Interreg CENTRAL EUROPE
European Union European Regional Development Fund

BOOSTEE-CE

DELIVERABLE T3.1.7

D.T3.1.7 – EE with OnePlace platform (PA6) in a kindergarten of Koprivnica (HR)

08/2019

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A.T3.1 Implementation of pilot actions for EE improvement

Issued by: Partner Nr. 05
Date: Aug 2019

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1. Introduction and aims

This deliverable is a kind of investment report that contains information and data about devices and technology implemented in the pilot action buildings.
Analysis of selected measures aimed at improving energy efficiency implemented in pilot actions is aimed at defining the possibilities of how to better manage/monitor energy and use/consume it rationally.
This document is also about the testing of the OnePlace platform as a design tool supporting the acquisition and dissemination of knowledge on the improvement of energy efficiency in buildings.
The aim of the document is to present investment activities and goals to be achieved as part of the tasks undertaken for each pilot action.

2. Identification of problem areas

Each project or investment should be preceded by an inventory, analysis of the current state and identification of the biggest problems in the building, which cause its energy and ecological inefficiency. These aspects also affect the financial issue and are a consequence of higher operating costs for facility users.
Braca Radic Elementary School and the Kindergarten Loptica were chosen because these two objects needed to went through refurbishment process and that was a chance to integrate smart metering system to track improvements in energy efficiency through process of refurbishment. Also, it was a chance to track possibilities for further energy efficiency improvements. These two buildings were struggling with problems of excessive energy consumption, lack of proper control and energy management, unreasonable and irrational use of energy, lack of energy awareness among users of the buildings, etc. and smart metering system is great way to fully or partly correct these problems.
Each investment is the result of the assumptions made therefore the pilot action has defined its own goals, which it will achieve in the perspective of the duration of the BOOSTEE-CE project. The objectives also point to existing problems that need to be minimized or eliminated entirely. The goals in this pilot action are listed below:

1. Increasing of energy efficiency and performance in public buildings
2. Energy consumption control and monitoring
3. Energy management demonstration
4. Education and promotion of energy efficient measures

3. Research on EE measures for the PA

Well-defined goals have allowed the right choice of measures and devices to improve energy efficiency. Analysis and review of available technologies that were used to implement the pilot action will allow for better understanding of what was done, how and why.
Intelligent energy management systems were built into two buildings, Braca Radic Elementary School and the Kindergarten Loptica.
Basically, the system includes measuring devices (smart meters) and software for displaying and comparing the results. Measuring devices include reed switch that collect information about electric energy, gas and water consumption as well as internal temperature and CO2 level. Central unit processes and displays collected data within specially designed software in real-time. This investment will provide numerous benefits such as monitoring, planning and control of energy and water consumption costs. Ultimately, the system will enable better management of energy consumption, easier maintenance of facilities and financial savings. Furthermore, smart metering data are integrated in Croatian Energy Management Information System (ISGE).

Figure 1: Smart metering hardware implementation. Source: REAN

Figure 2: Central Monitoring System – Main dashboard. Source: REAN

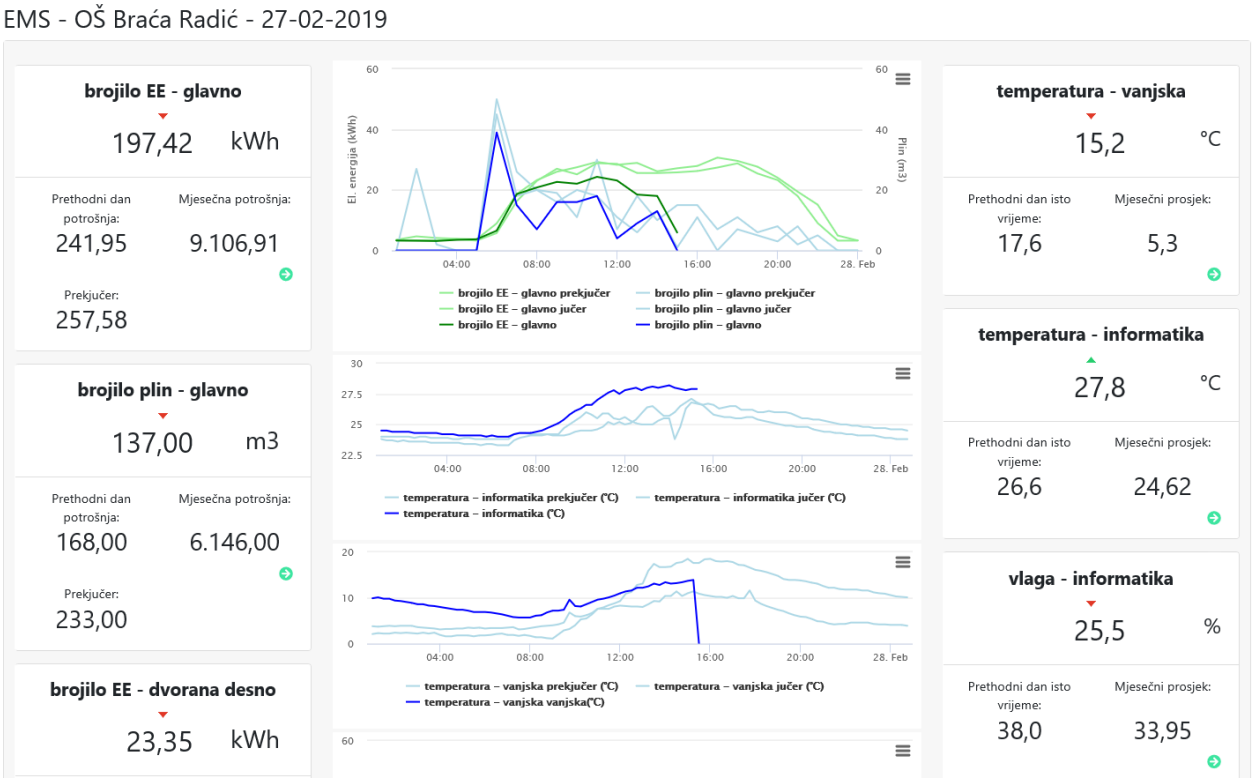

Figure 3: Central Monitoring System – Dashboard. Source: REAN

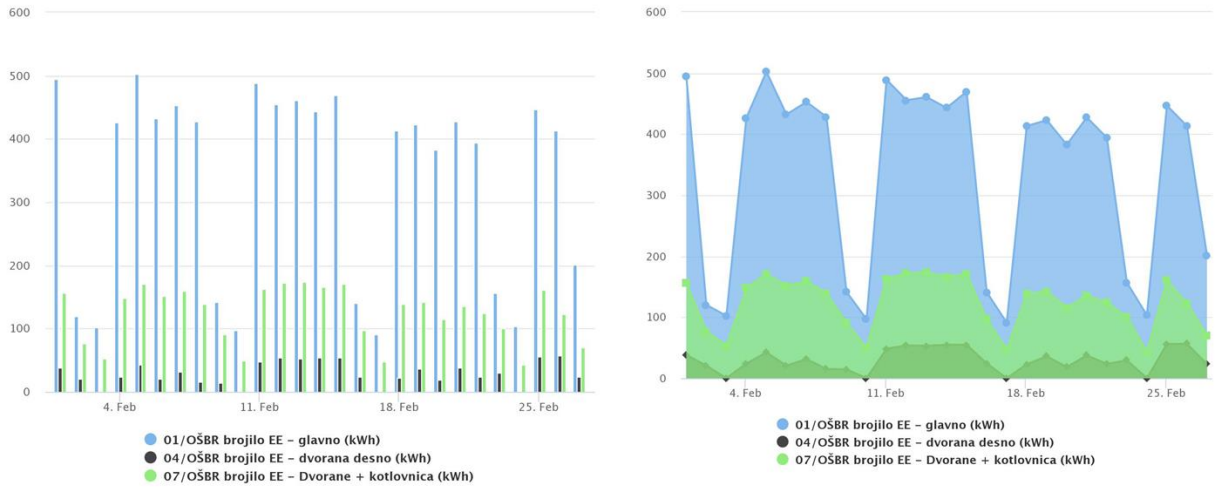

Figure 4: Central Monitoring System – Chart view. Source: REAN

4. OnePlace platform testing

Implementation of the pilot action consists of two aspects:

- technical, i.e. installation of smart metering for electricity, gas and water, measuring of air quality system (described in chapter 3);
- social / promotional like OnePlace platform use.

This chapter is devoted to the promotional aspect and describes the testing and structure of the project platform below.
The OnePlace platform consists of 4 different modules: Living Energy Marketplace; 3D Energy Management System; Energy Efficient Cities; Financing Energy Efficiency.
The first one is an online database helping to understand all different kinds of energy efficiency measures, electronic devices and offering qualified contractors who can carry out energy efficiency investments.
The second one is a webGIS system which can navigate a map of an urban environment, select a 3D building of interest and retrieve the energy audit and other cadastral/building information. The 3D Energy Management System aims to harmonize the different data sources in one database and visualize them.
Next module enables the exchange of experience and good practices between regions for public authorities and other public actors.
The last one is an attractive visual presentation of the transnational strategy outcomes (financial road map), examples of best practices and practical steps to use the national and EU-level resources. This module also tries to capture and present the methods of financing energy efficiency investments that will be transferred to the participating regions' Energy Efficiency Roadmaps.
The current content of the OnePlace platform has been tested by project partners and selected stakeholders. The chosen method of reviewing is the questionnaire. This choice was considered optimal and the best. It included a short time to gather feedback and comments.

Functionality testing and validation of the 3D city models with energy audit functions in City of Koprivnica

Focus group meeting was organized in order to present OnePlace platform and its content as well as to test 3D city models with energy audit functions. Focus group meeting took place in Koprivnica on April 19, 2019. There have been in total twelve (12) participants who have attend the focus group meeting and this participants are mostly City's employees and employees of the development and energy agencies which act as supporting organisations of the City in energy efficiency related projects. Meeting was conducted in form of presentation of OnePlace platform and its functionalities and also in form of practical use of OnePlace platform tools by participants. During this focus group meeting many constructive questions and suggestions have been discussed and overall conclusion is that this tool is one helpful online tool that can be used in a daily work for those people who are dealing with the public buildings in the City of Koprivnica. There is still room for improvement and adjustment of the tool possibilities to actual needs of the target groups. Nevertheless, this kind of short educational event was very useful for public authority employees because they showed their will and desire to gain new knowledge and skills that can upgrade their competences in the field of energy efficiency in buildings. Recommendation is to keep going with the educational events of this type in order to introduce as many as possible people with the possibilities of this tool because its usefulness is unquestionable.

Figure 5: Focus group meeting in Koprivnica. Source: REAN

5. Application of OnePlace platform in PA6

The OnePlace platform has also been tested in the conditions of the pilot action in Koprivnica. It has been confirmed that the platform works well and is useful.
As already mentioned, OnePlace platform consists of 4 different modules: Living Energy Marketplace; 3D Energy Management System; Energy Efficient Cities and Financing Energy Efficiency.
The first one, Living Energy Marketplace, is an online database of experts and electronic devices which can be very useful for pilot action objects because these databases can be used for existing smart metering systems improvement by finding the right parts for the systems or finding qualified contractors who can carry out energy efficiency investments. The second one, 3D Energy Management System, is a webGIS system which can navigate a map of an urban environment around pilot action buildings, select a 3D pilot action building or any other building of interest and retrieve the energy audit data and other cadastral/building information. The 3D Energy Management System will be used in order to get all relevant information about building of interest in one place. Third module named Energy Efficient Cities enables exchange of experiences and good practices between regions. It will be used for promotion of innovative and revolutionary solutions in energy efficiency field. As for the pilot action objects in Koprivnica, applied solutions will be promoted on OnePlace and it will probably be replicated elsewhere in Croatian regions and beyond as a good practice to follow.
The last one, Financing Energy Efficiency, will be used by all relevant stakeholders as a guide in order to find the most suitable financing solutions to finance energy efficient projects in Croatia.

6. Conclusions

The activities described in the pilot action in Koprivnica represent a good practice. They can serve as a model for carrying out investments aimed at improving energy efficiency consisting of installing smart metering for electricity, gas and water, measuring of air quality system electricity.

The whole process of SM system implementation in two pilot action objects in Koprivnica started with the first month of 2018. Basically, the system includes measuring devices (smart meters) and software for displaying and monitoring the results. Measuring devices include reed switch that collects information about electric energy, gas and water consumption as well as internal temperature and CO_2 level. Central unit processes and displays collected data within specially designed software in real-time. System is in full function since the beginning of October 2018.
Successfulness of the carried on projects lies in the fact that they have been implemented "just in time", i.e. implementation of SM systems has been finalized just few months before integral refurbishment of both buildings, that way perfect conditions were created for monitoring and tracking energy consumption in pilot action buildings before and after refurbishment. Integral refurbishment of pilot buildings together with SM system implementation makes a well-rounded story for future facility management establishment in the City of Koprivnica what makes these two buildings bright examples which paved the path for other buildings in the city. This story would not be so inspiring and successful without great coordination between REAN's technical team and city's financial crew who put their minds together in order to prepare and carry out the whole process of pilot action implementation in two buildings in Koprivnica.

The information from this study will be useful and used for documents D.T3.2.1 and D.T3.2.2.