x, PM and NO_x emissions in the port during the while vessels are at berth.</p> <p>Thereby, the shipping line(s) are enabled to comply with the international (IMO) and European regulations. Furthermore, noise levels (noise frequencies currently resulting from the vessel engines functioning at berth) are significantly reduced with benefits not only for the port, but also for the near-by residential areas of the City of Trelleborg.</p>	<p>To ensure an efficient and reliable OPS to ferry vessels, the following preconditions serve as technical parameters for the port works in Trelleborg and has been performed earlier: 1) Main installations and cables are placed ashore at the berths; 2) The installations have to be similar in both ports forming the maritime link / Motorway of the Sea; 3) Technical installations follows international standards.</p>



5.1 Action plan for the implementation of environmentally friendly solutions in freight transport of Szczecin and Świnoujście multimodal node and transport connections

Following the above, Szczecin and Świnoujście Seaports Authority SA and the West Pomerania Region have identified a number of actions to be taken as to tackle the weaknesses and threats and most importantly utilize the strengths and opportunities of the Szczecin-Świnoujście multimodal node with the result to improve its energy efficiency and environmental performance.

It is important to strengthen the cooperation between transport stakeholders in this area with the view of all modes of transport. As mentioned above, such cooperation will allow to prepare a list of infrastructural and/or organizational tasks and to carry them out by entities responsible for constructing, modernizing and operating the infrastructure and means of transport in order to increase the Energy and environmental efficiency of the region. At the same time, promotion of environmentally friendly forms of transporting cargo will support sustainable development.

5.2 The main challenges identified based on the analyses carried out so far

On the basis of the performed analysis and surveys, the main challenges for transport multimodal node have been noted. They are presented in the tables below.

The first table indicates the challenges that are mainly faced by facilities, such as warehouses, transshipment terminals (they mainly concern logistic companies, storage companies, local government units, infrastructure managers and owners, etc.). The second table presents challenges that are present directly in the process of transport (carriage) of goods (for transport companies, owners and managers of infrastructure, etc.).

The table below presents the main challenges regarding the implementation of ecological solutions in storage facilities and transshipment terminals.

Challenges concerning the implementation of ecological solutions in warehouses and transshipment terminals	
1	Improving the use of existing resources, constructing new facilities and modernizing the existing ones, in line with European standards and global trends in respecting the ecosystem.
2	More efficient use of energy in logistics and storage operations.



3	The use of solar, water, etc. energy for the generation of heat and electricity.
4	Introducing solutions that will improve the efficiency of warehouse lighting, including installation of motion sensors and good daylight lighting.
5	Improvement of the façade insulation and thermal performance of facilities.
6	Recovery of rainwater and its re-use.
7	Recovery of heat generated by devices working in buildings as well as people and heat emitted by goods stored in the facility (e.g. fruit).
8	Introducing innovative solutions, including ones not yet in use.
9	Implementation of electro-mobility programs in warehouses and transshipment terminals.
10	Constant monitoring and optimization of logistic and transshipment processes in order to reduce energy consumption.
11	Improving the safety of cargo handling processes, in particular dangerous and environmentally hazardous materials.
12	The use of modern condensing boilers for heating warehouses.
13	Construction of bicycle parking lots, bus stops in the immediate vicinity or in the area directly adjacent to the facility.
14	If possible, constructing connections of a given facility to the railway network – constructing industrial spurs – use of different means for transporting stored goods, alternative to road transport.

The table below presents the main challenges regarding the implementation of ecological solutions in the process of freight transport.

Challenges regarding the implementation of ecological solutions in the process of freight transport	
1	Replacement of vehicles that do not meet the highest emission standards for ecological vehicles, reduction of CO ₂ emissions.
2	Implementation of the electro-mobility policy in the process of transporting goods.
3	Optimizing the operation of multimodal logistic chains, also through the widespread use of resource-efficient systems.



4	Efficient use of transport and infrastructure through the use of better traffic management systems and advanced logistic and market measures, such as the full development of an integrated European rail market, the removal of cabotage restrictions, the removal of barriers in short sea shipping.
5	The use of means of transport of goods other than road transport, especially in long distance transportation.
6	The use of nanomaterials in industry for creating means of transport and infrastructure construction, modern recycling and utilization of harmful waste
7	Construction of a coherent network of motorways and expressways between agglomeration centres of the Westpomeranian Region, which will help reduce fuel consumption and limit the increase of emissions of harmful substances into the atmosphere per one vehicle.
8	Modernisation of last mile rail and road connections to the ports in Szczecin and Świnoujście.
9	Completion of S3 express road on sections between Szczecin and Świnoujście.
10	High-intensity traffic, including heavy goods vehicles, in built-up areas located along roads in which congestion often occurs (in such places harmful gas emissions standards are often exceeded). Transit traffic should follow strictly defined routes which meet the relevant parameters.
11	Limitations to the use of inland waterway transport on the Odra River.
12	Creating an alternative in the form of e.g. metropolitan rail for individual transport (commuting etc.).

The challenges presented both in the first and in the second table require proper planning and cooperation between infrastructure owners and other entities participating directly or indirectly in facing those challenges. It is currently assumed that the main emitter of pollutants into the atmosphere in the whole process of transporting goods is the means of transport used. At present, the transport of goods is mainly carried out using vehicles with conventional engines (combustion engines).

5.3 Results to be achieved

The key results to be achieved in the strive to improving the energy use and ecological efficiency of transporting goods can be grouped in the following areas:

- developing alternative power sources (drive units),



- wide introduction of electro-mobility in transportation of goods and people,
- wide use of ecological fuels for vehicles and transshipment equipment,
- effective organization of transportation chains (ICT solutions, modal shift from road to rail and inland waterways – intermodal, energy and minimum emission city transport),
- effective and energy efficient storage and transshipment of goods.

5.4 Tasks to be performed to achieve the expected results

Based on the collected materials from the conducted research, the tasks planned to be undertaken in order to achieve the assumed results are described in detail below:

- **Organizational and legal tasks.**

The process of implementing ecological solutions in transport is a long-term activity. It requires the involvement of many participants and the implementation of legal, organizational and technical solutions which meet the general objective, respecting the position of each of the stakeholders. One of the expectations formulated e.g. by the Świnoujście Ferry Terminal is to reduce exhaust and noise emissions from lorries operating in the immediate vicinity of and in the area of the Świnoujście Ferry Terminal.

Meeting this type of expectations, taking into account the current state of technology, allows to focus on the appropriate shaping of demand for transport services, their implementation time, etc. The shaping of this policy also applies to activities related to the creation of new services and the establishment of a multi-branch, co-modal way of performing orders. The abovementioned activities also require taking legal actions regulating the heavy goods vehicles' mobility both in the Westpomeranian Region and in the vicinity of the Terminal (in view of the limitations of vehicle capacity on particular types of roads). The presence and involvement of entities shaping the transport policy of the region is indispensable to achieve this.

- **Educational and promotional tasks**

Enhancing ecology in transport is a slogan that needs promotion i.e. raising awareness and spreading information on threats and presenting ways to reduce these risks.

Ecological awareness is an expression of knowledge about the environment and the ability to see phenomena and their mutual relations, causes and effects, as well as the readiness to take action to protect the natural environment. There is a need to undertake well-thought-out and integrated activities aimed at deepening and consolidating knowledge as well as building and strengthening ecological awareness of entrepreneurs (transport and logistic companies, operators and warehouse owners). The activities in this area are expected to be intensified by those directly involved in decision-making in enterprises. As a consequence, such activities should result in a change in the mentality of the people responsible for making decisions and a change of attitudes in conducting business. It is necessary to pay attention to the fact that



some of these activities will change the mentality of people working in enterprises, and thus change the ecological attitudes in society. In this regard, various types of informational, promotional and encouraging campaigns are required.

- **Infrastructural tasks**

Infrastructural activities follow a long and arduous process of stimulating ecological solutions and negotiating conditions for implementation between stakeholders.

An example of infrastructural actions aimed at increasing the efficiency (operational, energy, environmental) of transport operations is given by PP11. It has undertaken activities related to the modernization of the ferry terminal infrastructure in Świnoujście, which will result in its adaptation to intermodal transport operations in the 2021 horizon.

The scope of works to be carried out includes the reconstruction of two short ferry stands into one new wharf with a length of 293 meters. There will also be three new manoeuvring and parking yards for intermodal units, connected by an overpass. Railway tracks which are already on the terminal will be adapted to intermodal transshipment operations. In addition, two new tracks will be built. Equipment for carrying out intermodal transshipment operations will be purchased. That investment will be implemented with the aid of the CEF fund. It is estimated that thanks to the new infrastructure and the increase in the importance of intermodal transport by the end of 2021 the terminal in Świnoujście will service 30,000 intermodal units (semi-trailers, containers) and in 2040 this number will triple.

Another action consists in the construction of the overflow car park for trucks arriving at the ferry terminal in Świnoujście. It will be a free public car park for all trucks waiting to be loaded onto ferries operating from the ferry terminal. Currently, trucks that do not fit in existing car parks must in the meantime be parked on street sections leading to the terminal and the city of Świnoujście. This situation causes a decrease in efficiency and safety of traffic and also makes trucks move (in queue) with irregular and limited speed, which results in increased fuel consumption and increased pollution emitted to the atmosphere.

'Same time the port in Szczecin is preparing for increased vessels' deadweight expected as the result of undergoing deepening of the Świnoujście-Szczecin fairway to 12,5 m (current 10 m).

A huge investment in the promotion of ecological forms of cargo transport is the functioning LNG terminal. In April 2019, the Polskie LNG company signed a contract with the Oil and Gas Institute – National Research Institute for co-financing for the project "Extending the functionality of the LNG terminal in Świnoujście".

The LNG Terminal Expansion Program consists of the following elements:

- additional regasification installations – increasing the nominal regasification capacity of the terminal to 7.5 billion Nm³/year.
- the third LNG tank – increasing the flexibility of the LNG terminal installation and ensuring the optimum process capacity for storage of raw materials.



- LNG transshipment system for railways – extending the scope of services provided with the possibility of loading ISO containers and rail tankers and enabling the terminal to reach potential new customers.
- an additional ship berth, which will enable the loading and unloading of tankers, loading of LNG bunker units and bunkering service.

The LNG Terminal Expansion project is on the European list of Projects of Common Interest. This list includes investments that are of particular importance for increasing the safety and diversification of natural gas supplies in Europe and for building an integrated and competitive market and will contribute to achieving EU goals in terms of energy and climate.

As shown above, activities related to the development of infrastructure are being carried out in the Westpomeranian Region on a large scale. These are neither easy nor fast actions. They require a long lobbying, organizational and negotiation process. They also require huge amounts of effort related to obtaining funds. However, this is an example of a good practice supporting the increase of ecology in transport, an example at least on a European scale.

- **R&D tasks**

Infrastructure activities described earlier frequently induce the initiation of R&D activities. The identified need to reduce noise or air pollution causes action, which can manifest itself in many different ways. It can be a typical activity related to the emergence of innovative technical, infrastructural or ICT solutions, but it may also be an activity related to developing demand or transport policy, which is also to an extent perceived as R&D work.

The universities and R&D institutes are often responsible for the implementation of R&D but enterprises are increasingly often becoming the initiator of such activities. Clusters are also responsible for initiatives concerning environmentally friendly transport and transport technologies.

Maritime Cluster of Western Pomerania claims that one of its basic strategic goals is the promotion of the region as a recognized training and research base as well as a R&D base for the needs of international maritime economy.

Baltic Sea & Space Cluster sees scientific research and the promotion of space and information technologies in the design, construction and transforming ships into automated units as their expected goal by 2025.

Subsequent activities include the use of digitization and ICT elements in maritime transport and ports. It will develop its activities towards the automation of transshipment points, terminals, etc. In this case, space technologies used in maritime transport should be understood as research into the use of information transmitted via satellite for transport and logistics. There are, therefore, the issues of telemetry, ICT, but also the use of innovative solutions for control systems for autonomous vehicles, including sea drones.



5.5 Key actors

The tasks necessary to achieve the expected results have been grouped and enumerated in the following paragraph. The key actors responsible for their realization have also been named. Both the tasks and the responsible actors have been presented in tables divided into:

- Organizational and legal tasks
- Educational and promotional tasks
- Infrastructural tasks
- R&D tasks

Based on the collected materials from the conducted research, the level of involvement of particular actors and their participation in actions/tasks planned to be undertaken in order to achieve the assumed results are described in detail below.

The table below presents detailed tasks related to organisational and legal activities, the implementation of which will directly and indirectly contribute to the implementation of ecological solutions in the transport of goods. The involved entity has also been identified for each task.

Organizational and legal tasks	
Task	Entity involved
Lobbying and assessing changes in legal regulations	<ul style="list-style-type: none"> - Marshal's Office of the Westpomeranian Region, relevant local government units, - General Directorate for National Roads and Highways (Szczecin branch), PKP - Polish Railway Lines Operator, State Water Holding "Wody Polskie", Maritime Office in Szczecin, - users of the transport and logistic infrastructure of the Szczecin-Świnoujście node
undertaking actions aimed at a better integration of rail transport with other means of transport	<ul style="list-style-type: none"> - Marshal's Office of the Westpomeranian Region, - PKP - Polish Railway Lines Operator,



	<ul style="list-style-type: none"> - General Directorate for National Roads and Highways (Szczecin branch)
<p>preparing of a plan or program for the development of inland waterways (e.g. the Oder River) as transport means of special importance; including the implementation of the RIS program on the 240 km section of the Odra River and removing bottlenecks in access to sea port in Szczecin</p>	<ul style="list-style-type: none"> - State Water Holding “Wody Polskie”, - Inland Navigation Office, - Szczecin and Świnoujście Seaports Authority,
<p>active participation of Szczecin and Świnoujście sea ports authority in the development of intermodal transport and cooperation with operators of intermodal terminals and connections</p>	<ul style="list-style-type: none"> - Szczecin and Świnoujście Seaports Authority, - Marshal’s Office of the Westpomeranian Region, relevant local government units - External entities, companies, institutions.
<p>improving standards for safe navigation by sea-going ships and compliance with international requirements related to the protection of the marine environment</p>	<ul style="list-style-type: none"> - Inland Navigation Office, - Szczecin and Świnoujście Seaports Authority, - External entities, companies, institutions.
<p>creating favourable conditions for the development of ferry shipping, including its participation in intermodal transport</p>	<ul style="list-style-type: none"> - Szczecin and Świnoujście Seaports Authority, - Świnoujście Ferry Terminal, - ferry line operators (Unity Line, Polferries, TT-Line)
<p>organization and procedures of alternative fuel refuelling points in seaports, e.g. for the bunkering of liquefied natural gas (LNG)</p>	<ul style="list-style-type: none"> - Szczecin and Świnoujście Seaports Authority, - Maritime Office in Szczecin - PGNiG SA (Polish Oil and Gas Company SA) - companies specializing in the supply of fuel for ships



development of up-to-date appropriate guidelines, procedures, standards defining parameters, requirements for emission standards – local policy	ministries
preparatory activities to implement solutions in the field of electro-mobility	- Marshal's Office of the Westpomeranian Region, relevant local government units,

The table below presents detailed tasks related to education and promotion, the implementation of which will directly and indirectly contribute to the implementation of ecological solutions in the transport of goods. The involved entity has also been identified for each task.

Educational and promotional tasks	
Task	Entity involved
promoting the development of short sea shipping as a preferred form of transport in the European Union	- Shortsea Promotion Centre Poland - Szczecin and Świnoujście Seaports Authority, - Świnoujście Ferry Terminal, - Polish Chamber of Maritime Commerce, - local government units
participation in EU initiatives aimed at transferring cargoes from land to sea	- Szczecin and Świnoujście Seaports Authority, - Świnoujście Ferry Terminal, - Polish Chamber of Maritime Commerce, - local government units
promotion and active participation of seaports in the development of intermodal transport and cooperation of entities managing ports with operators of intermodal terminals	- Szczecin and Świnoujście Seaports Authority, - Świnoujście Ferry Terminal, - Polish Chamber of Maritime Commerce,



	- local government units
promotion of intermodal and combined transport, application of preferential fees for the use of railway infrastructure for intermodal transport	- Szczecin and Świnoujście Seaports Authority,
promotion of intermodal transport, application of preferential fees for the use of railway infrastructure for other carriers	- Świnoujście Ferry Terminal, - Polish Chamber of Maritime Commerce, - local government units
organizing information campaigns for local companies, meetings, seminars, conferences on the implementation of ecological solutions in transport	- Marshal's Office of the Westpomeranian Region, relevant local government units,
promoting public transport as an ecological form of mobility, commuting, etc.	- Marshal's Office of the Westpomeranian Region, relevant local government units,

The table below presents detailed tasks related to infrastructural activities, the implementation of which will directly and indirectly contribute to the implementation of ecological solutions in the transport of goods. The involved entity has also been identified for each task.

Infrastructural tasks	
Task	Entity involved
preparing technical documentation, construction, reconstruction, renovation and modernization of existing facilities (warehouses, transshipment terminals), including implementation of energy saving and ecological solutions;	Owners and/or users of the transport and logistic infrastructure of the Szczecin-Świnoujście node
Modernization and expansion of port infrastructure in Szczecin and Świnoujście enabling the use of economies of scale and the development of intermodal transport (modal shift).	- Marshal's Office of the Westpomeranian Region, - PKP Polish Railway Lines Operator,
Modernization and development of last mile access infrastructure (roads, railways, inland waterway	- Szczecin and Świnoujście Seaports Authority,



<p>transport) from land to ports in Szczecin and Świnoujście, helping to eliminate bottlenecks which slow down road, rail and inland transport, as well as to increase freight capacity.</p>	<ul style="list-style-type: none"> - Polish Chamber of Maritime Commerce, - State Water Holding “Wody Polskie”
<p>construction of inland terminals adapted to handling railway intermodal units</p>	<ul style="list-style-type: none"> - PKP - Polish Railway Lines Operator, - PKP S.A. - intermodal transport operators
<p>transferring transit traffic from Szczecin and along the S3 route on the section leading to Świnoujście, by constructing bypasses of the busiest towns and villages, which will contribute to the improvement of environmental conditions in these places</p>	<ul style="list-style-type: none"> - Marshal’s Office of the Westpomeranian Region, - General Directorate for National Roads and Highways
<p>implementation of a plan or program for the development of inland waterways on the Oder River as transport means of special importance, through removing bottlenecks limiting regular inland navigation along the Oder Waterway through maintenance, regulatory and modernization works, which will enable the revitalization and development of river transport and the takeover of transport from roads; the specific task in the area of the Szczecin-Świnoujście multimodal node consists in the replacement of the old single track railway drawbridge across the Regalica River (a section of the Odra River) with a new, higher, two track rail bridge. The existing old drawbridge constitutes a bottle neck both for inland waterway and rail transports.</p>	<ul style="list-style-type: none"> - Maritime Office in Szczecin, - State Water Holding “Wody Polskie” - Inland Navigation Office in Szczecin
<p>onshore electric power supply points (OPS) in ports</p>	<ul style="list-style-type: none"> - Szczecin and Świnoujście Seaports Authority,
<p>replacement of transshipment equipment and vehicles in ports and cargo terminals with more ecological ones using less energy and emitting lowest levels of exhaust gases</p>	<ul style="list-style-type: none"> - operators of transshipment terminals in the ports of Szczecin and Świnoujście, - urban transport operators



<p>construction of the Szczecin Metropolitan Railway which will allow employees to get to workplaces by collective transport instead of passenger car transport; promoting such an alternative</p>	<ul style="list-style-type: none"> - Marshal's Office of the Westpomeranian Region, - the City of Szczecin
<p>development of a network of charging points for electric vehicles and alternative fuel supply points (including CNG, LNG)</p>	<ul style="list-style-type: none"> - the City of Szczecin (lease of places for the construction of public charging points for electric vehicles) - operators of charging points for electric cars or charging service providers for these points - Szczecin and Świnoujście Seaports Authority - Szczecin-Goleniów Airport

The table below presents detailed R&D measures whose implementation will directly and indirectly contribute to the implementation of ecological solutions in the transport of goods. The involved entity has also been identified for each task.

R&D tasks	
Task	Entity involved
<p>development of new charging and refuelling systems for low-emission vehicles</p>	<ul style="list-style-type: none"> - Marshal's Office of the Westpomeranian Region, - the City of Szczecin - External entities, companies, institutions, universities, etc.
<p>development of innovation in inland navigation - prototype of inland barges, research related to the implementation of new solutions in the field of inland barge propulsion and reduction of emission gases</p>	<ul style="list-style-type: none"> - West Pomeranian University of Technology, Maritime University of Szczecin, - External entities, companies, institutions, universities, etc.
<p>development of the concept of infrastructure and innovative technological solutions to optimize traffic management using ITS technologies</p>	<p>West Pomeranian University of Technology, Maritime University of Szczecin,</p>



research on the possibilities of using new materials to construct means of transport, on infrastructure construction and on innovative recycling.

- West Pomeranian University of Technology, Maritime University of Szczecin,
- External entities, companies, institutions, universities, etc.

Due to the fact that private companies did not agree to use their names when indicating the implementation of individual tasks (business secrets), the entities were defined in a general way.

All the actions/tasks presented above in the tables have an indirect or direct impact on the sustainable development of transport in the area of the Szczecin and Świnoujście multimodal node. The TalkNET Project Partners 10 and 11 have no direct influence on the majority of activities/tasks carried out by individual stakeholders. However, they can lobby and create individual behaviours, which indirectly affects the implementation of certain activities. An important issue is the continuous further raising of public awareness regarding the need to implement ecological solutions in transport. The TalkNET Project Partners have appropriate instruments and opportunities which they intend to use to further educate the public and promote the implementation of ecological and energy efficient solutions in transport.

5.6 The timeline and financial resources

The activities which are to be implemented within the next 3 years, although interconnected as far as the expected results for this Action Plan are concerned, are implemented independently from each other. Most of them, namely the organizational/legal, educational/promotional and R&D tasks, are continuous ones. The implementation of most of them is already taking place. Activities which have not yet begun should be initiated immediately.

Although a greater number of infrastructural actions/tasks had been named in this Action Plan, at the time of producing this document, not all them have been defined in terms of time schedules and financing needs. Either, because of being still in their preparatory stages or because the responsible actors were not in a position to disclose the detailed information yet.

Nevertheless, the available information describes the magnitude of this Action Plan. See below:

Construction of the Szczecin Metropolitan Railway

This investment project is planned for the period 2018-2022. Estimated investment costs: EUR 124 million.



Modernisation of the Swinoujscie-Szczecin fairway to the depth of 12.5 m

Construction work started in the third quarter of 2019. Completion of the investment is planned in the third quarter of 2022 and its estimated cost amounts EUR 334,65 million.

Preparing a plan or program for the development of inland waterways (Odra River) of special transport importance, including the implementation of the RIS program

Inland Navigation Office in Szczecin is responsible for the implementation of RIS system Estimated cost amounts EUR 4,96 million. Project implementation time: 2016-2021

Adaptation of the infrastructure of the Ferry Terminal in Świnoujście to support intermodal transport service.

Estimated net cost amounts EUR - 55.3 million. Project implementation time: 2019-2021.

Improving rail access to ports in Szczecin and Świnoujście.

Planned total project cost amounts EUR 371,08 million. Project implementation time: 2019-2022

Construction of an additional ship's berth for LNG in the outer port of Świnoujście.

Estimated cost of investment amounts EUR 39,1 million). Estimated implementation period:2021-2023.

5.7 Expected results

The realisation of the planned activities and tasks will lead to creation of the multimodal transport node which performs its function in the most effective and most efficient, energy wise and environment wise, way.

In many instances, the implementation of the objectives of the action plan for the implementation of environmentally friendly solutions in freight transport of Szczecin and Świnoujście multimodal node and its transport connections depends on entities other than the Marshal's Office of the Westpomeranian Region or the Szczecin and Świnoujście Sea Ports Authority. In connection with the above, it is assumed that the monitoring of the implementation of the activities should take place every year through the preparation of periodic reports and the main report (three-year report). Report preparation and plan monitoring are the responsibility of the Marshal's Office, which should appoint a special team for this purpose. Reports should include an overall assessment of the implementation of the measures included in the action plan and include identification of the problems encountered.

By systematically monitoring the plan and identifying the problems encountered, the Marshal's Office will have the opportunity to identify and propose solutions to individual stakeholders that should help in the implementation of the specific objectives set out in the plan.



5.8References

This exercise has been prepared based on the desk-top research, involved project partners' own data and the survey conducted within the group of actors who agreed to take part in it.