INVESTMENT FACT SHEET

Investment I2 Pilot investment for a smart multimodal electric mobility station with PV installation

Version 2

Project index number and acronym	CE1100 LOW-CARB
Responsible partner (PP name and number)	PP6 City of Koprivnica
Linked to pilot action (number and title)	Pilot actions for low carbon mobility in functional urban areas
Project website	www.interreg-central.eu/low-carb
Delivery date	30/11/2020

Description and technical characteristics of the investment

The investment, “Smart” multimodal station Koprivnica is a public bus station that is being used by the users and the operator of the public transport systems of the City of Koprivnica. The station consists of the following elements;

1.) Plato of 70 m2 where two e-buses and five e-bikes can be stored
The plato is made of asphalt, with enough thickness to take on the stress of heavy public transport buses.

2.) Overhead construction that carries the photovoltaic system
The overhead construction is minimally 3 meters high, enough to accommodate public transport buses below the construction and strong enough to photovoltaic panels.

3.) Photovoltaic system located at the overhead construction
Photovoltaic system in total 72 cells, with a total power output of 4800W. Minimal constant power of the inverter is 4950VA and ist efficiency lies around 95%. The minimal warranty on the photovoltaic system is 20 years.

4.) Battery storage system located in the middle of the station
Minimal energy that can be stored into the batteries is around 10500 Wh.

5.) Fully integrated software system that integrates various public transport systems
Software system is a cloud solution that is fully integrated with the existing software systems that the City of Koprivnica has.

6.) Five chargers for e-bikes
Five chargers for e-bikes in the forms of pillars that are suitable for the existing fleet of electric bikes currently operating in Koprivnica.

7.) Two AC chargers for electric vehicles
Two 7 kw AC chargers (Type2 – Type2) capable for charging the buses in overnight conditions.

8.) Software management system that controls the usage of the stored energy and of the whole system.
Complex software management system that regulates the flow of energy stored in the batteries.

The photovoltaic power system feeds the energy produced into a battery storage system. The energy stored in the battery storage system feeds the energy, in parts of the day when power is not available to the consumers, to the AC chargers, e-bikes and other equipment that is mounted on the station. As stated, the station has a set of 5 e-bike charging stations and two AC chargers that are an integral part of the station.

The station is not fully autonomous, it has a connection to the electricity grid to provide electricity when it is not available from the energy storage system. As a major element of the station, it incorporates a tailor made software system that is replacing all of the existing systems, or partially integrate them into one unique system

that prepares the public transport system of the City of Koprivnica for the extension into the FUA area, with the focus of keeping track of how the different elements of the public transport system are functioning, cost figures, preparation for MaaS services and many other features that are important for the public transport operator of a small public transport system in a small city.

With this measure, the aim is to increase the usage of renewables, which is in Croatia on a very low level, make our public transport with a minimum of CO2 emissions and to develop a demonstration example of a station that could be used in future public transport operations of small and medium sized cities in Croatia and in the wider region.

This station is innovative in many ways, but the most important ones are:

- First multimodal station in Croatia, that combines the usage of electric buses and e-bikes at one place
- First station used in public transport, i.e. first charging system in public transport that uses on-the-place produced renewable energy and uses it to power electric vehicles used in public transport.
- First system in Croatia that incorporates different public transport systems, public bikes, public e-bikes, and electric buses, and integrates them into one functional system that is managed by one operator and one management system.

This station demonstrates the possibility of using on-the-spot produced energy from renewable energy sources and spending the energy, backed up by the battery storage system, when there is no energy from the sun available. This demonstrates the usage of energy produced from renewables when there are no possibilities to produce the energy from the sun, eliminating the main problem with renewable energy production, how to store energy that can be produced in one part of the day and use it when it is needed.

Investment costs (EUR) including a break-down of main cost items

The total cost of the investment was 349.000,00 HRK (46.530,00 €). Partially, 244.000,00 HRK (32.530,00 €) was spent on the equipment and installing the equipment and 105.000,00 HRK (14.000,00 €) was spent on the construction works. More of the costs in Annex I. of the document.

Investment location

NUTS 3	Address (Street, house number, postal code, city, country)	GPS coordinates
HR0045	Trg Žarka Dolinara, 48000 Koprivnica	46°10'32.9"N 16°50'41.4"E

Duration and process of investment implementation	
Start date	**End date**
29.07.2020	30.11.2020
Major milestones of investment implementation	
29.07.2020 – decision on equipment supplier 29.07.2020 – 25.11.2020. – implementation, testing and evaluating the equipment	

Ownership and durability of the investment (e.g. maintenance, financing)

The equipment and the station is in ownership of the City of Koprivnica. The public transport operator, municipal utility company Komunalac has been given the right to use the equipment for the purpose of running the public transport system. Organization in charge of running the station is MUC Komunalac, while the City of Koprivnica secures the funds for the normal functioning of the equipment installed. Therefore, in the budget of the City of Koprivnica for 2021. Funds have been reserved for the functioning of the station, including electricity costs and scheduled maintenance. Also, the before mentioned funds have been secured in the projections for the budget in 2022 and 2023.

The equipment has a minimal warranty period of two years on the equipment installed on the station. Installed equipment is durable and proven in real time conditions and in the evaluation period from the beginning of august 2020. Till the end of the project and the end of the reporting period, no problems have been reported.

References to related pilot action (output fact sheet) and relevant deliverables (e.g. pilot action report, studies) and web-links.
If applicable, additional documentation, pictures or images to be provided as annex

Please also refer to:
O.T3.2 pilot factsheet Koprivnica
D.T3.4./3 Report on pilot implementation and evaluation
and the LOW-CARB pilot handbook in all CE languages.

Below pictures of the pilot action:


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