REPORT

OVERALL ASSESSMENT REPORT ABOUT TRAININGS (Deliverable D.T1.4.2)

06.2018

PP5 - PNEC

I. INTRODUCTION

The aim of this report is to summarise overall training experience of the TOGETHER project and give critical review of the training material and training path delivered by the partners. The TOGETHER project promotes the concept of integrated energy management in public buildings through the development of innovative managerial tools and supporting implementation of selected technical, financial and DSM measures in 85 pilot buildings. The measures implemented will lead to significant reduction of energy consumption and change of behaviours of building users.

One of the project's tasks was to develop and test a comprehensive training model for increasing knowledge, capacities and skills of building owners, managers and decision makers, who then should be able to successfully implement sustainable energy measures in their buildings and to engage building users in the process. The model designed integrates different relevant topics and has "transnational" character, i.e. gives some common guidelines and contents that can be adapted to the training needs of specific countries, municipalities, projects etc.

The transnational training model on energy efficiency in public buildings, proposed and tested within the TOGETHER project, consists of the following steps:

All the steps were successfully implemented (leading to the execution of the 12 local trainings in partner countries) and partner's feedback gathered allowing for the trainings evaluation and drawing conclusions for the future. These are summarized in the present document.

II. LOCAL TRAININGS IN A NUTSHELL

Following project agenda and basing on the common training material (technical, financial and DSM), skills built during Master Train-the-Trainer workshop and guidelines provided by PNEC (TWP leader), each partner prepared and executed at least 12 local trainings for increasing energy managerial competences of building owners, managers and decision makers. Only SIEA compressed the training content into less training days to make sure that their targets can participate in as many of them as possible (they are located in different areas). Below there are some most important information on the trainings organised.

Trainings objectives

The main objective of the trainings was to increase thematic knowledge and practical capacities of building owners, managers and decision makers in order to allow them to:

- better manage energy consumption in their buildings in the long-term;
- plan, organise and implement necessary energy-saving measures (→ pilot action);
- plan further energy-saving projects and initiatives, both in pilot buildings and in other buildings of the municipality;
- facilitate energy retrofitting projects in private sector (through consultancy).

Additional objectives highlighted by the partners, include:

- calling the attention of the building users on energy saving opportunities and to provide them the necessary information on what they can do to save energy within their building both by changing their habits or through renovation measures.

Target groups:

The main target group of the trainings were the **pilot buildings' owners** (i.e. representatives of local administration responsible for public buildings and/or energy issues), **building managers** (both managers of the institutions hosted in the buildings and the caretakers) and **decision makers** (local politicians). Some partners, however, decided to widen this group, including also pilot buildings employees and/or users (e.g. students at schools). Some partners (like PNEC) also invited external stakeholders (e.g. representatives of neighboring municipalities) to benefit from the training opportunity (and thus spread the news on the project).

Training approaches:

Following common guidelines each partner designed its local trainings:

- based on the initial assessment of training needs and expectation of their targets;
- covering all key topics concerning technical, financial, analytical and behavioural aspects related to the overall topic of energy efficiency in public buildings;
- combining theoretical presentations with practical exercise, study visits, networking, etc.

The training material was based on the common, transnational training material delivered by the University of Maribor (technical part), Province of Treviso (financial part) and City of Zagreb (DSM part), supplemented by more detailed presentations and exercises prepared by local trainers. Adequate time intervals were maintained between the trainings to keep the trainees interested and focus but to also let them "digest" new knowledge gained. Below there is some info on individual training approaches of the partners:

PP1: Treviso - Each training day comprised of 6-hour classes organized in 3 didactic modules. An interactive learning format has been preferred to engage target groups (owners of buildings, managers, administrators and teachers) through classroom exercises and presentation of best practices. Whenever possible, besides appointed teachers, also members of the Province of Treviso and its partners have been involved to link training activities with ongoing activities of the Province of Treviso and TOGETHER. At the end of almost each didactic module, a multiple-choice self-assessment test was taken (4 to 5 questions). The self-assessment evaluation was useful for establishing the degree of understanding and for starting debate.

PP2: EAV - Each training day lasted from 8 to 16 with two breaks. Part of the trainings were discussions with building users. Lecturer tried to involve attendants in topics and gather their opinions and experience in their public building. Training day consisted of 3 main topics according to WPT1 training material – Technical, Financial and Demand Side management aspects. Due to fact that the aim was to raise awareness of building users in each pilot building, EAV organized the trainings with similar topics in each building. The key material used was the training materials elaborated within WPT1, together with presentation introducing smart metering in Czech pilot cluster. During trainings, metering devices purchased within the project have been used for practical demonstration. At the end of the training days, feedback of attendants has been gathered in a form of the satisfaction survey.

PP3: University of Maribor - A top-down approach was implemented, starting with buildings owners and managers and finishing with users and students. Local training path was based on energy audit results, Smart Metering System (SMS) implementation and national didactic version of training toolbox and included discussion on the most proper energy efficient measures. Focus was on the priority measures, consisting mostly of the technical measures and soft measures that local Strategy for energy efficiency could base on. Although, the training was implemented for pilot buildings target groups only, the results can be used also as good practices. At the end of each course the feedback of trainees was collected via questionnaire to validate quality of training courses.

PP4: Zagreb - The training days were held according to topics. The first topic tackled was the technical measures, financial measures and analytical and behavioral DSM. Two of the 12 trainings were held in the field, namely one in a school and one in a kindergarten participating in the project. The trainings were held by external experts from the field, as well as experts from the City of Zagreb. The trainings were subjected to self-assessment, namely the trainees filled out surveys on their knowledge about the topics presented in order to see how much their level of knowledge raised thanks to the trainings. As was expected, the level of knowledge concerning the behavioral part of the training was high at the beginning and stayed high (not surprising, as many of the trainees are teachers and are well acquainted with the teaching methods and well versed in behavioral issues), but the level of knowledge concerning the analyses and technical methods also rose by the end of the training.

PP5: PNEC – the trainers involved included representatives of PNEC (participating in Master Train-the-Trainer workshop) and external specialists. Also representatives of pilot buildings, being experts in specific topics, were asked to deliver some of the presentations, sharing their own expertise and experience. Due to significant distances between Cracow (PNEC's seat) and respective pilot municipalities part of the trainings were organised as physical meetings (2 in Cracow, 1 in Besko, 1 in Raciechowice and 1 in Żyraków) and part as on-line meetings. Whenever possible, trainings were combined with study visits in pilot buildings or other relevant sites. Theoretical lectures were also combined with practical exercise and the discussions on their relevance for pilot action.

PP6: PAKS – Building managers and owners were informed about the trainings at personal meetings and by phone calls or e-mails. Then they have appointed the persons to attend at the meetings. The project manager informed all stakeholders beforehand about the content of the project and the purpose of the trainings. The classes were scheduled when the project management received information on the status of the curricula. Four modules have been defined, each module included a three-day training session. The trainings have been organized between May – Sept 2017. After each training day the participants have evaluated the speakers and the training materials. The joint

training material was also completed with specific information – related to the energy management system operating at Paks.

PP7: Hegyvidek - the 17 trainings organised included 7 full day and 10 half day long sessions. The group of participants were changing each time, but there were sub-groups participating on multiple events. Hegyvidek did a strong emphasis on site visits within the trainings to show them how their building actually works and what concrete steps they can do to achieve savings. It covered technical, DSM and analytical aspects as well. The on-site trainings made them much more motivated than listening to general training materials. Certainly the Together training material was used on the trainings, but Hegyvidek always focused on selected chapters that were interesting for the specific target groups and relevant for the specific buildings.

PP8: **SIEA** - For the first training session, the training material was not yet translated, therefore SIEA has started with improvised introductory session which introduced all topics before summer break. After translation, trainings have started to be organized on regular basis and with full support of the material. Training material was used as a guide and a reference to what topics should be covered. However lectures were led in very interactive way. Therefore actual topics and concerns of trainees were discussed. Whenever possible, besides appointed teachers, also members of the SIEA and its partners have been involved in training activities. Due to organizational rezones SIEA had managed to organize only 8 trainings, however it covered all topics from the training material thanks to slightly longer training sessions with condensed agenda. Last two training sessions took place in premises of elementary school, since schools have been identified as a buildings with largest potential in behavioral measures. This sessions were done in close coordination with pilot actions in pilot schools.

III. MAIN CONCLUSIONS FROM THE TRAININGS

The overall training experience was very good. Most of the partners reported that they managed to catch attention of their target groups and increase their thematic knowledge and skills, establishing good basis for future energy saving efforts, also within the pilot action. Some problems were encountered on the way, however, that are reported here together with the best experiences from the trainings for future reference.

Main success stories

- proving that the TOGETHER transnational & interdisciplinary training model really works and is flexible enough to be adapted to different local situations, target groups, etc.
- establishing contacts with experiences trainers that improved the TOGETHER training path.
- catching attention of the target groups and increasing both their overall energy awareness and concrete competences to manage energy better.
- establishing good basis for the pilot action and further energy-saving projects that could be implemented in pilot buildings and municipalities.
- establishing efficient exchange of experience and energy-saving ideas between the representatives of the target group.

Partners individual success stories		
Treviso:	**EAV:**	**University of Maribor:**
1. Some municipalities (4 out 10 involved) had a strong "buy-in", actively participating in almost all of the planned lessons . 2. The 2 training lessons, which were organised in a most active way (division in mixed groups), have animated and created a less formal approach to the training activities and pushed the trainees to actively participate.	1. During training a few questions and informal approaches led to discussion with students, when they started to talk about their building and related problems and issues. 2. We could observe great willingness and involvement of gymnasiums' students	1. As the training based on real trainees needs and was focused on their needs in different topics it contributed to the behavioural changes of public building' users in energy savings. 2. As the training model based on common transnational model framework, tested in the Master Train the Trainers, and later adopted to the local needs it assured positive effects. 3. The organization of the training path in parallel with other partners' regions created a leverage effect/positive motivation, generating the idea of participating in the training path as a sort a co-working transnational community.
Zagreb:	**PNEC:**	**PAKS:**
1. The two trainings organized on site proved to be most interesting; there was no formality of a conference room 2. The second training which included a demonstration of measuring instruments succeeded in creating a relaxed atmosphere and many participants still often mention how interesting and entertaining it was	1. Managing to create good atmosphere within the training group. From session to session the trainees felt better with each other, were more eager to learn and engage in discussions and more eager to take part in the next session. 2. Using ICT to support execution of the training path - part of the sessions was organised on-line. Also during	1. Great experience were the interactive, intensive conversations when the participants discussed their problems and ideas related to their buildings. These conversations were mostly inspired by the case studies. 2. Some trainees expressed their interest in continuing the learning process, and they have

3. After all the 12 trainings have been completed, the participants expressed a great satisfaction with the level of knowledge gained; indeed, some even commented on how they didn't expect the trainings to be "as interesting as they were".	"physical" meetings some presentations were delivered on-line, when the well-experienced lecturer had problems (timing, distance) with reaching the venue. This helped to ensure higher participation rates, good-quality lectures and give practical insight into energy efficiency potential related with IC technologies. 3. Using knowledge and skills transferred and exchange initiated to improve pilot action, develop ideas for tasks for competing building teams and come up with energy-saving measures that could be potentially implemented in pilot buildings.	also taken part at the introduction of the thermos camera. 3. Several financial solutions and the DSM materials seemed to be new for the trainees, that means that their knowledge could be really improved.
Hegyvidek: 1. The training for the decision makers was very successful. We could catch the interest of the mayor and vice mayors for the project and for the project objectives. They have provided good advices for a more successful project implementation. 2. Children in the kindergarden liked the training activity a lot. They enjoyed the Humprey exercise book and we think we could get the message of the necessity for avoiding energy waste. 3. The on-site trainings in the pilot buildings were very productive. In nearly all pilot buildings several bad habits could be discovered and highlighted for the users.	**SIEA:** 1. Active involvement of some pilot buildings (mainly schools). 2. Mayors interest in saving measures. 3. Active discussions.	

Main obstacles encountered (and overcame!)

- timing – difficulty with fitting so many trainings into the agendas of the partner, the trainer and all the targets (a solution may be organizing part of the trainings as on-line trainings – as PNEC did – which is also a practical demonstration of how ICT can support energy and resource efficiency).
- multiplicity of obligations and tasks of the targets (which makes it hard for them to focus enough on the trainings).

- diversity within the target group regarding professional background and experience (each partner had to seriously adapt the training material and content to the specific needs of their targets).
- diversity within the target group regarding training needs (not all the topics were interesting for everyone).
- lack of interest of some of the targets.
- scarcity of reference material for some of the topics, including the ones that are especially important (integration of different measures, optimization scenarios, combining data analysis with changing users behaviours).

IV. FEEDBACK ON THE TOGETHER TRAINING MATERIAL AND MODEL

Partners' feedback on the TOGETHER training material:

Overall comment on the material	Material strengths	Material weaknesses
In principle, the common training material proved useful when preparing local trainings, however the content needed deep adaptation to meet local needs, as well as supplementation with more detailed information and case studies. Not all parts were relevant for all the target groups but created good basis for further development of knowledge in these areas, which are interesting for the specific person.	• Comprehensive, covers all necessary topics • Understandable • Well structured • Including relevant, valuable information, backed up with reference material • Including practical case studies • Combining theory with practice (exercises) • Including further suggestions for trainers and links to other useful material	• Too general to build whole training path only on it (needs completing with more in-depth material and information) • Too basic for some of the target groups (e.g. technical part includes many information that should be already known for energy managers and only some parts could provide new knowledge) • Created using different approaches -

		although the developers received common guidelines, the three parts of the material were developed using different level of detail and approaches • Sometimes a bit missing the target (e.g. including references to residential buildings and saving energy at home) • Sometimes including too many references and examples from one country (that of a material developer) • Including too few suggestions for trainers (it's good that they are there but could be more!)

Partners feedback on the overall TOGETHER transnational training model (as described in Deliverable D.T1.3.3):

Overall comment on the training model	Training model strengths	Training model weaknesses
The training model	• Comprehensive • Universal	• Master Train-the-Trainer workshop

proved to be very efficient and helped partners in organising series of well-designed and well-executed trainings for building owners, managers, decision makers and other targets. Although focused on specific topics, the model itself is universal and can be applied also for other thematic scopes. Especially efficient was „train-the-trainers“ concept, which helped the partners to increase their own knowledge and capacities before approaching the target groups. The quality of the training materials was high although some adaptations to the local context were necessary, as well as the supplementation with more detailed presentations and information on specific topics.	• Flexible • Efficient • Based on the thorough analysis of the existing training experiences, needs, etc. • Building capacities of all key stakeholders, including the trainers (particularly useful “train-the-trainer” approach)	focused too much on transferring thematic knowledge instead of building training skills of the trainers (both aspects should be equally included). • Regarding the training material, not all parts were equally relevant and appropriate for all the target groups. • The whole training model was created as a long-lasting process, which is not easy to implement. Especially 12-day local training path is challenging, as trainees usually have other obligations and are reluctant to attend so many sessions.

V. RECOMMENDATIONS FOR THE FUTURE

Below there are some partners' recommendations for the future followers of the TOGETHER training model:

General:

- look at the main training topic (energy efficiency in buildings) in a HOLISTIC way;
- get to KNOW your training group well (e.g. through initial assessment of training needs and expectations);
- increase your own KNOWLEDGE and training CAPACITIES;
- consult the EXPERTS for getting different perspectives;
- adopt INTEGRATED and TARGETED training approach;
- combine traditional training tools with interactive ones;
- don't only lecture! Make the trainees find their own solutions;
- make the trainings as PRACTICAL as possible;
- use trainees as experts;
- remember that a training is not a single action but part of long-term capacity building process.

Specific recommendations concerning trainings' organization:

- With diversified target group like in the case of TOGETHER it is better to organized several short trainings for different types of targets instead of large, unified trainings for all.
- In principle, short trainings with personalized messages are highly appreciated by the users, although such trainings require much more face-to-face interactions and direct communication.
- Lessons timetable should be as compatible with the working time of the trainees as possible.
- To catch attention of the trainees and keep them interested it is necessary to present technologies, solutions, examples, case studies and recommendations that are potentially applicable in their particular situation.
- It is worth to include on-site building visits of the training programme and show the saving opportunities where bad habits can be witnessed.
- It is important to give the trainees time to discuss and exchange experience, opinions on the information delivered, ideas for energy-saving measures, etc. (both during the training - networking sessions, and more informally, e.g. during common dinner at the end of the training day).

- When possible, embed the training programme into the regular training of staff.

Specific recommendations concerning trainings' content:

- Training content and material should be carefully adapted not only to the country situation (legal, climate, economic, social...) but also to the specific needs of the trainees, their educational and professional background and practical possibilities of taking certain actions.
- Technical trainings should be organized only for technical staff and energy managers, financial trainings only for people who are responsible for financial issues, raising funds for energy-related projects, etc. For other target groups it is enough to pass only basic knowledge on the topics.
- The trainings should feature specific examples of easy-to-implement measures and ideas or examples of successful projects targeting this topic.
- It would be worth to implement some training sessions with the specific in-depth knowledge and exercises about laws and regulations, addressed to the local administrations' technicians.
- Remember to insert as many local, specific information into the material as possible.

Other:

- Policy and decision makers should participate in trainings and the findings reached from training should mainstream into policy at local/regional/national level.