

D.T2.5.5 - ACTION PLANS ON ECO- SOLUTIONS DEPLOYMENT - RIJEKA (NAPA)

Energy efficiency

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Executive summary

For the past few years, Rijeka Port Authority as a responsible institution for the development and promotion of the Rijeka's traffic route, has been implementing numerous consultations with key stakeholders and experts in the field of multimodal transport. Various activities have been carried out with an aim of collecting bottlenecks and finding solutions to them, such as workshops, individual meetings, and conduction of surveys and desk researches. There are several examples of investments in renewable energy sources that have the greatest technical and economic potential under today's conditions, specifically in the Rijeka port area. Renewable energy sources have the same effects that completely or partly replace conventional fossil fuel energy sources. Energy efficiency reduces the environmental burden and contributes to limiting the associated climate change. Energy efficiency reduces energy consumption and costs for the same level of service. Also, the implementation of energy efficiency measures reduces energy demand, reducing the dependence on energy imports, increasing the security of energy supply, and reducing the need for new energy plant construction. Furthermore, investing in energy efficiency creates new business opportunities for small and medium-sized enterprises engaged in manufacturing, trading or installing energy-efficient equipment. The largest number of technologies and areas that are environmentally and energy efficient have their technical and financial justification for implementation in the Rijeka port area. Rijeka Port Authority's priority is to invest in energy production from renewal sources as well to decrease of energy consumption in entire port area.

This document is dedicated to the development and improvement of Eco-innovation, one of the two fields of action of the TalkNET project, along with Multimodality. Respectively, specific sub-topics are developed through the project activities of both fields, as shown in the table below:

1	LAST MILE CONNECTIONS OF MULTIMODAL NODES	MULTIMODALITY
2	NODE MANAGEMENT OPTIMIZATION	
3	ASSESSMENT OF MULTIMODAL SERVICES	
4	ALTERNATIVE FUELS DEPLOYMENT	ECO-INNOVATION
5	ENERGY EFFICIENCY SOLUTIONS	

In particular, this document will present the “*Action Plan on ECO-solutions deployment - Rijeka (NAPA)*” that will focus on creating conditions for energy self-sustainable port.

Starting point to present the actions that are planned is the “*Analysis on ECO-solutions deployment - Rijeka (NAPA)*” developed within the project, that reports the main challenges that Port of Rijeka has to face in order to improve its energy efficiency. In fact, the actions that will be presented in details in this document are the answers to the problems, needs and challenges identified within the first step of the project activities, that is to say the analysis phase of the TalkNET nodes’ regions.

In general, the analysis has foreseen the assessment of port system, to understand how is the state of art (AS-IS analysis) and what are the methods to improve the situation (TO-BE) that will be performed in the following stages of TalkNET implementation. The tool chosen to achieve these aims is the S.W.O.T. analysis.

The actions planned are presented per cluster. TalkNET has set-up five thematic clusters - corresponding to the five sub-topics shown in the table above - right on the basis of the common priorities identified through the analyses of all project partners, identifying the cooperation networks with mapped stakeholders in order to improve their coordination.

At the same time, the actions presented will support and will be the ground for the implementation of the pilot actions that will be carried out within the project.

Therefore, the core intervention logic of the project is the following:

- 1) to detect the problems affecting the nodes (*analysis phase*)
- 2) to find solutions through specific actions planned (*planning phase*)
- 3) to test and implement the solutions presented (*testing phase*)

Finally, the document will offer also a brief overview of the best practices that can offer good solutions to better plan action and the pilot action foreseen in the project (the complete collection of best practices is available in the knowledge management activity of the project: Outputs Knowledge tools).

In the following paragraphs, a summary of each action included in this document will be presented, clearly linking *problems/needs/challenges* and *actions/solutions* that will be illustrated through the support of the results of the SWOT analysis.

SWOT ANALYSIS OF ENERGY EFFICIENCY SOLUTIONS - RESULTS:

STRENGTHS	WEAKNESSES
<p>Renewable source</p> <p>Increasing energy independence</p> <p>Large and rich natural resources</p> <p>Ecologically acceptable in exploitation</p> <p>There are local and regional resources</p> <p>There is a basic legal regulation</p> <p>Great implementation options in the immediate vicinity</p> <p>Low operating costs of the RES, practically free energy use</p>	<p>Lack of experience in realization and exploitation</p> <p>Relatively large initial investments</p> <p>Longer economic return of investment periods. A complex administrative procedure for introducing RES</p> <p>Improper production dependent on the availability of energy-changing RES character</p> <p>Depending on the type of RES, the specificity of microlocation required for the introduction of an RES</p>

OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> Local industry development Reducing CO₂ emissions New workplaces High availability of funding sources Moving the industry into an environmental friendly energy source and renewable source Entrepreneurial consciousness 	<ul style="list-style-type: none"> Unfavorable economic trends Frequent changes of legislative arrangements that are editing the introduction of RES Frequent change in the availability of subsidies or funding opportunities for the introduction of RES Inadequately educated staff for the wider application of RES

The analysis researched ways of energy consumption in the Rijeka port area. Numerous conclusions can be drawn from the analysis to increase energy efficiency, but also conclusions for systematic monitoring and management of energy flows and energy at all. There are several examples of investments in renewable energy sources that have the greatest technical and economic potential under today's conditions, specifically in the Rijeka port area. For each technology, basic features with advantages and disadvantages are listed, as well as the greatest potential for their specific application.

Identified action will not be followed by a pilot action within the TalkNET project, but presents priority steps to improve port energy efficiency in future invasions.

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

Wave energy is a source of energy that is rarely used, and is a form of transformed solar energy that creates permanent winds in some parts of the Earth. These winds cause constant waviness in certain areas and these are places where it is possible to exploit their energy.

There are numerous roofs of halls, warehouses and buildings on the Rijeka harbor area where solar collectors can be set up for the production of heat and electricity. Especially this is because the roofs are close to the consumers of heat and electricity, which is actually an ideal opportunity for this form of energy.

Utilizing wind power is the fastest growing segment of energy production from renewable sources. Wind energy is an indeterminate form of solar energy, resulting from uneven warming of the Earth's surface, resulting in temperature differences caused by air or wind movements.

Action	Main challenges tackled	Results to be achieved	Tasks to be performed	Key actors	Timeline and financial resources	Expected results	References
Renewable energy production in port	The Port is a big consumer of the electricity which is currently only made available by burning fossil fuels.	In order to become completely energy-independent, utilize the existing large surfaces of the ports for the production of energy from renewable energy sources (sun, wind, sea).	<ul style="list-style-type: none"> - analyze the possibilities of energy production from renewable energy sources - develop a plan for building a construction for the production of energy from renewable energy sources, produce technical documentation - ensure financial resources 	Rijeka port authority, port concessionaires	2021	<p>Completely energy-independent port</p> <p>Lowered operational costs of the port</p> <p>Reduced carbon footprint</p>	Own research
Increase of energy efficiency in port area	Rijeka's port system consumes large amounts of energy. Transshipment technology, equipment used, energy efficiency of buildings, etc. are outdated and produced at a time when energy use and control could not be better understood.	It is necessary to achieve the lowest possible level of energy consumption for all port operations and strive for a self-sustaining system.	<ul style="list-style-type: none"> - analyze systems and processes in the port - create a map of use in the port - develop a plan to raise energy efficiency for technology and buildings in the port area - prepare technical documentation for investments - educate all port stakeholders - invest in new technologies - energetically upgrade all buildings in the port area 	Rijeka port authority, port concessionaires	2021	<p>Completely energy-independent port</p> <p>Lowered operational costs of the port</p> <p>Reduced carbon footprint</p>	Own research