

D2.2

A replicable workshop design template for co-creating Community Level Indicators

Prepared by: LUT
Contributions from: CWD, UNIBO, TNO

Deliverable nature	Report
Dissemination level (Confidentiality)	Public (PU)
Delivery date	2022-02-28
Version	1.0
Total number of pages	58
Keywords	Co-design, Community Level Indicators, energy communities, energy citizenship, workshops
Cite as	Wolff, A., Klein, L., Kumar, A. (2022). A replicable workshop design template for co-creating Community Level Indicators. D2.2 of the Horizon 2020 project GRETA, EC grant agreement no. 101022317, Lappeenranta, Finland.
Project contact	Annika Wolff, email: annika.wolff@lut.fi



Disclaimer and acknowledgement

The views expressed in this document are the sole responsibility of the authors and do not necessarily reflect the views or position of the European Commission or the European Climate, Infrastructure and Environment Executive Agency. Neither the authors nor the Agency nor the GRETA consortium are responsible for the use which might be made of the information contained in here.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101022317.

Executive summary

This deliverable represents the first step towards conducting co-design with case study citizens and representatives in order to understand how each community would prefer to measure progress against decarbonisation goals. A co-design approach brings several benefits. 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 will be conducted in all six GRETA case studies – two face-to-face and four online. The output of this deliverable will therefore be a co-design scheme for collecting community-level indicators in the context of each case study.

In order to conduct co-design, it is necessary to first identify the co-design methodology that will be followed and then design activities as part of the session that are designed to elicit the set of Community Level Indicators. The main objectives of this deliverable are:

1. To understand the theoretical background behind Community Level Indicators and methodologies for co-designing them.
2. To develop a replicable approach for co-designing Community Level Indicators, based on the prior research.

The first section introduces the deliverable and presents background literature on Community Level Indicators. The second section presents the literature review of existing Community Level Indicator methodologies as well as revisits the KPI methodologies that were already delivered in D8.1. The third section presents the co-design framework including definition of all the co-design activities and how they might be conducted in online and face-to-face settings.

Project information

Grant agreement No.	101022317
Acronym	GRETA
Full title	GReen Energy Transition Actions
H2020 Topic	H2020-LC-SC3-2020-NZE-RES-CC
Project URL	www.projectgreta.eu

Document information

	Number	Title
Deliverable	D2.2	A replicable workshop design template for co-creating Community Level Indicators
Work package	WP2	Information sensemaking and sharing within, between, and beyond energy communities
Task	T2.2	Participatory design of Community Level Indicators

Delivery date	Contractual: M10, Actual: M10
Nature	<input checked="" type="checkbox"/> Report <input type="checkbox"/> Other <input type="checkbox"/> ORDP
Dissemination level	<input checked="" type="checkbox"/> Public <input type="checkbox"/> Confidential
Authors (partners)	Annika Wolff (LUT), Lurian Klein (CWD), Ajesh Kumar (LUT)
Reviewers (partners)	Mari Kiviniemi (KAS), Pasi Nokelainen (KAS)
Summary (For dissemination)	This report details a set of workshop activities that can be used for co-designing Community Level Indicators (CLIs) within energy communities. Co-design of CLIs serves two purposes. On the one hand, the process of thinking about the goals that a community collectively holds for decarbonisation and how to measure progress towards goals or find evidence for new policies or interventions may empower communities to act as energy citizens. On the other hand, the outputs of such a process may be useful when considering how to define Community Transition Pathways. The report discusses both online and face-to-face versions of activities that can be easily tailored to different contexts. The co-design process is based on analysis of literature on co-design methodologies and tools, existing schemes for defining CLIs and also general business key performance indicator methodologies.
Keywords	Co-design, Community Level Indicators, energy communities, energy citizenship, workshops

Version	Date	Description
0.1	2022-01-15	First draft
0.2	2022-02-14	Second draft for the internal review
0.3	2022-02-18	Third draft
1.0	2022-02-28	Final version

Table of contents

Disclaimer and acknowledgement	2
Executive summary	3
Project information.....	4
Document information	5
Table of contents.....	6
List of figures	7
List of tables	7
Abbreviations and acronyms	8
1 Introduction.....	9
1.1 Community Level Indicators.....	9
2 Literature review	11
2.1 Community Level Indicator methodologies	11
2.2 KPI methodologies	15
2.3 Co-design methodologies	17
2.3.1 Co-design processes	17
2.3.2 Co-design methods	18
3 Developing a CLI co-design framework	20
3.1 Pre-design.....	21
3.1.1 Identify project goals	21
3.1.2 Conduct literature review.....	22
3.1.3 Identify key stakeholders.....	24
3.1.4 Define a recruitment strategy	25
3.1.5 Planning for co-design workshop(s)	32
3.2 Generative and evaluative	37
3.2.1 Introduction and familiarisation to the problem.....	37
3.2.2 Defining the community boundary	40
3.2.3 Collaborative case study goal setting.....	41
3.2.4 Ideating new indicators within framing of goals and CLI dimensions	43
3.2.5 Evaluating CLIs and making final selection	45
3.2.6 Closing activities.....	46
3.3 Post-design	47
3.3.1 Utilising CLIs within case studies as part of defining CTPs	47
3.4 Materials and equipment	47
4 Summary.....	49
References.....	50
Annex 1. Workshop Template	53

List of figures

Figure 1. The PuMP Blueprint's eight steps to choose, implement and utilise quantitative KPIs (Barr, 2019, 2014).....	16
Figure 2. Schematic representation of the communication flow between the gatekeeper(s) and other stakeholders involved with the co-design workshop in the Pilastro-Roveri CS.....	27
Figure 3. 5-tier awareness level among citizens within the GRETA Case studies (replicated from D7.1, Nokelainen and Talikka, 2021).....	27
Figure 4. An overview of all the example activities organised on a single Miro board.....	36
Figure 5. An example Miro board for exploring indicators.....	39
Figure 6. An example Miro board for defining the virtual and/or physical community.....	41
Figure 7. An example Miro board for defining the communities case study goals.....	43
Figure 8. An example Miro board for ideating indicators.....	45
Figure 9. An example Miro board for evaluating and elaborating indicators.....	46

List of tables

Table 1. Proposed co-design stages for GRETA.....	20
Table 2. Example KPIs within various domains from Angelakoglou et al. (2019) (replicated from Mendes et al., 2021).....	23
Table 3. Example KPIs within various sub-themes from Bosch et al. (2017) (replicated from Mendes et al., 2021).....	24
Table 4. 3-tier precision level for the identification of key stakeholders in the GRETA project (replicated from D7.1, Nokelainen and Talikka, 2021).....	26
Table 5. Recommended recruitment strategies and examples of mechanisms for their practical implementation.....	29

Abbreviations and acronyms

CS: Case Study

CLI: Community Level Indicators

CTP: Community Transition Pathway

DER: Distributed Energy Resources

KPI: Key Performance Indicator

RES: Renewable Energy Source

PS: Participatory Sensing

1 Introduction

1.1 Community Level Indicators

This deliverable is part of Task 2.2 which aims to define Community Level Indicators (CLIs) for each case study in order to understand how each community would prefer to measure their progress against GRETA objectives and against decarbonisation targets in general. This deliverable represents the first step towards conducting co-design with case study communities, which is to define the co-design scheme that will be applied to each case, either through online or face-to-face co-design workshops. The outcome of these workshops themselves will be reported within D2.3 which is also part of Task 2.2. This outcome will ultimately be used to inform the creation of the Community Transition Pathways (CTPs).

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).

Community Level Indicators (CLIs) are guides for identifying such parameters which, when measured, can determine whether changes have occurred as a result of a campaign. CLIs can be considered as bits of information that, when combined, generate a picture of what is happening in a community. They help identify insight into the overall direction of a community in terms of whether it is improving, declining, or staying the same, or is some mix of all three. A combination of indicators can therefore provide a measuring system to provide information about past trends, current realities, and future direction in order to aid decision making. In this sense, Community Level Indicators can also be thought of as grades on a report card that rates community well-being. It is not necessary that indicators are used for benchmarking purpose. Indicators themselves do not provide a model of how a community works or how to determine planning choices; rather, they provide information that can be used by planners and others when faced with decisions about the community (Phillips, 2003).

CLIs have long been used with the first ever use credited to Russell Sage Foundation for conducting surveys that presented information about a community and their condition with respect to social condition such as education, health care, crime, etc. Community Level Indicators were overshadowed by economic terms such as Gross Domestic Product and Gross National Product around the time of the great depression of the 1930's. In the 1960's and 1970's such indicators – which captured demographic details, factors affecting quality-of-life, and environmental quality – began getting

more attention from researchers as they were found to be a more effective way to ascertain community growth than traditional economic indicators. In the 1990's sustainability became a movement, and it resulted in Community Level Indicators being widely used in planning, policy, and citizen participation (Phillips, 2003). Citizens and other stakeholders such as private foundations, public agencies, and non-profit organisations, worldwide have eagerly embraced the application and idea behind community sustainability, and it has been called "virtual social movement" (Innes and Booher, 2000).

In the domain of energy, CLIs play a major role in helping to achieve energy sustainability and in trying to achieve a just transition. Examples of such indicators include, 1) access to electricity, 2) access to clean fuels and technology for cooking and heating needs, and 3) renewable energy share (Mei-Hua Yuan and Shang-Lien Lo, 2020).

This task will explore existing CLI methodologies and build upon the KPI methodologies identified in D8.1 and will use the final set of GRETA KPIs as a starting point for engaging communities in understanding how to use indicators to measure progress against certain targets.

The deliverable will focus on creating CLIs through a co-design approach. This brings several benefits. Firstly, by co-designing the indicators it is possible to develop indicators that have relevance to the people who are directly involved with or impacted by 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 addition to utilizing the co-design approach, existing KPI and CLI methodologies will also be considered.

In order to conduct the co-design effectively, it is necessary to have a precise plan for mediating activities with a diverse set of participants. Thus, it is necessary to first identify the co-design methodology that will be followed and then design activities as part of the session that are designed to elicit the set of Community Level Indicators. The output of this deliverable will therefore be a co-design scheme for collecting community-level indicators in the context of each case study. The co-design activities will then be conducted in all six GRETA case studies. In two case studies, the activities are currently planned to take place face-to-face, and, in the remainder, the activities would take place online. Therefore, a scheme for conducting workshops both online and face-to-face activities will be outlined. However, due to the ongoing situation with COVID-19, there is a possibility that all workshops will ultimately take place online. In either case, the workshop scheme will be continually evolved considering knowledge gained through the process of conducting the workshops.

2 Literature review

2.1 Community Level Indicator methodologies

Community Level Indicators (CLIs) are sometimes referred to as community KPIs. They define and measure the success of a project or initiative at a community level (Hemment et al., 2016). For example, in the past they have been used to measure outcomes of interventions designed to improve long term disaster recovery after a tsunami (Hettige et al., 2018), health and wellbeing (Coulton, 1995; Hancock et al., 1999) and social exclusion at a community level (Berman and Phillips, 2000). *One key feature of CLIs identified by Cheadle et al. (2000) is that they are derived from community rather than individual level information.* For example, when defining indicators of health outcomes, a community-level indicator might focus on how many restaurants contain a no-smoking area as opposed to surveying individuals to find out how many were smokers.

Kingsley et al. (2014) have identified 5 distinct uses of community or neighbourhood indicators:

1. *Situation Analysis*: analysing whether situations in a community are getting better or worse.
2. *Policy analysis and planning*: providing evidence for formulating policy.
3. *Performance management and evaluation*: monitoring performance of an intervention.
4. *Education and engagement*: empowering communities to act on problems, by presenting data (e.g., crime statistics) in ways that are easy to understand and interpret.
5. *Neighbourhood research*: identifying patterns of cause and effect, such as the effect of neighbourhood conditions on individual outcomes.

In the past CLIs have typically been defined by leaders of community initiatives and those defining interventions from a top-down perspective. However, especially since the advent of smart cities and since data started to become more readily available, several initiatives have looked towards how communities might leverage that data for measuring success of projects in ways that are meaningful to them. Whilst there is a wealth of information related to KPIs from a business, or top down, perspective, the idea that communities should define their own measures for success is relatively new. As such, there are still open questions as to what methodologies and tools should be available to support communities in defining CLIs and in their subsequent use for measuring progress towards defined goals. This section explores some of the literature related with both top-down and bottom-up creation of CLIs and the relevance of the questions raised, or methods proposed for the GRETA project.

Coulton (1995) identified CLIs as being important to understand how children and families are really impacted by the local community initiatives that are often targeted at them. In this work Coulton identifies that drawing of community boundaries can be problematic – should the boundary be identified based on geography, or by patterns of social interaction? Would the boundary be meaningful to all residents or dependent on their individual circumstance? Based on this, Coulton highlights that *choosing the boundary for a community indicator should be based on 1) being constant over time so that trends can be tracked, 2) it is possible to allocate the available data to that region, and 3) it should be appropriate to the purpose of the indicators.*

Coulton also identified that in the context of measuring wellbeing of children and families it was possible to take either an *outcome orientation* or a *contextual orientation*. In the outcome orientation, the indicators would focus on finding differences in health and wellbeing outcomes of children within the community area identified, but without necessarily understanding how the local community affects such outcomes. In the contextual orientation, the focus is instead on viewing the community as an environment that may affect wellbeing of children and families in either positive or negative ways and this in turn may be reflected in higher or lower rates of health or social outcomes. As such, the focus of measurement is aspects of the community environment.

Based on the above, some key considerations for defining CLIs within GRETA may therefore be:

1. How will we define the community boundary in each case?
2. Should we focus on CLIs that measure factors related to individuals, such as their actions or should the focus be on the environment in which they operate their energy citizenship actions?

Coulson et al. (2018) explored the participatory creation of CLIs to address an ongoing challenge of Participatory Sensing (PS) initiatives, namely, how to make the data useful for people with less expertise in handling data. Participatory Sensing is one tool that communities can use to evidence problems that they face, for example by collecting data about Noise Pollution to lobby authorities. However, communities also need to be able to monitor change and impact for themselves, which may require capturing and making sense of additional information sources. Coulson et al. (2018) therefore developed a participatory approach to generating CLIs to complement work they were doing on PS for noise pollution. They understood that relevant information might relate to where the community thought noise was originating from and so might include indicators related to the amount of traffic, volume of ear plugs purchased, or stress related health problems in noisier areas compared to quieter ones. To identify which CLIs were meaningful for this purpose, Coulson et al. (2018) designed and conducted workshops with local communities through which they tested several tools

for CLI generation. The first was a *noise timeline tool*, where participants used icons to collaboratively note down different noises, they heard within a 24-hour time period, marking also if they were pleasant or disturbing noises. The second was a *collaborative goal setting activity* where participants shared expectations of the noise pollution activities and defined concrete objectives, such as 'reduce traffic noise' or 'identify the relationship between noise and stress'. Finally, participants used a large sheet of paper to map goals to indicators and then identify how often they should be collected (and by whom, and how to collect them).

Overall, Coulson et al. (2018) found that the CLI activity increased awareness of the problem (of noise pollution) and the need to find solutions. This is consistent with the view of Kingsley et al. (2014), that indicators can empower communities to act on problems they find interesting, especially if information is presented in ways that make the problem easy to understand for a general audience.

For GRETA, the importance of the above work is twofold. First in identifying some potential activities for the CLI workshops, namely:

1. Familiarisation with the problem (e.g., through something similar to the noise timeline tool).
2. Collaborative goal setting.
3. Mapping goals to indicators.

Secondly, it gives an indication of how CLI workshops may themselves be useful for engendering active citizenship, by raising awareness of the problems being tackled through the local case study initiatives and in involving people in finding solutions. At the same time, it offers caution that the data and information should be presented in ways that are easy to engage with.

Boyd and Charles (2006) developed and used a framework for Community Level Indicators to monitor sustainability of local fisheries, which merged expert with local knowledge, which was integrated into the process via focus groups. The indicators were classified according to different aspects of sustainability that were relevant to the context in which the indicators were being developed, namely: *community, ecological, institutional, and socio-economic*. Their methodology went through the following stages:

1. Identify participants who will develop the indicators and for whom they will be developed.
2. Develop a common vision and an indicator framework to reflect the vision, for example based on identifying the relevant characteristics of sustainability.
3. Develop indicators to reflect characteristics of sustainability, through:
 - a. literature search (from other indicator development experiences) to create an initial list of possible indicators

- b. evaluation of initial list by indicator development team – which could include community members, experts, consultants and so forth. At this step indicators can be adapted to increase their relevance to the context and new indicators can be added.
 - c. multidisciplinary focus groups may provide an interactive forum to further discuss and clarify indicators
4. Classify and evaluate indicators, according to previous framework (e.g., under sustainability dimensions).
5. Evaluate the indicators according to *general quality* (relevant, predictable, measurable, easily interpreted, timely), *context specific criteria* such as practicality, appropriateness of scale and utility for policy making and *data-specific criteria* such as appropriate in temporal scale, accurate and precise, documented, current.
6. Select indicators for community use.

For GRETA, this process shows how a CLI methodology might combine different expertise and could take place through a mixture of top-down and bottom-up processes. One benefit of this could be to simplify the process for involving a general public with different skills in quite complex tasks such as evaluating indicators according to general and data specific criteria.

Finally, Murphey (1999) drew on experience of developing Community Level Indicators (or *community indicators* as they called them) for youth and family health over several years to highlight what are the most challenging issues that face the development of such indicators and to highlight some lessons learned. These included:

1. Devising the working definition of community. Like Coulton (1995), Murphey (1999) highlights that there are different ways to approach defining the boundary of a community and there is not necessarily a single correct answer. As such, the definition chosen should be based on a definition that is locally meaningful.
2. Creating an Integrated Database. Indicators rely on collection of data, yet the relevant data is rarely contained in a specific location. There can be both political and technical barriers, as well as issues of individuals' data privacy that need to be addressed.
3. Dealing with small numbers. With lesser amounts of data, it can be hard to identify real trends and not just noise and it may be easier to identify individuals within small data sets even when anonymised. It may be better to sometimes look at multi-year averages and to provide information on confidence intervals.
4. Designing a user-friendly presentation format. It can be difficult to present large datasets in ways that are useful and meaningful, yet at the same time avoid over-interpreting the data. The suggestion is to minimise the extent to which data is pre-digested and to provide tools for deeper exploration if needed.

5. Providing a context for thoughtful comparisons. It is not always useful to monitor with a view to saying that something is better or worse than something else. A more useful comparison might be to show that something is better or worse than itself, over time.
6. Fostering informed and continuous use of the data. Simply making data available is not enough to engage everyone. It may be necessary to overcome barriers such as fear of using data or make it easier to integrate use of indicators to everyday practice.

For GRETA, this raises a number of questions:

- Should we in GRETA also support the community to define its own neighbourhood/boundary, in order that it is meaningful to the context, and so that it increases ownership of the projects?
- How do we address technical, political and privacy issues?
- Do we include indicators if the data is only available as small numbers?
- How do we overcome data literacy issues?
- How do we frame the types of trends and comparisons that are useful for energy citizenship and positive green actions, as opposed to potentially creating competition between regions based on gamifying indicators?

2.2 KPI methodologies

KPIs are broadly defined as quantifiable indicators of the degree to which an intended result has been achieved. Businesses often define and use KPIs to measure their success in meeting their business targets and to intervene if things seem to be going in the wrong direction. Similarly, projects such as GRETA define and use KPIs to measure achievement against project objectives. The GRETA deliverable D8.1 (Mendes et al., 2021) has reviewed existing KPI methodologies in order to identify an appropriate method for generating a final list of project KPIs. In this process, several KPIs generated through similar initiatives were found. Both the methodologies and these indicators potentially provide useful input to designing a co-design strategy for community-level indicators. In this section, we summarise the key points of that earlier deliverable which we draw on in this work.

Mendes et al. (2021) explored both generic KPI methodologies and domain specific ones that had been created and used in the context of the clean energy transition and smart cities. Many of the domain specific methodologies had a strong focus on formalising the steps in defining and implementing KPIs. This is demonstrated most clearly through the KPI methodology of Barr (2019, 2014) in Figure 1. Other

methodologies, such as that of KPI.org (BSI, 2021) provide more detail on how to ensure the KPIs are appropriate, how to add targets and thresholds and how KPIs should be formally documented.

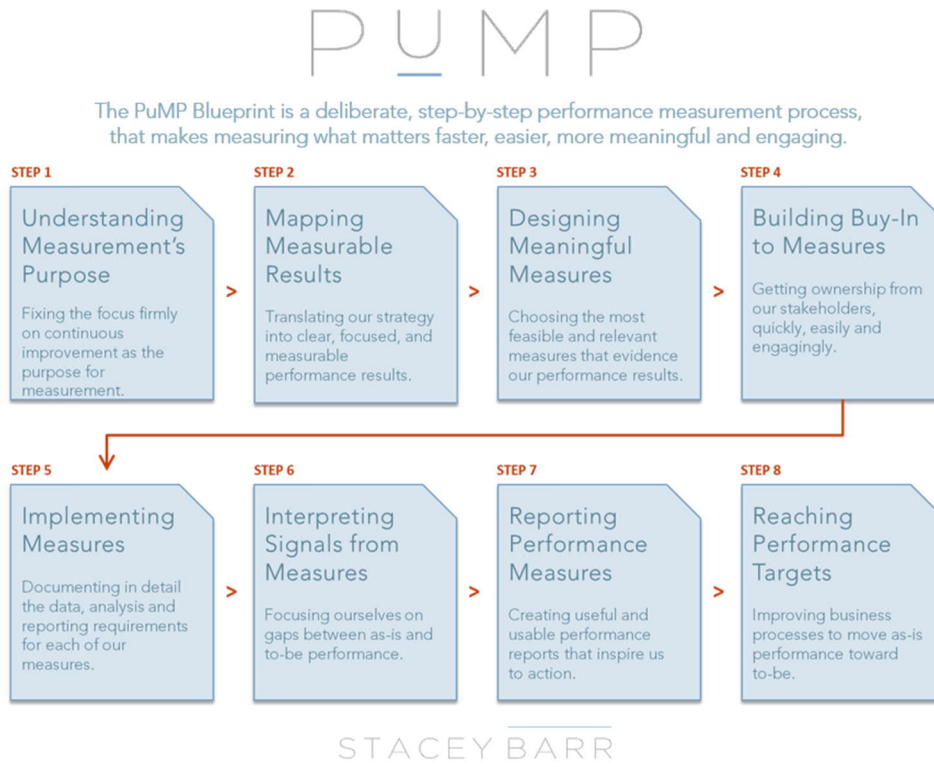


Figure 1. The PuMP Blueprint's eight steps to choose, implement and utilise quantitative KPIs (Barr, 2019, 2014)

From the review of approaches taken for creating KPIs in the context of clean energy transition and smart city projects, several common steps could be found. These included:

1. Identifying project goals (Lien et al., 2019), and categorising them (if needed) for example into different transition tracks (Angelakoglou et al., 2019).
2. Conducting a literature review to identify a broad starting base of KPIs (Lien et al., 2019; Torabi et al., 2020).
3. Identifying key stakeholders (Angelakoglou et al., 2019).
4. Defining KPI dimensions, such as technical, social, environmental, legal (Angelakoglou et al., 2019).
5. Filtering the initial KPI list to select the most relevant (Lien et al. 2019; Torabi et al., 2020). Lien et al. (2019) propose a multi-criteria decision-making approach (MCDM). Torabi et al. (2020) suggest a participatory workshop with the community might be used before a MCDM approach to produce a final ranking and list of indicators. Lien et al. (2019) describe user feedback being given on the outputs of the MCDM.

In addition, some focus was given to practical aspects of KPI definition and management, some of which also was identified in the business KPI methodologies. These included:

1. Defining a KPI repository (Angelakoglou et al., 2019).
2. Defining levels of evaluation, e.g., the scale at which evaluation occurs (Angelakoglou et al., 2019).
3. Defining a threshold (Angelakoglou et al., 2019).
4. Defining criteria against which KPIs can be evaluated (for example, during the selection process). These included relevance, completeness, availability, measurability, reliability, familiarity, non-redundancy and independence (Engels, et al., 2017).

The key questions for GRETA are: if we follow a similar methodology for co-designing CLIs, then:

- At what stages is it appropriate to involve the different case study stakeholders?
- Where does GRETA project's responsibility lay in the CLI process, beyond defining them (e.g., in setting up repositories and similar)?

2.3 Co-design methodologies

Co-design refers to a broad range of participatory approaches towards involving users or customers into a collective, creative design process. The benefits of co-design are varied, but a key benefit is that it is more likely than other approaches to produce outcomes that are closer to the needs of such users or customers and therefore more likely to be accepted, or adopted by them (Steen, 2013).

2.3.1 Co-design processes

During the process of co-design, ideas that may initially be quite fuzzy become more concrete through a process of iterating over the problem. Sanders and Stappers (2014) have identified 4 common phases through which a co-design process may iterate, starting from abstract ideas and moving towards concrete solutions. These are:

1. Pre-design in which prior research and organisational activities occur that are necessary to prepare people to participate in a co-design process. This includes understanding the problem context and the people involved.
2. Generative in which the design space is explored, and ideas are produced. This is usually the main participatory phase of the co-design and is *often supported by several tools and methods designed to help the ideation process*, that have been tailored to the problem context.

3. Evaluative in which the outcome of the design process is evaluated to understand whether it needs adaptation or refinement.
4. Post-design in which research takes place once the design is finalised to understand how well it meets the needs of people.

The tools and methods used within a generative phase may also be classified according to whether they are based on *making*, *telling*, or *enacting* (Sanders & Stappers, 2014), although a combination of approaches is commonly used.

Making involves creative acts by participants and may be supported by *probes* designed to elicit a response or help to understand more about a topic, *toolkits* tailored to the problem that provide resources for participants to be creative with and *prototypes* which are manifestations of ideas that resemble somehow the desired outcome.

Telling involves more dialogue-based approaches. One example of this is a world café or fishbowl, which are both specialised techniques designed to support conversations between people in small table groups, such as those in a co-design situation. Other examples are using diaries or daily logs, or the use of cards and other prompts designed to elicit conversation.

Enacting is a process of demonstrating through action. One example of this is *bodystorming* in which a story is acted out in order to show a particular type of design.

2.3.2 Co-design methods

Co-design methods provide a more detailed description of how to instantiate different parts of a co-design processes, which must then be tailored to the specific co-design task.

One example of this is the *dialogue labs* method (Lucero et al., 2012), which considers not just the *process* of co-design but also the orchestration of the co-design *space* and then the *materials* that support co-design and how they are used within the process and space. This is based on the philosophy of Schön (1988), that views design as an activity that comes about as a result of a reflective conversation and the materials of design, or in other words, using the tools and methods used to support the co-design process. In a dialogue lab-based co-design session the emphasis is less on the created artefacts and more on the conversations that happen during their creation. The method typically occurs *in the middle stages of a design process* – in other words, during the generative phase as identified by Sanders and Stappers (2014) – and consist of something like a 2-hour session divided into a series of 15-minute activities (including a 5-minute break after one hour). The dialogue lab has typically the following stages:

1. Introduction. A 15-minute introduction to the workshop goals and how the session will be conducted.

2. Co-design round (in pairs). Engaging in activities designed to elicit new ideas in relation to the goal of the session. Typically, there are several activities taking 15 minutes each.
3. Idea sharing. Everyone comes together to discuss ideas that have emerged during the activities.
4. Group co-design. Around 15 minutes in which everyone works together towards the final solution.
5. Closing discussion. Everyone sits together for around 15 minutes, working on a final activity on an ideal solution, possibly working with mock-ups, or play acting.
6. Debrief. Participants fill a questionnaire to assess the quality of ideas that they have agreed to put forward.

The World Café method, as mentioned briefly above, is a formal approach that can be used to facilitate dialogue as part (or all) of a co-design workshop. The World Café method is based on principles of collective intelligence leading to better ideas than individual ideation and that people should 'explore questions that matter'. It can be used with a wide range of participants, from as few as 12 to over 1000. The World Café has the following aspects:

1. Setting. Often set up like a café, with several tables for around 4-5 people at each table.
2. Welcome and introduction. Introducing the topic and making everyone feel comfortable.
3. Small-group rounds. Multiple rounds of 20-30 minutes each, with participants moving to new tables each time. A table host sometimes remains at each station. Large paper may be placed on the table, along with markers and post it notes, to record parts of the discussions.
4. Questions. Questions guide conversations in each round.
5. Harvest. Individuals share outputs with the rest of the group. The results are captured, for example using sketching or graphic recording.

The key considerations for GRETA are:

- We can utilise the four stages to frame the co-design of CLIs.
- When choosing the activities for the generative phase of the co-design, we should focus on *making* and *telling*. Enacting does not fit either to the requirement to support both online and offline co-design nor to the design task itself: it is difficult to imagine how CLIs would be demonstrated through action.

3 Developing a CLI co-design framework

Drawing across the different domain specific KPI methodologies, co-design approaches in general and prior research related to co-design of KPIs, we propose a co-design process that consists of the following steps, some of which are part of *pre-design* (and take place before the community involvement), some of which are part of *generative* and *evaluative* co-design and the rest which are *post-design*. Table 1 presents a list of steps that could be taken for co-designing CLIs including some considerations to be taken at each step and an indication of who might be involved at each stage.

Table 1. Proposed co-design stages for GRETA

Co-design stage	Steps	Considerations	Task participants
Pre-design	Identify project goals	Identify the purpose of the CLIs within GRETA, especially so that these goals can be communicated clearly as part of the co-design process (Kingsley et al., 2014). Define the scope of GRETA’s involvement in utilising CLIs beyond their ideation, taking into consideration factors such as availability of data, requirements for specialist tools and similar.	Researchers
	Conduct literature review to produce initial set of indicators to ‘seed’ the co-design and provide informative examples. This is common literature and not related to individual case studies.	Decision as to whether to take an <i>outcome</i> or a <i>contextual</i> orientation (Coulton, 1995).	Researchers
	Filter CLIs for local context	Conduct an initial filtering of CLIs to reduce the CLIs from literature to a small set relevant for each case study.	Researchers
	Identify key stakeholders	Consider how to effectively combine top-down and bottom-up processes to maximise the benefits of community involvement without taking too much time (Boyd and Charles, 2006).	Researchers
	Define a recruitment strategy	Define a recruitment strategy for attracting identified stakeholders to participate in the workshop(s).	Researchers, technologists, problem-owners, general public
	Planning for co-design workshop(s)	Select a co-design methodology to follow, e.g., Dialogue Lab, World Café, or other. Select appropriate tools to facilitate ideation within the chosen co-design process, considering activities may be either online or offline - for example making or telling but not enacting (Sanders and Stappers, 2014). Define how space is set up (Lucero et al., 2012) and in these days	Researchers, technologists, problem-owners, general public

		especially whether it will be online, face-to-face, or hybrid/synchronous or asynchronous. Ensure adherence to ethical principles of GRETA and use of consent forms as well as data management. Identification of materials (including technologies and software) needed to support co-design activities.	
Generative	Introduction and familiarisation to the problem	Utilise subset of CLIs as examples of indicators?	Researchers, technologists, problem-owners, general public
	Defining the community boundary	Based on geography, or some other definition? (Coulton, 1995)	Researchers, technologists, problem-owners, general public
	Collaborative case study goal setting		Researchers, technologists, problem-owners, general public
	Ideating new indicators within framing of goals and CLI dimensions	Whether to define thresholds, create CLI repositories, levels of evaluation etc. (Angelakoglou et al., 2019). How to overcome data literacy, technical, political, privacy issues? Or problems of 'small' data? (Murphey, 1999)	Researchers, technologists, problem-owners, general public
Evaluative	Evaluating CLIs and making final selection	Evaluate CLIs according to aspects, such as relevance, completeness, availability, measurability, reliability, familiarity, non-redundancy and independence. (Engels et al., 2017)	Researchers, technologists, problem-owners, general public
	Closing activities	E.g., 'harvest' or sharing the final outputs and capturing the results, debriefing and filling questionnaires.	Researchers, technologists, problem-owners, general public
Post-design	Utilising CLIs within case studies as part of defining CTPs	Identifying the availability of required data. Analysing available data in the context of the specific goal. Longitudinal tracking of co-design participants to understand effects of participation?	Researchers, technologists, problem-owners

These considerations are now unpacked into more details in the context of the activities that will take place in GRETA.

3.1 Pre-design

3.1.1 Identify project goals

Given that the CLIs will be used as part of defining Community Transition Pathways, which could ultimately lead to new policy recommendations, we identify three key goals for CLIs that could be of interest within GRETA, and we then examine them for practicality:

1. *Policy analysis and planning*, in other words providing evidence that could inform policy formation.
2. *Performance management and evaluation*, to identify whether interventions arising from active energy citizenship within a specific case study are having the desired effect.
3. *Education and engagement* with the goal of fostering increased energy citizenship amongst those participating to the co-design of CLIs, simply through the process of engaging with the case study characteristics under that lens.

In terms of practicality, we further consider the scope of GRETA's involvement beyond the ideation of CLIs that could be utilised towards these goals.

The use of CLIs for *policy analysis and planning* requires that data already exists that can inform policy making. Open data repositories and national statistics databases may in some cases provide access to relevant data. However, this is not guaranteed. The locating and use of open datasets within the actual co-design itself would be impractical, due to the time it would take – even for participating stakeholders with sufficient data handling skills. It would require advance planning to locate possible data sources and the relevant tools, and identifying potentially relevant data sets, whilst possible, would be complicated as the indicators that would be ideated during co-design are unknown. Therefore, the practical approach would be to include the assessment of data availability as a possible step within the co-design process but with final decisions made during the post-design activities. This information would then be used to provide a recommendation of indicators and possible data sources to support the definition of Community Transition Pathways and eventual policy recommendations that could be supported by evidence. Where data is openly available for the indicators, an analysis of the data would be performed and then delivered to the relevant GRETA case study partners to support the CTP definition process.

The use of CLIs for *education and engagement* is within the scope of GRETA and could be captured using questionnaires as part of co-design and follow up activities such as interviews or questionnaires later, to participants who agree to this.

The use of CLIs for *performance management and evaluation*, however, is potentially even more complicated than those for policy analysis and planning – within the scope of GRETA – since it implies that not only a certain amount of historical data is available from which to identify the impact of an intervention, but that monitoring continues to see evidence of change according to the defined criteria. Since GRETA is a short project, this adds additional complexity on top of the issues identified above. We therefore propose that such CLIs are included as part of ideation on the understanding that the responsibility of utilising such CLIs is outside the scope of GRETA.

3.1.2 Conduct literature review

As previously identified, a literature review was conducted as part of GRETA deliverable D8.1 (Mendes et al., 2021). The indicators found through this process are

replicated here in Table 2 and Table 3, including the dimensions they were allocated, since they form the basis for defining an initial set of KPIs within each case study. This process will be undertaken and presented as part of D2.3 in which the outcomes of the KPI co-design in six case studies will be delivered.

Table 2. Example KPIs within various domains from Angelakoglou et al. (2019) (replicated from Mendes et al., 2021)

KPI domain	Example KPIs
Technical	Degree of energetic self-supply by RES Reduced energy curtailment of RES and DER Average number of electrical interruptions per customer per year Average length of electrical interruptions (in hours) Energy demand and consumption Energy savings Smart storage capacity Battery degradation rate Storage energy losses Maximum hourly deficit Energy consumption data aggregated by sector fuel Yearly km made through the e-car sharing system instead of conventional cars Number of efficient vehicles deployed in the area Number of EVs charging stations and solar powered V2G charging stations deployed in the area
Environmental	Carbon dioxide emissions' reduction Increase in local renewable energy generation Increased efficiency of resources consumption Reduction in annual final energy consumption Decreased emissions of particulate matter Decreased emission of nitrogen oxides (NOx) Noise pollution
Economic	Payback Return on Investment (ROI) Reduction of energy cost Financial benefit for the end-user Grants Fuel poverty Stimulating an innovative environment Awareness of economic benefits of reduced energy consumption
Social	Consumers' engagement Professional stakeholder involvement Social compatibility (fit to people's frame of mind, does not challenge values) Ease of use for end-users of the solution Advantages for end-users Advantages for stakeholders People reached Thermal comfort Increased environmental awareness Increased consciousness of citizenship Increased participation of vulnerable groups Local job creation Local community involvement in the implementation phase Increased citizen awareness of the potential of smart city projects Number of city officials and urban experts trained to conduct meaningful and ethical engagement of citizens

Provision of a localised multi stakeholder co-creation and co-production Field Guide for Citizen Engagement activities
 Participation of citizens, citizen representative groups and citizen ambassadors in the co-creation of local/micro KPIs for Citizen Engagement for Smart Cities

Table 3. Example KPIs within various sub-themes from Bosch et al. (2017) (replicated from Mendes et al., 2021)

KPI sub-theme	Example KPIs
Energy and mitigation	Reduction in annual final energy consumption (by buildings) Reduction in life cycle energy use Reduction of embodied energy of products and services used in the project Carbon dioxide emission reduction Reduction in lifecycle CO2 emissions Local freight transport fuel mix
Pollution and waste	Decreased emissions of Nitrogen dioxides Reduction in the amount of solid waste collected
Economic performance	Financial benefit for the end-user Payback period
Materials, water, and land	Increased efficiency of resources consumption Share of recycled input materials Share of renewable materials Share of materials recyclable
Factors of success	Changing professional norms Changing societal norms
Climate resilience	Climate resilience measures

3.1.3 Identify key stakeholders

As per the definition set in deliverable D7.1, a stakeholder refers to an individual, group, or organisation which has a (positive or negative) impact on and/or is (positively or negatively) impacted by the case study. The relevant stakeholders will vary according to the case study. As such, there must be a process within each case study through which the stakeholders are identified. To support this, we have identified that at a *minimum* one or more representatives from the following categories of stakeholder should ideally be invited to a co-design process:

1. Project researcher: someone who represents expertise regarding the GRETA and project goals as well as the agreed co-design approach. Project researchers may have different roles (though they may overlap/be performed by the same person). These are:
 - a. *facilitator*: someone who facilitates the session.
 - b. *ethics*: responsible for ensuring adherence to ethics.
 - c. *participant*: participates in co-design activities alongside other stakeholders.

2. Problem owner: someone who represents the interests of the case study and its overall goals.
3. Technologist: someone who understands and can represent technological aspects of the case study (this may also be the problem owner)
4. General public/users: someone who represents the expertise of end-users who are involved in or impacted somehow by the case study. There may be different categories of user roles, depending on the case study. It is also important to represent diversity within the public who participate to the co-design.

It should be possible – if orchestrated appropriately – to involve all categories of stakeholder in each stage of the co-design process outlined in Table 1, starting from setting the goals for the project to long-term evaluating of the outcomes in practice. However, in the context of a three-year project that is working within existing case studies and where the overall project and case study goals are already known, it is impractical to do so. In addition, co-design is an activity that should take place to the mutual benefit of all involved. For this reason, we focus the co-design activities of GRETA around the core generative and evaluative stages. In those two stages, the participation will be of most mutual benefit, since participants get the opportunity to learn more about the case studies, define some goals from their local community perspective in conjunction with stakeholders representing the case studies themselves, and further potentially affect future priorities of case study activities. In addition, we will investigate the value to the participants of gaining knowledge and feeling more empowered as a result of taking part.

3.1.4 Define a recruitment strategy

In addition to identifying stakeholders, a recruitment strategy is needed to ensure their participation. The recruitment strategy is being led by CWD.

The GRETA project advocates that, in general, the involvement of end-users in participatory processes leads to deeper discussions, greater community support and buy-in, a better understanding of the specificities of the energy community context and, ultimately, more effective project outcomes. Hence, this section takes a pragmatic approach towards the recruitment of stakeholders for the co-design workshops planned in task T2.2. This recruitment strategy is deeply inspired by the methodological backbone of the engagement framework proposed by Klein et al. (2020) which was developed in the context of end-user involvement in the first real-life renewable energy community project in Portugal. That is because, despite the differences in specification and scale, both projects evidence a strong Social Sciences & Humanities focus on the conceptualisation of forward-looking ideas that put end-users as core actors driving the energy transition.

Step 1 – Contextualisation & identification of gatekeeper(s)

The success of co-designing Community Level Indicators is deeply associated with the effective recruitment of the key stakeholders to be involved in the co-design

workshops. Ultimately, considering that the main purpose of these workshops is to enable citizens to become more informed and invested in case study development, it becomes clear that the citizens within each of the 6 GRETA case studies (with their specific socio-cultural contexts) are the *main* target audience (or the key stakeholders) of T2.2.

Based on the work carried out by Klein et al. (2020), to successfully identify and reach those citizens, firstly it is essential to identify the key gatekeeper(s) within each CS. In qualitative research, gatekeepers essentially represent effective communicators responsible to analyse, filter, translate, and control which and when information is passed on to others (De Meyer, 1984). According to these authors, gatekeepers usually play the dual role of: (i) representing a means of information transfer between parties; and (ii) representing intermediaries that filter and translate the perceptions, expectations, and ideas of one group to the other, thus bridging their communication (De Meyer, 1984).

In the case of the GRETA project, it can be said that gatekeepers play the fundamental role of intermediating and bridging the interactions between the GRETA consortium and the citizens within each case study – which would be an extremely cumbersome and time-consuming task without the gatekeeper(s). Therefore, and based on the specificities of each GRETA case study, the first step of the recruitment process should be the identification of those actors who would best fit the role of gatekeepers.

The gatekeeper identification should follow the procedures set in deliverable D7.1 – “Stakeholder Engagement Framework” (Nokelainen and Talikka, 2021) for the identification of stakeholders as exemplified in Table 4. Illustratively, by analysing the description of the Pilastro-Roveri CS in D3.1 – “Background Studies on Case Studies” (upcoming), it becomes clear that the main gatekeepers within that case study are representatives of the City Hall.

Table 4. 3-tier precision level for the identification of key stakeholders in the GRETA project (replicated from D7.1, Nokelainen and Talikka, 2021)

Level 1 - too vague	Level 2 - not yet precise enough	Level 3 - precise
City Hall	Personnel from the City Hall of Bologna	Person X, W, and Y from the department Z within the City Hall of Bologna

A schematic representation of the interactions and communication flow between the gatekeeper(s) and other stakeholders involved with the co-design workshops in T2.2 is given in Figure 2 – which nonetheless does not convey information with 3-level precision as per the content in Table 4.

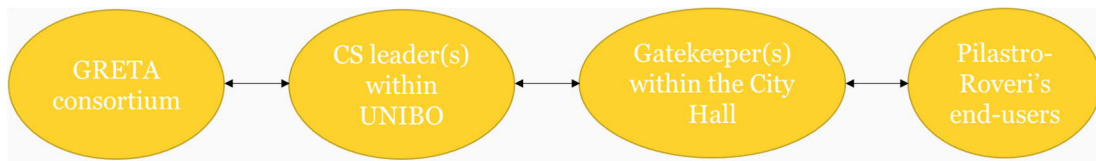


Figure 2. Schematic representation of the communication flow between the gatekeeper(s) and other stakeholders involved with the co-design workshop in the Pilastro-Roveri CS

Step 2 – Identification of the target audience

This step of the stakeholder recruitment strategy refers to the identification of the sample group of citizens within each case study to be involved in the co-design workshops – with the support of the gatekeeper(s) previously identified in step 1. To do so, it is important to firstly assess how prone each targeted citizen will be to participate in the co-design workshop. Ideally, this assessment should follow the categorisation proposed in deliverable D7.1 (Nokelainen and Talikka, 2021) as per Figure 3. This assessment helps to understand which citizens are easier to approach by the gatekeeper and what initial attitude they might have towards the case study. In other words, the higher the awareness level of a given citizen, the more likely that citizen is to engage with the co-design workshop.

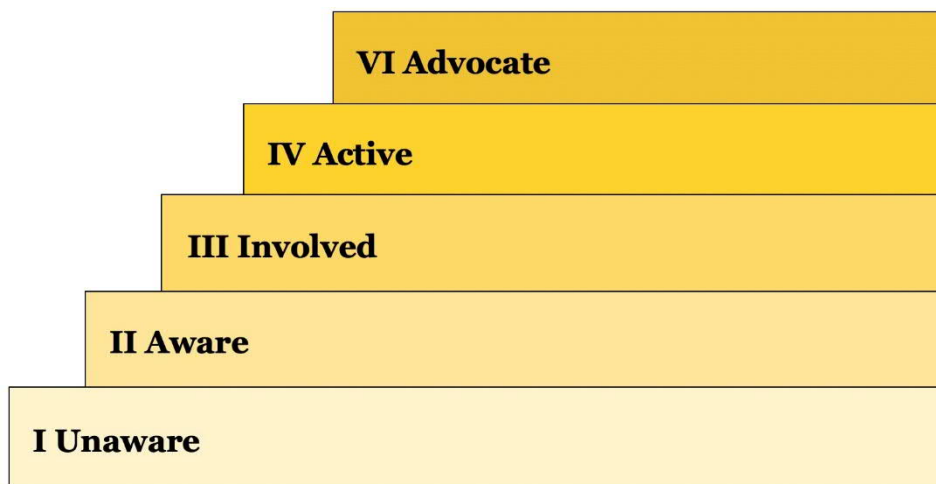


Figure 3. 5-tier awareness level among citizens within the GRETA Case studies (replicated from D7.1, Nokelainen and Talikka, 2021)

This categorisation activity can be supported by the analysis of pre-existing, context-specific indicators to be jointly defined between the case study leader and the gatekeeper(s) in each case study. Essentially, these indicators are the objective representation of something in “commonly understood units” or the “measure of the importance of something” (Klein et al., 2021; EsDinds, 2010). Hence, indicators allow to concretely evaluate something that is subjective in nature – e.g., how prone a given citizen is to participate in the co-design workshop.

Illustratively, in the case of the Coopérnico CS in Portugal, the analysis of the interview carried with Coopérnico's gatekeepers in deliverable D2.1 (Kumar and Klein, 2021) allows to identify some preliminary indicators that could guide the effective recruitments of citizens for the co-design workshop. Specifically, these indicators are:

- i. Citizens who subscribed to the GRETA and/or Coopérnico's monthly newsletters.
- ii. Citizens who personally financed the purchase of PV panels for the collective self-consumption schemes promoted by Coopérnico.
- iii. Citizens who attend the events promoted by Coopérnico – e.g., webinars, conferences, etc.
- iv. Citizens who proactively seek support (either online or through the phone) to clarify any doubt related to Coopérnico's activities, such as doubts about the information presented in the energy bills – e.g., consumption profiles; indexed tariff; etc.
- v. Citizens with a track record of being open to be contacted by Coopérnico.
- vi. Citizens who are active in Coopérnico's social media networks (i.e., Facebook, Twitter, LinkedIn, YouTube).
- vii. Citizens who take part in Coopérnico's General Assemblies.
- viii. Members who take part in the establishment and operation of the Local Groups (meetings between Coopérnico's volunteers from specific regions on matters of local relevance - no specific theme and dependent on the topics brought by each volunteer, such as Coopérnico's representation in a sustainability fair, search for new projects, etc.).
- ix. Members who take part in the establishment and operation of the Working Groups (meetings between Coopérnico's volunteers on specific themes of national/international scope - e.g., establishment of Renewable Energy Communities/collective self-consumption schemes; ICT-related work; building renovation work, etc.).

The definition of these indicators allows to concretely visualise the varying levels of engagement of citizens within each CS (from unaware to advocate). In other words, the more often someone is detected by these context-specific indicators, the more likely that citizen might be to engage with the co-design workshop – therefore allowing the selection of an optimal sample group of citizens with higher guarantees of proactive participation in the co-design workshops, thus leading to a more efficient use of GRETA's human resources, time, and funds.

Note that the definition of these indicators should be done in an iterative and interactive process between the CS leader and the gatekeeper(s) to foment reflection and learning between them. Furthermore, the selection of these context-specific indicators can follow different procedures, such as (i) unstructured observation (e.g., indicators defined by gatekeepers based on their own observation of citizens within their CS for the detection of behaviours that were not defined a priori); (ii) indirect measures (e.g., analysis of statistical data related to the number of citizens participating in previous events organised in the CS); among others.

Step 3 – Definition of the core strategies & mechanisms to reach the target audience

Once step 2 is concluded, it is necessary to define the core strategies and mechanisms to reach the sample groups of citizens to be involved in the co-design workshops. This should be also done with the support of the gatekeeper(s) and should ideally be based on pre-existing tools and mechanisms which are already familiar to those citizens (to avoid potential mistrust and biases among them).

Based on the work carried out by Klein et al. (2020), the engagement of end-users in the context of energy communities can be divided in two distinct phases: the (i) Activation and the (ii) Continuation phases. While the Activation phase refers to the initial phase of the end-user engagement process when they are still influenced by rooted old habits, the Continuation phase refers to the adoption and consolidation of all new behaviours and practices acquired during the Activation phase. Also, each of these two engagement phases entails different end-user engagement strategies and mechanisms to enable them.

Based on that, it is important to mention that the GRETA project sees the recruitment of citizens for the co-design workshops in task T2.2 as an inherent step of the Activation phase of citizen engagement. Therefore, the ideal strategies associated with the recruitment of citizens should be the same as the ones promoted during the Activation phase of citizen engagement. In view of that, some recommended strategies (as proposed by Klein et al., 2020) and examples of suitable mechanisms for their practical implementation are presented in Table 5:

Table 5. Recommended recruitment strategies and examples of mechanisms for their practical implementation

Strategy	Strategy description	Examples of practical implementation	Suitable mechanisms
Provide added value	It involves guaranteeing data privacy, data security and comfort gains to the citizens; applying financial incentives; providing information services; and ensuring various forms of citizens' control that can substitute automated procedures whenever necessary	Regarding data privacy (e.g., data minimisation, data transparency) and data security, there is a need to clearly articulate to the target citizens that these aspects are ensured by the GRETA consortium. Regarding financial incentives, a good example could be prize draws for the first subscribers of the co-design workshops to stimulate social comparison among them. Regarding the provision of information services, it is important to use all pre-existing communication channels that are known to the target citizens, as well as use different marketing techniques to induce their participation in the co-design workshops	i) Contact via telephone or email, face-to-face dialogues ii) news reported by local media iii) content promoted through the GRETA website iv) prize draws
Understand citizens	It involves identifying different categories of citizens and applying	The identification and categorisation of citizens is proposed in step 2 of the recruitment process in task T2.2	

	tailored strategies to reach each group	
Capacity building and awareness-raising	It involves educating and providing proper training and capacity building to citizens prior to the implementation of the core project activities to overcome potential knowledge and information barriers	The co-design workshops are precisely one of the first measures in the line of action towards the promotion of capacity building and awareness-raising among citizens - namely by fomenting project-related discussions and a shared understanding around the concepts behind the GRETA project
Create commitment and appeal	It involves taking advantage of social processes as facilitators of end-user engagement strategies. This includes guaranteeing trust in their involvement with the project; involving citizens in the early stages of the project implementation; involving role models respected by the sample group of citizens; providing credible testimonials from other end-users; coping with free-rider effects (i.e., citizens taking advantage from certain benefits without having contributed to obtaining them); promoting effective marketing strategies to create a sense of desire for what is being proposed in the project, etc.	<p>The GRETA consortium aims to promote emotional appeal for the core idea of the project through effective marketing strategies (e.g., by emphasising the key benefits of participating in the GRETA project and by setting up a new energy-related "lifestyle" associated with this innovative initiative).</p> <p>Additionally, trust can be gradually established in the CS through regular, personalised interactions between the consortium and the target groups of citizens (through the intermediation of the gatekeeper).</p> <p>Involving role models in the early stages of the recruitment process can also be beneficial as they can help referring the co-design workshops to other citizens within their own network that would not be contacted otherwise, creating a snowball effect.</p> <p>The categorisation of citizens in different categories (as proposed in step 2 of the recruitment process) helps coping with the free-rider effects, as it clearly outlines those who are indifferent to the objectives of the project</p>

In terms of the suitable mechanisms to enable the proposed recruitment strategies presented in Table 5, some further clarifications are given below:

- Contact via telephone or email or face-to-face dialogues: Citizens should be contacted (preferably by the gatekeeper, with whom they have more connection) via telephone or e-mail first. When these actions alone are ineffective, interactive face-to-face conversations between the gatekeeper(s) and the target citizens (whenever possible) can represent a more overarching solution.
- Prize draws: As presented by Klein et al. (2020), reward systems such as prize draws can "motivate citizens, provide feedback, promote social status, and engender loyalty and a sense of reward among those who achieve a step or complete a challenge of a given process, which are essential factors to heighten end-user engagement rates". This argument is based on the Goal Gradient

hypothesis, which asserts that citizens strive harder to reach a final goal as they progress towards earning a prize for doing that (Klein et al., 2020).

Additionally, these authors emphasised that the application of different types of awards increases the incentives towards higher citizens participation (Klein et al., 2020; Pires, 2017). In view of the abovementioned, different prize draws/awards can be distributed among the first subscribers of the co-design workshops in each case study to boost citizen participation, using their fast response to the co-design workshop invitation as eligibility criterion.

- Website: The GRETA website < <https://projectgreta.eu/>> represents a versatile awareness-raising mechanism to recruit citizens in the co-design workshops, as it presents synthesised information about the core idea behind the project and how citizens fit into it; and it is used to host regular updates about the project development (e.g., upcoming events, including the co-design workshop).
- Local media: Forwarding press releases to the local media (e.g., local newspapers and local authorities' official websites), giving interviews to regional television channels and inviting them to cover the co-design workshops are an effective mechanism to spread out information about the GRETA project (and the co-design workshops more precisely) in a collective manner, eventually reaching citizens that would be not reached otherwise. Klein et al. (2020) prefers the use of local media rather than self-advertisement as the former represented a more credible source of information (since it was presented by third parties) and is usually free of charge (which could eventually represent a disadvantage as there are no guarantees that the local press would release the news).

Step 4 - Knowing how to properly convey the recruitment message

Apart from identifying gatekeepers, mapping out target citizens, and promoting a wide array of recruitment strategies and mechanisms, it is also fundamental to understand how to properly convey the recruitment message. As explained by Klein et al. (2020), the articulation of the messages should follow some specific recommendations. That is because people usually absorb information in subjective ways, guided by their own worldviews, perceptions, ideologies, misconceptions, and personal experiences (CanmetENERGY Communities Group, 2014). This means that people tend to focus their attention only on the information that is aligned with their personal belief system. Therefore, it is fundamental to articulate messages in ways that address people's misconceptions and challenge their subjective perspectives, to stimulate the emergence of more educated interpretations or more overarching perspectives (CanmetENERGY Communities Group, 2014).

In view of the abovementioned, the recommendations given by Klein et al. (2020) on how to best frame messages to effectively engage are listed below:

- Use a common, more informal language rather than technical jargon so that citizens can start relating with the objectives of the co-design workshop. This approach is based on the study developed by Marinho (2006), who analysed the

key value of informal communication in effective knowledge sharing and transmission in organisations. Under this perspective, informal communication represents a crucial factor to further foment knowledge sharing since it reinforces social structures in ways that surpass formal boundaries of organisational communication (Marinho, 2006). Therefore, (informal and formal) communication must be thoroughly planned and controlled to “promote the transmission of useful information in the most appropriate and timely manner to the targeted group” (Marinho, 2006).

- Synthesise information using graphs, charts, comparative tables, figures, etc. to decrease the complexity of the core idea of the message.
- Create emotional appeal using anecdotes, success stories, figures, etc. to activate the intuitive/emotional side of people’s brains.
- Present ideas either in the form of encouragement or prevention of a given outcome.
- Focus on current gains or threats rather than future ones.
- Highlight the interconnections between the main message being delivered and other issues.
- Give preference to the local scale rather than a national/global scale, since individuals tend to be affected by messages that relate to local impacts or directly resonate with their personal context.

These suggestions should be filtered, selected, adapted, and translated by each case study leader (with the support of the gatekeepers) to better fit the specificities of each case study.

3.1.5 Planning for co-design workshop(s)

There are several considerations for planning the GRETA co-design workshops. These are visited in turn.

Overcoming barriers to co-designing with energy citizens

In co-design it is important to understand the barriers that participants may face and to address these, both in the recruitment stage, during the production of materials and when conducting the co-design itself. There are several reasons why people may be unwilling or unable to participate in co-design. Failure to address these limits may lead to exclusion of people and their ideas that could benefit the co-design process and who in turn might benefit from it. Some of the reasons that people may not want to, or be able to, participate in GRETA co-design activities include:

- activities are taking place at an unsuitable time
- activities take place across several sessions and there is inflexibility so that people are expected to attend all or none
- people do not understand how they will benefit or how the activities will be meaningful for them
- they cannot get there (if workshops are organised face-to-face)
- they do not have the technology (if workshops are online)

- they lack the funds
- they have a disability that makes it difficult to take part and contribute
- they do not think the activities are for people like them
- they lack childcare and there is no provision to bring children
- they lack literacy or technical expertise to take part in some of the planned activities
- they are not native language speakers within the country the activity takes place in

The efforts that need to be taken to overcome these barriers may be context dependent. For example, the efforts may depend on whether activities take place online or offline, or who would be the likely participants and what issues they might face.

Understanding this is part of stakeholder identification and defining of the subsequent recruitment strategy. Therefore, there is no 'one size fits all' approach to overcoming these issues that we could offer in this deliverable. Instead, case study partners will take into consideration who their participants are likely to be and tailor their recruitment and approach to conducting the workshop accordingly. Here, we offer a few suggestions.

First, Labattaglia (2019) has identified seven principles for improving co-design for people with disabilities, which might also be used for improving co-design for older people. These are:

1. Use appropriate language
2. Make participation accessible
3. Allow more time
4. Person first—disability second
5. Take a thoughtful approach
6. Offer, don't assume
7. Reflect continuously

Second, there are strategies that can be taken to make it easier for people to attend face-to-face workshops, such as arranging them outside of working hours, running the same workshop at different times of day, providing child-care, reimbursing travel and so forth. Such strategies can overcome some of the specific difficulties that are more likely to be encountered by women and therefore potentially improve representation of different genders. Regarding the activities, these should be created in such a way that they require the minimal amount of specialist knowledge. There should be time given to discussion around difficult ideas, and this should be built into the workshop schedule and workshop methodology. Finally, and perhaps most importantly, the workshops should provide participants with the possibility to learn new aspects of their local case study and find ways to get further involved, both in GRETA activities but also outside of this to other local actions related to the case. For GRETA, this further involvement should be via the invitation to also participate to defining the CTPs.

Ethics and data management

All workshop co-design activities need to be conducted with full consideration to any ethical concerns that might arise from involvement of people into GRETA project activities. Ethics has been covered in D8.6. Project partners must familiarise themselves with the principles detailed there. Essentially, this means working from the principles of informed consent, which in turn means that project goals and any experimental aspects must be made clear to participants in ways they will easily understand. GRETA will use consent forms, a template for which appears in D8.6, to obtain evidence of consent, and these forms will follow good practice including making clear the right to withdraw at any time. In addition, the data management must follow the good practices set out in the GRETA DMP, D8.5.

Space - online vs offline

In the past most of the co-design has taken place in person. One reason has been the lack of digital tools to support or facilitate the types of activities that often take place during co-design, especially physical prototyping and making activities, but also the small group work, the use of props and cards and other materials that may be picked up, passed around, discussed, modified and so forth. Another reason is that knowledge exchange – which is at the heart of co-design – may occur more naturally face-to-face. However, in these days where digital tools replicate many co-design activities quite well and where there are environmental reasons to reduce travelling, not to mention the issues caused by COVID-19, there is a lot of knowledge available to support conducting online co-design. Key differences between face-to-face and online co-design are:

- Sharing of common physical resources is not possible and participants will never be able to collaborate over one common physical artefact. This can be addressed in part by sending packs to participants beforehand with any materials they need during the co-design
- People get more fatigued doing activities online than they do in person. It may be necessary to plan for shorter sessions and increase the number (or else reduce the number of activities); and
- In face-to-face settings it is common to provide refreshments, whereas in online co-design each participant must sort themselves out for drinks and snacks. Time should be given for preparation of drinks and snacks. If possible, participants might be provided with remuneration for such snacks, that would otherwise have been provided by the workshop organisers in the face-to-face setting.

Task 2.2 initially outlined an approach for co-designing CLIs based on initially conducting the first two case study CLI workshops in a face-to-face setting and then using the knowledge gained from such deep engagement. The reason for this was that the novel process for co-designing CLIs could be more easily adapted on the fly, as needed, in a face-to-face setting. Information gained from the face-to-face workshops would help to improve the online workshops, which are less easily adapted on the fly. However, there is uncertainty as to whether this will be possible given the ongoing

COVID-19 situation. In the case that online workshops are conducted first it is *therefore important to pilot test the activities and try to identify any potential issues in advance*.

In either case, it is necessary to consider a common approach that would work in both the face-to-face and online settings. The following provides some guidelines for setting up the face-to-face or online spaces.

Face-to-face space: Provide areas where people can work on different activities in small groups as well as a 'coming together area'. If everything happens in a large room, then it is possible to lead the group activities from the front of the room as long as it is avoided that some participants would have their back to the person speaking or presenting there. Consideration should be made as to whether it is necessary to include a large screen, if introductory materials, or any task or scheduling information is shown there.

Online space: A video conferencing tool that allows formation of breakout rooms and which is generally accessible without need for specialist knowledge or download is recommended. We suggest Teams or Zoom. Similarly, browser-based tools such as Miro or Mural can be used to support online activities. In this deliverable we have produced examples based on Miro which can be used in the workshops directly. Figure 4 shows an overview of a Miro board created to provide templates for proposed workshop activities conducted in an online setting. The board can be replicated and tailored for the actual activities.

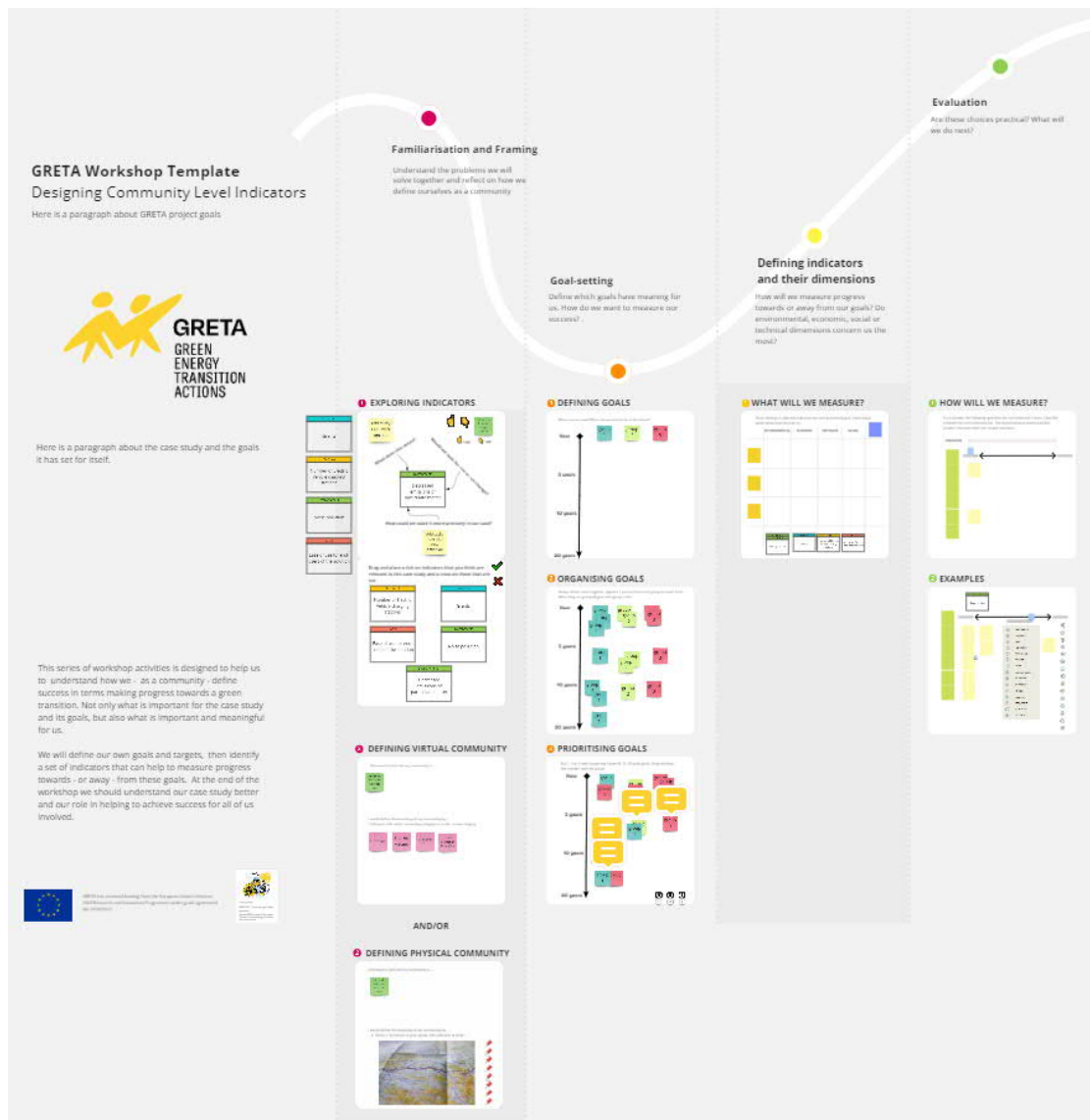


Figure 4. An overview of all the example activities organised on a single Miro board

A more detailed view of each activity is presented through the following sections.

Summary of considerations for co-design workshop planning

Based on the above, we propose to follow something like a dialogue labs approach for the following reasons:

- o It combines the practical activities required for ideating goals, CLIs and their dimensions with conversations and possibilities to clarify difficult concepts, thus overcoming some of the potential barriers to engagement.
- o It highlights the importance of space and how it is set up. This has relevance to both online and offline spaces. In the dialogue labs method, each table or area contains a different activity. This can be easily replicated using an online tool such as Miro, which is mediated via a

conference facility using breakout rooms for small group activity and bringing everyone back for the larger discussion.

We also recommend:

- A clearly defined recruitment strategy within each case study that ensures a range of stakeholders can and will attend.
- Consideration of accessible co-design and overcoming barriers participants may face - especially in understanding technical aspects of the case study or use of data for CLIs that are not part of everyday knowledge - whilst respecting the expertise that each participant *does* bring.
- Familiarisation with and adherence to ethical practices and data management practices outlined in D8.6 and D8.5 (respectively).
- Pilot testing of materials prior to conducting any co-design workshop activity but especially in the case that the first workshop will be online.

3.2 Generative and evaluative

In this section, we begin to elaborate the activities that will comprise the co-design from start to finish. As mentioned, these will be structured around a dialogue-labs format and spatial configuration. Given the estimated length of the activities, we would recommend the activities to take place during one single day with several breaks, or where possible, ideally over two different days.

During this section we refer to:

1. **Facilitator:** This is the person who is leading an activity. There may be more than one facilitator, in practice, for example in leading different breakout rooms.
2. **Participants:** These are taking part in the activity, from across all stakeholder categories. There is no distinction needed between different stakeholder categories during the workshop as everyone should participate as equals. Facilitators can act in the role of a participant.
3. **Small groups:** Groups of around 4-6 participants, possibly each having their own facilitator.
4. **Whole group:** Everyone who is involved in the co-design.

3.2.1 Introduction and familiarisation to the problem

Primary Goal(s): To understand the purpose of the workshop and what will happen. To understand what a Community Level Indicator is by looking at existing examples and to consider whether existing indicators may or may not be useful for the current case study.

Introduction (total 20 minutes, whole group): During the introduction, everyone could get to know each other briefly, ask questions and complete the consent forms (if they were not pre-organised). After a welcome message and any critical information (e.g., refreshment areas, emergency exits and similar) has been given, a common description of the GRETA project and its goals – prepared by Kaskas Media and translated as necessary to different languages – is used to introduce the project. Following this the workshop facilitator will introduce the local case study (within which many may already be participating) and outline the goals of the workshop, to find out what case study goals are most important to the case study community and how they would measure progress towards those goals. The facilitator will give a timeline and overview of the types of activities that will be part of the workshop. Use of technical terms and jargon should be avoided during the introduction. At the end of the introduction, everyone could ask questions.

Exploring Indicators, Part 1 (15 minutes, whole group): During the familiarisation to the problem, participants will get the opportunity to look at a set of approximately 5 indicators relevant to their case study and taken from literature. *This is a mediated discussion*. The facilitator introduces each indicator in turn (until time runs out) and uses question prompts to invite answers from the participants.

For example, the following five indicators might be relevant for a case study focusing on increasing the percentage of electric vehicles in the region, categorised under different dimensions. These are taken directly from Table 2. Here they are presented without changing the wording, however when finalising preliminary indicators for each case study then small clarifications might be made in order to make them more easily understood by participants:

1. Technical: Number of EVs charging stations and solar powered V2G charging stations deployed in the area
2. Environmental: Decreased emissions of particulate matter
3. Environmental: Noise pollution
4. Economic: Grants
5. Social: Ease of use for end-users of the solution

The following list of prompts can be used, or the facilitator could use their own:

- What do you think this indicator means?
- How could it be stated more precisely for our <Electric Vehicle> case?
- Would we be looking for a *positive* or a *negative* change?

Exploring Indicators, Part 2 (5 minutes, whole group): Participants vote on which of the indicators (given that they would be modified according to the previous discussion) are relevant to the case study and which are irrelevant.

Face-to-face: The participants are seated in one group with a facilitator at the front. They may view any presentation materials from a screen. Contributions are invited as part of a group discussion. For part 1 of the exploring indicators activity, the list of indicators may be displayed on a screen at the front and/or written onto sheets of paper or a handbook. The participants offer their answers to the questions. If facilities and space allow, the facilitator may write them on a whiteboard or flipchart, or directly to a slide in order to capture responses. For part 2, the facilitator might read out an indicator and ask for a show of hands, first for relevance and then for irrelevance.

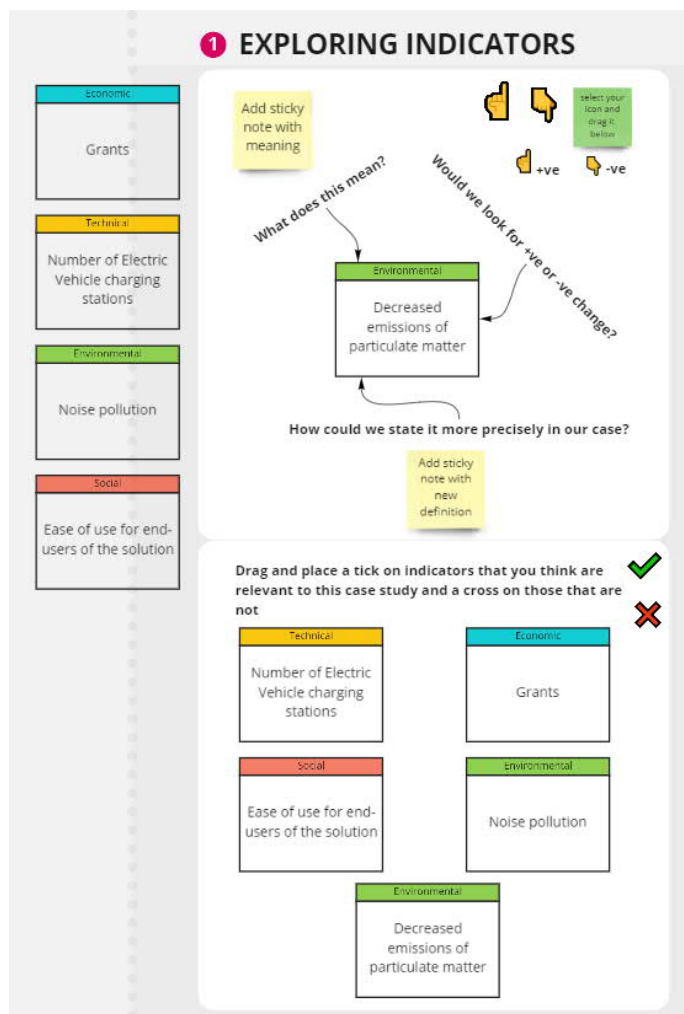


Figure 5. An example Miro board for exploring indicators

Online: Participants join to a conference call. The facilitator may invite a few words from each participant to introduce themselves or else divide into small groups for ice-breaker activities. The facilitator will share their screen to show any necessary presentation materials during the introduction. The participants are then invited to view a communal interactive space, such as Miro (all following examples use Miro), where the collaborative activities will take place either together or in small groups. The facilitator first instructs participants in the use of Miro and then explains the activity, by demonstrating with an example – such as placing a post-it note or dragging an icon

to indicate a vote. The participants place their ideas directly onto the Miro board for each activity. An example of these activities in a Miro form is shown in Figure 5.

For this and all following activities the Miro examples provide a guide and are available as a template, however facilitators of different case studies are free to adapt activities to suit their own style or preferences.

3.2.2 Defining the community boundary

Primary Goal(s): To reflect on and understand the community within which the indicators are being developed, defining what will be in scope and what will be out of scope.

In this stage of the co-design, the participants reflect on their community and how they themselves would define it. The ways in which a community could most easily explore their boundaries depends on whether their community exists in a physical or virtual location. Therefore, two possible approaches are outlined here, both or either of which could be used within a session.

Defining Virtual Community (20 minutes, small groups): Participants first write words that they feel represents their community. Next, they write down the shared attributes that they think define their community, such as hobbies, values, membership of groups or places where they socially interact.

Defining Physical Community (20 minutes, small groups): Participants first write words that they feel represents their community (*this part is skipped if combining virtual and physical*). Next, participants discuss where the physical boundary of their community should be defined.

Report back (10 minutes, whole group): Each group reports back on their discussion and how they define their community.

Face-to-face: Participants work in small groups, then report back. For the first part, participants may use sticky notes or else write directly onto a large sheet of A3 paper. Participants use markers and/or pins on a paper map, which could be placed on a pin board (if defining a physical boundary). A facilitator leads the group discussion from the front.

Online: Participants work in breakout rooms where they work directly to a Miro board (Figure 6) whilst communicating and discussing with each other. They then report back to the whole group.



Figure 6. An example Miro board for defining the virtual and/or physical community

3.2.3 Collaborative case study goal setting

Primary Goal(s): To identify what is important to the case study community in terms of their long-term goals.

Defining Goals (10 minutes, small groups): Participants note down on a timeline where they think they are now and where they want to be in the future.

Organising Goals (10 minutes, small groups): Everyone works on a common timeline onto which all the sticky notes from the previous stage are consolidated. Duplicates are removed via a collaborative clustering process. Participants assign a title to each grouping. Participants may choose to assign one leader from their group to move the sticky notes.

Prioritising Goals (10 minutes, whole group): Every participant gets the opportunity to vote for their top three goals.

Summary and questions (10 minutes, whole group): The facilitator summarises the main outcomes of the session and invites questions.

Face-to-face: For the first activity, each group is provided with a large sheet of paper with a timeline drawn on it. They place sticky notes directly onto the timeline. In the second activity, the notes are moved onto a larger, common timeline where they are grouped, and duplicates removed. A marker may be used to write labels next to the sticky note groupings. For the final activity, small stickers for vote 1, 2 and 3 could be provided to participants and these could be placed next to the group labels where they can later be counted for the purpose of ranking and prioritising the goals.

Online: Participants work on a Miro board (or similar). In the first task, the participants have their own region on the timeline and their own note colour but work on a common timeline (albeit in their small groups). They might discuss in groups first and agree on the goals or else write individually onto sticky notes. In the second and third activities, the entire previous board might be copied (by a facilitator) to a new area to maintain the history of activity. Figure 7 shows an example of a Miro board for these activities.



Figure 7. An example Miro board for defining the communities case study goals

3.2.4 Ideating new indicators within framing of goals and CLI dimensions

Primary Goal(s): To identify new Community Level Indicators for the case study that will help to achieve the prioritised goals and identify if new dimensions are needed.

Introduction to CLI goals (10 minutes, whole group): The facilitator introduces examples of how Community Level Indicators might be used as part of policy analysis and planning and gives an overview of the upcoming tasks for defining indicators and their dimensions.

What will we measure? (30 minutes, small groups): A grid is drawn onto a sheet of paper (or Miro board). The prioritised goals from the previous activities are written

vertically at the left side and the primary CLI dimensions are written horizontally along the top. Participants first have the possibility to place the indicators used in the familiarisation activities into the grid (if they feel they are relevant). Next, they are invited to think of new indicators for each of the goals in turn, while at the same time trying to classify them according to their dimension. New dimensions, or even goals, can be added as new knowledge and understanding is created amongst the participants. Participants should be made aware that there is no optimal number of indicators, there may end up being very few or quite many.

Report back (20 minutes, whole group): Participants report back from their groups and then the facilitator summarises and invites questions.

Face-to-face: Before this session starts, the facilitator must quickly assess the outcome of the previous activity where the goals were prioritised and write the 3 prioritised goals onto large sheets of paper for each group. The paper should already be set up with a grid drawn on it and the four main dimensions already written there. The familiarisation indicators should be made available for placement into the grid (e.g., written on paper or card that can be pinned or stuck, or on sticky notes etc.). Participants discuss in their groups where to place the original indicators (if they feel they are relevant). Next, they start proposing new indicators, which they write onto, e.g., blank paper, card or sticky note provided for this purpose. The report back is done by one person in each group. The facilitator mediates this from the front of the room.

Online: The participants work in small groups in breakout rooms. Each group has their own Miro board, an example of which is shown in Figure 8. For the report back, everyone leaves the breakout room. The person reporting from each group may share their screen as they talk, or else the main facilitator of the session could share the screen and navigate to each group's board in turn.



Figure 8. An example Miro board for ideating indicators

3.2.5 Evaluating CLIs and making final selection

Primary Goal(s): To elaborate on each indicator and think about the practicality of using the indicator.

How will we measure? (45 minutes, small groups): Participants work in the same group as before and with the same set of indicators they ideated in the previous activity. For each indicator in turn, they consider the following questions:

1. How relevant is this indicator?
2. What data or information is needed to be able to use the indicator?
3. Does the data exist, if so, where?
4. Does the data need to be collected, if so, how?
5. How often is the data needed?
6. Who would be responsible for the indicator?

Participants are made aware that they do not need to find answers or solutions for every question.

Face-to-face: Participants stay at the same place where they have placed their proposed indicators onto a grid. For each indicator in turn, they discuss the questions and then write down any answers they have on a sheet of paper, with the indicator name at the top. Information sheets could be provided to help them think about different methods of data collection.

Online: Participants work in breakout rooms in the same small groups they were in before. For each indicator they wrote in the previous session, they consider the questions on the Miro board in turn. The participants are shown how to replicate the Miro board for each indicator they work on. The Miro contains examples to help them. An example board is shown in Figure 9.

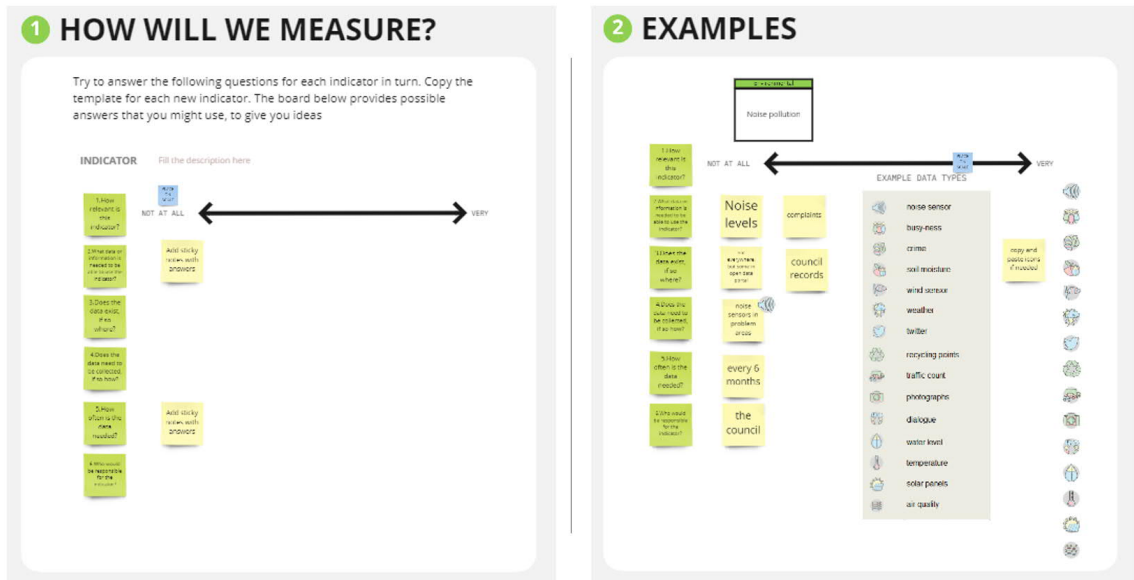


Figure 9. An example Miro board for evaluating and elaborating indicators

3.2.6 Closing activities

Primary Goal(s): To bring the session to a close.

Sharing and reflection (20 minutes, whole group): Each group summarises their evaluation activity in turn and reflects on the most important things they have learned about their case study community throughout the activity.

Debrief (10 minutes, whole group): The facilitator presents their own reflection on the activities and wraps up the session. Before closing, the facilitator invites the participants to fill any survey or questionnaire or other evaluation activities that have been defined for capturing feedback on the session.

Face-to-face: The activities take place with the whole group and the facilitator leads everything from the front.

Online: All the participants are in the conference call main session. As before, when sharing their group activities, it could be either the group or the facilitator that shares the screen to show that group's Miro.

3.3 Post-design

3.3.1 Utilising CLLs within case studies as part of defining CTPs

During the co-design workshops, participants collaborate on defining goals and potential indicators as well as starting to think about what type of data might be available - or might need to become available - in order to start using the indicators. Going beyond this to finding real data sets would be difficult to achieve either during online or face-to-face activities, since it is not possible to know in advance what indicators the participants will come up with. This means data cannot be pre-curated or made presentable in a way that would be relatable to all participants, and even for those with good data skills, it is time consuming to find and process data, especially during a time-limited event. As such, the feasibility of each indicator must be judged more completely after the workshop when there is more time available. Since these indicators are intended to be defined by the community, for the community and not – as such – for the GRETA project, the main post-design step in the context of GRETA will be in tidying up the workshop outputs and producing a brief report that will be made available to the community. The same community should then be involved in defining the Community Transition Pathways and may integrate the deeper knowledge obtained through the co-design process about goals and indicators into the process of defining CTPs. As such, the community are the ones who take ownership of follow up steps with the indicators although the project researchers will be available to give advice and make suggestions, if needed, for some time after the workshops.

For the GRETA project itself, the post-design activities will include evaluating the impact of participation on their overall understanding of the case study and any later effects the participation might have on active energy citizenship.

3.4 Materials and equipment

The following lists some materials and equipment that might be useful for the face-to-face co-design:

1. consent forms
2. refreshments
3. large screen for presenting information to the whole group
4. large sheets of A3

5. whiteboard/flip chart(s)
6. tables and chairs for group work
7. sticky notes
8. medium thickness markers and pencils
9. pin boards (or thick cardboard) and pins
10. paper or card, in A5 size
11. glue

A sheet for planning the face-to-face workshop activities is available in Annex 1.

4 Summary

This deliverable presents the theoretical background and planned activities for 6 co-design sessions within GRETA case study communities to ideate Community Level Indicators. These indicators are intended to reflect the local priorities of those involved in the case studies and can be used within the definition of Community Transition Pathways. The act of participating in the framing of case study goals and ideating ways to measure progress or influence policymaking may itself lead to greater engagement with case studies and to more active energy citizenship. The information provided in this deliverable provides a structure and templates for co-design activities that can each be tailored towards the specific case study prior to conducting the workshops. The activities may be conducted either online or face-to-face. This deliverable does not explore blended approaches. In the next stage of GRETA, the workshops will be conducted within the case studies and the outcome will be reported in the upcoming deliverable D2.3.

References

- Berman, Y. and Phillips, D., 2000. Indicators of social quality and social exclusion at national and community level. *Social Indicators Research*, 50(3), pp.329-350.
- Boyd, H. and Charles, A., 2006. Creating community-based indicators to monitor sustainability of local fisheries. *Ocean & Coastal Management*, 49(5-6), pp.237-258.
- CanmetENERGY Communities Group (2014). Stakeholder communications and engagement guide for district energy systems. Sustainable Cities International for Natural Resources Canada; 978-1-100-24705-2.
- Cheadle, A., Sterling, T.D., Schmid, T.L. and Fawcett, S.B., 2000. Promising community-level indicators for evaluating cardiovascular health-promotion programs. *Health Education Research*, 15(1), pp.109-116.
- Coulson, S., Woods, M., Scott, M., Hemment, D. and Balestrini, M., 2018, June. Stop the noise! enhancing meaningfulness in participatory sensing with community level indicators. In *Proceedings of the 2018 Designing Interactive Systems Conference* (pp. 1183-1192).
- Coulton, C.J., 1995. Using community-level indicators of children's well-being in comprehensive community initiatives. *New approaches to evaluating community initiatives: Concepts, methods, and contexts*, 1, pp.173-199.
- De Meyer A. A technological lifecycle approach to the organisational factors determining gatekeeper activities. *R&D Management* 1984;14(4):239e47. 1984.
- E. Innes, J. and Booher, D.E., 2000. Indicators for sustainable communities: a strategy building on complexity theory and distributed intelligence. *Planning theory & practice*, 1(2), pp.173-186.
- ESDinds (2010). The development of indicators and assessment tools for CSO projects promoting values-based education for sustainable development. Deliverable Number 17: Project Final Report to European Commission Seventh Framework Programme (FP7/2007-2013) (amended version, resubmitted 23 September 2011).
- Hancock, T., Labonte, R. and Edwards, R., 1999. Indicators that count! Measuring population health at the community level. *Canadian Journal of public health*, 90(1), pp.S22-S26.
- Hemment, D., Woods, M., Appadoo, V. and Bui, L., 2016. Community Key Performance Indicators (Community KPIs) for the IoT and Smart Cities. *Future Everything*: Manchester, UK.

Hettige, S., Haigh, R. and Amaratunga, D., 2018. Community level indicators of long term disaster recovery. *Procedia engineering*, 212, pp.1287-1294.

Kingsley, G.T., Coulton, C.J. and Pettit, K.L., 2014. Strengthening communities with neighborhood data. Washington, DC: Urban Institute.

Klein, L., Allegretti, G., Hes, D., Melkas, H. (2021). Revealing social values in the context of peer-to-peer energy sharing: A methodological approach. *Sustainable Futures*, vol. 3, pp. 100043, doi: 10.1016/j.sftr.2021.100043

Klein, L., Matos, L., Allegretti, G. (2020). A Pragmatic Approach Towards End-User Engagement in the Context of Peer-to-Peer Energy Sharing. *Energy*, vol. 205, pp. 118001; <https://doi.org/10.1016/j.energy.2020.118001>

Kumar, A., Klein, L. (2021). Understanding the role of digitalization and social media on energy citizenship. D2.1 of the Horizon 2020 project GRETA, EC grant agreement no. 101022317,

Labattaglia, O., 2019. Accessible Co-design (Doctoral dissertation, Auckland University of Technology).

Lucero, A., Vaajakallio, K. and Dalsgaard, P., 2012. The dialogue-labs method: process, space and materials as structuring elements to spark dialogue in co-design events. *CoDesign*, 8(1), pp.1-23.

Marinho S. (2006). O papel do Gatekeeper na comunicação informal das organizações: um estudo de caso em I&D. *Organicom: Revista Latinoamericana de Ciencias de la Comunicacion*; pp. 1807-3026.

Murphey, D.A., 1999. Presenting community-level data in an "outcomes and indicators" framework: Lessons from Vermont's experience. *Public Administration Review*, pp.76-82.

Nokelainen, P., Talikka, H. (2021). Stakeholder Engagement Framework. D7.1 of the Horizon 2020 project GRETA, EC grant agreement no 101022317, Helsinki, Finland

Phillips, R., 2003. *Community indicators*. American Planning Association Chicago, IL.

Pires F. (2017). Impacto da utilização de mecanismos de gamificação em aplicações móveis. Dissertation submitted as a partial requirement to obtain a Master's degree in Computer Science and Management. Portugal: University Institute of Lisbon.

Sanders, E.B.N. and Stappers, P.J., 2014. Probes, toolkits and prototypes: three approaches to making in codesigning. *CoDesign*, 10(1), pp.5-14.


















Schön, D.A., 1988. Designing: Rules, types and worlds. *Design studies*, 9(3), pp.181-190.


Steen, M., 2013. Co-design as a process of joint inquiry and imagination. *Design Issues*, 29(2), pp.16-28.


Yuan, M. and LO, S., 2020. Developing indicators for the monitoring of the sustainability of food, energy, and water. *Renewable and Sustainable Energy Reviews*, 119, pp. 109565.

Annex 1. Workshop Template

GRETA Workshop Plan

 <p style="text-align: center;">Max 25</p>  <p style="text-align: center;">2 half days, or one full day session: approximately 7 hours in total</p>  <p style="text-align: center;">Online / UNIBO</p>	 <hr/> <div style="display: flex; justify-content: space-around; align-items: center;">      </div> <p style="text-align: center;">Community Leaders Technologists Citizens Educators Researchers</p> <div style="border: 1px solid blue; background-color: #e0f0ff; padding: 10px; text-align: center; margin: 10px 0;"> <p>Who may participate?</p> </div> <hr/> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p> Facilitator</p> <p> Participants</p> <p> Large space</p> <p> Workplace</p> </div> <div style="width: 35%; text-align: center;"> <div style="border: 1px solid blue; background-color: #e0f0ff; padding: 20px; margin: 0 auto; width: 80%;"> <p>What are the requirements ?</p> </div> </div> <div style="width: 30%;"> <p>Stationaries </p> <p>Writing Materials </p> <p>Notes </p> <p>Post it </p> </div> </div>
---	---





THIS PROJECT HAS RECEIVED FUNDING FROM THE EUROPEAN UNION'S HORIZON 2020 RESEARCH AND INNOVATION PROGRAMME UNDER GRANT AGREEMENT NO 101022317.

1. Introduction and familiarization to the problem

Primary Goal: To understand what a community level indicator is by looking at existing examples and to consider whether existing indicators may or may not be useful for the current case studies in GRETA project

Introduction (20 Min)	Notes				
<ul style="list-style-type: none"> Know each other Get familiar Know about project Know Workshop goals 					
Exploring Indicators 1 (15 Min) <ul style="list-style-type: none"> Know existing indicators. Participate in mediated discussion and question answer session. Discuss their relevance to our case studies. Determine if we would like a positive shift or negative shift in Indicator 					
Exploring Indicators 2 (5 Min) <ul style="list-style-type: none"> Vote for relevant and irrelevant Indicators 					



THIS PROJECT HAS RECEIVED FUNDING FROM THE EUROPEAN UNION'S HORIZON 2020 RESEARCH AND INNOVATION PROGRAMME UNDER GRANT AGREEMENT NO 101022317.

Introduction (continued)

Primary Goal: To reflect on and understand the community within which the indicators are being developed, defining what will be in scope and what will be out of scope.

Virtual Community (20 Min)	Notes				
<ul style="list-style-type: none"> Words that best describe your community What are the shared attribute that define your community 					
Physical Community (20 Min) <ul style="list-style-type: none"> Words that best describe your community. Discuss where the physical boundary of your community should be defined 					
Report Back (10 Min) <ul style="list-style-type: none"> Each group reports back on their discussion and how they define their community. 					



THIS PROJECT HAS RECEIVED FUNDING FROM THE EUROPEAN UNION'S HORIZON 2020 RESEARCH AND INNOVATION PROGRAMME UNDER GRANT AGREEMENT NO 101022317.

2. Collaborative case study goal setting

Primary Goal: To identify what is important to the case study community in terms of their long-term goals.

Defining Goals (10 Min)	Notes				
<ul style="list-style-type: none"> Note down on a timeline where you think you are now and where you want to be in the future 					
Organizing Goals (10 Min) <ul style="list-style-type: none"> Works on a common timeline onto which all the sticky notes from the previous stage are consolidated. Remove duplicates via a collaborative clustering process. 					
Prioritizing Goals (10 Min) <ul style="list-style-type: none"> Every participant vote for their top three goals. 					
Summary and Questions (10 Min) <ul style="list-style-type: none"> The facilitator summarizes the main outcomes of the session and invites questions. 					



THIS PROJECT HAS RECEIVED FUNDING FROM THE EUROPEAN UNION'S HORIZON 2020 RESEARCH AND INNOVATION PROGRAMME UNDER GRANT AGREEMENT NO 101022317.

3. Ideating new indicators within framing of goals and CLI dimensions

Primary Goal: To identify new community level indicators for the case study that will help to achieve the prioritized goals and identify if new dimensions are needed.

Introduction to CLI goals (10 Min)	Notes				
<ul style="list-style-type: none"> Facilitator introduces examples of how CLI might be used as part of policy analysis and planning and gives an overview of the upcoming tasks for defining indicators and their dimensions. 					
<p>What will we measure? (30 Min)</p> <ul style="list-style-type: none"> Place the indicators used in the familiarization activities into the grid. Next, think of new indicators for each of the goals in turn, while at the same time trying to classify them according to their dimension. 					
<p>Report Back (20 Min)</p> <ul style="list-style-type: none"> Report back from your groups and then the facilitator summarizes and invites questions. 					



THIS PROJECT HAS RECEIVED FUNDING FROM THE EUROPEAN UNION'S HORIZON 2020 RESEARCH AND INNOVATION PROGRAMME UNDER GRANT AGREEMENT NO 101022317.

4. Evaluating CLIs and making final selection

Primary Goal: To elaborate on each indicator and think about the practicality of using the indicator.

<p>How will we measure? (45 Min)</p>	<p>Notes</p>				
<ul style="list-style-type: none"> Participants should work in the same group as before and with the same set of indicators they ideated in the previous activity. 					
<ul style="list-style-type: none"> For each indicator in turn, consider the following questions: 					
<ol style="list-style-type: none"> How relevant is this indicator? 					
<ol style="list-style-type: none"> What data or information is needed to be able 					



THIS PROJECT HAS RECEIVED FUNDING FROM THE EUROPEAN UNION'S HORIZON 2020 RESEARCH AND INNOVATION PROGRAMME UNDER GRANT AGREEMENT NO 101022317.