

## D2.3

# A set of community level indicators for six case studies

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## Disclaimer and acknowledgement

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## Executive summary

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This deliverable represents the final step of a two-step process. The first step is documented in the deliverable D2.2 which introduced a replicable co-design workshop framework to generate Community Level Indicators for each GRETA case study. This workshop framework was designed to understand how each community would prefer to measure progress against decarbonization goals.

A co-design approach brings many benefits. For example, when indicators are developed using the co-design method, it has more relevance to the participants. Firstly, by co-designing the indicators, it is possible to develop indicators that have the most relevance to the people who are involved in the case studies. Secondly, the process of developing indicators may help participants to become more invested in the topic and more aware of the actions they need to take in order to be active energy citizens and to support the case study goals. In order to conduct the co-design effectively, it is necessary to have a plan for mediating activities with a diverse set of participants. The co-design activities were intended to be conducted in all six GRETA case studies – two face-to-face and four online. This deliverable reports on the outcome of conducting the workshops and the CLIs that were produced through these workshops. In total four workshops were conducted out of which three were face-to-face and one online. A total of 187 CLIs were co-designed by the participants of these workshops and can be classified differently such as economic, environmental, social, or technical indicators. Some indicators were also identified using literature. Even though not all CLIs may be relevant or feasible, this report demonstrates that the co-design method is useful in generating CLIs.

## Project information

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<b>Summary (for dissemination)</b>	<p>This report details a set of Community Level Indicators (CLIs) developed through co-design workshop activities within the energy communities of GRETA. The list of CLIs developed through co-design workshops can serve two purposes. Firstly, it has been argued that the process of thinking about the goals that a community collectively holds for decarbonization and how to measure progress towards these goals or find evidence for new policies or interventions may empower communities to act as energy citizens. Secondly, the outputs of such a process may be useful when considering how to define Community Transition Pathways. This deliverable tries to achieve two goals: (1) Test whether the previously developed CLI framework works; (2) present the CLIs produced within the case studies. The report discusses the list of CLIs developed by different case studies and describes the process by which workshops were conducted. The workshops' challenges and experiences are also described in this deliverable.</p>
<b>Keywords</b>	Co-design, Community Level Indicators, energy communities, energy citizenship, workshops

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## Abbreviations and acronyms

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**CLI:** Community Level Indicators

**CTP:** Community Transition Pathway

**EV:** Electric vehicle

**FhG ISI:** Fraunhofer Institute for Systems and Innovation Research ISI

**GRETA:** GReen Energy Transition Action

**KPI:** Key Performance Indicator

**LED:** Light emitting Diode

**RES:** Renewable Energy Source

**RWDT:** Replicable Workshop Design Template

**TEC:** Tecnalia, Spain

**TNO:** Toegepast Natuurwetenschappelijk Onderzoek

**UNIBO:** Università di Bologna, Italy

# 1 Introduction

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## 1.1 Overview of the deliverable

This deliverable is part of Task 2.3 which aims to report a set of Community Level Indicators (CLIs) that have been identified using the replicable co-design workshop framework developed in Task 2.2. In this section, contents of D2.2 are explained briefly.

The co-design workshops were conducted by involving community members of GRETA case studies and other stakeholders. This deliverable also aims to evaluate and reflect on methods proposed in the Replicable Workshop Design Template (RWDT) developed in Task 2.2 with respect to different communities in GRETA, different geographies, and in different settings, such as online or face-to-face mode. The list of CLIs generated through the workshops can then be used as a part of defining Community Transition Pathways (CTP).

Co-design is a design activity with a varied range of creative processes that involve users in a participatory approach to problem-solving. One of the benefits of co-design is that it helps in producing outcomes that are contextually relevant for users and are thus more acceptable to them (Steen, 2013). Within the context of GRETA, co-design is used to help identify those indicators of progress towards decarbonization that are perceived as more relevant by the people who are more closely related to case studies. It also helps participants get more involved, in understanding the topic in detail, and know about actions they may take.

The output of this deliverable is a set of Community Level Indicators elicited through multiple workshops that were conducted using the Replicable Workshop Design Template (RWDT) described in D2.2, in different communities and through different modes such as face-to-face or online. This framework was developed considering the challenging and prevalent situation of COVID-19 at that time. Thus, in this deliverable, an assessment of the proposed framework in practice would be made. Out of six case studies in GRETA, four workshops were conducted, and two others will be conducted soon, as it was not feasible to organize workshops due to the unavailability of participants in the desired timeline.

## 1.2 Community Level Indicator (CLI)

A community level indicator (sometimes also called a community indicator) is a set of measurements that help planners, policy makers and community leaders to make decision based on information such as past and current trends and to predict future outcomes. CLIs are widely used in the study of health, sustainability, environment, climate, energy, and urban planning along with many other fields of interest. CLIs may

help understand how a policy implementation performs across the dimensions of social, economic, and environmental factors (Phillips, 2003). D2.2 has a detailed literature study related to this topic of CLI, co-design, etc. and is a precursor to this deliverable.

### 1.3 Replicable Workshop Design Template (RWDT)

Sanders and Stappers (2014) have argued that a co-design process helps in making ideas concrete, by using iteration in talking about the problem. They have discussed 4 common phases through which a co-design process may iterate, starting from abstract ideas and moving towards concrete solutions. The four steps of the co-design process are Pre-design, Generative, Evaluative, and Post-design.

To effectively conduct a co-design workshop, it is required to cater to a diverse set of participants and thus it is necessary that a plan is first drafted as precisely as possible considering all necessary requirements related to the workshop and the participants. In GRETA, this includes the co-design methodology that will be followed in the workshop, the set of co-design activities that will be carried out during the workshop to arrive at a set of Community Level Indicators, as well as refreshments or stationery if available in the budget.

The Replicable Workshop Design Template (RWDT) in D2.2 was designed with a great focus on adaptability as communities from different countries were going to test the framework within the overall GRETA project. Sanders and Stappers (2014) defined four stages of co-design which were further expanded into different steps for GRETA, which were defined based on different considerations that were supposed to be important for that step, and the stakeholder the step was directed to. For example, in the pre-design stage, the first step is to identify the workshop goals and in the case of GRETA, the considerations were to “identify the purpose of the CLIs within GRETA, especially so that these goals can be communicated clearly as part of a co-design process” and to “define the scope of GRETA’s involvement in utilizing the CLIs beyond their ideation, taking into consideration factors such as availability of data, requirements for specialist tools and similar”, which was specifically of relevance for researchers.

Following the above-defined process, a co-design methodology that consisted of many granular steps was proposed in D2.2. These granular steps were spread across each stage of pre-design, generative, evaluative, and post-design. This resulted in a list of considerations that were critical at each stage and activities could thus be designed in such a way that the output of this activity should generate a set of CLIs.

In the pre-design stage, workshop goals were identified in D2.2. Three key goals that could be of interest within GRETA and that were identified in D2.2 are:

- a) Provide evidence through data from those sets of CLIs that can be used for policy analysis and planning.
- b) Use CLIs to measure if a particular case study is showing signs of variation, both desired and undesired, due to the introduction of any new intervention to aid active energy citizenship.
- c) To educate and engage participants with a goal to increase the level of involvement as energy citizens.

In the next step of the pre-design phase, a literature review was conducted as part of GRETA deliverable D8.1 (Mendes et al., 2021) to list out the domain-specific and general KPIs that are then mapped to four different dimensions of Technical, Environmental, Economic and Social. These KPIs formed the basis of defining an initial set of KPIs for each case study.

The next step of the pre-design phase was to identify the key stakeholders from whom the participant pool could be created. A stakeholder was defined as “an individual, group, or organization which has a (positive or negative) impact on and/or is (positively or negatively) impacted by the case study.” It was known that the relevant stakeholders would vary according to the case study, and it was suggested that each case study should develop a process to identify stakeholders. Broader categories of stakeholders were also suggested.

Identifying stakeholders does not ensure participation in a workshop, and for that, we needed a recruitment strategy. The proposed recruitment strategy was a multi-step process consisting of contextualization & identification of gatekeeper(s), identification of the target audience, the definition of the core strategies & mechanism to reach the target audience and knowing how to properly convey the recruitment message. The execution of these steps was intended to result in a respectable number of stakeholder participation in workshops.

The next step of the pre-design phase was to plan for the co-design workshops. The planning process requires that barriers to co-designing with energy citizens are overcome by considering the situations of the participants as well as the location and schedule of the workshop. This also includes considerations such as data privacy laws and data ethics and online vs offline workshop mode. This resulted in a GRETA Workshop Template for designing community-level indicators. The template consists of nine different activities.

The deliverable D2.2 also lists out activities that will comprise the generative co-design from start to finish. It includes introduction and familiarization with the problem, defining the community boundary, collaborative goal setting for the case study, ideating new indicators within the framing of goals and CLI dimensions, evaluating CLIs, and making the final selection and closing activities. A common approach was deemed necessary so that it would work in both face-to-face and online settings.

Lastly, in the post-design phase, the feasibility of each indicator must be judged based on how much data is available or could be made available in the future for the indicator to function. This can only be done after the CLIs are generated and is not in scope of this deliverable.

## 2 Workshop method

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In GRETA, there are six case studies within which a workshop could be conducted, for which a replicable workshop framework was created. These workshops aimed to share the needs and experiences of the community on the topic of energy, environment, and climate and to reflect together on what possible actions can be put in place to achieve the decarbonization of their neighbourhoods and cities. Out of the six workshops, the project proposal had envisioned two workshops would be conducted in a face-to-face setting, taking COVID-19 protocols into account, two in an online mode, and the final two after refinement of the workshop process based on inputs from the previous four workshops. At the time of writing this deliverable, all case studies have been trained on the methodology, have made plans for workshop activities, and have applied the recruitment strategy. Four workshops have been successfully conducted and two are still in the recruitment phase. In these two there have been some difficulties recruiting due to the timing of the recruitment in relation to the project timeline which happened to fall during the summer holidays and due to the lack of a cohesive existing community in the case study of Electric autonomous and connected mobility network, which is in the early recruitment stage.

In the sections below, a detailed report on how workshops were conducted, what preparations were made, and how participants were contacted, and what are the outcomes of the workshops is presented in more detail.

### 2.1 Workshop Planning

In the planning phase, considerations for each step of four stage process (Pre-design, Generative, Evaluative, and Post-design) are revisited to determine what actions need to be undertaken and prioritized for that case study. For example, in the case of the face-to-face workshops, some materials and equipment are needed, such as consent forms, refreshments, a projector, sticky notes, tables, chairs, a whiteboard, large sheets for design, paper, pencils, etc. Planning also requires following the recruitment strategy to recruit participants for the workshop and then identifying a convenient date and an accessible venue for the participants.

Each case study owners were free to incorporate elements of their own case study goals or incorporate activities that could help them achieve their own work package objectives. For example, UNIBO decided to combine the CLI workshop with the CTPs, and thus scheduled the activities for two consecutive days on 27<sup>th</sup> and 28<sup>th</sup> May 2022. However, both days were independent of one another but were linked by a common activity. Moreover, the results of the first day were the starting point for the second day. Similarly, FhG ISI also conducted the workshop in two parts, the second part was combined with the CTPs. However, for the sake of keeping the deliverable crisp, the UNIBO workshop plan is discussed in detail to showcase the level of planning



required and the structure of the workshop conducted. Other workshops have used similar methods and all workshop plans and reports are added in Annexes 1 to 5.

A detailed workshop plan for the workshop conducted on two days of 27<sup>th</sup> and 28<sup>th</sup> May 2022, which combined CTP with CLI was created by UNIBO. The workshop had a well-defined objective to determine how energy citizenship may manifest at three different layers. Some prominent aspects that the workshop aimed to understand were, how everyone can intervene in their daily actions at home; how the community can intervene in the neighborhood to reduce consumption, and how together as a community, what actions they believe can have an impact on a global level. Also, the workshop aimed to understand what energy citizenship meant in the local context of Pilastro and Roveri regions and to know the CLI indicators related to energy efficiency, the energy community, etc., and to understand their contribution to sustainable living everyday life and in the neighborhood. The participant pool consisted of house owners, renters, solar power generators, policymakers, local association representatives, young students, etc. from Pilastro region in the workshop.

The workshop plan envisioned the outcome of different activities. For example, UNIBO envisioned that the workshop participants would be able to come up with sustainable objectives at each level that can be mapped as a timeline of achievable objectives as shown in Figure 1 with dummy text.



**Figure 1: Expected timeline of sustainable objectives for different levels of society**

The activities were designed in such a way that they should integrate with some of the already proposed actions in the pathway logic. Depending on the themes, actions could then be distributed or integrated, as required on a timeline as shown in Figure 2, Figure 3, and Figure 4. The actions were to be divided into three areas: home, neighbourhood, and the planet. The actions could be arranged to start from the macro actions of the previous activity and can be developed further. Along with participants, connections between elements related to Energy Justice and the listed actions can then be identified.

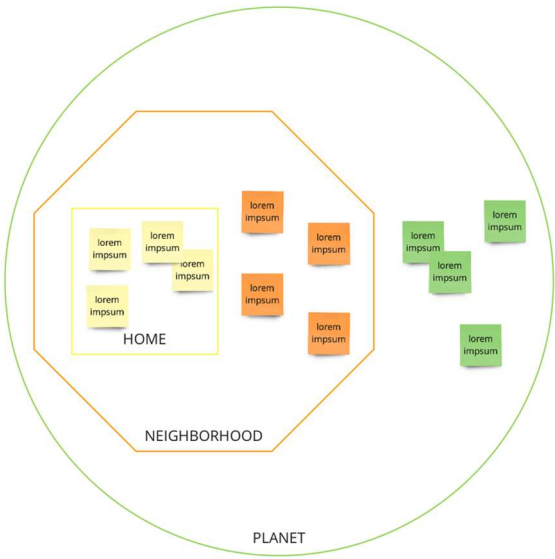


Figure 2: Arranging expected actions into level of home, neighborhood, planet

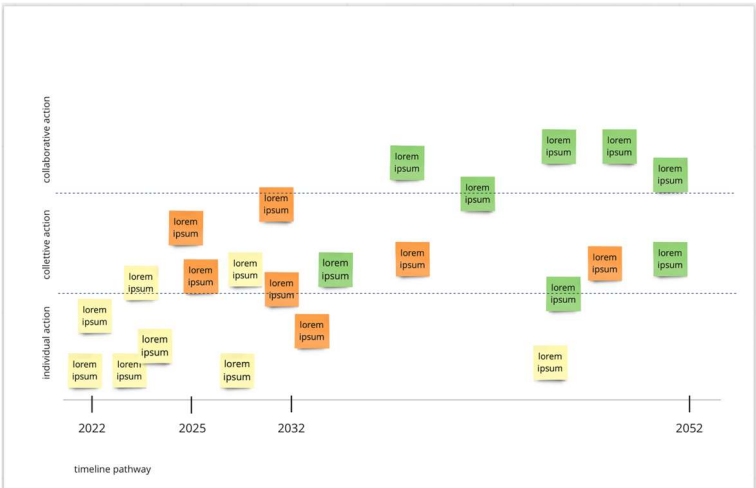


Figure 3: Classifying different expected actions based on the level they belong across a time axis

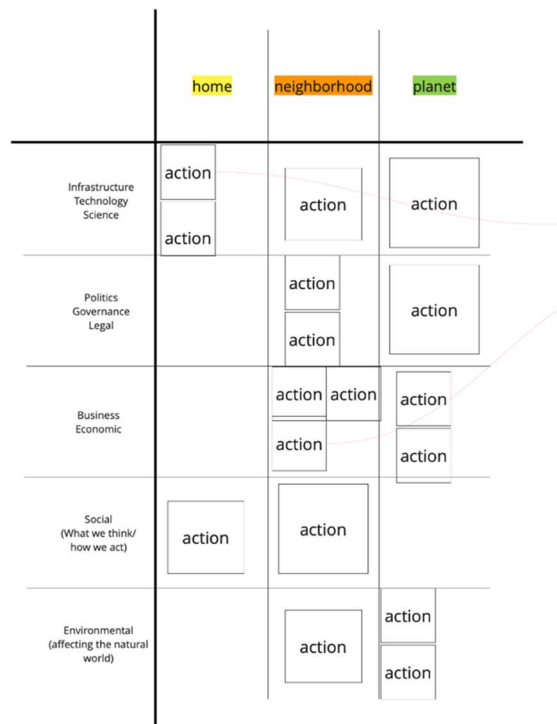


Figure 4: Placing expected actions within a matrix formed by two dimensions

The second day workshop was planned around CLIs to begin with an explanation of CLIs to participants. It envisioned co-creation activities between participants (citizens, institutions, enterprises, and students). In this phase, the plan was to connect CLI indicators to the actions of the pathway and see if new indicators could be applied to the pathway as shown in Figure 5.

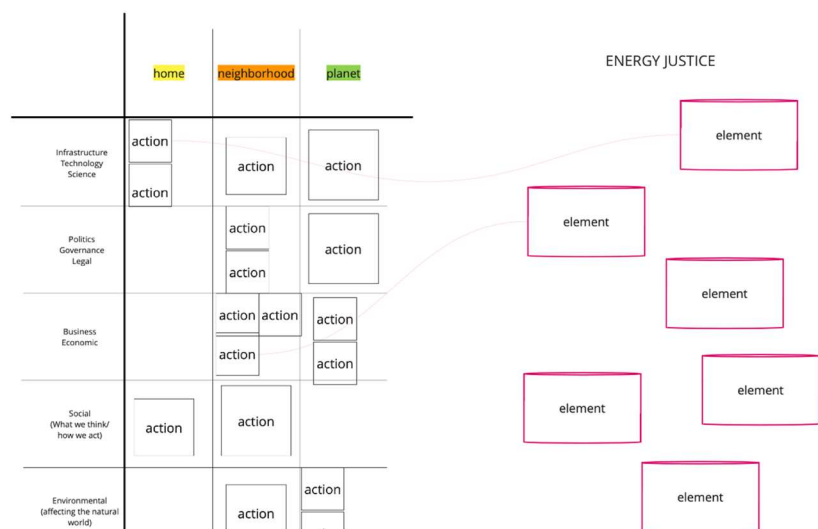


Figure 5: Graphical synthesis of the expected result

As seen above, a workshop plan is a detailed list of activities that would be conducted as the workshop progresses. The workshop plan also must include the objectives of each activity, the participant pool, the expected outcome, if any, and time duration of each activity, etc.

## 2.2 Gatekeeper Contextualization & Identification

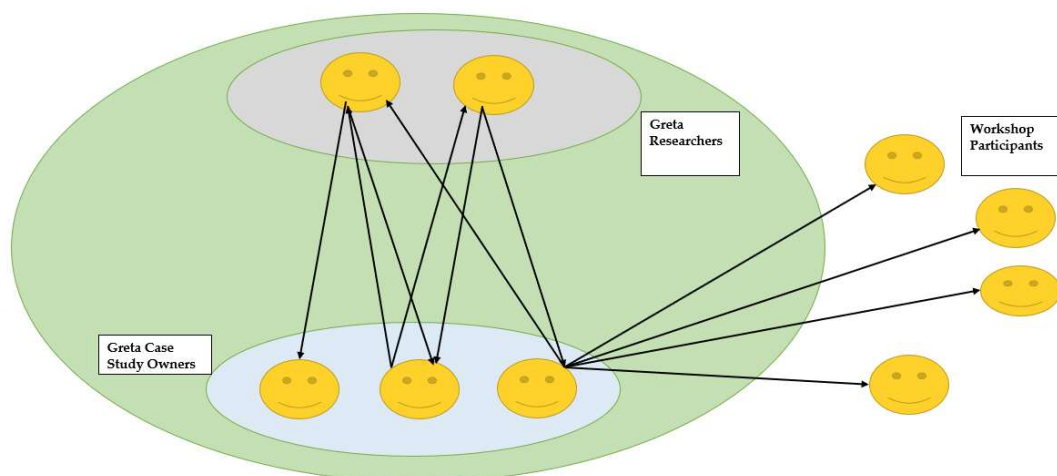
As explained in D2.2, the success of the implementation of CLI workshops is deeply associated with the effective recruitment and involvement of key stakeholders. For that, gatekeepers are essential actors as they essentially represent people-that-are-heard within their own contexts with an easier access to different parties - thus serving as coordinators of information between different groups of stakeholders in terms of an activity or a project, thus bridging their communication. In the case of the GRETA CLI workshops, the gatekeepers were essential actors for mediating and bridging the interactions between the GRETA consortium and the citizens within each case study that participated in the CLI workshops.

From the point of view of the project consortium, reaching the target audience in each case study to gather participants for the CLI workshop seemed challenging either because of the lack of direct access to each member of the case study, or because of the access to multiple touchpoints for contacting members within the case study, thus becoming a cumbersome task. With the support of the gatekeeper, however, these problems were surpassed. Illustratively, in the Portuguese case study (i.e., Coopérnico), the project consortium contacted the Executive Coordinator of the cooperative to invite its members to participate in the GRETA CLI workshop. Without the support of the Executive Coordinator, it would be virtually impossible for the project consortium to reach the cooperative's members in view of data privacy barriers and, if not that, of more subtle barriers, e.g., mistrust on an external actor. Because of the gatekeeper's support in using their influence to invite the cooperative's members to participate in the CLI workshop, the participation rate was high.

In essence, gatekeepers were considered the first point of contact in each GRETA case study, helping the project consortium to start a positive participant experience and boost the participants' confidence in participating in the CLI workshops.

## 2.3 Workshop Coordination

Arranging a successful workshop requires continued coordination between multiple actors, ranging from gatekeepers, facilitators, coordinators, and participants. In the case of the GRETA project, coordination activities consisted of three levels of coordination, that spans both inside and outside the project as shown in Figure 6.



**Figure 6: Coordination activities between GRETA members and workshop participants**

The first level of coordination was between the GRETA project research team with the GRETA case study owners who conducted the workshops. These coordination activities were carried out through multiple online meetings and involved providing more clarity on specific steps of the nine-step Replicable Workshop Design Template (RWDT), such as how to motivate participants, schedule of the workshop, finalize workshop plans, and what to report after the workshop and other issues such as financial matters related to workshop arrangement.

The second level of coordination was between the case study owners and the workshop participants and was carried out through multiple communication mediums, such as email, posters, flyers, face-to-face group hurdles as well as online meetings. The coordination activity at this level consisted of discussing workshop location and refreshments with vendors, inviting participants, guiding them to the location, sending reminders, answering queries of the participants, and managing resources and expenditures. It was due to coordination activity, that it was realized that there was no common understanding between case study owners as to how to report the results of the workshop, especially when the workshop included elements of CTPs. This in turn helped in realizing the need for a common template that can be used for reporting.

## 2.4 Workshop Reporting Format

After a workshop is conducted it is important to clearly make sense of the workshop outputs and results. This can be challenging, as the workshop environment can be dynamic and fast-paced, with participants who are acting spontaneously and are mostly focused on the activity at hand. Thus, if attention is not paid it becomes very

difficult to interpret the outcome of the workshop. In GRETA, workshops were conducted in different countries, with different energy communities, and in different languages, which creates challenges of its own. Thus, it was decided that a workshop reporting format was needed to guide case study owners on what to take note of when conducting the workshop.

Moreover, since each case study was essentially different, it became clear that each case study owners would modify the Replicable Workshop Design Template (RWDT) to suit their own conditions and may have to exclude certain steps which may not be clearly applicable to them. This made it important to keep track of changes and case study owners were asked to report on why such changes were required. This allowed us to keep track of deviations from the framework.

Apart from reporting on changes, it was also required that the engagement levels of the participants were kept track of, to ascertain if certain activities were more engaging than others. This would help researchers in modifying the workshop to make sure participants' engagement levels would not vary greatly throughout the workshop. Figure 7 below shows the Workshop Report Format that was used by the GRETA case study owners.

The Workshop Report Format was not exhaustive, and the filled reports can be found in full in the appendices (Annex 1-5). Case study owners were free to share more details about the workshop such as the workshop plan and workshop notes, and summary.

WORKSHOP REPORT FORMAT FOR (Name of Case Study)									
Date		Did you adapt the original workshop template? If yes, explain the changes and reason for the same.							
Number of Participants									
Location									
Duration									
Mode <input type="checkbox"/> Face to Face <input type="checkbox"/> Online <input type="checkbox"/> Dual	List of different activities done (Check, if done)								
Select if this activity was done	<input type="checkbox"/> Exploring Indicator (I)	<input type="checkbox"/> Exploring Indicator (II)	<input type="checkbox"/> Physical Community	<input type="checkbox"/> Virtual Community	<input type="checkbox"/> Defining Goals	<input type="checkbox"/> Organizing Goals	<input type="checkbox"/> Prioritizing Goals	<input type="checkbox"/> What is being Measured	<input type="checkbox"/> How to Measure
If this activity was not carried out, explain the reason.									
How will you rate participants engagement in activity?	<input type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent
Stakeholders who participated									
Result of each activity									
Reflection summary from participants									

Figure 7: Workshop Report Format

## 2.5 Workshop Experience

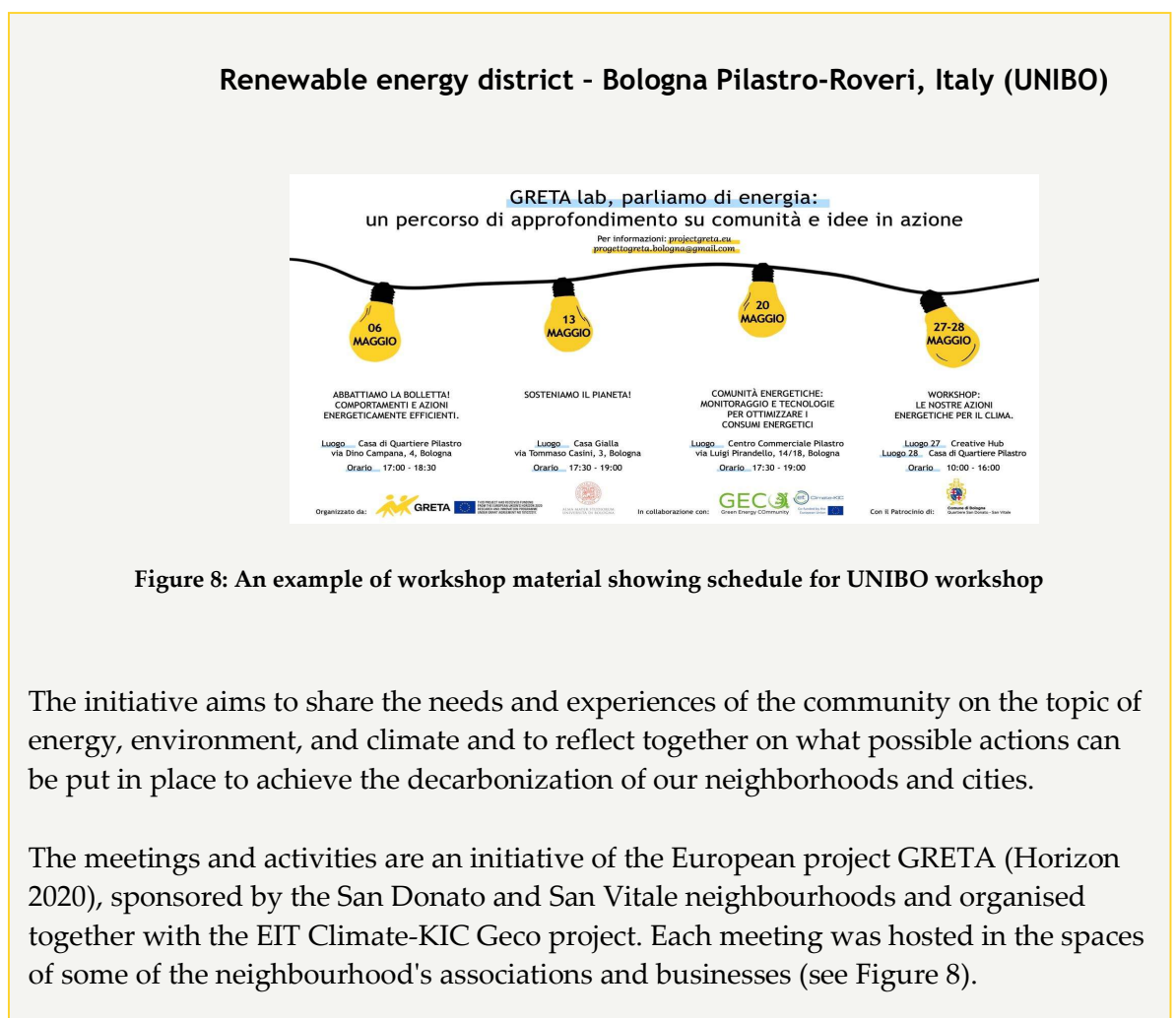
The workshop experience was obviously different for each case study. Not all case study owners were able to arrange the workshop in the given time frame of project deliverables and are in the process of arranging the workshop in near future. Thus, in this deliverable each workshop has been detailed based on the activity carried out and based on the reports submitted by case study representatives describing their own reflection about their experience.

One out of the four workshops completed was conducted online and the rest were conducted face-to-face. One workshop had participants who represented a virtual community as they were part of a community of app users with no physical boundary restricting their community in a physical landmass, which presented its own challenge. However, this workshop was conducted face-to-face allowing some members of the virtual community to see each other in person.

## 2.6 Workshop Results

The following sections present the workshop reports provided by each case study, in their own words along with the list of CLIs reported from different workshops. A summary of the six case studies can be found in the case study reports (D2.1) in (Kumar & Klein, 2021).

### 2.6.1 Renewable energy district - Bologna Pilastro-Roveri, Italy (UNIBO)





### **First Day Workshop 'Our Energy Actions for the Climate'**

The first day was held at the Creative Hub in Via del Tappezziere 4 with an introduction to the GRETA project, followed by the presentation of the methodology for the development of the Energy Citizenship Manifesto: a tool that will facilitate and accompany the exercise of energy citizenship and that GRETA will build together with the Pilastro district and the Roveri district.

Afterward, the first collaborative workshop on needs analysis took place, which identified the most important objectives that are needed to achieve decarbonization goals. Participants were divided into 3 tables

- o Home/office
- o Building/company
- o Region/district

Below is a report on the activities of the three groups on Needs Analysis:

#### **Home/office needs analysis**

The group was attended by a resident, students, two researchers and a legal consultant. The group dealt with some of the most relevant issues in relation to home/office management in order to identify what were some of the needs most felt by the participants in relation to living in their own homes or going to work. Although the scale was that of home/office, the discourses often tended to address the various issues from a broader condominium/neighbourhood/city of Bologna perspective.

In mapping the needs, we proceeded along thematic lines: energy (energy efficiency: consumption for heating/cooling and lighting), waste, water. In general, opinions on the centrality of individual actions in favouring the energy transition emphasised the importance of coordinating the activities of individual citizens with policies that facilitate such activities and create a sense of community. Both 'concrete' and practical needs emerged, as well as socio-cultural needs to be reached also through better political choices/decisions and a more inclusive type of communication that reaches different targets in terms of language, age, gender, as well as through an economic system that pays attention to the community and to the most economically and socially vulnerable segments of the population. The need to reduce the intergenerational gap on energy and environmental culture also emerges, emphasising the need for greater collaboration and cooperation between different ages and skills. These were Home/Office needs that were recorded.

Find alternative methods to offset emissions from heating/cooling and buildings.

Reduce consumption. Install energy saving devices. Raise awareness among condominium administrators, look for creative and not necessarily expensive energy saving solutions.

Improve separate waste collection system. Better communication between citizens and between communities and institutions.

Diversify, change habits, mitigate fear of change (and scepticism towards tap water, for example).

More and better information on water quality in the Bologna area.

Improve information events on energy, make the language used more comprehensible and inclusive.

### Building/company needs analysis

The group was attended by a resident, students from the Advanced Design course, researchers and university professors. The apartment building represents an intermediate scale between the house and the neighbourhood, and the issues and needs that emerged from the discussion often overlapped with other levels, especially that of the neighbourhood or neighbourhood unit. The discussion focused on various topics of the climate transition: from more strictly energy issues to those of the circular economy to possible new services and/or support tools for the ward. Given the participation of a citizen from the Pilastro district, the discussion mainly focused on that area, while the Roveri district was not investigated.

To support the creation of new citizen services and neighbourhood centres (concierge and similar) aimed at providing constant support to individuals who may find themselves in difficult situations.

Identify and set up an energy desk where figures with different but complementary professional profiles can help citizens and support condominium administrators.

Environmental education of citizenship starting in schools with the possibility of involving parents.

Restore the bike-sharing services present before the Covid19 pandemic in the vicinity of important places such as the library, the polyclinic and the sports campus.

To adopt tools and strategies that are as inclusive as possible and that help different citizens (children, elderly, etc.) to be as autonomous as possible in their movement and use of infrastructure.

Incentives, especially economic ones, as a key tool that can support actions of parts of the population that would otherwise struggle to access them. These aspects must be supported by real activities of constant accompaniment of the community in the actions, not only at the start-up of the initiatives but over time.

### District/ region need analysis

The group was attended by a resident of the Pilastro district, students from the Advanced Design course, workers from the San Donato and San Vitale districts, university researchers and professors, and legal consultants.

The payment of bills is a top priority for family/business organisation, which can sometimes become a difficulty.

To clarify what the benefits of energy investments are, highlight the externalities and quantify them, it is considered essential to have an economic return in order to be able to think about an energy transition in all respects.

To have more variety in the representation of needs.

In line with this need is the need to involve citizenship and reflect on the role of active citizens, defining their role and potential benefits. The most involved citizens are those who could speak to the less - or not at all - engaged citizens with a type of communication that must be as direct and objective as possible.

To reach the people who live on the Pilastro as well as the citizens of Bologna, using multiple tools and channels. The educators of the schools - of every order and grade - of the Pilastro could provide answers to the need to be able to communicate in a different language.

For greater involvement of the University, which can become an actor and spokesperson, but also of primary and secondary schools.

Seek listening not so much to arrive at a common position but to understand different positions and the reasons why one is not interested in that issue.

To question the way in which cycle paths are built, starting with the need to confront the institutions.

To safely connect the area 24/24. In addition, there is a need for public transport to be affordable, and for it to be networked and not exclusively radial. Hence the need to rethink scheme, frequency of trips, routes, as well as expanding the bus offer and installing bus shelters.

That people living on the Pilastro recognise the numerous green spaces as meeting and socialising spaces. Thus, the need emerges to enhance these areas so that people recognise them as places of participation.

The second workshop of the day focused on the construction of short-, medium- and long-term visions for energy citizenship, starting with a needs analysis and the identification of objectives to be achieved. It was a co-creation activity between the participants, starting from the objectives presented and the working themes of the students of the master's degree Course in Advanced Service Design.

Below are the objectives proposed in each of the working tables, then summarised in a common timeline (Table 1 and Figure 9).

**Table 1: List of short term, medium term and long-term objectives for individuals, organizations and community from UNIBO workshop.**

Objectives	Home/office	Building/Company	Ward/District/community
------------	-------------	------------------	-------------------------

Short Term	<ol style="list-style-type: none"> <li>1. Involvement of schoolteachers (2023).</li> <li>2. Awareness-raising among condominium administrators and improved communication (2024).</li> <li>3. Monitoring consumption (2024).</li> <li>4. Use of sports centres and schools as key places to initiate outreach, to communicate messages in relation to the target audience, and to control language and speech (2025).</li> <li>5. Insulation of buildings (in relation to incentives).</li> </ol>	<ol style="list-style-type: none"> <li>1. Activation of citizen support services (community concierge, energy help desk) by 2023.</li> <li>2. Creation of a pilot citizens-only energy community (self-consumption group) by 2024.</li> <li>3. Creation of a real energy community including companies by 2027.</li> <li>4. Drastic CO2 reduction with investments on the ground by 2030.</li> <li>5. Presence of a connected and efficient soft mobility network by 2025.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reactivation of the 20N night line.</li> <li>2. Reactivation of the Movi (formerly mobike) hubs.</li> <li>3. Reaching out to more people in the short term, both in terms of involvement and contextualisation of area plans.</li> <li>4. Outfitting areas (gymnasium type, etc.) with equipment.</li> <li>5. Promotion of dedicated events and initiatives.</li> <li>6. Enhancement of what is already there, communicating it better and making it better known, especially internally, creating a sense of affection for one's neighbourhood.</li> <li>7. Raising the population's awareness and understanding of how this area can be enhanced.</li> <li>8. Greater support for the elderly.</li> <li>9. Greater resources to reduce digital illiteracy.</li> <li>10. Accessibility of the Internet to everyone in more common spaces.</li> <li>11. Increased information for more people living in the Pilastro, with posters and information boards.</li> </ol>
Medium Term	<ol style="list-style-type: none"> <li>1. Construction of a tram line connecting the outer parts of the city (2026-2028).</li> <li>2. Possible investment by UNIBO in student</li> </ol>		<ol style="list-style-type: none"> <li>1. Reducing parking and increasing cycling infrastructure.</li> <li>2. Better integration between means: intermodally.</li> <li>3. Interchange car park.</li> <li>4. More infrastructure and investment.</li> </ol>

	halls of residence (2028-2029). 3. Leverage on economic aspect to hire people (2030).		5. Change in Acer housing policies. 6. Better integration between the population. 7. Reducing the concentration of Acer houses at Pilastro (or Barca).
Long Term	1. Creation of a culture of sharing (2035). 2. Municipalisation of water services (2038). 3. Elimination of gas as an energy source (2040). 4. Reduction and reuse of plastic (2040). 5. Creation of different ways of living (e.g., Co-housing) (2040). 6. Equalisation of social and environmental aspects (2040). 7. Elimination of air conditioners (2050).		1. Activation of a shuttle bus connecting Roveri and Pilastro to the centre. 2. Reducing the need for travel (more services within the area), not the possibility of it (more internal and external links) 3. Transformation of the district into a laboratory for logistics 4. Reduction of the gap between Roveri and Pilastro due to the stopover (physical caesura) 5. Improvement of the population's economic and cultural level.



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### **Second Day Workshop 'Our Energy Actions for the Climate'**

The second day took place at the Casa di Quartiere Pilastro, Via Dino Campana, 4. The opening of the day saw the return of the previous day's results, with a summary of the objectives arising from the needs analysis.

The workshop then continued with a division into working groups (this time not divided by scale) in which we worked first on the inspirations for possible innovative actions to respond to the needs and objectives highlighted and then on the measurement of these actions with community indicators.

The results that emerged are outlined below and broken down by theme.

#### **Awareness:**

- Energy coaching desk. Involve teachers from the Pilastro schools who can be informed about energy issues and who can work in close synergy. Make the counter an itinerant point of reference in the neighbourhood, so that it can reach even those people who are not able to use digital means (with, for example, an automatic chat always active for general questions, and a physical presence with set times). Informal information, as if it were a chat at the bar, so that the counter is flexible to the citizen. Some places in which to experiment with the energy desk could be, for example, neighbourhood houses or the vacant spaces of Acer buildings. The counter could be itinerant, not fixed in one place in the neighbourhood. The counter becomes something public, financed by private individuals interested in energy communities.
- Communication path, starting in 2022 until widespread awareness is reached, addressing environmental issues through several languages. Communication can make use of two main channels: the On-line channel (Blog, Mail, and social channels such as Telegram) and the Off-line channel (Neighbourhood Events, Counter, Physical landmarks such as: Yellow House, Red House and Neighbourhood House). This would respond to the need to create information meetings in areas close to residents (e.g., condominium areas) so as not to ask citizens to go to a dedicated place, but to go to citizens. Mini tutorials could be proposed as part of the course, explaining with videos how to waste less energy, tips, etc.



- Training of Energy ambassador figures capable of bridging the trust "gap" by giving clear and complete information but also bringing testimonies of other experiences. Use multi-level educational programs (starting from school age, to create aware future citizens who can, in turn, raise awareness in their families, up to the university to create the competent figures who can activate the counters). Training and identifying 'ambassadors', facilitators who act as spokespersons for each micro-community, so that people feel represented (as happens in city assemblies). Provide people who are like cultural mediators for the language issue (in this case it would be work, paid). Inform the elderly by going door to door and emphasize the economic benefit. An inhabitant of a block of flats can be trained and can become a contact person for the block of flats. An expert figure of the energy community would be created who would dialogue with and in the energy desk. The idea is to have several types: 'Young Ambassadors' (the Citizens of the Future, sensitized by teachers and targeted school trips); 'Teachers' (figures who live in the neighborhood and are already active in sensitization); 'Testimonials' (the 'Most Active Citizens' or 'Most Virtuous Citizens', recognized within the context and by the community).
- Energy Time Bank, offering services in exchange for services.
- Training for citizenship, To Receive (Carrying out trips to related virtuous contexts to "touch with one's own hands", but at the same time not submitting examples that are too distant to prevent a sense of mistrust and frustration from setting in) and To Carry out in person (Bringing Pilastro's example of a virtuous and change-conscious neighbourhood to other contexts that are not yet active).
- Rewards for virtuous neighbourhoods.

#### **Intergenerational Gap:**

- Set up physical and digital places for digital literacy, so that everyone, even those who are not digitally literate, can access essential e-services.  
Shared workshops to unite parents and children.



**Strengthening the quadruple helix:**

- Energy Manager and Mobility Manager as 'bridge' between community and employees
- Energy Contract and Business Model for companies
- Citizenship Contract for residents
- Awareness-raising course for companies on Last-Mile transport and logistics of their goods.
- Involve businesses through trade associations.
- Participate in FARETE, also get in touch with schools and inform.
- Communicate the mapping of spaces available for photovoltaic installations (previously done by GECCO).
- Creation of a spin-off of the University of Bologna at the Pilastro: a coworking, with offices, spaces in which to work, study, etc. (at the end of the GRETA project). A possible location could be one of Acer's empty spaces.

**Reducing energy poverty:**

- Exchange of services with other services (e.g., Time Bank).
- Energy exchange in the community, create a sharing of energy pooled (Energy Bank open to all) Energy "sendable" such as quick transactions from Condominium to Condominium or from Family to Family (idea: a sort of Paypal/Satispay of energy).
- Actions to promote energy sobriety.

**Energy community/social community:**

- Promoting urban agriculture as a tool for social cohesion must be combined with the implementation of new technologies. A kind of ToGoodToGo of vegetable gardens: inform gardeners (700 gardens) to create awareness; weekly market with stalls of urban gardens that have abundance. Introduce training on circular cooking to reduce or avoid waste. Bring citizens, market gardeners and restaurants together to share recipes. Share recipes and food between apartment blocks. Multi-ethnic condominium dinner.
- Biannual meeting between GRETA representatives and condominium managers.
- Building a community of people also through the establishment of transversal social spaces where meetings and exchanges can take place.

### Politicising individual actions:

- Politicising individual actions with broader political planning both to amplify the impact of the actions themselves and to build a collective and shared vision. E.g.: Institutional recognition of a self-organized group of citizens for cleaning the Pilastro parks as a practice for realizing the vision of the district as a common good.

### Active mobility:

Temporary pop-up actions for Pilastro-Roveri to become an energy laboratory. Reactivate the 20N night line and measure how useful it is to the neighborhood in terms of numbers, how much it is used and how much it would facilitate night-time transport. Use low-consumption LED lights to illuminate public spaces: a low-cost, pop-up solution. Try to expand carsharing and understand through monitoring whether it can have a future. Reintroduce Mobike hubs and understand through monitoring whether it can be successful to maintain them in the future. Provide citizens with a kit (Pin Bike) to make their bikes smart, which also benefits administrations through flow and traffic monitoring.

- Underlying the transition is the creation of a sense of community that will be based on different interests and levels of sensitivity.



Figure 10: Participants involved in different activities at workshop in UNIBO

### 2.6.2 UR BEROA - Energy efficiency-driven cooperative, Spain (TEC)

In this workshop a list of goals, year when it could be achieved and votes for each goal were carried out (see Figure 11 and Figure 12). The list is as below (Table 2):

Table 2: List of Goals and Votes in UR BEROA Workshop

Goals	Votes	Year
Increase in the number of members of UR BEROA through the geographical expansion of the district heating system.	17	2027
Planning and implementation of diversification projects, particularly those related to electric mobility and collective self-consumption with a photovoltaic system.	11	2024
Reduction of individual energy demand of the cooperative members.	9	2024
Decarbonisation of the UR BEROA facilities and their dependence on fossil fuels: adoption of clean energy sources.	5	2027
Increased participation and contribution of ideas by the members of UR BEROA.	1	2028
Dissemination of the UR BEROA experience as an energy cooperative.	1	2026
Maintaining competitive energy offer for the cooperative members.	1	2025
Improve the energetic empowerment of citizens through the information provided from a collective and attractive perspective for participation.	0	2028



Figure 11: Voting results – prioritized goals in a workshop at UR BEROA

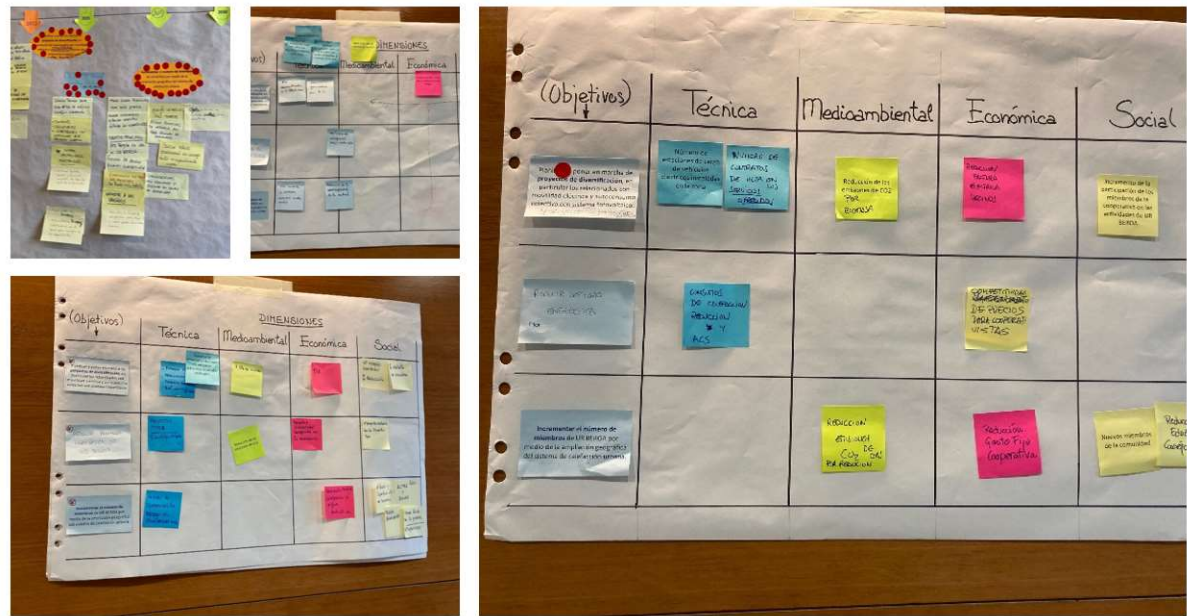


Figure 12: Goals and actions being defined in a workshop at UR BEROA

Once the goals are prioritised corresponding actions were listed down:

***Goal 1: Increase in the number of members of UR BEROA through the geographical expansion of the district heating system***

- Make publicity campaigns in the local press
- Increase the length of primary heating network to reach close by consumers
- Take administrative actions to ease the access inc. revision of the cooperative statutes
- Prioritise the joining of Pagola social housing
- Provide an introductory reception brochure to all new members
- Provide information on new projects to all members
- Make satisfaction surveys to all members
- Make more commercial actions, especially to the non-member housings in the neighbourhood
- Seek to make change of generation and inclusion of more women in the steering committee
- Improve and increase communication among the members through WhatsApp groups



Apart from defining goal and actions, participants were introduced to existing indicators so that they could explore and familiarize with the concept of indicators. For this a list of pre-defined indicators was presented and discussed.

**Technical:**

- Degree of energy self-supply by RES
- Energy savings
- Number of EVs charging stations deployed in the area

**Environmental:**

- Reduction of carbon dioxide emissions

**Economic:**

- Reduction of household heating costs

**Social:**

- New members of the cooperative
- Increased participation of cooperative members on activities of UR BEROA

The list of CLIs from this workshop is described in the next section (Section 3).

### 2.6.3 Earnest App Case - A virtual community for sustainable mobility in Karlsruhe, Germany (FhG)

The case study owner of a virtual community of users using the Earnest App for sustainable mobility in Karlsruhe, Germany (FhG) used the original workshop template as guidance but rearranged some of the activities and added a social justice component. Moreover, they divided the CLI workshop template into two parts. Two workshops took place on two different days spaced several weeks apart but with the same workshop participants. They started the first workshop with a quick introduction to the effects of global warming and how it is connected to energy consumption (and energy saving, particularly in the mobility sector, which is the focus of our case study). They subsequently spent some time on defining the challenge, thinking about the definition of (virtual) energy communities, and defining the community's goals. This is where the first workshop ended. In the second workshop, participants began with a reminder of the goals the community had previously defined and looked at them through a social justice lens. After this, facilitators asked the community to prioritize the goals and defined indicators for the three most highly ranked goals. While the first workshop revolved around defining the community and defining goals, the second workshop looked at the goals more closely (social justice) and identified indicators. The workshop was held in German.

The facilitators started the workshop by framing the problem/challenge the community is actively seeking to address and spent a lot of time having community members describe the "challenge" of energy saving in everyday life. However, during the second workshop, the facilitators provided some examples of indicators before we asked the community to come up with indicators for the three most highly ranked goals.

The facilitators think that dividing the workshop into two parts with 1,5 hours each worked well. On the one hand, participants could have used much more time for further discussions and to assess some aspects in more detail. On the other hand, it was felt that one hour and a half are a good time for people to concentrate and engage in fruitful discussions. The longer break between the two workshops also worked since people had time to reflect in between, engage with the app in the case study, and reassess their contributions to the first workshop. Participation was visibly more active while discussing the definitions of the community, defining goals, and assessing the through a social justice lens. The members of the community still actively participated when it came to defining indicators but were much less enthusiastic. The concept was a bit harder to grasp, particularly also because in the case study, the community is set up as temporary (and not long-term).

To summarize the findings most characteristics of a community were identified as being identical for both a physical and a virtual community. The definition consisted of two parts: (1) community, which was characterized as including engagement, commitment, social responsibility, and (2) energy, which is the goal/purpose of the community = reduce energy consumption, be environmentally conscious. Generally, the community defined their own purpose and goals much broader than we (as case study leaders) would.

Questions arose as to what extent a virtual community can be created with true long-term commitment. On the other hand, the community also saw an opportunity for higher engagement level in virtual communities due to lower costs (efforts) to become a part of it. Moreover, members regarded it as having the potential to be more accessible and inclusive than physical communities.

The goals defined by the community were generally very broad and more social than material. Interestingly, more short-term goals were seen as more local ones, whereas long-term goals addressed challenges on a national or even global scale.

We asked the community to define goals and - after they collected them organize them along a graph of (y) time & (x) individual to local to national to global activity. The second organizational dimensions were added by us in comparison to the Miro board example.

We asked them to prioritize goals generally and not according to 5, 10, 20 years' timeline.

Interestingly, the community very easily agreed on the most important goals:

- (1) education about energy and sustainability
- (2) create communities and commitment
- (3) increase environmental consciousness.

Despite the framing toward energy savings in the mobility sector of the workshop and the case study, the community saw the most important goals as much broader in nature (see also Figure 13).





Figure 13: Goals and actions being defined at a workshop for Earnest App

#### 2.6.4 Coopérnico - Renewable energy-driven cooperative, Portugal (CWD)

In this case study, the facilitator eliminated the step regarding the physical/virtual community definition as Coopérnico is a national cooperative with members scattered across the entire country (and sometimes beyond).

They also started from a different starting point from the other GRETA case studies since the cooperative has its own Manifesto (for a 100% renewable energy transition) which states the cooperative's main objectives and respective ways to reach them. Hence, the facilitator presented the existing macro-objectives (3) and related sub-objectives (10) to them, along with the CLIs identified and extracted from the manifesto. In general lines, the workshop was heavily focused on discussing new CLIs (beyond those in the manifesto) – mainly targeting CLIs that could be tied to the civic action of the cooperative members or the cooperative itself rather than to policymakers. The group was mixed with members that had just joined the cooperative while others were part of the Executive Board. The discussions were engaging and the participation was so lively that we surpassed 20 min above the workshop time limit of 2 hours without finishing the open discussions everyone was posing, so the facilitator proposed a secondary step for the workshop which referred to creating a living and collaborative document in which people could reflect and propose additional CLIs/objectives, as well as prioritise them – this was done to spur reflection and learning among them, as well as a sense of belonging to a cause – this was clear from the various messages the facilitator received and would even categorise most of the participants as defenders of the cooperative's cause, rather than just proactive participants. This was very clear from the beginning of the workshop, when the facilitator emphasised that the outcomes of it wouldn't merely serve the purposes of the GRETA project, but in fact would be a tool for them to use and keep working on within the cooperative to track its progress towards its own defined goals.

Another important aspect to point out is that the workshop had a very high rate of participation (36 people out of 70 interested), which wasn't any higher because the workshop was conducted during the afternoon of a working day and so many people couldn't join.

In this case study a collaborative document for the co-creation of Coopérnico Community Indicators was created which had the steps defined and was shared with the participants.

### 2.6.5 Natural gas-free neighbourhoods, The Netherlands (TNO)

The original template was adapted to the case study and the circumstances of a physical workshop of 132 minutes. The activities were divided into six sub-tasks:

1. Defining goals
2. Organizing goals
3. Prioritizing goals (optional)
4. Exploring indicators
5. What will we measure?
6. How will we measure?

Specifically, the sub-tasks “defining physical community” as well as “defining virtual community” were excluded and the order of the sub-tasks – “exploring indicators” and “defining/ organizing/ prioritizing goals” – were changed. Since the question of relevancy is also asked in “How to measure”, the case study owners have decided to exclude this part of the template. Both physical and virtual community is not relevant for this use case since the geographical boundaries of the use case do not influence the goals and CLIs of the neighbourhood and they are not virtual.

This workshop is still being planned and the workshop outcomes are mostly used to support other citizen-focused activities such as the creation of CTPs and so any subsequent activities will inform other activities related to those deliverables.

However, a detailed report on actions taken and other steps performed as well as a summary of literature review to identify preliminary CLIs from literature along with a report on challenges identified is presented in Annex 5.

#### 2.6.6 Electric autonomous and connected mobility network (TNO)

In this case study there does not exist any community as such. The electric autonomous vehicle technology is still in development stage and is not available everywhere. In such a scenario, there exist early adopters and researchers who work in this field. Due to this, conducting the workshop with community members was not feasible during this timeframe and it will be conducted in the future.

### 3 Results: Community Level Indicators identified by different case studies

As a result of the activities conducted at different workshops several CLIs were discovered, some not completely related to the strict boundaries of the case studies but that reflect the nuanced understanding of the topic among the participants as well as the rich amount of discussion carried out during the workshop, resulting in well refined CLIs. Since the workshops were each conducted according to how the case study owners adapted the template, the CLIs are organised differently in each case as decided by case study owners and haven't been changed to reflect the different thought processes of the participants and their unique aspects.

#### 3.1 Renewable energy district - Bologna Pilastro-Roveri, Italy (UNIBO)

Based on the identified and shared objectives and imagined actions, the working tables tried to answer the questions: What to measure? With which indicators? Below are some of the ideas that emerged (Table 3).

Table 3: List of CLIs from UNIBO Workshop

Indicator Type	Community Level Indicator
<b>ENVIRONMENTAL</b>	<ol style="list-style-type: none"> <li>1. Data shown on bills by energy providers on energy savings of avoided emissions.</li> <li>2. Number of kilowatts emitted by panels.</li> <li>3. Percentage of municipal budget directed to environmental-themed workshops.</li> <li>4. Number of new energy/environmental-themed associations.</li> <li>5. Number of town assemblies organized.</li> <li>6. Area redeveloped (in square meters) into green areas usable for social and cultural events or for the creation of urban gardens.</li> </ol>

TECHNICAL	<ol style="list-style-type: none"> <li>1. Number of people installing Smart Meters or similar devices.</li> <li>2. Number of buildings monitored by Smart Meters.</li> <li>3. Data on the mapping of surfaces that can be dedicated to photovoltaic panels.</li> <li>4. Location and number of spaces available for installing photovoltaic panels.</li> <li>5. Measurement of energy required, i.e., individual user needs.</li> <li>6. Measurement of heat/cooling losses.</li> <li>7. Percentages of access to the business/resident networking platform, whether citizens or businesses.</li> <li>8. Number of companies investing in energy efficiency.</li> <li>9. Number of new solar panel requests compared to previous year/increase in home requests compared to previous year.</li> <li>10. Number of solar panels installed on companies / surface area of photovoltaic roofs (in square meters)</li> <li>11. Number of empty spaces occupied by UNIBO off (GRETA spinoff)</li> <li>12. Number of users belonging to Energy Communities or Collective Self-consumption initiatives</li> <li>13. Number of energy requalification interventions in buildings</li> <li>14. Number of companies obliged (by law) to have in-house Energy/Mobility managers</li> <li>15. Percentage of innovative technologies in Roveri companies</li> </ol>
INTERMODAL MOBILITY/CONNECTION	<ol style="list-style-type: none"> <li>1. Number of public transport routes (buses and trams) and their frequency.</li> <li>2. Time slots covered by public transport services (buses and trams).</li> <li>3. Number of MoBike hubs in the area.</li> </ol>

	<ol style="list-style-type: none"> <li>4. Kilometers of tree-lined, independent cycle paths connecting the area to the center.</li> <li>5. Number of employees making sustainable choices over time (use of public transport / soft mobility / shared mobility) to travel to work.</li> </ol>
<b>ECONOMIC</b>	<ol style="list-style-type: none"> <li>1. Increase in public incentives to finance photovoltaics.</li> <li>2. Number of people who have received bonus of 110% run by local government.</li> <li>3. Number of municipal energy incentives for the area concerned</li> </ol>
<b>SOCIAL</b>	<ol style="list-style-type: none"> <li>1. Monitor type of topics addressed by the Pilastro blog over time. E.g., How much do people talk about the environment?</li> <li>2. Number of people joining the gardens and/or requesting them.</li> <li>3. Number of participants at events in the district and type by gender/age.</li> <li>4. Number of people willing to do the proposed energy improvements.</li> <li>5. Increase/decrease in energy-themed events.</li> <li>6. Increase/decrease in Pilastro blog views.</li> <li>7. Number of people who have put into practice what they have been taught in the training courses.</li> <li>8. Number of energy-saving companies moving to Pilastro.</li> <li>9. Number of people hired by the energy desk.</li> <li>10. Number of residents interested in joining the energy community.</li> <li>11. Number of businesses interested in being part of the energy community.</li> <li>12. Number of apartment blocks reached.</li> <li>13. Number of events related to awareness raising and education.</li> </ol>

14. Number of new collaborations compared to the previous year between local and outside companies.
15. Survey of energy literacy levels.
16. Number of people participating with or without reward concepts.
17. Number of proposals (e.g., in relation to climate assemblies) that are made and how many are listened to.
18. Number of accessions to the call for community spokespersons.
19. Number of agreements made between companies outside and inside Bologna (number of contracts, etc.).
20. Number of businesses set up in the area compared to the previous year.
21. Number of people from outside the area who actively participate in initiatives and events.
22. Number of feedbacks given on pop-ups related to sustainable mobility.
23. People from the GECO GRETA project being invited to speak at events.
24. Number of university employees moving to university spaces in Pilastro.
25. Number of participants at apartment block parties.
26. Number of over-65s joining awareness-raising events (towards energy communities).
27. Number of companies persuaded to form energy communities thanks to the aggregation action.
28. Number of subscriptions to an information newsletter on energy issues.
29. Number of newsletter subscribers interested in forming an energy community.
30. Number of new European projects using the Pilastro-Roveri case to study the energy community.
31. Number of activities generated from Pilastro off (neighbouring bars, etc.).
32. Number of people visiting unibo off to ask for information.



	33. Number of workshop projects conducted by UNIBO in the off spaces. 34. Increase in attendance in the area. 35. Number of classes involved in energy awareness projects. 36. Number of events organised by schools to raise awareness and number of families involved in the events. 37. Number of participants in guided tours of virtuous cases of Energy Communities already activated. 38. Time exchanged (hours) and number of people involved in the 'time bank' initiative.
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From the result we can see that the workshop was successful and quite an exhaustive list of CLIs has been co-created. Moreover, the CLIs were supposed to fit four broad categories, however the participants felt the need to have one more category related to urban mobility.

### 3.2 UR BEROA - Energy efficiency-driven cooperative, Spain (TEC)

Based on the identified goals and sorted by popular votes, CLIs to measure these goals were discussed and the top three were taken up for focused discussion. Below are some of the ideas that emerged (Table 4).

Table 4: List of CLIs from UR BEROA Workshop

Goal / Indicator dimension	Technical	Environmental	Economic	Social
<b>Goal 1: Planning and implementation of diversification projects, particularly those related to electric vehicles (EV) and collective self-consumption with a photovoltaic (PV) system</b>	1. Number of EVs charging stations deployed in the area 2. Number of new contracts for the services offered 3. Electricity demand of the EVs	1. Reduction of carbon dioxide emissions 2. Number of speeches promoting environmental attitude in the yearly meetings 3. Number of articles promoting environmental attitude in	1. Reduction of the heating and hot water costs 2. Reduction of electricity costs 3. Return on investment 4. Share of subsidy of total investment	1. Increase of number of participants in yearly meetings 2. Number of households connected to common electricity grid 3. Number of new members of the steering committee

	<ul style="list-style-type: none"> <li>4. Electricity supply to EVs (kW)</li> <li>5. Electricity generated by photovoltaics (KW)</li> <li>6. Share of rooftop surface covered by PV panels</li> </ul>	<ul style="list-style-type: none"> <li>4. Tonnes of carbon dioxide emissions not emitted</li> </ul>		
<b>Goal 2: Reduction of individual energy demand of the cooperative members</b>	<ul style="list-style-type: none"> <li>1. Reduction of heating and hot water consumption</li> <li>2. Number of pilot projects</li> </ul>	<ul style="list-style-type: none"> <li>1. Reduction of carbon dioxide emissions</li> </ul>	<ul style="list-style-type: none"> <li>1. Reduction of the heating and hot water costs</li> <li>2. Competitive energy prices (compared to energy market prices) for the cooperative members</li> <li>3. Subsidies achieved for housing energy efficiency improvements</li> </ul>	<ul style="list-style-type: none"> <li>1. Number of pilot projects implemented in larger scale</li> </ul>
<b>Goal 3: Increase in the number of members of UR BEROA through the geographical expansion of the district heating system</b>	<ul style="list-style-type: none"> <li>1. Reduction of the overcapacity of the central heating system</li> <li>2. Number of WhatsApp messages sent</li> <li>3. Number of visits at UR BEROA website</li> </ul>	<ul style="list-style-type: none"> <li>1. Reduction of carbon dioxide emissions from gas</li> </ul>	<ul style="list-style-type: none"> <li>1. Reduction of the heating and hot water costs</li> <li>2. Reduction of the fixed costs of the cooperative</li> </ul>	<ul style="list-style-type: none"> <li>1. Number of members</li> <li>2. Number of new members</li> <li>3. Total heating square meters</li> <li>4. Reduction of the average age of the members of steering committee</li> <li>5. Number of participants in training on cooperatives</li> <li>6. Number of visits at UR BEROA website</li> <li>7. Number of introductory brochures delivered</li> <li>8. Number of newspaper/magazine articles</li> </ul>

				9. Ratio of subscriptions / de-subscription of cooperative membership
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### 3.3 Coopérnico - Renewable energy-driven cooperative, Portugal (CWD)

Based on the identified goals, below are some of the ideas that emerged (Table 5).

Table 5: List of CLIs from Coopérnico Workshop

Goals	Indicators
1. ACTIVE PARTICIPATION OF ENERGY CITIZENS IN THE ENERGY TRANSITION	<ol style="list-style-type: none"> <li>1. No. of photovoltaic systems co-financed by co-members.</li> <li>2. No. of local/technical working groups in activity.</li> <li>3. No. of cooperative members.</li> <li>4. Set objectives of number of cooperatives to be achieved per year, per district, to ensure access to the entire population and geographical locations (coastal / inland).</li> <li>5. Creation of an internal platform for the support of participatory processes and energy citizenship (e-governance) among the co-members (in which the citizens present proposals and decide through their vote, using safe and reliable technologies for the allocation of votes, etc.).</li> <li>6. Online and public repository of Coopérnico's participation in different initiatives (e.g., research &amp; development projects, or initiatives technically supported by the cooperative) and the tools available to leverage energy citizenship.</li> <li>7. Creation of metrics for greater visibility of the carbon footprint, carbon handprint, social impacts of the participation of co-workers in the various initiatives promoted by the cooperative.</li> <li>8. To reduce the carbon footprint in photovoltaic projects funded by Coopérnico</li> </ol>

	<p>(CO2 emissions before and after investment).</p> <p>9. "Carbon Handprint" (complementary to "Carbon Footprint") which measures the actions (political, economic, educational...) carried out by Coopérnico to encourage the reduction of the carbon footprint (among its members, in society in general). In this case, it may be interesting to use some qualitative indicators: Coopérnico's actions are a) in sufficient and very strong numbers; b) sufficient but weak; c) insufficient, but very strong; (d) insufficient and weak.</p> <p>10. Promotion of training workshops, training, and literacy of co-workers in the strategic themes of the cooperative - with evaluation of the number of hours of training and number of trainees.</p>
2. GREATER TRANSPARENCY AND TRAINING OF THE COOPERATIVE	<p>1. Level of compliance with cooperative principles (establishing for each one a metric of their own).</p> <p>2. Reassessment of the governance model for greater participation of co-workers (currently very close to the centralized decision, and in the statutes themselves the involvement of the co-workers is not clearly assumed).</p> <p>3. Even the Board of Trustees itself is a non-existent body.</p> <p>4. No. of human resources board members.</p> <p>5. Budget and investment assessment.</p> <p>6. Coopérnico's capillary capacity through the promotion of a network of local cooperatives / of a more restricted scope.</p> <p>7. Removal/simplification of administrative barriers and operational costs of these local cooperatives.</p> <p>8. Creation of support offices by Coopérnico to support energy citizens who want to form such local cooperatives.</p> <p>9. Integration of other renewable energy technologies/sources (in addition to photovoltaic) in the cooperative portfolio</p>

	<ul style="list-style-type: none"> <li>10. Metrics for tracking the reach of Coopérnico's activities among non-cooperative.</li> <li>11. Creation of regional assemblies.</li> <li>12. Living list of the intermediations and privileged relationships with some institutions (institutional actors, business, etc.).</li> <li>13. Tools for attracting and retaining specialized human resources in the development of the cooperative's strategic activities.</li> <li>14. kWh marketed by Coopérnico.</li> <li>15. kWh produced in Coopérnico projects.</li> <li>16. Reduction ton CO2 with kWh marketed, produced and surplus exchanged by Coopérnico.</li> <li>17. Savings of euros with Coopérnico projects.</li> <li>18. Savings of euros with Coopérnico marketing contracts.</li> </ul>
3. MAXIMIZING ENERGY EFFICIENCY	<ul style="list-style-type: none"> <li>1. No. of financial ecosystems for the anticipation of future gains in energy efficiency – e.g., gains in efficiency due to investments in renovation of buildings can be reinvested in projects for the community, such as collective self-consumption systems.</li> <li>2. No. of models of transparent financing for the allocation of funds to citizens of energy / enterprises (e.g., under the New European Green Pact)</li> <li>3. No. and ease of access to public and private financial support for such energy efficiency interventions</li> <li>4. No. of existing national/international information allocated for energy literacy</li> <li>5. No. of service providers in the market to provide equipment for real-time management of energy use, in order to measure the reduction of fossil energy consumption after interventions made in this direction (windows, insulations, etc.).</li> <li>6. No. of existing methodologies for evaluating changes in attitudes and behaviours to ensure that there are no "rebound effects"</li> </ul>

	<ol style="list-style-type: none"> <li>7. No. of projects exist in Energy Poverty and Efficiency, including dealing with SDG7 - Renewable and affordable energies, since many institutions already have internal indicators associated with the SDGs (SDGs, Universities, Enterprises, etc...)</li> <li>8. No. of municipalities that have already signed the covenant of mayors and those who have already introduced the theme of energies (many of them may not have updated or monitored the initial Plan)</li> </ol>
4. INDIVIDUAL SELF-CONSUMPTION	<ol style="list-style-type: none"> <li>1. No. of financial cents (e.g., VAT reduction, IRS/IRC individual/collective person, IMI efficient homes)</li> <li>2. Number of families that have already installed individual self-consumption</li> <li>3. Number of institutions that have already installed individual self-consumption</li> </ol>
5. COLLECTIVE SELF-CONSUMPTION / ENERGY COMMUNITIES	<ol style="list-style-type: none"> <li>1. Number of Coopérnico members participating in RECs at national level and installed power in the respective CERs</li> <li>2. Number of agreements signed with national promoters of THE RECs for access and privileged conditions of consumption for co-members of Coopérnico</li> <li>3. Transposition of regulatory frameworks (Citizens' Communities for Energy - Internal Electricity Market)</li> <li>4. No. of obstacles to existing regulatory frameworks (collective self-consumption and CERs) – monitoring of obstacles – e.g., amelioration of Arts. 15 and 16 via the creation of customised and simplified permitting and administrative procedures exclusively for small actors like renewable self-consumers or REC members' sourcing of decentralised renewable energy and storage solutions, taking account into those that end-users are often unmotivated by unmotivated by excessive administrative burdens.</li> </ol>

	<ol style="list-style-type: none"> <li>5. Simplification of administrative procedures for registration of RECs - monitoring of administrative procedures (no. and process steps or the time it takes)</li> <li>6. No. of support (local/national) to inform energy citizens on how to implement collective self-consumption systems, energy communities, as well as their costs, burdens, and benefits</li> <li>7. Creation of regulatory sandboxes to test new business models (energy flexibility, peer sharing)</li> <li>8. No. of RECs in rural areas to the detriment of large plants in rural areas (under The European Advisory Hub for Rural Energy Communities)</li> <li>9. Promotion of dynamic tariffs (demand response)</li> <li>10. Provisions on how to improve and strengthen information related to the proactive role and engagement of self-consumers and REC members via the creation of specific incentive mechanisms and targets to measure such progress, which must consider information related to low-income and vulnerable consumers</li> </ol>
<b>6. INCENTIVE TO MEDIUM-SIZED PLANTS</b>	<ol style="list-style-type: none"> <li>1. No. of existing financial resources (e.g., PPAs or energy purchase agreements)</li> <li>2. Simplification of licensing / exclusion of applications by proximity</li> <li>3. Prioritization of combined solutions (agro-voltaic solutions) to protect the environment</li> <li>4. No. of financial incentives under Community funds (agriculture, rural development, energy)</li> <li>5. Provision and use of public spaces for installation of photovoltaic panels</li> <li>6. Measure the "performance" of the activities that Coopérnico develops in order to change this adverse context, that is, how it tries to pressure the Regulator to create conditions more favorable to small traders, etc. – e.g., quantity and quality of Coopérnico's presence in the media, number of</li> </ol>

	awareness-raising actions, undersigned campaigns (and number of subscribers), public events, etc.
<b>7. PURCHASE, EXCHANGE AND SHARING OF SURPLUSES</b>	<ol style="list-style-type: none"> <li>1. Simplification of processes</li> <li>2. Legal framework / digital platforms for aggregate sale of surpluses</li> <li>3. Number of contracts and kWh purchased, exchanged, shared in surplus by Coopérnico</li> </ol>
<b>8. IMPROVEMENT IN THE ALLOCATION OF LICENSES VIA AUCTIONS</b>	<ol style="list-style-type: none"> <li>1. Inclusion of ecological and social criteria (vs MW price)</li> <li>2. Monitoring and regulation of the implementation of the process by the competent authorities</li> </ol>
<b>9. DIFFERENTIATED AUCTIONS FOR SMALL TRADERS</b>	<ol style="list-style-type: none"> <li>1. Ensure priority access to exploration and energy licences at auction</li> <li>2. Ensure marketing at prices lower than the Last Resort Merchant in order to guarantee lower prices for citizens</li> </ol>
<b>10. REDUCE IMPACTS OF LARGE SOLAR PLANTS</b>	<ol style="list-style-type: none"> <li>1. Inclusion of new technical and socio-environmental criteria for: (a) protection and promotion of local ecosystems; (b) geographical exclusion criteria; (c) distancing from panels; (d) technological designs against "heat islands"</li> </ol>
<b>11. TRANSPARENCY AND PARTICIPATION IN LARGE SOLAR PLANTS</b>	<ol style="list-style-type: none"> <li>1. Participatory processes in project development</li> <li>2. Right to public participation in Environmental Impact Assessments</li> <li>3. Right to co-finance local communities and economic actors</li> </ol>



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|--|---|
|  | 4. Creation of measures for the benefit of local populations (creation and local maintenance of wealth) |
|--|---|

### 3.4 Earnest App Case - A virtual community for sustainable mobility in Karlsruhe, Germany (FhG)

Based on the identified goals, below are some of the CLIs that emerged (Table 6).

Table 6: List of CLIs from Earnest App Case Workshop

Community Goal	Steps to achieve the goal	CLIs
1) Create community/Commitment	<u>Behavioural change through:</u> <ul style="list-style-type: none"> <li>Regular community activities</li> <li>Communication strategies</li> <li>Inclusivity</li> </ul> <u>Ressources necessary:</u> <ul style="list-style-type: none"> <li>Education</li> <li>social Media, newspapers (communication)</li> <li>Funding/Money</li> </ul>	<ol style="list-style-type: none"> <li>Specific number of meetings/activities/events per year</li> <li>(social) media activities and presence</li> <li>Collecting data on diversity of community members</li> <li>Assess fit of public funding opportunities for various different communities</li> </ol>
2) Increase environmental conciousness among members of the community	<u>Behavioural change through:</u> <ul style="list-style-type: none"> <li>exposure</li> <li>activities</li> <li>representation</li> </ul> <u>Implemented through:</u> <ul style="list-style-type: none"> <li>education &amp; information events</li> <li>political incentives &amp; laws</li> </ul> <u>Ressources necessary:</u> <ul style="list-style-type: none"> <li>Funding/Money</li> </ul>	<ol style="list-style-type: none"> <li>Measure how many activites/events take place with how many active community members per year</li> <li>Assess internet/app user behaviour (numbers, time spent on the website, enageded with what information, etc.)</li> <li>Assess and increase information on sustainable lifestyles available in the city of Darmstadt</li> <li>Make information on sustainability publicly available</li> </ol>

Community Goal	Steps to achieve the goal	CLIs
<b>3) Sustainability Education</b>	<ul style="list-style-type: none"> <li>Assessment of status quo</li> <li>Assessment of community diversity</li> </ul> <p><u>Behavioural change through:</u></p> <ul style="list-style-type: none"> <li>➤ increased exposure (more discussion, debate, etc.)</li> </ul> <p><u>Implemented through:</u></p> <ul style="list-style-type: none"> <li>➤ political incentives &amp; laws</li> </ul> <p><u>Ressources necessary:</u></p> <ul style="list-style-type: none"> <li>➤ Funding/Money</li> <li>➤ Time</li> <li>➤ Location</li> <li>➤ Expertise</li> <li>➤ Human resources</li> </ul>	<ol style="list-style-type: none"> <li>change school curriculum</li> <li>train and educate educators</li> <li>establish organisational headquarters</li> <li>conduct certain numbers of seminars/workshops for multipliers per year</li> <li>Increase funding programs for sustainability education in each region</li> <li>Assess media presence of the topic</li> </ol>

### 3.5 Natural gas-free neighbourhoods, The Netherlands (TNO)

Based on the literature review detailed in Annex 5, the following preliminary CLI's can be identified. They are preliminary because these indicators are not co-created by the case study participants themselves but based on the findings of previous research by TNO, PAW and MarketResponse.

Table 7: List of CLIs from NGFN Literature Review

Technical	Environmental	Economic	Social
<ol style="list-style-type: none"> <li>Data on (change in) consumption behavior</li> <li>Data on usage of appliances in the house (i.e., heating and electricity)</li> <li>Data on the status of the quality of</li> </ol>	<ol style="list-style-type: none"> <li>Number of natural gas-free homes</li> <li>Data on the individual/ neighborhood impact on the environment, for example:               <ol style="list-style-type: none"> <li>Ecological footprint</li> <li>CO2 reduction</li> </ol> </li> <li>Dependency on gas from Groningen: yes/ no</li> </ol>	<ol style="list-style-type: none"> <li>Number of subsidies available by the government</li> <li>Number of investments available from citizens</li> <li>Number of investments</li> </ol>	<ol style="list-style-type: none"> <li>Number of people aware of the energy transition</li> <li>Number of people aware of the opportunities of becoming natural gas-free</li> <li>Number of residents who oriented themselves</li> <li>Number of people willing to participate</li> </ol>

<p>the home (i.e., energy label)</p> <p>4. Data based on energy scans and feasibility tests</p> <p>5. Number of contracts with contractors, installers and suppliers</p> <p>6. Number of reliable and skilled technicians</p>	<p>4. Clear plan available by the government, including a timeline: yes/ no</p> <p>5. Room for collective action provided by the municipality: yes/ no</p>	<p>available from municipalities</p> <p>4. Data on the expected value of gas-free homes available</p> <p>5. Current market price of the property available</p> <p>6. Expected market price of the property after the modifications available</p> <p>7. Data on how available budget is spent by the collective, e.g., how it flows back to members as lower rates or as an investment for new projects</p>	<p>in becoming natural gas-free</p> <p>5. Number of people participating in becoming natural gas-free (i.e., taken action)</p> <p>6. Presence of core team with shared vision/ common goals</p> <p>7. Number of people who are enthusiastic and have the perseverance to succeed</p> <p>8. Number of citizens who have knowledge and competence, for example:</p> <ul style="list-style-type: none"> <li>- Number of citizens who have asked for help</li> </ul> <p>9. Number of well-informed project members who can be approached by citizens for questions</p> <p>10. Number of satisfied people</p> <ul style="list-style-type: none"> <li>- Data on awareness and attitude towards 'making gas free'</li> <li>- Number of people satisfied with the neighborhood approach</li> <li>- Number of people satisfied with participation opportunities</li> <li>- Number of people satisfied with the role of the municipality</li> <li>- Number of people satisfied with the offer 'making your</li> </ul>
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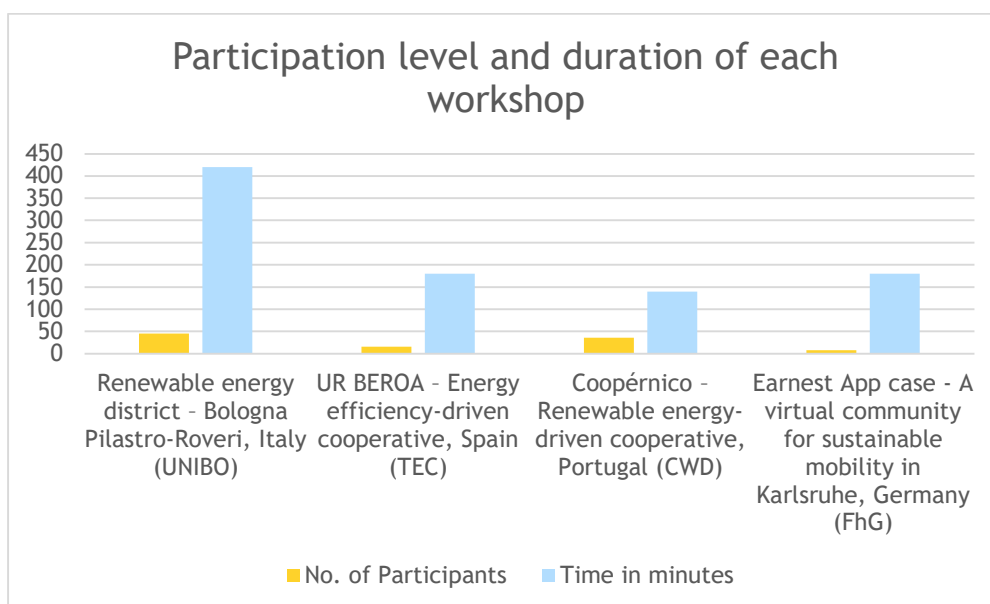
			<p>home gas-free'</p> <p>11. Data on wishes and values of a neighborhood</p> <ul style="list-style-type: none"> <li>- Insights in wishes and values in the neighborhood</li> <li>- Insights in the social network in the neighborhood</li> <li>- Number of activities in the neighborhood</li> </ul> <p>12. Data on the common goals within a neighborhood</p> <ul style="list-style-type: none"> <li>- Number of people within the neighborhood recognizing the common wishes and values</li> <li>- Number of ideas about follow-up activities</li> <li>- Number of planned appointments with a clear topic</li> </ul> <p>13. Data on social cohesion within a neighborhood</p> <ul style="list-style-type: none"> <li>- Data on the recognition of the common goals</li> <li>- Number of chosen follow-up activities</li> <li>- Number of ideas that are developed into activities</li> </ul> <p>14. Number of communication</p>
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			<p>channels used to reach citizens, for example:</p> <ul style="list-style-type: none"> <li>- Use of social media</li> <li>- Number of newsletters sent and read</li> <li>- Number of living room conversations</li> </ul> <p>15. Presence of socio-physical infrastructure for active involvement</p> <ul style="list-style-type: none"> <li>- Number of active associations</li> <li>- Number of local working groups</li> </ul> <p>16. An appropriate organizational form chosen: yes/ no</p> <p>17. Good cooperation with the municipality: yes/ no</p> <p>18. Knowledge sharing between collectives/ initiatives: yes/ no</p>
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## 4 Discussion

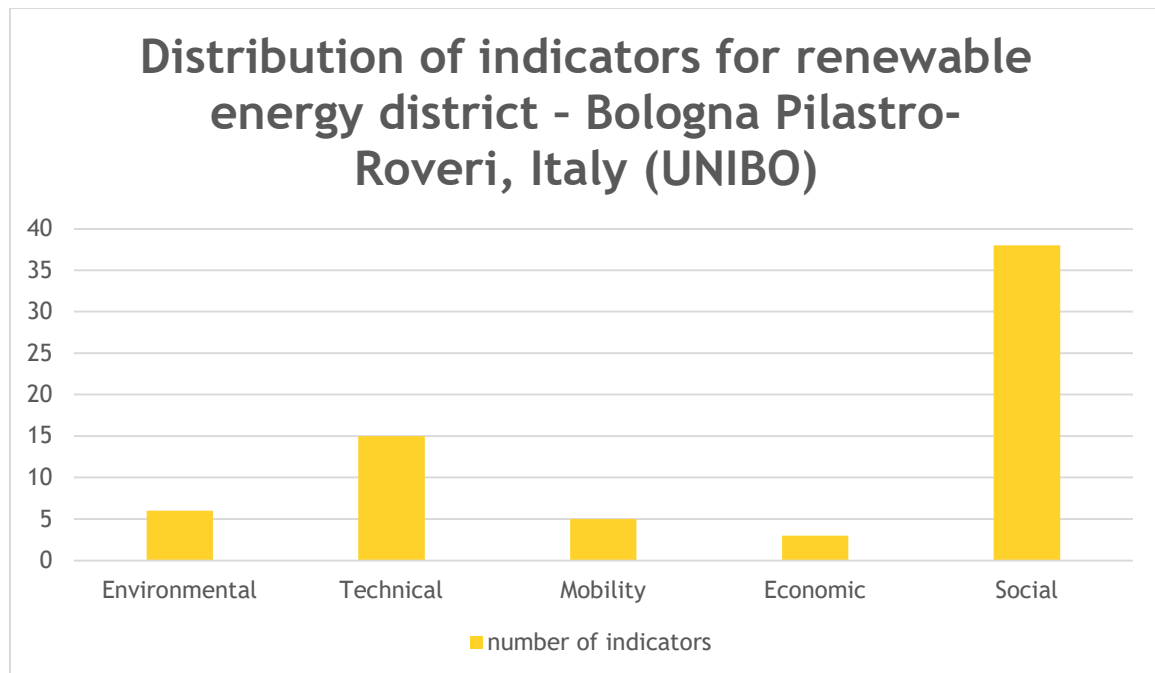
### 4.1 Co-design as method of identifying CLIs

From the results, it can be said that the co-design method was quite successful in generating numerous CLIs that covered a broad spectrum of indicators that measured numerous goals as well as were part of different categories such as environmental, social, technical, and economic. The Replicable Workshop Design Template (RWDT) in D2.2 was a useful template for creating workshop plans. It helped the case study owners to divide their workshops into manageable tasks and to create a workshop plan.

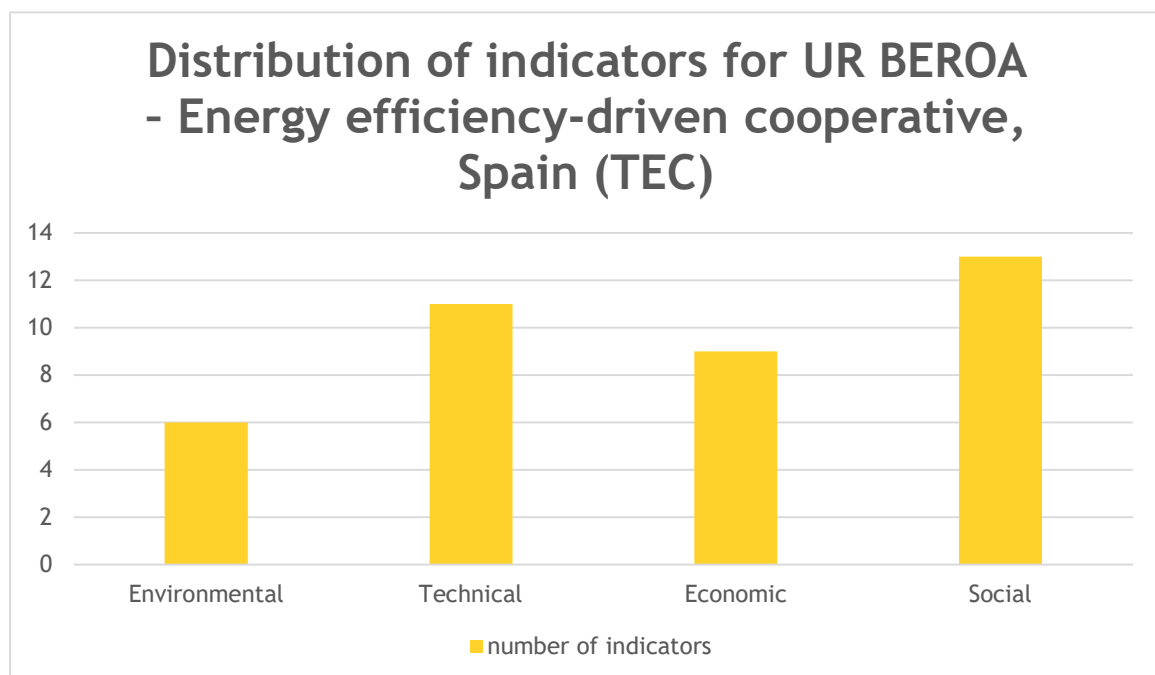


**Figure 14: Participation level and duration of each workshop**

Organizing a workshop is also challenging, especially in situations like a pandemic, thus workshops need to incorporate mitigation strategies and be adaptable. The workshop template was adaptable in this regard, as both face-to-face and online workshops were able to successfully follow the workshop template and adapt it to suit their own needs. Figure 14 above shows the participation level and duration of each workshop in minutes.



**Figure 15: Distribution of indicators for renewable energy district – Bologna Pilastro-Roveri, Italy (UNIBO)**



**Figure 16: Distribution of indicators for UR BEROA – Energy efficiency-driven cooperative, Spain (TEC)**

From the results section, the CLIs identified are of different categories such as Environmental, Technical, Economic, and Social, broadly. However, a certain workshop may have chosen to define their own set of categories for the indicators. From Figure 15 and Figure 16 above we see that it may be easier to identify technical and social indicators than to identify environmental and economic indicators.

## 4.2 CLI feasibility analysis

Once the indicators are listed, they need to be evaluated based on certain questions such as:

- How do we measure the indicator?
- Who has this data?
- Are investments needed to have a new source of data?

Choosing some of the proposed indicators, as in Table 3 to Table 6, we can reflect on the possibilities and criticalities of collecting data to track improvements with respect to energy citizenship in the area. The data required to measure CLIs can be collected from multiple sources such as technical and non-technical data. Moreover, data collection tools can be employed to collect additional data.

Some of the possible data collection tools that may help in collecting additional energy data could be:

- Guided and mediated questionnaire compilation
- Action-research
- School training projects
- Participant observation
- Administrator or policy makers interviews
- Open data portals

Apart from data sources, one of the other important aspects is to understand if a CLI is feasible or not. This is not an easy exercise, as it requires careful consideration such as what to measure; which unit is suitable for the measurement; where this indicator can be measured; what could be the source for data, and possible challenges. It is after such considerations CLIs can be shortlisted. Table 7 below shows a few indicators that have been analysed based on the above-mentioned criteria to determine if they are feasible or not.

Table 8: CLI Feasibility Analysis

Indicator	Units	Where	Source	Challenges	Feasible
Energy Consumption Measurement	Kilowatts	Home Office Neighbourhood, etc.	Data provided by the operator.	The operator may not want to give data. There are data privacy issues for individuals.	Maybe



Feedback left in pop-up installations or at the energy desk or on the blog	Numbers	City Centre Electricity Office	Interviews  Forms to be filled in both paper and digital, guided, mediated	Informed persons, ambassadors, spokespersons, and facilitators can do this	Yes
Number of people requesting photovoltaics installation	Number	City	Sales receipt  Company filings  Business Associations	Monitoring of the increase in requests for photovoltaic installation	Yes

## 5 Conclusion

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In conclusion, it can be said that the Replicable Workshop Design Template (RWDT) described in D2.2 was able to successfully guide the workshops and helped in generating the CLIs. The workshop template consists of activities and discussions which incite detailed discussion, common objectives, and actionable points. The discussion carried out by facilitators helped participants generate ideas related to the topic being discussed.

Another aspect is that a co-design workshop is quite dynamic in nature and could require facilitators to continue to direct the discussion if it is going too much off-topic. Sometimes, there could be other challenges, such as in the case of UNIBO, due to summer heat, people had to move outside in the open because it was cooler. UNIBO also modified the workshop, where they had a timescale for objectives to be achieved, actions they need to complete within the timeline, and they discussed energy sustainability, and community involvement. They had collectively come up with the objectives or goals they would like to achieve and discussed what actions will help them reach those objectives. In the next part, they collectively came up with how they will measure those actions.

The adoption of the workshop template by UNIBO demonstrated how the CTP and CLI processes are connected in many aspects. So, for example, in the Replicable Workshop Design Template (RWDT) there was the step of goal setting, which is a part of CTPs also. In the Replicable Workshop Design Template (RWDT), goal setting was a prominent activity that also allowed for setting goals over a period of time and was characterized by defining, organizing, and prioritizing.

Even though CTP and CLI workshops are not integrated for practical reasons, it is important to note that many workshops employed an integrated approach and it highlights that even though the CLIs were collected now and the CTPs will be reported on later, in the context of GRETA, when adopting CLIs into wider practice they could be organized in a timescale that corresponds to CTP.

Finally, it is beyond the scope of GRETA to support communities further to create strategies and procedures for collecting data and monitoring progress. As such, it is not possible to evaluate the extent to which the process has genuinely inspired and empowered GRETA case study participants to act towards positive change within their local contexts. However, continued engagement with the communities over the course of the remainder of the project, in defining Community Transition Pathways and creating Energy Citizenship Contracts that reflect mutually agreed procedures to support enacting the transition actions, may yield further insight into the impact of the CLI workshop activities.

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## Annex 1. Stitched Screenshot of Workshop Report format for face-to-face workshop at case study by UNIBO

WORKSHOP REPORT FORMAT FOR (PILASTRO-ROVERI)		
Date	27/28 May 2022 (preparatory activities on 6-13-20 May 2022)	Did you adapt the original workshop template? If yes, explain the changes and reason for the same.
Number of Participants	27 May: 55 28 May: 45	The original template was adapted to the circumstances of the two days workshop. The activities were divided into 4 slots corresponding to 4 collaborative laboratories: <ol style="list-style-type: none"> <li>Needs analysis</li> <li>Objectives definition</li> <li>Actions definition</li> <li>CLIs (what to measure and how to measure)</li> </ol>
Location	Pilastro-Casa di Quartiere (Neighbourhood House)  Roveri Creative Hub	
Duration	2 days (+ 3 more preliminary preparation appointments)	
Mode	<input type="checkbox"/> Face to Face  <input type="checkbox"/> Online  <input checked="" type="checkbox"/> Dual	

Select if this activity was done	<input checked="" type="checkbox"/> Exploring Indicator (I)	<input checked="" type="checkbox"/> Exploring Indicator (II)	<input type="checkbox"/> Physical Community	<input type="checkbox"/> Virtual Community	<input checked="" type="checkbox"/> Defining Goals	<input checked="" type="checkbox"/> Organizing Goals	<input checked="" type="checkbox"/> Prioritizing Goals	<input checked="" type="checkbox"/> What is being Measured	<input checked="" type="checkbox"/> How to Measure
If this activity was not carried out, explain the reason.			This activity has been avoided not to over-complicate the discussion. The boundaries of the community were informally discussed during the preparation meetings	We have not defined the virtual community since there is not one					

How will you rate participants engagement in activity?	<input checked="" type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input checked="" type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input checked="" type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input type="checkbox"/> Actively Engaged <input checked="" type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input type="checkbox"/> Actively Engaged <input checked="" type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input checked="" type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input checked="" type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent
Stakeholders who participated	Students, residents, associations, business owners, local institutions (neighbourhood, municipality), city agencies, researchers.				Students, residents, associations, business owners, local institutions (neighbourhood, municipality), city agencies, researchers.				
Result of each activity	See report attached								
Reflection summary from participants	The participants to the activities were actively engaged and motivated. Their insights have been clearly expressed and they also suggested to be further included in the communication and dissemination of the results of the workshop. On a critical note, the participation was high and variegated but, concerning residents, only few actively engaged in the working tables, others attended to get informed, others were just curious about the project.								

## Annex 2. Stitched Screenshot of Workshop Report format for face-to-face workshop at case study by UR BEROA along with workshop plan

WORKSHOP REPORT FORMAT FOR UR BEROA		
Date	13.06.2022	Did you adapt the original workshop template? If yes, explain the changes and reason for the same.
Number of Participants	16	<p>We adapted the original workshop design in the following manners:</p> <ul style="list-style-type: none"> <li>Readapting the agenda to the local context and needs of the community. The community is formed by an energy cooperative, established in 1985 in a neighborhood of San Sebastian, having 550 households as members. Since the community is well established, the activity of defining physical community was considered less important. In addition, the energy cooperative had recently defined a roadmap for 2035, and the CLI Workshop used the goals defined in the roadmap as a starting point.</li> <li>Adding to the original design the concept of "Actions". The "Actions" were considered as an intermediary step between the goals and CLIs, making the rather high-level goals more tangible and closer to practice. This way the workshop was also better aligned with the GRETA Community Pathways.</li> <li>Shortening the duration of the workshop to a 3-hours event <u>organised</u> in a weekday outside office hours (at 18:00-21:00) to enable participation of all type of citizens. Whole day event was not considered feasible in terms of attracting active participation of citizens.</li> <li>The activities related to indicators were joined to a one session, <u>organised</u> after the session on goals and actions. The indicator session included the activities of Exploring indicators I and II, as well as the Ideation of new indicators. Due to the time constraint, the activity How to measure was left out from the workshop design.</li> </ul> <p>Due to the above-mentioned reasons, the workshop agenda (see the full agenda in Annex 1) was <u>reorganised</u> in four sessions:</p> <ul style="list-style-type: none"> <li>Welcome and opening,</li> <li>Goals and actions,</li> <li>Exploring and defining indicators, and</li> <li>Closing.</li> </ul>
Location	Hotel Palacio de Aiete, Goiko Galtzara Berri, 27, San Sebastián (Spain)	
Duration	3h	

Mode	List of different activities done (Check, if done)								
<input checked="" type="checkbox"/> Face to Face <input type="checkbox"/> Online <input type="checkbox"/> Dual									
Select if this activity was done	<input checked="" type="checkbox"/> Exploring Indicator (I)	<input checked="" type="checkbox"/> Exploring Indicator (II)	<input type="checkbox"/> Physical Community	<input type="checkbox"/> Virtual Community	<input checked="" type="checkbox"/> Defining Goals	<input checked="" type="checkbox"/> Organizing Goals	<input checked="" type="checkbox"/> Prioritizing Goals	<input checked="" type="checkbox"/> What is being Measured	<input type="checkbox"/> How to Measure
If this activity was not carried out, explain the reason.			The energy community is already well established, and this exercise was considered less relevant.	The workshop was <u>organised</u> face-to-face.					Due to time constraint, this activity was left out from the agenda in the planning phase.
How will you rate participants engagement in	<input checked="" type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively	<input checked="" type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively	<input type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively	<input type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively	<input checked="" type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively	<input checked="" type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively	<input checked="" type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively	<input checked="" type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively	<input type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively

Stakeholders who participated	All participants (members of UR BEROA energy cooperative + the Manager of the cooperative)	All participants (members of UR BEROA energy cooperative + the Manager of the cooperative)	--	--	All participants (members of UR BEROA energy cooperative + the Manager of the cooperative)	All participants (members of UR BEROA energy cooperative + the Manager of the cooperative)	All participants (members of UR BEROA energy cooperative + the Manager of the cooperative)	All participants (members of UR BEROA energy cooperative + the Manager of the cooperative)	--
Result of each activity	7 pre-defined indicators were presented by the facilitator, followed by a small group discussion on their usability and relevance. See Annex 3 for more details.	The 7 pre-defined indicators were modified and linked to the three most important goals. See Annex 3 for more details.	--	--	Presentations of the work in 3 small groups on the goals and their timelines. See Annex 2 for more details.	A common timeline including jointly agreed goals. See Annex 2 for more details.	Selection of 3 most important goals, based on the voting results. See Annex 2 for more details.	Definition of new indicators for the set goals, classified in technical, environmental, economic, and social dimensions. See Annex 3 for more details.	--
Reflection summary from participants	The participants were overall very pleased with the workshop. They found it useful in terms of open, active, and constructive discussion on the direction setting of the energy cooperative. They considered that the workshop offered a forum for a strategic discussion that is not taking place during the ordinary meetings of the cooperative and involved members of the cooperative that are typically less actively participating.								

## GRETA CLI Workshop - UR BEROA

### Agenda

#### Session I: Welcoming and opening

- 18:00 Welcome and opening of the workshop
- Explaining practicalities (consent forms, refreshments, etc.)
- Agenda of the day

- 18:10 Introduction to GRETA and objective of today

#### Session II: Goals and actions

- 18:20 Presentation of the UR BEROA roadmap goals
- 18:30 Small group discussion on the goals - revision of goals and ideation of new goals
- 18:45 Plenary, including small group presentations and organizing, ending with voting for prioritizing

19:00            Small group ideation on actions related to the 3 prioritized

19:20            Plenary on actions

**Session III: Exploring and defining indicators**

19:45            Exploring indicators (presentation of the pre-selected indicators)

20:00            Indicator ideation: small group discussion on whether the example indicators are suitable for UR BEROA or not, and ideation of new indicators

20:30            Plenary on indicators

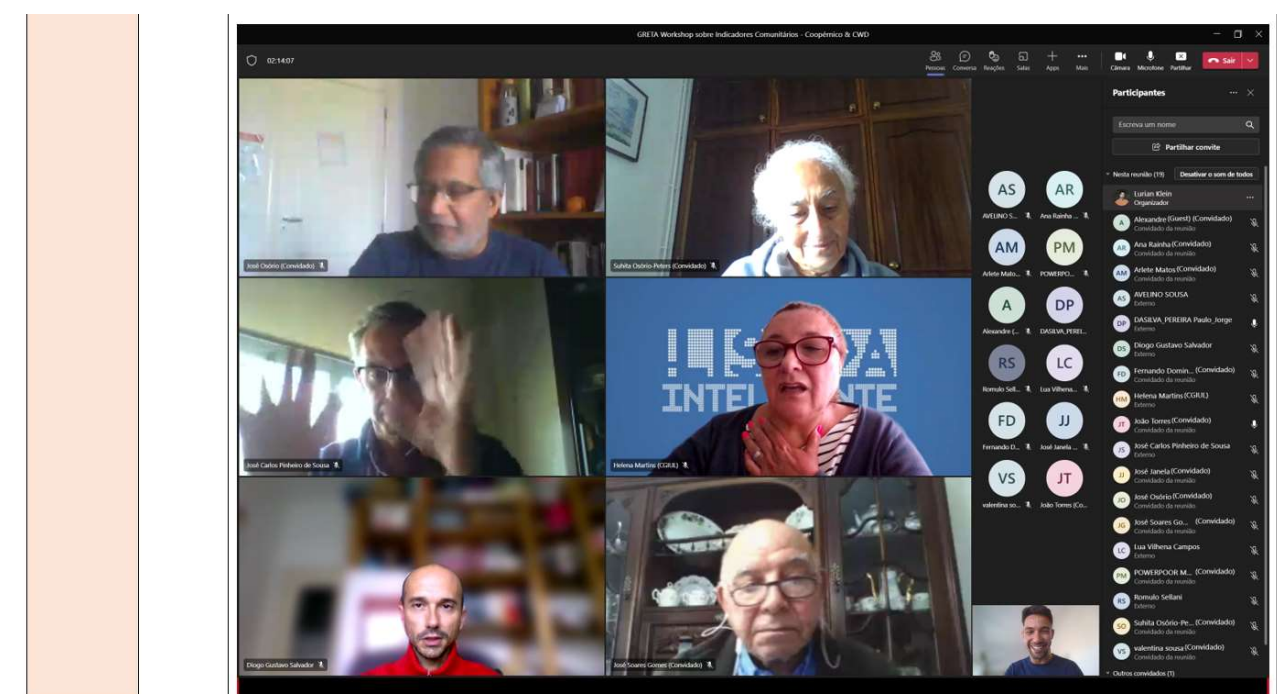
**Session IV: Closing**

20:45            Wrap-up discussion and next steps



## Annex 3. Stitched Screenshot of Workshop Report format for online workshop at case study by Coopérnico

WORKSHOP REPORT FORMAT FOR (Name of Case Study)		
Date	22/6/22	Did you adapt the original workshop template? If yes, explain the changes and reason for the same.
Number of Participants	36	Yes. We eliminated the step regarding the physical/virtual community definition as Coopérnico is a national cooperative with members scattered across the entire country (and sometimes beyond).
Location	Virtual (Teams)	<p>We also started from a different starting point from the other GRETA case studies since the cooperative has its own Manifesto (for a 100% renewable energy transition) which states the cooperative's main objectives and respective ways to reach them (which were translated by me as CLIs of various natures). Hence, I presented the existing macro objectives (3) and related subobjectives (10) to them, along with the CLIs identified and extracted from the manifesto. In general lines, the workshop was heavily focused on discussing new CLIs (beyond those in the manifesto) – mainly targeting CLIs that could be tied to the civic action of the cooperative members or the cooperative itself rather than to policymakers. The group was mixed with members that had just joined the cooperative while others were part of the Executive Board. The discussions were so engaging and the participation was so lively that we surpassed 20min above the workshop time limit of 2 hours without finishing the open discussions everyone was posing, so I proposed a secondary step for the workshop which referred to creating a living and collaborative document in which people could reflect and propose additional CLIs/objectives, as well as prioritise them – this was done to spur reflection and learning among them, as well as a sense of belonging to a cause – this was clear from the various messages I got from them. I would even categorise most of the participants as defenders of (the cooperative's) cause, rather than just proactive participants. This was very clear from the beginning of the workshop, when I emphasised that the outcomes of it wouldn't merely serve the purposes of the GRETA project, but in fact would be a tool for them to use and keep working on within the cooperative to track its progress towards its own defined goals.</p> <p>The document with Coopernico's objectives and associated CLIs follow in an annex. As can be seen, the highlighted parts in yellow represent the additions made by the participating members in the living document – showcasing a high rate of participation in the co-creation of both new objectives (the 2 first) and CLIs that can be directly associated with the capacity of Coopernico to measure its own progress.</p> <p>Another important aspect to point out is that we had a very high rate of participation (36 people out of 70 interested), which wasn't any higher because the workshop was conducted during the afternoon of a working day and so many people couldn't join.</p>
Duration	2h20	



Mode <input type="checkbox"/> Face to Face <input checked="" type="checkbox"/> Online <input type="checkbox"/> Dual	List of different activities done (Check, if done)								
Select if this activity was done	<input checked="" type="checkbox"/> Exploring Indicator (I)	<input checked="" type="checkbox"/> Exploring Indicator (II)	<input type="checkbox"/> Physical Community	<input type="checkbox"/> Virtual Community	<input checked="" type="checkbox"/> Defining Goals	<input checked="" type="checkbox"/> Organizing Goals	<input checked="" type="checkbox"/> Prioritizing Goals	<input checked="" type="checkbox"/> What is being Measured	<input checked="" type="checkbox"/> How to Measure
If this activity was not carried out, explain the reason.									
How will you rate participants engagement in activity?	<input checked="" type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input checked="" type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input checked="" type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input checked="" type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input checked="" type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input checked="" type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input checked="" type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent

Stakeholders who participated									
Result of each activity									
Reflection summary from participants	Read above								

## Annex 4. Stitched Screenshot of Workshop Report format for face-to-face workshop at case study by FhG

CLI WORKSHOP REPORT FORMAT FOR The Earnest App Case Study (Darmstadt, Virtual, Germany)									
Date	May 17, 2022 July 5, 2022	Did you adapt the original workshop template? If yes, explain the changes and reason for the same.							
Number of Participants	8	We used the original workshop template as guidance but rearranged some of the activities and added a social justice component. We started the first workshop with a quick introduction with the effects of global warming and how it is connected to energy consumption (and energy saving, particularly in the mobility sector, which is the focus of our case study). We subsequently spent some time on defining the challenge, thinking about definition for (virtual) energy communities, and defined the community's goals. This is where the first workshop ended. In the second workshop, we began with a reminder of the goals the community had previously defined and looked at them through a social justice lens. After this, we asked the community to <u>prioritized</u> the goals and defined indicators for the three most highly ranked goals. To summarize: While the first workshop revolved around defining the community and defining goals, the second workshop looked at the goals more closely (social justice) and identified indicators. The workshop was held in German.							
Location	Darmstadt								
Duration	2x 1,5 hours								
Mode <input checked="" type="checkbox"/> Face to Face <input type="checkbox"/> Online <input type="checkbox"/> Dual	List of different activities done (Check, if done)								
Select if this activity was done	<input type="checkbox"/> Exploring Indicator (I)	<input type="checkbox"/> Exploring Indicator (II)	<input checked="" type="checkbox"/> Physical Community	<input checked="" type="checkbox"/> Virtual Community	<input checked="" type="checkbox"/> Defining Goals	<input checked="" type="checkbox"/> Organizing Goals	<input checked="" type="checkbox"/> Prioritizing Goals	<input checked="" type="checkbox"/> What is being Measured	<input checked="" type="checkbox"/> How to Measure
If this activity was not carried out, explain the reason.	I am not sure about the difference between exploring indicators I and II. We did not start our workshop with the frame of indicators but with framing the problem/challenge the community is actively seeking to address. We spend a <u>lot</u> time having community members describe the "challenge" of energy saving in everyday life.	See previous box		..					?

	However, during our second workshop we provided some examples of indicators before we asked the community to come up with indicators for the three most highly ranked goals.								
How will you rate participants engagement in activity?	<input type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input checked="" type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input checked="" type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input checked="" type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input checked="" type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input checked="" type="checkbox"/> Actively Engaged <input type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input type="checkbox"/> Actively Engaged <input checked="" type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent	<input type="checkbox"/> Actively Engaged <input checked="" type="checkbox"/> Passively Engaged <input type="checkbox"/> Indifferent
Stakeholders who participated	We purposefully decided to conduct this workshop only with community members since this took place toward the beginning of our case study, the community members are young <u>student</u> and we did not want them to be intimidated or overwhelmed by the presence of political stakeholders.								

Result of each activity			To summarize the findings: (1) most characteristics of a community were identified as being identical for both a physical and a virtual community. The definition consisted of two parts: (1) community, which was characterized as <u>sth</u> including engagement, commitment, social responsibility, and (2) energy, which is the goal/purpose of the community = reduce energy consumption,	Questions arose as to what extend a virtual community can create true, long-term commitment. On the other hand, the community also saw an opportunity for higher engagement in virtual communities due to lower costs (efforts) to become a part of it. Moreover, members regarded it as having the potential to be more	The goals defined by the community were generally very broad and more social than material. Interestingly, more short-term goals were seen as more local ones, whereas long-term goals addressed challenges on a national or even global scale.	We asked the community to define goals and - after they collected them organize them along a graph of (y) time & (x) individual to local to national to global activity. I believe the second organizational dimensions was added by us in comparison to the Miro board example.	We asked them to prioritize goals generally, not according to 5, 10, 20 years. Interestingly, the community very easily agreed on the most important goals: (1) education about energy and sustainability; (2) create communities and commitment; (3) increase environmental consciousness. Despite the	We represented the members with the framework of technical, economic, social, and environmental indicators and asked them to collect ideas on how to measure the achievements of their three most highly ranked goals (how do you know that you achieved your goal?). The community came up with indicators that fit into the	We collected all ideas for indicators and discussed them within the group: What can this indicator tell us? What does it measure? How can it be broken down further? What is the timeframe for measurement
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		be environmentally conscious. Generally, the community defined their own purpose and goals much broader than we (as case study leaders) would.	accessible and inclusive than physical communities.			framing toward energy savings in the mobility sector of the workshop and the case study, the community saw the most important goals to (also) achieve this, much broader.	categories. Further discussion helped in defining the indicators further.	
Reflection summary from participants	<p>We think that dividing the workshop in two parts with 1,5 hours each worked well. On the one hand, we could have used much more time for further discussions and to assess some aspects in more details. On the other hand, one hour and a half are a good <u>time period</u> for people to concentrate and engage in fruitful discussions. The longer break between the two workshops also worked since people had time to reflect <u>inbetween</u>, engage with the app in our case study and reassess their contributions to the first workshop. Participation was visibly more active while discussing the definitions of the community, defining <u>goals</u> and assessing the through a social justice lens. The members of the community still actively participated when it came to defining indicators but much less enthusiastic. The concept was a bit harder to grasp, particularly also because in our case study, the community is set-up to temporary (and not long-term).</p>							



## Annex 5. Stitched Screenshot of Workshop Report format for face-to-face workshop at case study by TNO

WORKSHOP REPORT FORMAT FOR (Gas-free neighborhoods)		
Date	t.b.d.	Did you adapt the original workshop template? If yes, explain the changes and reason for the same.
Number of Participants	t.b.d.	The original template was adapted to the case study and the circumstances of a physical workshop of 132 minutes. The activities were divided into six sub-task:  1. Defining goals 2. Organizing goals 3. Prioritizing goals (optional) 4. Exploring indicators 5. What will we measure? 6. How will we measure?
Location	3 options: 1. <u>Wijkpaleis Paddepoel</u> 2. Municipality of Gouda 3. <u>Groenste Buurt</u>	
Duration	ca. 132 minutes	
Mode <input checked="" type="checkbox"/> Face to Face  <input type="checkbox"/> Online  <input type="checkbox"/> Dual	List of different activities planned (Check, if planned to be done)	

Select if this activity will be done	<input checked="" type="checkbox"/> Exploring Indicator (I)	<input type="checkbox"/> Exploring Indicator (II)	<input type="checkbox"/> Physical Community	<input type="checkbox"/> Virtual Community	<input checked="" type="checkbox"/> Defining Goals	<input checked="" type="checkbox"/> Organizing Goals	<input checked="" type="checkbox"/> Prioritizing Goals	<input checked="" type="checkbox"/> What is being Measured	<input checked="" type="checkbox"/> How to Measure
If this activity will not be carried out, explain the reason.		Since the question of relevancy is also asked in "How to measure", we decided to exclude this part of the template.	This is not relevant for our use case since the geographical boundaries of the use case do not influence the goals and CLI's of the neighborhood.	This is not relevant for our use case since gas-free neighborhoods are not virtual.					

How will you rate participants engagement in activity? <u>t.b.d.</u>	<input type="checkbox"/> Actively Engaged  <input type="checkbox"/> Passively Engaged  <input type="checkbox"/> Indifferent	<input type="checkbox"/> Actively Engaged  <input type="checkbox"/> Passively Engaged  <input type="checkbox"/> Indifferent	<input type="checkbox"/> Actively Engaged  <input type="checkbox"/> Passively Engaged  <input type="checkbox"/> Indifferent	<input type="checkbox"/> Actively Engaged  <input type="checkbox"/> Passively Engaged  <input type="checkbox"/> Indifferent	<input type="checkbox"/> Actively Engaged  <input type="checkbox"/> Passively Engaged  <input type="checkbox"/> Indifferent	<input type="checkbox"/> Actively Engaged  <input type="checkbox"/> Passively Engaged  <input type="checkbox"/> Indifferent	<input type="checkbox"/> Actively Engaged  <input type="checkbox"/> Passively Engaged  <input type="checkbox"/> Indifferent	<input type="checkbox"/> Actively Engaged  <input type="checkbox"/> Passively Engaged  <input type="checkbox"/> Indifferent	<input type="checkbox"/> Actively Engaged  <input type="checkbox"/> Passively Engaged  <input type="checkbox"/> Indifferent
Stakeholders who will participate	Citizen: homeowners Citizen: local energy initiatives Supplier (Policymaker: municipality)				Citizen: homeowners Citizen: local energy initiatives Supplier (Policymaker: municipality)	Citizen: homeowners Citizen: local energy initiatives Supplier (Policymaker: municipality)	Citizen: homeowners Citizen: local energy initiatives Supplier (Policymaker: municipality)	Citizen: homeowners Citizen: local energy initiatives Supplier (Policymaker: municipality)	Citizen: homeowners Citizen: local energy initiatives Supplier (Policymaker: municipality)
Result of each activity	See report attached								
Reflection summary from participants	<u>t.b.d.</u>								

## Methodology followed for Gas Free Neighbourhoods

This report provides an overview of the activities done by TNO that aimed at fulfilling the requirements of D2.3, a reflection on our recruitment strategy, a description of our way forward and a literature review on several relevant studies conducted by TNO, PAW and MarketResponse on the natural gas-free neighborhoods. Finally, based on this literature review, preliminary Community Level Indicators (CLI's) are formulated.

## Activities aiming at fulfilling the requirements of D2.3

In order to fulfill the requirements of D2.3, meaning conducting a workshop to retrieve CLI's from our case study, the natural gas-free neighborhoods in the Netherlands, the following activities have been executed:

- March 2022 • An introduction about the workshop and recruitment strategies was given by LUT.
- April 2022 • The template for the GRETA consent form and stakeholder invitation letter was provided by LUT. These templates were adapted to the natural gas-free neighborhoods and translated into Dutch (see **Error! Reference source not found.** and **Error! Reference source not found.**).
- The recruitment of workshop participants was started.
- The workshop template was adapted to own needs, i.e., the workshop being held physically (see **Error! Reference source not found.**).

- May 2022
- Confirmation of available budget (750€) to reimburse participants, rent a location and purchase necessary materials. The budget was based on the following indicative costs:

Indicative costs	
100€	Renting location: Wijkbureau Paddepoel, Winkelcentrum Paddepoel
100€	Lunch for participants
500€	50€ bol.com gift certificate as reimbursement for each participant (ca. 10 participants in total)
20€	Material for workshop (e.g. flip over and sticky notes)
<b>Total costs</b>	
720€	

- June 2022
- Additional leads were collected and contacted by means of asking colleagues within TNO.
- July 2022
- The recruitment is still on-going. No official confirmation was received by one of the natural gas-free neighborhood (see status below).

## Reflection on recruitment strategy

The recruitment of workshop participants started in April 2022. In April and May, we performed warm acquisition by contacting project partners of us via e-mail as well as via phone. In May, we received confirmation that there is a budget of a total of 750€ available to reimburse participants, rent a location and purchase necessary materials. After that, in order to attract potential participants, the reimbursement in form of a 50€ bol.com voucher as well as a free lunch were stressed towards all warm leads. Due to still being unsuccessful in June, we performed cold acquisition by contacting project partners and other relations of our colleagues within TNO.

After four months of recruitment, we are still experiencing recruitment difficulties. The main reasons are the following:

- In the Netherlands, a lot of natural gas-free neighborhoods are overloaded by research activities (among others workshops) and citizens are also often asked to participate in multiple activities. Hence, the project leaders are hesitant in participating in additional projects to not burden the citizens and make sure that they will remain part of their own research and participation activities on a long term.
- Timing is an issue as well. In many cases, the project is already in a more matured stage and goals have been formulated already. Hence, project leaders mention that we should



have been involved in their project earlier. Besides that, as soon as we approached May and June, potential case studies rejected our workshop due to the summer holidays.

Based on these experiences, we have learned the following:

- Develop long-term relationships with a few case studies, which are involved in your project from the start. This heightens the chance that case study leaders feel more involved and are therefore more inclined to take part in activities from the project.
- Start earlier with the recruitment. To get different stakeholders, such as citizens, policy makers, initiatives and suppliers on one table is not easy (especially not before the summer break).
- Make sure that the results of your project or research activities translate into practical steps/ procedures/ outcomes, case studies can use and implement easily. For example, in case of the workshop, defining and prioritizing goals and CLI's could be a starting point, monitoring should be defined and set up together, while follow-up workshop serve as update and possible adjustment sessions.

## Way forward

Due to the recruitment issues, we decided to move on with the following approach:

Firstly, there are a few projects that might be willing to participate in mid-august/ beginning of September 2022, namely:

1. Wijkpaleis Paddepoel
2. Municipality of Gouda
3. Groenste Buurt

We will arrange a workshop with one of the above mentioned projects and will include the results of this workshop in another deliverable at a later point in time.

Secondly, for D2.3, we will make use of research that was already conducted by the Program of natural gas-free neighborhoods (PAW), MarketResponse as well as TNO in order to distill preliminary CLI's.

## The power of the collective

In 2020, TNO has conducted research on *renewable energy communities*, which are communities with an energy-related goal (Klösters, de Koning, Kort and Kooger, 2020). These communities generate energy from renewable sources in a sustainable way. The technologies they use are partly or wholly owned by the local community. In this research, TNO analyzed the customer journey of the collectives, i.e., all the steps the community follow: from the first ideas until the realization of their plans. Based on desk-research and interviews with ten participants of different collectives, distributed over 7 provinces in the Netherlands, TNO mapped all the success factors and

bottlenecks the collectives experienced. In Figure 17. Customer Journey of the collective below, the customer journey of the collective is illustrated (in Dutch).

Figure 17. Customer Journey of the collective.



This customer journey consists of nine main steps (with a few side steps). In the following, these nine steps are summarized shortly:

### Step 1: Awareness of opportunities for sustainable energy and quality of life in one's own neighborhood

A collective usually arises from a concrete cause. The initiators are often interested because of a professional background in the field of energy transition, meetings organized by the municipality or external parties with residents from the neighborhood, or because of reports or a decision by the municipality. Initiators often find the environment and climate important, want to live more sustainably and see that they can contribute to energy transition at the local level.

### Step 2: Core team of residents with shared vision forms

A few initiators bring together residents with a shared vision. These initiators have a clear vision and are able to articulate it and to inspire others about it. Sometimes, initiators consciously invite not only like-minded people, but also a 'counter-movement' to hear other sounds and perspectives. The more residents agree with the shared vision, the more involved they will feel and the more support there will be. The presence of a socio-physical infrastructure is important for active involvement. Sometimes this infrastructure is already present, for example in the form of active associations or local working groups. These initiatives and organizations often already have

contact with each other and/or work together. Sometimes the collective itself sets up a new socio-physical infrastructure, for example by appointing several volunteers as contact persons in the neighborhood.

### **Step 3: Orientation on possibilities for concrete action**

The initiators orient themselves on the subjects they want to work on. For example, they want to make homes more sustainable, improve the quality of life in the neighborhood or examine, together with the residents, how they can generate sustainable energy or become natural gas-free. This starts with gathering information through various channels. To this end, the initiators look for sources that can provide reliable information and for possibilities to convert the ideas into concrete actions.

### **Step 4: Mapping shared goals and mission**

When it is clear which ideas and plans the initiators share, they translate this into objectives and a mission. Examples of objectives are energy saving, sustainability, affordability, cost-effectiveness and jointly achieving these principles. The mission may be to choose and work towards a technical solution, such as the construction of a solar field or making the neighborhood gas-free. But it can also be representing residents from the neighborhood and jointly drawing up requirements that the eventual technical solution must meet, regardless of what that solution may be. Examples of these requirements include keeping the cost of living constant, limited risks and guaranteed comfort. In this step, the collective also makes these objectives concrete so that targeted actions can be taken. In addition, the collective maps out its own position in relation to the vision and mission of external stakeholders.

### **Step 5: Choosing an appropriate organizational form**

The residents in the collective choose a form of organization with a legal status. Many collectives choose the form of a cooperative. They begin as a citizens' initiative without a legal form. As soon as financial aspects come into play, they have to sign contracts for orders, subsidies or projects and people want to invest jointly, the need to establish an organization quickly arises. A cooperative often proves to be the best solution because it is a form of enterprise that members manage and finance themselves on the basis of a shared objective.

### **Step 6: Further elaboration of plans, including research, feasibility test and intended financing**

The collective starts with the detailed elaboration of its own plans. This includes having research carried out by experts, such as energy scans by consultants or feasibility studies by consultants. A business case is also drawn up. The collective includes in its plans how it will arrange financing (based on the business case, subsidies and investments by residents and other stakeholders). Sometimes a different form of organization is needed, such as a Collective Private Ownership (CPO) for communal building. The collective tests the feasibility of the plans among its members in order to ensure support among residents. This can be done, for example, by organizing an information meeting and requesting declarations of intent from residents.

### **Step 7: Preparation for the realization of the plan**

In order to implement the plans, the collective makes preparations. These preparations include a detailed plan and a request for funding or investment, for example for a subsidy from the municipality. The funding makes it possible to organize activities and involve others in the collective, such as information meetings or hiring experts. In this step, the business case is also worked out and tested for feasibility. The collective sends out a request for offers or tenders to parties such as contractors, installers and suppliers. Sometimes, consortia of/with these parties are formed. A selection is made of contractors, installers and suppliers, possibly in the form of a consortium.

### **Step 8: Realization of the plan**

In this step, the plan is implemented. The financing is or will be arranged, the contractor, installers and suppliers will start work to realize the solution(s). The 'old' organizational form can be changed again at this stage (for example, a foundation) or disbanded (for example, a CPO). An organizational form is chosen that fits the business model elaborated in step 7. In this phase, the role of a collective may also change, depending on which party is responsible for the realization of the plan, whether or not in cooperation with the collective. This change too was elaborated on in the previous step.

### **Step 9: Management, maintenance and operation of the solution**

The solution has been realized in practice, the project has been implemented and is now entering the management, maintenance and exploitation phase. Depending on the business model, the management, maintenance and operation are assigned to one or more parties of which the collective may be a part or has full ownership. Depending on the role of a collective in this exploitation phase, it determines (with others) how the revenues from the implemented solution will be spent. For example, returning the revenues to the members as lower tariffs, or as an investment for new projects of the collective.

### **During steps 6 to 9: Encouraging residents to take steps (already)**

During the development of the 'bigger plan', residents are encouraged to already take steps. Examples of this are concrete actions to save energy or installing insulation solutions. Also, during the step 'development and realization', residents continue to be encouraged to take steps towards the ultimate goal.

### **Parallel to all steps: Collecting what's on the minds of residents and building and maintaining a network with external stakeholders**

During the customer journey, it is important for collectives to keep in touch with what is going on among residents in the neighborhood. It is also crucial to build up familiarity and support among the supporters, the residents the collective represents. When residents know and recognize the collective, this increases the chance of support for the plans of the collective. This makes the

members of the collective ambassadors of the objectives and mission throughout the process. The collective also gives feedback to the residents about what has been collected. This creates feedback loops between the collective and the residents, whereby the collective has a clear picture of what is important to the residents and the residents know what the collective is doing.

Throughout the process, a collective enters into dialogue with parties with whom it wishes to collaborate, such as the municipality, other local initiatives and companies in the region. The collective gradually builds and maintains this network. In this way, the name recognition of the collective increases. The network provides access to relevant knowledge and funding.

During this customer journey, several success factors and bottlenecks play a role (to a greater or lesser extent) during all the steps. Success factors that are identified by Klösters, de Koning, Kort and Kooger (2020) are:

- Enthusiasm and perseverance
- Right mix of knowledge and competences
- Common goal
- Clear own role and external positioning
- Close to residents
- Responding to what is going on and stimulating social cohesion
- Knowing how to find your way around the municipality
- Professional network
- Good cooperation with the municipality.

Bottlenecks that are identified are:

- Insufficient technical knowledge
- Limited contribution of board and working group members
- Not taken seriously enough by parties
- Little room for collective action from the municipality
- Little continuity within the municipality
- Insufficient integral cooperation within the municipality
- Barriers in legislation and regulations
- Different interests of collectives and municipalities
- Insufficient (structural) funding
- Insufficient knowledge sharing between collectives.

Based on the results of the study by Klösters, de Koning, Kort and Kooger (2020), we distilled the information needs of collectives, which we then partly translated into preliminary CLI's.

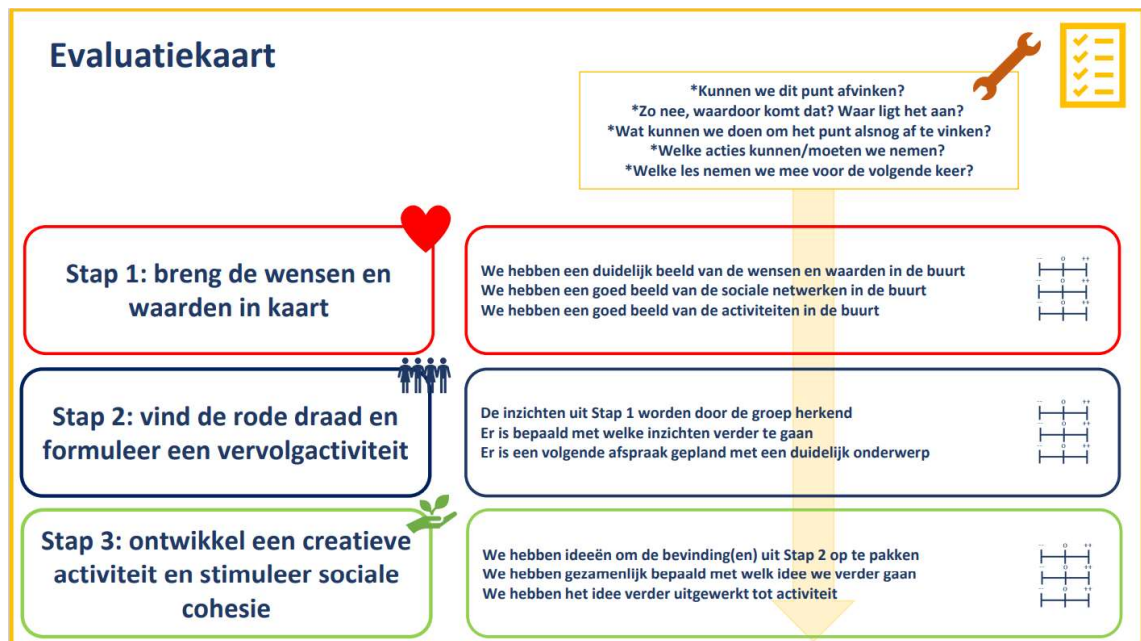
### Evaluation-card for local initiatives

Based on scientific insights, a toolkit was developed by Eerland, de Koning, Kort, Paradies and van der Weerdt (2020) in order to help locally-operating organizations and initiatives to map out what people find important, how to connect with them and thus create enthusiasm and growth.

The toolkit consists of the following evaluation card (in Dutch, see

Figure 18181818. Evaluation card to evaluate the approach of a project with local initiatives.).

**Figure 18181818. Evaluation card to evaluate the approach of a project with local initiatives.**



The goal of this evaluation card is to get better results and a closer team. The described three steps can be executed throughout a project. Each step consists of the following aspects:

#### Step 1: Identify the wished and values

- We have a clear picture of the wishes and values in the neighborhood
- We have a good picture of the social network in the neighborhood
- We have a good picture of the activities in the neighborhood

#### Step 2: Find the common thread and formulate a follow-up activity

- The insights from step 1 are recognized by the group
- The group has determined which insights to use next
- A next appointment is planned with a clear topic

#### Step 3: Develop a creative activity and stimulate social cohesion

- We have ideas on how to deal with the findings from step 2
- We have decided together which idea we will take further
- We have developed the idea into an activity



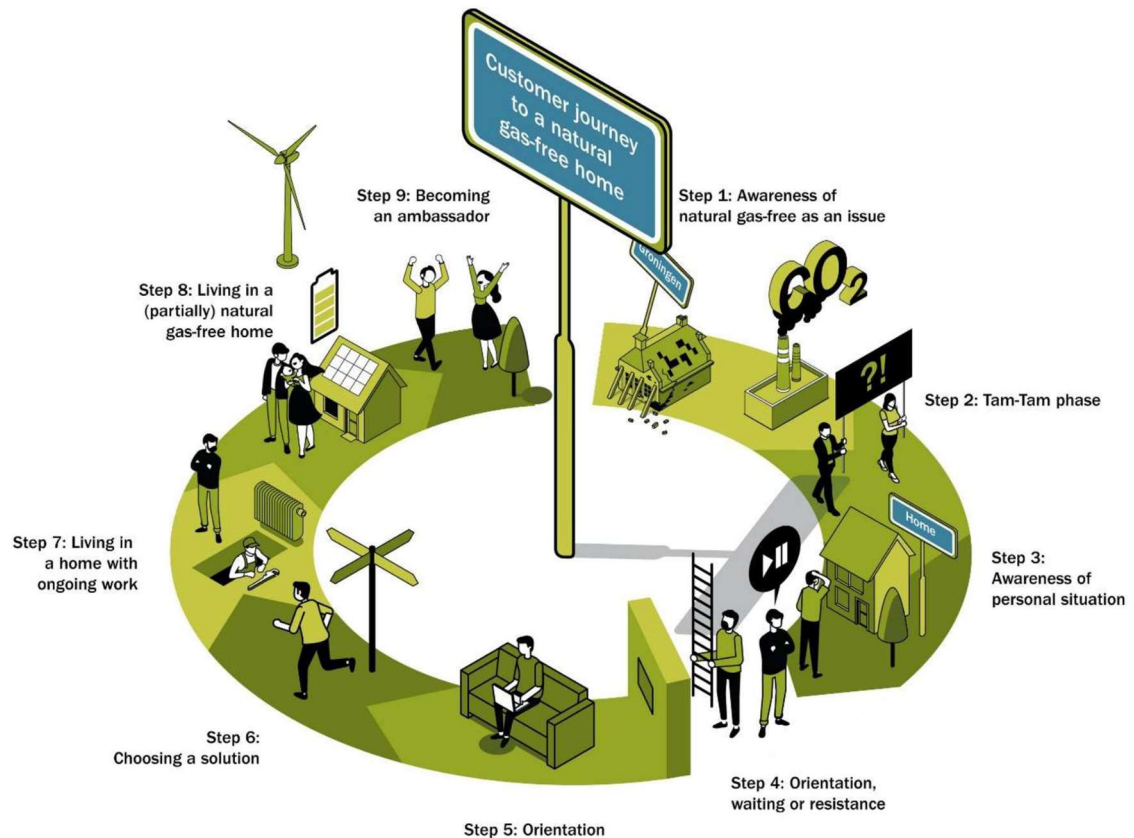
For each aspect, the following questions should be asked:

1. Can we check this point from the list?
2. If not, why? What is the reason?
3. What can we do to complete the task?
4. What actions can/should we take?
5. What lesson do we take away for next time?

### Natural gas-free homes and the role of the resident

In 2020, TNO has conducted research on the drivers and barriers that Dutch residents experience on the typical journey towards natural gas-free homes (de Koning, Kooger, Hermans, and Tigchelaar, 2020; see Figure 19. Customer journey to a natural gas-free home.).

**Figure 19. Customer journey to a natural gas-free home.**



This customer journey consists of nine main steps (with a few side steps). In the following, these nine steps are summarized shortly:

#### **Step 1: Becoming aware of natural gas-free as an issue**

In this phase, citizens become acquainted with the concept of a natural gas-free home. Through various sources, they become aware of what a natural gas-free home means (or an alternative

concept, depending on the framing). Citizens will move on to the next step in case they decide that this topic is relevant to them.

### **Step 2: Tam-tam phase**

Next, citizens form their own opinions based on the information available to them. This step is called the 'Tam-tam phase' because information could be incorrect or incomplete since they derive from each citizen's 'tam-tam': their social network, social media and/or regular media. Citizens will move on to the next step in case they are convinced of the necessity for themselves.

### **Step 3: Awareness of personal situation**

In step 3, it will become clearer to citizens what natural gas free homes means for their personal situation. They have a rough idea of what a natural gas-free home will look like for them. Citizens will move on to step 4 in case they feel that they can assess whether the alternatives are urgently needed, feasible and attractive enough or not.

### **Step 4: Choice of orientation, waiting or active resistance**

After the impact on the personal situation is roughly known, citizens will consciously or unconsciously make the choice for one of three things: either to orientate themselves towards practical solutions for their own home, or to wait (do nothing), or to actively resist natural gas-free. Of course, the most desirable choice is for citizens to find out which solution would suit their home and themselves. Citizens will move on to the next phase in case they want to take action.

### **Step 5: Orientation**

Citizens who want to take action, will obtain information through channels that are logical for them. They will move on to step 6 in case they feel sufficiently informed or if there is a suitable decision aid to base their choice on.

### **Step 6: Choosing a solution**

In this phase, citizens choose the solution that they find most attractive. To make this choice, citizens have found a good heuristic (what is the neighbor doing? how will the municipality advise me?) and they have a reason to actually make a purchase. A reason could be, for example, that they are called by a provider or advisor.

### **Step 7: Living in a home with ongoing work**

Citizens live in a home while the solution is installed. This can be a nuisance.

### **Step 8: Living in a (partially) natural gas-free home**



In this phase, the solution has been (provisionally) installed and people are living in a natural gas-free home. However, in case a solution has been chosen whereby the house has not been converted into a completely natural gas-free home all at once, the citizen is living in a partially natural gas-free home.

### Step 9: Becoming an ambassador

In this last phase, citizens share their positive or negative experiences about the process. This is important information for their social network and in particular those that have not yet completed the entire customer journey.

For each of the above-described steps of this customer journey, both energy and non-energy motives were examined. To investigate the drivers and barriers of owner-occupiers, a fieldwork was conducted in two comparable neighborhoods in the Netherlands: Overwhere-Zuid in Purmerend and Wijk 03 Noord in Zwijndrecht. Various methods have been used to gain insights into the drivers and barriers that residents experience in the transition to natural gas-free. Discussions were held with employees of the municipality and (street) interviews were conducted with residents. There were also two working sessions with a member of the Gasvrij Purmerend ('Gas-Free Purmerend') team to identify the Purmerend approach.

In total, 49 barriers and 38 barriers were found in both Purmerend and Zwijndrecht (see **Error! Reference source not found.**). For an overview of the identified barriers and drivers per step of the customer journey, please see: [Aardgasvrij wonen: drijfveren en barrieres van bewoners - Energy.nl](https://aardgasvrij.wonen.drijfveren-en-barrieres-van-bewoners-energy.nl).

Table 9: Overview of the amount of drivers and barriers per step of the customer journey, for Zwijndrecht and Purmerend

	Barriers		Drivers	
	Purmerend	Zwijndrecht	Purmerend	Zwijndrecht
Step 1: Becoming aware of natural gas-free as an issue	7	4	6	5
Step 2: Tam-tam phase	10	5	2	1
Step 3: Awareness of	6	7	4	1

personal situation				
Step 4: Choice of orientation, waiting or active resistance	7		5	3
Step 5: Orientation			5	3
Step 6: Choosing a solution			1	1
Step 7: Living in a home with ongoing work	2		1	
Step 8: Living in a (partially) natural gas-free home				
Step 9: Becoming an ambassador		1		
Total	32	17	24	14

Based on the results of the study by Klösters, de Koning, Kort and Kooger (2020), we distilled the information needs of individual home-owners, which we then partly translated into preliminary CLI's. These information needs can be found in **Error! Reference source not found.** for Purmerend and **Error! Reference source not found.** for Zwijndrecht in **Error! Reference source not found.**.

### Residents' satisfaction with pilot projects for gas-free neighborhoods

In 2021, research was conducted by MarketResponse in order to study the satisfaction of residents in pilot neighborhoods (MarketResponse, 2021). This quantitative survey is part of a broader annual monitoring system of the PAW. This measurement is a first step in measuring resident

satisfaction in a uniform way among the 46 participating municipalities. In this first measurement, 7 municipalities participated.

In order to measure the satisfaction of residents, the following aspects were identified:

1. Awareness and attitude towards 'making gas free'
2. Resident satisfaction with living lab neighborhood approach
3. Satisfaction with participation opportunities
4. Satisfaction with the role of the municipality
5. Satisfaction with the offer 'making your home gas-free'

The results clearly show that the attitude towards natural gas-free also determines how satisfied people are with the living lab approach: residents who are positive about the steps that will be taken and who also see a role for themselves in increasing sustainability give a much higher satisfaction score than residents who do not agree. The living lab neighborhood approach is rated with an average of 5.3, while 46% give an unsatisfactory rating (1-5), 34% a satisfactory rating (6-7) and 20% a good rating (8-10). There are clear differences in satisfaction between subgroups. The following groups of residents are generally more satisfied with the living lab approach:

- Residents of living labs where a residents' initiative is central to the process (bottom-up approach versus top-down approach neighborhood);
- Residents who want to contribute to the costs themselves (are intrinsically motivated);
- Residents who have already received an offer (despite the fact that they may be critical about the offer, it does remove concerns);
- Residents who are more satisfied with the offer received.

Further, results show that the financial side of making homes gas-free is a central issue for residents. It is often mentioned as a point for improvement and hardly ever as a reason for satisfaction. Other factors influencing satisfaction are low reliability of the proposed techniques and lack of freedom of choice regarding one's own home. Factors that influence resident satisfaction positively are clear and regular communication from living labs and involving residents. For involved and satisfied residents, sufficient progress in the process is needed. However, residents' preferences regarding the participation process differ greatly.

In general, the offer that residents receive does not always correspond to their wishes. Additional desk research shows that awareness of the living lab characteristics is necessary, since no district, neighborhood or testing ground is the same. From additional interviews with municipalities, external factors have been identified which complicate the participation process, namely corona, the general image municipalities and the influence and communication from 'The Hague'.