E-LAND

D2.5 Final Common Impact Model

E-LAND

*Integrated multi-vector management system for **E**nergy is**LAND**s*

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Abbreviations and Acronyms

Acronym	Description
BIKS	Port of Borg (E-LAND pilot site)
CIM	Common Impact Model
DCE	Discrete Choice Experiment
DSR	Demand-side response
HDEV	Heavy-duty electric vehicle
HVAC	Heating, ventilation, air conditioning
KPI	Key performance indicator
LES	Local energy system
M	Project month – project commenced on November 2018 = M1
PV	Photovoltaics
REC	Renewable energy community
SIN	Smart Innovation Norway
SME	Small and medium enterprise
ToC	Table of Content
TPO	Third-party ownership
UC	Use case
UsG	University of St.Gallen
UVTgv	University of Targoviste (E-LAND pilot site)
WP	Work Package
WTP	Willingness to Pay

Executive summary

Local renewable energy systems (LES) contribute to increasing clean energy production and meeting climate targets. Satisfying power and heating needs with locally produced renewable energy requires novel solutions to establish and manage these systems.

E-LAND project has created a modular toolbox for the planning and management of a LES. It includes a set of technology tools to optimise short-term and long-term operation of the energy assets, business modelling tools to guarantee a sustainable, long-lasting operation of the system, and community tools to enhance local stakeholders' engagement and community acceptance.

As part of the E-LAND toolbox, the Common Impact Model (CIM) was developed as a structured process to plan and manage stakeholder engagement in decarbonized multi-vector local energy systems. The CIM is a hands-on methodology for urban planners, energy managers and those who are interested in establishing a decarbonized local energy system.

The CIM methodology includes three phases. Phase 1 identifies relevant stakeholders and collects information on their views on a various topics influencing stakeholders' willingness to join or support a local energy system. Phase 2 summarizes the collected information into easily understandable visual dashboards to guide the design of optimal engagement actions and governance structure. Phase 3 involves setting up an engagement plan and establishing a "plan-do-check-act" cycle where engagement actions are implemented, followed up through key performance indicators (KPIs) and modified if necessary.

Each phase has its own set of tools to facilitate the implementation of the process. The tool for Phase 1 is a standardised modular discussion guide developed after a review of the academic literature on the drivers of social acceptance of local renewable energy solutions. Phase 2 features three standardised visual dashboards: the "Community Profile" visualises the characteristics of the local community; the "Solution Dashboard" summarizes stakeholders' views on key elements of the local energy system; the "Stakeholder matrix" visualize key stakeholders and their attitude towards the local energy system. Phase 3 includes an engagement plan, a tactical workbook template to guide detailed planning of engagement actions and a standardised evaluation questionnaire.

The CIM can be applied to a wide range of settings. It has been tested in its full in three E-LAND pilot sites: a rural community in Auroville (India), an industrial port in Norway, as well as a technology park in Spain. In addition, the process has been partially followed for a university campus in Romania. It has been tested with different types of stakeholders including residential energy users, SMEs, and areas with bigger industrial companies. Learnings from the testing has been integrated in the final model presented in this document.

This deliverable provides a full overview of the CIM methodology starting from the theoretical foundations, to opening up the process and explaining the available tools. A complete account of the CIM implementation at E-LAND pilot sites is available in the D2.4 “Sustained Engagement Plan and Impact Evaluation”, while more information on the interrelations between the tools within E-LAND toolbox can be found in the D6.3 “Tool Description and Replication Guidelines”.

1. Introduction

1.1 Objectives of this deliverable

Local renewable energy systems (LES) help to increase the production of clean energy in the changing energy systems. Relying increasingly on locally produced energy to satisfy power, energy and heating needs requires also novel solutions to establish and manage these systems.

The establishment and operation of a LES present challenges ranging from the selection of an optimal set of technological hardware and software to the selection of an optimal business model, and to the engagement of different local stakeholders in its implementation and the social acceptance among local stakeholders that are affected by it.

E-LAND project has created a modular toolbox to respond to these needs. The toolbox includes technology tools to optimise short and long-term management of the energy assets, business modelling tools to guarantee a long-lasting, sustainable operation of the system, and community tools to enhance local stakeholder engagement and community acceptance.

This deliverable will present the theoretical foundations and "how to" of the structured community engagement process developed during the E-LAND project, called "Common Impact Model" (CIM). This document takes a theoretical approach to the model, explaining theoretical underpinnings and describing the associated tools, while deliverable D2.4 *Sustained Engagement Plan and Impact Evaluation* presents the results of the application of the tool in the E-LAND pilot sites in India, Norway, Romania and Spain, as well as provides recommendations for long-lasting sustained engagement action. Learnings from the E-LAND piloting phase have been implemented in the final Common Impact Model, presented in this document. The CIM is designed to plan for long-lasting sustained engagement action.

The objectives of this deliverable are twofold:

1. To present the Common Impact Model as a planning tool for stakeholder engagement for local energy systems, including theoretical underpinnings and tool description
2. To function as a "how to" for those aiming to utilize the CIM in practice

This deliverable builds on past deliverables related to community engagement and engagement strategies, including:

- "*Deliverable 2.1: Common Impact Model, Communication and Engagement strategy"*: presents the first foundations of the CIM methodology, with an overall theoretical idea. This deliverable is the basis from where the model has evolved during the project. This is a restricted deliverable, available internally for project consortium members.
- "*Deliverable 2.2: Community analysis report*": describes the E-LAND pilot sites focusing on ambitions and challenges, presents first pilot narratives, summarises in a mostly qualitative way priorities, values and views of relevant local stakeholders at the European pilot sites. The analysis performed in Deliverable 2.2 was the starting point for the more in-depth analysis of stakeholders' views and values and later on formed a basis for the creation of the CIM tool. This is a restricted deliverable, available internally for project consortium members.
- "*Deliverable 2.3: Communications strategy and engagement tools*": provides a tactical tool to steer the first round of communication and engagement strategies at the European pilot sites. It includes two documents – a highly detailed and tactical excel workbook and a supporting companion book. The work for Deliverable 2.3 provided learnings for the later round of engagement strategy formulation that we mostly focus on in the present deliverable. This public document is available on E-LAND knowledge-centre[1].

[1] E-LAND repository for deliverables: https://elandh2020.eu/knowledge-center/

While the deliverable seeks to be a stand-alone document, it can be read hand-in-hand with the following deliverables:

- "*Deliverable 2.4: Sustained Engagement Plan and Impact Evaluation*": provides an account of the engagement activities implemented during E-LAND project, focusing especially on the application of CIM model at the pilot sites. The deliverable aims to provide recommendations to sustained engagement activities that will last also after the project ends.
- "*Deliverable 6.3: Toolbox description and replication guidelines*": provides and account on how tools in E-LAND toolbox are related to each other and offers guidelines for practical implementation.

Finally, the results of the implementation of the CIM model have been also reported in deliverables D6.1 and D6.2, which present first pilot results and final pilot results, respectively. Given the number of related deliverables which all tackle the model and its implementation from slightly differing angles, there will be an overlap with some of the sections. This will guarantee that the deliverables function as stand-alone reports for those interested in a specific topic.

The document is organized in following manner: the introduction provides an overview of the CIM tool, its relationship with other E-LAND tools, evolution of the model, as well as future plans. Chapter 2 focuses on the theoretical foundations of the model, including drivers that influence the community acceptance of local renewable energy production. Chapter 3 presents the process of implementation and tools associated with each phase of the model, serving as "how to" guidance for potential replication. Chapter 4 briefly summarizes the application of the model in practice, before moving to the conclusions.

1.2 Common Impact Model and the E-LAND toolbox

In this Section we present the Common Impact Model, discuss its relevance and connection with the rest of the E-LAND toolbox.

The E-LAND toolbox helps to establish and manage a multi-vector local energy system[2]. The Common Impact Model is the Community Tool within the larger ELAND toolbox.

The CIM consists in a methodology to engage community members and local stakeholders in LESs and in energy solutions that require approval or active participation of different individuals/organizations (e.g. companies in the community, building owners in the area, people living nearby, local authorities, financing bodies). Such energy solutions could be related to the establishment and management of a LES. During the E-LAND project, the CIM has focused on diverse energy solutions, including: the electrification of heavy-duty vehicles in an industrial sea harbour in Norway, the establishment of an industrial prosumers' energy community in a technology park in Spain and the installation of new solar PV systems and battery storage units in a residential township in Southern India.

The CIM is a process guided by a set of pre-made tools. The goal of such process is to enhance community acceptance and participation in the LES. The CIM suggests how to involve local stakeholders and/or the local community in the planning and establishment of the LES or an energy solution from the onset.

More specifically, the goals of CIM are:

1. Identifying stakeholders who matter for the successful establishment of a LES (or the selected energy solution), those who are affected by the LES operation, and those who could be the "local ambassadors".
2. Understanding local stakeholders' views, values, and priorities relevant for successfully designing a LES (or the selected energy solution).
3. Co-creating with a local partner a sustained engagement plan to maintain local stakeholders' engagement in/support of the LES (or the selected energy solution).

2 For a further discussion of the definition and key features of a LES refer to Chapter 2.2.

The outcome of the CIM consists in a sustained engagement plan that includes recommended engagement actions targeting key stakeholders and is carried out by local ambassadors. The users of the CIM could be urban planners, energy managers and, in general, those who are interested in establishing a local energy system or introducing an energy solution.

The CIM seeks to overcome one of the challenges for the establishment and operation of a LES. In fact, the establishment and operation of a LES presents various challenges, including the settling of potential conflicts among different stakeholders, their successful involvement in the implementation and/or their acceptance of the new technological solutions (von Wirth, Gislason, and Seidl 2018). Based on an online survey conducted by the E-LAND project with energy experts from all around Europe, one of the main barriers for the establishment of LESs and local energy communities is achieving successful participation of different stakeholders. The "community layer" in the E-LAND toolbox seeks to overcome this challenge and therefore plays a relevant role in establishing LESs. Key to successful stakeholders' participation and engagement is a shift from technology-push towards a needs-based approach. The latter approach identifies stakeholders' needs and makes sure that the LES creates value for stakeholders and addresses their needs. The CIM enables this needs-based approach. More specifically, it suggests including a customer/local user/community analysis since the very early stage of the establishment of a LES or a new energy solution, an approach that has been proven to be a success factor in many projects (Bridge 2019).

The Common Impact Model provides valuable inputs to the other layers of the E-LAND toolbox. The E-LAND toolbox replication guidelines (Deliverable 6.3) illustrate the optimal interplay between the Common Impact Model and the other E-LAND tools, taking into account valuable learnings from the piloting of the tools. In particular, it is recommended to establish joint sessions with the local partner/ toolbox customer and the tool developers to align the focus of the different tools as much as possible from the very early stage of the application of the toolbox.

1.3 Tool development process and future plans

The CIM has been developed during the E-LAND project by the University of St. Gallen and Smart Innovation Norway (SIN) in different phases, that are described below.

1. In 2019-2020 the tool developers created a first sketch of the CIM methodology[3] which has been the basis for conducting an initial community analysis and initial engagement plan for the three European pilot sites of the E-LAND project, reported in deliverables D2.2 and D2.3.

2. In the beginning of 2021 learnings from such activities, as well as a review of the literature and practice on social acceptance of energy and governance of collective resources, were used to refine the CIM methodology.

3. In the spring of 2021, the systematic testing of the CIM started with piloting at the E-LAND Indian pilot site in Auroville. Then, CIM application moved on to the E-LAND European pilot sites in late 2021 and continued until August 2022. In November 2021 a short video clip was created to summarize the methodology for a non-expert audience[4]. Petrovich et al. (2022) documented the revised version of the methodology based on its testing at E-LAND pilot sites in 2021.

4. Starting from September 2022, learnings from the CIM application allowed to finalize the CIM as it is presented in the present deliverable.

It is important to note that the CIM builds not only upon a review of the academic literature (see Chapter 2), but also builds on past work done on community engagement in smart grids and other energy solutions enabling the transition to a decarbonized energy system[5].

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3 Deliverable 2.1: Common Impact Model, Communication and Engagement strategy. Please note that the model has evolved substantially compared to the first sketch. One of main changes is that the classification of stakeholders based on the work by Gladwell (Gladwell 2000) has been dropped and replaced by the identification of “local ambassadors”. This change was made based on the learnings during the piloting phase. The categories proposed by Gladwell (mavens, connectors, salesmen) are in fact often overlapping between each other and can be seen as traits of the "local ambassadors”.

4 Available online at: https://youtu.be/BFY0zzxaJvc

5 For a a review of existing community engagement strategies the reader can refer to: Shortall, Mengolini, and Gangale (2022). The review proposes two different categories of engagement strategies, featuring two main goals: 1. Engaging people 2. Changing energy behaviour. CIM falls mainly into category 1.

CIM was also developed with reference to existing environmental management systems. In particular, we relate to the ISO 14001 quality management process, which is widely documented[6] and widely-used. Such environmental management systems have been proven to be efficient in ensuring a high quality of managerial processes. The "plan-do-check-act" structure, in particular, is directly linked to the ISO 14001 quality management process.

The CIM has proved to be complimentary to multi-criteria decision analysis methods that allow the inclusion of different criteria from different stakeholders in decision-making and public planning. More specifically, in the case of the E-LAND Indian pilot site of Auroville, the CIM provided inputs to a multi-actor multi-criteria analysis (MAMCA) (Lode et al. 2021), carried out in Auroville within the scope of the EU-funded project Renaissance[7].

Compared to existing community engagement methodologies, the added value and unique feature of the CIM lays in its modular nature. The modularity of the CIM allows tailoring different types of stakeholders and different types of solutions. In particular, the CIM has been tested not only with residential energy users, but also with commercial and industrial stakeholders, which often feature different drivers than residential ones (see Chapter 2 for a discussion). The methodology has been adapted to fit different types of stakeholders. Another advantage of the CIM's modularity is that it allows to expand its scope.

In particular, future plans exist for extending the methodology so that it can be used to change energy behavior of a group of energy users[8]. Scope for further integration between the CIM and widely-used environmental management systems and standards (such as ISO 140001 or EMAS) could be also explored, by reflecting upon what is needed for making the CIM ready to be plugged in such standardized processes, which are typically open to expert contributions. It is important to note that, however, such environmental management systems and standards

The review is based on the EU Joint Research Centre (JRC)'s inventory of EU-funded smart grid projects, i.e., projects that aim to efficiently integrate the behaviour and actions of all users connected to the electricity network. The JRC inventory is the most comprehensive database of smart grid projects in Europe, covering almost 15 years of EU R&I funding. Smart grid projects are projects dealing with the integration of distributed energy resources as well as connected energy users' behaviours.

6 https://www.iso.org/iso-14001-environmental-management.html

7 For further detail on the collaboration: https://www.renaissance-h2020.eu/auroville-community-engagement-workshop/

8 Future development and exploitation plans for the CIM are discussed in more detail in Deliverable D7.4 "Exploitation plans for E-LAND tools and policy recommendations"

are internal voluntary policies that might not be relevant for all potential CIM users. Another area of further development of the tool could be to set up an online tool to tailor the questionnaire template, process collected data and return the dashboards. Finally, during E-LAND field work, we observed potential synergies between the CIM, the Business Modelling Tool and the Multivector Simulator – all tools within the E-LAND toolbox. The tools complement each other, providing a holistic approach to the local energy projects that can reinforce the probability of successful implementation. Therefore, it could be interesting to develop further the tool to reinforce such synergies. For instance, the visual dashboards produced in Phase II of the CIM could be shown next to other indicators returned by other E-LAND tools, to facilitate an encompassing assessment of the local energy system, that goes beyond a purely technical overview.

2. Theoretical foundations for the Common Impact Model

In this chapter we present the theoretical foundations of the E-LAND Community Tool, also known as "Common Impact Model". This chapter represents an extended and revised version of Petrovich et al. (2022) where the model was first published. The CIM is underpinned by academic literature on the social acceptance of clean energy solutions and on participation on community energy initiatives. The rest of this chapter: 1) clarifies the key concepts used in the literature (local energy system, energy community, stakeholders' acceptance and participation); 2) presents the relevant academic literature and more specifically, reviews the drivers of social acceptance and participation in local energy systems, providing guidance on how to collect evidence on such drivers; 3) highlights potential differences between residential and commercial/industrial energy users.

2.1 Definitions

In this Section we present three key concepts: local energy system, renewable energy community and stakeholders' acceptance.

A **local energy system** includes a group of geographically close energy users that share locally produced power, as well as the soft and hard infrastructure required to generate, store and dispatch clean and locally produced energy (Koirala et al. 2016). Hardware and software solutions for LES include, for example, small or medium-scale renewable energy production assets (solar PV panels, wind turbines, biomass plants, heat pumps) to be built for collective consumption of a group of stakeholders, a new local electricity distribution grid (microgrid), a demand-response scheme for the heating, ventilation, and air conditioning (HVAC) of a building used by multiple users, a new energy storage system or a charging facility for electric vehicles for collective use.

A LES as some distinctive features that distinguishes it from other energy projects (Table 1). Local energy systems are also known as "local distributed energy systems", "local energy hubs" or "integrated multi-energy systems" or "smart grids for distributed generation"[9].

Table 1: Typical and Distinctive features of a local energy system (LES)

Collective use	The energy infrastructure (RE generation units, infrastructures, storage units) is of joint use to a group of individuals
Geographical proximity	The members of a LES are geographically close to each other
Common good provision	A LES provides for a common good, namely energy and the avoidance of negative climate impact
Subtractability	One member's consumption of the resource units makes those units unavailable to others: every kWh used by one consumer is not available to others (Becker and Ostrom 1995).
High level of self-organisation	A LES typically features a dedicated governing institution. One type of governing institution is the "renewable energy community".
Multi-vector	A LES typically requires the integration of many different energy vectors (electricity, heat) and technologies: renewable sources, energy-storage, active demand-side management solutions, smart grids
Citizen participation	Citizens and/or local organizations in a LES are typically involved in key decisions through different channels: information, consultation, direct or indirect decision-making power, financial participation.

9 For overview of the terminology and discussion of most common terms used for this concept in academic research and practice: Grosspietsch, Saenger, and Girod (2019)

Energy autonomy	A LES typically allows for a high level of energy autonomy for its members, defined as the share of local consumption met by local production. A LES typically strives for minimizing transit through the national power grid and maximizing local use of locally produced energy ("quasi-energy island") Optimization of energy flows with the community, through demand-side management schemes or local energy trading (also known as "peer-to-peer trading"), are typically used to increase local energy autonomy

In the European Union, LESs can be established and operated by an autonomous entity, known as "renewable energy community". A "**renewable energy community**" (REC) is a new legally autonomous entity that was defined in the EU energy package "Clean Energy for All Package" and it is currently being transposed in Member States' national laws (Frieden et al. 2020). This entity owns, develops and operates the local energy assets and shares the output of local energy sources among its members, who are located geographically close to the energy production facilities[10]. Sharing includes offsetting the energy consumption of the community members using the generation available within the community, even over the public network, provided that both metering points belong to the community. Electricity sharing enables members to be supplied with electricity from generating installations within the community without being in direct physical proximity to the generating installation and without being behind a single metering point (EU Directive 2018/2001). Local energy systems and energy communities are regarded as a cornerstone for a just and inclusive energy transition, as they promote citizens' participation in the energy transition and can accelerate investments in decarbonisation. Energy communities, in particular, are a key pillar for EU's decarbonisation goals for the energy sector and have the goal of helping local communities take ownership of the energy transition.

Establishing and operating successfully a LES or a REC, such as other energy solutions, requires **acceptance of the energy infrastructure among multiple local stakeholders**, such as potential

10 Key legal references: "Clean Energy For All Europeans", COM(2016) 860 final, November 2016; EU Directive 2019/944; EU Directive 2018/2001.

energy users and energy producers in a LES, financing actors for LES's assets, local public authorities that are involved in the permitting phase. Depending on the desired energy configuration of the LES, successful implementation requires local stakeholders' passive and/or active acceptance of energy technologies (Table 2):

- Passive acceptance requires a one-off consensus from a group of stakeholders (e.g. tenants living in a multi-apartment building vote for/do not oppose the realization of a new solar plan on their common roof).
- Active acceptance requires local stakeholders' participation in the financing, operation and/or governance of the LES. Example of active acceptance include, for instance: when LES users change their consumption pattern/their transport-fuelling or mobility habits to facilitate the operation of the LES, when they invest in new energy equipment, co-finance the energy assets and/or participate in their governance. Active participation often comes with data sharing on own consumption, to facilitate the operation of the LES.

Local stakeholders' active participation in a LES has three dimensions:

1. the financial investment volume in the collective energy assets;
2. the degree of participation in the governance of the energy system and
3. the willingness to participate in demand side response schemes and local energy trading that facilitate LES's operation and maximize the use of local production.

Table 2: Two types of acceptance of energy technologies for LESs

	Definition	Example of a metric to assess the phenomenon
"Passive" acceptance	Positive appraisal of the energy technology, whereby local stakeholders give one-off support to the project and do not oppose to it, while their energy-related behavior (how much/when/how they consume or pay energy) is not affected by the project.	Attitude Likert-type scale, e.g.: "Generally speaking, e-car sharing services are a great idea. E-car sharing services offer a lot of benefits. (answer options: I fully agree, I rather agree, I rather disagree, I fully disagree)

"Active" Acceptance (or "participation")	Willingness to actively support the energy technology, whereby local stakeholders change their energy-related behavior to support the project, and/or actively engage in the financing and/or governance of the collective energy assets. It has 3 dimensions: 1) financial participation: the financial investment volume in the collective energy assets; 2) participation in the governance: the degree of participation in the governance of the energy system 3) energy flexibility co-creation: the willingness to participate in demand side response schemes and local energy trading	Adoption intention Likert-type scale, e.g.: "The provider of locally-produced renewable energy could be a cooperative of all local energy users. To what extent do you agree with the following statement? My company/organization would apply to become a cooperative member with voting rights." (answer options: I fully agree, I rather agree, I rather disagree, I fully disagree, I do not know)

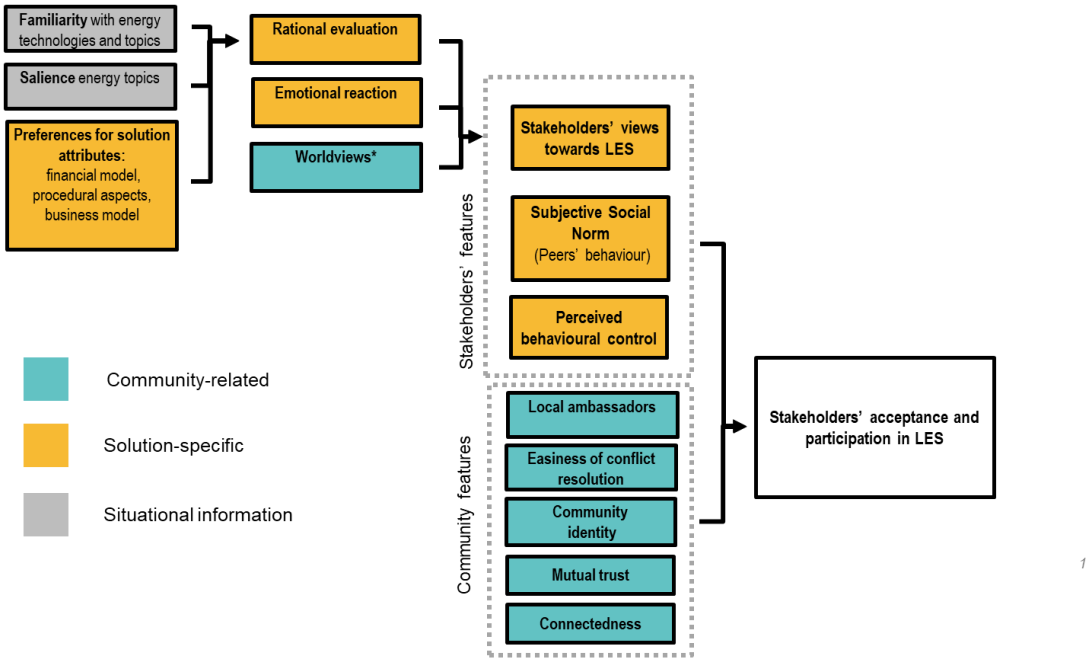
2.2 Drivers of acceptance and participation in local energy systems

In this Section the literature on drivers of acceptance and participation in local energy systems, energy communities and, more in general, community energy initiatives will be reviewed. The chapter also illustrates how to collect evidence on such drivers. In the next Section, potential differences between residential and commercial/industrial energy users will be highlighted.

In order to understand drivers and motivation for passive and active acceptance of LES systems, insights from the following behavioural theories and conceptual frameworks were gathered: Theory of Planned Behaviour (Ajzen 1991), Ostrom's principles for managing a "common" (Dietz, Ostrom, and Stern 2003), the framework for acceptance of renewable energies and smart grids (Huijts, Molin, and Steg 2012; Wolsink 2012; Wüstenhagen, Wolsink, and Bürer 2007). After this review, the acceptance factors were categorised into: LES community's features and LES stakeholders' features (Figure 1). By "LES community" we mean the group of local stakeholders (either citizens or organizations, or both) that should either

approve the energy technology or actively participate in it for the LES to be successful. The following describes each of these factors.

Figure 1: Drivers of acceptance and participation in local energy systems



a. Local ambassadors. Key committed individuals, entrepreneurs, politicians or organisations in a community, referred as "local ambassadors", can be essential to success in establishing collective energy projects, such as energy communities (Walker 2008). Azarova et al. (2019), based on data from a survey administered in four countries (Germany, Austria, Italy, and Switzerland), show that citizen acceptance of local energy communities can be enhanced by endorsement from trusted political leaders. In Germany's first village to produce heat and electricity by means of renewable biomass one of the key success factors was to have competent people in the village who were willing to provide information about this project at any time (Seidl, von Wirth, and Krütli 2019). Recruiting new members into a LES and winning support for it, in fact, often depends upon personal contacts and neighbourly relations (Hoffman and High-Pippert 2010). Local ambassadors help build a common and understandable language, divert doubts and fears, advocate the project among other local stakeholders (Renaissance project 2021). Distinctive features of local ambassadors are: high interest in the project, strong social bonds within the community, trusted by community

members, knowledge of the local context, competence in the project, availability to provide information and ongoing communication on the project (BRIDGE, 2019).

HOW TO IDENTIFY LOCAL AMBASSADORS:
stakeholder mapping exercise (see Chapter 3.1.2, p. 31)

b. Easy conflict resolution and effective enforcement. Easy and low-cost resolutions of disagreements and conflicting interests between LES community members is one a condition that facilitates the effective governance of common resources property, and therefore their long-lasting acceptance (Dietz, Ostrom, and Stern 2003). In a LES the energy infrastructure is of joint use of a group and one group member's consumption of the resource units makes those units unavailable to others. When subtractability exists, then collective use of resources could raise conflicts. Hence it is of foremost importance that a conflict resolution mechanism between LES community members exists, is easily accessible and low-cost, and allows enforcement of the rules. The conflict resolution mechanism and resource governing rules have to match local conditions. In particular, they may be different depending on whether the LES is decentrally operated (many members owning assets and sharing energy, i.e. residential prosumers) or centrally operated (one professional actor owning and managing energy resources and sharing energy to others).

HOW TO EVALUATE CONFLICT RESOLUTION:
Agreement Likert-type scale:
To what extent do you agree with the following statement?
Conflicts of interest and disagreements among individuals/companies at [XXX] are resolved in an accessible and low-cost way"
(answer options: I fully agree, I rather agree, I rather disagree, I fully disagree)
Important note: the prerequisite for this question is to know what kind of conflict-resolution mechanism is in place and whether this would be relevant for the energy solution.
This question tends to be more relevant in residential settings where informal rules for enforcement are common. In commercial/industrial setting conflict of interest and disagreement are typically regulated through contracts.

c. Community identity. Robust governance of localized resources requires a clear definition of the boundaries of common resources and their users (Dietz, Ostrom, and Stern 2003). A strong community identity facilitates a clear definition of who LES users are. Strong community identity translates into a sense of attachment to the group, a feeling of taking pride in the community, and having friends within the community (Kalkbrenner and Roosen 2016). The stronger the citizens' social identification to a group, the higher is their willingness to contribute to the community and actively support community energy projects (Kalkbrenner and Roosen 2016).

HOW TO ASSESS THE STRENGHT OF COMMUNITY IDENTITY:
An agreement Likert-type scale:

To what extent do you agree with the following statement?
Organizations working in …often talk about … as being a great place to be and work/ People living in…. often talk about … as being a great place to be and live
(answer options: I fully agree, I rather agree, I rather disagree, I fully disagree, I do not know)

d. Mutual trust between community members. A sense of trust is needed to achieve a high acceptance and willingness to participate in community energy projects (Kalkbrenner and Roosen 2016; Walker et al. 2010)**.**

HOW TO ASSESS MUTUAL TRUST
An agreement Likert-type scale inspired by the methodology used to measure trust in wide-used surveys, such as the European Social Survey:
According to you, how well do the following descriptions match people working / living at [XXX]?
Companies working in [XXX] in general trust each other / People in general trust their fellow community members in [XXX]
(answer options: Matches very well; Matches somewhat well; Does not match well; Does not match at all; I do not know)

e. Connectedness. Network theory studies suggest that ties in one kind of network favour ties in other kinds of networks ("multiplexity") (Krackhardt 1992). Citizens/companies who already had a close interaction (e.g. shared association, joint project), are more likely to be happy to be grouped together in a LES or energy community. Different communities/social groups display different communication channels.

HOW TO ASSESS CONNECTEDNESS

agreement Likert-type scale:

According to you, how well do the following descriptions match people working / living at [XXX]?

It is common to talk to each other when people meet in [XXX]

People often spend time with other people working/living in [XXX]

(answer options: Matches very well; Matches somewhat well; Does not match well; Does not match at all; I do not know)

Alternatively, question like the following one can be used to assess the frequency of interaction:

How often do you/your company interact with other organizations/people in [XXX] ?

HOW TO ASSESS COMMUNICATION CHANNELS

Questions like the following one can be used:

How does your organization usually learn about what happens in [XXX] or communicate to others in [XXX]? Please list up to three communication channels

f. Perceived behavioural control. This refers to whether the stakeholder feels capable of participating or not. Financial barriers and knowledge-related factors typically influence perceived behavioural control (e.g. adoption cost perceived as too high, offer considered too complex to understand).

HOW TO ASSESS PERCEIVED BEHAVIORAL CONTROL

agreement Likert-type scale:

To what extent do you agree with the following statement?

Your organization/You can substantially influence/can decide on the approval and implementation of this project/can participate in this project

(answer options: I fully agree, I rather agree, I rather disagree, I fully disagree, I do not know)

Alternatively, for a more general assessment that not refer specifically to the energy solution but to energy matters:

How do you rate your influence on energy-related decisions in your organization/family on a scale from 1 to 5?

g. Subjective social norm. Whether a stakeholder perceives social pressure from his/her peers matters for acceptance. Stakeholders' acceptance of an energy technology depends on whether they believe that important reference groups/peers approve or disapprove it.

HOW TO ASSESS SOCIAL NORMS
The following question can be used to assess how many in the reference group support/participate the LES (I.e. "descriptive social norm"):
In your opinion, how many groups/organizations/people in [XXX] would support this project?
(answer options: Everyone, Almost everyone, Most, Few, Very few, Nobody, I do not know)

h. Stakeholders' views towards the LES. Stakeholders' views (or "attitude") are the result of a combination between: 1) a rational evaluation of the new energy technology and the related project's attributes (e.g. location, financial model), 2) emotional reactions to it (positive and negative feelings that arise in relation to the LES.

Stakeholders' views are typically mediated by worldviews), knowledge of energy topics, and familiarity with energy technology. Worldviews that could lead to a positive attitude towards LES energy technology are: collectivism (or "societal interest value orientation", defined as a preference for being a member of the group rather than apart from the group), environmental concern, climate change awareness, positive attitude towards technological innovation, place attachment. Energy knowledge and energy literacy allow informed evaluation of the technology. Familiarity reduces perceived risk and can explain why often local acceptance vary over time, and in particular before, during and after implementation of an energy project, due to a learning effect (Wolsink 2007a; Wüstenhagen, Wolsink, and Bürer 2007).

HOW TO ASSESS RATIONAL EVALUATION
Questions can be asked about:
-perceived benefits/positive effects:
According to you, what would be the main benefit(s) of the project for you/ your organization? Please name up to three
How important for you on a scale from 1 to 5 each benefit is?
-perceived adoption costs/drawbacks/negative effects/barriers:
What would be the main barrier(s)/downside(s) of the project for you/ your organization? Please name up to three.
How serious on a scale from 1 to 5 each barrier is?

-perceived risk:

How risky is the project for your organization /you in your opinion? (very risky, rather risky, rather not risky, not risky at all)

-perceived cost/benefit distribution (fairness):

In your opinion, would some groups/organizations in [XXX] benefit from the project significantly more/less than others? Who and why?

HOW TO ASSESS EMOTIONAL REACTIONS

The method of continued word associations can be used to measure affective reactions:

What is the first word or phrase that comes to mind when you read [list of relevant technology components of LES]?

Can you tell me whether the word(s) or phrase(s) you indicated has a (very) positive, (very) negative or neutral connotation?

Important note: As this method tends to be time-consuming for respondents, it is not always advisable to include it.

HOW TO ASSESS RELEVANT WORLDVIEWS, ENERGY KNOWLEDGE AND FAMILIARITY

In the literature, worldviews are typically assessed using Likert-type scales (see, among others: Devine-Wright and Batel 2017).

Statements that can be used include:

For environmental concern: *Looking after the environment, caring for nature, saving resources is important to you/your organization*

For climate change awareness: *You/Your organization is ready to recommend friends & colleagues /colleagues & workers activities that will help reduce global warming*

For technological affinity: *You/People in your organization are reluctant to try new technologi*es

For place-attachment: *You/ People in your organization feel a very strong sense of belonging to [name of a physical location]*

For collectivism*: Your organization often does joint initiatives with neighbouring companies/ You like sharing little things with their neighbours*

<u>Important note:</u> in the case of large companies or large organizations, these statements tend to be not appropriate. In this case it makes more sense to have them answered by a representative sample

of people who are part of the company/organization. This strategy often requires a great data collection effort.

Familiarity could be assessed using questions like the following ones:
How many people in … are used to seeing the following in their immediate surroundings:[list of relevant technology components of LES]?
Have you ever discussed energy related topics in your organisation?
How many times does your organization discuss about energy-related topics?

Energy knowledge could be assessed by asking whether people know how much they/their organization spends for electricity/heating/transport fuel.

Stakeholders' views depend on key attributes of the LES or the energy solution. These attributes depend, among other things, on the chosen business model. In particular, procedural and distributional justice aspects matters for social acceptance of renewable energies and LES (von Wirth, Gislason, and Seidl 2018; Wolsink 2007b). Procedural justice is ensured by fair participatory planning processes, while distributional justice is ensured by a fair allocation of costs and benefits of the technology. Different increasing degrees of stakeholders' involvement are possible in the technology planning process: information, consultation or public hearing, delegated power, referendum, direct control in the governance (representing the highest degree of participation, as it happens in the case of an energy community owned and operated by a cooperative of all energy users).

The ownership of the energy assets that belong to the energy community or LES (e.g. generation plants, microgrids, storage systems) is also another relevant aspect for stakeholders. The ownership structure has consequences on the financial and governance participation requirements for the local energy users. The two extreme cases are: full co-ownership of the assets by the local energy users, who bear the initial investment, either equally or based on an individual quota; and third-party ownership (TPO), whereby a third party who is not a local energy user is the sole owner and manager of the energy assets and bears the initial cost. The co-ownership model is typically implemented by establishing a cooperative with the local energy users as members. The cooperative model requires higher degree of financial participation and participation in the governance for the local energy users, compared to TPO models. In the most common TPO models, the owner and manager of the

LES assets is either a local company (e.g. energy service company), an electricity supplier (e.g. local or national energy utility), or an international company (e.g. IT company).

Studies on the governance of common resources, however, show that there is no single type of local financial participation and asset ownership (government, private or community) that uniformly supports good resource management (Wolsink 2012). The suggested approach is context-specific, one that matches ownership and governance constructions with local stakeholders' procedural and distributional justice preferences (Wolsink 2012). The CIM allows to assess such preferences.

HOW TO ASSESS STAKEHOLDERS' PREFERENCES FOR KEY ATTRIBUTES OF THE LES/ENERGY SOLUTION

The attractiveness of procedural aspects and financing aspects can be elicited implicitly or explicitly. Explicit methods include direct questions on the desirability of different options for governance, ownership and financing, such as:

A*ccording to you, how should you/your organization and [other LOCAL STAKEHOLDERS] be involved in the project? Please select one or more options* [Alternatively: *how desirable are each of the following options for involvement the decisions?*]

** informational action (e.g. event, brochure)*

** consultation /public hearing*

** through the work of elected representative bodies*

** referendum (including veto right)*

** direct involvement of [LOCAL STAKEHOLDERS] is not necessary*

** Other ____*

Important note: options should be adapted to the context and it is important to have options that are feasible.

According to you, how should this project be mainly financed? Please select one or more options [Alternatively: *how desirable are each of the following options for financing the project?]*

** external donations*

** government money*

** internal funding*

** Involving [LOCAL STAKEHOLDERS] (e.g. fund-raising from individuals)*

** Other ____*

Important note: options should be adapted to the context and it is important to have options that are feasible.

One common implicit method is based on discrete choice experiments (DCE).
DCEs are an indirect method of eliciting individual stated preferences and willingness to pay for different product features (Green and Srinivasan 1990; Train 2009). Participants in DCEs have to choose repeatedly between two or more hypothetical product alternatives, which vary on several attributes, such as price, brand etc. (Green and Srinivasan 1990; Train 2009). The analysis of participants' choices over multiple rounds ("choice tasks"), where the levels of the attributes are randomly combined across the presented product alternatives, allows estimating the influence of changes in attribute levels on respondents' utility from the product and, ultimately, on respondents' willingness to pay for the product (Green and Srinivasan 1990; Train 2009)

2.3 Differences between residential and commercial energy users

Existing empirical studies on social acceptance and preferences for energy communities and LES mostly focus on residential energy users. They show that willingness to actively participate depends on both economic and normative factors. In other words, material incentives (such as decreasing energy costs) matter, but also a desire to protect the environment and strengthen existing social bonds does. Early work on energy autarkic regions already suggested that an increase in interactions between people, is perceived as desirable by citizens and could become a driver of decentralized energy systems (Bögel et al. 2021, Mäkivierikko et al. 2019). An improvement in perceived distributional justice, for example through local co-ownership, tends to improve citizens' acceptance of distributed energy infrastructures (von Wirth, Gislason, and Seidl 2018). Residential users tend to associate an implicit discomfort cost to schemes that reduce their ability to self-determine their energy behavior, and increase external control on their energy use, such as demand-side response (Kubli, Loock, and Wüstenhagen 2018). Individual control over own energy assets tends to be desirable, although willingness to pay extra to retain control is relatively low (Ecker, Spada, and Hahnel 2018).

As far as commercial and industrial energy users are concerned, field experience and research conducted within the E-LAND project (Petrovich and Kubli 2022) suggest that these stakeholders could display differing preferences for LES compared to residential users.

For such users, top drivers for participation in LESs are material "self-regarding" ones, such as lowering energy costs and hedging again market price uncertainty. Environmental and climate-related motivations are not a top concern. This said, support for the local economy appears to be also an important driver, suggesting that social identification to the local community could play a role for their participation in energy communities or LESs, as in the case of households. Reputation among final consumers also matters for businesses that sells products/services to end-consumers.

Resource and time constraints might lead to a scarce interest in financial and governance participation in LES, especially for smaller organizations. While being arguably a very effective model to enable local actors' active participation in energy choices, increase energy empowerment, community acceptance and redistribute benefits to the local community, the cooperative model could somewhat scare off some SMEs away from LES participation.

Commercial and industrial energy users tend to be more open to external control on their energy use or to adjust their own energy behavior than households. Small and medium enterprises, in particular, might be more open to demand-side response schemes than residential energy users, and might be even ready to pay a premium for optimal scheduling of their electrical appliances. Such measures are seen as opportunity to rationalize and optimize their energy consumption, increase energy efficiency and competitive advantage.

CONSIDERATIONS ON THE ASSESSMENT OF COMMERCIAL ENERGY USERS' DRIVERS FOR PARTICIPATION IN LES

- Decision-processes within companies and organization are different: either only one person or a group could have a say on the company-level decision to participate in an LES and/or support a given energy solution. When we try to assess company-level attitude towards a LES or a given energy solution, it is advisable to understand such decision-making processes. One strategy to assess company-level attitude towards the solution is to identify influential individuals within the company and assume that the company-level attitude could be inferred from the views of such influential individuals within the company.
In SMEs, those individuals coincide typically chief executive officers and company owners. Using screening questions, it is possible to target those individuals that in a real-world setting would have a say on the company-level decision to participate in an energy community, and/or would have a say

on signing up for a new electricity supply contract for the company. An example of such screening question is:
Can you influence your company's energy-related decisions (e.g. the decision to install solar panels on your company's building, or the decision to change energy supplier)? (answer options: yes, no)

- Bigger companies usually have internal policies and structured decision-making processes in place and understanding their motivation for action requires to go beyond analysing community values and single individuals' rational and emotional reactions towards the solution. We recommend to collecting evidence on internal policies and decision-making processes and understand the relationship between them and the proposed energy solution.

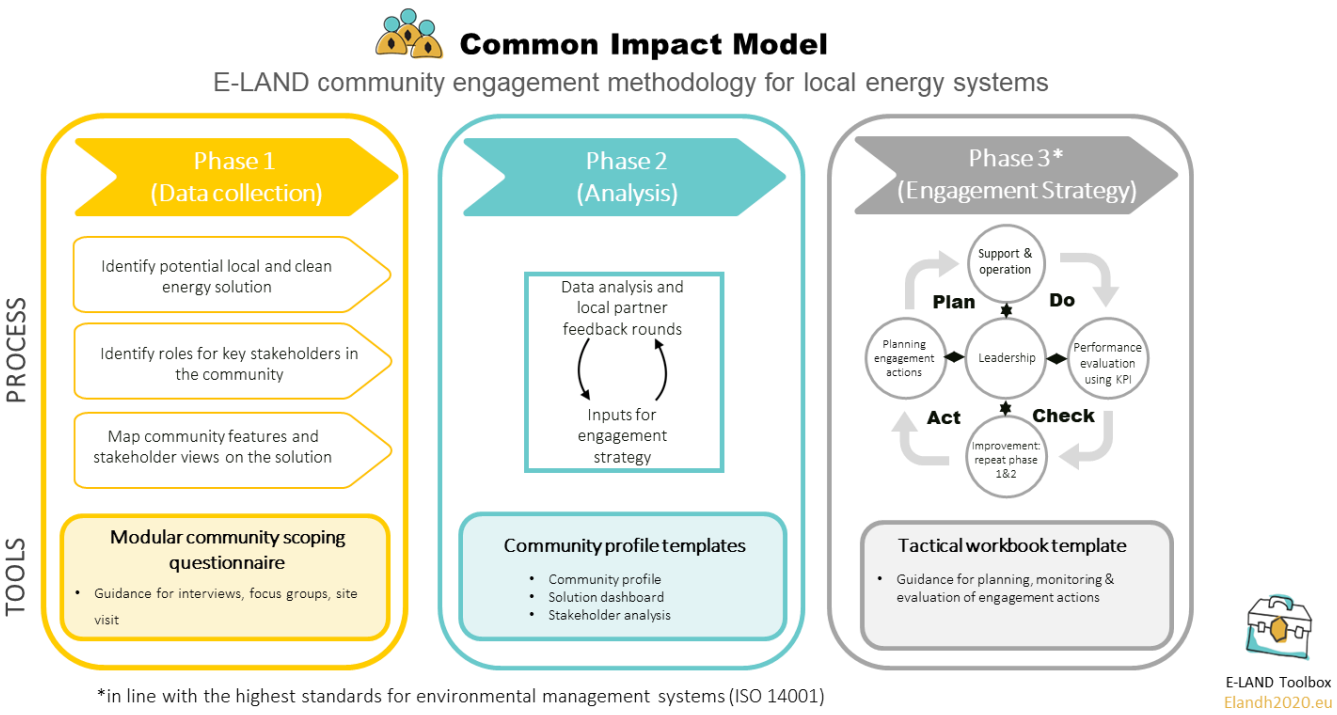
- In the case of large companies or large organizations, statements to measure worldviews (see above) tend to be not appropriate. In this case it makes more sense to have them answered by a representative sample of people who are part of the company/organization and who would answer with reference to themselves. This strategy often requires a great data collection effort.

- Individuals working in an organization or company might be time-constrained and it could be difficult to arrange interviews with them. Online survey could be an alternative for time-constraint individuals, although might be less insightful than interviews. Market research agencies could recruit a specific sample of people working in a given sector. Meeting local stakeholders on "their ground" with a site visit or using their typically communication channels could help. It is pivotal to have the support of a local ambassador that could facilitate the interaction with local stakeholders and can give insights on best way to interact with busy stakeholders.

3. Description of the tool and methodology

The Common Impact Model is a structured process for stakeholder engagement planning for those interested in setting up and operating local renewable energy systems and energy communities. It can be used by urban planners, energy managers, local actors interested in setting up local energy systems as well as companies offering services for local energy systems. The tool is designed to be utilized by an intermediary actor, but it could provide guidelines for a community or a local system to go through the process by themselves. The below figure (Figure 2) illustrates the CIM process.

Figure 2: Common Impact Model



The CIM process includes three phases, each of which includes clear objectives and a set of tools to guide the process.

Phase I: Data collection. In this phase, information is collected about social, cultural and technological aspects and preferences utilising pre-defined community scoping questionnaires and interview guides. The aim is to define jointly with local partners a technological solution to focus on, to identify relevant stakeholders, and to assess their views, values and practices that

can influence the long-term acceptance of the solution. This phase includes a **"discussion guide"** to guide the data collection process.

Phase II: Data analysis. In this phase, the data collected in the phase I is analysed and includes visualisation of the information in three dashboards. These include the **"community profile"** which maps the key community's values, priorities, and practices, that should guide the design and planning of new energy solutions that are compatible with community values and practices; the **"solution dashboard"** which summarizes local stakeholders' rational and emotional reactions to the proposed project or new way of operating existing assets, thereby helping to adapt the project design and communication accordingly and the **"stakeholder analysis matrix"** offering an overall visualisation of stakeholders position towards the proposed solution. This phase includes feedback sessions with the local partner.

Phase III: This phase includes co-creation of **engagement recommendations** with the local partner to create an engagement plan based on information collected in phases I and II. The engagement plan is accompanied by **"tactical workbook"** that includes detailed guidelines for implementing the activities, including identifying responsible parties, resources needed, and KPIs to follow up the success of the engagement. This phase sets up an iterative process in which recommendations can be carried out, assessed, and further fine-tuned along the project. Phases I, II and III can be repeated at a later stage to ensure that the implementation is on the right track.

The following sub-chapters will provide a more detailed account on the methodology and tools utilised at each phase of the process.

3.1 Phase I: Data Collection

3.1.1 Phase I: Process

Phase I includes collecting information to understand the community views and preferences related to a defined project or solution. The phase starts with defining a project or solution to focus on together with the local partner and continues with collecting information about key stakeholders and their views on the solution or project to better understand their rational and emotional reactions towards it.

The data collection process is threefold:

1. **Step 1**: Identify a clean and local energy solution or project to focus on and understand the position of the local partner towards the local energy solution,
2. **Step 2**: Identify key stakeholders and their role in the community or surrounding business ecosystem
3. **Step 3**: Map community features and stakeholders' views on the solution through interviews, focus groups or surveys, and, possibly, desktop research.

The CIM model offers guidance and tools to conduct each of the steps. The steps are guided by a modular questionnaire or discussion guide, as well as additional components that help to design exercises or data collection methods to obtain relevant information. The process to collect information is outlaid in this chapter, whereas the following sub-chapter presents the actual tools, including the discussion guide and stakeholder analysis matrix.

In continuation, the three steps of data collection process are explained:

Step 1: Identify a clean and local energy solution to focus on and understand the position of your local partner towards it

First step, "identify solution" includes an introductory pre-scoping session(s) with a local partner, to identify the problem, the ambitions of the local partner and the energy solution they want to focus on. The meeting can be hold either remotely or on-site, eventually combined with a site visit.

In this step, the process of the Common Impact Model and how it works in practice is explained together with the expected benefits for the tool user, and the scope and timeline of the tool application will be discussed.

A **pre-scoping semi-structured interview guide** can follow. The interview is guided by the standard questionnaire template with additional modules added to identify the solution and extended module for stakeholder analysis. The template helps identify and describe an energy solution/project where to focus the community engagement efforts. Moreover, it helps identify the local partners' expectations around this solution/project, and in particular:

perceived benefits, perceived barriers, perceived costs and riskiness, expected impact on other local stakeholders and reactions from them.

The topic selected determines the focus and scope of the process, guiding the rest of the activities, so paying attention to selecting the topic helps to smoothen the process and guarantee the focus to be on right issues when collecting information.

A good topic, project or solution would be such that:

1. the local partner would like to start to implement the solution/project in the near future, and it is committed to it,
2. for successful implementation of the solution/project, the local partner needs approval or active participation of other individuals/organizations (e.g. other companies in the community, building owners in the area, people living nearby, local authorities, financing bodies etc.)

Reserve time for defining well the focus or topic selected since it will have a high influence on how the process will go forward, what type of information is collected and how, as well as what modules to be utilised in data collection. For example, establishment of an energy community based on solar energy in an urban setting requires a different approach from collective wind production in a rural or offshore area.

At this stage, the first meeting can be turned into an ideation session if a clear topic does not exist from the beginning, or if a general topic needs to be narrowed down. If the partner needs additional time to confirm the topic, the pre-scoping session can be divided into two and the questionnaire completed at a later stage with a specific solution in mind.

WAYS TO CONFIRM THE TOPIC

The aim of this section is to identify and briefly describe a project where to focus our engagement efforts at XXX. The project has the following features:

1. your organization would like to start to implement the project in XXX

2. for successful implementation of the project, your organization need approval or active participation of other individuals/organizations (e.g. other companies in XXX, building owners in XXX, people living in XXX, local authorities in XXX, financing bodies) We understood that your organization would like to *[establish an energy community, install a wind turbine generating power for the nearby village, install a solar PV system on a common roof for collective use of a group of energy users…]***.** Did we understand this right? Can we focus on this project?
Imagine you have to present the project to your local stakeholders. How would you describe it (2-4 sentences)? *[Note: after this section the "solution" (or "project") is identified, the rest of questionnaire will refer to it.]*

Step 2: Identify key stakeholders and their role

The 2nd step consists of identifying the key stakeholders and their role related to the topic. To create a successful engagement strategy, the key stakeholders should be identified and their position towards the project understood. Stakeholders have differing levels of interest towards the proposed project or solution, and they may have differing levels of power to influence the possibility of the project to move forward.

In the CIM process, to understand the potential role of different stakeholders, an interest – influence matrix was utilised. Based on the type of project, another analysis method could be used as long as it focuses on identifying relevant stakeholders and understanding their role.

The stakeholder analysis exercise can be conducted during an initial meeting, or the pre-scoping session, depending on how the Step 1 in data collection is organised. Information is collected on:

- Who are the relevant stakeholders
- How would you place them based on influence/ interest matrix
- How do you relate with these stakeholders

Based on this exercise, relevant stakeholders are selected for further data collection (Step 3).

Note: stakeholder analysis is a process. During the CIM process, additional information will be collected from the stakeholders, and the matrix is updated based on stakeholder feedback.

Interview guidelines for stakeholder exercise
Next, we'd like to identify the stakeholders who might be important for the successful implementation of [solution]. Please name the relevant stakeholders for the implementation of [solution] and then position each actor in a matrix, defined by two dimensions: 1. Influence on other stakeholders and in the decision process (someone whose advice/opinion has great influence would score high on influence) and 2. Interest in solution (someone who is enthusiastic about the solution would score high, someone who is expected to oppose score low). [*After placing each stakeholder, ask "why?" to get qualitative insights.]*
Let's look back at the stakeholder matrix that we compiled together. • Which stakeholder do you meet or talk with at least once a week? • Which stakeholder do you meet or talk with at least once a month? • Are you and other stakeholder part of the same association, organization, board, club? • Which stakeholders do you have a good relation with? • Do certain stakeholders have a close relationship with some of the others? [*Post-its could be used to represent named stakeholders and arrows between them can be added to highlight the strength of the relationship]*

Step 3: Map community features and stakeholders' views on the solution

Step 3 includes collecting information about social, cultural and technological aspects of the community, and collecting stakeholder views, reactions and preferences related to the project or solution. Pre-defined community scoping questionnaires and discussion guides are utilized to guide the process. The model discussion guide has been designed to cover the theoretical foundations that influence people's and SMEs decisions to join local energy systems, and depending on the topic, it might need to be adapted at this stage based on the local needs, topic and target group (see Chapter 3.1.3).

Different tools can be utilized to collect information; interviews, focus groups and surveys are especially suitable for the process. Both online and onsite methods may function at this phase, and it is highly recommendable to conduct at least some of the information collection onsite, if possible. The local context and the ways in which people or companies commonly communicate with each other should influence the decision of which methods to use.
If the data collection process is being conducted by an external entity who is not a local actor or initiator of the process, a site visit at this stage would be highly recommendable to gain better understanding about the local context and interaction between the stakeholders.

This step may also require a desktop research phase, in which secondary information is collected on a range of themes, such as basic information on the stakeholders, further information on the drivers of engagement or motivation to join relevant to the topic, specificities of a local context, or any other relevant topics that might arise based on the combination of the topic selected, type of stakeholders and the context of operation.

3.1.2 Phase I: Relevant Tools

As described in the previous sub-chapter, a modular questionnaire or discussion guide has been designed to guide the data collection process indicating relevant topics to focus on. The questionnaire can be utilized as an interview guide or as a basis to develop a survey.

The standard discussion guide has its basis on theories of social acceptance, as well as theories on drivers and motivation of citizens to join local energy systems discussed in the Chapter 2. The discussion guide (in Annex I: Discussion guidelines – standard questionnaire) demonstrates the interlinkages between the theoretical underpinnings, questionnaire modules and set questions. Modules and dimensions can be added or adjusted based on local requirements.

Information will be collected within three main domains; situational information, community-related information, as well as solution-specific information, which all guide the data collection from different dimensions. The modules can be adjusted, and new modules can be added based on local context and characteristics of the project or solution. In addition to the three modules and, the discussion guide includes the stakeholder analysis exercise.

The model questionnaire includes model questions targeted for community members in residential settings, as well as questions targeted for commercial users, especially SMEs. The

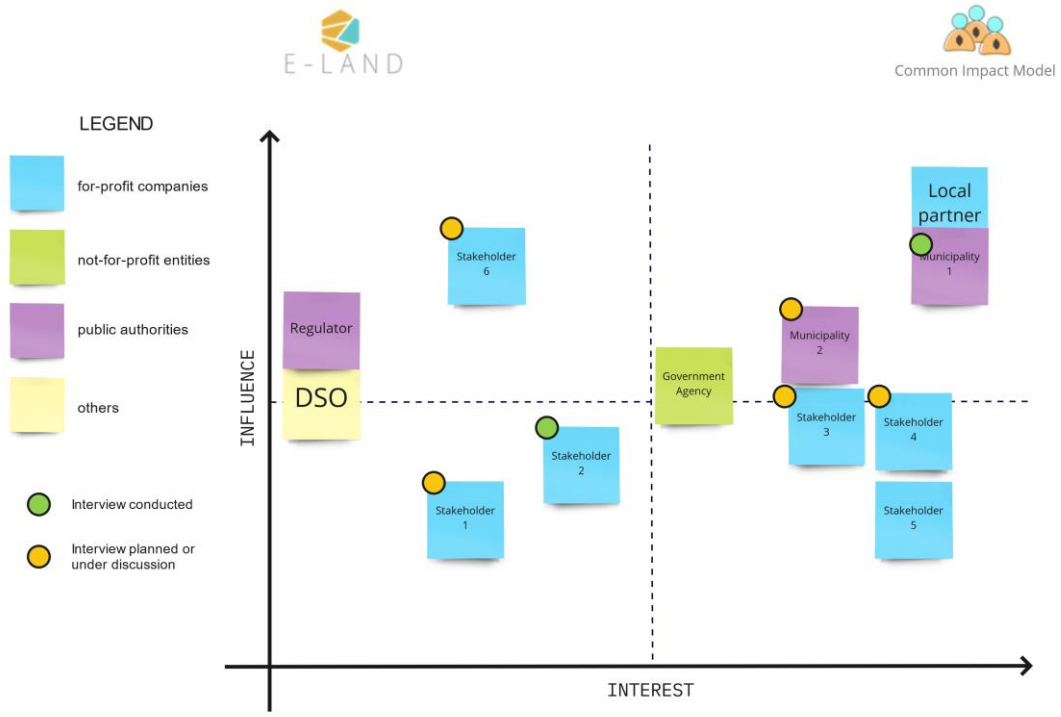
questions should be adapted so that they fit the correct target group and setting (community, industrial area, geographical location etc.).

In addition to the discussion guide, a stakeholder analysis exercise is conducted with the local partner to understand who the relevant stakeholders for a successful implementation of the project are, and how they relate to the solution or project in question. The stakeholders are placed on a matrix based on their 1. Influence on other stakeholders and in the decision process or the project itself, and 2. Interest in solution – how likely they are interested in joining or contributing to the initiative. In most cases, the exercise will be repeated with the stakeholders interviewed to further understand the potential role of the stakeholders. Please see figure Figure 3 for an example of a stakeholder analysis matrix.

The position in the matrix helps identify the type of actions that can be targeted to each stakeholder. Colors can be used to distinguish different categories of stakeholders, such as for profit, non-for-profit, local authorities etc. At the end of the exercise, the stakeholders who have a close relationship with some of the others will be identified, and the relations will be highlighted with arrows.

This exercise helps not only to identify the type of engagement action to be designed but also functions as a basis for defining the relevant stakeholders to be engaged in the data collection phase.

Figure 3: Stakeholder analysis matrix



3.1.3 Phase I: Adapting the data collection process

The above chapter presented a standardized discussion guide or questionnaire to assess community values and estimating the stakeholders' passive and active acceptance towards a project or a solution. However, no location is equal to another, and the focus may vary drastically between different settings. Based on this, the data collection methodology, including methods to collect information and the topics included need usually to be adapted based on local needs and the characteristics of sector worked with.

The standard questionnaire has been designed to setting up a LES or some of its components or manging existing resources differently in a LES system. While the questionnaire may be utilized for a range of topics where active participation or approval of end-users is required, it needs to be adjusted to cover relevant themes in the topic in question. In E-LAND, the CIM tool was utilized to assess community members' attitudes towards solar panels and battery storage, companies' willingness to join an energy community, and companies' attitudes

towards electrifying heavy-duty electric vehicles and heavy machinery. In these cases, especially the situational and solution-specific questions would require adjustment according to the topic.

One of the important considerations is the type of community and type of organisations worked with. The model questionnaire offers basic guidance for topics related to community acceptance of new technologies for individual people and SMEs. While the motivations of SMEs to join local energy systems differ from that of the individuals (Kubli and Petrovich 2022), enough similarities exist between these two types of stakeholders for most of the modules to be useful.

Bigger companies usually have internal policies and structured decision-making processes in place and understanding their motivation for action requires to go beyond analysing community values and rational and emotional reactions towards the solution. Even so, assessing attitude towards community, environment and technology (community values) provides insight into company's ways of operating and potential interest in taking part to joint activities. For the data collection process at a Port in Norway and the surrounding industrial area, questions about transport, logistics and green or sustainable policies were added to increase understanding on companies' attitudes towards heavy-duty electric vehicles and overall electrification of heavy machinery. This, combined with the deeper understanding of the culture at the industrial area helped to design engagement activities tailored for the context.

One of the main observations when working with other stakeholders than residents or SMEs is that the community values module might not function properly when applied to a large company. Ways to resolve the situation include to change the questions to ask respondents views regarding a specific geographical area or community (instead of the organization they work at) or repeating the questions, for example through a survey, with a higher number of employees. The latter approach may be time consuming, though, and the usefulness of community values modules should be considered case by case when working with large organisations.

An example of adjusting the questionnaire topic-wise includes testing of the CIM model in a technology park, which was one of the pilot sites in E-LAND. During the process, a need to

understand better the type of local energy system and the practical configurations companies present at the technology park would be willing to enrol was discovered. Having this in mind, we added a module utilising **discrete choice experiments** into the data collection phase. In this indirect method of assessing stakeholders' preferences, respondents needed to select from a set of hypothetical energy subscription models their preferred option multiple times, which helped to understand better the drivers and preferences for local companies regarding energy production methods.

Overall, while the CIM process and the questionnaire has been designed with a LESs in mind, a similar process could be utilised as a structured approach to collect stakeholder feedback and preferences in a wider range of topics, – if the content of the questionnaires would be changed to cover drivers, motivations and barriers relevant to that topic.

3.2 Phase II: Analysis

Phase II of the CIM process focuses on analysing of the data collected in phase I. The data is analysed and presented in visual dashboard to help to quickly grasp the essential findings related to community features and values, attitudes towards the solution, as well as the role and position of the stakeholders in the project. Visual dashboards function, simultaneously, as material that can be easily converted into communication materials or used for stakeholder outreach purposes.

The data is visualised in three dashboards: **"Community profile"**, **"Solution dashboard"**, and **"Stakeholder analysis"** -matrix.

The data analysis process includes feedback and co-creation sessions with the local partner to assess the findings, enrich the analysis and to feed into the development of an engagement plan. Feedback sessions may lead the data collection process to take new directions, if new open questions are raised.

3.2.1 Phase II: Process

In Phase II, the information gathered during the Phase I is analysed and summarised in visual dashboards described below. The results can be presented as a presentation including the dashboards, or as a report. In E-LAND, the deliverable D2.4 "Sustained engagement plan and

impact evaluation" also presents the results of the data collection phase for each pilot site, together with the future engagement plans.

The Phase includes 1-2 update sessions with a local partner to present initial results, receive feedback and reflect upon the results. The feedback sessions help to guide the data collection and analysis process, which sometimes can take new directions, if new, open questions are identified. Both online and presential sessions function at this phase.

3.2.2 Phase II: Tools

Three tools form the core of phase II and they are designed to summarise the main inputs from Phase I in a way that represents the key findings in an easy and visual way to guide energy infrastructure planning.

The three tools are:

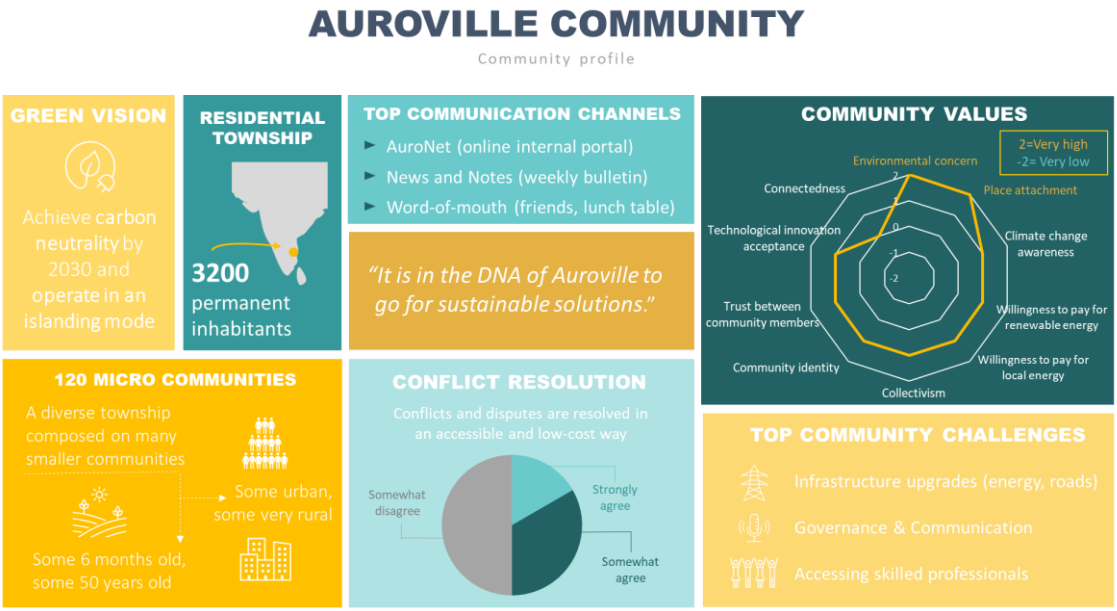
1. Community profile
2. Solution Dashboard
3. Stakeholder matrix

In continuation, each of the tools are presented and analysed.

Community profile

The community profile summarises the key findings related to the cultural scope including community feature and community values – all providing information on the different dimensions of a community, including sense of community, attitudes towards environment, climate change and technology, key challenges and key communication channels.

Figure 4: Community profile for Auroville Community



The components of the community profile are:

Basic information of the community, including the vision of the community related to the project or solution in question. Depending on the type of the community, the basic information may vary, for example from having a community characterization to including key sources of emissions at the community.

Other important elements include the customary **communication channels**, to define how to reach community members or what are the best sources of information for them. These communication channels can be utilized either directly as channels for information sharing, or to inform community members about possible events or activities related to the project.

Understanding **top community challenges** helps to understand better the main concerns within the community and to understand where the project stands within the overall community structure. At best, synergies can be found between responding to the community challenges and the project or solution studied, which would help to increase the interest towards the solution. Engagement activities should be designed keeping this in mind.

Level of knowledge about the topic (the technology or solution in question, or overall knowledge about the topic) helps to determine from where to start with the engagement

activities. Sometimes, dissemination of basic information is required for people or companies to be able to do informed decisions while if community members are more familiar with the topic, more direct action can be implemented.

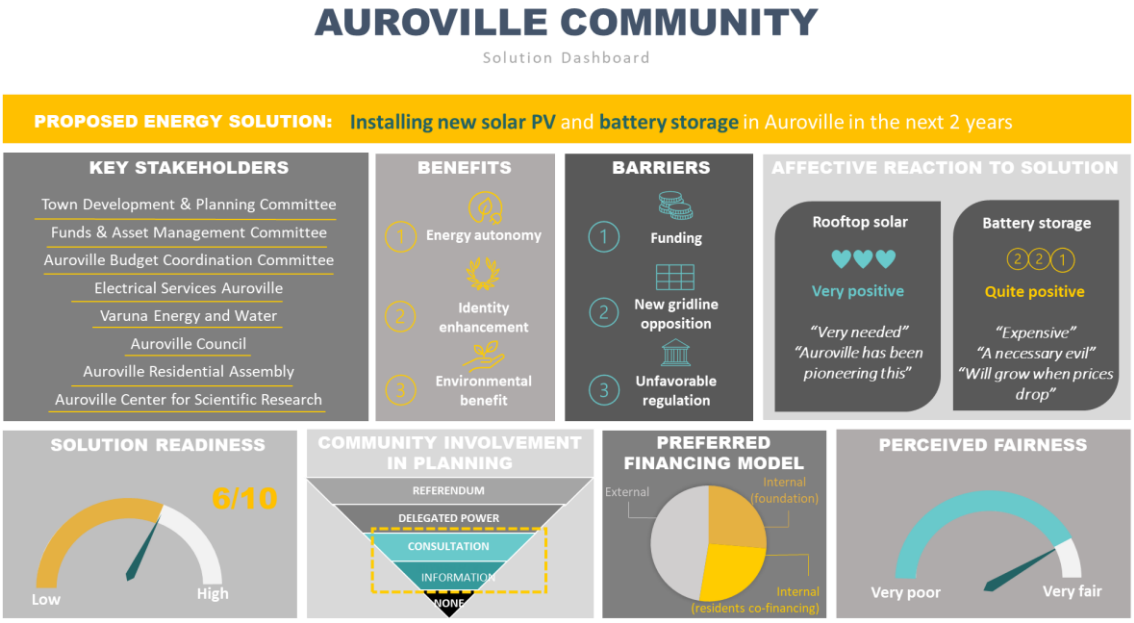
Perceived possibilities for **easy and low-cost conflict resolution** are additional determinants for people's willingness to join community-based or joint initiatives, and therefore, this is also presented in the Community Dashborad.

Community values are the type of values that typically influence the respondent's willingness to join collective action. Understanding these values guides the design of engagement action and help to frame communication with the stakeholders. Community values are visualised in a spider web that helps to grasp the general attitudes towards environment, climate change and technology, as well as to understand some key dimensions that function as determinants of a sense of community, including connectedness, trust, collectivism, place attachment and community identity. The "community values" section is a combination of "worldviews" and "community features" categories represented in Figure 1 in p.13. High or low score in either one of these is not necessarily positive or negative but helps to determine what kind of activities the community members are likely to prefer or what kind of language they are likely to respond to. Higher scores in values dimensions reflect likely preferences for communal and bottom-up activities, while lower scores may indicate preference for more individual activities. Preferences for environment, climate change and technological innovation help to determine key motivations for action, be it monetary, sustainability oriented, or technology focused.

Solution dashboard

The second dashboard, solution dashboard focuses on the attitudes towards the project or solution itself. It includes visualisations on key stakeholders, perceived benefits and barriers, reactions to the topic, preferred level of involvement, preferred type of financial participation as well as a general "solution readiness score" that helps to define the readiness of the respondents to use or accept the proposed technology or solution.

Figure 5: Solution Dashboard for Auroville Community



The solution **readiness score** measures community's readiness to accept local and collective clean energy solutions, it is average score over the score assigned to 10 key community values: environmental concern; climate change awareness; willingness to pay for renewable energy; willingness to pay for local energy; attitude towards innovation; collectivism; community identity; place attachment; mutual trust; and connectedness.

The solution readiness score helps choose the types of engagement actions: high scores suggest focusing on deployment, that could include recruit leaders/governing body, share results and disseminate impact); a medium score suggests to focus on development, such as co-creation workshops; a low score suggests to focus on exploration, build basic knowledge or market creation.

This score is originally designed especially for local energy systems and energy communities. In case of other type of solution or project, the questionnaire needs to be adjusted to cover the participants' or stakeholders' interest to support the project or the type of activity, and the average of this score needs to be included in the calculation of the solution readiness score. An alternative to this adaptation would be to add a scale on "social norm" providing a metering on what the neighbors or other community members would to. The question on social norms is present in the standard discussion guidelines and can be easily presented as a graph.

The section for **affective reaction to the solution** assesses the starting point of acceptance (baseline) and gives an indication where the community stands with regards to the project or solution. It helps to calibrate the level from where to start designing the engagement strategy. The engagement strategy can be evaluated by comparing this measure before and after the engagement actions.

The top **perceived benefits and concerns** help choose a focus for the engagement strategy, to frame a message communication campaigns or information sharing and, overall, design the solution in a way that maximise positive aspects and addresses concerns. Information on perceived benefits and concerns help to focus messaging towards addressing concrete consequences for stakeholders. When designing an engagement strategy, and approach that includes engagement actions for each major barrier can be considered – if the barriers can be tackled with available resources.

A sense of **emotional connectedness** with the new energy infrastructure is often one of the success factors for successful implementation of energy projects and local energy systems, so understanding the emotional responses and leveraging on positive associations with the technologies, as elicited using the questionnaire, helps to build acceptance and interest to the solution.

Procedural and distributional **justice** preferences' assessment helps design ownership and governance constructions for the LES that match local stakeholders' preferences.

Financial participation module seeks to assess community member's preferences on opportunities and ways of financing the initiative.

Stakeholder analysis

Third tool of the Phase II is the stakeholder analysis matrix. The matrix helps to visualise the most relevant stakeholders to the project, and their position or role in it. **¡Error! No se encuentra el origen de la referencia.** (p. 33) demonstrates an example of a stakeholder matrix where stakeholders can be classified based on their interest and influence towards the project. Local stakeholders can be divided into proponents of the solution (high interest), those with weak preferences for the solution (low/medium interest), and possible opponents of the

solution. In Phase II, the stakeholder matrix is updated based on the insight gathered in Phase I, through clarifying the position of the stakeholders, and adding any missing stakeholders identified during the data collection process.

Based on the stakeholder analysis, different actions can be targeted to the stakeholders based on their views and position towards the project. Typically, a top-priority target for engagement actions would be composed of highly influential stakeholders who are not interested in the solution.

The stakeholder analysis phase can be utilized to identify local ambassadors, who are most often stakeholders with high interest and high influence. They should be recruited as partners for engagement actions. Local ambassadors could be the local trusted contact persons/organisations. They establish from project start to project end (and at best beyond this) an ongoing communication with energy users interested in/affected by the project.

During the analysis, other essential stakeholders, such as gatekeepers can be identified. Additional groups, such as “early adapters” and “followers” can be identified when relevant for the project development.

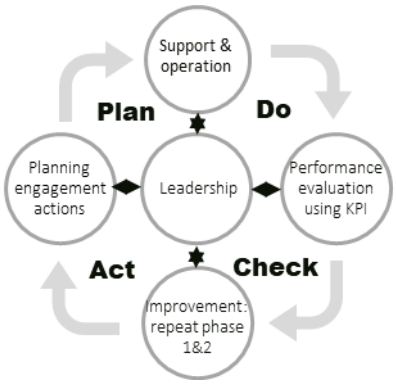
3.3 Phase III: Engagement Strategy

During Phase III, an engagement strategy is set up based on information collected and analysed in Phases I and II. To create an engagement plan, the results of the co-creation session described in Phase II will be analysed together with the rest of the information collected to guide the development of the plan. The aim is to combine the local knowledge of the local partners with the insights gained in the data analysis process to develop an engagement plan that is well rooted to the local needs and reality, taking into account available resources and timeline.

This phase includes three different tools: First is an outline for an overall engagement strategy with clear activities and a timeline, and the second includes a tactical workbook to provide guidance and clearly define objectives, resources, responsibilities and KPIs for each of the engagement activities. The third one is an evaluation survey for a local partner, applied in cases when the main responsible for conducting the CIM process is an external organization.

Phase III is not limited to setting up an agenda, but it includes implementation of the engagement activities, which can be then monitored based on set KPIs and calibrated or modified if needed. This plan-do-check-act cycle can be repeated as many times as needed during a project lifetime. This feature of the CIM is inspired by the plan-do-check-act cycle, from the ISO 14001 environmental management system.

Figure 6: Plan-do-check-act cycle



The CIM is a dynamic model - and therefore, also phases I and II could be repeated periodically during implementation of activities in phase III to ensure the changing dynamics of the community are captured and factored into future engagement recommendations.

While it is difficult to give one-size-fits-all estimation about the length of a cycle between implementation of activities and revision, be it related to revising a specific activity or the whole engagement plan, some rough estimates can be established. The activities should be assessed at least after coming to the end of pre-determined implementation period, and the whole engagement strategy could be revised at least if there is a reason to expect that the solution, or the situation of the community, has changed substantially from the situation at a starting point.

At this stage, periodic follow up meetings can be done with the local partner, if so agreed. In the follow up meetings, engagement milestones and KPIs can be revised as a part of the plan-do-check-act cycle, and next steps can be agreed upon.

The CIM is essentially a planning tool and while it provides detailed planning for engagement activities, if practical guidance for implementation of the activities might need to be sought from additional resources.

3.3.1 Phase III: Process - from data to engagement plan

Chapters 2.2, 3.1 and 3.2 discuss drivers of acceptance related to new technologies, as well as other factors that have an influence on stakeholders' preference to take part in LESs, and how the stakeholders views and preferences influence potential engagement strategy. The engagement plan should take into account the barriers and enabling factors identified, address the key community values and incorporate the local situational knowledge of the local partner. Co-creation session(s) with the local partner combined with insights collected from the other stakeholders should form the basis of the engagement plan. Chapter 3.2 above provides basic insight on how the different variables collected influence on the type of engagement action recommended.

While the multiple dimensions presented in previous chapters all influence the way in which an engagement plan could be designed, it is equally important to take into consideration the local situational information, including possible regulatory barriers and other physical or non-physical limiting factors. Often, the local partners or identified local stakeholders, such as local ambassadors, are good sources of information on specific considerations related to the locality, or types of engagement activities that could function or not in their local context.

While the data collection and analysis phases of CIM are strictly based on theories of acceptance and participation in LESs, the phase of turning information into action has some room for creativity and learning from good practices elsewhere adapted to the local setting.

Examples of how to go from analysis to recommendations include:

- The engagement activities should be deeply rooted to the local context. Activities that help to address common community challenges are likely to motivate local stakeholders to engage actively.
- The community values scores can be utilized to define what type of action could be best suited for the community in question. For example, if the community scores low on trust, a way forward could be to build on trust-building and joint activities – or to have a system designed in a way that allows entities with lower level of trust to operate together.
- Based on the knowledge level and motivations to participate in LES, messaging can be framed to be more appealing to the stakeholders – for example, many stakeholders value possible savings in energy costs, while others appreciate possibility to utilize locally produced energy or to achieve CO^2 savings. The general knowledge level helps to determine whether to start with information sharing activities, or to start from more advanced discussions.
- Existing social norms and comparison to other people or companies in the area may help to motivate people to adapt or shift to new practices. Framing the messaging based on what neighbours or peer-groups do may help to promote the activities in question.
- Finally, external factors such as available resources, people available, budget and timeline influence the final engagement plan.

3.3.2 Phase III: Tools

Phase III includes three set of tools. First is an overall engagement plan, that is noting but a timeline demonstrating the main engagement activities designed based on time and resources available.

The main tool at the phase III is the tactical workbook template that is designed to help the planning and implementation of engagement action. The tactical workbook includes a short description of the activity, including objectives. Furthermore, target audience, required resources, division of responsibilities and materials required are all planned ahead in this

workbook. KPIs help to measure the effectiveness of the action and can be utilised to define and design future action as well.

Finally, this phase includes an evaluation survey for the local partner, to assess and improve the process itself (see Annex III: Evaluation questionnaire).

Table 3: Tactical Workbook Template - example

Engagement recommendation	Online campaign to educate residents
Objectives	Address identified knowledge gap and build acceptance of local grid connection for a carbon-free electricity sourcing. Connect homes to local grid.
Description of activity	Provide educational resources by sharing information in small, digestible chunks in internal intranet. If possible, bring the discussion to the target group by arranging/promoting it around an existing event (e.g. monthly steward meeting)
Description of tasks	- Produce easily understandable communication materials - Publish materials as a series of energy related postings in the intranet - Consider presenting some of the key messages in existing events at the community
Target group	Resident representatives, town planning and development entities, residents
Materials	
Timeline	The winter/rainy season is the best time to address these topics
KPIs	willingness to join the local grid (measured with survey), pre/post action; number of off-grid homes
Cost	
Reward/incentive scheme	n/a for this activity
Leadership	Local partner
Supporting team	Local ambassadors
Open questions	

4. Application of the Common Impact Model

The CIM model has been tested in four places at E-LAND project pilot sites. The test sites differ from each other by the location, climate and type of energy vectors included in the LES. They include a Sea Harbour in Norway, a technology park in Northeastern Spain, a University Campus in Romania, as well as an energy community in India in a predominantly rural setting.

Table 4: Application of the CIM model, summarises the implementation and testing of CIM in real-life conditions during the E-LAND project. Learnings from this testing, including the implementation process and feedback from the partners, have been incorporated into the final model presented in this deliverable. More information about the results of CIM application can be found in E-LAND deliverable 2.4 "Sustained Engagement Plan and Impact Evaluation".

Table 4: Application of the CIM model

Pilot sites	Location	Energy solution	Local partner(s)
Port of Borg - sea harbor in an industrial area	Norway	Focus area: Shifting from fossil-fueled heavy trucks to electric ones, powered by locally produced renewable energy	Borg Havn IKS (BIKS), the port operator
Campus of Valahia University of Targoviste – university campus including dorms, education buildings and one research building	Romania	Focus area: Decarbonize the University Campus area, increase the use of renewables and create a healthier habitat for students and staff	Valahia University of Targoviste
WALQA technology park - initiative by local authorities, hosting ~60 companies, mostly small tech startup	Northeastern Spain	Focus area: Establishing an industrial prosumers' energy community in the Park	INYCOM, a large tech company with office in the Park; Park Management
Auroville – residential township with ~3000 residents	South India	Focus area: Installing new solar systems and battery storage in the town	Auroville Consulting – a local non-for-profit organization

5. Conclusions

Local renewable energy systems and energy communities can contribute to the decarbonisation of the energy system. Successful and long-lasting local energy systems and energy communities require a functioning technology, a sustainable business model, and acceptance from various local stakeholders and community members.

The Common Impact Model is a tool developed within E-LAND project to help urban planners, energy managers, and other interested parties to design clean and local energy solutions that are compatible with local stakeholders' views, values and priorities. The process is designed based on the academic literature on governance and social acceptance of collective energy solutions.

CIM is a structured process comprising 3 phases, including data collection, analysis and engagement planning. Each phase includes a set of tools to help guide the step. These include a discussion guide and stakeholder matrix for data collection, pre-designed dashboards to summarise the information collected, and a tactical workbook to help with engagement planning and implementation. This report provides guidance on how to use these tools in the planning process.

The CIM model has been designed with local renewable energy systems in mind, but its applicability goes beyond that. The model is especially suitable when planning new energy assets or operating existing assets differently, but practical experience from E-LAND demonstrates that with slight adaptation, it is suitable for all kinds of energy solutions that require approval or active participation of various individuals or organisations.

Within E-LAND, the tool has been tested for a wide range of energy projects. The included a plan to establish a local energy system in a technology park, a plan to add solar and battery assets to an energy community as well as the assessment of community reactions to the electrification of heavy-duty vehicles in an industrial port and surrounding industrial area. Experience demonstrates that the CIM model can bring benefits for stakeholder engagement planning when the model is tailored to the local context. In addition to opening up and explaining the model, the present report also provides tips on how to adapt the process based on local needs.

The CIM model is essentially a planning tool and guides effective planning for engagement based on stakeholders' needs and priorities and considering existing available resources. Implementation of engagement activities always requires human resources and time, and the time invested in engagement of stakeholders, participants or end-users should not be underestimated. Only through proper and continuous implementation of the engagement activities will the benefits become visible.

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E-LAND deliverables

H2020 E-LAND report, *D2.1 Common impact model communication and engagement strategy* (Restricted access)

H2020 E-LAND report, *D2.2 Community analysis report* (Restricted access)

H2020 E-LAND report, *D2.3 Communications Strategy and Engagement Tools, available online at: https://elandh2020.eu/wp-content/uploads/2020/09/D2.3-Communications-strategy-and-engagement-tools.pdf*

H2020 E-LAND report, *D2.4 Sustained engagement plan and impact evaluation, available online at:* https://elandh2020.eu/knowledge-center/

H2020 E-LAND report*, D6.1 First piloting results, available online at:* *https://elandh2020.eu/knowledge-center/*

H2020 E-LAND report*, D6.3 Replication guidelines* (not yet published)

H2020 E-LAND report*, D7.4 Exploitation plans for E-LAND tools and policy recommendations*

Annex I: Discussion guidelines – standard questionnaire

Below questionnaire is a standardized E-LAND scoping interview questionnaire designed to collect information on stakeholders' passive and active acceptance of a LES. This questionnaire should be adapted to the local setting and modified to cover the necessary elements to understand the technological solution to be focused on, if other than a local renewable energy system.

Situational information - background information	
Dimension	**Questionnaire item**
Introduction	Introductory questions as required to get a good understanding of the operating environment, including; Background information about the interviewee, role in the organisation, basic information about the organisation or the community.
Priorities_organisation Priorities_community	What are the main challenges for your organization today in your opinion? Please name up to three Which issues are of most concern (challenges) today for your community in your opinion? Please name up to three
Communication channels, connectedness	How does your organization usually learn about what happens in [your area] or communicate to others in [your area]? Please list up to three channels.
Connectedness	How often do you/your organisation interact(s) with other organizations/people in [organisation, area, community, neighbourhood]?
Situational information - familiarity with the topic	
Dimension	**Questionnaire item**
Familiarity with energy topics	How often does your organization discuss about energy-related topics?
Energy topics	What energy topics were discussed in your organization lately?
Energy cost and rent	How does your organization pay for …electricity …cooling/heating needs …transport fuel

Salience_energy, fuel and transport cost	How would you describe the amount that your organization pays for …their electricity …cooling/heating their buildings …their transport fuel
Salience_energy, CO^2 emissions	What are the main sources of CO2 emissions of your organisation?
Perceived behavioural control	How do you rate your influence on **energy-related** and **transport-related** decisions in your organization on a scale from 1 to 5? Could you tell us who is highly influential on **energy-related** and **transport-related** decisions in your organization?

Defining the solution	
Dimension	**Questionnaire item**
Familiarity with energy topics	Imagine you have to present the project to your local stakeholders. How would you describe it (2-4 sentences)? [Note: after this section the "solution" (or "project") is identified, the rest of questionnaire will refer to it.]

Solution specific - Attitudes towards the project/solution	
Dimension	**Questionnaire item**
General_acceptance	Generally speaking, the project/ solution just described is a great idea?
Community participation preferences (procedurial participation preferences)	According to you, how could your organization participate in the [project, solution]? [list of options can be provided to support the answer/ discussion] Alternatively: According to you, what role could your organization take in the [project, solution]?
Perceived benefits_community	According to you, What would be the main benefit(s) of [project, solution] to the community/ area?

Perceived benefits_organisation	According to you, what would be the main benefit(s) of [project, solution] for your organization? Can you estimate the magnitude of the benefit on a scale from 1 to 5?
Perceived barriers_community	According to you, what would be the main barrier(s)/downside(s) of the [project, solution] to the [area, community]? Please name up to three
Perceived barriers_organisation	What would be the main barrier(s)/downside(s) of [project, solution] duty electric vehicles for your organization? Please name up to three Can you estimate the seriousness of the barrier on a scale from 1 to 5?
Indirect perceived barriers	What has to happen so that the project/ solution becomes a success?
Subjective social norm	In your opinion, do you think other groups/organizations at [organisation, area, community, neighbourhood] would support [project, solution]? In your opinion, would external stakeholders support the [project, solution]? [only to be asked after the stakeholder exercise, if relevant]
Perceived distributional justice	In your opinion, would some groups/organizations in [area, neighbourhood, community] benefit from [project, solution] more/less than others?
Perceived risk	Do you see some risks for your organization/ community related to the [project, solution]?
Perceived riskiness	How risky is investing in the [project, solution] for your organization/ for the community members in your opinion?
Perceived behavioural control	Do you think that [community members, organisation] can influence to a large extent the decision to implement the [project, solution]?
Financial participation preferences	According to you, how could the [project, solution] be mainly financed? [list of options can be provided, together "other, please specify" option]

	How desireable are each of the following options for financing the project? [provide list of options, important to have clear and practical options, the interviewee should be aware of different existing models, even novel ones, to construct a list and explain it in a clear manner]

Community-related - Community features - stakeholders	
Dimension	**Questionnaire item**
Stakeholders	Stakeholder matrix exercise
Connectedness	How often do you interact with [list of stakeholders]; are you part of the same board, association?

Community-related - worldviews and community features	
Dimension	**Questionnaire item**
Environmental concern	Looking after the environment, caring for nature, and saving reseources is important to me Looking after the environment, caring for nature, and saving reseources is important to [workers at an organisation, members of a community/ neighbourhood]
Climate change awareness	I am ready to recommend colleagues and workers/ other community members activities that will help reduce global warming or to live a clean and green life People working at [organisation]/ living in [community, neighbourhood] are ready to recommend colleagues and workers/ other community members activities that will help reduce global warming or to live a clean and green life
WTP renewable energy	How much you would be willing to pay for renewable energy compared to a traditional energy subscription/ your current energy subscription? [add a scale; 10 % more, “the same price, if it is 10 % cheaper, only if it would offer significant reductions from the current bill, I would not use it]

WTP local energy	How much you would be willing to pay for locally produced energy compared to a traditional energy subscription/ your current energy subscription? [add a scale; 10 % more, "the same price, if it is 10 % cheaper, only if it would offer significant reductions from the current bill, I would not use it]
Attitude towards technology/ innovation	I am reluctant to try new technologies People working at [organisation]/ living in [community, neighbourhood] are reluctant to try new technologies
Collective vs. individualism	I engage in joint initiatives with other people in my community/ at workplace People working at [organisation] engage in joint initiatives with neighboring companies
Community identity	I feel [organisation, community, neighbourhood] is a great place to work/ live People working at [organisation] often talk about [organisation/ area] as being a great place to be and work
Multiple place attachment	I feel a very strong sense of belonging to [area, community, neighbourhood] People working/ living at [organisation, community, neighbourhood] feel a very strong sense of belonging [area, community, neighbourhood]
Trust between each other	In general, I trust other members of my community/ neighbourhood/ organisation People working at [organisation, area] in general trust each others
Connectedness	I commonly talk to the members of my community/ my colleagues when I meet them It is common to talk to each other when people meet in [organisation, area, community, neighbourhood]
Connectedness	I often spend time with other people living in my/ working at [community, neighbourhood, organisation] People often spend time with other people living in/ working at [community, neighbourhood, organisation]
Conflict resolution	Conflicts and interests in [community, area] are resolved in an accessible and low cost way

Solution-specific - Stakeholders' features and emotional reactions	
Factor	**Questionnaire Item(s)**
Familiarity with the topic	People in [area, neighbourhood] are used to seeing the following in their immediate surroundings: [list of relevant technology components of LES]?
Emotional reactions	What is the first word or phrase that comes to mind when you read …: [list of relevant technology components of LES in question] Can you tell me whether the word(s) or phrase(s) you indicated has a (very) positive, (very) negative or neutral connotation?

Annex II: Visual templates

E-LAND visual templated for CIM phase II. Templates in power point format available upon request.

Figure 7: Community profile template

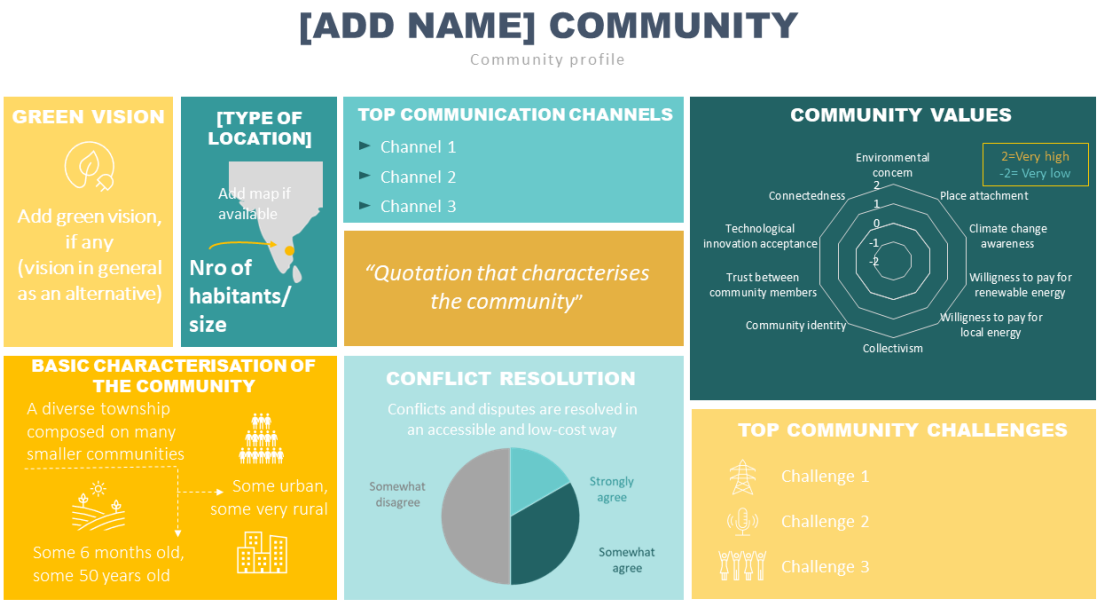
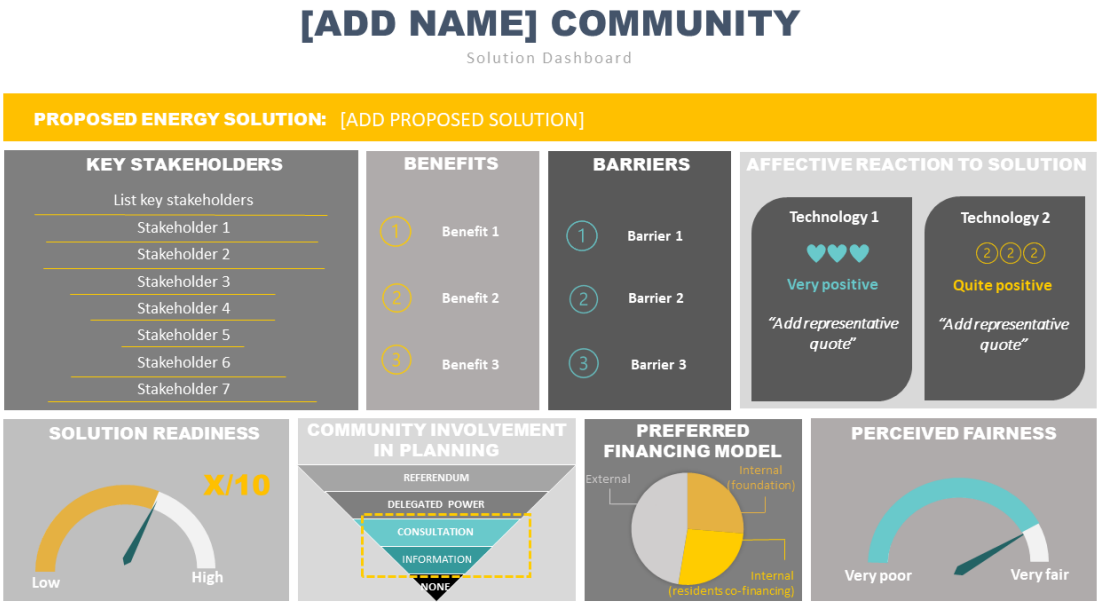


Figure 8: Solution Dashboard template



Note: Power point template available upon request

Annex III: Evaluation questionnaire

Background information	
Dimension	**Questionnaire item**
Organization	Which organization do you work for?
Role	What is your role in the organization you work for?
Tool User	What type of person is the user of the E-LAND Community tool within your organisation or community? -Decision maker (community manager, director, etc.) -Financial person -Technical person (technician, engineer, etc.) -Other (please specify) ___
User experience	
Dimension	**Questionnaire item**
Goals	What goal are you trying to achieve with the E-LAND Community tool? [open question]
User expectations	Was your expectations about the E-LAND Community tool met, unmet, or exceeded? - Exceeded - Met - Unmet
User satisfaction (1)	To what extent were you satisfied as a user of the E-LAND Community tool? - Very satisfied - Rather satisfied - Somewhat unsatisfied - Not satisfied at all
User satisfaction (2)	How likely it is that you recommend the E-LAND Community tool to someone else? (10-point scale) - 10: Very likely - 1: Not at all likely
Perceived usefulness (Phase 1 & 2)	How useful was the information collected (stakeholders' matrix, community profile and solution dashboard)? - very useful - rather useful - rather not useful - not useful - I do not know - not applicable to my case

Perceived usefulness (Phase 3)	How useful were the engagement recommendations provided (tactical workbook)? - very useful - rather useful - rather not useful - not useful - I do not know - not applicable to my case
Implementation	Did you implement the engagement recommendations? - yes, all of them - yes, some of them - no, but I plan to implement them - no, I have decided against implementing them - I do not know - Other (please specify) ___
Comments	Any further comments you would like to share? ____