

Interreg

CENTRAL EUROPE



ENERGY@SCHOOL

European Union
European Regional
Development Fund

REPORT ON THE TECHNICAL IMPLEMENTATION OF THE EIGHT PILOT ACTIONS

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Introduction

The goal of ENERGY @ SCHOOL is to simplify the introduction of smart energy schools. With an integrated approach, teachers and students are trained as Senior and Junior Energy Guardians (EGs). They are committed to a sustainable increase in the energy efficiency of buildings and an understanding of the appropriate energy consumption ("energy culture") of a school building.

Within the project, ENERGY@SCHOOL, there will be 8 pilot actions in 8 different cities in 7 European countries. The pilot actions are linked to investments, which include the procurement and installation of necessary technical equipment. This on-going report gives an overview of the 8 pilot actions including the number of schools involved, quantitative data about the equipment and a qualitative description about the proceeding. The information of the 8 pilot actions are shown in a table, which spreads over 3 pages. The last column of the table includes a summary of all pilot actions.



Overview of all 8 pilot actions and summery

	LP	PP3	PP5
City	Fusignano, Italy	Bydgoszcz, Poland	Karlovac, Croatia
Number of schools	2	7	5
Overview	Installation of smart meters to improve the energy consumption and awareness of the students	Installation of RES and an energy management system including smart meters, detectors and related equipment	Installation of RES and an energy management system including smart meters, network connection and web design application
Quantitative data and information	<ul style="list-style-type: none"> • devices for measuring and monitoring of consumption • multifunctional sensors • devices for management of lighting fixtures • general electric floor panels • related cabling work 	<ul style="list-style-type: none"> • 1 thermal + 1 electricity smart meters per school • installation work for smart meters • sensors for each school • 30 thermostatic valves per school • technical system to regulate valves • 50 LED lamps per school • laptops + software per school • PV cells for 2 schools 	<ul style="list-style-type: none"> • 482 Thermostatic valves (incl. Installation) • LED lamps for one classroom in each school • energy monitoring equipment (waiting for technical data of PP to procure the right equipment): includes smart meters (electrical + thermal), sensors, installation works, network connection, Building Energy Management System
Qualitative description of the overall proceedings	<ol style="list-style-type: none"> 1. Technicians of UCBR obtain information about possibilities of technical equipment 2. UCBR launched official tender and assigned the company "Smart Domotics" to install the technical equipment 3. The technicians of the company and UCBR are in contact to test and optimize the functioning of the smart metering system 	<ol style="list-style-type: none"> 1. Preparation of initial assumptions for investment 2. Inventory in terms of implementation possibilities, order of works and the initial cost estimated (external company) 3. Adjusting (reducing) the scope of the concept in terms of project budget <p>!! Lack of companies that fulfill the previous assumptions →Due to this lack the Public Procurement Department suggest to implement the tasks separately (contractor selection, contract) and to purchase tablets and laptops by the IT Department</p> <ol style="list-style-type: none"> 7. Preparatory work for the development of new task documentation 8. Transfer parts of current tasks to a new person 	<ol style="list-style-type: none"> 1. Public Procurement for supply and installation of thermostatic valves (launched in July 2017) 2. Public Procurement for supply and installation of LED lamps (launched in Aug. 2017) <p>!! Before the procurement and installation of smart meters, PP5 first needs technical data from other PPs about the central data collection system.</p>



	PP7	PP8	PP9
City	Szolnok, Hungary	Újszilás, Hungary	Stuttgart, Germany
Number of schools	5	2	5
Overview	Installation of smart meters and thermostatic valves. Creating a renewal plan for one school.	Building a demonstrative knowledge RES centre	Installation of an energy management system including heat/electricity meters and Stuttgart energy control systems (SEKS)
Quantitative data and information	<ul style="list-style-type: none"> • smart meters • thermostatic valves • compilation of design documentation incl. Presentation of current situation, development of suggestions (referring heating, cooling, hot water, electricity, RES), energy savings, architectural drawings, engineering drawings 	<ul style="list-style-type: none"> • Smart meters • solar panel model • solar collector model • wind turbine model • geothermal model • facilities design 	<ul style="list-style-type: none"> • 4 SEKS (Stuttgart energy control system) • more than 7 heat meters • 4 electricity meters • LEDs in one classroom and one assembly hall
Qualitative description of the overall proceedings	<ol style="list-style-type: none"> 1. Architectural plan: architectural drawing, specification of the design, calculations and other documents are in process and will be finished on April 30th. 2. Buildings engineering: specification of the design and calculations are finished, engineering drawings, other documents are in progress and will be finished on April 30th. 3. Smart meters have been ordered and will be installed in all schools by end of April. 	<ol style="list-style-type: none"> 1. Installation of the 3 models of RES demonstrating their utilization and operation by end of April 2. All technology models will be made understandable by schematic diagrams and explanations 3. Both visual tables and computer applications will be used for the presentation of the process reviews (educational image, slide shows, short films, simulations) 4. Smart meters will be installed by end of April 	<ol style="list-style-type: none"> 1. schools are already equipped with basic technology like thermostatic valves, general meters for water, heat and electricity consumption, 1 school has a solar thermal system, 2 schools have a photovoltaic system, 1 school already has a SEKS 2. LED have been installed in one classroom and one assembly hall 3. all SEKS have been procured, 2 are already working, the other 2 will be set up soon 4. 7 heat meters have been installed, the others will be installed by end of school year 5. 4 electric meters will be installed during holidays in May



	PP10	PP12	Summary
City	Klagenfurt, Austria	Celje, Slovenia	8 cities in 7 European countries
Number of schools	11	7	44
Overview	Installation of LED lamps and an energy management system including smart meters and network connection	Installation of an energy management system including related equipment	7 PP build an energy management system using intelligent metering equipment 1 PP builds a demonstrative knowledge centre for RES
Quantitative data and information	<ul style="list-style-type: none"> energy monitoring system for 7 schools including: monitoring system for heat, electricity and water consumption, network connection, pc software, mobile application LED lamps for 2 classrooms in 1 school new lighting system in one sports hall 	<ul style="list-style-type: none"> 144 thermostatic valves with Wi-Fi connectivity 7 Wi-Fi communication links 120 window sensors 14 electric energy meters 287 LED lamps and panels 68 electric meters for outlets 19 new windows for 4 rooms of 2 schools 	<ul style="list-style-type: none"> 8 PP installed an intelligent metering system (smart meters, sensors and similar) 5 PP installed LED lamps in selected rooms 4 PP installed thermostatic valves other investments were made incl. PV cells, RES-models, window refurbishment, laptops, software, network connection, drawings, ...
Qualitative description of the overall proceedings	<ol style="list-style-type: none"> 4 Schools were already equipped with an energy monitoring systems but adaptations were necessary energy monitoring was built in 7 schools during June 2017 and February 2018 LED lamps were installed in 2 classrooms and a new lighting system were installed in one sport hall. The rooms and the sports hall were selected according to the outcome of energy audits → all installation work is now completed 	<ol style="list-style-type: none"> KSENA (PP4) prepared an inventory report for 10 primary schools in Celje Based on the schools willingness and existing equipment 7 schools were selected for the project. Energy consumption analysis was carried out in order to make an investment plan for each school public tenders were carried out in July 2017 After signing the contracts in August 2017, the equipment was installed 8 to 10 frequently used rooms in each of the 7 schools were equipped with an energy monitoring system (a slightly lower number of rooms as in the AF, due to heating entities) The official handover was made by 31.8.2017 	<p>The proceedings of the PP were different due to different investments and difficulties that occurred. Nevertheless, the following steps were similar for most PP.</p> <ol style="list-style-type: none"> analyzing the state of the schools and possibilities for improvement Based on the existing equipment, the AF and financial resources offers for necessary equipment were invited. Installation work was done either by one or more companies; some PP also did some of the installation work themselves. Some PP finished their pilot investment, other will do so in summer 2018