



# D.T3.5.3 EVALUATION REPORT OF PILOT ACTION

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Country

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# 1. General information about the pilot

## 1.1. Aim of pilot activities

Pilot programme is a small-scale version of a larger project. It allows testing proposed approach, identifying problems and preventing them from escalating. When identified, problematic issues might be solved, and the programme adjusted. Pilots reveal unforeseen challenges and help the staff involved in the programme to get prepared for a full-scale implementation. The aim of evaluation of pilot programmes is to verify whether objectives defined for the pilot phase are met, and to propose recommendations how to improve the programme before launching it in a full-scale. It is done by reviewing activities performed and evaluating whether they allowed for achieving the objectives.

The aim of FEEDSCHOOLS pilot activities was to test and evaluate the FEEDSCHOOLS toolkit: ERE App, Financial App, and the database of best NZEB practices. When validated, apps should allow non-experts for development of an energy renovation plan for school. ERE App should provide qualitative data on current energy performance of a building and compare it with other buildings in a given country in terms of energy consumption. It should be followed by a list of improvement measures that would allow for reaching the nZEB standard. Data on energy savings, emissions avoided, financial costs, and carbon footprint of a renovation should be also available. Using these results, the Financial App should suggest an optimal financing plan, i.e. combination of using own funds, credit/loans, subsidies, ESCO and PPP. Database of best practices should allow for getting more information about innovative solutions that have been successfully implemented in other public building in the Central Europe region.

Pilots have taken place in 6 countries: Croatia, Czech Republic, Hungary, Italy, Poland, and Slovenia. 8 schools from each country have been involved. In each school three different functional zones were targeted: classroom, sport hall, and canteen. Pilot consisted of the following activities:

1. Data collection - preliminary data, such as historical energy consumption and building technical schemes, have been collected.
2. On site energy audits - pilot schools have been visited and energy audits have been conducted. As a result, reports describing building energy performance have been drafted.
3. Improvement options - based on on-site energy audits results, energy efficiency measures have been proposed so that nZEB standard could be reached.
4. Optimal financing schemes - using the Financial App, plans of financing the renovation measures have been proposed.
5. Carbon footprint of restoration - using the ERE App, the improvement of building carbon footprint has been calculated.
6. Open lessons for behavioural change of school staff and students - in each school participating in the project lessons activating energy saving behaviour have been organised. Lessons targeted students, teachers and technical staff.
7. Improvement and validation of the apps - results of the ERE App and Financial App have been compared with results of on-site audits, so that Apps could be improved.

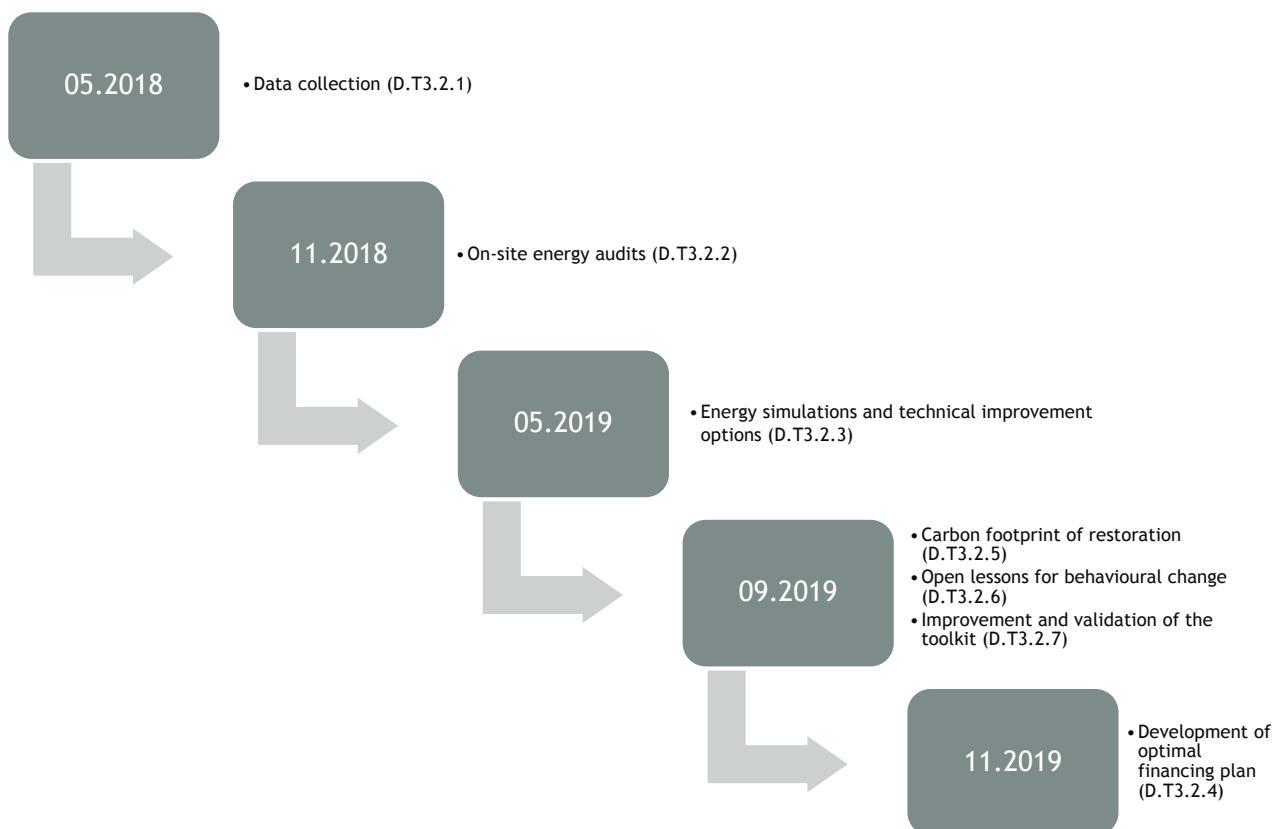


The aim of activities 1-3 was to collect on-site data and perform calculation using traditional energy auditing approach usually used in a given country. Results got in this process have been considered then as a reference level for apps validation and improvement within activity 7. When developed, ERE App was used for development of financing plan (activity 4) and carbon footprint calculations (activity 5).

## 1.2. Schools selected for pilot activities

School ID	Building name	Street, number, city and postcode
HR_01	Osnovna škola Dobri	Slavićeva ul. 40, 21000, Split
HR_02	Osnovna škola Ravne njive	Sarajevska ul. 30, 21000, Split
HR_03	Osnovna škola Split 3	Bruna Bušića 6, 21000, Split
HR_04	Osnovna škola Žrnovnica	Hrvatskih velikana 41, 21251, Žrnovnica
HR_05	Osnovna škola Brda	Put Brda 2, 21000, Split
HR_06	Osnovna škola Meje	Gunjačina ul. 1, 21000, Split
HR_07	Osnovna škola Pojišan	Viška ul. 12, 21000, Split
HR_08	Osnovna škola Spinut	Teslina 12, 21000, Split

## 1.3. Pilot timeline





## 1.4. Partners involved in Pilots

> **City of Split**

- Country: Croatia
- Partner type: institutional
- Partner description: City of Split is the second largest city of Croatia, with about 250,000 people living in its urban area. The city's target, committed in the Sustainable Energy Action Plan, is to reduce CO<sub>2</sub> emissions by 20% and energy consumption by 20% by 2020 compared to 2007.
- Main role and duties in Pilots: institutional partner, coordinating collaboration with schools.

> **Roterm Ltd.**

- Country: Croatia
- Partner type: subcontractor
- Partner description: Roterm Ltd. is expert company for providing technical consulting services, specialized in engineering design and works supervision. Besides engineering design and supervision, also provides technical consulting services throughout the whole investment process. Roterm Ltd. Is providing professional assistance and expertise in the field of energy auditing and energy efficiency improvement of buildings.
- Main role and duties in Pilots: subcontractor responsible for audit conducting.

## 2. Pilot evaluation

### 2.1. Pilot implementation

Consumption data for energy and water consumption was taken from the Energy Management Information System (EMIS).

Energy Management Information System (EMIS) is Internet application for monitoring and analyzing energy and water consumption in public sector buildings and an inevitable tool for systematic energy management.

In our schools by energet's only one value is available, because there is only one gauge installed for the whole object. Distribution for the consumption of part of the classroom/sport halls/canteens are made according to the surface area of the same in relation to the whole object. Most of the schools don't have available technical documentation.

Schools have been visited and audits have been conducted. Result is energy audit which is describing building energy performance.



Based on the energy audits, efficiency measures have been proposed to reach in two scenarios: nZEB standard scenario and Q<sub>hind</sub> reduction of 50%.

In Croatia, there have been 8 lessons organised. In total, 349 students and 18 school staff participated in open lessons. The main objective is to encourage and activate students in energy efficiency issues as an important element in counteracting the negative impacts of climate change. The aim of the workshop is to raise students' awareness of the need for efficient use of energy and sustainable management of resources for environmental protection.

The advantage of the Feedschools project is to create a database of facilities that have prepared parameters for saving from the implementation of energy measures and various financing models for achieving savings.

The strongest activity is the energy simulations and the options for technical improvements, basis of project are the results from this part of the project.

Main difficulties with the pilot implementation are in development of optimal financing plan, because the costs of implementing energy renovation measures are high at the start, and there are no significant savings achieved in the area of Split (compared to the continental part of Croatia) due to the milder climate conditions, which cause the return on investment extends.

Positive aspect are open lessons for behavioral change.

Schools form one unit, and it is not common to divide a school into three zones (as required by this project), because it is not common to have separate energy consumption in 3 zones. In most cases, it is not possible to implement the measures by zones when implementing energy renovation measures, since the buildings are for the most part a unique architectural unit.

In Croatia, the requirements for reaching the nZEB standards are too high, and thus the investment in implementing energy renovation measures is in most cases too large.

## 2.2. Relevance

Procedures and instruments are specific to each country where the project was implemented, but they also have some points in common. This project facilitates the exchange of experiences, thus providing the preconditions for the creation of standards at central European level.

Europe have a lot of nature conservation policy aims to reduce environmental impact, since the project aims to reduce energy consumption at both Member State and European level.

The City of Split has selected 8 participating schools as part of this project. The City of Split provided access to all available data and all available project documentation. Establishing contacts and organizing the term education of object users.

Since the trainings were held with the users of the facilities, the same was followed by the media, a part of the residents in the city got a picture of how energy savings can be achieved with changing behavior.



## 2.3. Transnational added value

This project facilitates the exchange of experiences, thus providing the preconditions for the creation of standards at central European level. It is possible to gather all the positive experiences in one place, so that guidance on the best possible approach can be obtained.

In Croatia there is no central base for the public objects, as they are mostly founders and managers of the local self-government unit. This project guides how to create a quality base of facilities, that is, to create all the preconditions for selecting schools for the implementation of energy renewal, as far as we know at the level of Central Europe.

Unified templates for all countries were used, which resulted in synergies at the multi-country level. Energy audits of objects were performed according to the template, and complementarity was obtained, because the methodology of energy audits is not the same in all countries.

## 2.4. Impact

The project was presented at the 1st Regional Workshop and the Symposium "Sustainable Construction I nZEB", which was attended by people from different structures of the society (state representatives, scientists, designers, representatives of the material producers). On the workshop, the conditions for achieving the nZEB standard are presented to all of the participants.

International contacts were made and the experiences of the partners were changed. The project has its own structure of communication and interaction of partners which is the right way to implement international projects and cooperation in future.

In Croatia, the reconstruction of public buildings has been co-financed for several years, generating EU grants, thereby reducing the initial investment of the local stakeholder. The project has implemented and introduced various financing methods, making it easier for the manager to choose the easiest financing model. Achieving the nZEB standard is in most cases unprofitable for projects in the city of Split, long return on investment is required. Considering that these are public buildings, which have a long lifespan, and the vast majority of buildings are old, investment in maintenance is still required. The most appropriate financial model should be selected and the proposed measures can be implemented.

In project were open lessons for behavioural change, which educate users how by changing the behavior it is possible to achieve energy savings, and it is estimated that change of behavioural can save up to 5% per year in energy consumption.

Given the limited financial resources, and since the City of Split is currently implementing several energy renovation projects for public facilities, no significant financial investments by the City itself are possible. If interested partners are found for co-financing, then it would be possible to give results in below 2 years.

## 3. Summary

The pilot project has a good future because it has created an exchange of international partners, and it could provide best from all countries, so it could provide local authorities with new solutions, technical, educational and financial, to help them implement the nZEB concept at school and public buildings.

