DELIVERABLE D.T3.3.2
SOLAR ENERGY DEMONSTRATOR
(INCLUDES D.T3.2.5 AND.T3.3.1)

Final assessment of greening transport measures for Solar Energy Demonstrator

Version 2

06 2022

Index

1. Introduction 2

2. Solar Energy Demonstrator in Koper 2

2.1. The Basics 2

2.2. Step by Step description of the implementation 3

2.3. Cost and emission effects 3

3. Solar Energy Demonstrator in Berlin 4

3.1. The Basics and emission effects 4

3.2. Lessons Learned and Experiences 4

1. Introduction

The Solar Energy Demonstrator is one of 7 pilot actions of the InterGreen-Nodes project. To demonstrate the infrastructure and technological possibilities for the application of clean fuels at the local level, meaning the last mile, and at the terminal, measures to make transport greener have been assessed and validated through stakeholder inputs.

This concluding report is the final assessment report for the pilot activity (D.T3.2.5 + D.T3.3.2) and includes the evaluation of technical performance and environmental impact measurements, as well as lessons already learned from the mid-term evaluation D.T3.3.1).

Demonstrations of the use of solar energy for terminal operations were carried out in Koper and Berlin. The technical performance was analysed and the positive expected effect on the environmental impact was measured.

2. Solar Energy Demonstrator in Koper

2.1. The Basics

The micro solar power plant will be set up to generate electricity from renewable sources, promote the green port and provide energy for future self-sufficiency in electricity. The purpose of setting up a micro solar power plant is to partially provide the electricity necessary for lighting the port main road connection.

The photovoltaic power plant will be implemented with photovoltaic modules placed on the roof of the existing TP TROPLES transformer station in the port of Koper (on the figure below is marked in red).

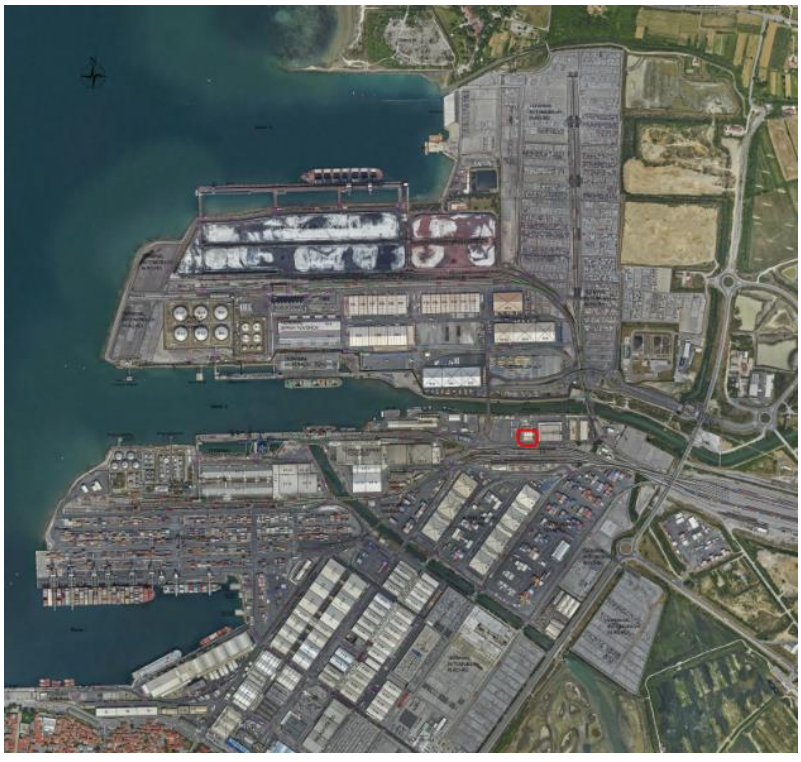

Figure: Location of micro solar power plant in the port of Koper

Figure: Existing transformer station

It is expected that 24 photovoltaic modules with a power of 330 Wp will be installed, which form a maximum, peak power of 7.92 kWp and an estimated 9000 kWh annual amount of electricity energy produced.

The solar power plant will be connected to the internal electricity network behind the existing metering point of the facility.

2.2. Step by Step description of the implementation

Step 1: Needs identified within Luka Koper company (Health protection and Ecology Department, Strategic Development Department, Investment Department); several internal meetings

Step 2: Including the investment of micro solar power plant in the Luka Koper annual plan for 2020 (adopted by Management Board of Luka Koper)

Step 3: Public procurement procedure for project documentation (PZI – detailed design and PID – project for execution works); contractor selected: E PRIHODNOST d.o.o.

- PZI documentation prepared before the construction
- PID documentation prepared after the construction

Step 4: Public procurement procedure for construction of micro solar power plant; contractor selected: Plan-net solar d.o.o

Step 5: Execution of works (foreseen until end of December 2020)

Step 6: Testing of the solution (foreseen until March 2020)

2.3. Cost and emission effects

Use the SOP and the EXCEL model from DT3.1.2, in order to calculate cost and emission effects, compared to a conventional building of the same size and function.

↳ Fact Sheet: https://www.interreg-central.eu/Content.Node/InterGreen-Nodes/CE1444-O.T3.1-fact-sheet-Tools.pdf

- SOP: https://www.interreg-central.eu/Content.Node/InterGreen-Nodes/CE1444-O.T3.1-SOP.pdf
- Excel: https://www.interreg-central.eu/Content.Node/InterGreen-Nodes/O.T3.1-Basic-Model-KPI-System.xlsx

3. Solar Energy Demonstrator in Berlin

3.1. The Basics and emission effects

EnTerra Solar Holding GmbH has installed two photovoltaic systems with a total output of 268 kWp on the roofs of BEHALA. The entire system produces 253 MWh of clean electricity per year. This saves around 224 tons of carbon dioxide. The electricity generated by the systems can supply up to 60 four-person households. Both companies thus make a valuable contribution to environmental and climate protection.

One of the two systems is operated by the Berliner Energieagentur GmbH (BEA). A photovoltaic system with a module area of 888 square meters was installed on the flat roof of a 4,200 square meter warehouse at the Westhafen location.

The total of 604 polycrystalline modules with an output of 127 kWp generate around 114 MWh of electricity per year and in this way save 74 t of carbon dioxide. The electricity generated is fed into the power grid and remunerated accordingly. BEA financed and planned the system and had it built by specialized service providers and will operate it for a period of 20 years. BEHALA will receive a corresponding share of the solar electricity remuneration.

The PV system was put into operation in 2010.

3.2. Lessons Learned and Experiences

The photovoltaic system contributes to the base load coverage in Berlin's Westhafen. Due to its large area, it can make a significant contribution to improving the port's emissions balance within the average useful life of 20 to 30 years.