ECOEMPOWER

ECOsystems EMPOWERing at regional and local scale supporting energy communities

August 2024

D3.1 ADAPTABLE FRAMEWORK FOR ENERGY COMMUNITIES ENGAGEMENT AND BUILDING

The project ECOEMPOWER - ECOsystems EMPOWERing at regional and local scale supporting energy communities receives funding from the European Climate, Infrastructure and Environment Executive Agency (CINEA) under Grant Agreement n°101120775.

Co-funded by the European Union

TECHNICAL REFERENCES

Project Acronym	ECOEMPOWER
Project Title	ECOsystems EMPOWERing at regional and local scale supporting energy communities
Funding Programme	LIFE 2027
Call	LIFE-2022-CET
Topic	LIFE-2022-CET-ENERCOM
Project Coordinator	Cinzia Morisco (FBK), cmorisco@fbk.eu
Project Start Date	September 1st, 2023
Project End Date	August 31st, 2026
Project Duration	36 months
Project ID	101120775

Deliverable No.	D3.1 – Adaptable Framework for energy communities engagement and building
Dissemination Level	PU - Public
Work Package	WP3 – Enabling social participation
Task	T3.1- Define and refine a shared approach to energy communities engagement
Lead Beneficiary	University of Trento (UNITN)
Author(s)	Attila Bruni, Vincenzo D'Andrea, Letizia Zampino
Contributing Beneficiaries	ACV, AURA-EE, BAUM, eza!, ROCG, PAT, PSOE
Reviewer(s)	Massimo Plazzer (PAT) Teresa Notz (eza!)
Due Date of Deliverable	August 31th, 2024

Actual Submission Date	August 30th, 2024

REVISION AND HISTORY CHART

Version	Date	Editors	Comment
0.1	28/06/2024	UNITN	ToC shared with the reviewers
0.2	02/08/2024	UNITN	Document shared with the reviewers
0.3	23/08/2024	Massimo Plazzer (PAT); Teresa Notz (eza!); Cinzia Morisco (FBK	Reviewers' inputs integrated in the document
0.4	28/08/2924	UNITN	Finalisation of deliverable
1	30/08/2024	UNITN	Final version submitted

DISCLAIMER

The opinion stated in this report reflects the opinion of the authors and not the opinion of the European Commission. The European Union is not liable for any use that may be made of the information contained in this document.

All ECOEMPOWER consortium members are committed to publish accurate and up to date information and take the greatest care to do so. However, the ECOEMPOWER consortium members cannot accept liability for any inaccuracies or omissions, nor do they accept liability for any direct, indirect, special, consequential, or other losses or damages of any kind arising out of the use of this information.

EXECUTIVE SUMMARY

The primary goal of Work Package 3 (WP3) is to establish a unified approach to enhance social participation in energy-related initiatives, with a focus on developing and engaging energy communities—groups of citizens managing their energy needs collectively.

Task 3.1 under WP3 was specifically dedicated to creating an Adaptable Framework aimed at facilitating the formation and engagement of energy communities. This framework serves as a comprehensive tool, offering guidelines and methodologies that can be customised to various contexts. It is designed to assist stakeholders, including One Stop Shops, in consulting and engaging citizens effectively in energy community initiatives.

This deliverable is structured into four main chapters. Chapter 2 provides an extensive review of existing literature, defining energy communities and exploring their dimensions and implications. Chapter 3 introduces a flexible framework adaptable to different contexts, emphasising inclusivity and collaboration. Chapter 4 discusses participatory methods and actions to involve community members actively, offering practical tools and techniques for engagement. Chapter 5 summarises the findings and the importance of the developed framework in promoting sustainable energy practices and social cohesion.

The adaptable framework provides a robust conceptual foundation by synthesising existing research and integrating diverse strategies for community engagement. By empowering citizens and local organisations with knowledge and tools, the framework aims to foster a collaborative approach to energy management. The deliverable links closely with Deliverable 3.3, which will assess the social impact of energy communities, ensuring a cohesive approach to community engagement and impact assessment. The developed framework involves three key stages – recruitment, involvement, and methodologies – to take into account when constructing an engagement strategy that must be adapted to the contexts and practices in which an energy community is to be promoted or maintained. Establishing an energy community requires individual and collective commitment and motivation, which are essential for the project to not only take root but also sustain itself over the long term. Finally, methodologies are the practical approaches and techniques used to implement the engagement strategies (see chapter 4). These methodologies provide structured ways to involve community members, facilitate their active participation, and ensure that their input is meaningfully integrated into the project.

CONTENTS

1 Introduction

1.1 Objectives of the work reported

The main objective of Work Package 3 (WP3) is to create a shared approach to enable and enhance social[1] participation in energy-related initiatives. Specifically, WP3 focuses on fostering the development and engagement of energy communities, which are groups of citizens who collectively manage their energy needs and resources.

Within this broader objective, Task 3.1 was dedicated to developing an Adaptable Framework designed to facilitate the engagement and building of energy communities. This framework serves as a versatile tool, providing guidelines and methodologies that can be tailored to different contexts and needs. By utilising this framework, various stakeholders, including One Stop Shops, can effectively consult and engage citizens in the process of forming and nurturing energy communities.

The document offers a comprehensive literature review to define the concept of an energy community, exploring its various dimensions and implications. It synthesises existing research and case studies to build a robust conceptual foundation. Additionally, the framework integrates different strategies for community engagement, drawing on diverse approaches to ensure inclusivity and effectiveness in participation efforts.

Ultimately, this work aims to empower citizens and local organisations by providing them with the knowledge and tools needed to collaboratively manage energy resources. Through this shared approach, WP3 seeks to promote sustainable energy practices, enhance social cohesion, and contribute to the broader goals of energy transition and environmental sustainability.

1.2 How to read this document

This document can be read independently of other deliverables. Nevertheless, it will be closely linked to Deliverable 3.3 *Adaptable Framework for energy communities engagement and building,* which will be published chronologically subsequent to this document. Deliverable 3.3 aims to assess the social impact of an energy community, so several concepts presented in this document will be revisited and adapted accordingly.

The deliverable is structured in four main chapters, each designed to systematically address key aspects of energy communities and their development. The chapters are organised as follows:

- Chapter 2: “Literature and research on Energy Communities”, provides a comprehensive review of existing literature and research related to energy communities. It covers various definitions, concepts, and theoretical frameworks that underpin the idea of energy communities. The chapter delves into historical developments, current trends, and future prospects in order to identify

[1] For the sake of completeness, it should be noted that in this document the term 'social' will be used synonymously with “society” and 'societal', as the concepts involve both the dynamics of human inter-relationships and the structures of society that guide their functioning.

common challenges faced by energy communities.

- Chapter 3: "A Framework for Energy Communities engagement and building", introduces a flexible framework for engaging and building energy communities. The framework is designed to be adaptable to different contexts, providing a set of dimensions and sub-dimensions for building and developing community engagement. The chapter emphasises the importance of inclusivity, transparency, and collaboration in the engagement process.
- Chapter 4: "A participatory approach to engagement actions" focuses on the participatory methods and actions that can be employed to engage community members in energy initiatives. It explores various participatory techniques, such as workshops, public meetings, and collaborative decision-making processes, to ensure active involvement of stakeholders and the local population. This section provides actionable insights and tools to engage citizens, ensuring their commitment and contribution to the community's energy goals.
- Chapter 5: Conclusions and considerations on the deliverable.

2 Literature and research on Energy Communities

Since 2018, the concept 'community' has become a term that cuts across a multiplicity of disciplinary frames and policy discourses around sustainability and energy differentiation (Creamer et al., 2018; Walker & Cass, 2007). From the earliest formulations of the energy community concept, governments and policy-makers have recognised the term 'community' as an ideal concept through which to address environmental issues and initiate social transformation towards the realisation of environmental sustainability governed by the development of renewables. This has been accompanied by the development of *feed-in premium tariffs* designed to incentivise the development of renewable plants promoted by energy communities, which have indeed fostered a growing interest in the concept. However, the social sciences warn against the instrumental use of this concept, pointing out that it often becomes a *hurray-term* that elicits positive evaluations and evocations without any problematisation (Rapport & Overing, 2000).

If we refer to sociological theory, our thoughts go to the famous distinction made by Tönnies (1921) between **community and society**. Simplifying the author's concept, the community is characterised by informal but shared rules in which the group precedes the individual and norms are very strong; whereas society is characterised by a greater balance between individual autonomy and social norms and a less strong sense of identification with the community. In society, individuals act primarily for their own benefit and social relations are shaped by laws and regulations rather than by traditions or emotional ties. In this context, people are more autonomous and independent, with a greater emphasis on rationality and economic progress.

In ecological studies[2], the word community also refers to processes occurring in the same ecosystem that connect goals and ideals. In particular, ecological studies define the community as a collection of organisms of different types (species, life forms) that act in space and time, giving rise to states of equilibrium and relative functional autonomy with respect to other units of the same type (Jax 2006).

The word 'energy' associated with the term 'community' refers to the ability of people to come together to produce energy to heat and light their homes through the use of renewable sources found in 'nature'. A key importance in the establishment of the scope of study on energy communities is commonly referred to in Walker and Devine-Wright's (2008) article. The two scholars, in their article *Community renewable energy: What should it mean?* (Walker & Devine-Wright, 2008), propose an initial reflection on the concept of a renewable energy community, emphasising the importance of considering two dimensions: processes and results. With the first dimension, it is suggested to consider as an energy community all those initiatives that lead to the realisation of a project; while with the second dimension, attention is focused on the impacts of a project and thus what spatial and social effects are produced and who are the actual beneficiaries. In this sense, the energy community can be defined as a project that to varying degrees is developed and managed through an open and participatory process that produces local and collective benefits.

A crucial theme addressed in the various energy studies is that of energy consumption and energy saving. In this line of research, the individualistic and rationalistic strands of economics and psychology have often been used to explain the motivations that lead individuals to come together to produce and consume renewable energy (Steg & Vlek, 2009). In the late 1980s and early 1990s, however, sociology highlighted the limitations of these approaches, pointing out instead that there were psychological and social variables

[2] Ecological studies are used to analyse the relationships between organisms and their environment, focusing on the interactions within and between species, populations, communities, and ecosystems.

in addition to rational motivations related to saving money. Forming and joining an energy community also means re-establishing a relationship of mutual aid, sharing and support among the members of the community in order to re-establish a relationship with the environment that starts from the use of renewable sources for the realisation of a sustainable economic and social system for present and future generations (Magnani et al., 2023).

Various attempts have been made in the academic literature to analyse the heterogeneity of renewable energy communities in practice and to highlight social transformations. One typology that has been widely used to classify renewable energy communities is the distinction between 'communities of place' and 'communities of interest' (Hicks & Ison, 2018). The former type refers to those projects where citizens come together because the plants are located and have a direct link to the territory; while the latter type refers to groups of citizens who come together because they share an environmental, social or economic interest. In fact, as pointed out by Walker and Devine-Whright (2008), energy community projects can take a variety of organisational forms. Although the most common legal form is the cooperative, other forms are also emerging, such as partnerships between private actors and local authorities (Creamer et al., 2018; Wade et al., 2022). The result is that this diversity of stakeholders is producing complex arrangements that differ in terms of governance and values and increasingly blur the dichotomous division between cooperatives focused on mutualistic benefits – i.e. a energy community that seeks to obtain the lowest price for its members and redistribute the dividends from the sale of the energy produced –, and cooperatives focused on public benefits – i.e. an organisation that aims to reduce the cost of energy for the widest number of people whether they are members of the cooperative or not (Bauwens & Defourny, 2017).

The current trend is to go beyond the defining efforts of the energy community concept, to the point that some authors (Carrosio & Magnani, 2021) propose to consider it as a 'boundary-object' (Star & Griesemer, 1989). Boundary-objects are objects, concepts, ideas, plastic and malleable theories, which, while retaining their own identity, are at the same time able to adapt from time to time in different contexts, enabling coordination and alignment *between and within* different disciplinary, social, economic and political spheres.

2.1 Energy Communities and energy practices

The way we use energy at home is a combination of social, cultural and technical meanings as well as an accumulation of knowledge about when and how to use artificial light or how much water we let run while brushing our teeth, for example. The way we use energy at home is a combination of social, cultural, and technical meanings, as well as an accumulation of knowledge about when and how to use artificial light or how much water we let run while brushing our teeth, for example. Within the sociology of the environment, the theory of practices emphasises that technical skills and infrastructural technologies, such as the characteristics of the territory where an energy community needs to be implemented, are crucial factors to consider. These aspects play a vital role in engaging people in the project, as they influence not only the feasibility of implementation but also the community's willingness to participate and adapt to new energy practices. Understanding the specific technological and infrastructural context, alongside the social and cultural dimensions, is essential for fostering meaningful engagement and ensuring the success of energy initiatives.

In particular, the theory of practices makes it possible to observe energy consumption as means practices that develop in the interaction between things and people in a given space-time (Shove & Pantzar, 2005; Spaargaren, 2011; Warde, 2005). This theory has emerged in the social sciences since the work of Pierre Bourdieu (1977) and Anthony Giddens (Giddens, 1984), who laid the foundations for conceiving the organisation of social life through the concept of social practice.

Scholar Elizabeth Shove (Shove et al., 2012) has taken up and expanded this concept of social practice, defining it as the dynamic interaction between three different dimensions. In the perspective of Shove and colleagues, a practice is composed of three elements that come into connection with each other: a) materials, which include objects, technological devices and all tangible physical entities that contribute to carrying out particular activities; b) skills, which include the abilities that need to be acquired to carry out a particular practice, including the implicit know-how related to this particular activity; c) meanings, which involve the symbolic dimension related to practices, i.e. the ideas that compose it and the representations that are made of it.

This definition of practice includes cultural patterns that influence the production and use of energy. The emphasis is on domestic contexts where energy consumption is considered as the result of numerous daily activities that use energy for cooking, lighting, heating. The intention is to analyse whether there are everyday and emerging practices in a certain context by reconstructing its socio-cultural and socio-technical context (Carrosio & Magnani, 2024; Spaargaren, 2011).

The framework of the 'Communities of Practice' established by the European Commission Joint Research Centre also goes in this direction (European Commission, 2021). ‘Practice’ becomes a useful conceptual tool to stimulate collaboration and knowledge sharing through a continuous learning process. The idea is to connect people through their practices to learn how to share and use data, information, and knowledge. Applying practice theory to energy communities helps to look at practices as a means of engaging citizens, emphasising the active role of individuals in the energy transition process. This perspective makes it possible to recognise and value the everyday actions of citizens, identifying cultural and social barriers that hinder the adoption of innovative energy solutions. For example, community workshops can reveal local practices that favour the use of traditional energy over renewables. Surveys and interviews can reveal a lack of confidence in new technologies or financial constraints that prevent investment in energy-efficient appliances. In addition, public forums can highlight generational differences in attitudes towards sustainability, helping policymakers adapt their strategies to different demographic groups. In this way, energy communities are not just technical structures, but become spaces of interaction and active participation, where citizens are motivated and involved in co-creating a more sustainable energy future.

2.2 Energy Communities and energy culture

Another concept that is instrumental in enhancing our framework is that of energy culture. The term culture in this context encompasses the knowledge, beliefs, and tangible objects possessed by individuals that shape their energy consumption habits (Stephenson et al., 2010). Energy culture reflects how people’s values, understandings, and physical assets influence their patterns of energy use. For instance, the ways in which individuals utilise energy to heat their homes are shaped by various factors. These include the residents' awareness and beliefs about energy efficiency, their financial capacity, and environmental concerns. Additionally, material factors such as the degree of insulation, the types of heating systems installed, and

the existence and use of programmable thermostats play a significant role. Variations in heating practices may also depend on how many rooms are heated, which specific rooms are chosen, and the duration of heating. Thus, energy culture is a comprehensive concept that integrates both behavioural and material dimensions of energy use.

Expanding on the idea of energy culture, awareness about energy usage and its impacts are critical components (Caratù et al., 2023; Coy et al., 2021; Piselli et al., 2022). Awareness encompasses not just knowledge of how energy is consumed but also an understanding of its broader implications on environment and society. It includes recognizing the carbon footprint associated with different energy sources and appreciating the importance of energy conservation. Enhanced awareness can drive more conscientious energy behaviours, encouraging individuals to adopt practices that reduce consumption and improve efficiency. For example, increased awareness can lead to the more mindful use of heating, better insulation practices, and the adoption of Renewable Energy Sources (RES).

Furthermore, the transition to sustainable energy systems can create a range of employment opportunities across various sectors, from the development and maintenance of renewable energy technologies to energy efficiency services and green construction. These new job opportunities can contribute significantly to local economies and offer pathways to meaningful employment, which in turn fosters social wellbeing (Llena-Nozal et al., 2019). The creation of green jobs not only supports economic stability but also empowers communities to engage actively in the energy transition, aligning their livelihood with sustainable practices.

Wellbeing, at the individual and collective level, is another crucial aspect influenced by energy culture. Sustainable energy practices can lead to healthier living environments by reducing pollution and mitigating climate change impacts (Tong & Ebi, 2019). Improved energy efficiency in homes, for instance, can enhance indoor air quality, leading to better health outcomes. Additionally, the financial savings from reduced energy costs can improve overall quality of life, making more resources available for other essential needs. A community's collective wellbeing is also enhanced when energy systems are managed in ways that promote equity and access, ensuring that the benefits of energy transitions are shared widely and not just concentrated among a few.

Expanding on the idea of energy culture, community-based renewable energy production and consumption initiatives represent a growing research area. These initiatives are increasingly recognised as a form of social enterprise that can significantly contribute to sustainable energy transitions. Such an approach underscores the importance of creating and leveraging relational resources, particularly social capital, to facilitate the shift towards renewable energy (Bauwens & Defourny, 2017; Huybrechts & Mertens, 2014). Social capital here refers to the networks, trust, and norms that enable collective action within a community.

Researchers identify two primary types of community organisations in this domain:

- Mutual Benefit-Oriented Organisations: these entities are primarily designed to meet the needs and interests of their members. They often foster strong, trust-based relationships among participants, enhancing engagement and shared responsibility in energy initiatives. This close-knit structure can facilitate the effective pooling of resources, knowledge sharing, and cooperative management of renewable energy projects.
- Public Benefit-Oriented Organisations: these aim to promote the welfare of a broader community or society beyond their immediate membership. Such organisations typically engage a wider array of stakeholders, promoting inclusive decision-making processes. This inclusivity ensures that the benefits of renewable energy initiatives are distributed more broadly, contributing to greater social

cohesion. Public benefit-oriented organisations can help build community-wide support for energy projects, leading to initiatives that are more resilient and sustainable due to their deep-rooted community involvement.

By comprehending and utilising these organisational frameworks, community-based initiatives can better mobilise social capital to drive sustainable energy transitions. This differentiation allows for tailored strategies that align with the specific goals and motivations of each type of organisation. Mutual benefit-oriented groups, for instance, can enhance participation by leveraging the strong relationships and trust among members. In contrast, public benefit-oriented groups can facilitate wider community engagement, ensuring that renewable energy projects gain robust backing and contribute to the welfare of a larger population.

Ultimately, this inclusive approach fosters not only the sustainability of the energy initiatives but also strengthens community bonds, making the projects more resilient and adaptable to changing circumstances. By integrating the insights from energy culture and community-based organisational frameworks, we can develop more effective strategies for advancing the transition to renewable energy.

2.3 Energy Communities and social participation

A significant body of research explores the role of energy communities through the lens of social movement analysis. Mey and Diesendorf (Mey & Diesendorf, 2017) propose that community energy initiatives represent a distinctive field of strategic action, where both symbolic and structural resources play crucial roles in mobilisation. Symbolic resources include elements like collective identity and the pursuit of autonomy, which resonate on an emotional level and drive community engagement beyond purely rational or instrumental motivations. These symbolic dimensions are pivotal as they foster a sense of belonging and shared purpose among community members, fueling their commitment to the cause.

On the other hand, structural resources pertain to the broader political and regulatory contexts that can either facilitate or constrain the activities of energy communities (Bomberg & McEwen, 2012). These might include governmental policies, funding opportunities, and market regulations that shape the landscape within which community energy projects operate. Understanding these structural factors is crucial for navigating the complexities of political support and regulatory frameworks that impact the feasibility and success of community energy initiatives.

This perspective aligns with findings from a recent EU report that identified 24 distinct approaches to developing energy communities (Caramizaru & Uihlein in Wuebben et al., 2020). These varied approaches highlight the diverse ways in which citizens can organise to become pivotal actors in the energy transition. When citizens form energy communities, they not only take charge of their energy production and consumption but also acquire the technical skills and knowledge necessary to manage these processes effectively. As these communities evolve, they may function either as competitive market actors or as cooperative entities that pursue broader social and environmental benefits for their regions.

Interestingly, the motivations and actions of these communities are not always inherently ethical or altruistic (Szulecki & Overland, 2020). While some energy communities may prioritise social equity and environmental stewardship, others might focus on financial gains or local economic resilience. This variability underscores the complexity of energy democracy, which refers to the concept of making energy

accessible and manageable for all. Within these communities, energy democracy (see para. 2.4) involves ongoing processes of technical and value negotiations, where members continually learn, adapt, and refine their practices to align with evolving community goals (Magnani et al., 2023). This iterative process enhances the collective capacity to address challenges and optimise energy systems.

The development of energy citizenship is integral to understanding how citizen participation can drive these processes. Research, such as that by Walker and Devine-Wright (2008), examines how potential members are attracted to and retained within energy communities. Energy citizenship transforms individuals into active stakeholders in the energy system, encouraging them to take responsibility for energy decisions and participate in collective actions. This concept introduces new possibilities and challenges for increasing participation within energy communities by raising additional questions and concerns that need to be addressed to enhance engagement.

Framing participation through the concept of energy citizenship enables a deeper understanding of its role within the broader context of social movements. It emphasises how energy communities contribute not only to renewable energy provision but also to collective action and social change. Participants are seen as agents of change who align their individual actions with broader social movement goals towards sustainability. This approach fosters a sense of belonging and shared purpose by tapping into the values and identities that motivate social movements.

By integrating social movement theory, energy communities can develop more effective strategies to mobilise citizens, address systemic challenges, and foster a participatory culture that is essential for a successful transition to sustainable energy. This participatory culture encourages active involvement, enhancing the resilience and adaptability of energy initiatives. It ensures that energy transitions are not just technologically driven but are deeply rooted in the collective efforts and aspirations of the communities they serve.

2.4 Energy Communities and energy democracy

The literature on energy democracy looks at the decision-making processes that lead citizens to translate their opinions and ideas into results (Van Veelen, 2018). Thus, the focus is on the procedures and mechanisms associated with decision-making. Energy democracy is linked to the concept of energy justice because it helps to imagine processes and mechanisms that enable all members of a community to participate in and challenge innovations that affect them.

In his analysis of the literature, van Veelen (2018) points out that energy democracy is defined in the literature in its participatory character by providing for the involvement of citizens in decisions that affect them. Participatory democracy can be distinguished into three subcategories: associative democracy, deliberative democracy and material democracy.

Associative democracy is the easiest to identify. In this form, ownership or control of energy resources at the local level is favoured through civil society organisations at the local level. Voluntary associations are seen as an alternative to both liberal individualism and socialist collectivism, and as a critique of state centralisation and bureaucratic growth (Hirst, 1994). Associative forms of democratic governance are a means of managing and ensuring public welfare by giving priority to the direct choices of citizens.

Deliberative democracy is based on the idea that public debate processes lead to higher quality decisions (Dryzek, 2002). This form of democracy involves citizens coming together to share opinions and plans in order to reach a common, shared decision. A first problematic issue in the realisation of this sub-type of democracy is the effective and concrete realisation of a process with large-scale direct involvement of citizens. Another issue concerns taking it for granted that citizens actively engage in these forms of participation because it necessarily benefits the common good. As Young (Young 1996-1990) points out, it cannot be taken for granted that each participant leaves behind his or her own interests and experiences for the benefit of the common good. Inequalities of resources and power influence the definition of individual goals and strategies in determining energy behaviour.

The concept of material democracy foregrounds the issue of access to material resources, which the other two types of democracy leave in the background (Van Veelen, 2018). In this case, the focus is on the materiality required for the construction of renewable energy facilities and thus also on the economic resources needed. There are concrete risks associated with the realisation of an energy community from a technical point of view that have to be taken into account, such as the high costs of the required technology, the complexity of regulatory and legal rules, and the physical and graphical space required to install the renewable energy infrastructure. The question arises as to what assumptions are inscribed in the socio-technical process of renewable energy production and what roles are delegated to the groups of people and technologies that are to be deployed (Latour, 2005). As argued by authors such as Marres (2016), Chilvers and Longhurst (2016) adopting a material perspective can help to observe energy publics as co-produced by the set of interrelationships that arise in the accessibility of renewable technologies with economic and aesthetic costs/benefits. These three subsets of democracies can be seen not as mutually exclusive but as different aspects that can combine to constitute an even more inclusive and equitable participatory democracy.

In conclusion, while the concept of energy community and the process of participatory democracy are widely discussed in theoretical and positive terms, it remains an open question how to effectively involve citizens in these forms of bottom-up renewable energy production. Despite the enthusiasm for energy democracy, practical challenges persist in translating theory into practice. The crux of the issue lies in developing mechanisms and strategies that not only invite but also sustain citizen engagement over time.

In the next section, the discussion on the energy community will highlight key factors such as social capital, trust, inclusivity, and the socio-political context that influence citizen participation. Understanding these dimensions is crucial for identifying the barriers and facilitators to active engagement in energy communities.

2.5 Energy communities and energy justice

The concept of energy justice is grounded in the broader notion of social justice within the global energy system. It asserts that the positive and negative impacts of energy systems should be fairly distributed across society, ensuring that no group is disproportionately affected by the burdens or benefits of energy production and consumption. This concept addresses the ethical dimensions of energy policy, aiming to create a more inclusive and equitable energy system.

In scholarly discourse, energy justice is often delineated into three key dimensions: distributive justice, procedural justice, and recognitional justice (Jenkins et al., 2016; Sovacool et al., 2017). These dimensions provide a comprehensive approach to understanding and mitigating inequalities within the energy sector.

Distributive Justice pertains to the equitable distribution of the benefits and burdens associated with energy systems among all societal groups. It involves ensuring that access to energy resources and the benefits such as economic gains, as well as the burdens like environmental impacts and costs, are distributed fairly. For example, distributive justice examines the spatial allocation of energy infrastructure, such as power plants or renewable energy installations, to prevent the concentration of negative impacts in disadvantaged or marginalised communities (Bielig et al., 2022). It aims to achieve a balance where all communities share both the benefits and responsibilities of energy systems. When community members perceive a benefit for the community, they are more likely to trust the initiative and actively participate in it.

Procedural Justice focuses on the fairness and inclusiveness of decision-making processes related to energy policies and projects. It seeks to ensure that all stakeholders, irrespective of their socio-economic status or demographic characteristics, have meaningful opportunities to participate in energy-related decisions. This includes establishing transparent processes, enabling public engagement, and providing platforms for marginalised groups to voice their concerns and influence policy. Procedural justice aims to democratise energy governance, making it more accessible and responsive to diverse community needs. Procedural justice emphasises the importance of inclusive and transparent decision-making processes within energy communities. This inclusion ensures that citizens have a voice in decisions bringing diverse perspectives and knowledge into the planning and management of energy projects, making the initiatives more accountable and acceptable.

Recognitional Justice extends the principles of inclusiveness by emphasising the equitable recognition and respect for diverse social groups, particularly those who are often marginalised. Recognitional justice addresses the need for acknowledging the unique experiences, identities, and needs of various populations, such as economically vulnerable groups, young people, and women. It involves ensuring that energy policies and practices are attuned to these differences and actively work to eliminate biases and discrimination. In this sense, it promotes social inclusion by ensuring that underrepresented groups are not only included in the energy community but also have their unique needs and concerns addressed. Recognitional justice seeks to correct historical inequities and foster a more inclusive energy landscape by validating the perspectives and contributions of all community members.

The principles of energy justice build trust within the community, which is fundamental for long-term commitment and engagement in energy projects. Indeed, trust creates a collaborative culture where members feel valued and respected leading to stronger community bonds and collective action towards energy goals.

3 A framework for Energy Communities engagement and building

3.1 Promoting citizen engagement

Engagement is often considered an indicator of social cohesion, as it reflects the degree of involvement and active participation of citizens in public life (Coy et al., 2021). In the literature, engagement can be described as the active and involved participation of individuals in certain activities, communities or projects, which include political activism, participation in social groups or movements (Giddens, 1990; Smith et al., 2017). Furthermore, engagement is intrinsically linked to the willingness and interest of individuals in contributing to social change or improving conditions in their community.

In the European context, promoting engagement means encouraging the active participation of citizens in decision-making processes, in political life and in building an inclusive and solidarity-based society (Shortall et al., 2022). In this sense, engagement can be considered one of the pillars to strengthen democracy and the promotion of social cohesion within the European Union.

The engagement of citizens can become one of the enablers for pursuing a more rooted and engaged energy transformation. Strategies to involve citizens in the energy transition process have multiple purposes: creating acceptance, motivating participation and behavioural change, supporting the creation of a more sustainable environmental future. Citizens as prosumers can transform their energy practices and self-organise to form energy communities to produce clean energy for their territories, becoming not only consumers of energy but also owners of energy facilities.

To achieve the engagement of citizens in the building of energy communities, the developed framework involves three key stages – recruitment, involvement, and methodologies – to take into account when constructing an engagement strategy that must be adapted to the contexts and practices in which an energy community is to be promoted or maintained. Understanding contexts and practices requires considering how material objects, infrastructure, institutions, actors, networks, and social norms collectively shape and are shaped by the actions and events in a particular environment.

The stage of recruitment focuses on identifying the target audience, thus attracting and enlisting community members to participate in the energy project. The target group is divided into: core, committed, congregation, crowd and community. The stage of involvement ensures these members are actively engaged and contributing to the project's development. This phase focuses on identifying the dimension of values and culture of the community members, divided into sub-dimensions: energy culture, social participation, energy democracy, energy justice and motivation. Finally, methodologies are the practical approaches and techniques used to implement the engagement strategies. These methodologies provide structured ways to involve community members, facilitate their active participation, and ensure that their input is meaningfully integrated into the project.

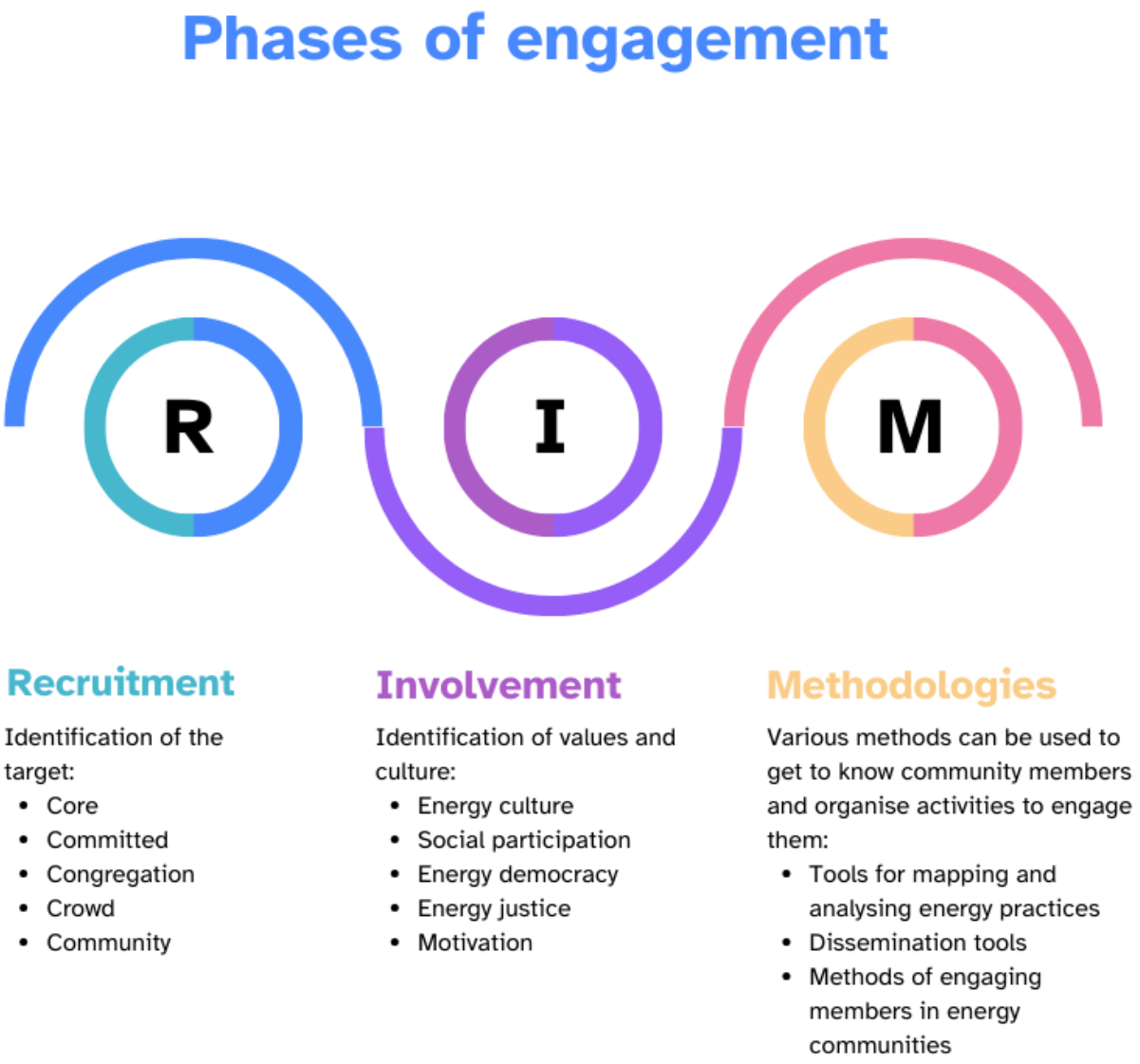

Figure 1: Phases of engagement

3.2 Recruitment: Identification of the target

The target is the segment of the population to be reached, often defined by demographic factors like age, gender, income, and interests. The target might be the audience for a campaign or initiative aimed at influencing behaviour or opinions. Identifying a target involves understanding the characteristics, needs, preferences, and behaviours of the intended recipients to effectively tailor the approach and maximise the likelihood of engagement and impact.

Following the model created by Michael Pulsford (2014), the target can be seen as an engagement scale by looking at the different levels of involvement that a person can demonstrate towards a project by implementing concrete practices and activities in support of it.

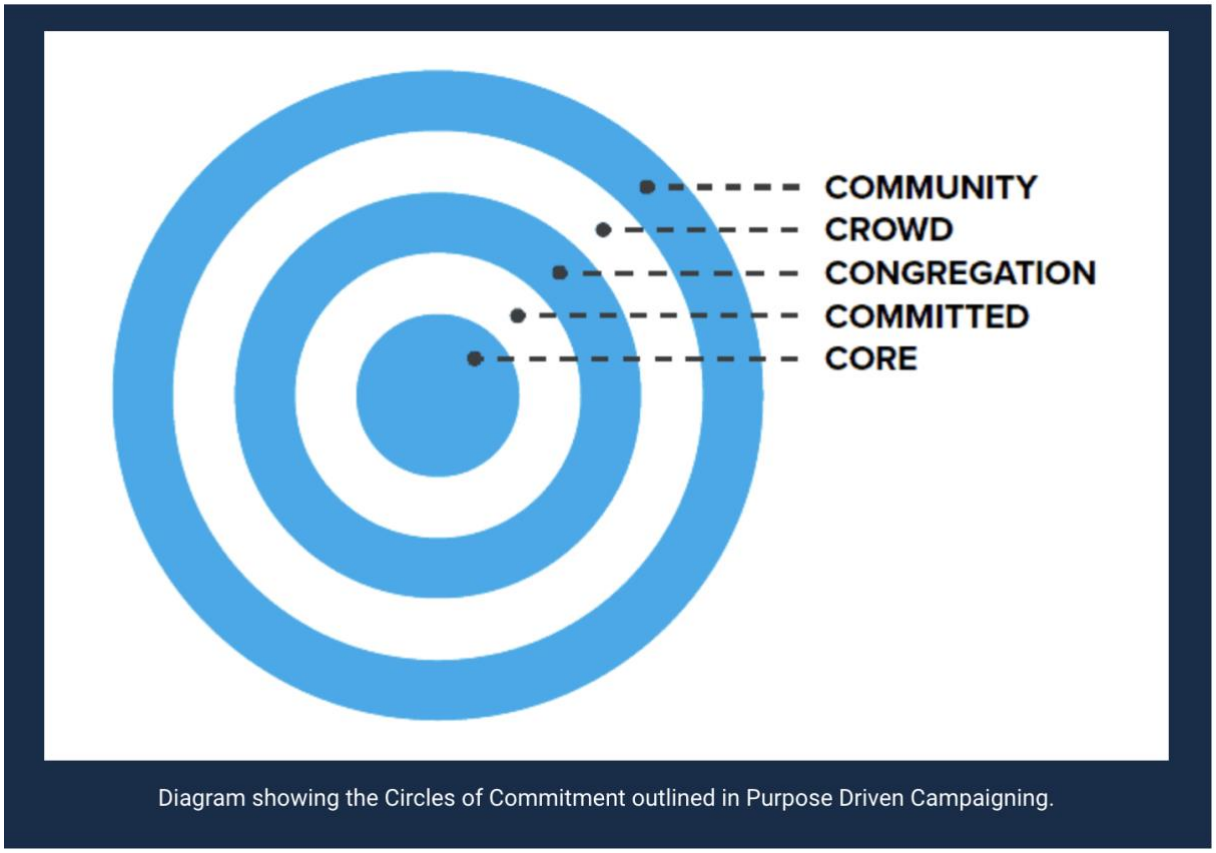

Figure 2: Diagram showing the Circles of Commitment outlined in Purpose Drive Campaigning - By Michael Pulsford (2014)

It is a model that divides the people you want to involve in an energy community project into 5 groups, visually represented by circles as each group is contained in the larger one[3]. The people who are involved (or whom you intend to involve) in a communication campaign or project that relies on the involvement of many, are categorised as follows:

- Core is made up of the people who run the project and who took charge of the communication campaign. They can be the people who have taken the initiative to heart from the very beginning and who have put themselves on the line to realise it also by investing in interpersonal relations and engaging in direct dialogue with the public administration. It is essential that they are competent and knowledgeable people, and that they are equally clear and transparent about the community's objectives. It is also useful to collaborate with other communities to discuss the various regulatory, legal and economic aspects that need to be dealt with if a successful energy community is to be sustained in the long term.
- Committers/trainers are those contributors who are structurally committed and support the project on a permanent basis. This level is more demanding than that of contributors, because these members feel a certain responsibility for the success of the energy project and feel a higher level of ownership of the project.
- This brings us to the occasional contributors/volunteers, i.e. those who contribute to the project in any way. These are the people who decide to contribute to the project if the task is defined by someone else, they are offered training or support, or they can also contribute through a donation.

[3] https://commonslibrary.org/circles-of-commitment/

They are the members of the crowd who, with due support, decide to volunteer in areas that are indispensable for the establishment and support of a community, such as: administration, data protection, data acquisition from the facilities and communication of these to the appropriate institutional bodies, but also taking care of the newsletter, or distributing flyers.

- The Crowd - could become Followers - comprises people who have encountered the project expressing consent and initial interest. These are part of the wider community but who begin to engage mostly passively, perhaps by subscribing to the project's newsletter. Advertising campaigns serve to reach these people whose passive engagement can be transformed into an involvement that requires practical and concrete actions.
- The outermost circle is called 'Community' and is the set of people the campaign is trying to reach. It therefore includes the entire population that could potentially become part of the energy community. Most cities are made up of smaller groups of citizens, so it is important to capture their composition through mapping tools. One mapping tool may be to subdivide cities by neighbourhoods or surrounding areas. Another engagement strategy can be based on bringing together people with similar interests, thus mapping and involving associations, parishes, sports centres, etc. Individuals often join energy communities to meet like-minded people: one might consider encouraging the creation of LinkedIn groups, Slack channels, Facebook groups, or periodic in-person meetings on a voluntary basis.

The aim of the core group is to engage new members and move them up the ladder of commitment necessary for the success of the community project. This is why communication strategies need to be put in place to engage new volunteers and motivate them to become active participants in the process of developing an energy community as a collective and environmental value.

3.3 Involvement: Identification of values and culture

The Values and Culture dimension is a key aspect of creating engagement and involvement of citizens. This dimension is divided into several sub-dimensions that explore the various ways in which values and cultures influence the approach to energy. The main sub-dimensions include energy culture, social participation, energy democracy, energy justice and motivation.

3.3.1 Energy culture

The concept of 'energy culture' is a useful sub-dimension for reconstructing the values associated with energy use in a certain socio-material context. Stephenson et al. (2010) define culture as a distinct and integrated system of knowledge and behaviour that creates and is created by material objects that influence the way energy is used. By observing the energy culture of the context in which an energy community is to be developed, it is possible to understand the energy behaviour of the people interested in being part of the project.

The literature on the subject has highlighted different theoretical approaches. A growing strand of research adopts a perspective that recognises community initiatives for renewable energy production and

consumption as a form of social enterprise. This approach emphasises that one of the major contributions of social economy organisations in promoting sustainable transition is the creation and mobilisation of relational resources, specifically social capital (Bauwens & Defourny, 2017; Huybrechts & Mertens, 2014). When identifying where to build an energy community, it is important to take into account the social capital of the residents; in fact, mutual trust, shared norms and a sense of belonging can positively influence collaboration and active participation.

The different level of social capital can influence the choice of organisational structure to be adopted. The studies and case studies analysed (Curtis et al., 2020; Ferrari, 2016; Oxoby, 2009) show that the cooperative form is the most widely adopted and supported. Co-operatives are based on principles of democracy, participation and equality, ideals that promote collaboration and involvement of community members. In this regard, co-operatives can be either mutual benefit-oriented - essentially addressing the needs of their members - or public benefit-oriented, aspiring to improve the well-being of the broader community. Significant differences emerge between these two orientations in terms of the type and level of social capital mobilised. Social capital refers to the networks, relationships, and norms that enable collective action within a community or society. It encompasses the trust, mutual understanding, shared values, and behaviors that bind the members of a social group together and facilitate cooperation and coordination for mutual benefit. For instance, public benefit-oriented cooperatives tend to develop a broader and more diversified social capital, involving a wider range of stakeholders. Whereas mutual benefit-oriented co-operatives mobilise a lower level of social capital by involving only those residents of an area who have common interests, such as accessing economic incentives or making an investment in the energy future of their homes.

Another element to take into account is that social capital can also be negatively affected by the growth of co-operatives' organisational structures. As organisational complexity and the number of members increase, individual trust and involvement tend to decrease. This dynamic highlight the importance of finding a balance between growth and maintaining a high level of social capital.

A recent EU report identified at least 24 different approaches for the development of energy communities (Caramizaru & Uihlein, in Wuebben et al., 2020). Similarly, another recent deliverable emphasises 19 multifacted success factors for the development of energy communities, depending on various aspects such as community's goals, local, context, regulatory environment and specific business model (ECOEMPOWER, 2024). This demonstrates the diversity and creativity of strategies adopted by communities to promote the energy transition. In the desirable case that citizens aggregated in energy communities know how to be leading actors in the energy transition, committing themselves to acquire the necessary skills and technical knowledge to manage the processes, they will be able to choose whether to act as market actors, competing with each other, or cooperating to achieve social and environmental as well as economic benefits.

Community initiatives and energy cooperatives represent significant examples of how energy culture can be shaped and mobilised to promote a sustainable transition. However, it is essential to consider organisational and technological dynamics and their impact on social capital to ensure the long-term success and sustainability of community energy projects.

3.3.2 Social participation

Another sub-dimension to be taken into account in the development of an energy community is that of social participation taken from social movement theories. This is particularly the case with strategic action fields

theory, which focuses on stability and change at the meso-level. Mey and Diesendorf (2017) emphasise how energy communities can be considered a real strategic action field, characterised by interaction dynamics in which rules, composition and structures are constantly reforming. They highlight the competitive and cooperative nature of 'games' within strategic fields of action, highlighting how the actors involved continually negotiate their roles and strategies.

Bomberg and McEwen (2012) focus on the interaction between two groups of factors that influence collective action: structural resources and symbolic resources.

- Structural resources refer to the political and regulatory context that structures and constrains the possibilities of mobilisation, such as laws, regulations and government policies.
- Symbolic resources, on the other hand, concern the less rational or instrumental aspects, such as values, identities and narratives that influence mobilisation. In particular, two strategic symbolic resources are crucial for the development of community energies: collective identity and the quest for autonomy. Collective identity strengthens the sense of belonging and cohesion among community members, while the quest for autonomy motivates efforts to become independent from large energy suppliers and to manage energy resources independently.

However, as Szulecki and Overland (2020) point out, it is not a given that local communities are homogeneous or inherently ethical or altruistic. The dynamics within communities can be complex and influenced by conflicting interests, requiring special attention in managing relationships and promoting shared values. The ability of energy communities to navigate these challenges and harness both structural and symbolic resources will be critical to their success in the energy transition.

3.3.3 Energy democracy

What we have discussed in the previous section ties in with the concept of energy democracy. Social participation presupposes that there is a high degree of energy democracy, and thus that everyone is potentially able to actively participate in decision-making processes through shared and democratic rules.

Energy democracy is a project to aspire to in order to achieve more decentralised and socially controlled energy systems (Pearl-Martinez & Stephens, 2016), with fair accessibility (Farrell, 2014) and whose consumption harms neither people nor the environment (Weinrub & Giancatarino, 2015). Some conceive it as a means of putting power in the hands of ordinary citizens in order to break down inequalities in energy access and consumption. Seen in these terms, energy democracy has more to do with the procedures and mechanisms associated with decision-making (Goodin et al., 2014). For some scholars, this means that people have the decision-making right to challenge and decide on innovations and energy consumption that affect them.

Indeed, a key point in the energy democracy literature is the participatory dimension of democratic governance. Here, it is argued that the way in which energy decisions are made needs to be reformed. The literature focuses heavily on direct participation, highlighting the ways in which citizens can participate. The statute of an energy community must therefore be able to protect the active participation of all members (including future members) through rules that enhance decision-making processes in which everyone has equal decision-making rights and can contribute to energy decisions. As Vansintjan (2015) states, energy democracy suggests a vision in which people, through their vote, are active and involved both

as financiers and producers, owners of energy (Pearl-Martinez & Stephens, 2016; Vansintjan, 2015). The concept assumes a citizenship that must act through active participation rather than a citizenship conferred by a set of obligations and rights that come from above.

Cooperatives are useful organisational entities for the implementation of energy and economic democracy, as they are helpful in creating greater citizen involvement in the creation of a more sustainable future (Bielig et al., 2022). In this sense, cooperatives could support actions aimed at creating shared and more distributed ownership, moving from the idea of individual ownership to that of collective and community ownership. This is highly relevant because the literature discusses how participation in 'desirable' energy activities is influenced by social and economic factors, including gender (Gioannis, Dudka & Łapniewska, 2024; Fraune, 2015), economic status (Walker, 2008) and ownership (Rogers et al., 2008). Therefore, the promotion of individualised ownership may cause a process whereby those with high socio-economic status invest in energy communities, thus undermining the principle of accessibility for all segments of the population.

Therefore, in order to ensure a high level of involvement, attention must be paid to the democratic rules governing the status of an energy community. Below is an example of how to structure an energy community to ensure democratic participation:

- All residents of the area and interested local organisations can become members of the energy community.
- The admission of new members is decided by the Members' Assembly.
- Every member has the right to participate in the assemblies, to vote and to be elected to the collective bodies.
- Every member has the duty to respect the articles of association and to actively contribute to the achievement of the community's objectives.
- The members' assembly is the sovereign body of the energy community, and is convened at least twice a year.
- Each member is entitled to one vote, regardless of financial contribution.
- Decisions of the Assembly are taken by a simple majority of those present, except where a qualified majority is required.
- The Executive Board is elected by the Members' Assembly and remains in office for a fixed term.
- The Executive Board has the task of executing the decisions of the Assembly and managing the day-to-day activities of the energy community.
- All documents relating to decisions, budgets and activities of the energy community must be made available to the members.
- The energy community promotes transparency and open communication through public meetings and the publication of regular reports.

Each energy community can adopt this model to its specific needs and local context, while maintaining the principles of inclusiveness, transparency and democracy.

3.3.4 Energy justice

The concept of energy justice emphasises the importance of ensuring that everyone has access to a fair and sustainable energy transition, both environmentally and economically. This is pursued by taking into consideration the most vulnerable and marginalised population groups, but also territories with fewer economic resources to invest in building technological infrastructures. In the literature, there is often a tendency to emphasise the close link between energy justice and economic resources, leaving in the background the social aspects that we can trace back to three pillars: distributive, procedural and recognition justice (Bauwens et al., 2022; Jenkins et al., 2016; Sovacool et al., 2017).

Distributive justice refers to how economic resources and privileges should be distributed among members of a community to ensure that everyone has access to renewable energy regardless of their socioeconomic status. Recognition justice recognises the importance of including usually marginalised segments of the population, such as youth and women. It aims to analyse how policies, different levels of literacy, practices and energy infrastructure can create inequalities and barriers to access to the energy transition. Procedural justice focuses on decision-making processes within communities, thus, on community governance and how decisions are made, linking to the previous dimension of democratic justice. This pillar presupposes the participation of community members and the active exchange of ideas and points of view (McHarg, 2016).

To build an energy community in which citizen participation is guaranteed, it is important to take five elements into consideration (Breukers et al., 2017):

- Recognition: is a mapping of the actors - and their socio-demographic characteristics - inhabiting the neighbourhood done? Are the aspirations, perspectives, needs and expectations of the neighbourhood's residents valorised?
- Participation: are residents involved in the process of defining the needs and rules of engagement in the process of building and developing an energy community?
- Distribution: who gets what? This is the distribution of positive and negative impacts among the actors in the energy system. For example, households with higher incomes may benefit more from energy redistribution due to the possibility of having access to smart systems to install in their homes and thus obtain higher economic benefits. Conversely, negative impacts may be related to the lack of privacy of energy consumption (Slingerland et al., 2021).
- Capacities: what skills and competences are needed for actors to be involved in order to actively participate in building and maintaining an energy community? People with fewer digital skills, less time and/or access to technological infrastructure might be disadvantaged in accessing the services that an EC could provide (Slingerland et al., 2021).
- Responsibilities: with this dimension we ask about a person's assumption of responsibility according to his or her possibilities and capabilities in carrying out the process of establishing and developing an EC, such as ensuring the energy well-being of the planet and future generations.

By considering and addressing these dimensions, energy communities can be more equal and sustainable, ensuring that all members benefit fairly and contribute meaningfully to the collective goal of energy transition.

3.3.5 Motivation

A critical dimension in the success of energy communities is the motivation of participants. Motivation in energy communities can be individual and collective and can be reconstructed by enquiries directly from the members of the community through the tools of value proposition design and the business model canvas (BMC, see ECOEMPOWER, 2024). These tools help clarify the benefits for participants and outline the structure needed to sustain the community.

The Business Model Canvas (BMC) is a strategic management tool that outlines the essential components needed to create, deliver, and capture value within an energy community. Referring to *D4.1 – Classification of organisational forms for collective and cooperative energy supply and their typical business models*, the BMC also includes among its key elements value propositions that provides motivations for how the citizens will deliver and sustain the building of energy communities (see ECOEMPOWER, 2024). Value proposition design is a crucial component of a business model. It focuses specifically on defining the value that a product or service offers to its customers. The value proposition is a fundamental element of the business model canvas, which is a broader tool used to describe, analyse, and design a business model.

Value Proposition Design (VPD) is a strategic tool used in marketing to provide value to customers. It is used to implement market orientations towards consumer values (Payne et al., 2017; Spickett-Jones et al., 2004; Storbacka & Nenonen, 2004). For its characteristics, the VPD could be used to build a strategy of involvement in the realisation of an energy community designed with the needs of the citizens in mind. VPD could be used to focus on understanding and addressing the needs and desires of community members. It involves creating a compelling value proposition that resonates with potential participants, ensuring they see the tangible and intangible benefits of joining and actively participating in the energy community.

- The first step in value proposition design is to identify what community members value most. This includes financial savings, environmental impact, energy independence, and community cohesion. Surveys, focus groups, and interviews can help uncover these needs and desires, providing insights into what motivates individuals to join and support an energy community.
- Once the needs and desires are identified, the next step is to craft a value proposition that clearly communicates how the energy community addresses these aspects. For instance, the proposition might highlight how members can save on energy costs, reduce their carbon footprint, gain control over their energy sources, and strengthen local ties. This proposition should be communicated through various channels to reach a broad audience.
- The value proposition must be backed by tangible and intangible benefits. Tangible benefits can include installing renewable energy systems, offering energy-saving workshops, and providing real-time data on energy consumption and savings. Intangible benefits can include the redistribution of accumulated incentives to realise community programmes, school programmes, implement initiatives that support energy transition practices. By delivering on promises, the community builds trust and encourages continued participation and engagement.

The dimension of motivation is crucial for the success of energy communities. By utilising value proposition design and the business model canvas, these communities can effectively attract and retain members, ensuring that they deliver meaningful benefits while maintaining operational sustainability. Understanding and addressing the motivations of community members not only fosters participation but also strengthens the overall impact and longevity of the energy initiative.

4 A participatory approach to engagement actions

In this section we will focus on the methodologies for building engagement for the development and maintenance of an energy community. At this stage, several methodologies are proposed with the aim of selecting the most effective ones to stimulate and maintain engagement over time. Through a targeted combination of these methodologies, it will be possible to develop a resilient energy community, capable of growing and sustaining itself over the long term.

The chapter will be structured as follows. The next section explores useful tools for mapping and analysing energy practices within the local population. These tools allow to better understand the behaviour and habits of members, providing a basis for developing targeted engagement strategies. A second section is devoted to dissemination tools, which are essential for communicating and sharing the events and initiatives organised. It looks at the different communication strategies useful for implementing and improving interaction and participation of community members. Finally, the last section focuses on specific methods to actively involve members in the life of the energy community. The section discusses the methodology of participatory design, illustrating how to involve community members in the decision-making and design process to increase their sense of ownership and responsibility. Moreover, self-assessment and gamification tools are explored as strategies useful to incentivise virtuous behaviour and keep members' motivation and interest high in the long run.

4.1 Tools for mapping and analysing energy practices

In order to reconstruct the target and the energy practices to be changed, it is necessary to put in place tools to map and analyse energy practices. Social sciences can offer methodologies to better understand the energy habits of the local population. Useful tools include **semi-structured interviews**, **structured questionnaires**, **energy diaries** and **focus groups**.

Qualitative interviews help collect detailed and in-depth data on individuals' perceived energy practices, motivations and barriers to access. **Semi-structured interviews** can be conducted with residents of a certain neighbourhood to explore in depth their experiences with energy consumption, the reasons influencing their choices and their reactions to different energy policies. These interviews can reveal important qualitative information that quantitative surveys might not capture.

The use of **structured surveys** or **questionnaires** makes it possible to collect large-scale quantitative data on the energy habits and perceptions of the local population. A municipality could distribute online and paper questionnaires to residents to collect information on how they use energy in their homes, which electrical devices they use most frequently, their opinions on energy-saving programmes, and their willingness to participate in community energy efficiency initiatives. The results can be statistically analysed to identify consumption patterns and population segments with similar behaviour.

Focus groups are guided discussions with small groups of people to explore specific topics in depth. Focus groups could be organised with residents of different ages, professions and socio-economic backgrounds to discuss their energy habits, barriers to reducing energy consumption and possible solutions. The data collected can provide insights into the social and cultural dynamics that influence energy practices.

Residents who are particularly interested could also be asked to keep a detailed **diary** of their daily energy consumption and activities. Residents of a neighbourhood can be asked to keep energy diaries to record when and how they use energy throughout the day, the motivations behind these choices, and any challenges they encounter in trying to reduce energy consumption. This data can provide detailed insight into energy habits and potential areas for intervention.

4.2 Information tools

Educating citizens on energy-related problems or raising their awareness of possible solutions can facilitate learning and achievement of new knowledge and facilitate greater awareness of individual and collective energy consumption behaviour. Information sessions, informative posts or articles via social networks or newsletters can be used as techniques of exchanging information among members of a community. The "information tools" category encompasses resources designed to present clear and accessible information on energy topics, including energy communities. These tools are intended to consolidate relevant information in a single, easily accessible location. Information material can range from more conventional brochures, posters, fact sheets, videos, blogs, graphic tutorials, comics, and dedicated showrooms to demonstrate as part of the project's dissemination plan.

In order to be able to engage as many people as possible, it is useful to communicate directly with residents by tailoring communication activities that are also based on a clear idea of what is to be achieved and how. This could lead to a massive increase in acceptance and support from citizens, thanks also to clear communication on the type of commitment required from members, how and what tasks need to be carried out for the success of the energy community.

Awareness-raising campaigns are one of the most popular, effective and flexible ways of raising public interest and informing people about the energy community. One topic to invest in is the creation of spaces that offer the opportunity to educate people on energy justice and energy democracy. Energy communities raise awareness of energy transition issues and enable people to actively contribute to the mission of changing their energy consumption practices. With a view to building social participation from the bottom up, one can think of harnessing skills within the community and opening up sharing spaces where people pool their expertise in energy refurbishment of homes, for example, or taking steps to make their homes more energy efficient.

The engagement of energy communities goes in the direction of collaborating with local authorities on the sustainable use of local resources and harnessing incentives from renewable energy production to improve the wellbeing of the entire community, create local employment, or implement sustainable energy education projects for young people. The results of the European EC project2 suggest a set of tools that can help promote energy citizenship and energy communities (Athensted et al., 2022). The tools have been divided into communication strategies and social channels.

4.2.1 Communication strategies

Among the tools useful to realise a campaign to raise awareness on the issue of environmental sustainability are certainly activities related to communication. These can include strategies aimed at providing information on the topic of energy and broadening the understanding of what is meant by an energy community. Topics can range from providing general information about environmental sustainability and sustainable energy consumption to much more specific topics concerning the functioning of energy communities.

In this case, one of the risks is to think that everyone will understand perfectly and immediately the importance and potential of that initiative, immediately starting to think about the actions to be taken to launch the project. REScoop offers a series of guidelines for constructing a good communication strategy capable of involving citizens (REScoop, 2020).

The first step to define the objectives of the communication activity to be undertaken, and then to choose the most suitable tool. After defining the objective of one's communication strategy, the second step is to clarify the target audience. Deciding who we are addressing is important for building a specific communication for the audience we want to engage. To this end, strategies can be used to get to know the target audiences. A first strategy could be to make a map of the people interested in joining the project and classify them according to their level of involvement and the power they have to influence other people to join the project. Another strategy is to construct a communication strategy by thinking of an ideal type of person you want to engage, establishing a series of parameters such as: age, professional occupation, the motivations that would motivate him/her to participate. Obviously, the choice of technique for gathering information on the target audience also depends on the time and budget available.

The third step is to think of a catchy message useful not only to inform the local community but also to create curiosity. As the REScoop guide suggests, the message should clarify the why of the project: the vision and motivation must be very clear and explicit, identifying the common values of the area to be engaged. After clarifying the vision, it is important to present the energy community project by giving a clear and concise explanation. Finally, it is appropriate to clarify what the public can do to help. It is important to wait for the right moment to organise activities and choose the most appropriate channels according to the sociodemographic characteristics of people you want to reach. It is always good to take into account incentives that might motivate people to participate.

The fourth step involves choosing which channels to use to communicate and the activities to be developed such as creating an online communication plan through social networks. The first factor to take into account is the social network most used by the target audience you want to reach. Another factor to take into account is the time to create social content. Social network profiles must be fed with daily content if they are to reach the target audience, so in some cases it is more appropriate to use an already active account such as that of the municipality or other actors who are already considered reliable sources of information.

Another strategy that can be used is the creation of a website: this allows for a stable online presence. The website could be conceived as a place where the most important information of the project is displayed, which is always up-to-date and where one can easily find the latest content translated into a language accessible to all. Another useful tool could be to think of creating periodic newsletters to be sent to people who show interest in the initiative.

Alongside online communication, posters and brochures can be considered for distribution to potential partners. In this case, special attention must be paid to the balance between text and images in order to offer a visual identity and slogans that make the project objectives easy to imagine. A further communication channel is in-person communication, such as "conversation tables around a coffee" to start sharing ideas in one's own area.

Figure 3: 4 steps for creating a communication strategy

Example of a Communication Campaign on Environmental Sustainability and Energy Communities

1. Define your goals: campaign objective

The first step in our campaign is to clearly define the objectives. The main objective is to raise awareness in the local community of the importance of environmental sustainability and to promote the creation and functioning

of energy communities. We want to inform and involve citizens, encouraging them to actively participate in sustainable energy initiatives.

2. Define your target

For effective communication, it is essential to identify our target audience. Our campaign could be aimed at: local residents interested in sustainability; young adults and families who want to reduce their ecological footprint; homeowners and small business owners interested in saving on energy costs; local administrators and members of community associations.

Useful strategies in the target setting phase are:

a. Mapping of target audiences:

- People already engaged in environmental activities.
- Community leaders and figureheads who can influence others.
- Residents and entrepreneurs who might be interested once informed about the benefits.

b. Building a typical target audience. An example:

- Name: Maria Rossi
- Age: 35 years
- Occupation: Primary school teacher
- Motivation: She wants to reduce his energy bills and teach his children the importance of sustainability.
- Most frequently used communication channels: Facebook, community events, newsletter, etc.

3. Create a catchy message

The campaign message must be clear, appealing and motivating. It must communicate why the energy community project is important and how citizens can participate:

- Vision: “Imagine a neighbourhood where energy is shared, sustainable and affordable for all. Join us in creating an energy community!”
- Motivation: “Energy communities enable residents to produce, share and manage energy independently. This not only reduces energy costs, but also contributes to a cleaner and more sustainable environment.”
- Call to Action: “Find out how you can participate in our project! Visit our website, attend our workshops or subscribe to our newsletter to stay up-to-date.”

4. Select communication channel

To effectively reach our audience, we will use a combination of online and offline channels:

- Social media: creation of a dedicated Facebook page and use of the municipality's Instagram account to post updates, success stories and event promotion.
- Website: Development of an informative website hosting project details, participation stories, educational resources and a calendar of events.
- Newsletter: Regular newsletters are sent out to keep stakeholders informed and provide updates on project progress.
- Printed material: Distribution of posters and brochures in key community locations such as schools, libraries, community centres and local shops.
- Events in person: Organisation of workshops, round tables and informal meetings such as 'sustainable cafes' to discuss energy communities and gather feedback.

Campaign implementation

1. Initial launch:

- Publication of an advertisement on social media and website.
- Distribution of posters and brochures.

2. An ongoing engagement:

- Regular updates on social media.
- Sending monthly newsletters.
- Organisation of regular in-person events.

3. Special events:

- Sustainability Day: launch event with information stands, presentations and activities for families.
- Roundtables: regular discussions with energy experts and representatives of existing energy communities.

4. Monitoring and Evaluation:

- Collection of feedback through post-event surveys.
- Monitoring social media engagement and website traffic.
- Evaluation of the number of participants and new members of energy communities.

This example of a communication campaign aims to create awareness, involvement and concrete action on energy sustainability, using an integrated strategy combining different communication tools and channels.

4.2.2 Digital communication

Digital communication tools aim to motivate people to become active and connect with others. These are tools that seek to simplify organisation in communities by encouraging peer sharing, e.g. WhatsApp groups, Telegram, forums and the like. A WhatsApp group could be created for prosumers (energy producers and consumers) in the community, where they can share information, discuss energy efficiency strategies, and organise meetings to exchange experiences and resources. Through this group, members can also organise votes on issues relevant to the community, such as the installation of solar panels on the roof of a shared building.

In addition, an online forum platform could be created to allow community members to openly discuss new ideas, solutions to local problems and proposals for improvement. Sub-teams could be formed within the forum to address specific issues, such as planning community events, promoting sustainable practices or managing local projects.

A crowdsourcing platform could be used to involve residents in finding new solutions for local problems, such as waste management or pollution reduction. Residents could be invited to submit ideas and projects, and the community could vote for those they find most promising. Winning ideas could then be further developed with the support of the community.

Another strategy that could be used is the creation of thematic working groups within the community to address specific issues, such as environmental sustainability, local economic development or the promotion of social welfare. These groups could organise regular meetings to discuss new ideas, plan concrete actions and collaborate with local authorities or other organisations to implement projects.

Example of digital communication tools

Co-operation and integration tools are essential to motivate people to become active and connect with others within a community. These tools seek to simplify organisation and encourage peer-to-peer sharing. A practical example of these tools is the use of WhatsApp groups, Telegram, online forums and crowdsourcing platforms. Below are some concrete examples of how these tools can be used in an energy community.

WhatsApp group

A WhatsApp group could be created. This group would serve as a platform to share useful information, discuss strategies to improve energy efficiency and organise meetings to exchange experiences and resources. For example, through this group, members can:

- Sharing energy consumption updates and energy-saving tips.
- Discuss and plan the installation of new solar panels on shared buildings.
- Organising votes on issues relevant to the community, such as the decision to invest in new energy technologies.

Online community forum

An online forum could be established to allow community members to openly discuss new ideas, solutions to local problems and proposals for improvement. Within the forum, sub-groups dedicated to specific issues could be created:

- Planning of community events: A group could take charge of organising events to raise community awareness of sustainable practices.
- Promotion of sustainable practices: Another group could focus on promoting eco-friendly practices and disseminating information on how to reduce environmental impact.

Crowdsourcing platform

A crowdsourcing platform could be used to involve residents in finding new solutions for local problems. The community could invite members to submit ideas and projects, and then vote on the most promising ones. For example:

- Pollution reduction: Ideas on how to reduce CO2 emissions using renewable energy or by improving sustainable mobility could be presented and further developed.

Thematic working groups

The creation of thematic working groups within the community can address specific issues such as environmental sustainability, local economic development or the promotion of social welfare. These groups could:

- Organise regular meetings: To discuss new ideas, plan concrete actions and collaborate with local authorities or other organisations.
- Implement projects: Work on specific projects such as installing green infrastructure, improving public transport or promoting cultural activities.
- Recruiting new members: Through awareness-raising activities and communication campaigns, groups can attract new participants and expand the network of collaboration.

4.3 Methods of engaging members in Energy Communities

4.3.1 Participatory design methodology

This section proposes a Participatory Design (PD) methodology to strengthen the engagement techniques identified from an analysis and mapping of European projects (UP-STAIRS project[4]; HESTIA project[5]; Lightness project[6]; GRETA project[7]).

Adopting the methodology of participatory design means directly involving people in the co-design of tools, products, companies, social institutions, with the aim of ensuring that they function in a way that is more

[4] UP-STAIRS (n.d.). *Uplifting energy communities*. Retrieved 02/08/2024, from https://www.h2020-upstairs.eu/.
[5] HESTIA (n.d.). *Holistic demande response services for residential European communities.* Retrieved 02/08/2024, from https://hestia-eu.com/.
[6] LIGHTENESS (n.d). *Enganging communities in the future of energy.* Retrieved 02/08/2024, from https://www.lightness-project.eu/.
[7] GRETA (n.d). *GReen Energy Transition Actions*. Retrieved 02/08/2024, from https://cordis.europa.eu/project/id/101022317.

responsive to citizens' needs. In particular, with PD, stakeholders are directly involved through various types of design workshops to collaboratively imagine what kind of practices - as well as the intermingling of these - might be the most efficient for the social engagement tools proposed above to produce results within the territory. One could directly include stakeholders in order to identify needs, requirements, motivations at an early stage and co-design together communication and engagement strategies that can include the entire community (Robertson & Simonsen, 2012). Participation in participatory design means investigating, understanding, reflecting on, developing and supporting an ongoing learning process. This methodology proposes an approach to the understanding of practice exploited as an alternative to the formal diagrams and highly abstract design flow processes that define traditional approaches to the development of technologies, objects, ideas, institutions and social practices, etc. (Robertson, Simonsen, 2012). By considering the local territorial features and existing technological infrastructure, this approach ensures that the development process is more grounded in the local context, thereby fostering solutions that are not only innovative but also practical and responsive to the specific needs and capabilities of the community.

In this section the deliverable aims to provide an overview of participatory design tools and techniques to engage non-experts in specific participatory design activities. Adapting the framework proposed by Sanders et al. (2010), each methodology can be broken down into three elements: technique, implementation and setting.

- Techniques include interactive workshops, events and conferences, focus groups, semi-structured interviews, surveys and questionnaires, customised training sessions. These are all techniques through which it is possible to orient and direct the interaction with the individuals one wishes to engage. Each technique also allows you to collect data on the context in which you want to act and use the information gathered to develop energy communities that respond to the needs and motivations of the area.
- Implementation is intended to explore participants' opinions, probing various perspectives and points of view related to the topic under discussion. The aim is to actively engage participants, encouraging them to fully immerse themselves in the topic at hand to foster meaningful participation. The aim is to stimulate participants' creativity and imagination, encouraging them to come up with new concepts or imagine future scenarios related to the topic under investigation.
- The setting describes the circumstances in which the tools and techniques are used, including aspects such as the size and composition of the group, whether the interaction takes place in person or online, and stakeholder relations.

Below are examples of PD methodologies that can be adapted to the development of an energy community through the active involvement of the local population.

A) Workshop

Technique:

The workshop is useful for organising practical and participative sessions where users can learn by doing. It is based on practical exercises and simulations with the objective of raising participants' awareness of building ideas to stimulate the active process of designing an energy community. It is important to ensure that clear instructions and support are provided during the activities to help users understand and apply

the concepts presented, to encourage interaction and exchange of ideas among participants. Workshop is more a "family" of techniques rather than a single specific format. Brandt, Binder and Sanders (2013) provide an introduction on how the various workshop formats can promote creativity and, through creativity, stimulate reflection and shared understanding.

Framework dimensions and sub-dimensions: target (registering the people attending the conference helps to have an initial mapping of the people interested in the EC); values & culture (social participation, energy justice, energy democracy, energy culture).

Implementation:

1. Explore participants' opinions:
    a. Interactive Whiteboard Materials: To break the ice, interactive whiteboard materials could be used where post-it notes could be attached, or cards could be placed on a board depicting energy consumption habits in the home (timeline of appliance usage times).
2. Encourage a discussion and actively involve the participants:
    a. Facilitate discussion: the discussion can be conducted by asking open-ended questions about the habits displayed on the board and encouraging participants to share why they follow certain routines and how these might impact their energy consumption. Possible technical and infrastructural limitations related to energy use can also be explored at this stage.
    b. Peer learning: By discussing their habits and comparing them with others, participants can learn from their peers.
    c. Active participation: Ensuring every participant has a chance to contribute by rotating speaking opportunities or using small group discussions to dive deeper into specific topics before sharing with the larger group.
3. Understanding participants' experience:
    a. Peer-to-peer comparison: Creating pairs or small groups where participants can discuss their experiences in detail. This can be facilitated through structured questions or prompts.
    b. Sharing best practices: Encouraging participants to share successful energy-saving strategies they have implemented.
    c. Identify common challenges: Discussing common difficulties participants face in managing their energy consumption. This can help in understanding barriers to energy efficiency and exploring collective solutions.
4. Stimulate and imagine new scenarios:
    a. Future scenarios activity: Engaging participants in an exercise where they imagine and sketch out scenarios for a more energy-efficient home. An idea could be provide prompts or themes, such as "a day without electricity waste" or "the ideal energy-efficient mobility".
    b. Group brainstorming: Facilitating brainstorming sessions where participants can propose innovative ideas and solutions.

Setting:

A minimum number of 10 participants should be reached. In case of more participants, subgroups can be built. An in-person workshop offers several advantages over an online workshop, mainly related to group dynamics and active participation. Physical presence helps to create a more immersive and engaging environment. Participants are less subject to external distractions and can better focus on the activity at hand. Moreover, the atmosphere of an in-presence workshop can foster spontaneity and creativity, stimulating livelier discussions and greater collaboration.

B) Events and Conferences

Technique:

Events and conferences can be organised with experts that share knowledge and best practices with users. With this aim it is necessary planning a series of presentations or debates covering various aspects of the topic. Conferences are useful to build opportunities for networking and active audience participation through question and answer sessions or guided discussions.

Framework dimensions and sub-dimensions: target (registering the people attending the conference helps to have an initial mapping of the people interested in the EC); values & culture (social participation, energy justice, energy democracy, energy culture).

Implementation:

1. Exploring participants' opinions
    a. Interactive whiteboard or digital polling: At the start of the event, you can utilise an interactive whiteboard or digital polling tools (like Mentimeter or Poll Everywhere). Participants can submit their opinions and habits regarding energy consumption.
    b. Survey or questionnaires: A short survey could be distributed to capture detailed information on participants' energy habits. Questions could include topics like awareness of energy-saving practices.
2. Encourage discussion and actively involve the participants
    a. Peer Learning: Emphasising the value of peer-to-peer learning by encouraging participants to share their personal success stories and best practices in energy conservation. It is important to highlight common themes and strategies that emerge from the discussions.

Setting:

A minimum number of 10 participants should be reached. An in-person event offers a number of advantages over a webinar, mainly related to group dynamics and active participation. Physical presence helps to create a more immersive and engaging environment. Participants are less subject to external distractions and can better focus on the activity at hand. Moreover, the atmosphere of an in-presence event can stimulate more discussion and collaboration.

An example from ECOempower Pilot Site: Eppishausen, Allgäu (GERMANY)

The event was organised by eza!, a non-profit cooperative partner of the ECOempower project. A combination with a presentation on 'Photovoltaics, electricity storage and electric cars' helped to introduce ECOEMPOWER to interested citizens. It was a useful information evening to make citizens more aware of the project and the main concepts related to environmental and energy issues.

In this way, we started this ongoing regional exchange with the civic topics of solar energy, home storage, etc., which continue to arouse great interest among the local community.

A total of 41 people were present, of whom only 2 were women, confirming the need to pay more attention to gender inclusiveness. The event was held during on 5 May 2024 between 7 p.m. and 9 p.m. so as to allow for broad participation after working hours.

eza! explained the technical and regulatory basis of photovoltaic systems, as well as their dimensioning and associated self-consumption. The optimal combination with storage batteries and e-mobility was also discussed. The advantages of these technologies were also addressed. The last content point dealt with the currently in vogue topic of balcony photovoltaics or plug-in solar devices, outlining the legal, technical and financial framework conditions.

A question-and-answer session followed. The conditions and changes in the regulatory framework were discussed in depth, as well as the potential of various technical combinations, so that no questions remained unanswered at the official end of the event.

Afterwards, the interested audience chatted over drinks and the evening ended with the exchange of contacts between the participants.

C) Focus group

Technique:

Focus groups are often used in market research, product development, or social science research to gather insights, opinions, and attitudes from participants in a group setting. A skilled moderator guides the discussion, posing open-ended questions to encourage participants to share their thoughts, experiences, and perspectives. The interactive nature of focus groups allows researchers to explore complex topics in depth and gain a deeper understanding of participant attitudes and behaviours.

Framework dimensions and sub-dimensions: motivation; values & culture (social participation, energy justice, energy democracy, energy culture).

Implementation:

1. Explore participants' opinions:
    a. Icebreaker activities: the focus group can start with icebreakers to create a comfortable atmosphere for participants to share their opinions. This could involve simple introductory questions related to energy usage, such as their favourite energy-saving tip or their biggest energy-related challenge.
    b. Open discussion: Facilitating a discussion where participants can freely express their opinions on various aspects of energy consumption. An open discussion can facilitate the sharing of their thoughts on topics such as energy-saving practices, their perceptions of energy justice, and any obstacles they face in reducing barriers to accessing technology infrastructure to benefit from the energy transition.
    c. Use of visual materials: Incorporating visual materials such as charts, graphs, or images related to energy consumption to prompt discussion and provide context for participants to express their opinions.
2. Encourage discussion and actively involve the participants:
    a. Group activities: The organisation of interactive activities can encourage collaboration and engagement among participants. This could include group brainstorming sessions, role-playing exercises, or small group discussions on specific energy-related topics.
    b. Moderated discussions: Discussions are facilitated by asking stimulating questions and encouraging participants to share their thoughts and experiences.
    c. Active listening: Discussions are facilitated by asking stimulating questions and encouraging participants to share their thoughts and experiences. It is important that all participants can contribute to the discussion and that quieter people are encouraged to speak.
    d. Feedback loops: Establishing feedback loops where participants can respond to each other's comments, ask follow-up questions, and provide additional insights. This creates a dynamic dialogue where ideas are continually refined and expanded upon.
3. Understanding Participants' Experience:
    a. Sharing experiences: Participants should be helped to share anecdotes and personal experiences related to energy use, such as asking them to talk about cases in which they managed to reduce their energy consumption or cases in which they encountered difficulties in doing so.

b. Reflexive exercises: Participants may conduct reflection exercises with the aim of critically reflecting on their own energy consumption patterns. Timelines can be prepared to be filled in with daily consumption, such as self-assessment quizzes or guided reflection activities.

4. Stimulate and Imagine New Scenarios

a. Brainstorming sessions: Brainstorming sessions can generate and explore new ideas for energy efficiency practices, encouraging them to think outside the box and consider new projects addressing energy challenges.

b. Scenario planning: Planning exercises can encourage in imaging hypothetical situations and discuss potential responses. This could involve exploring scenarios such as the transition to RES and the effects on the community.

c. Visualisation techniques: The use of visualisation techniques such as mind mapping, sketching, or storytelling could help participants imagine and articulate new energy consumption scenarios or new ideas to engage new members.

Setting:

A focus group is a qualitative research method where a small group of people, typically ranging from 5 to 10 participants, are brought together in a structured setting to discuss and provide feedback on a specific topic or issue.

D) Interviews

Technique:

A semi-structured interview is a qualitative research method where the interviewer follows a predetermined set of open-ended questions but has the flexibility to explore additional topics and probe deeper into participants' responses. Unlike structured interviews, which follow a strict script with fixed questions, and unstructured interviews, which are more open-ended and free-flowing, semi-structured interviews strike a balance between structure and flexibility.

Framework dimensions and sub-dimensions: target; motivation; values & culture (social participation, energy justice, energy democracy, energy culture).

Implementation:

1. Explore participants' opinion

a. Open-ended questions: The semi-structured interview is based on semi-structured questions that manage to leave room for the interviewee to freely express his or her opinion and thoughts.

b. Probe for depth: As participants share their opinions, probe further to delve deeper into their reasoning and beliefs, asking follow-up questions to clarify their viewpoints and explore any contradictions or ambiguities.

c. Active listening: The interviewee should practice active listening throughout the interview, paying close attention to verbal and non-verbal cues. Showing genuine interest in

participants' opinions is important so that a sense of trust and empathy is built during the interview.

2. Encourage discussion and actively involve the interviewee
    a. Facilitate open communication: A comfortable environment can help increase a sense of trust between interviewee and interviewer. A trusting relationship can be created that helps in the sharing of personal anecdotes and experiences.
    b. Use probing techniques: The use of probing techniques such as paraphrasing, summarising and mirroring responses can encourage further exploration of opinions and reflections. This helps maintain momentum and keep the conversation flowing.
3. Stimulate and imagine new scenarios
    a. Thought-provoking questions: Questions to investigate hypothetical situations could encourage participants to think beyond their current perspectives and consider alternative scenarios.
    b. Brainstorming: Brainstorming with interviewee can help generate new ideas, solutions or possibilities related to the topic, encouraging them to think creatively and explore unconventional approaches.

Setting:

There are usually two actors in a semi-structured interview, and it is important that the surrounding space is quiet and comfortable. It can be conducted online, in the home, in a park, in offices or in public settings that provide some privacy.

E) Questionnaire

Technique:

The questionnaire is a quantitative research method consisting of a series of structured questions to collect information on certain dimensions and indicators. It is important to define the target audience by trying to reach people with specific socio-demographic characteristics in order to ensure that the data collected is representative and provides meaningful insights into the population of interest.

Framework dimensions and sub-dimensions: target; motivation; values & culture (social participation, energy justice, energy democracy, energy culture).

Implementation:

1. Explore participants opinions
    a. Clear and direct questions: When designing a survey, think about clear questions that get directly to the point of interest, using a mix of closed-ended (e.g., multiple-choice, Likert scale) and open-ended questions to capture a range of opinions.
    b. Neutral language: The use of neutral language in survey questions is indispensable to allow participants to freely express their opinions without feeling forced to conform to a particular point of view.

2. Encourage discussion and actively involve the participants
    a. Comment sections: Open text fields at the end of the questionnaire encourage participants to provide further feedback or insights and to share thoughts, experiences or suggestions related to the survey topic.
    b. Follow-up interviews: Conducting in-depth interviews with some of the survey participants allows for an in-depth exploration of the participants' opinions and experiences and offers the opportunity for a more interactive discussion.
    c. Participant feedback sessions: Giving back the survey results to the participants fosters dialogue and mutual learning between the participants.
3. Stimulate and imagine new scenarios
    a. Scenario-based questions: asking participants to answer questions based on scenarios or hypothetical situations stimulates the respondent to think and imagine new actions towards the energy transition.

Setting:

Questionnaires can be conducted through various mediums, including paper-based forms, online platforms, telephone interviews, or face-to-face interviews. Surveys are often structured with a predetermined set of questions designed to gather specific information about participants' opinions, attitudes, behaviours, or demographics.

4.3.2 Self-assessment and gamification tools

Each of these techniques can be accompanied by self-assessment and gamification tools. Self-assessment tools, such as questionnaires through which individuals can answer and critically reflect on their energy practices and saving habits, can be considered. The use of a self-assessment tools can be enhanced with elements related to the process of gamification, i.e. the use of game situations such as competition, rewards and prizes to engage and motivate people to perform certain actions. An online questionnaire could be created asking individuals in the community to rate their energy habits, e.g. how long they leave appliances on, whether they use LED lights, whether they have energy-efficient devices, whether they use their bicycle or car to get around, etc. After completing the questionnaire, participants receive personalised feedback on their energy behaviour, with suggestions on how to improve it.

In this context, gamification strategies can be used to encourage sustainable energy behaviour, such as saving energy and using resources efficiently. A point system could be created where residents earn points for sustainable energy behaviours, such as switching off lights when not needed, reducing the use of energy-intensive appliances during peak hours, etc. Residents could compete to accumulate more points and earn rewards such as vouchers on energy bills, energy efficient devices, or even non-monetary rewards such as vouchers for local shops or cultural experiences. One can think of giving them suggestions on how to improve their energy behaviour, even in the form of rewards to be won for consuming, for example, energy at times of maximum self-production.

Based on self-assessment tools and personal energy data (e.g. average daily consumption), personalised suggestions could be given to residents on how to improve their energy behaviour. For example, if a resident consumes more energy during peak hours, he or she could receive suggestions on how to move some non-essential energy activities to less congested times to save energy. Or rewards or discounts could be offered to residents who consume energy during the community's peak energy times, for example when there are solar or wind power peaks. This could encourage residents to adapt their energy consumption to align with community energy production patterns, thus helping to reduce dependence on non-renewable energy sources.

Example of self-assessment and gamification

Programme objective

Encourage residents to critically reflect on their consumption practices through a points system and friendly competition in order to reduce energy consumption and promote efficient use of resources.

1. Registration and access

- Residents register on the online energy saving portal.
- Each participant receives a personal profile where they can monitor their progress and scores.

2. Self-Assessment questionnaire

- Participants fill in an initial questionnaire to assess their energy habits.
- The questionnaire is repeated periodically (e.g. every 3 months) to monitor improvements.

3. Points system: residents earn points for a range of sustainable behaviours. Examples of actions and points awarded

- Switching off lights when not needed: 5 points per day.
- Use LED bulbs: 10 one-off points for each bulb replaced.
- Carry out full load washes: 5 points for each wash.
- Use the bicycle or walk for commuting: 10 points for each day.
- Reduce the use of electrical appliances during peak hours: 10 points per day.
- Install energy efficient devices: 20 points per device.
- Use energy during solar/wind production peaks: 15 points per action.

4. Competitions and rankings

- Participants compete to accumulate the most points.

- Weekly, monthly and quarterly rankings are published to keep motivation high.
- Top finishers receive recognition and benefits.

5. Rewards and awards

- Discount vouchers for local shops: by accumulating points, residents can redeem discount vouchers.
- Non-monetary rewards: such as vouchers for cultural experiences, access to community events, etc.
- Energy-efficient devices: top performers can receive LED bulbs, smart power strips, or other sustainable devices.

6. Personalised feedback

- After each session of the self-assessment questionnaire, participants receive a report with suggestions on how to improve their energy practices.
- Feedback includes specific tips based on personal energy consumption and suggestions for earning more points.

Practice application

Daily Scenario:

- Marco turns off all the lights when he leaves the house (+5 points).
- Chiara replaces two old bulbs with LED bulbs (+20 points).
- Loredana uses her bicycle to go to work (+10 points).
- Giovanni washes the washing machine at full load (+5 points).
- Laura increases the use of electrical appliances during the hours of energy self-production (wind, solar, hydro) (+10 points).

Each action is recorded via the app or online platform, and points are automatically added to each participant's personal profile.

4.4 Map of activities and strategies for engaging energy communities

In this last paragraph, we provide a quick overview of which activities to organise according to the needs of the energy communities.

OBJECTIVES	Target: Core	Target: Committed	Target: Congregation	Target: Crowd	Target: Community
Active and in-depth involvement on specific topics	Workshop	Workshop			
Collect qualitative feedback	Focus group	Focus group	Focus group		
Collecting individual experiences	Interviews	Interviews	Interviews		
Collecting quantitative data on a large scale		Questionnaires	Questionnaires	Questionnaires	Questionnaires
Delving into specific topics	Interviews	Interviews	Interviews		
Develop new ideas and collaborative solutions	Focus group	Focus group	Focus group		
Encouraging interaction and continuous engagement		Self-assessment and gamification tools	Self-assessment and gamification tools	Self-assessment and gamification tools	Self-assessment and gamification tools
Facilitating discussion and learning	Workshop	Workshop			
Knowledge dissemination and best practices	Events and conferences	Events and conferences	Events and conferences	Events and conferences	Events and conferences
Large-scale networking	Events and conferences	Events and conferences	Events and conferences	Events and conferences	Events and conferences
Measuring the level of awareness and participation		Questionnaires	Questionnaires	Questionnaires	Questionnaires
Promoting self-assessment and self-awareness		Self-assessment and gamification tools	Self-assessment and gamification tools	Self-assessment and gamification tools	Self-assessment and gamification tools
Providing clear and accessible information			Information tools	Information tools	Information tools
Raising awareness and knowledge on energy issues			Information tools	Information tools	Information tools

Table 1: Map of activities and strategies for engaging energy communities

Table 1 is designed to help visualise how different activities can be used according to specific objectives and groups within energy communities. Each activity listed – such as workshops, events, focus groups, interviews, questionnaires, self-assessment and gamification tools, and information tools – is accompanied by a description of its main objective or distinguishing features.
The target group is divided into five categories of energy community members (refer to Section 3.2 for a detailed discussion on the target group categories):

- **Core**: the core members, those who are most involved and committed.
- **Committed**: those who are faithful and dedicated, albeit with a slightly lower level of participation than the Core.
- **Congregation**: regular participants who, although not as active as the previous ones, show interest and participation.
- **Crowd**: a larger and less involved group, which could be reached through more general activities.
- **Community**: the whole community, including those who are less involved or external.

How to use the table:
Although in specific situations any activity can be used for any objective, Table 1 summarises the most common use of each activity. Imagine you have to plan an activity for an energy community. The table helps you decide which activity is best suited to the needs of your community. For example, if your objective is to deepen specific knowledge or stimulate constructive debate, you could organise a workshop or focus group, targeted mainly at "Core" and "Committed" members.

If, on the other hand, you want to collect feedback on a large scale or disseminate knowledge widely, a questionnaire or an event/conference would be better suited to reach members of the "Congregation" and "Crowd". Finally, workshops, self-assessment and gamification tools are perfect for encouraging continuous interaction and increasing self-awareness, targeting the most engaged members up to the whole community.

"Information tools", on the other hand, are ideal for raising general awareness and disseminating clear and accessible information. These tools work well with a broader target audience, from "Committed" members to the 'Community', as they provide educational and informative resources that can reach a wide audience.

5 Conclusion

This deliverable focuses on tools and strategies to enhance social participation in energy-related initiatives through the development of an adaptable framework. *T3.1- Define and refine a shared approach to energy communities engagement* specifically addressed the need for a versatile tool that provides guidelines and methodologies which can be adapted to various contexts and needs.

The document provides a comprehensive literature review, defining the concept of an energy community and exploring its various dimensions and implications. By synthesising literature on EC, the framework builds a conceptual foundation that integrates different strategies for community engagement. This ensures that the framework is both inclusive and effective, drawing on diverse approaches to meet the unique needs of different communities.

The primary aim of this work is to empower citizens and local organisations with the necessary knowledge and tools to collaboratively manage energy resources. This shared approach not only promotes sustainable energy practices but also enhances social cohesion and contributes to broader environmental goals. By fostering a sense of ownership and commitment among community members, the framework helps ensure the long-term viability and success of energy transition projects.

Furthermore, this deliverable is closely linked to *D3.3 – Collection of indicators for assessing social impact and guidelines for their measurement*, which will be published subsequently and will assess the social impact of energy communities. Several concepts presented in this document will be revisited and adapted in Deliverable 3.3, ensuring a cohesive and comprehensive approach to community engagement and impact assessment.

Overall, WP3's efforts represent a significant step towards achieving a sustainable energy future through active citizen participation and community collaboration. The adaptable framework and participatory methodologies developed in this deliverable provide a basis for ongoing and future initiatives aimed at building resilient and sustainable energy communities. Through continuous refinement and application of these strategies, it is possible to achieve cohesion among the members of an energy community focused on energy democracy and justice, social participation and energy culture.

6 List of Figures

7 List of Abbreviations

ABBREVIATION	DEFINITION
BMC	Business Model Canvas
OSS	One Stop Shop
PD	Partecipatory Design
VPD	Value Proposition Design
RES	Renewable Energy Sources
ToC	Table of Contents

BIBLIOGRAPHY

Athensted, U., Corcoran, K., Gutschi, C., Held, J., Lurger, B., & Mogg, M. (2022). *D5.1 Overview of available tools to support energy communities.* Energy Citizenship and Energy Communities for a Clean-Energy Transition.

Bauwens, T., & Defourny, J. (2017). *Social capital and mutual versus public benefit: The case of renewable energy cooperatives*. Annals of Public and Cooperative Economics, 88(2), 203–232.

Bauwens, T., Schraven, D., Drewing, E., Radtke, J., Holstenkamp, L., Gotchev, B., & Yildiz, Ö. (2022). Conceptualizing community in energy systems: A systematic review of 183 definitions. *Renewable and Sustainable Energy Reviews*, 156.

Bielig, M., Kacperski, C., Klingert, S., & Kutzner, F. (2022). *D1.5 Guidelines to optimize energy-efficiency information campaigns and citizen participation for collective action and energy communities with practical views and methods*. DECIDE.

Bomberg, E., & McEwen, N. (2012). Mobilizing community energy. *Energy Policy*, 51, 435–444.

Bourdieu, P. (1977). *Outline of a Theory of Practice.* Cambridge University Press.

Brandt, E., Binder, T., & Sanders, E. B.-N. (2012). *Tools and techniques: ways to engage telling, making and enacting*. In J. Simonsen, & T. Robertson (Eds.), *Routledge International Handbook of Participatory Design*, (pp. 145-181). Routledge.

Breukers, S., Mourik, R. M., van Summeren, L. F. M., & Verbong, G. P. J. (2017). Institutional 'lock-out' towards local self-governance? Environmental justice and sustainable transformations in Dutch social housing neighbourhoods. *Energy Research and Social Science*, 23, 148–158. https://doi.org/10.1016/j.erss.2016.10.007

Caratù, M., Brescia, V., Pigliautile, I., & Biancone, P. (2023). Assessing Energy Communities' Awareness on Social Media with a Content and Sentiment Analysis. *Sustainability*, 15(8). https://doi.org/10.3390/su15086976

Carrosio, G., & Magnani, N. (2021). *Understanding the Energy Transition: Civil society, territory and inequality in Italy*. Springer Nature.

Carrosio, G., & Magnani, N. (2024). Renewable Energy Communities between critical capacity and socio-technical constraints. Introduction. *Rassegna Italiana di Sociologia*, 65(2), 233-234.

Coy, D., Malekpour, S., Saeri, A. K., & Dargaville, R. (2021). Rethinking community empowerment in the energy transformation: A critical review of the definitions, drivers and outcomes. *Energy Research and Social Science*, 72. https://doi.org/10.1016/j.erss.2020.101871

Curtis, S. K., Singh, J., Mont, O., & Kessler, A. (2020). Systematic framework to assess social impacts of sharing platforms: Synthesising literature and stakeholder perspectives to arrive at a framework and practice-oriented tool. *PloS One*, 15(10).

De Gioannis, E., Dudka, A., & Łapniewska, Z. (2024). Gender stereotypes and empowerment of women in energy cooperatives: A comparative analysis from Italy and Belgium. *Energy Research & Social Science*, *116*, 103673.

Dryzek, J. S. (2002). *Deliberative democracy and beyond: Liberals, critics, contestations*. Oxford University Press.

ECOEMPOWER (2024). *D4.1 - Classification of organisational forms for collective and cooperative energy supply and their typical business models*. Retrieved 2/08/2024, from https://ecoempower.eu/Resources/Deliverables

European Commission: Joint Research Centre, Williquet, F., Szkola, S., Catana, C. and Debremaeker, I. (2021). *The communities of practice playbook – A playbook to collectively run and develop communities of practice*, Publications Office, https://data.europa.eu/doi/10.2760/443810

Farrell, J. (2014). *Beyond utility 2.0 to energy democracy*. Institute for Local Self-Reliance.

Ferrari, M. Z. (2016). Beyond uncertainties in the sharing economy: Opportunities for social capital. *European Journal of Risk Regulation*, 7(4), 664–674.

Fraune, C. (2015). Gender matters: Women, renewable energy, and citizen participation in Germany. *Energy Research & Social Science*, 7, 55-65.

Giddens, A. (1984). *The Construction of Society*. Cambridge: Polity Press.

Goodin, R. E., Pateman, C., Dowding, K. M., & eds. (2014). *Justice and Democracy*. Cambridge University Press.

GRETA (n.d). *GReen Energy Transition Actions*. Retrieved 02/08/2024, from https://cordis.europa.eu/project/id/101022317.

HESTIA (n.d.). *Holistic demande response services for residential European communities*. Retrieved 02/08/2024, from https://hestia-eu.com/

Hirst, P. (1994). Associative democracy. *Dissent*, 41, 241–247.

Huybrechts, B., & Mertens, S. (2014). The relevance of the cooperative model in the field of renewable energy. *Annals of Public & Cooperative Economics*, 85(2), 193–212.

Jenkins, K., McCauley, D., Heffron, R., Stephan, H., & Rehner, R. (2016). Energy justice: A conceptual review. In *Energy Research and Social Science* (Vol. 11, pp. 174–182). Elsevier Ltd. https://doi.org/10.1016/j.erss.2015.10.004

Latour, B. (2005). *Reassembling the Social. An Introduction to Actor-Network-Theory*. Oxford University Press.

LIGHTENESS (n.d). *Engaging communities in the future of energy*. Retrieved 02/08/2024, from https://www.lightness-project.eu/.

Llena-Nozal, A., N. Martin and F. Murtin (2019). The economy of well-being: Creating opportunities for people's well-being and economic growth. *OECD Statistics Working Papers*, No. 2019/02, OECD Publishing, Paris, https://doi.org/10.1787/498e9bc7-en.

Magnani, N., Vittori, F., & De Vita, A. (2023). *Transizione energetica e partecipazione della società civile*. Quaderni del Dipartimento di Sociologia e Ricerca Sociale, 7, 1-75.

Marres, N. (2016). *Material participation: Technology, the environment and everyday publics*. Springer.

McHarg, A. (2016). *Community Benefit through Community Ownership of Renewable Generation in Scotland: Power to the People?*. In Lucas et al. *Sharing the costs and benefits of energy and resource activity: legal change and impact on communities.* Oxford University Press.

Mey, F., & Diesendorf, M. (2017). Who owns an energy transition? Strategic action fields and community wind energy in Denmark. *Energy Research & Social Science*, 35, 108–117.

Oxoby, R. (2009). Understanding social inclusion, social cohesion, and social capital. *International Journal of Social Economics*, 36(12), 1133–1152.

Payne, A., Frow, P., & Eggert, A. (2017). The customer value proposition: evolution, development, and application in marketing. *Journal of the Academy of Marketing Science*, 45, 467–489.

Pearl-Martinez, R., & Stephens, J. C. (2016). Toward a gender diverse workforce in the renewable energy transition. *Sustainability: Science, Practice and Policy*, 12(1), 8-15.

Piselli, C., Fronzetti Colladon, A., Segneri, L., & Pisello, A. L. (2022). Evaluating and improving social awareness of energy communities through semantic network analysis of online news. *Renewable and Sustainable Energy Reviews*, 167. https://doi.org/10.1016/j.rser.2022.112792

Polanyi, M. (1962). *Personal Knowledge: Towards a Post-Critical Philosophy*. NY Harper Torchbooks.

Pulsford, M. (2014). *Circles of Commitment: A Model of Engagement*. The Commons: Social Change Library .

Reckwitz, A. (2002). Toward a theory of social practices: A development in culturalist theorizing. *European Journal of Social Theory*, 5(2), 243–263.

REScoop. (2020). *Community Energy. A practical guide to reclaiming power*. REScoop.eu.

Robertson, T., & Simonsen, J. (2012). Challenges and opportunities in contemporary participatory design. *Design Issues*, 28(3), 3–9. https://doi.org/10.1162/DESI_a_00157

Rogers, J. C., Simmons, E. A., Convery, I., & Weatherall, A. (2008). Public perceptions of opportunities for community-based renewable energy projects. *Energy Policy*, 36(11), 4217-4226.

Sanders, E. B. N., Brandt, E., & Binder, T. (2010, November). A framework for organizing the tools and techniques of participatory design. In *Proceedings of the 11th biennial participatory design conference* (pp. 195-198).

Shortall, R., Mengolini, A., & Gangale, F. (2022). Citizen Engagement in EU Collective Action Energy Projects. *Sustainability*, 14(10). https://doi.org/10.3390/su14105949

Shove, E. (2010). Beyond the ABC: Climate change policy and theories of social change. *Environment and Planning A*, 42(6), 1273–1285. https://doi.org/10.1068/a42282

Shove, E., Pantzar, M., & Watson, M. (2012). *The dynamics of social practice: Everyday life and how it changes*. Sage.

Slingerland, S., Young, J., Mourik, R., Lutz, L. (2021). Energy Communities for Just Energy Transitions on a Local Scale: Initial Lessons from the Lightness Project. *Environ. Sci. Proc.*, *11*, 29. https://doi.org/10.3390/environsciproc2021011029

Smith, A., Fressoli, A., Abrol, D., Arond, E., & Ely, A. (2017). *Grassroots Innovation Movements*. Routledge.

Sovacool, B. K., Burke, M., Baker, L., Kotikalapudi, C. K., & Wlokas, H. (2017). New frontiers and conceptual frameworks for energy justice. *Energy Policy*, 105, 677–691. https://doi.org/10.1016/j.enpol.2017.03.005

Spaargaren, G. (2011). Theories of practices: Agency, technology, and culture. Exploring the relevance of practice theories for the governance of sustainable consumption practices in the new world-order. *Global Environmental Change*, 21(3), 813–822. https://doi.org/10.1016/j.gloenvcha.2011.03.010

Spickett-Jones, G. J., Kitchen, P. J., & Reast, J. D. (2004). Social facts and ethical hardware: Ethics in the value proposition. *Journal of Communication Management*, 8(1), 68–82.

Stephenson, J., Barton, B., Carrington, G., Gnoth, D., Lawson, R., & Thorsnes, P. (2010). Energy cultures: A framework for understanding energy behaviours. *Energy Policy*, 38(10), 6120–6129. https://doi.org/10.1016/j.enpol.2010.05.069

Storbacka, K., & Nenonen, S. (2004). Scripting markets: From value propositions to market propositions. *Industrial Marketing Management*, 40(2), 255–266.

Szulecki, K., & Overland, I. (2020). Energy democracy as a process, an outcome and a goal: A conceptual review. *Energy Research & Social Science*, 69(101768).

Tong, S., & Ebi, K. (2019). Preventing and mitigating health risks of climate change. In Environmental Research (Vol. 174, pp. 9–13). *Academic Press Inc*. https://doi.org/10.1016/j.envres.2019.04.012

GRETA (n.d). *GReen Energy Transition Actions. Retrieved 02/08/2024*, from https://cordis.europa.eu/project/id/101022317.

Van Veelen, B. (2018). Negotiating energy democracy in practice: governance processes in community energy projects. *Environ.Polit.*, 27, 644–665.

Vansintjan, D. (2015). *The Energy Transition to Energy Democracy, Report of the REScoop 20-20-20 Intelligent Energy Europe project*. REScoop.eu.

Walker, G. (2008). What are the barriers and incentives for community-owned means of energy production and use?. *Energy Policy*, 36(12), 4401–4405. https://doi.org/10.1016/j.enpol.2008.09.032

Walker, G., & Devine-Wright, P. (2008). Community renewable energy: What should it mean?. *Energy Policy*, 36(2), 497–500. https://doi.org/10.1016/j.enpol.2007.10.019

Weinrub, A., & Giancatarino, A. (2015). Toward a climate justice energy platform: Democratizing our energy future. *Local Clean Energy Alliance/Center for Social Inclusion.*

Wuebben, D., Romero-Luis, J., & Gertrudix, M. (2020). Citizen science and citizen energy communities: A systematic review and potential alliances for SDGs. *Sustainability*, 12(23), 1–24. https://doi.org/10.3390/su122310096