T3 FOSTERING THE CO-CREATION OF LOCAL ENERGY COOPERATIVES AND IMPLEMENTATION OF CITIZEN BASED PILOT ACTIONS

D.T3.14.2 – Evaluation report on pilot project implementation

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1. Introduction

This Evaluation report on pilot project implementation is made for providing horizontal analysis of all pilot projects after their implementation with the focus on toolbox testing for citizen engagement in real case scenario. In order to prepate the document, the questionnaire for collecting inputs from the ENES-CE including partners has been developed and sent to them. The questions were comprised of several topics related to implementation of pilot actions, establishment of different citizen energy groups/cooperatives and testing the implementation of participative tools for citizen engagement. All collected partner inputs within the questionnaire helped in development of this evaluation report for the whole partnership.

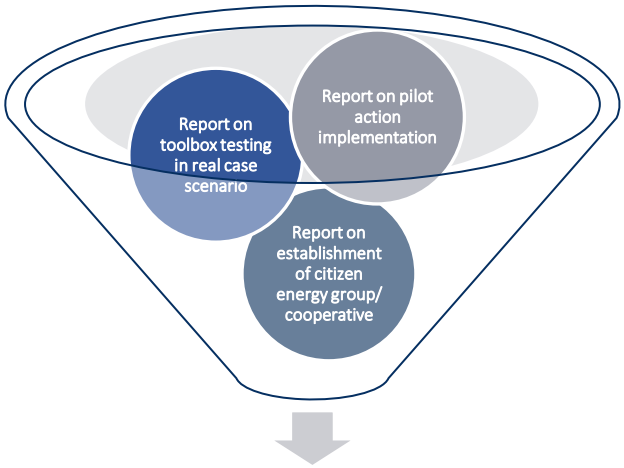

Figure 1 - The inputs for evaluation process of pilot project implementation

Firstly the partners were asked to briefly describe their pilot action which was implemented in their region. Since prior to development of this document all pilot actions were considered to be completed, it was possible to give a clear picture of what has actually been implemented in partner regions, how the relevant actions will influence the interest of citizens to participate in implementation of energy projects in the future, how well were they acquainted with the pilot project actions and to identify the key stages and milestones in the pilot action implementation process. Accordingly, the partners were asked to elaborate the implemented pilot action based on relevant questions.

In the second part, the partners were asked to evaluate the parameters which can influence the successful implementation of pilot action in their region. Here the partners were asked to rate the parameters from 1 to 5 and to give an explanation on the rating itself.

In the third part, the partners were asked to provide information on establishment of citizen energy group/cooperative in their region and on distribution of the roles of its members. In addition, the partners elaborated the usefulness of the established citizen energy group/cooperative for relevant region and community by answering relevant questions in questionnaire.

In the fourth part of the questionnaire the partners were asked to provide information on the usage of **Tool 1 – Co-design workshop methods for engaging participants into local energy planning** in the process of establishing different citizen energy groups/cooperatives, **Tool 2 - Community energy investment guidelines – technical, business and legal aspects** while planning the pilot action and **Tool**

3 - Communication methods for local energy plans and creating an atmosphere of acceptance to communicate potential pilot actions and revised local energy plans to wider public and to what extent. In this part partners were also asked to identify possible shortcomings of the tools or obstacles that may negatively affect their successful application in practice and acceptance by end users. In addition, they were asked to share their opinion on the necessity of updating the tools and in what manner in order for them to increase the citizens participation in local energy planning in the future planning periods. Here the partners were asked to rate the overall impression of the usefulness of the tools towards end users from 1 to 5 and to give an explanation on the rating itself.

In the fifth and the final part partners were asked to share their experiences, both positive and negative in implementing pilot projects in their region with regard to the main elements of pilot projects implementation. The partners were also asked to give some recommendations for other similar pilot projects in the future.

Figure 2 - The structure of questionnaire for partners

Based on received inputs it can be concluded that a deeper horizontal analysis enabled understanding of pilot action implementation process in different CE regions, use of developed participatory tools and involvement of citizens in planning processes from several different aspects, which in turn allows the identification of obstacles and key challenges in achieving the desired results. Taking into account the identified obstacles and challenges, it is possible to define potential recommendations that may result in successful implementation of pilot projects, high level of engagement and motivation of citizens in planning processes and effective fostering co-creation of local energy cooperatives and citizen energy groups in different communities.

All results of this Evaluation report are presented in the following chapters, for each included project partner country individually. At the end of the document all received information were jointly evaluated and delivered as integrated evaluation with defined recommendations for toolbox refinement.

2. Pilot project implementation

2.1. Germany

The CO_2 Climate clock has attracted a lot of attention, especially from students, younger citizens and older citizens, to the cause, the ongoing EU project and the activities to revise the SECAP. An excellent technical solution was found for the battery swarm storage system (SWP) with a relatively small budget. The technical, organisational and regulatory results are currently being incorporated into the SWP tenant electricity activities. Both pilot actions were proposed by individual citizens during the workshops on or around citizen involvement in the revision of the Sustainable Eenergy and Climate Action Plan (SECAP) for Pfaffenhofen and implemented with citizens. The engagement of the citizens and stakeholders involved has increased considerably as a result. The broad publicity of the pilot actions has generated a good response from the citizenry.

The original idea generator(s) of the pilot action were on board for the entire duration of the pilot action. Naturally, the commitment of the idea generators varied over the course of the project. It was always important that included mentors and LPP regularly approached the idea providers and invited them to a personal exchange.

The most important activities for the successful implementation of the investment in the pilot project were the meetings. These have taken place as needed, but also on a regular basis. The exemplary GANTT plan charts for the CO2 Climate Clock project action and Battery swarm storage system pilot action were also developed (Figure 3 and Figure 4).

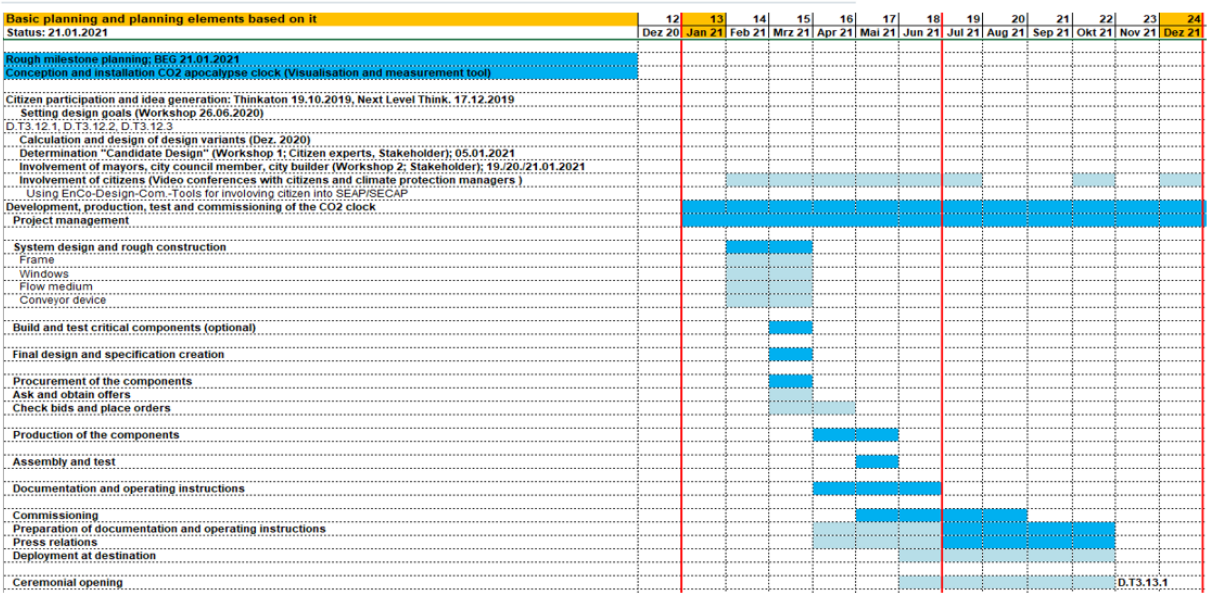

Figure 3 - Gantt plan chart of CO2 Climate Clock pilot action

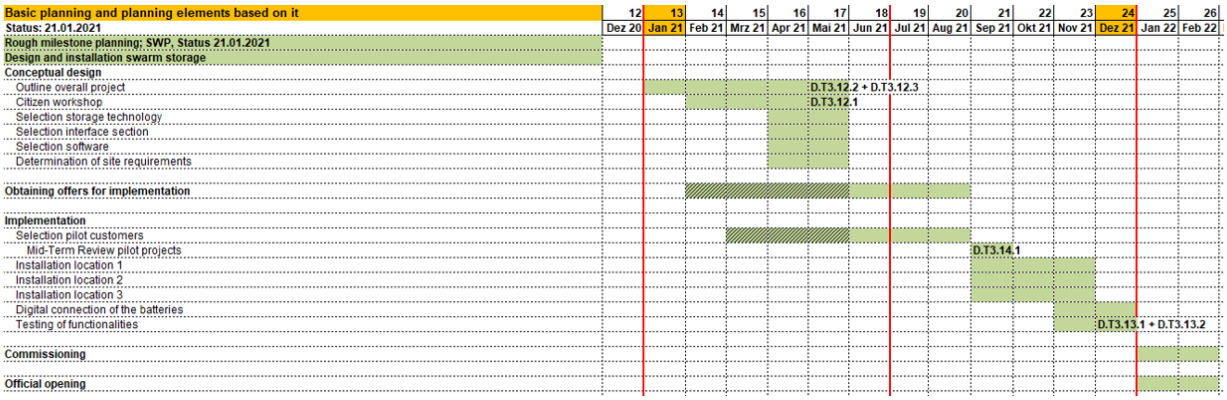

Figure 4 - Gantt plan chart of Battery swarm storage system pilot action

In addition, to paying attention to the SECAP, there is a plan to incorporate the results of the SWP pilot into tenant electricity models. It is believed that this may have a greater impact.

In the SWP pilot action, two fundamental new industry partnerships were entered, these have a very high technical potential. The aim is to tap into greater market potential. As of today, it would be pure speculation to say anything about possible future sales. What is clear is the high technical relevance and the systemic efficiency.

Citizens, leaders or institutions need a jointly developed vision, goals and a long-term canon of values that are jointly nurtured and jointly developed.

2.1.1. Implementation of pilot actions

Below it is shown in what extend the relevant parameters influenced the successful implementation of pilot actions in Pfaffenhofen.

Table 1 - Rating of pilot action implementing parameters in Germany

Real needs and goals of municipality/region	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Clear pilot action goals and good working plan	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Efficiency of the pilot action implementation team. => **Friendlyness, helping each other and flexibility is more important.**	☐ 1	☐ 2	☒ 3	☐ 4	☐ 5
Open communication and cooperation according to assigned responsibilities among responsible persons	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Total investment cost and available timeline	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Technical possibilities	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Possible funding outside ENES-CE project	☐ 1	☐ 2	☒ 3	☐ 4	☐ 5
Sustainability of investment	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Regulatory restrictions	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Engagement and acceptance by citizens	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Support from political level (local and regional governments)	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5

Life cycle of the investment	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Press and other communications cannels	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5

In the table above mark 1 means this parameter was not taken into account at all, and mark 5 means this parameter has been taken into account completely.

The following explanations for the ratings were given:

- Real needs and goals of municipality/region: Battery swarm storage systems are very important for our smaller PV systems. With such systems, they can technically bring electricity production and demand together better.
- Clear pilot action goals and good working plan: Clear goals are extremely important and project managers pay close attention to them.
- Efficiency of the pilot action implementation team: Friendlyness, helping each other and flexibility is more important.
- Open communication and cooperation according to assigned responsibilities among responsible persons: Enormous/very important.
- Total investment cost and available timeline: Resources, teaming and goals must fit together. This is a fundamental principle at the beginning of planning. Mistakes are made in the beginning.
- Technical possibilities: Working technically means working solidly and creatively at the same time. When planning, however, it has to plan conservatively from the start.
- Possible funding outside ENES-CE project: There was only ability and willingnes to use the EU funding. The goals were set and then achieved.
- Sustainability of investment: It is important to think sustainable first. The investments are of course also sustainable.
- Regulatory restrictions: You should know the regulations well and have the gaps explained to them through advice. The gray areas are not without risk, but so are the fields in which innovations sometimes have to be placed.
- Engagement and acceptance by citizens: Very important.
- Support from political level (local and regional governments): Also very important, especially when there is a headwind or crosswind.
- Life cycle of the investment: It is important to be familiar with the life cycle of technical solutions. This has been attempted to be addressed from the start.
- Press and other communications cannels: Good public relations work is always very important in municipalities. However, the basic prerequisite is that people trust their managers and each other. Trust and credibility are the basis for EVERY cooperation.

2.1.2. Establishment of citizen energy group/cooperative

The Citizen energy cooperatives in district of Pfaffenhofen a.d.Ilm (BEG) was founded before the ongoing ENES-CE project. The pilot actions in Pffaffenhofen were of a technical natur and should once again dramatically demonstrate the attention to climate change (CO_2 climate clock).

2.1.3. Usability of participative tools for citizen engagement (Tool 1, Tool 2 and Tool 3)

The Tool 1 – Co-design workshop methods for involving participants in local energy planning was extensively used. A technical extension was made, among other things, because there was a need for calling a lot more during the pandemic or ViCo exchanged those responsible and citizens and worked together.

The use of the tools was of course very helpful in the field of revision of the SECAP in the pilot actions, where they played a supporting role.

The Tool 2 was mostly used at the beginning of the pilot actions planning. The basic data have been included in the planning process.

An extension was not made. There was awarness that the tool is user-friendly. New users did not come into contact with the tools developed during the planning and implementation phases of the pilot actions.

Tool 3 – Communication methods for local energy plans and creating an atmosphere of acceptance):

- In general, communication methods to support the revision of local energy plans and create an atmosphere of acceptance is very important. During the pandemic, it was hardly to communicate during larger town meetings. But important events were streamed and communicated via zoom etc. and lead as well as possible.
- Now that the pandemic is over, it will be possible to fully use the Tool 3 in the version that has been developed. What works to some extent in the Panadie will certainly work even better now and support and involve the citizens even more.
- At the moment it isn't possible to identify any serious shortcomings that have negatively impacted its successful application in practice and acceptance by end users.
- In the future it will be seen to what extent the Tool 3 can be revised. Only further practice can show where updates should be carried out.

Below it is shown overall impression of the usefulness towards end users of developed participative tools for future citizens engagement in energy planning.

Table 2 - Rating of participative tools for citizen engagement by German partners

Tool 1 – Co-design workshop methods for engaging participants into local energy planning	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Tool 2 - Community energy investment guidelines – technical, business and legal aspects	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Tool 3 - Communication methods for local energy plans and creating an atmosphere of acceptance	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5

The explanations for the ratings are given below:

- Tool 1 – Co-design workshop methods for engaging participants into local energy planning: As described above, Tool 1 is a very important tool. It supported German partners very well during the pilot actions.

- Tool 2 – Community energy investment guidelines – technical, business and legal aspects: It was used at the beginning of planning phase for the pilot actions. The tool creates a good basis. Technical projects are usually very specific. It was able to be build well on Tool 2.
- Tool 3 – Communication methods for local energy plans and creating an atmosphere of acceptance: The tool is very important and good, but the pandemic has revealed obstacles to the implementation. Tool 3 will probably only be able to show its full strength in the future.

2.1.4. Sharing experiences after implemented pilot projects

Setting the vision/purpose of the pilot projects

The vision is that the battery swarm storage system will be installed in 1.000 households, commercial units and residential areas in the next 5 years.

Defining and achieving objectives of the pilot projects

As part of the EU project, the goals were more than achieved. Technically with the Battery swam storage system pilot action, but even more so with the CO_2 climate clock. Even and especially during the pandemic, the climate clock has drawn enormous attention to climate change and the EU project. It was also shown how important self-sufficiency with energy is. Renewable energies also provide security! The Ukranine war illustrates this.

Stakeholder engagement and contribution

Tools 1, 2 and 3 have been very well supported by stakeholders and citizens. The commitment and the contributions were extremely remarkable despite the pandemic.

Activities, services and products

The results of the battery swarm system are already being incorporated into activities on tenant electricity models. In the future, SWP will certainly be able to derive further services and sub-products from here.

Pilot project implementation

Working with the artists at CO_2-Klima Clock was very sensitive. The communication here was managed very well by a sub-project manager. The pilot project could have failed at this point. The large technical network helped with the Battery swarm storage system. This enabled the implementation of such technical project for so little money.

Financial plan

The big challenge in this project was to realise two hardware pilot projects with very little money. The rough initial financial planning showed that an enormous amount of own work and a large network were necessary to be able to implement the desired pilot projects. Therefore, the implementation and commissioning could only be achieved through the commitment of the citizens involved and excellent network partners. 15.000,00 EUR within an pilot project is a very very little money for such technical projects.

Public and private cooperation

With the CO_2 climate clock, the involvement of the mayor was very important. The experience as project developers was particularly important for the technical implementation of the pilot actions. Old cooperations worked and new cooperations were sought and found in a targeted manner.

2.2. Italy

The main pilot action activity is the distribution of 100 Energy saving kits for free under request up to the end of the available equipment by a one stop shop office on energy efficiency (Energy Help Desk), within the Municipality of Forlì which is open to the citizens and to the members of the consumer energy group, but not exclusively.

The Energy Saving Kit is composed by several technical devices, which are intended to be helpful in measuring the use of energy in everyday domestic life. In more detail, the equipment handed out included the following:

- A thermo-hygrometer and CO2 air monitoring device;
- A power and energy plug-in measurer;
- A luxmeter;
- A high-efficiency LED lamp.

Beside the distribution of such technical equipment, the Municipality of Forlì purchased 500 Solar Toys to be handed out to any parent who request it for his/her child or to be distributed during some educational activities in schools: the energy saving subject can be taught to children through the use of renewable energy in such everyday life activity like playing.

The use and the debate among citizens about the use of energy in every day's life will lead to highlight the importance of being aware of any individual contribution and of acting jointly.

The idea was developed in collaboration with the environmental associations and the economical stakeholder, which participated in the whole implementation of the project.

The interviews carried out during the initial assessment phase pointed out the need of a role of guidance from the Municipality side: both environmental associations and economic stakeholder asked for it. Than the interest was quite high, but mainly form an already sensitized public. The activities in schools and the production of a couple of stop motion videos with the contribution of the children helped to raise the interest also by other families.

The whole project and the pilot action in particular didn't lead to any new collaboration, but strengthened the existing ones.

Municipalities can benefit of the possibility to increase their reliability towards citizens and local economic actors.

2.2.1. Implementation of pilot action

Below it is shown in what extend the relevant parameters influenced the successful implementation of pilot action in Municipality of Forli.

Table 3 - Rating of pilot action implementing parameters in Italy

Real needs and goals of municipality/region	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Clear pilot action goals and good working plan	☐ 1	☐ 2	☒ 3	☐ 4	☐ 5
Efficiency of the pilot action implementation team	☐ 1	☐ 2	☒ 3	☐ 4	☐ 5

Open communication and cooperation according to assigned responsibilities among responsible persons	☐ 1	☐ 2	☒ 3	☐ 4	☐ 5
Total investment cost and available timeline	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Technical possibilities	☐ 1	☐ 2	☒ 3	☐ 4	☐ 5
Possible funding outside ENES-CE project	☒ 1	☐ 2	☐ 3	☐ 4	☐ 5
Sustainability of investment	☐ 1	☒ 2	☐ 3	☐ 4	☐ 5
Regulatory restrictions	☒ 1	☐ 2	☐ 3	☐ 4	☐ 5
Engagement and acceptance by citizens	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Support from political level (local and regional governments)	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Life cycle of the investment	☐ 1	☐ 2	☒ 3	☐ 4	☐ 5
Press and other communications cannels	☐ 1	☐ 2	☒ 3	☐ 4	☐ 5

In the table above mark 1 means this parameter was not taken into account at all, and mark 5 means this parameter has been taken into account completely.

The following explanations for the ratings were given:

- Real needs and goals of municipality/region: In the assessment analysis, the stakeholder and the citizens pointed out their willingnes to be guided and informed about energy rational use by the Municipality.
- Clear pilot action goals and good working plan: The definition of the actions and the selection of equipment, the purchase of the devices and the distribution at a one-stop shop, as well as the participation to the Consumer Energy Group followed a linear process.
- Efficiency of the pilot action implementation team: The working team of FMI S.r.l. and the Municipality of Forlì could face every step of the pilot action fulfilment in a collaborative ambiance with the citizens.
- Open communication and cooperation according to assigned responsibilities among responsible persons: The activities of definition of selection of the pilot action and then of the equipment have been held with online videoconference due to the COVID-19 pandemic with good results. The phase of purchasing of the equipment have been done by FMI S.r.l. staff among the office activities and then, for the diffusion of the project and the Consumer Energy Group were quite useful the in presence workshops: the outdoor ones worked better as people were able to discuss easily with each other and exchange opinions in a more flowing way.
- Total investment cost and available timeline: Costs and timeline were in line with the fulfilled pilot action.
- Technical possibilities: Among the technical possibilities have been chosen the more suitable for an use both educational and energy saving oriented of the distributed kit.
- Possible funding outside ENES-CE project: As the pilot action didn’t require an immediate investment from the citizens, no further funding outside the ENES-CE has been envisaged.

- Sustainability of investment: As the pilot action didn't require an immediate investment from the citizens, the budget at disposal for the pilot action activities were meant to inform and engage the citizens and the goal have been fulfilled. The consequent impact, i.e. which further investments will citizens do after the pilot action is not measurable.
- Regulatory restrictions: No restrictions due to regulations affected the pilot action implementation.
- Engagement and acceptance by citizens: at a first impact the acceptance is always a hard challenge, but the interest of the issue, the work done in organizing dedicated meeting and educational workshops in schools and then the word of mouth led to a positive ambiance where the activities have been implemented.
- Support from political level (local and regional governments): The most important help came from the Local administration. The Assessor of the Environmental office of the Municipality gave his support towards the stakeholder and the citizens in every part of the ENES-CE project, proving the engagement of the whole City Council to the project.
- Life cycle of the investment: The distributed devices constituting the energy saving kit do not have a strong environmental impact and can lead to energy efficiency habits.
- Press and other communications cannels: Unfortunately press and communication channels are not so interested in energy issue yet. Anyway during the project they have been informed and involved and they assured a certain coverage to the activities.

2.2.2. Establishment of consumer energy group in Municipality of Forli

The Consumer Energy Group in Forlì is an informal association of citizens. It refers to the Municipal Energy Help Desk for the issue discussed among the participant and for a technical support, even after the end of the project.

An invite to participate to the activity of the Consumer Energy Group has been made to everyone who asked for the distributed energy kit (pilot action) and everybody was interested and entered the group. Many ideas of collective actions started to circulate: from a joined purchase of LED lamps or washing machines, to the creation of a renewable energy community.

The new opportunities given by the new regulation about Renewable Energy Communities are opening new perspectives and new possible projects.

A Consumer Energy Group is a very young entity in an Italian local frame, thus it needs a strong effort for the presentation and the promotion to the citizens, as well as the local authority needs a support to raise an ambience of acceptance for its activities.

The interest in the Consumer Energy Group grew little by little at every activity on energy efficiency and renewable energy of the Municipality, the support of the Energy Help Desk and a series of new projects involving the Municipality of Forlì will hopefully further increase the engagement of the population.

2.2.3. Usability of participative tools for citizen engagement (Tool 1, Tool 2 and Tool 3)

The main challenges in revising the Sustainable Energy Action Plan (SEAP) into the SECAP are reaching, involving and engaging the citizens into the participative path and the following actions. The tool provided by Lead partner of the Thematic Work Package 2 (WPT2) has been used to develop a strategy to involve the stakeholders during the workshops and to return to the citizens the decisions of the participative path. The most important action implemented, descending from the mentioned tool, was the recruitment of a professional moderator, who assured (also during the pandemic restrictions) an effective communication among the participants and helped to build an open and positive atmosphere for the discussion. Other tools developed by the ENES-CE project and during the workshops are at disposal for the community, the stakeholders and to all of those who visit the Energy Help Desk and are useful to raise the interest of the people to the SECAP issues.

The Municipality of Forlì produced a videoclip within the project which permitted to report to the institutional and economic local stakeholders and to the whole City the opinion of the children attending the classes in some of the primary schools in Forlì. Such an important communicative instrument was shot by some professional video-makers who collected opinions, sounds and images and built a stop-motion animation to illustrate the kids' point of view. The short-film was presented by the Environment Assessor through a dedicated press release, projected during the Project Workshops and published on the social media accounts of the Municipality of Forlì to reach as much population as possible. During the workshops was also possible to use a questionnaire to make the stakeholders think on their role in the fulfilment of the SECAP goals and of the participative path. As an output of the process is the definition of the pilot action developed within the energy group which will lead to the purchase of elements connected to the energy efficiency in everyday life.

Among the key features, the excel sheet developed within the Deliverable DT2.2.2 is particularly helpful for scouting the opportunities of refurbishments and joined investments. Unfortunately, the regulation about energy communities was not approved yet, when the project started so it was not possible to exploit the tool in the most fruitful way. The tool remains in the availability of the Municipal Help Desk and will be surely become more and more important in the next activities for the local territory.

Tool 3 is a very important tool to implement a communication strategy and it gets deep in the analysis of the target groups and of the communicative channels. The best way to use it is having some professional skills in social media management and some workshop facilitator competences.

Below it is shown overall impression of the usefulness towards end users of developed participative tools for future citizens engagement in energy planning.

Table 4 - Rating of participative tools for citizen engagement by Italian partner

Tool 1 – Co-design workshop methods for engaging participants into local energy planning	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Tool 2 - Community energy investment guidelines – technical, business and legal aspects	☐ 1	☐ 2	☒ 3	☐ 4	☐ 5
Tool 3 - Communication methods for local energy plans and creating an atmosphere of acceptance	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5

The explanations for the ratings are given below:

- Tool 1 – Co-design workshop methods for engaging participants into local energy planning: The manual gave useful inputs, furthermore in Forlì was produced an animated short-video (replicated in the last year) exploring the point of view of pupils attending the Municipal schools. It was possible to use it to engage the stakeholders during the workshops and to reach a wider public among other citizens.
- Tool 2 – Community energy investment guidelines – technical, business and legal aspects: Since in Forlì, due to a lack of regulation about energy communities during the project, it was planned to establish an Energy-Consumers' Purchasing Group, the community investment guidelines seem to focus on far more expensive activities. Currently, after the approval of the laws about renewable energy communities the Tool 2 starts to be fruitfully exploitable.
- Tool 3 – Communication methods for local energy plans and creating an atmosphere of acceptance: The communication methods and the following communication strategy gave a useful prompt for the efficiency of the project and its diffusion among the citizens.

2.2.4. Sharing experiences after implemented pilot projects

Setting the vision/purpose of the pilot projects

It is very difficult to define the goals of a community at the first steps of a newborn group of people. It is positive that the target community asks the Municipality (main actor of the project) to cover a role of guidance.

Defining and achieving objectives of the pilot projects

The main trigger to accomplish the definition and the achievement of the objectives strongly depends on how much the participants rely on each other.

Stakeholder engagement and contribution

Stakeholder are mainly concerned on their core business, they are interested on what can simplify their work, not always in experimenting new pilot projects.

Activities, services and products

Dealing with public authorities, everything which foresees the use of services or products is slowed down by burocracy.

Pilot project implementation

The willpower of the proponent actors has to be strong, and the aim must be shared and accepted by every participant.

Resources allocated to the implementation of pilot projects

The resources allocated to the implementation of the Municipality of Forlì's pilot action were in line with the defined action.

Financial plan

No financial plan for citizens was needed for the implementation of the pilot action.

Public and private cooperation

Public and private cooperation can be possible, but they must be based on trust and simplification of burocracy.

2.3. Poland

In the ENES-CE project, after the “Energy Cluster Niemce” was created in the Niemce Commune in the Lubelskie Voivodeship, the pilot action consisting in ecological education for local community was implemented. The title of the pilot action was „Every resident and entrepreneur from the Niemce Commune can contribute to clean air in the Commune“.

The aim of the pilot action was to raise awareness among the local community about the possibility of reducing low emissions in the commune and to inform about the possibility of choosing air quality notification systems in the future. In addition, cluster members promoted the idea of cooperation within the cluster and the possibility for potential new members to join the cluster and join the common bottom-up energy planning in Niemce Commune. The target groups were the entrepreneurs and the residents of the Niemce Commune. Under the pilot action 3 meetings were organized. The total number of participants of the pilot action was 68 persons. With the first effects of joint work, (which was the establishment of “Energy Cluster Niemce” and common update of Low Carbon Economy Plan) it was possible to inspire public confidence and acceptance for investments in renewable energy sources (RES) in wider group of inhabitants and stakeholders and encourage them to cooperate in the future.

The main result of implemented pilot action was raised awareness among the local community about the possibility of reducing low emissions in the commune. The pilot action meetings participants gained knowledge about available programs dedicated to RES investments and improving energy efficiency of buildings. The participants of the pilot action also gained knowledge about what is low emission and what causes low emissions, as well as about energy/heat sources which do not cause low emissions. Having gained knowledge during the pilot action, the residents of the Niemce Commune also reported the question which everyday behaviors/habits they would like to change in order to reduce energy consumption and thus the CO_2 emissions and influence the quality of air in the commune, mentioning among others: reducing the use of cars, not leaving appliances on stand-by mode, saving energy, saving the consumption of hot water, using appropriate fuel and wood with appropriate humidity, using electric heating, photovoltaics, replacing the central heating boiler.

Ecological education aroused public confidence, acceptance and understanding for presented planned investments in RES in wider group of inhabitants and stakeholders of the Niemce Commune. This will also help the public bodies to implement their strategies in a more efficient and bottom up approach what was also one of the objectives of the ENES-CE project.

There was the original idea generator(s) of the pilot action on board for the entire duration of the pilot action. A the same time there were changes in the dates of meetings and some topics were discussed in more detail, depending on the interest and questions from the meetings participants of the pilot action.

Main activities carried out for needs of successful implementation of the pilot action were:

- hearing the voice of commune inhabitants and other stakeholders, discussion on proposals during workshops and taking opinions into account by planning of the future investments in RES and the pilot action.
- preparing the description and plan of the ecological education pilot action and Letter of Intent – on the decision, of the members of the energy cluster in the Niemce Commune, in the Lubelskie Voivodeship: "Niemce Energy Cluster", on the choice of the pilot action to be implemented in the timeframe of the ENES-CE project in the Niemce Commune in the Lubelskie Voivodeship.

- signature of the Letter of Intent and realisation of a pilot action of ecological education for the local community as part of information and promotion meetings to raise awareness on the possibility of reducing low emission in the commune and on the possibility of choosing air quality notification systems in the future: „Every resident and entrepreneur from the Niemce Commune can contribute to clean air in the Commune".
- cooperation of the energy cluster members in meeting organisation with residents, active participation of cluster members in the discussions, who promoted the idea of cooperation within the cluster.

The direct positive effects of the pilot action in the Lubelskie region are that the gathered by the Niemce Energy Cluster experiences and results of the ecological education pilot action can be promoted to other communes in the Lubelskie Voivodeship as examples of good practice for ecological education, involving inhabitants in the bottom-up process of energy planning and energy saving in the future in the municipality and promotion of creating local energy savings communities, citizens energy groups. This experience and knowledge can also be used in transferring the experience to other communes in Poland or EU.

In the implementation of pilot action were involved energy cluster members and external expert who through transfer of knowledge, answering questions and joint analysis of proposals, reached the interest of 16 pilot action participants in joining the Niemce Energy Cluster what they declared in the meetings evaluation questionnaire. But none has yet submitted a completed declaration of accession to the Energy Cluster Niemce.

The best way to support leaders or institutions so that they can successfully carry out pilot actions in their regions is engagement of local people supported by the external expert, who work together to prepare good plan for pilots, who will educate through transfer of the knowledge, support the local leaders and clarify the technical, financial and organisational issues of investments with use of RES. If the voice of commune inhabitants and other stakeholders is heard by local authorities and then taken into account in process of the energy planning and with support of experts, it will be easier to gain involvement of the local community in joint activities and acceptance for investments in RES.

2.3.1. Implementation of pilot action

Below it is shown in what extend the relevant parameters influenced the successful implementation of pilot action in Lubelskie Voivodeship.

Table 5 - Rating of pilot action implementing parameters in Poland

Real needs and goals of municipality/region	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Clear pilot action goals and good working plan	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Efficiency of the pilot action implementation team	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Open communication and cooperation according to assigned responsibilities among responsible persons	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Total investment cost and available timeline	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Technical possibilities	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Possible funding outside ENES-CE project	☐ 1	☐ 2	☒ 3	☐ 4	☐ 5

Sustainability of pilot action	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Regulatory restrictions	☐ 1	☒ 2	☐ 3	☐ 4	☐ 5
Engagement and acceptance by citizens	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Support from political level (local and regional governments)	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Life cycle of the pilot action	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Press and other communications cannels	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5

In the table above mark 1 means this parameter was not taken into account at all, and mark 5 means this parameter has been taken into account completely.

The following explanations for the ratings were given:

- Real needs and goals of municipality/region: The idea of the pilot action was the outcome of the arrangements made during the workshop meetings within the ENES-CE project. The meetings were attended by the citizens involved in the process of the update of the Low Carbon Economy Plan for the Niemce Commune and creation of the citizen energy group in the Niemce Commune.
- The idea of ecological education of the local community, was included in the updated LCEP for Niemce Commune, adopted in 2020: point. 4.2 Non-investment activities: "environmental education of the local community, through information and promotion actions, air quality notification systems, raising awareness on the possibilities of reducing low emissions and others".
- The activity related to ecological education action among the local community has been included in the LCEP update for the Niemce Commune for the period 2021-2030, with a vision of activities until 2050 (update), as activity No. 3 planned until 2030: "Conducting an educational and information campaign to raise awareness about EE – energy efficiency and related financing opportunities for investment activities". Additionally, it states that a pilot under the ENES-CE project, an environmental education action for the community will be carried out to raise awareness of the possibilities of reducing low emission and about air quality notification systems.
- Clear pilot action goals and good working plan: The description and plan of the ecological education pilot action was prepared taking into consideration the arrangements made during the workshop meetings within the ENES-CE project. It was attached to the the Letter of Intent – on the decision, of the members of the energy cluster in the Niemce Commune, in the Lubelskie Voivodeship: "Niemce Energy Cluster", on the choice of the pilot action to be implemented in the timeframe of the ENES-CE project in the Niemce Commune in the Lubelskie Voivodeship. During the implementation there were changes in the dates of meetings and some topics were discussed in more detail, depending on the interest and questions from the meetings participants of the pilot action.
- Efficiency of the pilot action implementation team: There was high commitment of members of the Niemce Energy Cluster, commune authorities and employees, in cooperation with the expert involved in the ENES-CE project and employees of the Marshal Offices.
- Open communication and cooperation according to assigned responsibilities among responsible persons: Tasks as part of the organization of the pilot action were discussed during the

preparation of the plan for the implementation of the pilot action and by signing the letter of intent, moreover, cluster members were open to changes and willingly complemented each other.

- Total investment cost and available timeline: The organisational costs of the pilot action of ecological education of the local community „Every resident and entrepreneur from the Niemce Commune can contribute to clean air in the Commune“, included providing a meeting place, the equipment for conducting the meetings, participation of the commune employees, refreshments etc. were covered from own resources of the members of the Niemce Energy Cluster. The cost of participation of an external expert was covered from the ENES-CE project budget. Due to the specificity of the costs, which results due to the current activities of the Niemce Commune and other members of the Niemce Energy Cluster and the complexity of the services of the external expert engaged in the ENES-CE project it is not possible to estimate them precisely. The pilot action was implemented at the assumed time, but during the implementation there were changes in the dates of meetings and some topics were discussed in more detail, depending on the interest and questions from the meetings participants of the pilot action.
- Technical possibilities: On the basis of a letter of intent, a member of the cluster – the Niemce Commune provided technical equipment to carry out a pilot action.
- Possible funding outside ENES-CE project: The organisational costs of the pilot action included providing a meeting place, the equipment for conducting the meetings, participation of the commune employees, refreshments etc. were covered from own resources of the members of the Niemce Energy Cluster.
- Sustainability of the pilot action: After realisation of the pilot action, its results, conclusions and next planned steps by the energy cluster, will be presented the commune inhabitants. It is also recommended to organize similar information and education actions in the future by Niemce Energy Cluster and the Niemce Commune as its coordinator. Niemce Energy Cluster can use the available plan prepared by an external expert within the ENES-CE project: "Plan of consultation and advisory system regarding possible RES and EE investments in Niemce.
- Commune with the Communal Engineer or an external expert". This plan defines the consultation system, which can include:
  1. Annual meetings for more stakeholders,
  2. Monthly meetings as part of stakeholder meetings individually.
- Regulatory restrictions: There were no legal restriction.
- Engagement and acceptance by citizens: The total number of participants of the pilot action was 68 persons. After the pilot action it is also planned to organize the meeting with the children in the Niemce Commune.
- Support from political level (local and regional governments): The local authorities of the Niemce Commune cooperated at workshops in planning phase of the pilot and participated in all meetings of the pilot action. They covered the costs of the equipment for conducting the meetings, participation of the commune employees.
- Life cycle of the pilot action:
  - cooperation of the local authorities of the Niemce Commune at workshops in planning phase of the pilot action with residents and other stakeholders,

- discussion on the future RES investments and need of education activities, with the support of the external expert, energy advisor and other persons, entrepreneurs who are respected in the commune,
- preparing the description and plan of the ecological education pilot action and Letter of Intent - on the decision, of the members of the energy cluster in the Niemce Commune, in the Lubelskie Voivodeship: "Niemce Energy Cluster", on the choice of the pilot action to be implemented in the timeframe of the ENES-CE project in the Niemce Commune in the Lubelskie Voivodeship,
- signature of the Letter of Intent after establishment of the “Niemce Energy Cluster”,
- implementation of the pilot action, report, conclusion, the consultation and recommendation to use the prepared consultation systems, which can include:
  1. Annual meetings for more stakeholders,
  2. Monthly meeting as part of stakeholder meetings individually,
- presenting the results of the pilot action and next planned steps by the energy cluster in the next future.

2.3.2. Establishment of energy savings community in Lubelskie Voivodeship in Municipality of Niemce

In the Niemce Commune, in the Lubelskie Voivodeship the "Niemce Energy Cluster" was established. This energy cluster is not a legal person and does not conduct business activity. It is allowed to transform the cluster into an energy cooperative, a commercial company or any other legal form enabling business activities in the area of heat and electricity distribution. The civil-law agreement on the establishment of „Niemce Energy Claster" and cooperation of Cluster Members has been signed by the Niemce Commune, 3 economic entities, 2 associations and 4 inhabitants of the commune. All possible target groups were get involved in this activity.

Three main points, which can make proud of established citizen energy group – “Niemce Energy Cluster” are:

- the aim of the energy cluster, which is common for all cluster members and motivated them to be and to stay a part of the whole process in a long run and not only by end of the project implementation,
- increased cooperation between residents, entrepreneur and local authorities in energy planning in the commune through good communication, common dialog hearing each other and use of experts knowledge,
- involvement of all cluster members for realization cluster goals and encouraging other inhabitants of the commune to join the activities aimed at using the RES and taking care of the air condition in the commune.

The aim of the Niemce Energy Cluster is to support the development of local distributed energy, improve energy security in an economically effective manner, respecting the principles of sustainable development and the planning and implementation of investments in RES will be one of the means to achieve the set goals.

All the initially set goals in fostering citizens to participate in local energy planning in the region by establishing citizen energy group were achieved in the Lubelskie Voivodeship in the Niemce Commune. The Niemce Energy Cluster members were motivated to establish this citizen energy group through

the participation in project workshops, discussion with experts for energy planning and understanding the necessity to make a common and individual effort in the commune for sustainable development, reduction of the CO_2 emissions and other pollutants to the air and increase of the use of alternative energy – from RES in the production of final energy and on this way lowering the energy bills.

Some of the cluster members were interested in investing in RES even on the beginning of the project and process of the common energy planning and establishment of the citizens energy group, so it can be assumed that they will be leaders in motivating the other cluster members in the preparation of projects for obtaining the subsidy for investments in renewable energy after the end of ENES-CE project. One of the motivation for establishment of energy cluster was also the possibility for applying for subsidy from program: Funds for Lubelskie 2021-2027 addressed for local energy groups like energy clusters. Niemce Energy Cluster is waiting for the announcement of call for proposals, and will consider prepare projects and apply for subsidy for investments in RES.

The importance of the existence of “Niemce Energy Cluster” for the lubelskie region in the future will be big and significant for support the development of local distributed energy. The dissemination of good practices about creating and actions of the energy cluster as the energy savings community will be also of great importance for other municipalities in the region. Citizen's energy group will be the leader who is able to mobilize others stakeholders to implement investments with use of RES, to create innovative ideas and visions in the local energy planning.

As the first activity after the establishment of the Niemce Energy Cluster its members have implemented a pilot action of ecological education for local community. During this pilot action members of the Niemce Energy Cluster promoted the idea of cooperation within the cluster and the possibility for potential new members to join the cluster and join the common bottom-up energy planning in Niemce Commune.

By showing the first effects of joint work in the energy planning in the commune, which were establishment of the citizen energy group and common list of the investment in RES included in the updated Low Carbon Economy Plan for the Niemce Commune cluster wanted inter alia to inspire public confidence in wider group of inhabitants and stakeholders and encourage them to cooperate in the future preparation of projects and obtaining financial support for the implementation of investments in RES.

The motivation of members to be part of the citizen energy group increased during the project ENES-CE implementation and the members are interested to participate in implementation of energy projects also outside of the project. The Niemce Energy Cluster is waiting for the announcement of call for proposals, and will consider preparing and applying for subsidy from program Funds for Lubelskie 2021-2027 addressed for local energy group like energy cluster.

To practice "professional project development" in the citizen energy group should be created the understanding and engagement of stakeholders in the planning and in implementation phase of the project. This should be reach by good communication, by the meetings with the experts who will pass the knowledge about renewable energy sources and investments with use of RES and will inspire confidence and belief in the benefits of renewable energy and distributed energy.

2.3.3. Usability of participative tools for citizen engagement (Tool 1, Tool 2 and Tool 3)

TOOL 1

Tool 1 (D.T2.2.1 Co-design workshop methods for engaging participants into local energy planning) was used for organisation the regular workshop meetings with the stakeholders in the ENES-CE project.

Workshops included presentations and discussions on proposals of investments with the use of RES to be implemented by the commune and the residents and on common energy planning in the Niemce Commune, as well as next steps in the ENES-CE project.

Common values and goals in energy planning were presented, the project idea, the engagement in the project and energy planning of active politicians from the commune. Experts from a different range of areas, residents, entrepreneurs, the energy advisor and the external expert participated in the meetings and discussed the proposals of the RES investments from the citizens.

Each workshop was moderated primarily by an External Expert or Niemce Commune representatives. Secondary and tertiary moderators were among the audience, their role was to bring new impulses into the discussions; these were the energy advisor or the ENES-CE project coordinator, and the representatives of the Marshal Office of the Lubelskie Voivodeship.

The Energy Advisor and the external expert played an important role in informing and explaining the complexities of the topic. As moderators they passed the ball to and supported each other – they were asking questions to the participants to involve them in the interactive discussion, ensuring that the participants were active and free to ask questions, describe their goals, and expectations, and so reached also acceptance for proposals of investments with use of RES includes in the local energy strategy.

The professional knowledge of the energy advisor or the external expert, combined with plain/down-to-earth language provided a comprehensive and comprehensible picture of creating a citizen energy group and its activities, related to investments in renewable energy and the acceptance for realisation the investments included to the update of Low Carbon Economy Plan for the Niemce Commune.

The meetings were concluded with a summary of the discussion points and the invitation to the next workshop, including the description of the following steps in the project.

It is difficult to identify possible shortcomings of the tool or obstacles that may negatively affect its successful application in practice and acceptance by end users in context of local energy planning.

Tool 1 is now optimal, but in the future, it should be updated and adapted depending on the technical possibilities to reach the audience.

TOOL 2

Tool 2 (D.T2.2.2 Community energy investment guidelines – technical, business and legal aspects) was used in the projects workshops in the Niemce Commune.

During workshop 2 in 2020 the external expert presented Tool 2, the community projects assessment tool, created as part of the ENES-CE project and comments provided by the Lubelskie Voivodship developed by an expert, involved in the project.

During workshop 3 in 2020 the expert talked about the commune's priority activities and investments in renewable energy (e.g. project of PV installations) based on Tool 2 developed in the ENES-CE project.

The tool didn't helped or encouraged the residents to decide on the selection of implemented pilot project investment in the Lubelskie region, as they have decided beforehand but outlined some aspects of the investment.

Tool 2 may have been useful during the workshops, but it should be adapted to the specificity of the projects and the user's knowledge to explain the economic, technical and environmental dependencies related to the implementation of jointly planned energy investments.

Tool 2 should be updated or adapted considering user experience – also depends on the specific nature of projects.

TOOL 3

Tool 3 (D.T2.2.3 Communication methods for local energy plans and creating an atmosphere of acceptance) present communication channels for 4 key groups that need to be informed about local energy plans and initiatives. These stakeholders are children, families, the business sector and the elderly.

During workshop 3 in 2020 the revised energy plan was presented also to a wider public. In the aspect of digital communication, there was and will be used: the web homepage of the Niemce Commune and also a Facebook page of the commune. It is difficult to reach the business sector by Twitter, Instagram or LinkedIn because not everyone uses it. Also, the commune does not have it.

Before and during the workshops brochures were distributed to provide information about the project to reach workshops participants.

Tool 3 was also used for planning the target groups of ecological education of local community in the Niemce Commune and the presentation of the investments in RES included in the updated LCEP and in the implementation of the pilot action of ecological education by the established Niemce Energy Cluster. The investments in RES were described using simple descriptive language. Common values and goals in energy planning were presented by explaining the investments in RES.

The video clip about the pilot action was made, which is developed as contribution to promotional video in the project.

The usage of Tool 3 can motivate target groups to be a part of energy planning process in the future, through use of the different communication channels matched for different stakeholders like: children, families, the business sector and the elderly and so influence their inclusion in established citizen energy group and set up innovative energy investments in the region. The possible shortcomings of the tool or obstacles that may negatively affect its successful application in practice and acceptance by end users weren't identified.

Tool 3 should be updated – depends on the developed technical communication possibilities in the future.

Below it is shown overall impression of the usefulness towards end users of developed participative tools for future citizens engagement in energy planning.

Table 6 - Rating of participative tools for citizen engagement by Polish partner

Tool 1 – Co-design workshop methods for engaging participants into local energy planning	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5

Tool 2 - Community energy investment guidelines – technical, business and legal aspects	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Tool 3 - Communication methods for local energy plans and creating an atmosphere of acceptance	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5

The explanations for the rating itsels are given below:

- Tool 1 – Co-design workshop methods for engaging participants into local energy planning: This tool may have been put to very good use for organisation the regular workshop meetings with the stakeholders in the ENES-CE project and engaging participants into local energy planning in the Niemce Commune.
- Tool 2 – Community energy investment guidelines – technical, business and legal aspects: The tool may have been useful during the workshops, but it should be adapted to the specificity of the projects and the user's knowledge.
- Tool 3 – Communication methods for local energy plans and creating an atmosphere of acceptance: This tool may have been put to very good use for planning the target groups of ecological education of local community in the Niemce Commune and the presentation of the investments in RES included in the updated LCEP and the implementation of the pilot action of ecological education itself by the established "Niemce Energy Cluster".

2.3.4. Sharing experiences after implemented pilot projects

Setting the vision/purpose of the pilot projects

The idea of the pilot action was the outcome of the arrangements made during the workshop meetings in the ENES-CE project. The idea of the educational action came from the participants of the project workshops when discussing the RES investments. The local authorities inclined to the idea of the workshop participants. In that way their opinions have been heard. It was than easier to make decision on implementation of the pilot action.

By showing the first effects of joint work, (which was the establishment of "Energy Cluster Niemce" and common update of Low Carbon Economy Plan) it was possible to inspire public confidence and acceptance for investments in RES in wider group of inhabitants and stakeholders and encourage them to cooperate in the future.

Defining and achieving objectives of the pilot projects

- The residents were encouraged to engage in activities related to investments using RES, future cooperation with the energy cluster by implementation of investments with use RES aimed also at reducing the emission of pollutants into the air in the commune.
- There was intention to inform about programs co-financing investments in RES and EE. In order to obtain funding for such investments in RES, the old heat source (stoves heavily polluting the air) should almost always be replaced. That is why it was decided on such an action title: "every resident and entrepreneur resident from the Niemce Commune can contribute to the clean air in the commune".
- There was intention to tell what the residents/ entrepreneur could do for clean air in the commune and show how they can contribute to the clean air, by making simple decisions and what they want to do should be they own choice. In the evaluation questionnaire after the

meetings they were asked about the preferences to take some activities with use of RES or to safe energy.

That is why the aim of the action was to inform about possible activities, investments, financing programs and to raise awareness among the local community about the possibility of reducing low emissions in the commune and to inform about the possibility of choosing air quality notification systems in the future. In addition, cluster members promoted the idea of cooperation within the cluster and the possibility for potential new members to join the cluster and join the common bottom-up energy planning in Niemce Commune.

The target groups were the entrepreneurs and the residents of the Niemce Commune. Three meetings were organised and the total number of participants of the pilot action was 68 persons.

The main result of implemented pilot action was achieved. The awareness among the local community about the possibility of reducing low emissions in the commune was raised. The pilot action meetings participants gained knowledge regarding available programs offering funds for investments in RES and for improving the energy efficiency of buildings. The participants of the pilot action also gained knowledge about what is low emission and what causes low emissions, as well as about energy/heat sources which do not cause low emissions. Having gained knowledge during the pilot action, the residents of the Niemce Commune also reported the question which everyday behaviors/habits they would like to change in order to reduce energy consumption and thus the CO_2 emissions and influence the quality of air in the commune.

Stakeholder engagement and contribution

Tasks as part of the organization of the pilot action were discussed during the preparation of the plan for the implementation of the pilot action and by signing the letter of intent, moreover, cluster members were open to changes and willingly complemented each other.

There was high commitment of members of the Niemce Energy Cluster, commune authorities and employees, in cooperation with the expert involved in the ENES-CE project and employees of the Marshal Offices.

The local authorities of the Niemce Commune cooperated with cluster members and participated in all meetings of the pilot action. Coordinator of the Energy Cluster (Municipality of Niemce) covered the costs related to the organisation of the meetings, participation of the commune employees. The other cluster member association “Social Initiative of Krasienin” organised 2 meetings in Krasienin. The president of the association actively participated in the dialogue with the participants of the pilot action.

The owner of the Greenhouse Farm LEONÓW Sp. Z.o.o in Niemce together with another cluster member, presented the idea of investments with use of RES and further plans of creating a special purpose company for realization of RES investments. They talked also about possibilities to join the cluster and becoming active in common energy planning.

Other members of the energy cluster, private persons were also engaged by preparing and conducting the meetings for the pilot action.

Activities, services and products

Instead of 2 initially planned meetings, a total of 3 meetings were organised. It was an added value in this action.

The external expert in the ENES-CE project provided information based on PowerPoint presentations and educated the pilot action participants. Cluster members presented the idea of investments with use of RES and further plans of creating a special purpose company for realization of RES investments.

Cluster members cooperated very well to achieve the same goal. They committed themselves strongly and adapted to jointly agreed activities as well as to changing conditions, which were difficult to predict in the planning phase. The local authorities of the Niemce Commune cooperated with cluster members and participated in all meetings of the pilot action.

The product of the pilot action are presentations which can be used by the cluster to continue this ecological education.

Pilot project implementation

There were held three meetings in the pilot action of ecological education for the local community on 03.12.2021 (one meeting) and 10.12.2021 (two meetings). The total number of participants of the pilot action was 68 persons, project stakeholders: residents and entrepreneurs from Niemce commune, including seniors, councilors, village leaders, families.

During the information and education meetings "Every resident and entrepreneur of Niemce commune can contribute to the clean air in the commune", information was provided with use of PowerPoint presentations. Discussions were held with the participation of an external expert and members of the cluster, who answered questions from meeting participants.

The issue discussed during the meetings were:

- Niemce Energy Cluster – the idea of creation, possibilities for the inhabitants to join the cluster as a new member and to be engaged in energy planning in the commune;
- Investment activities included in the draft document LCEP for the Niemce Commune for 2021-2030 with a vision of activities until 2050 (update);
- Air pollution, low emissions, smog – causes and effects, what influences the air pollution in the Niemce Commune, sources of pollution by sectors (status as of 2020);
- Summary of boiler emission parameters: out-of-class, class 3, 4 and 5;
- What are the heat sources that not cause low-emissions and an explanation of what are "low-emission heat sources" (in the graphic);
- Overview of what are Renewable Energy Sources, Energy Efficiency and its improvement;
- Indication of the impact of RES investments on improving air quality in Niemce commune;
- Possibility of using subsidies for investments in RES and EE for entrepreneurs from the Agroenergy programme, RPO WL for 2014 - 2020 (call for 2022: measure 15.1 Support for enterprises in the field of energy) and the programme described in the draft document European Funds for Lubelskie 2021-2027 (meeting with entrepreneurs);
- Possibility to use co-financing for RES and EE investments for inhabitants within the programmes: Agroenergy - farmers, RPO WL for 2014 - 2020 (call for 2022), European Funds for Lubelskie 2021-2027, Clean Air, My Current, My Heat (meeting with inhabitants);
- Possibilities of using subsidies for inhabitants from the above mentioned programs, while the Stop Smog program was discussed in detail (meeting with inhabitants and members of the Niemce Commune Council);
- Influence of inhabitants and entrepreneurs on air quality in the Niemce Commune; List of possible actions for entrepreneurs and inhabitants to reduce emissions of pollutants to air. List

of actions how to change your daily behaviours to reduce energy consumption and thus reduce CO_2 emissions to air (based on the translation of the graphic developed in the ENES-CE project);

- Possibilities of selecting an air quality notification system in the future;
- Discussion panel in the Q&A formula (questions and answers), filling in the evaluation and satisfaction questionnaire.

In order to confirm reaching the target groups and implementation of the pilot action of ecological education an attendance list was made for each meeting. A total of 68 people participated in the three meetings held as part of the pilot action (3 people did not sign the attendance list). Moreover, the participants of the pilot action received an anonymous evaluation and satisfaction questionnaire to fill in, and the results of the questionnaire were used to prepare report on the implementation of the pilot action.

Resources allocated to the implementation of pilot projects

The organisational issues and costs of the pilot action included providing a meeting place, the equipment for conducting the meetings, participation of the commune employees, refreshments etc. were covered from own resources of the members of the Niemce Energy Cluster.

Tasks as part of the organization of the pilot action were discussed during the preparation of the plan for the implementation of the pilot action and by signing the letter of intent, moreover, cluster members were open to changes and willingly complemented each other, what contributed to the success of the pilot action.

Financial plan

The organisational costs of the pilot action of ecological education of the local community „Every resident and entrepreneur from the Niemce Commune can contribute to clean air in the Commune“, included providing a meeting place, the equipment for conducting the meetings, participation of the commune employees, refreshments etc. were covered from own resources of the members of the Niemce Energy Cluster. The cost of participation of an external expert was covered from the ENES-CE project budget. Due to the specificity of the costs, which results due to the current activities of the Niemce Commune and other members of the Niemce Energy Cluster and the complexity of the services of the external expert engaged in the ENES-CE project it is not possible to estimate them precisely.

Public and private cooperation

Cooperation between public and private entities can be a success when all of them have the same goal and are able, in the name of achieving this goal, to commit themselves strongly and adapt to jointly agreed activities as well as to conditions that change from time to time, which were difficult to predict in the planning phase.

2.4. Slovenia

The main result of the implemented pilot action investment in the Municipality of Koper are renovated public lights. This was done as one of the main action of the energy plan. Investment into smart lighting – modernisation of public lighting for the Slemenska road was made in accordance with the Decree on limit values due to light pollution of environment, with amendments and supplements.

Pilot project investment is reflecting the overall project objectives (main and specific) – to improve territorial based low-carbon energy planning strategies and policies supporting climate change mitigation. The original idea generator of the pilot action was on board for the entire duration of the pilot action.

36 inefficient luminaires were replaced with new LED luminaires. Energy savings and operating costs of the installed SCADA system, together with LED lighting technology, will contribute up to 60 percent lower lighting costs. On the other hand, this technology prolongs the life of the lamps and further contributes to the reduction of light pollution.

Main activities carried out for successful implementation of the pilot investment are as follows:

Activity	
Preparation of the public tender	August 2021
Selection of an external expert	September 2021
Pilot investment implementation	October 2021 – February 2022

Direct positive effects: Energy consumption after the implementation of the investment will decrease by 9.876 kWh per year. Energy cost savings are estimated at 1.086,40 €.

Citizens were not directly involved in the implementation of pilot project action – modernisation of public lighting in MOK. However, they will experience less light pollution in their environment.

The pilot investment was handed over to the company Petrol, which manages all the luminaires in the municipality.

2.4.1. Implementation of pilot action

Below it is shown in what extend the relevant parameters influenced the successful implementation of pilot action in Municipality of Koper.

Table 7 - Rating of pilot action implementing parameters in Slovenia

Real needs and goals of municipality/region	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Clear pilot action goals and good working plan	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Efficiency of the pilot action implementation team	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Open communication and cooperation according to assigned responsibilities among responsible persons	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Total investment cost and available timeline	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Technical possibilities	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Possible funding outside ENES-CE project	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Sustainability of investment	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Regulatory restrictions	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Engagement and acceptance by citizens	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5

Support from political level (local and regional governments)	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Life cycle of the investment	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Press and other communications cannels	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5

In the table above mark 1 means this parameter was not taken into account at all, and mark 5 means this parameter has been taken into account completely.

The following explanations for the ratings were given:

- Real needs and goals of municipality/region: Energy efficient renovation of public lighting is set as one of the SEAP measures.
- Clear pilot action goals and good working plan: Clear goals and good working plan were defined.
- Efficiency of the pilot action implementation team: Team was efficient.
- Open communication and cooperation according to assigned responsibilities among responsible persons: There were no communication problems between the external expert and municipality.
- Total investment cost and available timeline: Total investment cost was higher than 15.000,00 – additional money was provided within the municipal budget. Enough time was available to carry out the investment but due to difficulties in the supply of material, the work took longer.
- Technical possibilities: --
- Possible funding outside ENES-CE project: Additional money was provided within the municipal budget.
- Sustainability of investment: The investment creates a more pleasant living environment, as they have a uniform standard of lighting. It is an investment in the future, as the luminaires are suitable for smart city management. Simultaneously with the renovation, the cadastre of municipal public lighting was updated, and the implementation of energy monitoring was also ensured.
- Regulatory restrictions: --
- Engagement and acceptance by citizens: Improved visibility, safety at night, traffic safety and the overall image of the settlement.
- Support from political level (local and regional governments): Very important.
- Life cycle of the investment: Longer lifespan.
- Press and other communications cannels: --.

2.4.2. Establishment of solar energy cooperative in Municipality of Koper

Within the pilot action, Municipality of Koper is trying to create a solar energy cooperative in the suburban part of the municipality – in local community Sveti Anton.

The original idea generator of the pilot action was on board for the entire duration of the pilot action. The cooperative is still in the phase of establishment. Due to the change of government in Slovenia, delays in the adoption of bylaws are expected.

A proposal for the establishment of the Solar Cooperative of St. Anton, with the aim of setting up a community self-sufficient solar power plant on the public roofs of the local community home and local

branch school, has been elaborated. Municipality of Koper in cooperation with Goriška local energy agency has implemented several workshops and meetings. In addition, to the municipality, local community, primary school and citizens from the settlement of St. Anton, were identified and invited to take an active part. Participative process of residents at the workshops was very involving. The biggest motivation for citizens to join the cooperative are savings.

Main activities carried out for successful implementation are defined below:

Activity	
Preparation of the public tender	July 2021
Selection of an external expert	August 2021
Examination of the legal bases of renewable energy sources and cooperatives	August-September 2021
Analysis and site selection for solar power plant installation	August 2021
3 Workshops	August – September 2021
Preparation of the business model of the solar energy cooperative in the Municipality of Koper	September-October 2021
Preparation of the act on the establishment of the solar energy cooperative and the basic cooperative rules	September-October 2021
Preparation of an easement agreement	November 2021
Additional meetings with potential cooperatives	December 2021 of-January 2022

Citizens were involved in the initial phase of setting up the cooperative. All household of local community Sv. Anton were invited to the workshop where the model of establishment of energy cooperative was presented. The general public was informed about the activities through various channels – radio interview, video article on national television, Facebook, etc.

2.4.3. Usability of participative tools for citizen engagement (Tool, Tool 2 and Tool 3)

Tool 1 was useful and played a supporting role at workshops, where stakeholders were involved. It is well structured, without any shortcomings, so there is no need for update.

Tool 2 was used to calculate the PV investment that the cooperative will place on the roof of the primary school. Tool 2 had no influence on the selection of pilot project action. Pilot action (smart public lighting) was selected as one of the best evaluated pilot project at first workshop.

Tool 3 was useful for presenting goals and results of our activities to the general public. Tool 3 is well structured, without any shortcomings, so there is no need for update.

Below it is shown overall impression of the usefulness towards end users of developed participative tools for future citizens engagement in energy planning.

Table 8 - Rating of participative tools for citizen engagement by Slovenian partner

Tool 1 – Co-design workshop methods for engaging participants into local energy planning	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5

Tool 2 - Community energy investment guidelines – technical, business and legal aspects	☐ 1	☐ 2	☒ 3	☐ 4	☐ 5
Tool 3 - Communication methods for local energy plans and creating an atmosphere of acceptance	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5

The explanations for the rating were given below.

- Tool 1 – Co-design workshop methods for engaging participants into local energy planning: The tool has useful ideas for approaching wider range of important stakeholders and involvement of citizens.
- Tool 2 – Community energy investment guidelines – technical, business and legal aspects: The tool is intended for the use by professionally trained personnel and not the general public. Wider public will need assistance when using a tool.
- Tool 3 – Communication methods for local energy plans and creating an atmosphere of acceptance: The tool was very useful for presenting goals and results of our activities to the general public.

2.4.4. Sharing experiences after implemented pilot projects

Setting the vision/purpose of the pilot projects

The vision of the pilot project follows common goals of reducing emissions as well as other goals of EU directives, the Covenant of Mayors initiative and national legislation. Municipal documents – LEK, SEAP and SECAP all have the same goal – reduction of CO_2 emissions. Local administration is a key stakeholder in promoting the energy transition and combating climate change. On this basis it is highly recommended that the local administrations take over the leading role and becomes an example of best practice to citizens and other authorities.

Defining and achieving objectives of the pilot projects

Although significant achievements have been made, one of the goals has not been achieved yet – establishment of solar energy cooperative. A lot of effort has been put into laying the foundations for the establishment of the solar cooperative.

Stakeholder engagement and contribution

It is very important to assess who are relevant stakeholders, seek their input and obtain their feedback. Different stakeholders should be engaged in the very early phase of the implementation of the pilot project. Despite the COVID-19 situation, they decided to carry out all the workshops face-to-face.

Pilot project implementation

Detailed pilot implementation plan is needed for every successful pilot. Pilot project investment was done with some delay – due to difficulties in the supply of material. But enough time was available to carry out the investment.

Resources allocated to the implementation of pilot projects

The budget was sufficient. Total investment cost was higher than 15.000,00 – additional money was provided within the municipal budget.

Financial plan

The financial plan functioned quite good.

2.5. Croatia

The pilot action in Croatia included the installation of 50 kW PV power plant on the roof of Town Prelog kindergarten “Fijolica”. The whole investment was selected by citizens and triggered by Town of Prelog and Medjimurje Energy Agency Ltd. who implemented several workshops with citizens and relevant stakeholders from year 2019 until the finalization of creation of citizen energy association in year 2021. These workshops combined with other relevant communication activities have triggered involvement of interested citizens in process of revision of current energy plan (SEAP), development of new energy plan (SECAP) and identification of most relevant measures to be implemented in Town of Prelog.

Certainly, the greatest interest of the citizens was focused on the measure Installation of photovoltaic powerplants on public buildings which resulted in installation of PV power plant on the kindergarten building and that interest existed until the moment when the PV power plant was put into operation.

Since the building was energy refurbished within the last two years, with the additional installation of a PV power plant on its roof, it became a good example of a building with increased energy efficiency which will consequently create a better working environment for kindergarten staff and affect the quality of service to citizens and their children. This investment is considered to be a very important energy community project where citizens and other stakeholders were directly involved from the very beginning – in the process of deciding on the type of pilot action which was implemented as part of the ENES-CE project. With this investment, the town administration stimulated additional interest of citizens in investing in the installation of PV power plants on their private homes which makes this investment as very important driver of similar projects in the future. This can certainly be considered as one of the positive effects of such investment. The investment also encouraged the town administration to launch additional energy projects and initiatives such as installation of an integrated charging station for electric vehicles to the kindergarten building and the purchase of an electric vehicle for Town Prelog employees. Other positive effects which can be mentioned are: increased awareness of the importance of energy projects, increased economic activity in the town, promoting the importance of the use of renewable energy sources, etc. Energy projects involve generous energy resources and often local budgets cannot cover the full cost of the investment, so additional sources of funding need to be sought. This process often demotivates local government employees and hampers the implementation of investments.

The main activities that were necessary for the successful implementation of this investment are the following: providing support from local governments during the entire process – from planning and implementing till final phase, involving citizens in deciding on the type of investment which makes the whole process even more acceptable by general public, ensure cooperation between investors and contractors to implement the investment within the deadline and seeking funding from different financing sources to ensure the sustainability of this and similar investments in the future. Everything mentioned above is considered to be a key in supporting other institutions so that they can successfully carry out similar pilot actions in their regions taking into account the specifics of their market situation, the legislative framework and possible administrative barriers which arise from this framework.

The positive effect of this investment can be also seen through the campaign "Prelog, join the sun" managed by Town of Prelog, Medjimurje Energy Agency Ltd., Green Energy Cooperative and new citizens' association called the Green Energy Club Prelog where a new collaboration was established. Through this new collaboration, the entire idea of installing PV power plants received a long-term character especially for inhabitants of Town Prelog and surrounding settlements.

2.5.1. Implementation of pilot action

Below it is shown in what extend the relevant parameters influenced the successful implementation of pilot action in Town of Prelog.

Table 9 - Rating of pilot action implementing parameters in Croatia

Real needs and goals of municipality/region	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Clear pilot action goals and good working plan	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Efficiency of the pilot action implementation team	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Open communication and cooperation according to assigned responsibilities among responsible persons	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Total investment cost and available timeline	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Technical possibilities	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Possible funding outside ENES-CE project	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Sustainability of investment	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Regulatory restrictions	☐ 1	☐ 2	☒ 3	☐ 4	☐ 5
Engagement and acceptance by citizens	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Support from political level (local and regional governments)	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Life cycle of the investment	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Press and other communications cannels	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5

In the table above mark 1 means this parameter was not taken into account at all, and mark 5 means this parameter has been taken into account completely.

The explanations for the ratings are given below.

- Real needs and goals of municipality/region: Most potential with renewable energy sources usage in Medjimurje county lies in solar power. Due to this information and inevitable raise of the electric energy prices, it has been concluded that installation of PV systems on buildings meets regional energy transition goals and leads it to become energy sufficient. In line with that Town of Prelog considers the installation of PV power plants on private or public buildings as one of core steps in becoming a town that encourages green projects.
- Clear pilot action goals and good working plan: The first step for the successful implementation of the pilot action certainly consists of clearly defined goals and a well-developed work plan with defined milestones.
- Efficiency of the pilot action implementation team: The team in charge of implementing this type of investment should be composed of relevant experts, from town officials who are not experts in the field to technical experts who provide support in the entire process of planning and implementing the pilot action.

- Open communication and cooperation according to assigned responsibilities among responsible persons: In addition to the pilot action implementation team, their internal communication and cooperation are crucial for successful implementation of this pilot action because they are the key in identifying barriers and defining solutions.
- Total investment cost and available timeline: Funds that are allocated in the project budget for Town Prelog pilot actiont, are not sufficient to fund whole investment so Town of Prelog agreed to finance the rest of the investment cost from its own budget and from alternative funding options. Due to limitations in terms of alternative sources of financing, the start-up and implementation of the action was delayed, but was still successfully implemented before the finalization of the project.
- Technical possibilities: While planning and implementing the investment, proximity to the electric grid, the state of the grid itself as well as the state of the building on which the PV plant will be installed were been taken into account. Technology of the PV modules has also been communicated with experts in this field.
- Possible funding outside ENES-CE project: The implementation of this action partially depends on funding sources outside ENES-CE project, since the whole investment exceeds the amount financed from the project so the plan is that part of the investment will be financed by National Energy Efficiency and Environmental Protection Fund (FZOEU) who publishes yearly calls to co-fund installation of RES systems in public buildings.
- Sustainability of investment: The calculations conducted show that building owner will have significant decrease in the consumption of electric energy from the grid and thus also smaller energy bills. Town of Prelog also plans to install an integrated charging station for electric cars which will use electricity from PV power plant installed on the roof of the kindergarten building. The excess energy that will be produced during summer times will be used to power electric car that the Town of Prelog plans to buy in the near future.
- Regulatory restrictions: There were no special regulatory restrictions in implementing the pilot investment.
- Engagement and acceptance by citizens: Through decrease of the cost of electricity for the kindergarten, saved funds will be invested to raise quality of service given to citizens of Prelog in pre-school education of their children. The comfort of stay in the kindergarten will also increase as will their energy sustainability and independence.
- Support from political level (local and regional governments): Support from local and regional governments is extremely important especially for launching such investment projects not only by securing funds through local and regional budgets but also through activities such as campaigns and workshops to raise awareness of the importance of such projects for the community.
- Life cycle of the investment: The investment will reach point of the return in following several years since the planning has been well performed and calculations prior to the installation conducted.
- Press and other communications cannels: Good public relations work and well-chosen communication channels are always very important in local governments. However, the basic prerequisite is that people trust their managers and each other which is a basis of good cooperation.

2.5.2. Establishment of citizen energy group in the Town of Prelog

Croatian partners within ENES-CE project managed to establish a citizen energy association which is according to the current legislation in Croatia, most suitable form of energy group to establish. A prerequisite for the establishment of such an association was creation of basis of the acceptance atmosphere through marketing and communication activities as well as three interactive workshops for wider audience in the first part of project implementation. The following three workshops (in late 2020 and first half 2021) were organized to determine main participants to include into the newly established citizen energy group as well as legal requirements and limitations. Finally, the founding assembly was held between 2nd and 3rd workshop in 2021, i.e., on July 7th 2021. The president, vice-president and management board were defined, the name of the association ("Green Energy Club Prelog") was determined and members enlisted.

Now the association is open for anyone to join and its main goals are sustainable development, development and implementation of energy and climate projects, environmental protection and cooperation with other similar organization to satisfy its main goal. The Town of Prelog as well as Medjimurje Energy Agency Ltd. have been supporting the establishment of the association from the beginning and will do so through the course of its actions in the future.

By creating such association, the Town of Prelog and Medjimurje Energy Agency Ltd. managed to go deeper in creating social innovation activities and include their inhabitants in the whole process of creating and directing the town's strategy towards green and sustainable energy and climate related projects which are crucial in achieving carbon neutrality on local level. To be clear, during the initial workshops the project problems seemed quite foreign to the citizens, but this further stimulated their interest to get better acquainted with the terminology and problems that hinder the process of involving citizens in local policy making. In the end of the whole process of establishing citizen energy association, all initially set goals in fostering citizens to participate in local energy planning in Medjimurje region were achieved and they were involved in the whole process from beginning. The whole process was also well promoted through various online and offline communication channels which ensured a good attendance of project events and increasement of citizens' inquiries about green projects.

According to last data the association "Green Energy Club Prelog" has a total of 11 members, i.e., citizens whose interest is focused on green community projects. The included members are well informed about the whole concept of community energy projects and are very interested in promoting the usage of RES in Town of Prelog and surrounding settlements which made them motivated enough to be part of the association and its further work outside of ENES-CE project. The association "Green Energy Club Prelog" was also included into the campaign "Prelog, join the sun" in addition to Town of Prelog, Medjimurje Energy Agency Ltd. and Green Energy Cooperative and made the whole idea of installation of PV power plants on private houses attractive to a wider public.

In addition to that, there are two more points connected to the work of the association which made the Town administration proud: the extent to which the Town Prelog residents understand the need for running energy and climate related projects in order to raise their living standard and active involvement in defining future green energy projects (i.e., installation of integrated charging station for electric vehicles and procurement of electric car for Town of Prelog business needs).

In order to ensure future sustainability of established citizen energy association, Town of Prelog as well as Medjimurje Energy Agency Ltd. tend to organize regular meetings according to the needs of the community energy projects and tackle the future problems which will emerge in the energy and climate change sector (energy refurbishment of public and private buildings, development of local and

regional energy and climate strategies, installation of RES on private and public buildings, innovative and/or alternative financing mechanisms, etc.) and possibly transform the established association into energy cooperative in order to provide citizens with the opportunity to invest in locally produced RE and energy-related services.

2.5.3. Usability of participative tools for citizen engagement (Tool 1, Tool2 and Tool 3)

TOOL 1

Tool 1 has been used in organisation of workshops for citizens and other interested stakeholders in Town of Prelog and has proven to be a very useful tool for organizing interactive workshops where participants were motivated enough to share their opinions, ideas and visions resulting in conclusions that were crucial in the revision of the existing SEAP and the development of a new SECAP and also identifying future sustainable and green community projects. Since the Tool 1 is developed as manual, it actually provides the quality tips on how to organize interactive and collaborative workshops which makes the tool certainly applicable to various topics and various participant profiles.

Based on that the Tool is well developed and useful with relatively small shortcomings, however, it should be updated regularly in accordance to new needs of the users and target groups. Adhering to the advice from Tool 1 Town of Prelog managed to ensure high acceptance of developed SECAP during the implementation phase in the targeted region which can be seen through active involvement of citizens in deciding the pilot project investment and through the whole process of investment planning and implementation which extremely motivated them to launch such projects for their private needs.

In order for the workshops to be successful and result in quality conclusions, the profiles of the participants are also important, so in the future it is recommended to supplement the tool with the specification of participants who should participate in workshops of this type in order to invite persons who possess a certain degree of knowledge relevant to the topic.

TOOL 2

Tool 2 has been used to prepare investor for the pilot action and was accepted as very useful tool for identifying community relevant energy investments. All main features of the Tool 2 were presented to the wider public including citizens, to familiar them with the investment and to show how all of the involved stakeholders will benefit from the same.

Although the Tool 2 is considered to be very useful, it is quite complex tool (a lot of background tasks were done to make the tool so extensive and high quality) where it is necessary to know a lot of input data, especially technical ones, which can be a problem for someone who is not professional enough. Another downside of the tool the strongly oriented towards large investment projects that provide long-term benefits to the community (for large production plants), but require significant financial resources for the implementation. In the future maybe it should be considered amend the tool to be applicable also for a small-scale energy related projects which will made the tool more useful also for local governments and other target groups which do not possess a sufficient level of knowledge related to the topic.

In addition, for the Tool 2 to be useful in the future it will have to be updated regularly with respect to the potential changes in the PV market.

TOOL 3

Tool 3 has been extensively used while preparing and implementing workshops for citizens and other interested parties in Town of Prelog and also for setting the ground for acceptance atmosphere on

local level. It has also been used to encourage citizens to join newly established citizen energy association “Green Energy Club Prelog” in Town of Prelog and has proven to be a successful tool for motivating citizens to participate in project workshops and joining the citizen energy association but also for disseminating the project results and activities outside the borders of Medjimurje county, i.e., other regions covered by the ENES-CE project.

Adhering to the guidelines from the Tool 3, Town of Prelog and Medjimurje Energy Agency Ltd. have managed to encourage citizens to get involved in the process of developing SECAP from the very beginning and point out the importance of drafting such documents at the local level. This tool is also considered to be beneficial for setting the ground for future energy community investments and projects with focus on green energy and sustainable development beyond ENES-CE project by raising awareness among citizens and other interested stakeholders.

Taking into account new trends in communication and extensive usage of social networks in the latest years, the Tool 3 will surely have to be updated in the future.

Below it is shown overall impression of the usefulness towards end users of developed participative tools for future citizens engagement in energy planning:

Table 10 - Rating of participative tools for citizen engagement by Croatian partners

Tool 1 – Co-design workshop methods for engaging participants into local energy planning	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Tool 2 - Community energy investment guidelines – technical, business and legal aspects	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Tool 3 - Communication methods for local energy plans and creating an atmosphere of acceptance	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5

The explanations for the ratings are given below.

- Tool 1 – Co-design workshop methods for engaging participants into local energy planning: The tool was very useful tool in organizing interactive and collaborative workshops where the citizens were relaxed enough to share their ideas, opinions and problems and thus contribute to the development of SECAP and select the pilot action of the ENES-CE project.
- Tool 2 – Community energy investment guidelines – technical, business and legal aspects: The tool proved to be useful for large investment projects such as large production plants and is intended exclusively for professionally trained personnel and experts but not for the general public.
- Tool 3 – Communication methods for local energy plans and creating an atmosphere of acceptance: The tool most certainly is a useful tool in setting the ground for creating a positive environment of acceptance and including citizens and other target groups into local energy planning from the very beginning of the process. The tool recommends the use of different channels of communication in relation to the relevant target groups and as such it will be very useful to local governments in promoting the idea of involving citizens in local energy planning and their engagement in established citizen energy cooperatives and other forms of citizen energy groups.

2.5.4. Sharing experiences after implemented pilot projects

Setting the vision/purpose of the pilot projects

The vision/purpose of pilot projects implemented in Croatia were in line with ENES-CE project main and specific objectives with included specifics of local government where they were implemented. The implementation of the pilot projects addressed the importance of involving citizens in the creation of local energy policies and encouraged additional investments in green community projects in private (increased interest in installation of PV power plants in family houses) and public sector (installation of integrated charging station for electric vehicles, electric vehicle for town administration).

While setting the vision/purpose of the pilot projects, especially the ones related to energy and climate it is necessary to be intentional, i.e., create a clear vision and purpose which will generate satisfaction and trust and have a real impact on creating quality policies and strategies at local level which will provide momentum for further investments in the local infrastructure.

Defining and achieving objectives of the pilot projects

Clearly defined objectives where the key for successful implementation of pilot projects in Croatia. The responsible partners were upfront about main objectives and provided all the information and data which helped relevant stakeholders understand the issues addressed by the ENES-CE project.

While defining and achieving the objectives it is necessary to be transparent, i.e., upfront about the main objectives and give accurate feedback and ground sentiments on achieving the defined objectives.

Stakeholder engagement and contribution

Due to the fact that local governments have lack of professional staff in energy field, the engagement of relevant stakeholders and their contribution was critical in successful implementation of pilot projects in Croatia. Their contribution was important for understanding the context of the pilot projects and helped in reaching to wider range of general public.

While engaging relevant stakeholders it is necessary to be inclusive and reach out to as many stakeholders groups that may be affected by the pilot project and future policy change. In addition, it is necessary to engage them through various events in order to establish an environment where they can help in co-delivering, share their ideas and influence the creation of new policies or initiatives.

Activities, services and products

Implemented activities were in line with defined objectives of the pilot projects.

Pilot project implementation

Through the entire process of pilot project implementation responsible partners faced several challenges but each of them was successfully overcomed. By setting a clear pilot project implementation plan at planning stage and including relevant stakeholders ensured successful implementation of pilot projects.

The whole idea of ENES-CE pilot projects was well accepted among citizens which has been achieved by good collaboration between Town of Prelog and Medjimurje Energy Agency Ltd.

While implementing relevant pilot projects it is important to provide public with feedback which will further boost the engagement. In the process the focus should be on the main aspects of the project, identification of key target groups and finally in selection of right communication channels and tools in order to reach everyone and share the purpose of the project.

Resources allocated to the implementation of pilot projects

Since the financial resources allocated to the implementation of pilot project investment (approx. 55.700,00 EUR) were higher than the amount secured through ENES-CE project (15.000,00 EUR) responsible partners had to seek additional funding outside the ENES-CE project. This influenced some delays in implementing the pilot project action.

In order to obtain the sustainability of pilot projects regardless of the financial resources necessary for their implementation, it is necessary to seek for additional funding sources that exist.

Financial plan

Well developed financial plan was crucial in implementing pilot projects in Croatia.

Whether it is a smaller or larger investment project, for its successful implementation it is crucial to develop a financial plan that follows the pilot project implementation plan because possible discrepancies affect delays in the implementation.

Public and private cooperation

Building relationship with relevant public or private institutions was critical in achieving planned outcomes of pilot projects implemented in Croatia. Through engaging citizens and relevant stakeholders, responsible partners managed to develop a sense of co-ownership of the pilot project results and a new way of creating local energy initiatives.

Public and private cooperation should be tackled by issues and challenges arisen from implementation of pilot projects. Every problem or challenge should be seen as opportunity for collaboration and relationship building.

2.6. Hungary

In Hungary four pilot project actions were implemented which made the Hungarian partners very ambitious in achieving ENES-CE project main and specific objectives. Each pilot action including establishment of Zugló Climate Action group are described below.

2.6.1. Pilot action: Measure together

Target group: Local public institutes, local decision makers

Activity: Energy monitoring system was launched in 40 local public institutes of Zugló municipality. Prior to this ENES-CE initiative, the energy consumption data of the public buildings were collected and documented in various systems: some institutes have super modern smart metering systems, some of them pay the bills on a flat rate, other consumers read the meter once a year.

From this year 40 institutes are joined to the „Online Monitoring System" database and collect the data regularly in unified system. The data will be processed and analysed by the energy expert partner of the municipality. The software background of the data management was developed in the Compete4SECAP project (https://compete4secap.eu) and it is tried out and used by several European municipalities. The new system helps to get an accurate picture of the electricity, heat, and natural gas consumptions of the public buildings.

The sharp data analysis is a crucial point of decision making in preparation of investments and energy procurement, it helps to identify deviations in energy consumption and ensures the transparency of

the institution management. Beyond the above objectives, the evaluation of strategic goals of the local government set out in climate and energy papers should be based on data.

Timeline: 2021 January –2022 January

Milestones: Buy competence4SECAP online software, organize regular meeting with the lead energy manager and the collaborated institutions officers, agree on the methodology of data collection, finalise summary, write policy recommendation based on the collected data.

Link to SECAP/Climate Strategy action: SZI15 Energy and climate database and geo information system development.

Sustainability and positive effects: The plan is that all the municipality owned local public institutions join the unified system to get an up-to-date and transparent energy management system.

Involvement: The project can be considered as an in-house project, as the buildings are owned by Zugló, but operated by 6 different independent institutions, which had to be consulted during the data collection. The involvement of citizens in the project was not feasible, but attempts were made to involve a third party (Simens) with whom they discussed the donation of smart meters on several occasions, but it did not work out for administrative reasons.

2.6.1.1. Implementation of pilot action Measure together

Below it is shown in what extend the relevant parameters influenced the successful implementation of pilot action Measure together in Zugló district in Budapest.

Table 11 - Rating of pilot action implementing parameters – Measure together

Real needs and goals of municipality/region	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Clear pilot action goals and good working plan	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Efficiency of the pilot action implementation team	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Open communication and cooperation according to assigned responsibilities among responsible persons	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Total investment cost and available timeline	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Technical possibilities	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Possible funding outside ENES-CE project	☐ 1	☐ 2	☒ 3	☐ 4	☒ 5
Sustainability of investment	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Regulatory restrictions	☒ 1	☐ 2	☐ 3	☐ 4	☐ 5
Engagement and acceptance by citizens	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Support from political level (local and regional governments)	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Life cycle of the investment	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Press and other communications cannels	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5

In the table above mark 1 means this parameter was not taken into account at all, and mark 5 means this parameter has been taken into account completely.

The explanations for the ratings are given below.

- Real needs and goals of municipality/region: The new system helps to get an accurate picture of the electricity, heat, and natural gas consumptions of the public buildings and help to make decision.
- Clear pilot action goals and good working plan: The process was flexible and provided regular monitoring occasions.
- Efficiency of the pilot action implementation team: There were some data processing difficulties, but overall the implementation was fine.
- Open communication and cooperation according to assigned responsibilities among responsible persons: The public was regularly provided by information.
- Total investment cost and available timeline: Investment cost 3.000,00 EUR.
- Technical possibilities: Software and xls.
- Possible funding outside ENES-CE project: Own budget.
- Sustainability of investment: Ensured.
- Regulatory restrictions: n.a.
- Engagement and acceptance by citizens: Generally positive feedbacks.
- Support from political level (local and regional governments): Strong support.
- Life cycle of the investment: Fine.
- Press and other communications cannels: The public was regularly provided by information.

2.6.1.2. Usability of participative toopls for citizen engagement (Tool 1, Tool 2 and Tool 3)

The tool Co-design workshop for engaging participants into local energy planning was used in the planning phase of the engagement planning. In addition, the document to learn new tools and methods was also used. The Tool 1 was an easy understandable and useful tool.

Unfortunately, the Community energy investment guidelines – technical, business and legal aspects tool was not valid in district Zugló. There was a huge delay in the setting up the legal framework for Energy Communities in Hungary and finally the business and legal aspects are very different in Hungary. The Tool also concentrated on energy supply and not energy efficiency therefore the tool was used only as a best practice in communication. The Tool 3 – Communication methods for local energy plans and creating an atmosphere of acceptance in the planning phase of the engagement planning was also used.

Below the overall impression of the usefulness towards end users of developed participative tools for future citizens engagement in energy planning is shown.

Table 12 - Rating of participative tools for citizen engagement by Hungarian partners within the pilot action Measure together

Tool 1 – Co-design workshop methods for engaging participants into local energy planning	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Tool 2 - Community energy investment guidelines – technical, business and legal aspects	☐ 1	☒ 2	☐ 3	☐ 4	☐ 5
Tool 3 - Communication methods for local energy plans and creating an atmosphere of acceptance	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5

The explanations for the ratings are given below.

- Tool 1 – Co-design workshop methods for engaging participants into local energy planning: Very useful.
- Tool 2 – Community energy investment guidelines – technical, business and legal aspects: Not useful.
- Tool 3 – Communication methods for local energy plans and creating an atmosphere of acceptance: Useful.

2.6.1.3. Sharing experiences after implemented pilot projects

Setting the vision/purpose of the pilot projects:

It is necessary to involve decision makers from the first step.

Defining and achieving objectives of the pilot projects:

Try to set ambitious goals.

Stakeholder engagement and contribution:

Use several channels to ensure involvement (personal meetings, emails, online meetings).

Activities, services and products:

Necessary to repeat the main aim and the agreed methodology and targets in every meeting.

Pilot project implementation:

Ensure that the new collaborators are know the process and are capable to do the work.

Resources allocated to the implementation of pilot projects:

3.000,00 EUR.

Financial plan:

Map out possibilities and connect different sectors.

Public and private cooperation:

The Municipality as public body is not able to receive donations in Hungary. It is necessary to explore the possibilities to gain third party donations.

2.6.2. Pilot action: Let's go green together!

Target group: Citizens

Activity: The aim of the pilot project is to create small local communities that become active, responsible and support each other in various green topics such as energy saving, composting, shopping and so on.

One of the pillars of the Let's Green Together project is the District EcoCircles, organised by the Association of Conscious Consumers and launched at the beginning of November. The Chamber-themed EcoCircles focus on the sustainability and practical aspects of food. Thus, among others, healthy eating, climate change and food will be important pillars of the 6-week training. In Zugló, there are currently 13 EcoCircle Chamber groups working, experiencing and learning from each other week by week about sustainable eating.

Climate-friendly Challenges and Climate Friendly Kitchen Adventure and Happy Compost Challenge will be organised. The participants committed to try out lifestyle tips to reduce the environmental impact of their diet for 1 month.

Timeline: 2021 November – 2022 February

Link to SECAP/Climate strategy action: SZI1 awareness raising of the local communities.

Sustainability: The Eco Circles members and participants will be invited to the Zugló Energy Action Group.

2.6.2.1. Implementation of pilot action Let's go green together!

Below it is shown in what extend the relevant parameters influenced the successful implementation of pilot investment in Zugló district in Budapest.

Table 13 - Rating of pilot action implementing parameters by Hungarian partners- Let's go green together!

Real needs and goals of municipality/region	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Clear pilot action goals and good working plan	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Efficiency of the pilot action implementation team	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Open communication and cooperation according to assigned responsibilities among responsible persons	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Total investment cost and available timeline	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Technical possibilities	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Possible funding outside ENES-CE project	☐ 1	☐ 2	☒ 3	☐ 4	☒ 5
Sustainability of investment	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Regulatory restrictions	☒ 1	☐ 2	☐ 3	☐ 4	☐ 5
Engagement and acceptance by citizens	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Support from political level (local and regional governments)	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Life cycle of the investment	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5

Press and other communications cannels	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5

In the table above mark 1 means this parameter was not taken into account at all, and mark 5 means this parameter has been taken into account completely.

The following explanations for the rating were given:

- Real needs and goals of municipality/region: The new system helps to get an accurate picture of the electricity, heat, and natural gas consumptions of the public buildings and help to make decision.
- Clear pilot action goals and good working plan: The process was flexible and provided regular monitoring occasions.
- Efficiency of the pilot action implementation team: There were problems with some data processing difficulties, but overall the implementation was fine.
- Open communication and cooperation according to assigned responsibilities among responsible persons: The information for the public was shared regularly.
- Total investment cost and available timeline: Investment cost 3.000,00 EUR.
- Technical possibilities: Software and xls.
- Possible funding outside ENES-CE project: Own budget.
- Sustainability of investment: Ensured.
- Regulatory restrictions: n.a.
- Engagement and acceptance by citizens: Generally positive feedbacks.
- Support from political level (local and regional governments): Strong support.
- Life cycle of the investment: Fine.
- Press and other communications cannels: The information for the public was shared regularly.

2.6.2.3. Sharing experiences after implemented pilot projects

Setting the vision/purpose of the pilot projects:

It is necessary to involve decision makers from the first step.

Defining and achieving objectives of the pilot projects:

Try to set ambitious goals.

Stakeholder engagement and contribution:

Use several channels to ensure involvement (personal meetings, emails, online meetings).

Activities, services and products:

Necessary to repeat the main aim and the agreed methodology and targets in every meeting.

Pilot project implementation:

Ensure that the new collaborators are know the process and are capable to do the work.

Resources allocated to the implementation of pilot projects:

3.000,00 EUR.

Financial plan:

Map out possibilities.

Public and private cooperation:

The Municipality as public body is not able to receive donations in Hungary. It is necessary to explore the possibilities to gain third party donations.

2.6.3. Pilot action: Eco-Map of Zugló – a virtual compass towards sustainability

Target group: Citizens, local NGOs, local companies

Activity: The Zugló Eco-Map is an online map (http://www.zugloiokoterkep.hu) that provides tips and local information for a green, conscious and sustainable lifestyle, e.g green businesses, repair workshops, community composting bins, recycling centers, etc.

The map was tested and filled with content in cooperation with green communities and NGOs in Zugló.

Timeline: 2020 November - 2022 March

Sustainability: Registered users and participants will be invited to the Zugló Energy Action Group. The future development, maintenance and operation of the website is under negotiation.

Link to SECAP/Climate strategy action: SZI1 awareness raising of the local communities, SZI7 Online community map to facilitate circular economy.

Figure 5 - Online Zugló Eco-Map

Budget: The programming and the content development was around 3.000,00 EUR.

Further developments: They made an offline version that also provides tips and tricks towards sustainability.

Main milestones: Desk research on available eco-maps online and offline in Budapest, desk research on suitable online designs/programs, Make public procurement and taylormade project, Involve local NGOs and groups to provide content, organise PR campaign.

2.6.3.1. Implementation of pilot action Eco-Map of Zugló

Below it is shown in what extend the relevant parameters influenced the successful implementation of pilot investment in Zugló district in Budapest.

Table 14 - Rating of pilot action implementing parameters by Hungarian partners - Eco-Map of Zugló

Real needs and goals of municipality/region	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Clear pilot action goals and good working plan	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Efficiency of the pilot action implementation team	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Open communication and cooperation according to assigned responsibilities among responsible persons	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Total investment cost and available timeline	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Technical possibilities	☐ 1	☐ 2	☐ 3	☒ 4	☒ 5
Possible funding outside ENES-CE project	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Sustainability of investment	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Regulatory restrictions	☒ 1	☐ 2	☐ 3	☐ 4	☐ 5
Engagement and acceptance by citizens	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Support from political level (local and regional governments)	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Life cycle of the investment	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Press and other communications cannels	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5

In the table above mark 1 means this parameter was not taken into account at all, and mark 5 means this parameter has been taken into account completely.

The following explanations for the ratings were given:

- Real needs and goals of municipality/region: The new system helps to get an accurate picture of the electricity, heat, and natural gas consumptions of the public buildings and help to make decision.
- Clear pilot action goals and good working plan: The process was flexible and provided regular monitoring occasions.
- Efficiency of the pilot action implementation team: There were some programming difficulties, but overall the implementation was fine.
- Open communication and cooperation according to assigned responsibilities among responsible persons: The information for the public was shared regularly.
- Total investment cost and available timeline: Investment cost 3.000,00 EUR.
- Technical possibilities: Open source admin surface.
- Possible funding outside ENES-CE project: Own budget.
- Sustainability of investment: Ensured.
- Regulatory restrictions: n.a.

- Engagement and acceptance by citizens: Generally positive feedbacks.
- Support from political level (local and regional governments): Strong support.
- Life cycle of the investment: Fine.
- Press and other communications cannels: The information for the public was shared regularly.

2.6.3.2. Sharing experiences after implemented pilot projects

Setting the vision/purpose of the pilot projects:

Make desk research on available ecomaps and try to involve them in the process

Defining and achieving objectives of the pilot projects:

Try to set ambitious goals.

Stakeholder engagement and contribution:

Use several channels to ensure involvement (personal meetings, emails, online meetings)

Activities, services and products:

Necessary to repeat the main aim and the agreed methodology and targets in every meeting.

Pilot project implementation:

Ensure that the new collaborators are know the process and are capable to do the work.

Resources allocated to the implementation of pilot projects:

3.000,00 EUR

Financial plan:

Map out possibilities.

Public and private cooperation:

The Municipality as public body is not able to receive donations in Hungary. It is necessary to explore the possibilities to gain third party donations.

2.6.4. Pilot action: Bike storage and energy retrofit in AZTA

Target group: citizens, NGOs, SMEs

During the engagement process implemented in Zugló around the elaboration of the local climate strategy, the need for an exemplary community bike storage facility was one of the main pilot project areas defined. Although the efforts of Zugló Municipality's team have not led to success in this filed and they finally implemented other types of community actions, by involving a formal group of active citizens, the community bike storage, sharing and renting possibility has been set up in Zugló, supported by Energiaklub in the frame of ENES-CE project.

In the frame of this pilot, the AZTA! Community Workspaces (owned by Zugló Municipality) were energetically upgraded (insulation) and a community bike-sharing facility was formed by May 2022 with the active involvement of at least 30 people. The term of use of the community bike storage can serve as a model for other similar initiatives. The energy renovation is estimated to result in a saving around 1500 kWh per year.

Main activities:

- preparation (this was the longest part: to get technical solutions and money for the implementation);
- community action in December 2021: emptying the room of rubbish, cleaning, painting;
- insulation works (party by the community, February-March 2022);
- development of the terms of use April 2022;
- communication (continuously).

As listed above, there were 2 concrete actions to which 25-35 local activists has joined, both possibilities were promoted in FB. Positive effects of the pilot that the problem of cargo-bike storage has been resolved and the local community has been strengthened.

Experiences with the pilot: local communities know the best what they need and this is more and more related to sustainability and energy efficiency – both crucial objectives of all local SECAPs. In turn, they usually lacking capacities and/or money to carry out what they want – this fields can be supported by external parties, 1st of all, by the local municipality. The form of targeted call for ideas (that Energiaklub has used) seems optimal to gather and evaluate the pilot ideas of the local community and select some of them to support in their implementation.

2.6.4.1. Implementation of pilot action Bike storage and energy retrofit in AZTA

Below it is shown in what extend the relevant parameters influenced the successful implementation of pilot investment in Zugló district.

Table 15 - Rating of pilot action implementing parameters by Hungarian partners - Bike storage and energy retrofit in AZTA

Real needs and goals of municipality/region	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Clear pilot action goals and good working plan	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Efficiency of the pilot action implementation team	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Open communication and cooperation according to assigned responsibilities among responsible persons	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Total investment cost and available timeline	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Technical possibilities	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Possible funding outside ENES-CE project	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5
Sustainability of investment	☐ 1	☐ 2	☒ 3	☐ 4	☐ 5
Regulatory restrictions	☒ 1	☐ 2	☐ 3	☐ 4	☐ 5
Engagement and acceptance by citizens	☐ 1	☐ 2	☐ 3	☐ 4	☒ 5
Support from political level (local and regional governments)	☒ 1	☐ 2	☐ 3	☐ 4	☐ 5
Life cycle of the investment	☒ 1	☐ 2	☐ 3	☐ 4	☐ 5
Press and other communications cannels	☐ 1	☐ 2	☐ 3	☒ 4	☐ 5

In the table above mark 1 means this parameter was not taken into account at all, and mark 5 means this parameter has been taken into account completely.

The following explanations for the ratings are given below:

- Real needs and goals of municipality/region: The implementing group of citizens have clearly seen the needs that in addition matched the goals of the SECAP of the municipality.
- Clear pilot action goals and good working plan: Thanks to the 'call for ideas' the idea had to be drafted concretely that always helps to materialize the ideas.
- Efficiency of the pilot action implementation team: The formalized group of citizens have already a large scale of experiences to coordinate and implement local programs and actions – that is crucial in the implementation.
- Total investment cost and available timeline: The quite low-budget action – mainly thanks to the level of the volunteer-work – and the suitable timeframe helped to succeed.
- Technical possibilities: Former evaluation of the technical possibilities were crucial. The chosen technical solution has to be changed meantime.
- Possible funding outside ENES-CE project: Without the financial support of ENES-CE project, the pilot couldn't be implemented so simply and fast.
- Sustainability of investment: The investments help to maintain the community workspace in a more sustainable way, both environmentally and financially.
- Regulatory restrictions: No effects to the pilot (as renovations have no such strict regulations as new buildings in Hungary).
- Engagement and acceptance by citizens: Suitable number of citizens have joined the actions that make possible the implementation.
- Support from political level (local and regional governments): Political support was substituted by the support from Energiaklub. Unfortunately, the relationship between the action-group and the municipality is not the best.
- Life cycle of the investment: Not relevant.
- Press and other communications cannels: Communication was crucial to have appropriate number of volunteers to the actions. Mainly SM channel of the project implementor was used.

2.6.5. Establishment of energy savings cooperative in City of Budapest, District 14 Zugló

The Zugló Climate Action group by signing an Memorandum of Understanding (MOU): Cooperation Agreement on the Support of the Sustainable Energy and Climate Protection Objectives of the Municipality of Zugló, Budapest XIV District was established.

Planning together at local level is the first step, and implementing the plans is a shared interest and responsibility.

Only 7% of the total energy consumption in the Zugló area can be attributed to the operation of the Zugló Municipality of Budapest, District XIV. The rest is accounted for by the residential sector (42%), transport (24%) and the service and industrial sectors (27%). If they are serious about reducing energy consumption in the district, all actors need to take action.

What can the municipality do, beyond increasing energy efficiency and the share of renewable energy in its own buildings? First and foremost, it can play a facilitating, organising and information-sharing role to help people and businesses in the area.

The Energy Community Actions Group aims to implement the municipal energy management target setting by involving the relevant actors, i.e. the population and local businesses.

The aim of the cooperation is to enable the Municipality, companies, organisations, civil groups and individuals in Zugló to act and commit in a coordinated way, and to facilitate the launch of community energy and climate projects.

What does the cooperation cover?

Initiating technical discussions, launching joint projects, sharing and transferring good practices, sharing information, informing the public through www.zugloiokoterkep.hu about carbon footprint reduction, initiating and delivering training on sustainable energy and climate protection.

They are very proud of the MOU as they managed to involve several NGO and civil group and company. They organised a signing ceremony at “the Earth day” for the MOU where 7 NGO, one company and the deputy major was presented. They are working on the enlargement of the Group.

They received a small amount from the central budget (10.000,00 EUR) to continue the facilitation of the MOU and the Group.

Figure 6 - Employees of municipality

This cooperation will be an example for other Municipalities in Budapest and beyond. Citizen energy group has specific interest to implement future energy investments, they already started to plan 2022 actions. The Group with Municipality support can overcome the present administrative barriers and would be able to kick-off energy and climate related investments and other actions.

There is a need to provide information and facilitate the Group by organizing meetings, support their networking capacity and provide financial source for projects.

3. Conclusion and future recommendations

In the following table, the status of implementation of certain pilot project activities within Thematic work package 3 (WPT3) per each included region can be seen.

Table 7 WPT3 activities implementation status

Region	Activity	
	Establishing of citizen energy group/cooperative	Implementation of the pilot project action
	Status of implementation	
Germany, Pfaffenhofen	Established	Al stages of pilot actions have been finalized
Italy, Forli	Established	Al stages of pilot actions have been finalized
Poland, Niemce	Established	Al stages of pilot action have been finalized
Slovenia, Koper	Not established	Al stages of pilot action have been finalized
Croatia, Prelog	Established	Al stages of pilot action have been finalized
Hungary, Zuglo (Budapest)	Established	Al stages of pilot action have been finalized

As can be seen in the table, five partners have already established some sort of a citizen energy group while the partner from Slovenia (Municipality of Koper) is still in the process of establishing the citizen energy group/cooperative. Due to the change of government in Slovenia, delays in the adoption of bylaws related to the establishment of citizen energy groups/cooperatives are expected.

While establishing citizen energy groups, all of the partners conducted several interactive and collaborative workshops with interested stakeholders. During that process they were using developed Tool 1 – Co-design workshop methods for engaging participants into local energy planning, for engaging participants to get involved in the process of energy plans revision and join energy groups. It can be concluded that this tool is well developed and useful, in the opinion of the partners, however, it should in the future be updated depending on the technical possibilities to reach the audience. Since the Tool 1 is developed as manual, it actually provides the quality tips on how to organize interactive and collaborative workshops which makes the tool certainly applicable to various topics and various participant profiles.

In order for the workshops to be successful and result in quality conclusions, the profiles of the participants are also important, so in the future it is recommended to supplement the tool with the specification of participants who should participate in workshops of this type in order to invite persons who possess a certain degree of knowledge relevant to the topic.

By mid of June the implementation of the pilot actions is finalized and all partners have implemented all of the planned pilot action activities. All of the partners stated that they used Tool 2 Community energy investment guidelines – technical, business and legal aspects, while planning their pilot actions. Also, it has been noted that they find Tool 2 very useful and will continue to use it when planning their future energy and climate projects. All main features of the Tool 2 were presented to the wider public including citizens, to familiar them with the investment and to show how all of the involved stakeholders will benefit from the same. Although the Tool 2 is considered to be very useful, it is quite complex tool (a lot of background tasks were done to make the tool so extensive and high quality) where it is necessary to know a lot of input data, especially technical ones, which can be a problem for someone who is not professional enough. Another downside of the tool the strongly oriented towards large investment projects that provide long-term benefits to the community (for large production plants), but require significant financial resources for the implementation. In the future maybe it should be considered amend the tool to be applicable also for a small-scale energy related projects which will made the tool more useful also for local governments and other target groups which do not possess a sufficient level of knowledge related to the topic. In addition, for the Tool 2 to be more useful in the future it will have to be updated regularly with respect to the potential changes in the PV market.

All of the involved partners stated that they used Tool 3 Communication methods for local energy plans while organizing the workshops to motivate and engage citizens to join energy groups in their region and also for setting the ground for acceptance atmosphere on local level. It has also been used to encourage citizens to join newly established citizen energy groups/cooperatives and has proven to be a successful tool for motivating citizens to participate in project workshops but also for disseminating the project results and activities outside the borders of regions covered by the ENES-CE project.

Adhering to the guidelines from the Tool 3, project partners have managed to encourage citizens to get involved in the process of developing SECAP from the very beginning and point out the importance of drafting such documents at the local level. This tool is also considered to be beneficial for setting the ground for future energy community investments and projects with focus on green energy and sustainable development beyond ENES-CE project by raising awareness among citizens and other interested stakeholders. Taking into account new trends in communication and extensive usage of social networks in the latest years, the Tool 3 will surely have to be updated in the future.

In all participating regions it is visible that the citizens were generally interested to participate in revision of local energy plans and defining of most relevant future energy and climate projects. The organization of the workshops was very challenging sometimes for the partners due to the constant change in restrictions linked to the Covid-19 pandemic. However, even when organizing online events, the participation proved to be substantial and all planned activities were implemented within set deadlines.