

DELIVERABLE T3.1.6

**D.T3.1.6 – PA5 to monitor and control energy
flows in a public building in Plonsk (PL)**

08/2019





D.T3.1.6: PA5 to monitor and control energy flows in a public building in Plonsk (PL)

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.

The biggest but often overlooked problem in the field of energy efficiency in educational public buildings is the lack of care from its users. Students rarely pay enough attention to turn off the light in places frequented by them, e.g. toilets. They are often inadequately lit with sunlight coming in through small window openings or in winter due to faster falling dusk, the light is lit there earlier than in summer. Such a state of affairs contributes directly to increasing bills for electricity consumption. The main objective of the project was to estimate the savings generated by energy efficient lighting system in comparison to the traditional one.

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. Demonstrating the effectiveness of EE solutions by implementation of energy monitoring and modernization and control lighting system, not only in ecological but in purely financial aspect.
2. Increasing the comfort of the building use
3. Easier operation of the building
4. Promoting and disseminating knowledge about energy efficiency measures in building

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.

The idea is to compare an old and inefficient lighting system based on “traditional” bulbs with EE LED system using motion sensors in 2 classrooms and 2 toilets with similar parameters (location in the building, dimensions). Smart metering system is connected to the WI-FI Network and is able to send the gathered

data on e-mail or allowing user to view the data in “real-time”. The intelligent remote energy meters enable automatic data transmission on energy consumption. The owner of the building receives bills for actual energy consumption, not forecasted. In addition, it can monitor energy consumption on an ongoing basis, which in turn will allow to manage this consumption and reduce electricity bills. Control of the level of energy consumption will allow to optimize the level of contracted power, which in turn will generate savings.

Energy Efficient LED lighting is used almost everyday in the classrooms and toilets. Classrooms are places where light is lit almost all the time (especially during autumn and winter when days are shorter) during the lessons. Toilets are places where students often don't care about turning the light off before leaving.

Data collected by smart metering system can be used to estimate energy and financial savings in similar places / conditions.

The method of selecting the contractor was an inquiry. The procedure started on 4-11 July 2018. Energorozwój S.A. was the selected contractor for the investment.

The investment has a finished status – smart metering system is operational and collecting data.

Funds for the investment and real costs:

Thematic equipment used, such as 2 device management systems – DMS and 2 light control systems were covered with funds for the investment in the amount of 6 900,00 Euro - real costs: 28 700,00 PLN (approx. 6 577,90 Euro). Figure 1 presents photos of installed equipment in the pilot building.

Works such as the installation of energy device system and light control system cost 7 000,00 Euro - real costs: 29 300,00 PLN (approx. 6 715,41 Euro).



Figure 1: Investment activities photos for the PA5. Source: City Municipality of Plonsk

4. OnePlace platform testing

Implementation of the pilot action consists of two aspects:

- technical, i.e. installation of smart metering, energy monitoring and light management system and replacement of the bulbs with energy saving bulbs (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 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. The stakeholders selected by the CMoP belong to a group of industry professionals in the field of broadly understood energy from the managers and employees of municipal companies, i.e. Płońsk Heating Company and Municipal Waste and Energy Company through designers planners, energy auditors and workers of School (PA building), both teaching staff and administrative staff. Project implementation team presented the platform's capabilities, among others, at the energy cluster meeting and conferences similar to BOOSTEE-CE project called TOGETHER (implemented within the frames of INTERREG-CE).

5. Application of OnePlace platform in PA5

The OnePlace platform has also been tested in the conditions of the pilot action in Plonsk. It has been confirmed that the platform works well and is useful.

Thanks to the platform involved parties will be able to find interesting information on public buildings owned by the city of Płońsk. The platform's strong point is its accessibility for a not very advanced user, while for its administrators it is easy to add detailed information about subsequent buildings. Reliable technical information on the pilot building included on the platform comes from the energy audit project developed also as part of the project. As energy audits for new public buildings will be developed, other buildings could be described in as much detail as the pilot building.

6. Conclusions

The activities described in the pilot action in Plonsk represent a good practice. They can serve as a model for carrying out investments aimed at improving energy efficiency consisting of installing smart metering, energy monitoring and light management system and replacement of the bulbs with energy saving bulbs.

The success and innovation of the project was a component of many factors. The primary school is the only building in Płońsk with a smart metering system. If as a result of the project measurable benefits are noticed, its assumptions can be used in the remaining 3 primary schools belonging to the partner which are similar in energy consumption habits and building parameters or they can be expanded to include other rooms in the pilot building, replicating the solution and accumulating energy and financial savings.



Cooperation between the project implementation team, the contractor and school staff was very good, which undoubtedly contributed to achieving the indicators assumed at the planning stage.

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