



ENCLUDE

Energy Citizens for Inclusive
Decarbonization

D3.2 – Report on emergence and consolidation factors and their trade-offs

WP3 – Contextualising the emergence
and consolidation of energy citizen-

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Preface

The overall vision of ENCLUDE is to help the EU to fulfil its promise of a just and inclusive decarbonisation pathway through sharing and co-creating new knowledge and practices that maximise the number and diversity of citizens who are willing and able to contribute to the energy transition. Motivated by achieving an equitable and sustainable future and the fulfilment of individual potential, ENCLUDE will contribute to the upcoming transformation of energy use by: (1) Assembling, aligning, and adapting disparate energy citizenship concepts for diverse communities of citizens and for different scales of policy making, lowering the barrier for action. (2) Operationalising the energy citizenship concept at all scales of policy making for decarbonisation. (3) Catalyzing a chain reaction of decarbonisation actions across the EU.



Changes with respect to the DoA

Due to a delay in receiving the case studies-related work from the field researchers, the preparation of the report was slightly postponed, resulting in the deliverable being submitted two months later than originally envisaged.

Dissemination and uptake

This deliverable presents the results of the ENCLUDE case studies data collection and analysis and aims at showcasing expressions of collective expressed and manifested energy citizenship. This report – second and last of the Work Package 3 deliverables – contributes to the ongoing debate on how collective energy initiatives can support the active engagement of citizens in the energy sector and how this engagement can be further developed.

This report will be of interest to researchers and policy makers working in the energy field as well as to practitioners who are involved in the organisation of collective energy initiatives.

Short Summary of results (<250 words)

This deliverable presents the findings of Work Package 3 (WP3) in the ENCLUDE project, focusing on collective energy initiatives. The report is structured into four tasks, exploring the emergence and consolidation of energy citizenship groups. Methodologically, it employs a multi-stage process, involving case identification, surveys, interviews, and cross-examination.

Key themes include energy poverty, motivations for joining, funding, regulations, community culture, and barriers faced by the community. Discrepancies between representatives and members highlight messaging alignment importance. Funding challenges, bureaucratic barriers, and regulatory concerns are emphasized. Community culture and communication play pivotal roles.














Tailored recommendations are provided for various CEI stages, addressing general CEIs, emerging and consolidated Energy Communities (ECs), and Collective Targeted Actions (CTAs). Specific insights for policymakers offer nuanced understandings of factors shaping CEI emergence and consolidation.

Evidence of accomplishment

This report serves as evidence of accomplishment.



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Executive Summary

This deliverable outlines the outcomes of Work Package 3 (WP3) within the ENCLUDE project, focusing on a comprehensive study of collective energy initiatives in and outside of Europe. Structured into four tasks, the WP3 analysis aims to identify crucial processes and factors influencing the emergence and consolidation of energy citizenship groups.

The report's first section, "Deep Dive" delves into in-depth case studies through stakeholder interviews. The subsequent part "Cross-Comparison of Interviews and Survey Results" aligns data from interviews and surveys. "Factors Influencing Emergence and Consolidation" thoroughly analyses ten key factors affecting Collective Energy Initiatives (CEIs). The final section, "Outlook and Recommendations" synthesises conclusions and provides tailored recommendations for CEIs and policymakers.

The methodology employed in this study is a multi-stage process. Initially, relevant cases were identified in Europe, North America and Africa, characterizing them as collectives. Individual perspectives were captured through online surveys and deepened through interviews with representatives, participants, and external experts. Specific topics were identified for in-depth investigation, and all gathered information underwent cross-examination. The findings formed the basis for the formulated recommendations.

The report identifies energy poverty, motivations for joining, funding and subsidies, regulations, community culture, and barriers faced by the community as crucial themes. Discrepancies between representatives and members underscore the importance of aligning messaging in CEIs. Funding challenges and bureaucratic barriers are highlighted, emphasizing the significance of initial as well as ongoing funding.

Regulatory concerns pose challenges, especially regarding unclear regulations and administrative aspects. Community culture and communication play pivotal roles, with democratic decision-making structures and shared eco-friendly mindsets fostering engagement. Barriers like maintaining an engaged core team and securing funding are identified, emphasizing the need for higher external visibility in Collective Targeted Actions (CTAs).

Derived from the analysis, tailored recommendations are presented for various CEI stages, addressing general CEIs, emerging and consolidated Energy Communities (ECs), and CTAs. Additionally, specific insights for policymakers are provided, offering a nuanced understanding of the factors shaping CEI emergence and consolidation.



Acronyms and abbreviations

CEI Collective Energy Initiatives

EC Energy Communities and Ecofarms

CTA Collective Targeted Actions

PM Political and Social Movements

TC Testing Conditions

RES Renewable Energy Source



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1. Introduction

The work reported in this deliverable was conducted in the context of Work Package 3 (WP3), which is central to the ENCLUDE project, as it establishes a structured pool of organised expressions of energy citizenship in Europe¹. This WP is divided into four tasks: T3.1 Case study pool and organisation of data collection; T3.2 Survey across all case studies; T3.3 Ground-truth potential emergence and consolidation factors; and T3.4 Assessment and analysis of examined factors and their trade-offs.

The aim of the WP3 data collection and analysis is to study energy citizenship from a group-centred perspective, to identify the most important processes and factors affecting the emergence and consolidation of energy citizenship groups. Furthermore, the pool, along with the case studies survey and stakeholder interviews, serve as a study source and reference framework for the comprehensive analyses throughout the entire project.

The collaborative efforts invested in these tasks are captured in this deliverable. Expanding on the Collective Energy Initiatives (CEIs) typology and survey results proposed in our first report (Deliverable 3.1: “Report on survey and structured interview results for identifying potential emergence and consolidation”), the first section ([Deep Dive](#)) of this report unveils the outcomes of an in-depth analysis of selected case studies through interviews with various stakeholders. In the second part, we cross-compared data collected in the interviews that took place in the context of Task 3.3 (“Ground-truth potential emergence and consolidation factors”) with the survey data collected in Task 3.2 and concluded with an examination of the factors influencing the emergence and consolidation of energy citizenship ([Integrated Insights](#)). The final section of the report synthesizes our ultimate conclusions and presents a set of recommendations.

Finally, this report is divided into seven sections as outlined below:

- 1 – Introduction, presents a short overview, describing the aims and objectives and outlines the structure of the document.
- 2 – Scientific Framework, defines the research question and presents the scientific frameworks chosen for the delivery of the study.
- 3 – Methodology, outlines both the research strategy and subsequent research methodology that has been designed for this WP.
- 4 – Deep Dive of Selected Case Studies, provides detailed analysis of the data collected through the interviews with various stakeholders from the selected case studies.
- 5 – Cross-Comparison of the Interviews and Survey Results, provides detailed analysis of the data collected through different means from the case studies stakeholders,
- 6 – Factors Influencing Emergence and Consolidation of Collective Energy Initiatives, provides detailed analysis of the factor which influence various types of collective expressions of Energy Citizenship,
- 7 – Outlook and Recommendations, summarizes the key findings of the report and proposes actionable recommendations, strategically positioning them in relation to ongoing work and the overarching goals of the ENCLUDE project.

¹ Separate and comprehensive analyses of case studies from Africa and Canada will be conducted, resembling the methodology applied in this report but tailored to the unique contexts of these regions. This dedicated examination, while following a similar structure, will be presented in a distinct publication to ensure a thorough exploration of the diverse energy citizenship landscapes in these specific geographical settings.



2. Scientific Framework

2.1 Research question

To address the WP3 research question -

“What factors, together and separately, contribute to the emergence and consolidation of energy citizenship, from a group-centred sociological perspective?”

- one can learn from the needs and attitudes of real-world cases where citizens are already involved in diverse types of energy initiatives and actions². To better understand this emergence and consolidation, we aim to identify a broad variety of factors within and beyond the communities that have the potential to influence if people are willing to join forces and stay together to tackle climate-related issues. To select the most relevant factors, we build on existing research and use two frameworks to explain energy related behaviour and group processes in energy initiatives, namely the Energy Cultures Framework and the Socio-Ecological Systems Framework for Integrated Community Energy Systems.

2.2 Framework description

The Energy Cultures Framework is particularly influenced by systems theory, structuration, and practice theory. It was originally developed by Stephenson et al. (2010)³. The aim is to understand the drivers of energy-related behaviour, and to help direct attention to the parts of the system that may benefit from change to influence energy behaviour in a desired way. This framework is founded on the concept of ‘culture’, in the sense of a relatively distinctive and integrated system of knowledge, belief and behaviour that both creates and is reinforced by its material objects. The main idea thereby is that in the context of energy use distinctive clusters of knowledge, belief, behaviour and material objects exist and all these elements influence each other. More concretely, the Energy Cultures Framework suggests that citizen energy behaviour can be understood at its most fundamental level by examining the interactions between cognitive norms (e.g., beliefs, understanding), material culture (e.g., technologies, building form) and energy practices (activities).

The Energy Cultures Framework thus assumes that a specific observable energy behaviour is connected to certain clusters of similarly interacting norms, material cultures and/or practices. Transmitting this idea to the scientific problem of ENCLUDE, we hypothesise that the establishment of a collective energy citizenship initiative and its consolidation depend on aspects of cognitive norms, material cultures and energy practices.

One shortcoming of the Energy Cultures Framework, if it is used for the purpose of investigating and explaining collective initiatives, is that it focuses strongly on the individual, and that it gives little information on how the three aspects of cognitive norms, material culture and energy practices are tied together. Therefore, we will bridge these gaps by including a second layer of analysis to the individual level of variables proposed by the Energy Cultures Framework, namely by adding the Socio-Ecological Systems Framework for Integrated Community Energy Systems (SES-ICES), as proposed by Acosta and colleagues (2018)⁴.

² Actions are understood as smaller units of a larger activity or initiative.

³ Stephenson J. (2010), Energy cultures: A framework for understanding energy behaviours, *Energy Policy*, Volume 38(10); 6120-6129, <https://doi.org/10.1016/j.enpol.2010.05.069>

⁴ Acosta, C., Ortega, M., Bunsen, T., Koirala B.P. & Ghorbani, A. (2018). Facilitating Energy Transition through Energy Commons: An Application of Socio-Ecological Systems Framework for Integrated Community Energy Systems, *Sustainability*, 10(2): 366. <https://doi.org/10.3390/su10020366>



The SES-ICES framework was originally designed to provide a systematic way to analyse the degree of organization among the users of a common-pool resource and to manage the resource efficiently for a long-lasting benefit. It focuses on the dynamics within a group of people that are bound together by a common goal and managing common goods. We believe that this framework can also be expanded to analyse the degree of organisation towards various kinds of CEIs (not necessarily with the aim of commonly managing goods).

Acosta's SES-ICES consists of two main elements. The first element includes social, economic, and political settings, which consider the broader framework in which a CEI is embedded (economic development, political stability, market situation, etc.). Economic and political settings will especially influence the material (energy) conditions an individual will face (the material culture), and social and political settings will influence the development of individual opinions, values and prejudices (the cognitive norms), and vice versa.

The second element of the SES-ICES comprises the so-called Action Situations, which focus on the interaction between actors in a given system (communication, conflicts, decision making, etc.). These aspects will influence concrete energy behaviour and are linked to the cognitive norms (shaped in the exchange with others and according to results of concrete behaviour) and material culture (collaborating with others changes material options and willingness to use them of an individual). This leads to the general framework depicted in Figure 1 below.

The framework will be used to inform the research instruments as described in the next chapter.

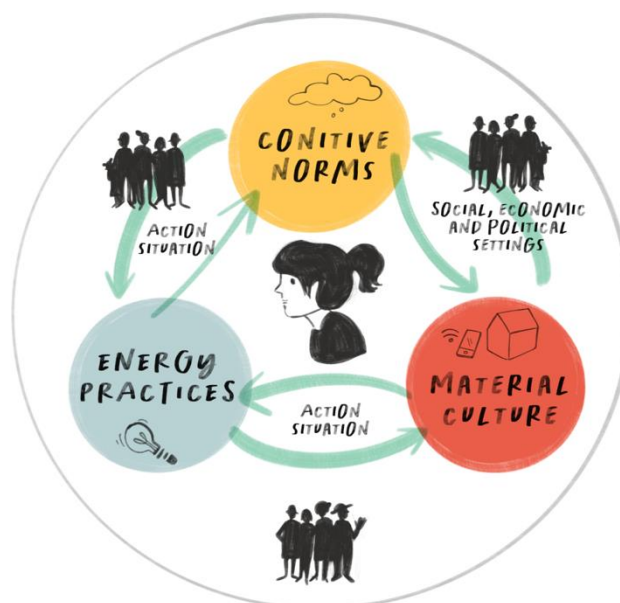


Figure 1. The WP3 theoretical framework. The Energy Cultures Framework is depicted in yellow (Cognitive norms), red (Material culture), blue (Energy practices). The links established through the Socio-Ecological Systems Framework for Integrated Community Energy Systems are drawn with green arrows.



3. Methodology

3.1 General methodology

To better understand the emergence and consolidation of collective citizen initiatives, we applied a three-stage process. In the first stage, we identified relevant cases in Europe (see 3.2.1 section), and collected information that more specifically characterised these cases as collectives to a) get an overview about the character of the respective cases and b) identify remarkable patterns and specifics of different types of cases.

The second stage of the process aimed to capture the individual perspective of the members⁵ or participants⁶ of the initiatives to better understand a) the characteristics that define these members and participants, which might be especially relevant for the emergence of new initiatives and the identification of potential target groups for consolidated initiatives and b) their views on their initiative to derive pertinent information about how to improve initiatives. To do so, we collected the members' views via an online survey, and the results were discussed in the first WP3 report⁷.

In the third stage, we identified special topics that we considered, based on the information we gathered in the first two stages, as especially relevant and/or worth further investigating and deepening the understanding by conducting interviews with representatives and people with special knowledge from selected cases as well as from external experts that we considered to their expertise regarding the identified topics. The results of this deep dive are presented in Section 4 of this deliverable.

In the fourth stage, we cross-examined all the information gathered during the desktop research in the initial phase of our work, the survey conducted with the case studies' members and participants, and interviews conducted with various stakeholders, including initiative representatives and employees, as well as members and participants, and local political representatives. This approach allowed us to gather a wide range of opinions, which is presented in Section 5.

Finally, we analysed the factors encountered in the previous parts of the study that were relevant for both the emergence and consolidation of Collective Energy Initiatives (CEIs), which represent the collective expressions of Energy Citizenship. These findings enabled us to formulate a set of recommendations presented in section 7 of this report.

3.2 Methodological approaches: case study pool, survey and conceptual definitions

WP3 aims to gain a deeper understanding of the emergence and consolidation of collective citizen initiatives. This section outlines the methodology used in the initial study stages and introduces the developed concept definitions.

⁵ Members were defined in the previous WP3 report as “involved at least partially in the decision-making of the group (e.g., by voting in the General Assembly)”.

⁶ Participants were defined in the previous WP3 report as “not involved in the decision-making process (only exerting power by threatening to abandon the initiative)”.

⁷ Brenner-Fliesser et al, (2022), D3.1 – Report on survey and structured interview results for identifying potential emergence and consolidation factors https://encludeproject.eu/sites/default/files/2024-01/D3.1_Report_on_survey_and_structured_interview_results_final_14_06_2023.pdf



3.2.1 Methodological framework for building and analysing the case study pool

In Task 3.1 of this WP, we compiled information from 78 case studies across Europe (68), Africa (4), and North America (6)⁸. This task collected initial characteristic features of these initiatives along with associated conditions. Identification of potential cases was guided by either personal expert knowledge of the members of the consortium or desktop research. The target was to collect case studies as diverse as possible in terms of a) geographic location, b) organisational form, c) size, d) used technologies e) aim f) impact etc. To capture this diversity, we distinguished between four types of CEIs: (I) Energy Communities and Ecofarms, (II) Collective Targeted Actions, (III) Political and Social Movements and (IV) Testing Conditions. These concepts are explained in detail in the next subsection of the report (Subsection 3.2.2).

In terms of the methodology, the case study pool task originally consisted mainly of content analysis via desktop research, executed by the WP3 leaders and contributors (Phase 1 – case studies screening). The analysed material included, for example, the homepages of the cases, case documents (statutes, etc.) and other relevant documents (such as deliverables, if the case is part of a scientific project). As the information gathered through these documents was proven not to be sufficient to launch a comprehensive analysis of the cases, we gathered additional information through semi-structured interviews with case study representatives in a second phase (Phase 2 – case studies – additional information gathering).

In this task, the following information was collected for these cases, if available:

Phase 1 – case studies screening.

- General description of the case study,
- Start and end date (if applicable),
- Size of the group (number of participants),
- Geographical location,
- Demographics (if such information was gathered at the case study level),
- Communication channels within the case,
- Decision making structure,
- Main activity of the case and primary energy source (when relevant),
- Used technologies,
- Goal of the case,
- Existence of a plan,
- Planned and achieved impacts,
- How much money was invested in the project by local/ national/ supra national bodies,
- Relevant documentation.

Phase 2 – case studies – additional information gathering.

In the second phase of the data collection exercise, the WP3 research team revised some of the factors and identified additional ones to be evaluated by each case study at group level. The new set of factors derives from the theoretical considerations and is relevant for the whole case study:

- Energy poverty consideration,
- Social network structure,

⁸ Separate and comprehensive analyses of case studies from Africa and Canada will be conducted, resembling the methodology applied in this report but tailored to the unique contexts of these regions. This dedicated examination, while following a similar structure, will be presented in a distinct publication to ensure a thorough exploration of the diverse energy citizenship landscapes in these specific geographical settings.



- Occurring conflicts,
- Information sharing structure (internal and external),
- Liaisons with other networks,
- Organisation and decision-making structure,
- Monitoring and evaluation activities,
- Lobbying activities,
- Influencing event,
- Planned and achieved impact,
- Resources spent on the development of the case.

3.2.2 Methodological framework of the questionnaire

The objective of Task 3.2 was not solely to enhance comprehension of the factors linked to the emergence and consolidation of energy initiatives, but also to collect insights into the barriers and facilitators of energy actions. This included examining the perspectives of individuals and delving into the personal backgrounds of citizens involved in collective energy actions. Drawing back on the theoretical foundation of the Energy Cultures Framework and the Socio-Ecological Systems Framework for Integrated Community Energy Systems, we identified the following aspects as relevant for the questionnaire:

- Personal background/demographics of participants: These questions helped us to better understand if people in different forms of initiatives differ in their personal background (e.g., education, income, etc.).
- Cognitive norms and material culture, more concretely: Perception of climate change in general and certain (non-)sustainable energy solutions specifically, own perceived collectivism, individualism, competitiveness, collegueship, and carefulness.
- Energy practices: Climate-related behaviour patterns that changed after joining an initiative.
- Reasons for joining the initiative: This allowed to understand better the motives of people for joining an initiative.
- Satisfaction with communication and knowledge provision within the initiative: Building on the SES-ICES framework, we wanted to understand better the role communication and knowledge acquisition aspects play for the consolidation of initiatives.
- Trust in initiative's members and attachment to initiative: These questions were used to investigate on the emotional bonding of the members to the initiative.
- Barriers for initiative as seen by members: With this question, we aimed to better understand the barriers different types of initiatives are facing from the point of view of the members of this initiative.

For these topics, standardized survey instruments were chosen wherever possible. The resulting questionnaire was translated by a professional translation company into all European languages with cases of more than 30 members in our case study pool. In total the questionnaire was provided in 11 languages: Danish, Dutch, English, Estonian, French German, Greek, Macedonian, Portuguese, Spanish, and Slovenian. The translations then were checked back with native speakers from the consortium wherever possible and adapted if needed.

An online questionnaire was then created with the open source software “Limesurvey”, allowing free choice of the language among the covered ones. The graphic design was optimized and adapted to the ENCLUDE corporate identity. Individualized survey links for every case were created (allowing the identification of the case in the analysis) and distributed to previously identified case representatives asking them to further distribute the questionnaire among the members, participants or customers of the respective case. Questionnaire collection



started in July 2022. We sent reminder mails every three weeks, informing the case representatives about response rate of their initiative and asking for further distribution. On October 31st 2022 we closed the questionnaire.

The comprehensive findings from the questionnaire were outlined in the initial report (Deliverable 3.1: “Report on survey and structured interview results for identifying potential emergence and consolidation”). Section 5 of this report will cross-examine the key results from the survey with those obtained from the interviews (Task 3.3).

With this information, WP3 compiled an **anonymised case studies pool** accessible by all project partners on the data sharing platform Basecamp, which is used for exchange within the project team.

Further, the WP3 team completed an analysis of the (68) European case studies of the case studies pool. The analysis strategy used the method of Grounded Theory as originally developed by Glaser and Strauss (1967)⁹ and saturation considerations suggested by Aldiabat & Le Navenec, (2018)¹⁰. Relevant topics deriving from the interview answers and desktop research were identified by firstly analysing the cases as a whole and then looking into specific answers to the interview questions (inductive and deductive approach). Specific expressions of a certain topic in a certain case were assessed qualitatively using assignment rules. This allowed the comparison of different cases according to various aspects (type of collective action, structure, etc.). The main results of the first analysis were published in the Deliverable D3.1 – Report on survey and structured interview results for identifying potential emergence and consolidation factors. Furthermore, to make scientific results publicly available, we created two graphic representations ready for download from the project website: “[This may surprise you - Things we have learnt from talking about energy with 68 initiatives](#)” and “[Citizens at the heart of the energy transition – Uncovering motivations and barriers for Collective Energy Initiatives](#)”.

3.2.3 Conceptual definitions: various types of Collective Energy Initiatives

Based on the most relevant collective and individual factors influencing energy related behaviour and group processes in energy initiatives, as depicted in both the Energy Cultures Framework and the Socio-Ecological Systems Framework for Integrated Community Energy Systems (such as organisational form, size, and used technologies), we distinguished four main types of the Collective Energy Initiatives (CEIs):

1. **Energy Communities and Eco-farms (ECs):** Expanding the EU-definition of energy communities, we consider a case as this type if all the following conditions apply:
 - i. its main activity involves the production, storage, distribution or optimisation of sustainable energy, including sustainable farming practices that reduce energy and water needs,
 - ii. the ownership of assets is rather equally shared between members of the case,
 - iii. community aspects are central to the case, such as clear rules for decision making and choosing of leadership, clearly defined roles, and democratic participation,
 - iv. financial gains are secondary.

2. **Collective Targeted Actions (CTAs):** We consider a case as this type if:
 - i. its main activity is related to the implementation of solutions for the production, storage, distribution or optimisation of energy, including energy efficiency solutions, renovation, as well as trainings and demonstrations aiming to create awareness on energy issues, but

⁹ Glaser, B., & Strauss, A. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Mill Valley, CA: Sociology Press.

¹⁰ Aldiabat, K.M. & Le Navenec C.-L. (2018). Data Saturation: The Mysterious Step In Grounded Theory Method. *The Qualitative Report*, 23(1): 245-261. <https://doi.org/10.46743/2160-3715/2018.2994>



- ii. participants have very limited contribution to the decision making / participation is not primarily based on the principles of community, and
- iii. financial aspects could potentially play an important role.

3. **Political and Social Movements (PMs):** We consider a case as this type if:

- i. its main aim is to influence policy makers towards certain goals connected to energy production, distribution, storage, or optimisation; and
- ii. no technical projects are implemented.

4. **Testing Conditions (TCs):** We consider a case as this type, if:

- i. new technical or socio-technical solutions are applied for testing, and citizens' participation is very limited. Examples are pilot projects testing innovative solutions in the frame of national or European projects.

The abovementioned typology guided our comparative analysis featured in this report.

While all four types were analysed and compared during the first two stages, we shifted our focus to ECs and CTAs from stage three, recognizing their distinct characteristics and the need for a more in-depth examination. Political movements, with their unique status, structure, and modus operandi, present a challenge for direct comparison with ECs and CTAs. Furthermore, Testing Conditions, lacking participants or with their roles significantly limited, also pose difficulties for meaningful comparisons.

3.3 Methodology of the deep dive of selected case studies

During Task 3.3, between 3 to 8 interviews were conducted per case study in a total of 13 cases, with the aim of gaining a more profound understanding of topics identified as particularly relevant and interesting in Tasks 3.1 and 3.2. The choice of cases was based on the interest of cases for an in-depth exploration of the identified topic(s) as well as their participation in the Task 3.2 questionnaire (the selection process is described in more detail in the subsection below). To ensure comparability of results, all identified cases covered all eight topics described below.

3.3.1 Field data collection and topics for the deep dive interviews

Field data collection in the 3.3 Deep Dive phase was managed by WP3 team and supported by the WP3 contributors through a structured process. Once a case study's participation was confirmed, the WP contributor was tasked with identifying stakeholders for interviews, ensuring representation from various perspectives such as the case study representative, specialists in legal or technical fields, and representatives of local authorities. The contributor was also responsible for conducting desktop research on the case study. The task methodology was collaboratively developed and discussed with our WP3 contributors during two workshops held on March 8 and 31 March 2023. Following these meetings, all workshop materials were made available to our 3.3 partners on Basecamp. The WP3 team provided a short summary of the 3.2 survey results for each case study in PDF format.

During the preparation and execution, which took place between spring and fall 2023, the WP3 contributor referred to a "List of preselected topics and interview guide" provided by the WP3 team (Annex 1). Emphasis was placed on prioritizing the most relevant topical areas while addressing proposed guiding questions for all topics, ensuring comparability across case studies. Selected areas of interest for the interview discussions were:

- **Energy poverty:** Besides greenhouse gas emissions, energy poverty is among the top issues where great expectations rest on the future role of CEIs. However, if a CEI is socially exclusive (e.g. due to upfront investments that need to be made to join the



initiative), its potential for tackling energy poverty could be small. Insights regarding this kind of dynamics provides a better understanding about the role of the respective CEI in relation to energy poverty.

- **Energy prices and factors influencing energy prices:** Energy prices play a role not only for households concerned by (energy) poverty but may influence behaviour and decision making of nearly all individuals. In our prior analysis¹¹, we observed that energy prices have significantly contributed to the establishment of CEIs in certain regions.
- **Planned and achieved impacts:** The presence or lack of common goals can be a decisive factor for planning within a CEI as well as for cohesion and collective efficacy. A more profound comprehension of the role of impact-related objectives could offer valuable insights into the emergence, consolidation, and upscaling of CEIs. In our previous analysis, we discovered a significant variation in the extent to which initiatives explicitly formulate concrete impacts and measure progress toward achieving them. While some initiatives lack specific impact formulations entirely, others have highly detailed plans. We are intrigued by how this variability influences the development of initiatives.
- **Regulation:** Regulatory framework conditions are usually outcomes of complex balancing and decision making. Consequently, some regulatory conditions may reflect unintended consequences and unnecessarily complicate the activities of CEIs. From the previous conducted research, we know that regulatory barriers are indeed seen as one of the main aspects that hamper CEI's development. Thus, better knowledge about regulatory barriers might support future policy and regulation related decision-making.
- **Funding/subsidies/business models:** In general, CEIs are expected to evolve to a state where they can sustain their activities independently, without relying on continued funding or subsidies. To achieve this, they require a viable *business model* that ensures ongoing operations. Shedding light on this dimension allows us to better understand if and how CEIs think about their long-term financial model and if they see a way to evolve to the state where they can be sustained independently. In our previous analysis we discovered that financing was consistently cited as the most frequently mentioned and crucial aspect concerning improvement potential and the consolidation of an initiative.
- **Community Culture:** The community culture plays a pivotal role in shaping the experience and satisfaction of members within a CEI. Developing a deeper understanding of this aspect is crucial for contextualizing the barriers and challenges faced by the CEI. Based on our previous research, we have found that the communication dynamics, decision-making processes, and the overall sense of community are significant motivators for individuals to join and remain members of an initiative. We want to better understand, how different aspects of communication and decision-making contribute to the emergence- and especially consolidation- of CEIs.
- **Technical Aspects** (use of specific technologies): The technologies chosen by the CEI strongly reflect the material culture aspect of the applied Energy Cultures Framework. Creating a more detailed insight into this dimension allows us to link the CEIs technology related decisions and considerations with all other context conditions and driving or hindering factors, and to generate a holistic picture of the CEI and its energy culture. Building on our previous research, we observed a prevalent choice of Photovoltaic applications as a primary technical feature in numerous initiatives. This prompts us to

¹¹ Brenner-Fliesser et al. (2022). D3.1 – Report on survey and structured interview results for identifying potential emergence and consolidation factors. Downloaded under: https://encludeproject.eu/sites/default/files/2024-01/D3.1_Report_on_survey_and_structured_interview_results_final_14_06_2023.pdf



explore the aspects that render this application particularly appealing to energy initiatives and potentially well-suited for their emergence and consolidation.

- **Barriers faced by the communities:** These questions give the research team the opportunity to revisit barriers/issues previously discussed and delve into new relevant barriers that may not have been mentioned during the first phases of the project. In our prior research, in addition to bureaucratic and financial barriers, a range of other obstacles were identified that could impede the progress and, consequently, the consolidation of energy initiatives.

Additionally, any contributor-suggested topics, like gender diversity, were incorporated at the end of the interview. The interviews involved obtaining consent from interviewees through a provided form, with all interviews transcribed, anonymized, and integrated into the final case study write-up.

The entire case study delivery covered a minimum of three interviews with stakeholders per case study, transcripts and anonymization of these interviews, desktop research, and survey analysis. The final case study, along with anonymized interview transcripts, was sent to the WP3 team in a 10-15 pages Word Document.

3.3.2 Case selection

Thirteen cases were chosen based on previous analysis, specifically for their uniqueness in at least one of the mentioned topics, as further elaborated below. In cases where multiple instances were equally suitable for a particular topic, we gave preference to those with which we established stronger connections during the initial (Tasks 3.1 and 3.2) phase. This decision was based on the belief that these cases are more likely to collaborate with the research team within the task 3.3.

Topic	Cases	Relevance
Energy poverty	EC1	100% of questionnaire respondents declared that they never or only rarely have problems paying bills
	EC2	100% questionnaire respondents declared that they never or only rarely have problems paying bills
Energy prices and related issues	CTA1	The choice of this case was driven by the high renovation costs of apartment buildings for private owners after the privatization of the apartment sector
Planned and achieved impacts	EC3	The community did not have any specific plan to achieve a certain impact (task 3.1)
	CTA1	The case had a rather general impact planned at the beginning, achieved a lot more currently
	CTA2 and CTA3	In both cases, there were clearly defined objectives, and the attainment of these goals was intricately tied to external factors
Funding/subsidies/business models	EC4	100% questionnaire respondents declared that funding of the activity was not a barrier
	EC2	100% questionnaire respondents declared that funding of the activity was not a barrier
	EC3	80% questionnaire respondents indicated using private funding



	EC9	73% questionnaire respondents indicated that access to funding was a barrier
Social, economic, political settings	Cover different regions	Social, economic and political settings are to a high degree influenced by national regulations, so a variety of cases from different countries was most promising
Communication	EC8	This EC has a different mode of communication between the members than the usual channels used by most ECs.
	EC1	Despite high communication intensity 80% of members see improvement potential
	CTA2 and CTA3	Lack of appropriate communication with citizens
Barriers in general	EC9	The questionnaire respondents indicated over 2 barriers on average
	EC7	None of the barriers mentioned within the questionnaire are seen as challenging
Technical Aspects	EC2	Uses diverse technologies
	EC3	Uses diverse technologies
	EC5	Only PV nothing else
	EC6	Despite trying to become climate neutral they only use PV
	EC1	Various technologies used

Following the rationale mentioned above, we selected twelve¹² cases of which nine are ECs, three are CTAs, covering all broader regions of Europe (Estonia, Romania, Ireland, Germany, Greece, Slovenia, North Macedonia, the Netherlands, Portugal).

¹² The thirteenth case, categorized as a PM, was excluded from analysis in this deliverable to maintain comparability.



4. Deep Dive of Selected Case Studies

4.1 Energy poverty

It is worth noting that, to date, there is no EU-wide accepted definition of energy poverty and identifying and assisting individuals facing energy poverty present significant challenges. According to the European Commission, energy poverty occurs "when a household must reduce its energy consumption to a degree that negatively impacts the inhabitants' health and well-being. This challenge is primarily rooted in three underlying causes: a high proportion of household expenditure spent on energy, low income, and low energy performance of buildings and appliances"¹³.

Beyond concerns about greenhouse gas emissions, addressing energy poverty stands out as a crucial area with high expectations for the future impact of CEIs, and more specifically, for the energy communities. While some researchers argue that considerable attention has been directed towards exploring the potential of energy communities as an effective approach to address energy poverty¹⁴, we have observed significant limitations of this approach when various CEIs become socially exclusive, often due to upfront or regular investment requirements. In such cases, the CEI's capacity to effectively tackle energy poverty appears constrained, despite implementing various initiatives for this purpose. This section of the report will present insights into the role that CEIs, according to case representatives and experts could play in relation to energy poverty by examining these dynamics in the selected case studies.

4.1.1 Energy Communities

Establishing an Energy Community (EC) can be referred to as an "expensive sport" as highlighted by one of our interviewees (a non-founding member of an EC). This phrase describes well the financial and constant commitment required from the members of the ECs. Usually, ECs start with an initial financial investment from each member, for example to pay for the construction of the power plant. As shared by the interviewees, these initial costs of launching a community may vary from €40 to €100.000 (it should be noted that the smallest amount of €40 was the investment for the testing phase and further money was invested for scaling up the plant), depending on the number of the members that are joining the EC and on the availability of a subsidy in a Member State. ECs that have their plants set up earlier in the process ask their members to pay an annual fee. These participation costs are a clear barrier for households with low or unsteady income and without a possibility of gathering funds.

A study for the Netherlands states that 48% of Dutch households cannot participate in the energy transition lacking the possibility to upgrade their homes due to financial means or because they are not owning the property¹⁵. With these preconditions it is not surprising that all our EC cases report that their members have no concerns with energy poverty or unpaid energy bills. They are financially stable, most of the rural ECs members live in single-family homes and most of them have the possibility to heat their homes with wood.

¹³ European Commission, 2024, Energy poverty. Downloaded under: https://energy.ec.europa.eu/topics/markets-and-consumers/energy-consumer-rights/energy-poverty_en

¹⁴ Konstantopoulos, G, Konstantinos, K & Kanellou, E. (2023). Exploring the energy community actions to alleviate energy poverty in the Greek context, *Technical Annals*, 1(2). doi: 10.12681/ta.34183.

¹⁵ Mulder, P., Dalla Longa, F., & Straver, K. (2023). Energy poverty in the Netherlands at the national and local level: A multi-dimensional spatial analysis. *Energy Research & Social Science*, 96, 102892. <https://doi.org/10.1016/j.erss.2022.102892>



While considerations of energy poverty may not be the primary focus of the ECs, some are actively working to assist households facing energy challenges. One of our case studies, located in Greece, is raising funds from its members through a small surcharge on kilowatts. The objective is to give 25KW of free energy to vulnerable consumers. In 2018, Greece introduced Law N4513/2018, which specifically focuses on energy communities and extends virtual net metering to include them. Emphasizing the broader societal impact, the law provides that "Energy communities are supposed to reduce energy poverty"¹⁶ among their various objectives.

To identify energy poor households, the Greek EC has partnered with an intermediary organization specialising in supporting citizens in need of financial and social assistance. The EC emphasized the importance of involving these intermediary organizations to establish trust with the targeted households. The ultimate goal is to provide free energy for 25 years to 12-13 individuals. Additionally, the same EC is working to reduce the barrier for participating in new plant production projects by offering the option to pay the initial monetary instalment through multiple payments.

In case of the Dutch cases, the efforts to reach energy-poor households involved establishing contracts with housing associations and foundations. These agreements aimed to provide guidance on energy efficiency and to install devices to monitor energy consumption. However, a challenge arose when there was limited space for installing the PV panels, especially for individuals who did not own their residencies and lack the legal rights to renovate. To address this, one interviewee suggested that ECs could serve as a solution, functioning as a diverse mix of producers, prosumers, and consumers.

Another instance of tackling energy poverty within an EC was to actively engage tenants and people in rental properties through a partnership with an intermediary organization to collectively address energy and environmental issues. Meanwhile, a different approach was taken by an EC which adopts inclusivity by offering participation without the typical obligatory expenses and implications associated with installing solar panels on personal property. Residents without access to a suitable roof, such as in an apartment building, could still become members.

In general, the establishment of ECs appears to be more closely associated with the processes of the energy transition, including environmentalism, independence, and reliability (as elaborated in subsequent sections), rather than directly addressing energy poverty. However, some ECs recognize the financial barriers that energy-poor households face to participate in this transition. As a result, they have either already implemented support arrangements or have plans to do so. It has to be noted that those ECs trying to tackle energy poverty are either situated in Greece, where the legislation obliges them to support vulnerable consumers and poor households, or their leading vision is to be inclusive and supply all inhabitants with sustainable and affordable energy.

4.1.2 Collective Targeted Actions

We have noted that many Collective Targeted Actions (CTA) predominantly concentrate on identifying approaches to reduce energy-related expenses for their participants. While addressing energy poverty is not a common objective for the interviewed CTAs, some initiatives do incorporate it as a goal. For example, a specific CTA includes addressing energy poverty as one of the objectives within the training program. Nevertheless, in the broader context, energy poverty is not the primary motivation for establishing a CTA.

¹⁶ Energy Community Hub (2024). Greece. Downloaded under: <https://energycommunitieshub.com/country/greece/>



The high costs associated with the energy transition present a clear barrier, preventing financially vulnerable individuals from participating. In Romania, it is estimated that without government subsidies, it takes 6 to 8 years to recover the initial costs of PV installations, considering the PV cell lifespan of approximately 25 years. Even for wealthier households capable of installing PVs without financial aid, the investment remains uncertain due to the fluctuating price of electricity. This situation renders it nearly impossible for the households with lower financial resource to take part in such collective actions. Consequently, subsidy programs predominantly benefit well-off households with the financial means and knowledge to navigate the system.

Further, we have noted that, when dealing with energy poverty, individuals often lean towards individual solutions rather than collective actions. Many perceive it as a private responsibility rather than a shared concern, which influences the adoption of energy-efficient practices at an individual level.

At the local level, in many countries, subsidy schemes are in place, and governments have acted to regulate energy prices. However, it is noteworthy that CTAs, while operating in such contexts, may not offer additional financial support to those struggling with energy poverty.

4.2 Political, social and economic setting, special focus energy prices

Settings in which CEIs are embedded vary, and their development may be either supported or hindered by the broader context. Political settings thereby refer to government policies and support as well as to relevant laws and regulations (with those considered relevant discussed in their own chapter). Social settings refer to general acceptance and attitudes regarding topics related to CEIs. Economic settings refer to economic conditions and market dynamics that impact the development of communities. With the last sharp changes in energy costs, this topic seems to be especially relevant to understand how it contributes to the emergence and consolidation of CEIs and are widely considered as one of the main instruments to influence their development¹⁷.

However, comparing various schemes and their influence on consumer choices and CEIs proves to be difficult, since the tariffs are constructed differently in the EU Member States, leading also to strong differences in the prize structure: in the first half of 2023, the lowest household electricity price was observed in Bulgaria (11 €/kWh), while the highest was noted in the Netherlands (47.5 €/kWh)¹⁸. The electricity tariffs are mainly composed of distribution network costs, transmission network costs, system services costs, and non-network-related policy costs, such as taxes, levies, costs of support schemes, and in certain countries also other costs (e.g. maintenance of public lightning in Belgium, nuclear safety and territory compensation in Italy).

To push the development of CEIs (and especially ECs) some countries (like Austria, Belgium, Portugal and France) have adopted or are considering the introduction of local network/electricity tariffs or specific tariffs for self-consumption. These settings influence the development of CEIs in different countries, according to the interviewees, as presented in the sections below.

¹⁷ Peters et al. (2021). Economies of Energy Communities- Review of electricity tariffs and business models. https://energy.ec.europa.eu/system/files/2021-06/bridge_tf_energy_communities_report_2020-2021_0.pdf

¹⁸ Eurostat: Electricity price statistics
[Electricity price statistics - Statistics Explained \(europa.eu\)](https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&plugin=1)



4.2.1 Energy Communities

Members of ECs in Greece have observed that newcomers were concerned about the billing process and the unclear electricity price structure mentioned above. They perceived it as “opaque” and “undemocratic”, and they were not willing to be charged “arbitrarily”. Instead, they preferred “the autonomy of paying for and producing their own energy” (representative of an Greek EC). EC members from Greece sensed that the uncertainty of the energy market played a significant role in encouraging more people to get involved.

Many ECs we examined noted a substantial interest among consumers in self-production, particularly in rooftop photovoltaics and applications for collective self-consumption, aiming to reduce their energy costs. However, the significant challenge of grid saturation, as reported in Greece, has been a major limitation to the widespread adoption of this trend.

Apart from the usual annual price adjustments, the members of ECs did not significantly feel the impact of rising energy prices. In fact, those ECs that sell excess electricity experienced higher profits compared to typical years, thereby reducing members' costs even amid an energy crisis. The sole price-increasing effect resulting from the war in Ukraine for one EC was the installation of an intrusion detection system. Due to continuous attacks on their IT infrastructure since the start of the war, they now incur an annual cost of €6000 for IT security.

However, beyond economic considerations, the European energy crisis may have served as a catalyst for establishing an EC with the aim of achieving independence from the energy market and ensuring energy security. One interviewee emphasized this perspective, stating that: “It's one thing to have imported oil and gas from any dictatorship, not just Russia, and it's another thing to produce my own energy on my roof” (representative of an EC).

This ties into the reliability of power supply. A lot of EC members were primarily motivated by the assurance of having a reliable power supply. Their decision to invest money and time stemmed from local conditions and the instability of the grid, with the reduction of energy costs being a beneficial side effect. Furthermore, the foundation of another EC was driven solely by the need for an energy supply. This community appears confident that their hydropower plant will continue generating electricity even in the event of a blackout in Europe. The residents are well-prepared with food and wood, placing trust in their EC to provide energy, and this trust is reciprocated with loyalty.

In general, external factors such as the energy crisis and the associated fluctuations in energy prices appear to serve as catalysts for the emergence of ECs. These factors have played a significant role in enhancing the visibility of ECs and mainly contributed to the growth in membership size. The driving forces touch upon two crucial aspects for individual functioning in our society: the security of energy supply and one's ability to afford personal energy consumption.

4.2.2 Collective Targeted Actions

The establishment of CTAs is driven by various factors, with a prominent focus on reducing energy expenses and achieving energy self-sufficiency. These goals emerge as particularly popular motivations for initiating CTAs. Out of the three cases that were analyzed, two were initiated with the hope of decreasing the costs for public energy use within the area where the CTAs are located and improving the socio-economic status of these villages.

A strong interest among consumers in self-production, especially in applications for rooftop Photovoltaics, has been observed as well. In Romania, for instance, the Casa Verde subsidy scheme has supported numerous projects, financing 12,271 initiatives with a total budget of approximately 471,480,000 RON (approximately 94,300,000 EUR). This subsidy program,



which required a 10% beneficiary contribution, granted a maximum allowance of 20,000 RON (approximately 4,000 EUR).

In general, individuals show a willingness to adjust their energy-related behaviours, driven by the desire to reduce overall energy expenses. This behavioral adaptation is reflective of a broader trend among individuals seeking ways to minimize their energy costs.

In Romania, the interviews show that individual solutions are preferred over collective actions when it comes to coping with the energy prices. When the interviewees were asked how locals cope with the rising energy prices, it was stated that: “People tried this and that, some bought wood-burning stoves, others installed their old ones and heated them with wood, gas or even electricity, depending on how they managed it or turned down the heat a little.”

Meanwhile in Estonia, we encounter a case that illustrates how CTAs can assist a community in their quest for increased energy efficiency and savings collectively. In this particular case, educational training is provided to apartment associations, focusing on multi-apartment renovations. Beyond the gains linked to the renovation process, these training sessions serve as a platform for communities to gain insights into collaborative action towards a shared goal. The initiative helps to foster a collective understanding of how communities can address their needs more effectively by working together rather than pursuing individual solutions.

4.3 Funding, subsidies and business models

In recent years, a noticeable shift has occurred in energy business models, moving away from traditional approaches that only partly integrated decentralized renewables through mechanisms like feed-in-tariffs or net metering. This shift has given rise to new potential business models where decentralized actors actively participate in the energy market¹⁹. Authors categorize various business model archetypes for energy communities and other types of initiatives, including energy cooperatives, community prosumerism, local energy markets, community collective generation, third-party-sponsored communities, and community flexibility aggregation.

Regarding the funding options, CEIs, especially Renewable Energy Source (RES) projects, have the flexibility to secure financing from diverse sources in both *private* and *public* sectors.

- *Private financing* poses challenges due to the unconventional nature of ECs, which are typically small, risky, and maintain democratic governance and ownership models and non-profit orientation. This uniqueness makes them less attractive to traditional financial institutions²⁰. Nevertheless, ECs looking to secure private financing have various options, including share offers and self-financing, leasing, bank loans, ethical loans, and crowdfunding, among others.
- Various types of *public financing* are available for CEIs. Regional funding, including Cohesion funds, Recovery and Resilience Facility, Just Transition Mechanism, and Modernization Fund, amongst other, provides crucial support. Additionally, national support schemes, encompassing subsidies and support mechanisms, play a vital role, especially in the start-up phase.
- *Policy and market-based mechanisms* such as feed-in-tariffs (FITs)²¹, have been instrumental, but their phasing out in several Member States poses challenges for

¹⁹ Tuerk et al. (2023). D3.3 Final report on Business Models, contractual conditions and recommendation. Downloaded under <https://decide4energy.eu/resource?uid=1374>

²⁰ Ibidem

²¹ Guaranteeing a fixed, premium price for the electricity produced by the renewable energy system



smaller-scale CEI development. Other emerging mechanisms like auctions and tenders, though designed to finance RES projects, often favour larger developers, creating barriers for CEIs²².

This section of the report will delve into various funding options, subsidies, and business models for CEIs, providing relevant examples from the case studies.

4.3.1 Energy Communities

The studied EC cases have very distinct business models and offer different services for their members, ranging from a simple solar power plant on the roof of a housing complex to a full-service energy provider. First, we will provide some examples to show the diversity in how the business models of the ECs are structured. Second, we will also find common features and challenges concerning the financing and maintenance of ECs.

- *EC with a long history and multiple services*: The development and diversification of their business is a continuous process that started 100 years ago. They have reached a steady state in terms of finances, employees, clients and members. Growth in terms of their core business (power generation, distribution and grid operation) beyond their region is not envisaged. Their role as grid operator gives them constant financial security and the revenues from energy production varies depending on the energy market. Last year, they had a surplus of approx. €1 million which is higher than usual, because they are selling the excess produced electricity to the energy market and the energy prices were higher in 2022. The members of the EC are the associates of the cooperative, who receive a yearly rate of return of 5% of their primary deposit, which was €500 and therefore they receive €25 every year. They do not know the economic value of the cooperative, but they guess that one share is worth €25.000 – 30.000, however the shares cannot be sold. No matter how high the surplus is, they do not receive personally any additional bonus. A proportion of the profit gained yearly is converted to a bonus per associate, but they have to invest it within the cooperative. Therefore, they do not have a capital drain and can save for economically difficult times but also for the opening of new business activities, such as the installation of wall boxes and public charging stations for electrical vehicles (see section Planned and achieved impacts).
- *Self-financed EC*: The EC is completely self-financed via private investments (equal payments per member) for building up a PV park, as this is considered simpler by the members than applying for subsidies. Furthermore, the legal framework does not allow ECs to get bank loans. Also, in Greece, where the EC is located, subsidies- at the time of the interviews (- were only given for power plants with storage capacities. They have a business plan to see when their collective PV station will amortise and how they manage the operating and maintenance costs, but it is low in complexity compared to a for-profit project.
- *A simple cost reduction model*: At the time the idea was born (around 2016/2017) to use renewables for energy production, the first goal was to reduce the maintenance costs for the common areas of the housing complex (125 flats). The condominium spends approximately €75.000 per year to pay a company for a general maintenance and surveillance, another contractor for the elevators and for all the electricity needed for elevators, lightning and ventilation. The initiator of the EC concluded that the reduction of electricity costs for the common areas is “the only screw that they could turn”. The first small investment of €5.000 was approved in the condominium assembly in 2016 or 2017. Until the time of the interview, the EC was able to reduce their energy costs by 25-33%. Since they started, the EC invested around €25.000 for their solar

²² Arnould J. & Quiroz, D. (2022). Energy Communities in the EU. Downloaded under <https://friendsoftheearth.eu/wp-content/uploads/2022/09/Energy-Communities-in-the-EU-opportunities-and-barriers-to-financing.pdf>



plant. Their next investment will be around €60.000 with the expectation that 70-75% of the costs will be reimbursed from a national environmental fund. This is seen as a great opportunity to install batteries for storage.

While not all initiatives have received subsidies or external funding, most of them have received initial funding during their formative stages, e.g. (a) three ECs received money from regional authorities during their initial stages and (b) one governmental support type was a 15-year exemption from energy tax on solar or wind energy if collectively generated (members of the EC reclaim their tax benefits according to their consumption through their energy supplier) and this played a significant role in the implementation of the EC's solar roof project and by now earnings from the solar roof are considered profit. Two ECs were granted subsidies for dedicated project activities, e.g. (a) installation of charging stations (funds from the federate state and the state), (b) being a partner in research projects (funded by the EU) to cover staff costs for the project activities. Also, the establishment of one EC has been financed through a European-wide project (about € 500.000 from Horizon 2020), but it has to be noted that this community consists of only 8 households and each of them had additionally a relatively high private investment sum of €100.000.

What has been reported as a general problem is that ECs often compete for resources with other community projects and activities.

In those countries, where interviewed stakeholders reported that to their knowledge and during the time of the foundation of their EC, there were no funds targeting ECs per se (Slovenia, Greece and North Macedonia), but there were national payments to reduce the costs for installing PVs (Slovenia) or ECs were able to receive funding if they were also installing storage (Greece) or they received funds from a national NGO and from a foreign Embassy (North Macedonia). The interviewed ECs in Slovenia and Greece did not use this opportunity, because either it was too complicated, or they had a more profiting solution. The EC in North Macedonia received the money for reconstructing a school and for strategic development of the local community. Along the reconstruction they installed PVs on the roof.

All interviewed ECs had to collect money from private investments (ranging from €40 - €100.000) for the kick-off of their EC. Additionally, most of the ECs were supported from public sources, but only one EC reported that this was crucial for their establishment and one EC was even created within a European-wide project. Along their lifetime some ECs applied for public subsidies (federate state, national and EU level) for specific matters (technical applications used, projects conducted). ECs with a wider impact (e.g. building up additional services for a wider community) and therefore with dramatically higher costs, also received loans from banks and grants for their additional activities (e.g. education, renovation of public buildings). And to cover operating and maintenance costs, some of the ECs have annual membership fees.

The second determining factor are human resources and their skill set. For this report we cannot claim to put a monetary value of the work performed by those invested persons, but we can claim that this (unpaid) resource is the essential driving force for an EC under construction (for deeper understanding see section [Community Culture](#)). Finally, no matter how small the EC is (in terms of membership size or of power generation capacity), most of them want to grow (in terms of their core business), keep developing further the founding ideas or diversify their portfolio (see also section Planned and achieved impact).

4.3.2 Collective Targeted Actions

CTAs use diverse funding approaches for their projects, primarily relying on public funding, a significant portion of which is sourced from the EU funds. Initial funding for most cases was secured at the kick start of their projects, and in some instances, the projects themselves were



fundamentally shaped by the financial support they received. For instance, in the case of a Romanian CTA, funding for the project—creating a municipality-led photovoltaic park—was obtained through POSCCE (Sectoral Operational Program for Economic Competitiveness) to enhance the socio-economic status of the area. It's noteworthy that in certain cases, the initially proposed projects had to be adjusted to align with specific financing conditions, underscoring the impact of funding on shaping and refining project goals. From interviews conducted with people in Romania, we find: "Initially it was a project written for 3 MW capacity, later, in order to be able to fit into the financing conditions set for local public authorities, we modified the project and went down to 0.6 MW, the condition of financing being a balance between the level of production, the quantity of produced photovoltaic energy, respectively the quantity consumed for public purposes, by local public authorities."

- and -

"There were already 100-110 W panels on the market, and the 75 W panels were already going out of production, because the technology was already moving at a fast pace. We tried to get the funder to change the technical solution and replace the original 75 W panels with 110 W panels, but we were not allowed to do that because we were not achieving the panel count indicator. We made efforts until the last moment, we even had difficulties in the implementation, in the sense that it was difficult at the time to find 75 W panels on the market, but we had to make these efforts, because we were not allowed to change this indicator, and we had to stick to those 9,480 panels, that was the indicator in the financing contract, and we had to respect it."

Interviewees highlighted the significant challenge faced by CTAs in formulating comprehensive long-term plans due to limited funding. The availability of financial resources intricately ties their strategic initiatives and innovative ideas. "We can ensure our own contribution, so these are all projects that we can add our part to. But it will certainly not be possible for us to implement such projects entirely from our own budget for another year or two, because we have a lot of tenders that have been launched, and we have to provide the co-payments and the associated infrastructure improvements. For this reason, we will not be able to start new ones completely on our own" [Romanian case, civil servant]. An interviewee from the Estonian case stated: "It's difficult to plan anything long-term because when applying for a project, there aren't any guarantees for funding." Despite this challenging constraint, many CTAs find motivation to expand and continually develop their foundational ideas or diversify their portfolio.

In the examined countries, government subsidies endorse specific types of technologies, resulting in a widespread preference for installing photovoltaic (PV) panels among the public and among initiatives. Consequently, people tend to overlook and avoid exploring alternative technical solutions. Although there is notable interest among CTAs in exploring alternative technical solutions such as wind turbines or geothermal wells, these plans are currently on hold due to a shortage of available funding. For instance, in Romania, part of the Integrated National Energy and Climate Plan includes adding 7 GW of new renewable energy capacity, with a significant portion from solar projects. The Recovery and Resilience plan for Romania allocates 460 million EUR for the development of energy projects, ensuring the production of 950 MW. For households, the most well-known subsidy scheme was the Casa Verde (the Green House) Photovoltaic Program. The Program offers up to RON 20,000 (EUR 4,000) for a photovoltaic system of at least 3 kW for individuals interested in producing their electricity.

4.4 Regulation

Navigating the landscape of CEIs is not always easy for individuals and communities. The rules, provided by the Renewable Energy Directive (RED) and Energy Marked Directive (EMD) add an extra layer of complexity. These directives aim to encourage initiatives like Renewable



Energy Communities (RECs) and Citizen Energy Communities (CECs) but the way that the Member States interpreted them and transposed them varies. Some countries have clear guidelines and support for community-driven renewable energy projects, while others have more confusing rules, creating challenges for those looking to start and sustain energy initiatives.

However, the primary objective of this report is not to delve into an analysis of the transposition of European directives into national regulations or to scrutinise the shortcomings in the specific national laws. Instead, our emphasis is on understanding whether regulations play a pivotal role in hindering or facilitating the consolidations and emergence of CEIs.

Further, in this chapter, we focus specifically on the issues highlighted by the interviews conducted in the countries covered by the case studies. It is noteworthy that not every country mentioned in the study raises these concerns. The focus remains on the selected issues voiced during the interviews within the specific countries investigated.

4.4.1 Energy Communities

Some of the ECs reported in a greater detail on their administrative barriers but also on issues connected to the national legislation on renewables and ECs. In these circumstances, a newly created community in Portugal faced various challenges, as public authorities had to adjust the new procedures. Moreover, private individuals aiming to establish an EC encountered additional difficulties due to lack of information about application procedures, a concern highlighted also by other European research projects²³. On the other hand, interviewees (consultants from different organisations) highlighted that, the public authorities dealing with the approval of ECs are short-staffed. On top of that, the number of technicians needed to inspect and certify the safety of the installed solar plants is also small compared to the amount of newly installed PVs. External actors, like Coopernico, are supporting potential ECs in their approval process, leveraging their awareness of the obstacles and the applicable rules.

In Greece, the regulatory framework is quite unstable with legislation on energy communities undergoing frequent changes, e.g. concerning the membership of ECs. At the establishment of our Greek case study, initially, five citizens were required as founding members. This number increased to 60 during the interview phase. However, with the introduction of a new law in March 2023, the requirement was once again reduced, this time to 30 members, with exemptions applicable in cases such as energy communities located on small islands or with SMEs as members. The interviewed stakeholders complained about changes in subsidies as well. Three different types of energy communities are defined by national legislation, however not all of them are eligible for all subsidies targeting energy communities. ECs were considering changing their organisational form to become eligible for a certain subsidy, but this would put them in an operational dysfunction, because such procedure could endure several years. Besides the continuous legislative changes and the accompanying uncertainty, the application process takes a long time and the institutions or companies (DSO, energy providers) have compliance rules on managing the RES applications. This can take from 2-12 months until the ECs are informed if they can build a plant or if the grid is stable enough because of saturation, an issue flagged also by other European projects²⁴.

²³ Mayer C., Ferreira, F. & Nina, M. (2023). Enabling Framework of pilot countries: Portugal. Downloaded under https://citizen-led-renovation.ec.europa.eu/system/files/2023-11/T2.1%20Enabling%20framework%20of%20pilot%20countries_Portugal_V2.0.pdf

²⁴ Tuerk et al. (2023). Energy communities and collective actions: Yearly policy brief on regulations. Downloaded under https://decide4energy.eu/fileadmin/user_upload/Resources/DECIDE_D3.5.pdf



Although the Netherlands show a good practice in transposing the EU directives and the accompanying enabling frameworks²⁵, one issue was reported within the interviews. Under current regulation, energy cooperatives could make the use of the roofs of third-party building owners for their solar power plant construction, but if several cooperatives use the same roof, only one of them can benefit from profits gained from the power generation, restricting the cooperatives from cooperation between each other.

Slovenian case study revealed that the net metering scheme until the end of the year 2023 has been considered as appealing for prosumers, as the interviewed stakeholders saw an investment boom in PV power plants. In that scheme, the accounting period is occurring at the end of each calendar year. If the prosumers used the same amount of energy they produced within the given year, they would only pay the (rather low) network fee. Some prosumers found it beneficial to store their self-produced energy in home batteries. However, only installations of 11kVa and smaller can participate in the program²⁶. According to the interviewed stakeholders, the regulation on the fee charging and the net metering schemes will be changed by 2024, by adapting measuring the power consumption on a short-term (and no longer on a yearly) basis. The interviewees stated that this will negatively impact the prosumers' investments in high-capacity storage systems, as they would rather invest in PVs with small batteries for single households. Some of the interviewees anticipate a decrease in energy efficiency as prosumers will not be incentivised to save the produced energy.

In conclusion, the perceived legislative uncertainty deriving from the institutions (both at the European level and at the national level) is one of the biggest barriers for new ECs. There is a lack of knowledge about the application procedures for the creation of an EC for both the institutions enabling them and the ECs themselves. The procedures are lengthy due to the lack of personnel resources within the institutions and organisations that are legally bound to provide information or certifications to ECs along the whole application process. Some of the ECs experience that the current legislative framework or the implementation process favours (big) corporations over citizen initiatives (see also section “Barriers”).

4.4.2 Collective Targeted Actions

The Romanian case studies under examination involve RES projects, and specifically a 1MW PV park led by local municipalities. Therefore, in this subsection of the report we will not delve into the energy communities legislation. It is noteworthy that, in terms of households, Romania has introduced the legal framework for *prosumers* in 2008, but the ability to sell the energy produced was only granted in 2019, following new legislation that permitted households to *sell* energy rather than just *injecting* it into the network.

Since 2019 the number of prosumers has been exponentially growing, from 300 in 2019 to almost 40,000 prosumers in 2022 with an estimated capacity of 440 MW. This growth was driven by various government subsidy schemes (explained further in section 4.3 of this report). The most well-known subsidy scheme was the Casa Verde (the Green House) Program which granted a maximum allowance of 20,000 RON (approx. 4,000 EUR) with the condition that the beneficiary would make a 10% contribution of 2,000 RON (approx. 400 EUR). The scheme was very popular, the funds being allocated within hours of the opening of each new financing program.

However, financing guidelines for the Program, targeting the installation of Photovoltaic panel systems by *public entities* to produce electricity for meeting consumption needs and delivering surplus to the national grid, are currently under public consultation. The Program will allow

²⁵ RESCOOP (2024). Enabling frameworks/support schemes. Downloaded under <https://www.rescoop.eu/policy/netherlands>

²⁶ IEA & IRENA (2016). Slovenia Net-Metering System. Downloaded under <https://www.iea.org/policies/5958-slovenia-net-metering-system-uredbo-o-samooskrbi-z-elektricno-energijo-iz-obnovljivih-virov-energije>



public entities access to fund for the installation of PV panels on public buildings. This regulatory issue with the current *compensation scheme* not being available to public entities was mentioned by our Romanian case studies.

“[...] because we were not consuming electricity locally, but at municipal level, in the public institutions and for street lighting, we could not charge back, so we had to sell the energy. [Electricity distribution and supply market company] refused to buy the electricity from us, so we had to find a company to buy it from us and deduct it from the bill in the same way, because the Municipality could not have any income from it. We could not sell it on the market, but we had to find a company that would sell us the electricity and deduct the price of the energy sold from the amount. So it works in a compensation system to this day.” (civil servant)

Due to the municipality's public status, they are unable to function as private prosumers who receive compensation on a 1/1 kW ratio, but they have to sell the energy produced to a third party at market value without the Added Value Tax. In this system the commune sells energy at a lower price than the price which they buy it, due to the fact that the energy bought has an added value tax.

On the other hand, the Estonian interviewees highlighted the close collaboration between their organization [case study] and the Ministry of Economy in the context of regulation. They actively contribute by providing valuable feedback on draft regulations, leveraging their extensive field experience as a significant asset. This cooperation underscores the importance of practical knowledge in shaping effective regulatory frameworks.

4.5 Planned and Achieved Impact

Our aim was to deepen our understanding of the importance of visions, collectively expressed goals and concrete plans formulated by the CEIs during the early stages of their establishment and the impact of these elements on the emergence and consolidation of such initiatives. We hypothesised that we would observe a difference in the success of the initiatives and their potential impact depending on how elaborate goals and plans were set. The obtained results from the interviews do not allow us to draw conclusions based on a cross-comparative analysis of cases. It seems that different approaches of whether or not having detailed plans of what to achieve can be successful. Further, it is crucial to consider that our conversations were primarily with the successful initiatives, introducing a survivorship bias. Certain factors that impeded the establishment or consolidation of the CEIs might have been thus overlooked.

However, we were able to identify key aspects from the interviews that underscore the success of the initiatives, showcasing their effectiveness whether or not there is a formal, written plan in place. We have noted that some of the CEIs have goals transcending their own community and visions with a global societal impact²⁷ (e.g. reducing CO₂-emissions, contributing to a more democratic society). Other communities have rather modest objectives and successfully accomplished them.

4.5.1 Energy Communities

The short stories mentioned below are reflections shaped by interviews we have conducted across our ECs.

²⁷ Kreissl, R., Fritz, F. & Ostermeier, L. (2015). Societal Impact Assessment. In: Wright, J.D. (ed.), *International Encyclopedia of the Social & Behavioral Sciences*. Elsevier: Amsterdam, pp 873-877.



“A sustainable neighbourhood as a model for living in the 21st century”: The community aims to minimize air, water and land pollution; demonstrate a new approach to rural regeneration; maximize the potential for earning a living both inside and outside the village by facilitating systems whereby people can create local and sustainable work; and act as an education enterprise and research resource for all. Initially, concrete guidelines have been set down upon which to begin, continue and grow as a sustainable community. The community members are content with reaching their overarching goals, but they are still struggling with widening their community (56 houses instead of 132) due to issues that are out of their control.

“Independence and access to electricity for all our villagers”: In the beginning, the goal of the community was to electrify the homes of all residents. The EC members were concerned about the dependency on the neighbouring town, which produced electricity in a hydropower plant situated close to the EC village. The EC was established during a municipal meeting, with 48 determined citizens signing the statutes on the same day. Overcoming obstacles such as high inflation and low economic standards, they successfully constructed their own hydro-power station later on.

The degree of formality in defining goals and long-term strategies varied over the 100 years of existence. Their EC is run as a cooperative and is doing its business “for the good of the cooperative and the associates”. According to the current director, it is not important if the strategies are formally written down if they are consequently followed upon.

Nowadays, the EC has become increasingly environmentally conscious. With a solid financial foundation (as explained in section 4.3 on funding), they are well-positioned to embark on the journey of energy transformation. They perform an internal CO₂ balance (carbon footprint) and plan to be climate neutral by 2030. In alignment with their environmental strategy, they intend to get permissions to set up photovoltaic power plants, because the valley aims to be climate neutral by 2040.

Investing not only in their own cooperative but also in their region has proven to be highly profitable, and the EC will continue with their transformational pathway. However, members express a preference to not change certain aspects, such as the member structure and core business. They believe that the cooperative's current conditions are favourable and wish to preserve them.

“People were just discussing how to lower their [electricity] costs [...] And so I suggested that we could try to start thinking about using solar panels. To install them locally and see how it goes.” This EC initially had a relatively simple plan and gradually adjusted both their goals and the size of the solar panels. With the support of another organization that exerted pressure on the directorate responsible for processing EC applications in Portugal, they successfully achieved formal constitution as an energy community in 2022. During the next phase, the EC plans to invest further in their solar plant to reach a total production of 90 kW and to install monitoring devices. If the second phase proves to be successful, the EC wants to add a storage system. For this community, initiating with a simple and easily attainable goal proved to be effective, as the members were initially unaware of the full spectrum of advantages associated with collective energy production from renewable sources. Following the initial small success, members’ interest gradually increased, making it easier to formulate and pursue more challenging goals.

“The very first community of collective self-determination in their country”: Guided by that vision, this EC set concrete plans for internal organisation and general goals transcending their community (“act as beacon for other citizens”). With the construction of a PV park their tangible goal was to offset energy they consume in their urban homes. On this pathway, they



had a rather big setback (PV park denied due to grid saturation after one year waiting time) and made many adjustments, which led them to also learn a lot. This in return helped them to reach another goal, which is to help new communities with their experience. In the end, they are satisfied what they have reached and feel that they are on a more qualitative track now. The community also sees the need to reformulate, discuss and adapt their goals to incorporate the ideas and visions of the new people joining. The community has also initiated the process of developing a charter outlining key principles and goals.

4.5.2 Collective Targeted Actions

In our analysis, we consistently observe that the initial goals and desired outcomes were articulated in some form for all CTA cases under consideration. Whereas goals represent specific, measurable, and achievable targets that the initiative strives to attain, impacts are considerably broader, encompassing the enduring effects or consequences that arise from the accomplishment of these goals. Upon examining the anticipated impacts at the project's outset through interviews, our findings suggest a noteworthy trend: what were initially framed as expected impacts often align more closely with the formulation of goals rather than the broader and more far-reaching nature of impacts.

Most of the CTA's objectives primarily focused on reducing energy expenses and achieving energy self-sufficiency. [*"The main goal of the project was to develop a PV park to supplement the budget of the administration in order to decrease the costs for public energy use."*]. In the context of the Romanian cases, it becomes evident that, despite having a well-defined vision for what they intended to create and achieve to reduce their energy bills, adjustments to their plans were imperative to secure funding. Essentially, it can be concluded that funding plays a pivotal role in shaping the goals and outcomes of such initiatives. [*"The initial goal was to build a PV park with a capacity of 3 MW, but it needed to be scaled down in order to access funding".*]

When it comes to evaluating the achievement of goals, the Estonian initiative stands out as it presents a clear methodology for such an assessment. To ensure the ongoing realization of their constitutional goal to promote and develop the apartment associations movement, this CTA formulates an annual action plan and conducts yearly assessments of the activities carried out by them. Additionally, a comprehensive strategy is produced every five years to provide overarching guidance. In contrast, the Romanian cases do not explicitly address the methodology employed for measuring or assessing the achieved impacts and accomplishments during the interviews.

The interviews indicate a consistent trend across all cases: CTAs demonstrate flexibility in their goals.

4.6 Community Culture and Social Network Structure

In our exploration of CEIs, we adopted a distinctive perspective in the Community Culture and Social Network Structure that recognizes the unique features of Energy Communities and Collective Targeted Actions. We have thus tailored our analysis to account for the varying importance of community aspects within these distinct contexts.

For ECs, our focus revolves around decision-making and information sharing, social norms and mental models, social network structure, and the driving forces of social capital. This nuanced framework reflects the particular dynamics that shape sustainable practices within these communities.



On the other hand, in examining CTAs, our analysis centres on the potential impact of communication and social interaction, researching whether these factors influence the effectiveness of such initiatives. This approach aims to capture the inherent differences in community dynamics, offering a nuanced understanding essential for advancing sustainable energy practices.

4.6.1 Energy Communities

Decision making and information sharing

Formally, all members in the studied ECs have decision-making rights, however the full execution of these rights varies across the cases. Factors such as loose community structures, members' perception of non-necessity in decision-making, or trust in designated groups (administrative board, board of directors, owner's committee) influence the extent of member involvement. Furthermore, one EC challenges their members with their obligation to reach a consensus for each decision and although it sometimes causes frustration among the members it is overall appreciated “once you've made that decision, it's a very strong decision and you go forward from there, you don't have to visit that again.” (representative of an EC)

In the studied ECs, there are different degrees of engagement. Core group members are highly engaged and proactive, others are less invested but still involved, and some act as observers. Many ECs seek to enhance member engagement and foster trust through various means, such as information sharing, events, voting, and incentives. Communication approaches vary, including continuous chats, mailing lists, newsletters, regular meetings, and informal gatherings like movie outings, to ensure widespread participation and interaction among members.

Almost all the studied ECs offer some kind of membership benefits, such as free monitoring feedback on energy consumption, access to dedicated energy coaches providing advice on various measures like insulation, solar panels, and heat pumps, and organizing discussions for skill-sharing among members. These initiatives aim to achieve formal objectives of enhancing energy efficiency and knowledge about consumption practices. Some ECs note an obvious trend in energy users becoming more cost-conscious, and in response, they provide practical advice and empower individuals with the knowledge and resources necessary for informed decisions on energy efficiency.

In general, there is an observed trend where fewer interactions among members lead to more formal interactions (e.g., an EC with a loose community structure holding only one general assembly per year and no additional meetings). Additionally, depending on the level of member involvement during the founding process and the size of the EC, members may feel less obligated to participate in decision-making processes or engage in activities as the community grows or if they were less involved initially. Nevertheless, this does not seem to impact their sense of identification and belonging with the EC or their pride in being part of the energy transition or a member of the community.

Social Norms and Mental Model

Every EC has its shared social norms and their mental model, i.e. their common cognitive perception about certain issues and topics, guiding their individual and group behaviour²⁸. Some ECs with a long history and highly formalized communication and community structures coexist alongside others that are more “spiritual” in the sense that they more strongly emphasise the good things they can achieve together. Despite these differences, a shared sense of

²⁸ Acosta, C., Ortega, M., Bunsen, T., Koirala, B. P., & Ghorbani, A. (2018). Facilitating Energy Transition through Energy Commons: An Application of Socio-Ecological Systems Framework for Integrated Community Energy Systems. *Sustainability*, 10(2), Article 2. <https://doi.org/10.3390/su10020366>



belonging brings together the members. Such sense of belonging has different degrees of intensity, as shown by the following examples from different ECs:

- *“The prime principle of the cooperative is to act for the good of the cooperative and then of the associates.”* Social responsibility is a highly valued feature and is rewarded with loyalty and appreciation. Members have a lifelong commitment, with new members largely being heirs of the former ones. They take pride in belonging to this small yet esteemed cooperative, viewing it as a mark of quality.
- EC membership is about cooperating with others for joint actions, sharing knowledge and empowering each other. *“The most important part of the energy community is being part of a community.”*
- Partial connection in an EC formed due to practical reasons: members were not asked to become an active part during the forming of the EC. Nevertheless, there is reassuring feedback from the members: *“this [the power plant construction] is the only positive thing that we discussed in our condominium meetings. Because it's positive, it's about energy and it's about savings, and it's something that we are doing together.”*

The adoption of an eco-friendly mindset does not appear to be a determining factor influencing technology choices or energy consumption practices among members. While members may exhibit environmental consciousness, such as enjoying the beauty of the landscape or engaging in regenerative activities in nature, these considerations, according to the interviewees, may not be their primary motivations for joining the EC or altering their energy practices. Reasons cited in interviews, though not ranked, include concerns related to energy security, reliability of energy supply, cost reduction, sustainable energy consumption, energy independence, non-capitalistic energy production and consumption, and a sense of belonging to the community or movement (see also the following subsection).

The ECs reported having no internal conflicts, but they stated facing challenges with involving and engaging all members, ensuring a fair distribution of energy, or solving technical problems. The relationships between the communities' members and their values are described by the interviewees as “supportive”, “trustful”, “loyal”, “preferring long term stability over short term profits”, “spontaneity in decision making”, “solidarity”.

Social network structure

Acosta et al. proposes that it would be beneficial for CEIs to first set up a strong social network structure, before e.g. developing a business model, to align the offered services with the local conditions²⁹. The interviews indicate that the interviewees are aware of that. Their networking activities include:

- *Securing local support for RES:* One EC is mindful of how they present their services. They inform customers that active opt-in is required for access to clean power within their contracts, supporting locally produced hydropower. Otherwise, customers pay for the conventional energy mix, including electricity from nuclear and coal power plants. This awareness-raising is crucial, aiming to garner resident support for new plants powered by renewable sources. For instance, the EC plans to generate electricity from new renewable energy plants, but space is limited due to nature and landscape protection

²⁹ Acosta, C., Ortega, M., Bunsen, T., Koirala, B. P., & Ghorbani, A. (2018). Facilitating Energy Transition through Energy Commons: An Application of Socio-Ecological Systems Framework for Integrated Community Energy Systems. *Sustainability*, 10(2), Article 2. <https://doi.org/10.3390/su10020366>



regulations and existing land use (agriculture and tourism). Residents prefer this electricity to be supplied to their homes rather than sacrificing their beautiful landscape for others' energy needs.

- *Supporting locals in decreasing their energy consumption:* One EC is identifying energy leaks using CO₂ monitors and thermal scans. Despite the lack of subsidies, these smaller-scale approaches have generated considerable interest, and the use of infrared cameras has created significant enthusiasm among people. They are eager to see thermal images of their homes and identify areas with potential energy leaks, making it an enjoyable experience.
- *Interconnecting end-use sectors:* the administrative board of one EC is composed of young members full of zest for action. All of them are entrepreneurs and have experience in business decisions and are quick-acting. A good example to show their entrepreneurial capability is the establishment of the first public charging infrastructure for cars. The municipality was not willing to offer public places for the charging columns, but the hotel close to the ski lift saw an opportunity and freed some parking slots from their private grounds although the charging is open for anyone.
- *Engaging in climate-neutral goals of their region:* One EC wants to play an important role in the energy transformation and to support the environmental goals of their region (to become climate-neutral by 2040). Having a close relationship with their municipality they know that reaching this goal needs a lot of effort and they are willing to invest their money to create a bigger impact for their local community.
- *Collaborating to drive the energy transition:* One ECs reported that they have either continuous or temporary collaborations with other organisations (public authorities, funded projects, political parties, local newspapers) to stay in the loop and to actively engage in the transformation towards a sustainable future by e.g. supporting in the setting up of energy communities.

Most of the residential communities, including villages and municipalities, actively encourage and support ECs. In some cases, the ECs are regarded as a fundamental part of their self-image, especially in instances where the founders are perceived as visionaries, particularly in the case of long-standing ECs. One EC noted that they are concerned to have a balanced member structure, so that the residents of the region feel represented but also that the EC has sufficient influence and can develop projects that are accepted by the local population. Additionally, specific events or happenings contributed to a shift in the perception of the value of an energy community. For example, an EC was filmed for a documentary, which encouraged more members of the EC to become active; educational activities (conferences, events) about the importance of energy communities and renewables changed the perspective on future energy use; or a very specific event - an earthquake - changed the way people viewed the importance of the community.

Social Capital and its Driving Forces

All ECs are relying on *committed individuals* who contribute significantly to the workload, particularly during the formation phase. The organization and motivations for participation vary between ECs and even among members within a single EC, depending on their level of engagement. In the studied ECs, we observed diverse intentions and dynamics during the initial phase of the EC:

- *Energy Democracy:* Some ECs started as a group of dedicated people with the desire to change the way how energy is produced and consumed. Their main aim is to transfer the knowledge they gained in the energy community building to the society and helping other groups to collectively and independently produce their own energy. The mindset of one of their core members is captured in the following statement: "if we don't move



forward, if we don't try to fix a little bit of access to power generation for everybody, then how much hope is there? if we, who care very much, who supposedly know and have pulled so much, and have the stubbornness do not remain, then who will do it? But it makes me wonder whether the whole of society will have the same, shall we say, disposition. We're going to keep trying to make it easy for everyone else.". Many of their members work in the energy sector and *believe* in renewable energy. They have plenty theoretical knowledge, willingness for change and action, a strong advocacy capacity and they believe(d) in the institutions. Because of this certainty in their goals, they were confident in their ability to achieve them, anticipating a smooth and swift process. Reality proved them wrong, obstacles occurred that led to a slower process. However, their dedication and beliefs are stronger and this helped them to overcome many obstacles.

- *Energy Supply and Reliability*: In the recent years and especially since the war in the Ukraine, blackout scenarios were discussed publicly all over Europe. Now that people became aware of the possibility of such an event, they appreciate their local energy supply more. For the formation of two of the ECs, the energy supply per se was not secured and the people involved in the founding phases invested a high amount of resources, e.g. €100.000 per household, or built the powerlines themselves and installed electricity within their homes.
- *Energy Prices*: For at least two ECs, we can report that their main reason for the foundation was to lower the energy bills. It is important to mention, that both formed prior to the 2021-2022 energy crisis.
- *Sustainable Neighbourhood*: some of the ECs developed out of an existing social cohesion, where residents teamed up to build an EC.

Many of the ECs collaborate with other organisations to either compensate for missing expertise or to join forces for the same purpose. What we have observed within several ECs is the *influential power of individuals*. Several character attributes of leaders of initiative were an important force for other people to either join or start an EC:

- *Qualified and skilled*: In the 1980s, when numerous agricultural cooperatives emerged in countries with a communist system, people had negative experiences with cooperative schemes. Today, for individuals to join a community, they require assurance that those involved possess the necessary skills and abilities and are able to establish credibility and trustworthiness.
- *Successful*: A local entrepreneur, who already had his own production of biomass and its own power plant, is also seen as an informal leader, whom people would follow. It seems that his success speaks for him and his gained knowledge within this topic were graspable for the other residents.
- *Steady and imaginative*: The new director is regarded as active, visionary, open to new ideas and projects and forward thinking. Being somebody with a mind of his own means also to have critics. But the members trust and support him. According to the statements we can assume that this person plays a leading role in networking, drumming up business and participating in research projects.
- *Knowledgeable and reliable*: In one case, the annual condominium meetings are described as rather joyless or unpleasant and that decision-making is quite difficult unless an influential person whom others trust is part of the process.

We observed that a small number of active and very engaged people are pushing the processes of establishment and operating an EC. However, most of the ECs also connected with other private companies, research organisations, public or political institutions and other collectively organized energy initiatives to receive external expertise or to collaborate on the same



matter. What seems to be an important enabler of such initiatives are competent and supportive key players of the energy system.

4.6.2 Collective Targeted Actions

From the survey data we collected, we hypothesized that Community Culture aspects would not be as significant in the CTAs as they are in the ECs. Our findings indicate that *social links* and *interactions* hold greater importance for EC members compared to those in CTAs. Notably, these observations were further validated during the interviews.

One of the CTAs involves a citizen-initiated organization, while the two other cases are municipality-driven projects with no intent to engage citizens in planning or decision-making processes [There was no consultation with the people. We did it, we told them it had been set up, that it was a great help, but people didn't particularly say yes or no, there was no particular response" (Romanian CTA official)]. When it comes to communication, each CTA expresses a distinct community spirit, with citizen-initiated organizations showcasing a more formalized communication and community structure. Conversely, some CTAs exhibit a less organized approach to community engagement, creating a noticeable absence of a shared sense of belonging among citizens.

Facilitating opportunities for discussions emerges as a crucial aspect, as a lack of such interactions may lead to individuals feeling detached and perceiving their feedback as irrelevant to the project. Interviews reveal a common sentiment where individuals may view the project as unrelated to their lives, emphasizing the need for effective communication to bridge this gap. When locals were questioned about their perspective on a project initiated by a municipality lacking community involvement, their response was as follows: "I think there is very little opinion on this because they don't understand the potential benefits. They only know about the things they feel on their own wallet, so I would say that a lot of people may not be aware of it. This solar park is in a remote place, in a village far away from here, so if you ask 10 people, maybe 6 of them would not know that we have it. They can't really form an opinion on something that doesn't concern them. And from the moment it doesn't help in their own household, it doesn't affect them. So, the best they can say is good or not so good. But I think a lot of people don't even know about it". (Local of Romanian municipality)

Indeed, the role of CTAs in shaping people's perceptions of energy and related behaviours is significant when communication is tailored to individual needs. As one participant noted, the impact of the municipality setting an example, such as creating a solar park, plays a role in shaping community perspectives. Numbers are underlying this as well as for example in one of the Romanian municipalities analysed, it was expected that nearly one third of the population would apply for the Casa Verde program to install solar panels on their homes. Of course, this interest is due to the available government subsidy scheme.

Further, the interviews underscore the transformative potential of CTAs in moulding individuals into role models through education and encouragement. An interviewee from Estonia highlighted the profound impact of their initiatives, describing the euphoria experienced upon successfully renovating a Soviet-built apartment building, subsequently becoming a housing manager for multiple houses. This success story underscores the pivotal role of trust in fostering community development and individual empowerment.



4.7 Technologies

Considerations about the technical system are an evident topic of discussion for CEIs, reflecting the material culture dimension of the Energy Cultures Framework³⁰. The used technologies are outcomes of interactions between the cognitive norms and energy practices of the members, influenced by external contexts (social, economic, and political settings) and external interactions (social networks).

In this section, we will delve into the specific local and national implications and explore why certain technologies, such as photovoltaics, are more appealing for CEIs. Additionally, we will analyse both EC and CTAs to understand why certain technologies have been chosen while others have not been favoured by the initiatives.

4.7.1 Energy communities

All the younger ECs (formed between 2008 and 2021) have been using solar power for electricity generation. Compared to other power plants, PV panels are easy to install, almost maintenance-free, and involve a less complicated administrative process. Additionally, the financial investment required is lower. Solar panels can be conveniently installed on rooftops, utilizing available space without requiring additional land.

A disadvantage of solar power plants, mentioned by the interviewees, is the mismatch between supply and demand. Usually, the highest demand occurs during a period when production is not possible due to the missing energy source. A simple but cost-intensive solution is to store the energy. Another option is to have a broad variety of users within the EC using the energy during the daytime when production is happening.

One of the ECs is located in a neighborhood that embraces a sustainable lifestyle. In addition to their solar electricity production, they also employ a district heating system (DHS). Due to the underground placement of pipelines, they are less susceptible to storm-related disruptions. If the power goes out, heat can still be delivered to homes. This is possible because "District heating providers invest in backup heating supply systems to ensure customers are supplied with heat even in the worst winter weather."³¹ Furthermore, the DHS demonstrated its value during severe energy cost increases, as the heating costs to residents were not significantly affected.

The oldest interviewed EC uses hydropower and has expanded its services over time to adapt to the evolving needs of the community. The founders had to personally use working tools to install power lines and electrify homes. In addition to these tasks, they sold light bulbs and later expanded their offerings to include other electric devices. Today, they have evolved into a full-service provider, capable of adjusting easily to changing market situations and regulatory frameworks.

The benefits and problems of establishing other RES power plants are being discussed within the communities. These include:

- The installation of open space PVs conflicts with several interests, such as food production, landscape protection, and tourism.
- According to the interviewees, although there is an interest in setting up a wind farm in one of the ECs, there are only limited available areas suitable for a wind farm and public resistance against a wind farm is much higher than for example against PVs. Wind

³⁰ 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>

³¹ Gartland, D. (2018). Developing District Heating in Ireland. Downloaded under <https://www.seai.ie/blog/developing-district-heat/>



turbines, were judged by the interviewees as “noisy” and require precise positioning for productivity, making them more challenging to install compared to PVs of any size.

- The community is interested in starting biofuel projects but has not identified a fitting funding solution yet.

Some technologies for energy production (e.g. biomass and biogas) are ruled out due to higher costs, which would increase financing for everybody. Additionally, it sets the threshold even higher for individuals with low incomes. Depending on the location of the ECs, certain technologies may not be suitable for local conditions. For example, wind turbines might not be suitable in urban environments, and open space PVs may conflict with areas dedicated to recreation, tourism, or agriculture.

Some interviewees stated that the challenge lies in finding a balance between production and consumption, which can be addressed by storing and/or consuming the self-produced energy within the EC. One of the interviewees recognizes the potential of ECs as enablers of flexibility services, particularly when working in close collaboration with the DSO.

4.7.2 Collective Targeted Actions

Through a careful analysis of the interviews, a noticeable trend emerges wherein certain technologies, particularly PV applications, are frequently selected as the primary technical features in numerous CTAs. We looked at what aspects, apart from the maturity and availability of this technology, make this application more interesting for energy initiatives and probably most suitable for the emergence and consolidation of initiatives. In the majority of cases, PV panels are chosen.

This selection is driven by their compatibility with specific geographical settings, further supported by the advantage of relatively low maintenance costs. Furthermore, the majority of available funding, both in Estonia and Romania, is directed toward this particular technology. “However, the most prevalent solution the association managers are interested in is the use of solar energy”, an interviewee from Estonia indicated. “One of the reasons is the fact that the government offers financial support for installing solar panels”. Further, “Even with the governmental subsidies, it has been challenging to integrate new energy sources. The topic is new, and there are many questions to cover” (Estonian interviewee).

The interviews highlight that despite government subsidies, the integration of new energy sources has proven to be challenging, and there remains a need for more comprehensive information, discussions on technologies, and real-life experiences. In Romania, “Insufficient knowledge persists in these matters. Our engagement with renewable energy started relatively recently, about a year or two ago when discussions about panels became more prevalent. Just five years back, I wasn’t even aware of what photovoltaic panels were. It has only been three years since we truly began discussing them. Gathering ample information is crucial, and state involvement is essential. The panels are notably expensive, and although they become cost-effective in about five to seven years, making a substantial initial investment of around 20-30 thousand lei, closer to 30, for household use seems daunting. Support and intervention from the government are necessary, as people cannot handle such investments independently.”

As shown above, it seems that in the countries examined, government subsidies endorse only specific types of technologies, leading to the widespread preference for this technology among the public. Consequently, people tend to overlook and avoid exploring alternative technical solutions. Although the interviews reveal a notable interest among CTAs in exploring alternative technical solutions, such as wind turbines or geothermal wells, the plans are currently on hold due to a shortage of available funding.



4.8 Barriers faced by the community

In addition to the comprehensive analysis of various topics covered in this report, we delved deeper by posing a specific question about the barriers that initiatives encounter and must overcome. This inquiry provided valuable insights into the unique challenges faced by ECs and CTAs, shedding light on the complexities they navigate in areas such as project implementation, community engagement, and sustainable energy practices.

4.8.1 Energy Communities

Local conditions

In Germany, the shortage of suitable areas for RES projects sparks an intense debate in one of the interviewed ECs. A dilemma arises as the tourism sector, the largest energy consumer in the region, is also the most adversely affected by RES expansion. Tourism businesses struggle with impact of a transformed landscape, posing both aesthetic concerns and the loss of vital areas for skiing and hiking. Additionally, the deployment of open space PV installations introduces a trade-off between land use for food and energy production, highlighting the intricate balance required in navigating the region's energy transition challenges.

In Greece, a significant portion of land is allocated through already submitted applications for RES projects. However, these areas often lack updated information on publicly available maps. This poses a notable challenge for ECs, as they are obligated to rely on outdated data, potentially leading to rejections when competing with other renewable energy projects for the same area. Complaints from ECs underscore concerns that professional companies receive preferential treatment or faster application processing, a sentiment echoed by CTAs.

Missing Driving Force from Human Power

ECs face various challenges, including recruiting new steering group members and dealing with a consistently low turnover of board members. The commitment required for long-term management of solar roofs, often considered a low-income responsibility, makes finding dedicated individuals a barrier. Additionally, there is a difficulty in engaging a diverse group of community members to raise awareness and facilitate social learning. The complex application process for establishing ECs further compounds these issues. A practical suggestion given by one interviewed stakeholder to address this complexity is to establish accessible "one-stop shop" offices guiding and supporting the ECs. This approach aims to streamline the application process, ensuring broader community participation in the energy transition.

4.8.2 Collective Targeted Actions

Interviewees from various CTAs universally identified the primary challenge as obtaining adequate funding. In Estonia, additional hurdles include the inclusion of members from remote areas, hindered by marketing challenges and language-related barriers. Romania faces a funding challenge as well, with interviews underscoring systemic issues that favour larger entities within a centralized system, putting smaller players at a disadvantage.

It is evident that all the researched initiatives face challenges when it comes to effectively communicating with citizens and portraying the project as a positive contribution to the community. The interviews reveal that in initiatives where citizens lack awareness of project successes, there appears to be a weaker foundation of trust and diminished interest in the project. ["I have no information on how much the municipality has reduced its electricity costs. I have heard from others that it is indeed beneficial, but what that means in terms of amount, I cannot say" (Citizen living close to the initiative's location)]. Moreover, the interviews revealed that the benefits/outcomes of the project are not being communicated towards the locals.



Through a comprehensive analysis of numerous interviews with individuals engaged in CTAs, it can be confidently asserted that *trust* plays a pivotal role in the success of such projects. In Estonia, where communication and local/member involvement in projects are strong, trust seems robust. Conversely, in Romania, trust issues arise regarding municipality-initiated projects, possibly stemming from inadequate communication directed towards the community.

4.9 Conclusions and Outlook

Energy poverty:

After conducting a comprehensive study on both ECs and CTAs, it is evident that engaging in the energy transition, whether through collective or individual approaches, poses significant challenges for households with lower incomes. Financial barriers, in particular, constrain their active participation. ECs, for instance, very often demand initial financial investment or an annual membership fee. Interviews conducted with CTAs reveal that, while subsidies may be accessible in certain countries to assist households with their energy transition-related costs, a requisite financial commitment still exists, acting as a limiting factor for households with lower incomes.

Both for ECs and for CTAs, energy poverty cannot be considered as the driving force for their establishment. ECs often is associated more strongly with energy transition and energy independence, while CTAs are most commonly being established to focus on the reduction of energy-related expenses.

However, we were able to identify initiatives that actively work towards combatting energy poverty. In the case of ECs, these instances are primarily found in Greece, where legislation mandates their support for vulnerable populations or in communities where an inclusive vision strives not to leave anyone behind. For CTAs, while reducing energy-related expenses for the community is defined as a common goal, it cannot always be achieved as the initiatives often do not offer financial support to individuals facing challenges associated with energy poverty.

Energy prices:

The significant fluctuations in energy costs underscore the importance of the energy prices in understanding their role in the emergence and consolidation of CEIs.

According to our findings, CEIs generally seem to be rather resilient with regards to energy price changes, due to their usually long-term strategies. We observed an increase in consumer interest in self-production, particularly in rooftop photovoltaics and applications for collective self-consumption, driven by the rise in energy prices and the aim to reduce overall energy costs. The establishment of CTAs appears to be primarily guided by the desire for energy cost reduction, with energy self-sufficiency emerging as a relevant factor. Conversely, for communities and individuals aiming to establish ECs, energy self-sufficiency seems to be the primary motivation.

Overall, external factors like the energy crisis and the corresponding fluctuations in energy prices, along with the expenses for necessary equipment in renewable energy production, seem to play a significant role in triggering the establishment of ECs. On the other hand, for CTAs, the primary driving force appears to be the aspiration to decrease energy costs.

Funding :

In the early stages of both, ECs and CTAs, ensuring funding is a common challenge. For CTAs, initial funding from *public sources* was secured for all cases examined. Not all ECs received public funds, indicating that the emergence of their initiatives is more closely linked to *private funding*. These private investments were ranging from €40 to €100,000, to kick-start their EC.



Further, it is noteworthy that the majority of the examined CTA cases received funding with the objective of improving the socio-economic status of the respective area.

Concerning the ongoing improvement and expansion of projects throughout their lifespan, many ECs reported applying for public subsidies at the federate state, national, and EU levels. These subsidies were typically sought for specific purposes such as technical applications or additional projects they aimed to undertake. To cover operating and maintenance costs, some ECs implement annual membership fees, a practice uncommon among CTAs, at least for those examined in this report. For CTAs, further enhancement and expansion are heavily reliant on funding. Their ability to determine goals and visions is also tied to funding, emphasizing the pivotal role it plays in shaping these initiatives.

Both ECs and CTAs express a willingness to grow, continuously develop their founding ideas, and diversify their portfolios. However, CTAs did mention that long-term planning poses a significant challenge for them, primarily due to funding constraints. While there is an evident openness and interest in embracing new technologies such as geothermal wells and wind farms, the identified cases reveal a bias in government subsidies that tends to favour specific types of technologies. This favouritism has led to a widespread preference for the installation of photovoltaic (PV) panels among the public and various initiatives. Unfortunately, this bias hinders initiatives from further exploring the possibility of implementing other innovative technologies.

Regulation:

Exploring the regulatory landscape of CEIs poses challenges for both individuals and communities. For ECs, it was observed that newly established communities encounter numerous regulatory obstacles. They perceive legislative uncertainty originating from institutions at both the European and national levels. In certain Member States, the regulatory framework is notably unstable, with legislation concerning energy communities undergoing frequent changes. This uncertainty also extends to subsidies. In one of the scrutinized countries, despite national legislation defining three distinct types of energy communities, not all of them are eligible for the full range of subsidies intended for energy communities. Administrative challenges prove to function as barriers for these initiatives as well. There is a lack of knowledge about the application procedures for the creation of an EC, and the procedures are lengthy due to the lack of personnel. Some barriers restrict cooperatives from cooperation between each other. For example in one examined country, under current legislation, energy cooperatives could make use of the roofs of third-party buildings owners for their solar power plant construction, but if several cooperatives use the same roof, only one of them can benefit from profits gained from the power generation.

Planned and achieved impacts:

Both CTAs and ECs tend to have articulated initial goals and desired outcomes. CTAs aim to be a lot more concrete in what they aim for, most of their objectives primarily focus on reducing energy expenses and achieving energy self-sufficiency. The diversity of planned goals and impacts but also of the concreteness of formulating them, is comparatively lower within ECs.

We encountered instances where ECs set goals that extended beyond their immediate community, aiming to create impacts on a broader societal scale. Conversely, some ECs establish more modest objectives. In the case of CTAs, their goals are generally comparable, but they face the added challenge of maintaining a realistic approach in goal setting and expanding their vision. Interviews revealed that CTAs universally acknowledged the pivotal role of funding in shaping their goals and outcomes. Interestingly, funding did not emerge as a relevant factor for setting goals in the context of ECs.



When assessing the achievement of goals and monitoring the alignment with the desired vision, the approach and relevance differ not only between ECs and CTAs but also among different ECs and CTAs. When it comes to evaluation, there is variability among CTAs, with some conducting evaluations and others not. Meanwhile, among ECs, we encountered a less formal evaluation.

Community Culture:

Our findings indicate that social links and interactions hold greater importance for EC members compared to those in CTAs. In terms of community engagement, various degrees are identified within the studied ECs. Core group members are highly engaged, others are less invested but still involved, and some act as observers. ECs express intentions to enhance member engagement through information sharing, events, voting, and incentives. However, they acknowledge challenges in involving and engaging all members. The importance of engagement differs between ECs and CTAs. In the case of CTAs, less organized community engagement results in a noticeable absence of a shared sense of belonging among citizens. On the other hand, for ECs, members usually express a high sense of identification and belonging with the EC and pride in being part of the energy transition and the community.

When it comes to decision-making, formally, all members in the studied ECs have decision-making rights, however the full execution of these rights varies across the cases. There is even a case that uses consensus to make a decision. In the case of CTAs we find that decision making is mostly done without discussing it with citizens.

Once again, it reinforces the notion that increased participation fosters stronger bonds among individuals and members with projects of this nature. The facilitation of opportunities for discussions emerges as a pivotal aspect, leading us to hypothesize that a majority of residential communities, encompassing villages and municipalities, actively endorse and support ECs due to this engagement. In certain instances, ECs are even deemed a fundamental component of their self-image. Contrastingly, with CTAs, we observe that a lack of such interactions can result in individuals feeling disconnected, perceiving their feedback as inconsequential to the project. Interviews unveil a prevailing sentiment where individuals may regard the project as unrelated to their lives, presenting a stark contrast to the sense of connection found within EC communities.

While citizens and community members may experience detachment from projects initiated by the CTA, it is evident that these initiatives play a significant role in shaping people's perceptions of energy and related behaviours. Besides the projects themselves, we have observed in several cases the influential power of individuals. From the interviews, we find that strong and trustworthy leaders were the main driving force for other people to either join or start an EC.

Technologies:

Both among ECS and CTAs, the most prevalent technology employed for renewable energy production is photovoltaic (PV) panels. When discussing the advantages of PV panels, interviewees from both types of collective actions asserted that solar panels are easy to install, require minimal maintenance, and are easily adopted to the local conditions, e.g. can be integrated within the existing natural or built landscapes. From interviews conducted with CTAs, it becomes evident that, in addition to the reasons listed above, one of the primary factors influencing the choice of this technology for renewable energy production is the availability of funding specifically designated for PV panels. In contrast to CTAs, ECs did not emphasize the availability of funding as the primary reason for choosing PV panel technology.



Within ECs, we observe greater diversity in the currently used technologies. In addition to solar panels, some ECs also prefer Distributed Heating Systems (DHS) and Hydropower, although they are not the majority choices. Nonetheless, there is still noticeable interest in establishing other types of renewable energy power plants. Wind farms have been mentioned by both ECs and CTAs. However, all respondents emphasized the lack of suitable areas for wind farms as a barrier when considering this technology. The primary challenge is related to the increased costs and less funding available. Despite a willingness to explore new technologies, most of the studied cases assert that the unavailability of sufficient funding makes it challenging to pursue those directions. In addition to financing, CTAs also regard the scarcity of available information and the absence of discussions on these topics as complicating factors for improvement and development. Interestingly, this aspect was not specifically mentioned by ECs during the interviews.

Barriers faced by the community:

Overall, more barriers were reported by ECs, but this could be attributed to the larger number of EC cases analysed compared to CTAs. The latter generally encounter similar challenges, primarily related to funding or marketing. Meanwhile, ECs tend to report a wider range of challenges. These difficulties may also vary across different countries where they are located but in all countries the majority of barriers are either linked to legal conditions or stem from a perceived absence of motivation or initiative from individuals.

In certain countries, RES projects face opposition from the tourism sector, which raises concerns about the impact of these projects on the landscape. The tourism industry expresses aesthetic apprehensions and protests against the loss of crucial areas for activities like skiing and hiking. However, it is important to note that the tourism sector is not the sole contender against RES projects, there is also a trade-off between land use for food and energy production. Concerning legal conditions, ECs report systematic issues that favour larger entities within a centralized system, a sentiment also echoed by CTAs. Many cases from both ECs and CTAs encounter challenges in terms of effective communication. The ability to communicate effectively is crucial for promoting initiatives and engaging more members, citizens, and key advocates. Interviews reveal that trust plays a pivotal role in the success of these projects, and building trust is closely tied to maintaining good communication.

Identifying barriers is important, but we are also keen to understand if initiatives can successfully overcome them. For CTAs, it is evident that they have effectively addressed and surmounted most barriers, yet challenges linked to funding, beyond their control, persist as a significant hurdle. Similarly, ECs confront numerous barriers beyond their control. However, interviews reveal their willingness to generate ideas and propose logical solutions to systematic issues, demonstrating a proactive approach to overcoming challenges.



5 Integrated Insights: Cross-Comparing Interview and Survey Findings

In this section of the report, we will draw insights from both interviews and surveys as part of our multi-method approach. This analytical strategy is crucial for two primary reasons: i) it enables us to compare opinions from various groups of stakeholders, ensuring a comprehensive understanding, and ii) it allows for a nuanced examination of factors that might differ between anonymous survey responses and interviews. In interviews, respondents may feel 'assessed' by the project team, possibly influencing their answers.

This comparative analysis will enhance the robustness of our recommendations, offering a holistic perspective on the key considerations for CEIs.

5.1 Energy Poverty

5.1.1 Energy Communities

Despite the observation that EC-members, seem to be a privileged group in the society with around 85 percent survey respondents indicating that their income is average or above compared to the average household in their respective country, still *23 percent of respondents state that they have problems paying the energy bills at least sometimes*. This is not reflected in the interviews where no problem at all is indicated.

ECs are not able to adequately address energy poverty for the following reasons:

- 1) *Membership* is almost exclusively awarded to households that have at least medium to high income. Some initiatives aimed to change this dynamic by raising surcharges from members to provide poor households with free electricity, partnering with citizen-supporting organisations and housing-associations, etc.
- 2) Households *without their own property* – enabling them to install the necessary technical equipment for establishing an EC – are usually not the typical founders or members of ECs. To tackle this discrimination, one EC reported (Greece) offering participation without the usual obligatory installation of solar panels on personal property.
- 3) While members coming from a rather privileged background, EC representatives do not seem to be *aware* that energy poverty is still an issue for a relevant minority. A stronger focus on and awareness about this topic therefore might help to gain new members and retain the existing ones.

5.1.2 Collective Targeted Actions

Representatives of CTAs are aware that high costs associated with the energy transition are a barrier for the participation of energy poor people. This is reflected in the members' survey that shows that 90 percent of its members come from households with at least an average income, although 13 percent still indicate to have at least sometimes troubles to pay their energy bills.

Putting together the fact that reducing energy costs is one of the main aims of many CTAs and that most of the members have a higher income background indicates, that CTAs' efforts often do not reach those that would profit the most from the goals of CTAs.



5.2 Political, social and economic setting, special focus energy prices

5.2.1 Energy Communities

EC representatives report a shift in the reasons for joining ECs, a change that began with the energy crisis. Since then, they see *self-production* and *self-sufficiency* as well as reducing the uncertainty of *energy prizes* as an important topic for the emergence and consolidation of ECs, and experienced an increase in their membership size.

General importance of the topic can be partially confirmed by the survey: 33 percent of EC members see *saving money* as their main motive to join, 30 percent state becoming more self-sufficient as a main motive (third and fourth most named motive). The importance of these topics thereby seems to vary strongly depending on other political and economic settings. For example 57 percent of respondents from Greece naming saving money as an important motive versus only 6 percent in Belgium, while 80 percent of Slovenian respondents naming becoming more self-sufficient as their main motive, versus 0 percent in Germany.

5.2.2 Collective Targeted Actions

Similar to ECs, representatives of CTA's also perceive the *reduction of energy expenses* and the attainment of *self-sufficiency* as important driving factors. This perspective aligns with members' viewpoints, with 21 percent citing saving money as the primary motive for joining and 24 percent identifying self-sufficiency as the second and third most mentioned motives.

5.3 Funding, subsidies and business models

5.3.1 Energy Communities

The EC representatives acknowledge in the interviews the importance of *securing stable fundings* and often express difficulties to especially gain access to public fundings due to unclear and/or *missing national infrastructure and expertise* or *inadequate national policies*.

This is also reflected by the opinion of the members expressed in the survey since 40 percent see a lack of funding as a barrier and 45 percent see bureaucratic barriers. More financial resources and more support in dealing with bureaucratic barriers are also seen as the two areas with the highest improvement potential in the ECs.

5.3.2 Collective Targeted Actions

For CTAs, *public funding* appears to be the most important source of financial support. However, the interviewees also highlight considerable problems related to this fact. This includes the low adaptability of projects which are publicly funded since the original criteria on which the funding was granted needs to be met, restricting for example, the use of more advanced technologies that are available at the time of deployment. The available fundings make it also difficult for CTAs to develop long-term business models. Furthermore, it restricts the CTAs to those topics and technologies for which fundings are available.

These shortcomings are also reflected partially in the members' survey: While interestingly "only" 24 percent see lack of access to fundings as a main barrier, 60 percent see greatest improvement potential for their CTA in securing financial resources. This seemingly discrepancy might be to the fact, that members usually only join a CTA once the initial funding is secured, and this barrier is non-existing anymore. However, the difficulty of securing ongoing



financing seem an important issue for all members. To date, it seems that there is a lack of sustainable business models in the area of CTAs.

5.4 Regulation

5.4.1 Energy Communities

Unclear and changing regulations are seen as *one of the biggest issues* by almost all interviewed representatives. Regulations also sometimes restrict ECs in the way they can distribute incomes/profits (e.g. not allowed to share profits gained from electricity generated on one roof between different cooperatives). This is also reflected by the members survey, since 48 percent of members indicate not enough authority support and 45 percent name bureaucracy as major barriers (both highest figures of all indicated barriers). Accordingly, 47 percent wish for higher support when dealing with authorities.

5.4.2 Collective Targeted Actions

For CTAs, problems related to regulations are relevant in some cases, but it seems to a much lower degree than for ECs, probably due to the fact that CTAs by definition are not included in the very specific regulations that apply for ECs. Some even mention the very good collaboration with the ministries.

This is partially reflected by the members survey where “only” 20 percent indicated bureaucratic barriers as relevant and 24 percent missing support by authorities. However, both numbers, along with the problem of accessing funding, represent the highest figures among all barriers. 29 percent indicate also more support in dealing with bureaucratic barriers as an improvement potential, ranking it on the third position of all improvement potentials. This suggests that, in some cases, enhanced communication efforts from the representatives may be needed to better demonstrate their capability in handling regulations to the members.

5.5 Planned and Achieved Impact

This topic was not included in the members' survey, thus no comparison can be drawn.

5.6 Community Culture

5.6.1 Energy Communities

Decision making and Information sharing

Due to the, more or less, democratic structure of all ECs, decision making and communicating decisions (and opinions regarding upcoming decisions) and information play an important role for all representatives of the ECs. However, this sometimes leads to frustration when decisions take a considerable amount of time, and discussions seem endless. On the other hand, they highly value that once the decision is made it represents a consensus of the entire group, which facilitates the implementation process.

This is also reflected by the opinions of the members: More than 80 percent of the survey respondents are satisfied with the degree of communication within their community and 90 percent see decision making as transparent. However, if there are conflicts in the community (which are rare), they indicate decision making as the second most frequent cause of this



conflict (after financial issues). This emphasises again the importance of finding functioning and satisfying modes and structures to decide.

Social Norms and Mental Model

ECs, according to the interviewees, typically share a common *feeling of belonging*. Also a shared *eco-friendly mindset* often plays an important role, although this is not always seen by the representatives as the most important reason for people to become members. Conflicts are rare, but if seen, they seem to evolve around trust issues.

This is supported by the members answers in the survey: 69 percent indicate that they identify rather strongly with the initiative and 72 percent say that the communities' activities and interactions increased trust among the members. When it comes to reasons to join, around 48 percent indicate living more climate-friendly as the main reason which is the highest number of all indicated reasons.

So, regarding social norms and mental models, it seems that there is a common understanding between representatives and members and this common ground is perceived as important by both sides.

Social Network Structure

Regarding social networking, the representatives identify *awareness raising* for their sustainable solutions among the locals (using renewable energy sources and increasing energy efficiency) and engaging in climate-related activities outside their community but within their region as important activities. The goal is to be perceived as a relevant and trustworthy actor in the region.

This topic was only marginally addressed in the members' survey. However, what can be noted, that one third of the members see a higher *external visibility* as an improvement potential of their respective initiative. This indicates that members also recognize the importance of a functioning networking structure.

Social Capital and its Driving Forces

Many communities find within their members' base people willing to dedicate time and resources to push forward the community's agenda. They also acknowledge, that a *broad set of skills* is needed to operate the communities on a daily basis and that this expertise either needs to be developed within the communities or brought in via external support.

Accordingly, 30 percent of members identify an increase in *technological expertise* as an important improvement potential for their community. Nevertheless, the ongoing capacity building process of these communities is also reflected as 80 percent of the members indicate, that the community increased their knowledge on renewable energy technologies and 64 percent say that the work increased their skills in working together with other people.

It can be thus concluded that ECs are relying on a broad variety of expertise to become operational. Their focus often is to acquire the needed skills within their members base, who seem to be willing to learn new skills relevant for the communities.

5.6.2 Collective Targeted Actions

For CTAs, *community aspects play a much smaller role*, as indicated by the interviewees, as well as by the survey results, as for example 15 percent of CTA members name being together with the people of the initiative as important aspect to join it (compared to 35 percent of EC members). Also, a sense of belonging together is far less stressed by the CTA representatives and members of which only 30 percent indicate that they feel strongly attached to the initiative (compared to 60 percent in ECs).



Given the fact that half of all questioned members say, that the initiative means a lot to them, and that 21 percent wish for a more transparent decision making (compared to 9 percent of EC members), that might be an indication, that a stronger focus on community aspects might be seen as an improvement of the CTA by many members.

5.7 Technologies

This topic was not included in the members' survey, thus no comparison can be drawn.

5.8 Barriers faced by the community

5.8.1 Energy Communities

Local Conditions

This subtopic was not included in the members' survey, thus no comparison can be drawn.

Missing driving forces from the Human Power

According to the interviewees, securing an active and long-engaged core team that guides the activities of the community is challenging to achieve and maintain. This view is also partially reflected in the members' survey: 33 percent of participants from ECs see *higher engagement of the members* as a key improvement area, compared to only 7 percent who also request higher engagement of key personnel. It appears to be one of the key challenges not only to attract members but also to *keep them actively involved* over a longer period.

5.8.2 Collective Targeted Actions

CTA-interviewees identified *securing fundings* and *communicating with citizens* as main barriers. This also includes making people aware of the successes of the CTA to increase trust.

This view again is partly reflected by the members' survey: 24 percent see lack of access to fundings as one of the main barriers (highest number together with bureaucratic barriers) and 58 percent see higher financial resources as one of the main improvement potentials. Higher external visibility is seen by 38 percent of members as a main improvement potential (second highest number after financial resources).

Regarding trust, 44 percent agree to the statement that they can count on the community's people when they have a problem (compared to 57 percent in ECs) and 40 percent stated that since joining the initiative they increased the trust in its members.

5.9 Conclusions

In this chapter we compared the statements of the community representatives and experts with those of the members.

1. Energy Poverty:

- While EC representatives state no issues with their members paying energy bills, 23% of survey respondents indicate facing problems, highlighting a potential gap in awareness.



2. Motivations for Joining:

- Discrepancies arise in ECs, where representatives see saving money and self-sufficiency as very strong motivations, whereas members emphasize more strongly *living more climate-friendly* and *community aspects*. EC representatives therefore should be careful to not emphasise too strongly the aspects of saving money and self-sufficiency.
- In CTAs, alignment is observed between representatives and participants regarding the importance of reducing energy expenses and achieving self-sufficiency.

3. Funding and Subsidies:

- EC representatives express challenges in accessing public funding, while the survey underscores members' concerns about bureaucratic barriers and a lack of funding. Here perception seems to be aligned.
- In CTAs, interviewees stress the importance of public – and initial – funding. The survey reveals members' identification of securing financial resources as a significant improvement area, which seems natural given that usually the initial funding is already there when (more) participants join.

4. Regulations:

- EC representatives voice major concerns about *unclear regulations* and aligned members highlight issues with authority support and bureaucracy.
- In CTAs, interviewees downplay regulatory concerns, yet survey results indicate bureaucratic barriers and a need for support by authorities as noteworthy issues from a participant's perspective

4. Community Culture:

- In ECs, representatives emphasize a *democratic decision-making* structure, supported by members who identify decision-making as a major cause of potential conflicts.
- Social norms and mental models align between representatives and members, emphasizing a shared eco-friendly mindset and a sense of belonging.

5. Barriers Faced by the Community:

- In ECs, interviewees stress the challenge of *maintaining an engaged core team*, as do the survey results which suggest members see higher engagement as a key improvement area.
- In CTAs, interviewees highlight barriers related to *securing funding*, while the survey indicates members' concerns about lack of access to funding and *the need for higher external visibility*.



6 Factors Influencing Emergence and Consolidation of Energy Citizenship

Our research focuses on unveiling the factors that influence the emergence and consolidation of collective energy citizenship. We deduce the potential relevant factors from both the Energy Cultures Framework and the Socio-Ecological Systems Framework for Integrated Community Energy Systems. We aim to understand what elements *positively* or *negatively* impact the emergence and consolidation of collective energy initiatives, as well as those for which we did not find evidence of substantial influence. By categorising these factors, our study seeks to provide a nuanced understanding of various aspects surrounding the development of CEIs.

To facilitate a comprehensive overview, the identified factors will be presented in two distinct tables: *Table 1* highlights factors influencing the emergence of CEIs (both ECs and CTAs), while *Table 2* delineates those affecting its consolidation. Through this analysis, we aspire to contribute valuable insights that enhance comprehension of the forces at play, informing strategies for an expansion of existing and faster uptake of new CEIs.

Table 1 Factors influencing emergence of CEIs

Table 1 contains factors that are reinforcing (+), hindering (-) or () not affecting the emergence of ECs or CTAs, respectively. The + or – before the explanatory reason indicates what kind of influence the factor has.*

Factors Identified	Energy Communities	Collective Targeted Actions
Autonomy and energy security	+ Desire of members for independence in energy production + European energy crisis as a catalyst for ECs. Uncertainty in the energy market encourages participation	
Energy cost reduction	* Not identified as driving force for becoming or staying EC member	+ Members motivated by reducing energy expenses and achieving self-sufficiency
Funding and subsidies	+ Crucial role of private funding especially in the initial stages	+ Use public funding, especially from sources such as EU funds - However, reported as challenge when it comes to obtaining funding
Regulation and administrative aspects	- Administrative challenges and bureaucratic procedures faced by some ECs - Unclear regulatory frameworks and legislative uncertainty impacting formation and functioning	
Legislative and procedural uncertainty	- Lack of knowledge about application procedure for EC creation - Lengthy procedures and personnel resources shortages	
Intrinsic motivation	+ Motivated by sustainability, independence, and pioneering spirit	+ Motivated by reducing energy expenses and achieving self-sufficiency



Social capital and driving forces	<ul style="list-style-type: none"> + Sufficient human resources and adequate skill sets - Over-reliance on committed individuals during formation + Influential power of key individuals in ECs 	
Communication	+ Facilitating discussions is crucial, as it fosters engagement and prevents detachment	+ Facilitating discussions is crucial, as it fosters engagement and prevents detachment
Technologies and knowledge requirements	<ul style="list-style-type: none"> - Importance of grid stability and connection possibilities + Influence of easily accessible technologies and geographical location. - Some technologies ruled out due to higher costs affecting financing 	<ul style="list-style-type: none"> + Technology selection driven by compatibility with geographical settings. + Focus on low-maintenance technologies, often centered around specific options like photovoltaics (PVs). - Linked to available funding
Factors without significant influence on emergence		
Energy poverty	<ul style="list-style-type: none"> * Energy poverty is not a determining factor in the emergence of ECs * Some ECs acknowledge financial barriers faced by the energy-poor but do not establish or consolidate based on energy poverty considerations 	
Economic considerations	<ul style="list-style-type: none"> * Established ECs prioritize energy security over financial aspects. Surplus funds in ECs are treated as cooperative investments 	

Table 2 Factors influencing consolidation of CEIs

Table 2 contains factors that are reinforcing (+), hindering (-) or (*) not affecting the consolidation of ECs or CTAs, respectively. The + or – before the explanatory reason indicates what kind of influence the factor has.

Factors identified	Energy Communities	Collective Targeted Actions
Energy poverty	+ Community leaders are not aware that for a substantial minority of EC members of 10 to 20 percent have difficulties in paying energy bills (at least sometimes) and that support might help stabilize their contribution to the EC	
Energy security	+ European energy crisis functioned as a catalyst for ECs. Uncertainty in the energy market encouraged participation	



Limited funding		- Limited funding poses a significant challenge for CTAs in developing comprehensive long-term plans
Regulatory challenges	- Legislative uncertainty impedes business development in the long run	- Compensation schemes not adapted to the status of CTAs
Legislative and procedural uncertainty	- Administrative barriers, unclear regulatory frameworks, and frequent changes - Some ECs feel current legislative frameworks favour larger corporations over citizen initiatives	
Community culture and Communication	+ Cohesive community structures and trust in designated groups influence member involvement + Offers of membership benefits such as promotion of cost-consciousness, and provision of practical advice + Power of individuals as leaders, first-movers and influencers	- Lack of and appropriate communication hinders development + Tailored communication shapes perceptions and behaviours
Social norms	+ Relationships within communities if supportive, trustful, and loyal + Sense of belonging is crucial for community members	
Social network structure	+ Developing a strong social network structure within the immediate social environments is important for the long-term stability	
Technical aspects and lack of technical knowledge		- Insufficient knowledge about alternative technologies, overshadowed by government endorsements for specific types
Impact of government subsidies on technology choice		- Government subsidies endorsing specific technologies negatively affect CTAs - Widespread preference for photovoltaic (PV) panels, due to subsidies, limits exploration of alternative technical solutions
Competition	- ECs competing (between each other and with bigger players) for space in solar projects hinder cooperation	
Individual solutions preferred over collective		- Many locals prefer individual solutions (purchasing wood-burning stoves, installing old ones, adjusting heating methods) over collective actions to address rising energy prices
Factors without significant influence on consolidation		
Social interactions		Social links and interactions are observed to be of greater importance



for members within ECs compared to those in CTAs. This observation was consistently validated during interviews.

Concluding this section, we move forward to explore tailored recommendations for specific stakeholders in the next section. Our focus will be on actionable insights aimed at advancing and ensuring the success of CEIs.



7 Outlook and Recommendations

Derived from our comprehensive case study analysis, we suggest tailored recommendations for various stages of Community Energy Initiatives (CEIs). This includes guidance for CEIs in general, emerging and consolidated ECs, and emerging and consolidated CTAs. Additionally, we provide specific insights for policy makers. This structured advice is closely tied to the factors discussed in Section 6, offering a nuanced understanding of what shapes the emergence and consolidation of CEIs.

7.1 For the founders of new Collective Energy Initiatives:

- *Think carefully which is the best fitting organisational form of the initiative:* Within this work we distinguish specifically between Energy Communities and Collective Targeted Actions, whereby the former has a strong democratic and non-profit orientation, strong focus on community aspects and typically evolves in rural regions. The latter one has a stronger focus on commercialisation, accompanied by usually a more hierarchic organisation, less focus on internal communication and typically is more fitting in urban areas.
- *Make sure to secure legal expertise in an early phase:* Existing CEIs constantly report that one of the biggest barriers they have to overcome is to deal with the often complex and complicated regulatory barriers associated with the energy system in general, and citizen-driven energy initiatives specifically. Make sure to either have legal expertise within your initiative (preferable, since this secures constant availability of experts and reduces the risk of additional costs to hire experts), or to establish contact to organisations that can provide support. In almost all European countries there exist state-driven support-centres as well as networking organisations.
- *Make sure to secure financial expertise in an early phase:* The second big challenge for CEIs constantly reported is to ensure funding and to develop a sustainable business model. There are a broad variety of fundings and subsidies available, amongst others specific fundings dedicated for the development of ECs, fundings for specific sustainable technology support, fundings for regional development. Since not all fundings are available for all kinds of organisational forms in the same manner, it is important to identify on-time what fundings seem to be most promising for the initiative's goals and to organise accordingly.
- *Aim to develop a business model that doesn't rely strongly on specific public funding:* Many existing CEIs express having experienced unexpected changes in available amounts of fundings and regulations associated with these fundings, sometimes making them not eligible anymore for the funding. To be more resilient against such changes it is advisable to develop business models that are only to a small degree dependent on public fundings of specific kinds. This can be done by diversifying the type of services provided, which - apart from generating, storing and sharing energy - very often consists in selling products and/or services to non-community members. Such services can be selling energy, offering consultancy for other communities or private residents, doing installations of energy systems, building e-charging infrastructure and many more.
- *Embrace government-supported technologies and push for the inclusion of other sustainable options to ensure both immediate financial support and long-term innovation:* Public funding, according to our research results, very often focusses on specific technologies especially solar-based solutions. Focussing on these specific technologies, therefore might give access to more funding opportunities. Simultaneously, initiatives should advocate for broader government support to explore alternative technologies,



fostering innovation and addressing specific geographical challenges for a more diverse and resilient energy landscape.

7.2 For the founders of new Energy Communities:

- *Emphasise the community's contribution to climate-change prevention and independence from the big players in the energy-system:* While becoming more sustainable was not strongly emphasised by the community representative interviewees, the members in the survey expressed it as the most important motive for joining their community. This topic therefore should not be underestimated when communicating advantages of communities. Furthermore, especially since the recent energy crisis, we can see a stronger expression of the wish of becoming more independent from fluctuations in the energy system. Thereby the motivation seems to be less on reducing the own energy bill (typically much lower prices than commercial suppliers cannot be provided by ECs), but the knowledge of having a reliable energy provider (that will stick with its members/customers also in case of changes in the energy-system) and a less market-dependent and better predictable development of the energy prices.
- *Try to secure private fundings:* A majority of the successful ECs we examined were able to secure a significant amount of private funding, typically through their members, at the beginning of their journey. This money typically is connected to less conditions such as formal organisational forms than public funding which is especially beneficial for emerging communities which often might not yet have established the necessary organisational form and/or expertise to apply for public funding.
- *Identify and engage with strong leaders:* Try to identify and commit people from the community who are considered trust-worthy and able to drive development. We have seen in several communities that if such leaders are part of the core-team of developing initiatives, they can strongly increase the chances of initiatives becoming successful and attract more members.
- *Establish a strong relationship with public authorities:* Lack of information on regulatory and legislative aspects as well as difficulties and delays in the communication with public authorities were named multiple times as major barriers for emerging communities. Therefore, it is important to establish regular information exchanges with relevant authorities and to know who is responsible and can provide support for specific topics.
- *Focus on a strong, open and transparent communication with the members:* Frequent interaction and the feeling of being accepted as part of the group is a strong motive for members to become and stay active. Be aware of the fact and keep in mind that the members are the most important resource of an EC.
- *Be aware of external factors relevant for the emerging community:* Establishment of ECs sometimes are hindered by factors beyond their control, as for example problems with grid stabilization might lead to a restriction of the expansion of renewable energies, or other communal organisations (like tourism associations) might oppose plans of the EC due to conflicting interests.

7.3 For the representatives of existing Energy Communities:

- *Focus strongly on internal communication and community-activities:* We have observed that many EC-members express the possibility to do things together with other members as a value in itself. To provide sufficient opportunities for the members to exchange, discuss and feel as contributing to the community should therefore be a priority for all ECs to keep members engaged and active. Furthermore, it often seems easier to implement actions that are considered as driven by the whole community.



- *Strengthen sense of belonging among members:* We have repeatedly observed that a strong sense of belonging to the group is a strong motive for members to stay active and engaged. Therefore, try to strengthen that feeling.
- *Establish a supportive and trustful relationship with all members:* As with sense of community, successful ECs maintain a respectful relationship among members and between members and core team.
- *Provide benefits for your members (apart from financial benefits):* Providing non-financial benefits prove in many ECs as valuable to keep members motivated and engaged. Such benefits very often can be services provided like consulting on how to optimise energy-use or how to use specific technical devices, but also doing group-activities.
- *Be aware that regulatory frameworks might change:* This aspect is regularly reported as main slowing factors for communities. Changes in regulatory frameworks for example might restrict the excess to certain funding possibilities. Be aware of this problematic situation and always try to have a mitigation strategy. Such strategies can be to diversify the offered services as well as using private and public funding and applying simultaneously for different funding sources.
- *Be aware that administrative procedures might take a long time:* Long-lasting administrative procedures (e.g. receiving permission for new technical installations) might take a long time. Plan therefore with as much buffer as possible when relying on administrative decisions. Furthermore, try to plan your working tasks in a way that produce as little idling as possible while you are waiting for administrative feedback.
- *Establish a good relationship with the people in the region you are operating in:* Successful ECs very often seek to actively contribute to the development of the region they are situated in, by supporting (free or cheap) services for locals or contributing to (sustainable) goals the region has set. If the community is seen as an important and trustworthy stakeholder by the locals, a lot of resistance against their actions is reduced or diminished.

7.4 For the founders of new Collective Targeted Actions :

- *Reassess your strategy to ensure inclusivity:* The survey results, indicating that 90 percent of CTA participants come from households with at least an average income, underscore the potential mismatch between the intended and actual beneficiaries of the initiatives. Considering the significant focus of CTAs on *reducing energy-related expenses*, there is a need to evaluate and refine outreach efforts to *better target and support those who would benefit the most*.
- *Emphasise the crucial significance of minimizing energy costs and attaining self-sufficiency:* Both case study representatives and the CTAs' participants recognise the importance of reducing energy expenses and achieving self-sufficiency as driving factors in the establishment of their respective initiatives. As the founders engage with potential participants, it is essential to prioritize these two aspects. This strategic emphasis ensures that the messaging aligns closely with the motivations driving individuals to participate in CTAs, fostering a more effective and targeted outreach.
- *Explore alternative financial strategies:* The limited adaptability of publicly funded projects and the difficulty in establishing sustainable long-term business models highlights the need for diversification. CTAs should actively seek alternative funding sources, including private partnerships or community-driven (private) financing. This strategic shift towards diversified funding streams and financial innovation aligns with the challenges highlighted by the interviewees and survey respondents.



- *Address the challenges related to regulations and bureaucracy by implementing enhanced communication efforts with public authorities:* Bureaucratic barriers and missing support by authorities represent the highest figures among all barriers, with 29 percent of survey respondents identifying the *need for more support in dealing with bureaucratic obstacles*. To improve this aspect, initiatives should consider, from the outset, *establishing proactive engagement channels with relevant authorities*. Building stronger connections and fostering open communication can facilitate a better understanding of the challenges faced by CTAs. Additionally, initiatives should explore *advocacy efforts* aimed at highlighting the positive contributions of CTAs and seeking increased support from authorities. By actively addressing these concerns, initiatives can contribute to creating a more conducive regulatory environment for their operations.
- *Emphasise open communication, transparency and strengthen community engagement with participants from the outset.* Initiatives should prioritize transparently communicating successes and achievements to increase awareness and build trust among locals. This involves not only addressing financial needs but also highlighting the *positive impact and value generated by the CTA*. Additionally, a strategic emphasis on external visibility through various communication channels will enhance engagement and support from citizens. Open and clear communication plays a pivotal role in bridging gaps, addressing concerns, and fostering a sense of trust and partnership within the regional community.

7.5 For the representatives of existing Collective Targeted Actions:

- *Focus on highlighting the collective benefits of joint efforts:* Our research shows that locals prefer individual solutions over collective actions to address rising energy prices (i.e. through adjusting heating methods). Consolidated CTAs should improve their communication to effectively highlight the benefits of collective actions, such as opportunities for group purchase discounts on modern heating alternatives, encouraging locals to unite for more impactful and sustainable outcomes over individual solutions.
- *Address regulatory challenges by proactively enhancing communication with public authorities:* Initiatives should establish engagement channels, fostering open communication and advocating for increased support from authorities. This proactive approach will contribute to creating a more conducive regulatory environment for CTAs.
- *Increase awareness and knowledge about alternative technologies:* within CTAs. While PV panels are commonly chosen based on alignment with geographical locations and available funding, addressing the lack of knowledge about alternative technologies is crucial. Initiatives should actively seek information and resources to explore diverse technical solutions beyond PV panels, ensuring a well-informed and comprehensive approach to technology selection and implementation.
- *Enhance communication strategies to address challenges in effectively engaging citizens and portraying the project as a positive contribution to the community:* Initiatives should invest in clear and inclusive communication methods, emphasising the positive impact of the project on the community. This approach will foster understanding and support among citizens, ensuring a more favourable perception of the initiative.

7.6 For policy makers:

- *Recognize the diversity among CEIs, acknowledging that they encompass not only Energy Communities but various forms with distinct motivations and challenges of their participants:* Develop communication strategies that account for this diversity, tailoring



messages to resonate with the unique motivations and concerns of different groups. This inclusive approach ensures that policies and communications effectively address the diverse landscape of CEIs, fostering greater engagement and support across a spectrum of community-driven projects.

- *Strengthen the emphasis on addressing energy poverty within Energy Communities:* Consider implementing measures such as providing a long-term guaranteed electricity tariff to offer members security. Additionally, offer low-threshold and confidential consultancy services to optimize energy use and explore alternative ways to reduce energy bills. This focused approach can enhance the effectiveness of ECs in mitigating energy poverty among their members.
- *Facilitate the transition from planning to action:* While CTAs acknowledge energy poverty in their goals, there is a gap in practical implementation, especially given the preference for individual solutions. Policy makers should explore tailored programs and financial assistance initiatives. This ensures that the impact of collective efforts extends to those facing economic challenges in the energy transition, aligning practical strategies with the recognized goal of addressing energy poverty.
- *Streamline bureaucratic processes by implementing policies that prioritize simplicity, transparency, and efficiency:* Establish clear guidelines for CEIs in your area, reducing unnecessary administrative hurdles. Additionally, promote the use of digital platforms to facilitate smoother interactions between initiatives and relevant authorities, ensuring a more agile and accessible regulatory environment for community-driven energy projects.
- *Implement subsidy programs that support various technology options for CEIs:* Ensure clear communication of these subsidies to initiatives, providing detailed information on eligibility criteria and application procedures. This approach encourages diversity in technology adoption and promotes informed decision-making within the community-driven energy sector, contributing to a more inclusive and innovative energy landscape.



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Annex 1: Interview Guidelines

Name of the case study:
Overall research questions: What factors, together and separately, contribute to the emergence and consolidation of Collective Energy Initiatives (CEI)? What are important criteria of success for CEIs?
Topics for more detailed investigation
<p>1. Energy poverty [core topic]</p> <p><i><u>Background:</u> Besides greenhouse gas emissions, energy poverty is among the top issues where great expectations rest on the future role of CEIs. However, if a CEI is socially exclusive (e.g. due to upfront-investments that need to be made to join the initiative), its potential for tackling energy poverty could be small. Insights regarding this kind of dynamics provides a better understanding about the role of the respective CEI in relation to energy poverty.</i></p> <p>We found in our previous analysis that energy poverty has led to the emergence or consolidation of CEIs. To what degree is this true for your particular context?</p> <p><i><u>Example questions:</u> How energy poverty played a role in encouraging or hindering the creation or sustainability of the CEI? Why or why not? <i>Energy poverty means that people are heating or cooling or using electricity less than they would prefer, because they cannot afford a more intense use. Has this topic any relevance for the initiative? Do you already include or is there a plan to include energy poor household? Does one need a certain level of financial means to join / participate? Are there specific financing schemes for people with low income? If a higher amount of your members would have problems with affording enough energy, would that change anything in your initiative?</i></i></p>
<p>2. Political, social and economic setting, special focus energy prices [core topic]</p> <p><i><u>Background:</u> Energy prices play a role not only for households concerned by (energy) poverty, but may influence behaviour and decision making of nearly all individuals. Better knowledge about the general role of energy prices for the CEIs activities</i></p> <p><i>We found in our previous analysis that energy prices have played an important role in leading to the creation of CEIs in some areas. In some cases, the creation was a direct reaction to increasing energy prices. Energy prices play a role not only for households concerned by (energy) poverty, but may influence behaviour and decision making of nearly all individuals.</i></p> <p><i><u>Example questions:</u> Do you see similar dynamics or relationships between these issues in your context? Do you know what the electricity and gas prices were when the initiative was created? How high are they now? Are they a motivating factor for the participants to join? How much are you influenced by prices? How does the political situation in your country influence your work?</i></p>
<p>3. Planned and achieved impact [core topic]</p>



Background: The aim to achieve an impact (environmental, social, economic etc.) is implicitly or explicitly present in many CEIs. Presence or lack of common goals can be a decisive factor for cohesion and collective efficacy. Better understanding the role of impact related goals might provide valuable orientation for the emergence, consolidation and upscaling of CEIs.

We found in our previous analysis, that the degree to which initiatives explicitly formulate concrete impacts and measure the progress towards reaching them, varies strongly. Some initiatives have not formulated concrete impacts they want to achieve at all, others have very detailed plans. We wonder how this aspect supports or hinders the development of initiatives. Having explicit impacts in mind, might help to get the people on board and working that are dedicated to reach these impacts. On the other hand, it might hinder people from joining that might have other goals (which nevertheless might be targeted by the initiative).

Examples: How is it in your initiative? Do you have concrete goals that you want to achieve? How much are you planning your activities in orientation to these goals? Are you measuring if you are progressing toward your goals? Are the goals always the same or do they change? What is your opinion, is it better to have clear goals to follow or no or vague goals to stay flexible? Would you prefer to have clearer goals in your initiative? Do all your members also know those goals? Are they also discussed and refined according to feedback? What do you think, does the fact that you have or do not have such goals help the establishment of your initiative or is it more a hindering factor?

4. Regulation [core topic]

Background: Regulatory framework conditions are usually outcomes of complex balancing and decision making. Consequently, some regulatory conditions may reflect unintended consequences and unnecessarily complicate the activities of CEIs. Thus, better knowledge about regulatory barriers might support future policy and regulation related decision-making.

In our previous analysis, we found, that regulations and how they are handled was named as one of the main barriers initiatives encounter when establishing as well as consolidate their initiatives.

Examples: How is it in your initiative? Is the field of activity of your initiative subject to regulation? If so, how? Are there any regulatory barriers for technologies implemented/used by CEI? What other regulatory barriers do you see? How should the regulatory framework change to make your work as CEI easier? Do you have special staff in your initiative to deal with regulatory aspects? How do you learn about new regulatory aspects and how do you usually react to them in your initiative?

5. Funding / subsidies / business model [core topic]

Background: Generally, CEIs expected to be transformed into a state where they can proceed with their activities even without continued funding / subsidies. For this case, they need a “business model” that allows continued operations. Shedding light on this dimension allow us to better contextualize members’ responses about the 10-year future perspective of the CEI (covered by the survey) and the planned/achieved impact related information.

In our previous analysis we found, that the issue of financing was named most often as the most important aspect when it comes to improvement potential and the consolidation of an initiative.



Examples: How is it in your initiative? Do your initiative already have a clear idea on how it will be financed short- middle, and long-term? Did your CEI use EU funding (i.e. through Horizon projects etc.) and/or national funding? What role does public funding play for the future in your initiative? Can you continue your activities without further funding/ subsidies? How does the respective “business model” look? What subsidies are available to members / participants? Do you think the amount of subsidies are an important aspect for your members or are they joining and staying for other reasons?

6. **Community Culture** [core topic]

Background: The community culture can be a decisive factor for the experience and satisfaction of members. Creating a better understanding for this sphere helps us to contextualize barriers and issues the CEI is facing.

From our previous research we know that the way a community communicates and decides as well as aspects of being together with other people can be an important motive for people to become member and stay in an initiative and with that for the consolidation of that initiative.

Examples: How is that in your community?

Would you prefer to include your members more or less in the communication and decision process? How often do you exchange on a formal basis with your initiatives members? How important would you consider these exchanges for the ongoing work of the community? Does that communication help you to understand your members needs and to steer the initiative in a desired direction?

Is it mainly a core team that decides on the most important aspects of the initiative, or do you include a broader basis of the initiative’s members? Do you consider a broader engagement more as advantage (for example more opinions are taken into account) or as hindering for the community (for example it slows down the decision process)?

Do you have any mechanisms in place to assure that you incorporate feedback you get from your members?

Do you consider building trust amongst your members as an important aspect of your initiative? How do you do that (if there is concrete action)?

What do you think, how important are social aspects, like having the chance to exchange and interact with other (similar minded?) people and come-together for the consolidation of your initiative? Are some members probably mainly on board, because they want this exchange or are interested in supporting other people?

7. **Barriers faced by the community** [core topic]

Background: These questions give the interviewee the opportunity to either come back to barriers/issues already touched earlier, or to mention new relevant barriers that were not yet mentioned during the interview.

In our previous research, among bureaucratic and financial barriers, a variety of other barriers were named that might hinder the progress and therefore consolidation of energy initiatives.

Examples: In an overall view, what are the most relevant barriers is your initiative is facing right now, and what future challenges do you see? Do you already have plans how you can overcome current and future barriers? What barriers have you been facing in the past, especially in the foundation phase? How did you overcome them?



8. **Technical aspects** [core topic]

Background: The technologies chosen by the CEI strongly reflect the “material culture” aspect of the “energy cultures” framework we are using. Creating a more detailed insight into this dimension allows us to link the CEI’s technology related decisions and considerations with all other context conditions and driving/hindering factors, and to generate a holistic picture of the CEI and its “energy culture”.

From our previous research we know, that especially Photovoltaic applications are very often chosen as main technical feature in many initiatives, which makes us wonder, what aspects make this application more interesting for energy initiatives and probably most suitable for the emergence and consolidation of initiatives.

Examples: How is it in your initiative? Why was the specific technology chosen by the CEI? Why did you choose them? Did it prove challenging to the members? Were they offered help / training in understanding it? Have the members received any energy advice? How much does the general perception of certain technologies influence your work? Are there any other technologies you want to use but haven’t done yet? If so, why not? Are you expecting any concrete problems? Do you think that certain in general certain technologies can be easier used by energy initiatives of a certain type (like energy communities)? If so, why?

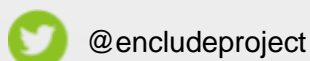
PARTICIPANTS



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