



ENCLUDE

Energy Citizens for Inclusive
Decarbonization

D3.1 – Report on survey and structured interview results for identifying potential emergence and consolidation factors

WP3 – Contextualising the emergence
and consolidation of energy citizen-

14.06.2023

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ENCLUDE PROJECT & DELIVERABLE PROFILE

Project Acronym and Full Name:	ENCLUDE - Energy Citizens for Inclusive Decarbonization
Grant Agreement No.:	101022791
Programme:	H2020-EU.3.3.6. - Robust Decision Making and Public Engagement
Topic:	LC-SC3-CC-1-2018-2019-2020 – Social Sciences and Humanities (SSH) aspects of the Clean-Energy Transition
Funding Type:	RIA - Research and Innovation Action
Deliverable:	D3.1 – Report on survey and structured interview results for identifying potential emergence and consolidation
Work Package:	Contextualising the emergence and consolidation of energy citizenship
Deliverable Due Date:	Project month 24 (31/05/2023)
Actual Date of Submission:	14/06/2023
Dissemination Level:	Public
Lead Beneficiary:	Joanneum Research, Th!nk E
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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 with the ethical approval for the fieldwork, the preparation of the report was slightly delayed. This led to the deliverable being submitted two weeks later than 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 – first of two 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 part of the ENCLUDE project focuses on the emergence and consolidation of collective energy initiatives, aiming to understand the factors contributing to energy citizenship from a group-centered sociological perspective. Two frameworks, Energy Cultures and the Socio-Ecological Systems Framework for Integrated Community Energy Systems, are used to identify influential factors within and around communities. The methodology involves a three-stage process: identifying cases, surveying initiative members, and conducting interviews with representatives and experts. The analysis shows a good fit between organizers and participants regarding goals and understanding of initiatives and a relatively low incidence of conflicts, with only 15% of survey respondents indicating any kind of conflicts. Bureaucratic barriers, lack of funding, and lack of support by authorities rank high as barriers and fields for improvement. Regarding social composition, different initiative types attract different but relatively specific citizen groups, emphasizing the need for inclusivity and engaging individuals with various socioeconomic backgrounds. Identifying opportunities to integrate broader and more diverse citizen groups, requires follow-up research to explore push- and pull-factors for different target groups, and additional factors affecting collective energy initiatives and concrete success criteria. Future research may focus on energy poverty, political and economic settings, planned and achieved impact, regulations, funding, community culture, barriers faced by communities, and members' relationship with technologies. The presented findings provide valuable starting points for in-depth work into these factors and may thereby help in shaping collective energy initiatives, emphasizing inclusivity, community culture, and addressing barriers for a just and inclusive energy transition.

Evidence of accomplishment

This report serves as evidence of accomplishment.



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Executive Summary

This deliverable presents an analysis of various factors that could potentially contribute to the emergence and consolidation of different expressions of energy citizenship from a group-centered sociological perspective. We collected data from 78 case studies in Europe, Africa, and Canada to understand the needs and attitudes of energy transition actors at both the individual and collective levels. To determine the most relevant factors, we utilized the Energy Cultures Framework and the Socio-Ecological Systems Framework for Integrated Community Energy Systems. In this report, we propose a typology for Collective Energy Initiatives (CEIs) and provide an analysis of the survey administered to members and participants of these initiatives.

The four types identified are as follows:

1. **Energy Communities:** These are characterized by shared ownership and a strong emphasis on community aspects.
2. **Collective Targeted Actions:** These have less democratic structures compared to Energy Communities and place a stronger focus on individual benefits for involved citizens, both financially and otherwise.
3. **Political and Social Movements:** These are usually not directly involved as actors in the energy sector but aim to influence policy makers toward specific (energy-related) goals.
4. **Testing Conditions:** These involve a low level of citizen involvement and primarily focus on testing new technical solutions in the energy sector.

The case studies provide examples of successful CEIs and highlight the importance of factors such as strong leadership, effective communication, and collaboration with other stakeholders. While there is no one-size-fits-all approach to promoting energy citizenship, the case studies offer valuable insights into strategies and practices that have been successful in different contexts.

The Survey Analysis section presents the results of the survey administered to members and participants of CEIs. The survey found that the most common motivation for joining energy communities and collective targeted actions was the desire to contribute to climate protection and environmental sustainability. In contrast, members of political and social movements were more strongly driven by the concrete goals of their movements, such as preventing the construction of power plants in the analyzed cases. The survey also revealed that members of energy communities and collective targeted actions tend to be highly educated and politically active, with a strong sense of community and social responsibility. However, there is still significant potential to involve all citizen groups in achieving a just transition. Additionally, the survey identified regulatory and financial barriers as the most common obstacles in CEIs.

The report concludes that CEIs have the potential to play a crucial role in promoting energy citizenship and empowering citizens to actively participate in the energy transition. It emphasizes the need for further research and collaboration to build upon the findings presented in this deliverable and develop effective strategies for promoting energy citizenship at the local, national, and international levels.



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 Europe, Canada, and Africa. 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 sociological perspective, to identify the most important processes and factors affecting the emergence and consolidation of energy citizenship groups. Furthermore, the pool serves as a study source and reference framework for the whole project's analyses.

The work collectively undertaken in these tasks will be presented in two parts of this deliverable. The first part of this report presents the results of the case studies' data collection and analysis. We propose a typology for Collective Energy Initiatives (CEI). In the second part, we show the results of a survey carried out across different case studies. A second report (deliverable 3.2 "Report on emergence and consolidation factors and their trade-offs"¹) will build on the work of this deliverable and drawing from all four tasks in the WP forward comprehensive conclusions on how collective energy initiatives can support the active engagement of citizens in the energy sector and how this engagement can be further developed.

Finally, this report is divided into six 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.
- 3 – Case study pool analysis, provides detailed analysis of the data collected in the case studies pool.
- 4 – Survey analysis, provides detailed analysis of the data collected through the survey across selected case studies.
- 5 – Conclusions and outlook, summarizes the key findings of the report and position them in relation to related ongoing work and to the work of the ENCLUDE project as a whole.

¹ Due month 30 of the project.



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 **actions**. To better understand this emergence and consolidation, we aim to identify a broad variety of factors within and outside of communities that have the theoretical 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 originally was developed by Stephenson et al. (2010)². 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 in order 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 distinctive clusters of knowledge, belief, behaviour and material objects exist, which influence how energy is used. Also, it is assumed that 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** initiative, is that it focusses 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)³.

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

² 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>

³ 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>



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 take into account 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 linking them to 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.

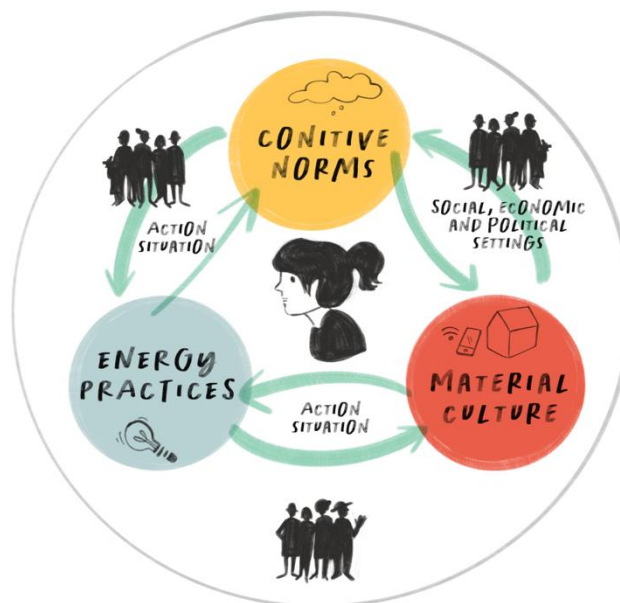


Figure 1. The WP3 theoretical framework. The Energy Cultures Framework is depicted in yellow (Cognitive norms), red (Material culture), blue (Energy practices). The links established through the Socio-Ecological Systems Framework for Integrated Community Energy Systems are drawn with green arrows.



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, North America and Africa, 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 aims to capture the individual perspective of the members⁴ or participants⁵ of the initiatives to better understand a) what characterises those members and therefore might be especially relevant for the emergence of new initiatives and the identification of potential target groups for consolidated initiatives and b) to better understand their view on their initiative to be able to derive relevant information about how to improve initiatives. To do so, we collected the members' views via an online survey (more information below).

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 own special knowledge regarding the identified topics. The results of this deep dive will be presented in the second deliverable.

3.2 Methodology Case Study Pool

WP3 aims to gather information from 78 case studies from Europe (68), Africa (4) and North America (6). The task gathered some preliminary characteristic qualities of these initiatives, as well as conditions associated with them. 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 Section 5 of this deliverable.

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). Overall, we were able to identify 68 European, six North American (Canadian) and four African cases.

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

⁴ Members are defined in this report (section 4.1.4) as “involved at least partially in the decision-making of the group (e.g., by voting in the General Assembly)”.

⁵ Participants are defined in this report (section 4.1.4) as “not involved in the decision-making process (only exerting power by threatening to abandon the initiative)”.



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),
- Type of citizen participation (according to the pyramid of degree of participation),
- 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,
- 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.

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. It has been initially foreseen that the anonymised case studies pool will be published after the end of the project. We can thus conclude that the aim of Task 3.1 has been achieved.

The WP3 team has already 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)⁶ and saturation considerations suggested by Aldiabat & Le Navenec, (2018)⁷. 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

⁶ Glaser, B., & Strauss, A. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Mill Valley, CA: Sociology Press.

⁷ 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>



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 this analysis were published in the WP3 leaflet, ready to download from the [project website](#).

3.3 Methodology Questionnaire

Aim of Task 3.2 was to deepen the understanding of factors and processes associated with the emergence and consolidation of energy initiatives, and to gather information on barriers and enablers of energy actions from the perspective of individuals as well as on personal backgrounds of citizens taking part 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 help us to better understand if people in different forms of initiatives differ in their personal background (e.g., education, income, etc.). This information can be used for emerging citizen initiatives to better understand on what population groups to focus first. For the consolidation of citizen initiatives, it allows to derive recommendations on potential additional target groups (who are not yet strongly involved). If we see for example, that women typically are not strongly involved in a certain type of initiatives, well-established initiatives might aim at focussing more strongly on their needs to gain further members or participants.
- 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. This allows for emerging initiatives as well as for consolidated ones to better understand on what to focus communication (internally as well as externally) as well as mission and vision on. If we see for example, that for a specific type of initiative general climate-change action doesn't play an important role, initiatives of this kind should focus on other aspects in their communication.
- Energy practices: Climate-related behaviour patterns that changed after joining an initiative. This allows to determine co-benefits of joining initiatives and recommendations on what additional services initiatives possibly can successfully provide for their members. If we see, for example, that members of energy communities typically change their transportation patterns towards e-mobility, providing charging services can be a relevant additional service.
- Reasons for joining the initiative: This allows to understand better the motives of people for joining an initiative. Potential reasons span from saving money, over climate-concerns to comfort improvement.
- 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 aim to better understand the barriers different types of initiatives are facing from the point of view of the members of this initiative.



- Perceived conflicts: Conflicts between members or between members and core staff might be an important aspect that contributes to the emergence and especially consolidation of initiatives. Therefore, we asked for frequency, intensity and topics of conflicts as perceived by the members.
- Transparency of decision-making: Another aspect of communication that might influence the emergence and consolidation of an initiative is how transparent decisions that are made are communicated to the members and participants.
- Improvement potential of initiative: This question asks for the aspects, for which the members see the highest potential for improvement and therefore as an important factor for the consolidation of the initiative.
- Future of the initiative: To get an impression how sustainable the members/participants see their initiative, we asked what they think how the initiative will develop during the next ten years in terms of growth.
- Exclusivity of initiatives: Often energy initiatives are seen as something which is only for a certain type of people in a society (e.g., higher educated people with good income and much free time). We asked the members/participants, if they see similar patterns in their initiative.
- Benefits from initiative: With this question we identified the benefits members of the initiatives see because of their membership. Answer options rank from becoming more pro-environmental, to energy and money saving, to social benefits, to knowledge gains.

For these topics, standardised 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. In some cases (e.g., Estonian) we collected feedback from case representatives from the case study pool to adapt the questions.

An online questionnaire was then created with the opensource software “Limesurvey”, allowing free choice of the language among the covered ones. The graphic design was optimised and adapted to the ENCLUDE corporate identity. Individualised 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.

In the next step, we performed data cleansing and plausibility checks and then made the data available for all relevant project partners, especially WP4 and WP5 while starting our own analysis (see chapter 6 survey results).



4. Case study pool analysis

As mentioned in the methodology section above, WP3 aims to gather information from 78 case studies from Europe (68), Africa (4) and North America (6). However, in this deliverable, we analyse the data gathered from the European case studies only. Analysis of the Canadian and African case studies will be included in the next deliverable of this Work Package, as further conceptualisation of the cases, including interviews with the case studies' representatives, is needed.

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:
 - its main activity involves the production, storage, distribution or optimisation of sustainable energy, including sustainable farming practices that reduce energy and water needs,
 - the ownership of assets is rather equally shared between members of the case,
 - community aspects are central to the case, such as clear rules for decision making and choosing of leadership, clearly defined roles, and democratic participation,
 - financial gains are secondary.
- 2) Collective Targeted Actions (CTAs):** We consider a case as this type if:
 - 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
 - participants have very limited contribution to the decision making / participation is not primarily based on the principles of community, and
 - financial aspects could potentially play an important role.
- 3) Political and Social Movements (PMs):** We consider a case as this type if:
 - its main aim is to influence policy makers towards certain goals connected to energy production, distribution, storage, or optimisation; and
 - no technical projects are implemented.

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

- 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.



4.1 General information

This section of the report provides a more in-depth look at the Collective Energy Initiatives' (CEIs) basic features such as their geographical location, size of the location of origin, start and end of the activity as well as the size of the group (number of members or participants).

4.1.1 Geographical location

The WP3 case studies, referred to as the Collective Energy Initiatives (CEIs) are present in 17 countries in Europe (Austria, Belgium, Croatia, Denmark, Estonia, France, Germany, Greece, Ireland, the Netherlands, North Macedonia, Portugal, Romania, Slovenia, Spain, Turkey, the UK), three countries in Africa (Ghana, Niger, Zambia) and one in North America (Canada).

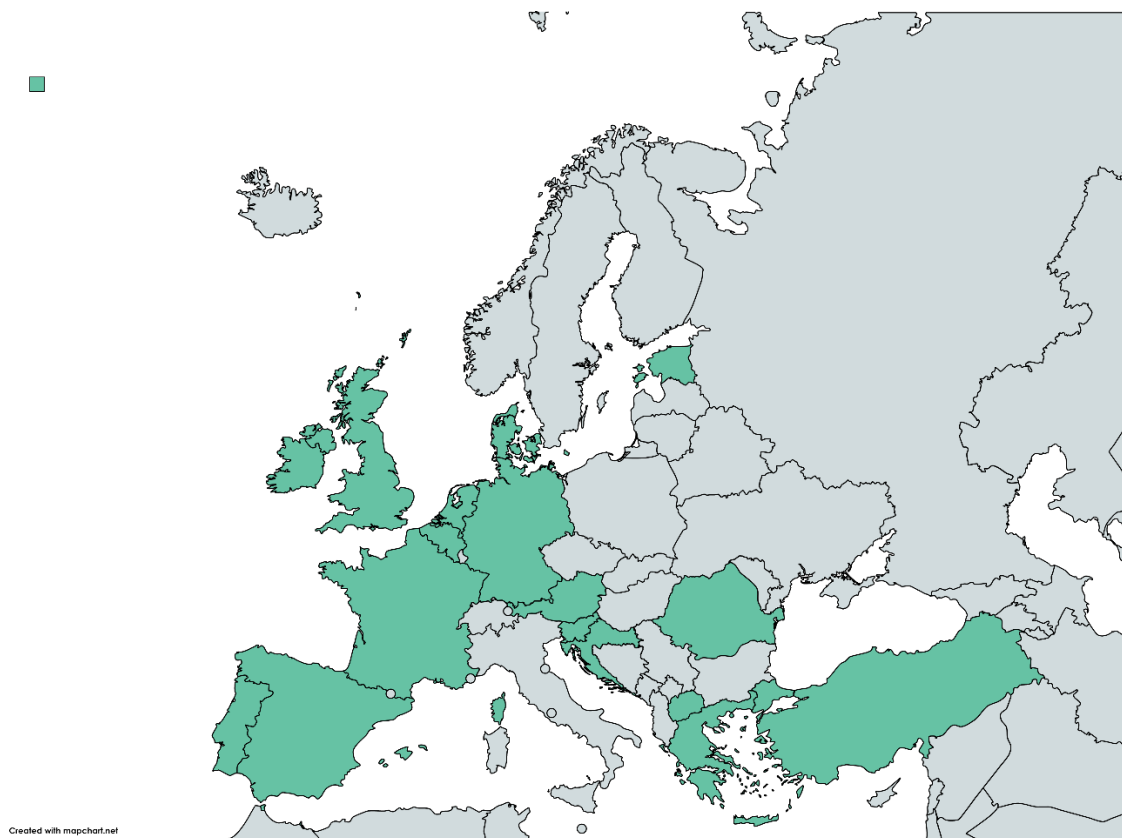


Figure 2 Geographical location of the European CEIs

4.1.2 Size of the location of origin

To understand whether the size of the location of origin of the CEI (whether a small village, big city or the whole country) is linked to the creation of different types of initiatives, the locations of origin of the CEIs were classified in the following groups:

- Village or small town: <10.000 inhabitants
- Medium town: 10.000-50.000
- Small to medium city: 50.000-500.000
- Large city: >500.000 / Active in the whole region or country

It has been noticed that most of the CEIs were created either in villages or small towns, or in large cities.

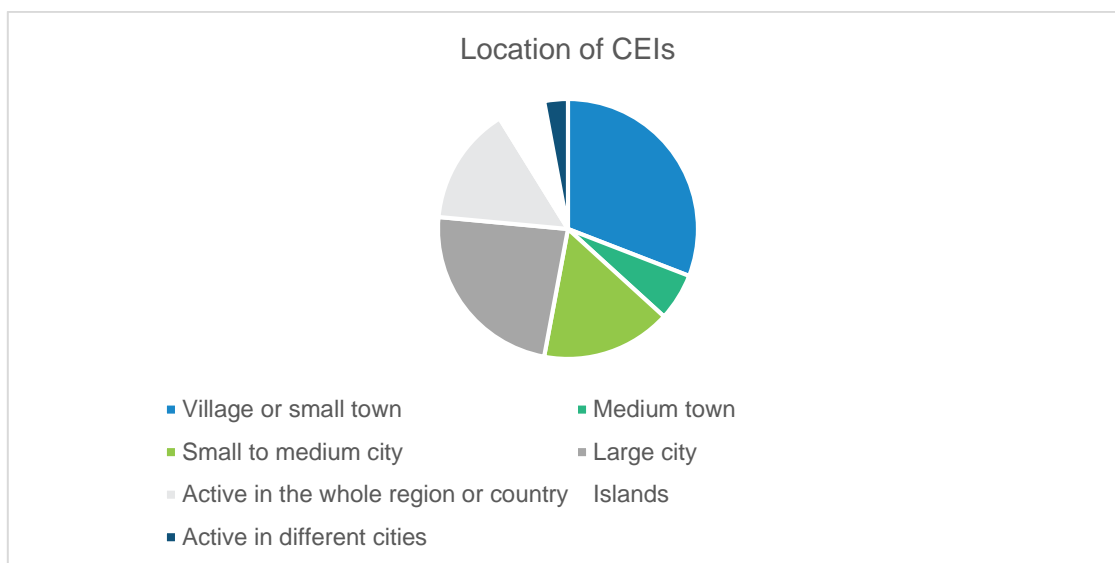


Figure 3 Size of the location of origin of the CEIs

In Table 1 below, we provide result for the four types of CEIs (ECs, CTAs, PMs and TCs). It has been observed that almost half of the ECs were created and are active in villages or small towns, including three out of the four islandic ECs, which are located on islands below 10.000 inhabitants. On the contrary, a large majority of CTAs are active in cities (small to large) or cover an entire region or the country. We can conclude that while the ECs in the pool are rather located in rural areas where there is in general a higher sense of community, the CTAs are rather established in cities above 50.000 inhabitants.

	Village or small town (< 10,000)	Medium town: 10,000-50,000	Small to medium city: 50,000-500,000	Large city: >500,000 / Active in the whole region or country
EC	14	3	3	13
EC-islands	3	0	1	0
CTA	4	0	7	12
PM	3	0	0	1
TC	0	1	1	2

Table 1 Size of the location of origin per CEI type

4.1.3 Start and end of the initiative

	Energy Communities and Eco-farms	Collective Targeted Actions	Political and Social Movements	Testing Conditions
1930 – 1990	1	0	0	0
1991 – 2000	2	1	0	0
2001 – 2010	7	2	1	0



2011 – 2020	24	18	3	4
2021 – 2022	3	1	0	0

Table 2 Creation of CEIs

As shown in Table 2 above, most of the CEIs were established in the period 2011-2020. These findings coincide with the research results presented in the scientific literature⁸. For instance, Germany saw a boom in the foundation of energy cooperatives in the aftermath of the Fukushima disaster in 2011. Moreover, the country has noted the highest number of energy cooperatives in 2018. In 2010, the UK has seen an important increase in the number of cooperatives following the introduction of feed-in tariffs in 2010.

In reference to A. Wierling *et al.*'s work⁹, another spike can be noted in early 2000s, when the new field of activities such as the provision of broadband internet access, e-mobility and car sharing were made accessible.

It is noteworthy that a large majority of our CEIs are still operating. All the ECs are functioning, seven of the 23 CTAs have already come to an end, two PM and two TC have also ended.

4.1.4 Size of the group

To examine whether the size of the CEI has an impact on its emergence and/or consolidation, we explored data from existing documents about the number of citizens involved in the initiatives. It is noteworthy that other types of stakeholders, such as local authorities or private actors were not investigated. To ensure the robustness of the results and based on the respondents' answers, we included two types of involvement, *i.e.*, membership and participation.

- Members: involved at least partially in the decision-making of the group (e.g., by voting in the General Assembly).
- Participants: not involved in the decision-making process (only exerting power by threatening to abandon the initiative).

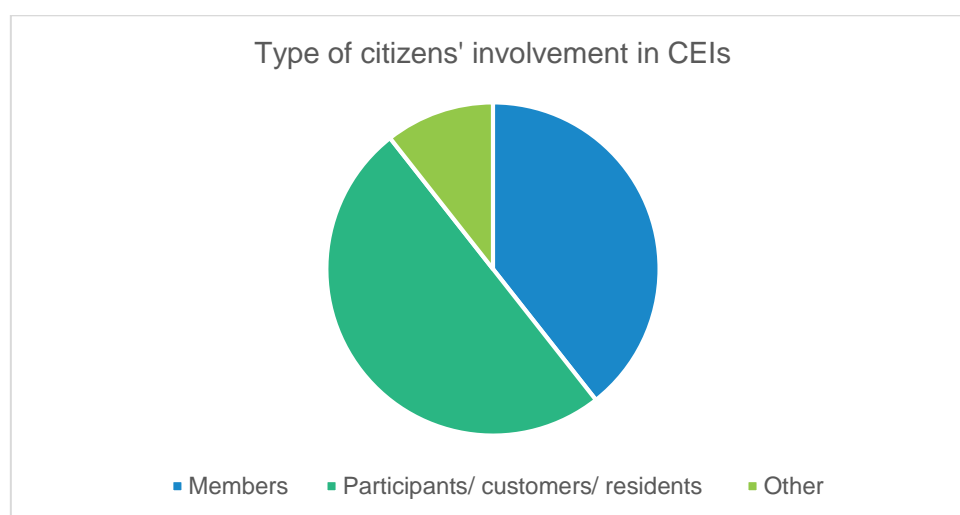


Figure 4 Type of citizens' involvement in CEIs

⁸ Wierling, A., Schwanitz, V.J., Zeiß, J.P., Bout, C., Candelise, C., Gilcrease, W. & Gregg J.S. (2018). Statistical Evidence on the Role of Energy Cooperatives for the Energy Transition in European Countries, *Sustainability*, 10(9): 3339. <https://doi.org/10.3390/su10093339>

⁹ Ibidem.



Members

Out of 68 European CEIs, 26 describe the citizens' involvement on a membership basis, 24 of which are the ECs and only two are CTAs.

Number of members	Number of CEIs
1-50 members	13 CEIs
51-100 members	4 CEIs
101-200 members	4 CEIs
200 and more members	5 CEIs

Table 3 Number of members in CEIs

13 out of 26 CEIs having members, are all rather small initiatives (1-50 members).

Participants

Out of 68 European CEIs, 35 describe the citizens' involvement on a participative basis, 20 of which are CTAs, ten ECs, three PMs and two TCs.

Number of participants	Number of CEIs
1-100 participants	8 CEIs
101-200 participants	6 CEIs
201-500 participants	3 CEIs
501-1000 participants	5 CEIs
1001-5000 participants	9 CEIs
10000 and/or more participants	4 CEIs

Table 4 Number of participants in CEIs

13 out of 35 CEIs that have participants, have more than thousand participants, five of them have 100.000 or more participants.

It is noteworthy that while only five CEIs have more than 200 members, 21 CEIs have more than 200 participants. In comparison with the ECs, CTAs are larger in terms of participation size (18 out of 35 having 500 participants or more). Two of the CEIs were not investigated, as the citizens are not involved. Data was not available for five CEIs.

4.1.5 Key Insights: General CEI characteristics

Regarding the location of CEIs and considering the emergence of new citizen organizations, we can derive that concepts related to ECs seem more suitable for rural regions, whereas concepts related to CTAs seem to be more suitable for urban regions. For the consolidation and expansion of initiatives, it might be worth to consider how and if the types can be adapted to better fulfil the needs of citizens in the respective environment.

Further, based on the data collected about the start of the CEIs' activities, we can assume that the emergence of CEIs relies either on the development of outside conditions (e.g., regulatory,



economic/financial and technical developments) or on certain societal changes (e.g., rejection of electricity from nuclear power plants in Germany after Fukushima).

Finally, regarding the size of the members/ participants' groups in CEIs, we have seen that while only five CEIs have more than 200 members, 21 CEIs have more than 200 participants. In comparison with the ECs, CTAs are larger in terms of participation size (18 out of 35 having 500 participants or more). These results showcase that the emergence of new initiatives might be strongly dependent on the expected numbers of members and participants: if several hundred people are involved, CTA concepts might be more suitable.

4.2 Socio-Ecological Systems Framework

This section of the report analyses different elements related to the Socio-Ecological Systems Framework, namely Social, Economic and Political Settings, including aspects such as the CEI's social network structure and organisation and decision making, and Action Situation, including insights on communication, conflicts, monitoring and evaluation practices and investment activities.

4.2.1 Social, Economic and Political Settings

4.2.1.1 Social Network Structure

Expert support

Some practitioners and researchers argue that having access to expert knowledge offers support during critical phases and co-design of any local energy initiative¹⁰. To assess whether the emergence and then, consolidation of the CEIs are correlated with the access to expert knowledge, including technical, legal, financial, law and other experts, we asked the case studies representatives' whether their CEIs "can rely on experts".

	Energy Communities and Ecofarms	Collective Targeted Actions	Political and Social Movements	Testing Conditions
Technical Experts	81,3%	86,4%	100%	100%
Marketing Experts	18,8%	18,2%	25,0%	0
Financial Experts	34,4%	22,7%	25,0%	0
Law Experts	62,5%	40,9%	100%	33,3%
Other Experts	37,5%	27,3%	25,0%	100%

Table 52 Expert support in CEIs

As depicted in the Table 5 above, technical expertise is used most by the different types of CEIs, followed by law experts, whereas marketing experts are the least used category. The only exception are the Testing Conditions cases, which rely heavily on technical experts and on "other" experts, mainly scientific researchers.

¹⁰ Hatzl S., Seebauer, S., Fleiß, E. & Posch, A. (2016). Market-based vs. grassroots citizen participation initiatives in photovoltaics: A qualitative comparison of niche development. *Futures*, 78: 57-70. <https://doi.org/10.1016/j.futures.2016.03.022>



ECs use more legal and financial expertise than CTAs, which might be connected with the membership status of the citizens and the ownership of assets being rather equally shared between members of the case.

Local embeddedness

To examine whether there exists a correlation between the local embeddedness and different forms of organisation and ownership in CEIs, we asked the case studies' representatives if their initiatives have a regular interaction “with local authorities” and “with locals outside of the initiative”.

	Energy Communities and Ecofarms	Collective Targeted Actions	Political and Social Movements	Testing Conditions
Regular Interaction	81,3%	86,4%	100%	100%
Co-creation	18,8%	18,2%	25,0%	0

Table 63 CEIs having regular interaction with local authorities

Our results have shown that 80% of ECs and CTAs, and 100% of PMs and TCs report regular interaction with authorities. From this number, 20% of CTAs and ECs and 25% of PMs report even co-creation with local communities (usually meaning that either the authority as a whole or single members of the authority are also member of the case).

It seems that a large majority of all the CEIs interact with local authorities and in the local environment. Those results are particularly interesting in the context of CTAs, which can be implemented not only at a local but also at regional or even national level. It would be thus important to further investigate whether some aspects of those initiatives can be seen as catalysts for the expansion beyond the local level, in a quest for wider social transformation, and be examples of cases which could be easily replicated or scaled up.

Further, we were interested in investigating how often the CEIs are in contact with local groups of the population outside their own community. We distinguish between no interaction (CEI does not interact with people outside the initiative), low interaction (being in sporadic contact with one local group), medium interaction (being either in sporadic contact with more than one local group or in regular contact with one) and high interaction (being in regular contact with more than one outside group).

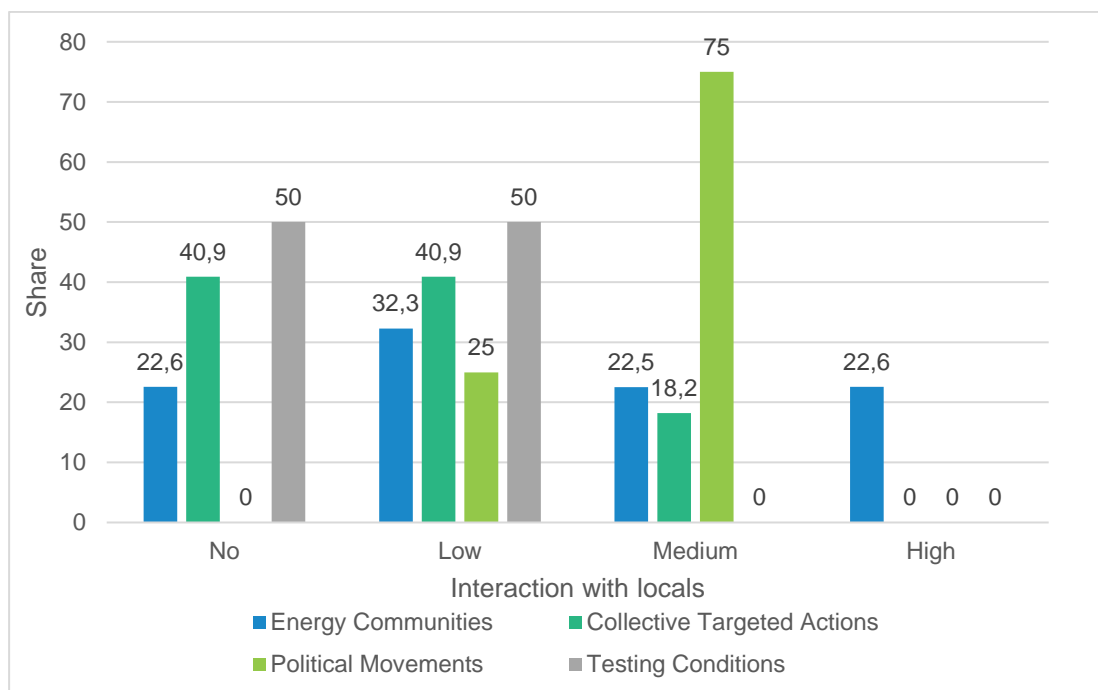


Figure 5 Interaction of CEIs with locals

As depicted in the Figure 5 above, it can be observed that about 75% of CTAs have no regular interaction with the local population, versus 60% of ECs and 50% of PMs. In the case of CTAs, the interaction is sporadic and rather intended to explain the project once at the beginning rather than maintain a constant communication. Cases with high interaction typically support social events of the community or contribute to the community's tasks (e.g., water and waste management).

4.2.1.2 Organisation and Decision Making

The decision-making processes, different types of structure and organization of CEIs might determine their emergence, development and further consolidation. To assess what are the main differences between the CEI's in this regard, we asked the case studies' representatives "how formalized and transparent are the decision making and organizational processes in their CEIs?", "are there specific rules in place on how decisions are made?" and "is there a clear distribution of roles?".

Formalisation of decision-making, leader selection and role distribution

We assumed that, if the case study representative gave negative answers to all three questions, the decision-making processes in the respective CEI are not formalised; if two questions were answered negatively, the degree of formalisation is low; if two questions were answered positively, the degree of formalisation is medium and if all three questions were answered positively, the degree of formalisation is high. Different types of formal decision-making bodies may include for example a leaders' board, which governs everyday business, and/or an annual General Assembly, meeting of all the members of an organization. The leaders are usually selected through a voting process during the General Assembly, and a clear distribution of roles means for example that every member of the leaders' board has certain aspects of the initiative under control.



Level of Formalization	Energy Communities and Ecofarms	Collective Targeted Actions	Political and Social Movements	Testing Conditions
No	6%	21%	25%	0
Low	6%	11%	0	0
Medium	25%	32%	25%	100%
High	64%	37%	50%	0%

Table 7 The level of formalisation of decision-making, leader selection and role distribution in the CEI

As shown in Table 7 above, the level of formalisation of a decision-making process varies strongly between different types of CEIs. While 100% of TCs and 89% of ECs have a high or medium formalization of the decision-making and organization, the percentage drops to 75% for PMs and 65% for CTAs. This once again emphasises the importance of community aspects especially for ECs, whereas CTAs seem to be more result-oriented, *i.e.*, as long as the outcome is satisfying, it is not so important how decisions are made or how leaders are chosen. This implies that especially emerging as well as consolidated ECs need to ensure clear and transparent rules and decision making processes to satisfy the needs of their members.

4.2.2 Action Situation

4.2.2.1 Communication

To examine whether, and if so to what extent, different communication aspects impact the emergence and/or consolidation of CEIs, we questioned the case studies' representatives about their internal information sharing practices as well as about the use of digital tools and participation in other networks.

Internal information sharing

More specifically, we asked the case studies' representatives "how their CEIs share relevant information with their [potential] members and participants". Based on the data collected through the interviews, we distinguished between:

- low information sharing (only sporadic and unidirectional, meaning that there is no possibility for the members/users to give feedback),
- medium (regular but still without feedback possibilities), and
- high (regular with feedback options).

A typical activity of low-density interaction is sending out sporadic newsletters. Medium density activities are for example regular postings on the website. High density activities are regular meetings and provision of fora.

D3.1 – Report on survey and structured interview results for identifying potential emergence and consolidation



Communication Density	Energy Communities and Eco-farms	Collective Targeted Actions	Political and Social Movements	Testing Conditions
Low (sporadic and unidirectional)	25%	38%	25%	50%
Medium (regular but unidirectional)	39%	29%	50%	25%
High (regular and bidirectional)	36%	33%	25%	25%

Table 8 Communication density in CEIs

As depicted in the Table 8 above, 75% of ECs and PMs report a regular interaction with their members, while for of TCs and CTAs it drops to 50% and 62% respectively. ECs and PMs seem to require very regular engagement of their members to keep participation high. CTAs on the other hand seem to be more strongly divided: whereas the percentage of CTAs with high engagement is comparable to ECs, there is a recognizable higher number of CTAs, which report only a sporadic interaction.

Digital communication

Further, we asked the case studies' representatives whether their CEIs "use social media for communication". Based on the data collected through the interviews, we distinguished between:

- no digital communication being used,
- unidirectional digital communication, and
- bidirectional digital communication.

	Energy Communities and Ecofarms	Collective Targeted Actions	Political and Social Movements	Testing Conditions
No digital communication	31%	45%	50%	33%
Unidirectional digital communication	6%	10%	50%	0
Bidirectional digital communication	63%	45%	0	67%

Table 9 Digital communication in CEIs

The use of digital communications tools is distributed quite differently: whereas around 65% of ECs and 45% of CTAs use bidirectional digital communications (meaning using channels where members/participants have the possibility to respond to actions of the initiative), this is not the case for PMs (which use either unidirectional communication tools like newsletters, or no digital communication at all). But also, nearly half of the CTAs do not use any digital tools for communication.



Other networks

We asked the case studies' representatives whether the members/ participants of their CEIs "are present in local or national networks with similar goals". Based on the data collected through the interviews, we distinguished between:

- No members participate in other networks,
- Low presence,
- Medium presence,
- High presence.

Networking Activities	Energy Communities and Eco-farms	Collective Targeted Actions	Political and Social Movements	Testing Conditions
No	17%	14%	50%	33%
Low	23%	29%	0%	0%
Medium	34%	43%	25%	66%
High	26%	14%	25%	0

Table 10 Networking activities of CEIs

Networking activities of the CEIs members and participants, defined as being in touch with other relevant networks is distributed nearly evenly between all groups. All CEIs' types have initiatives with low level of participation or no networking activity and initiatives with high activity.

Lobbying activities

Lobbying is one key coercive way that political power can be shaped. Its effectiveness usually depends on access to both financial resources and decision makers¹¹. While the literature is divided on which lobbying strategies different initiatives could apply to influence policy, it recognises that new energy actors have already gained importance in the sector also through increasing the effectiveness of their lobbying¹². We examined whether the CEIs are involved in any lobbying activities.

	Energy Communities and Eco-farms	Collective Targeted Actions	Political and Social Movements	Testing Conditions
No lobbying	48%	47%	0	66%
Low (sporadic)	29%	12%	0	33%
Medium	20%	35%	25%	0
High	3%	6%	75%	0

Table 11 Frequency of lobbying activities in CEIs

¹¹ Brisbois M.C. (2023), Chapter 9 - Decentralizing energy systems: Political power and shifting power relations in energy ownership, In M. Nadesan, M. J. Pasqualetti, & J. Keahey (Eds.), *Energy Democracies for Sustainable Futures*, (pp. 83-92) Academic Press. <https://doi.org/10.1016/B978-0-12-822796-1.00009-7>

¹² Ibidem.



Unsurprisingly, lobbying activities were often mentioned by the case studies' representatives from the PMs. Other types of CEIs (EC, CTAs and TCs) report mainly sporadic or no lobbying activities.

4.2.2.2 Conflicts

Another important aspect for the development of a CEI is how well the initiative can solve potential conflicts before they escalate. We therefore investigate the main topics and the frequency of conflicts, as reported by case study representatives by asking them “Are there conflicts between members of the initiatives?”.

Based on the data collected through the interviews, we classified the reported conflicts into:

- **climate-related** conflicts (arguments about important decisions regarding potential climate change impacts of a CEI, such as the use of gas),
- **communication-related** conflicts (like members not getting enough information about what will happen),
- **money-related** conflicts (arguments about the source or use of financial means),
- **organisation-related** conflicts (members not satisfied by the way an initiative is managed), and
- **technology-related** conflicts (like arguments about the location of windmills and PVs).

	Energy Communi- ties and Eco- farms	Collective Targeted Ac- tions	Political and Social Move- ments	Testing Con- ditions
Climate-related	1	0	0	0
Communication-related	2	0	0	0
Money-related	0	3	0	0
Organisation-related	3	3	0	0
Technology-related	3	0	0	0

Table 124 Conflicts reported by the CEIs

As shown in the Table 12 above, the number of reported conflicts was low: TCs and PMs have not reported any conflicts between the participants or members. 30% of ECs and 37% of CTAs reported at least one conflict among members and participants, respectively.

It is noteworthy that conflicts, although the overall number is low, in CTAs seem to be more strongly connected to money-related issues, which however played no role for ECs.

4.2.2.3 Monitoring and Evaluation

A robust monitoring and evaluation system is essential to ensure that initiatives are achieving their intended goals. Moreover, many experts in the energy sector argue that such a process should be carried out both internally and externally, as “while independent and external exper-



tise are useful at the evaluation stage, local participants should be involved in monitoring implementation to ensure project relevance and sustainability”¹³. To examine whether the CEIs have implemented appropriate monitoring and evaluation tools, and whether those aspects play an important role in their emergence and consolidation, we have asked the case studies’ representatives: “are there feedback mechanisms or rules in place for how to monitor the progress of the initiative?” and “are there activities in the initiative to evaluate the actions and to learn from it?”.

	Energy Communities and Ecofarms	Collective Targeted Actions	Political and Social Movements	Testing Conditions
No formalised Quality Assurance	44%	11%	100%	0
Yes but not specified	31%	11%	0%	33%
Yes financial quality assurance	3%	37%	0%	0%
Yes technical Quality Assurance	9%	42%	0%	67%
Yes Participant Feedback	13%	53%	0%	33%

Table 13 Quality assurance in CEIs

Based on the data collected through the interviews, it seems that the evaluation and monitoring processes are the least common in PMs, as none of them have a formalised quality assurance system. 44% of ECs do not have standardised monitoring and evaluation processes either. On the other hand, technical assurance is most relevant for TC and “participant feedback” and “financial quality checks” for Collective Targeted Actions.

4.2.2.4 Investment Activities

To assess whether the CEIs have a developed business case, or if their action and/or plan is entirely based on the use of public funding, we asked the case studies’ representatives “how much was invested (money, human capital) in the project by the local, national, supra national bodies” and “how much is invested by the members/participants? What is expected and actual ROI for members (if relevant)?”. We hypothesised that a sound business plan helps an initiative both in their emergence (if ready at the kick-off phase) and further consolidation (adapted constantly to the market trends).

The case studies representatives’ answers were grouped into the following categories, based on the approximate proportion of public investment:

- 85-100% of private investment
- 65-85% of private investment
- 35-65% of private investment
- 15-35% of private investment
- 0-15% of private investment

¹³ Annecke W. (2008), Monitoring and evaluation of energy for development: The good, the bad and the questionable in M&E practice, *Energy Policy*, 36(8): 2839-2845. <https://doi.org/10.1016/j.enpol.2008.02.043>



We have seen that for ECs, it is much more common to have a majority of private investment. This is usually in the form of buying shares into a specific RES project. Annual participation and membership are often rather small. The support with public funding is mentioned to cover costs of setting up the EC, participation in pilot projects or benefitting from national support schemes for RES that are not necessarily specific for ECs.

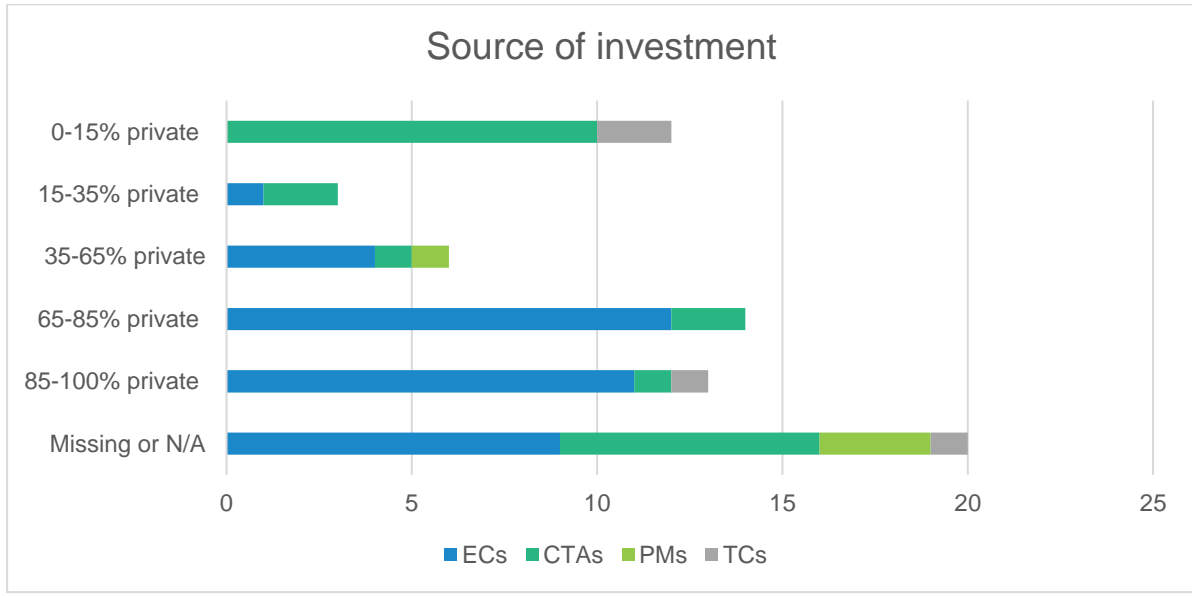


Figure 6 Source of investment of CEIs

On the other hand, most of the studied CTAs are primarily based on public funding, a large portion of which comes from EU projects¹⁴. In 20 out of 60 CEIs either there was no information at all (9), or not relevant (e.g., political movement), or unclear, so that it couldn't be categorised.

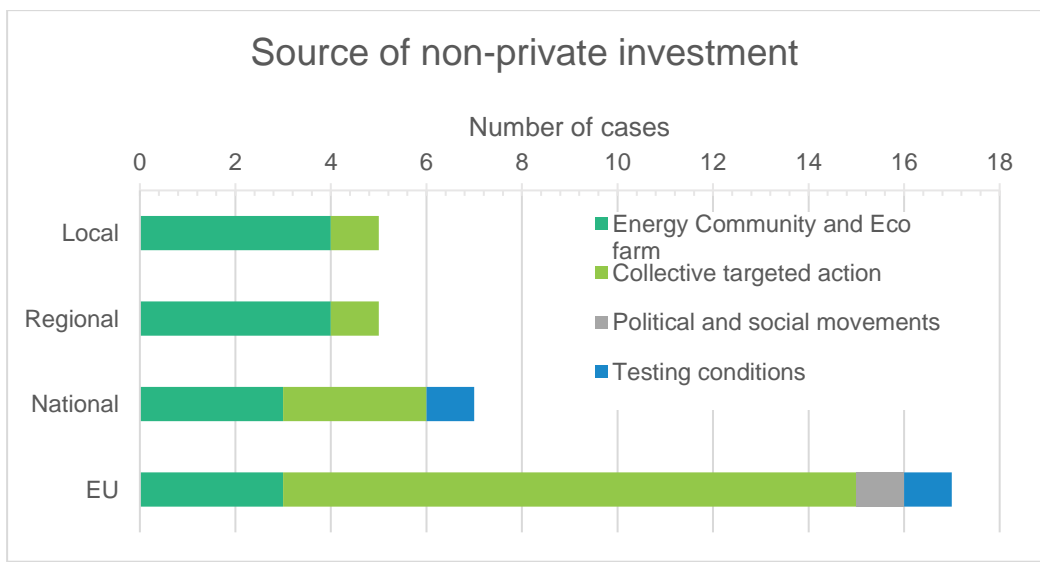


Figure 7 Source of non-private investment in CEIs

4.2.2.5 Key Insights: Action Situation

Regarding the use of experts by the CEIs, no significant difference exists between the initiatives – almost all of them rely on the expertise of professionals. However, ECs use more legal and financial expertise than CTAs, which might be connected with the membership status of

¹⁴ Particularly regarding this outcome, our selection bias might be important.



the citizens – the ownership of assets is rather equally shared between members of the case. Concerning the emergence of the CEIs, we can conclude that the citizen initiatives might need a high amount of legal and financial expertise and should ensure from a very early stage to cover this need, either by including legal and financial experts as core team members or by reserving resources to higher external expertise.

Further, we have seen that communication aspects are more important for ECs and PMs, which are rather locally embedded. ECs and PMs report to regularly interact with their members, there is a rather recognisably higher number of CTAs, which report only a sporadic interaction.

Regarding external communication of CEIs, while CTAs seem to interact closely with local authorities, they are the least involved in the interaction with locals outside of the initiative – a third of CTAs declared not to have any regular interactions. This aspect can be linked to the participatory nature of CTAs, as the participants of CTAs interact less also with each other, comparing to the members of ECs and PMs. However, if a CTA initiative wants to consolidate itself integrate new members, it should ensure in time to establish functional interaction channels to the outside. Networking activities, or lack of thereof, are rather evenly spread between different types of CEIs. Lobbying activities does not seem to be decisive in emergence or consolidation of any type of CEIs apart of PMs.

The differences in the decision-making practices emphasise the importance of community aspects especially for ECs, whereas CTAs seem to be more result-oriented. For the latter, it is not so important how decisions are made or how leaders are chosen. This implies that especially emerging as well as consolidated ECs need to ensure clear and transparent rules and decision-making processes to satisfy the needs of their members.

Regarding conflicts, although the overall number is low, in CTAs seem to be more strongly connected to money-related issues, which however played no role for ECs. We can thus conclude that, while consolidating themselves, should ensure transparent rules on distribution of resources which are accepted by their participants.

Even though the scientific literature emphasises the importance of monitoring and evaluation processes to be implemented by the initiatives, it seems that in general, most of CEIs do not have formalised Quality Assurance processes in place. While almost a third of ECs have only general procedures in place, more than half of CTAs collect their participants' feedback, 42% of them monitors the technical aspects of quality assurance and 37% of them monitors financial aspects. Unsurprisingly, TCs have appropriate procedures in place.

Finally, regarding the investment activities of CEIs, it is apparent that the “grassroot” initiatives, mostly ECs, have foreseen mobilization of private capital. Even though they use public funding at the initial phase, a business model on a shareholder basis or other type of financial participation is generally foreseen. On the other hand, most of the CTAs were kicked off or function as EU projects and are thus based on EU funding. This scheme does not help in the consolidation of such initiatives, even though it certainly influences their emergence.

4.3 Energy Cultures Framework

4.3.1 Material Culture

This section of the report provides insights on two elements related to the Material Culture element of the Energy Cultures Framework, namely Activities of the initiatives and Technologies applied by them.



4.3.1.1 Activity

To assess whether the types of CEI's activities are intertwined with their emergence or consolidation, and if so, to what degree, we asked the cases "what is the main activity [of the CEI]? e.g., building refurbishment, training/workshops, information campaign..." as well as "what sort of energy is generated?".

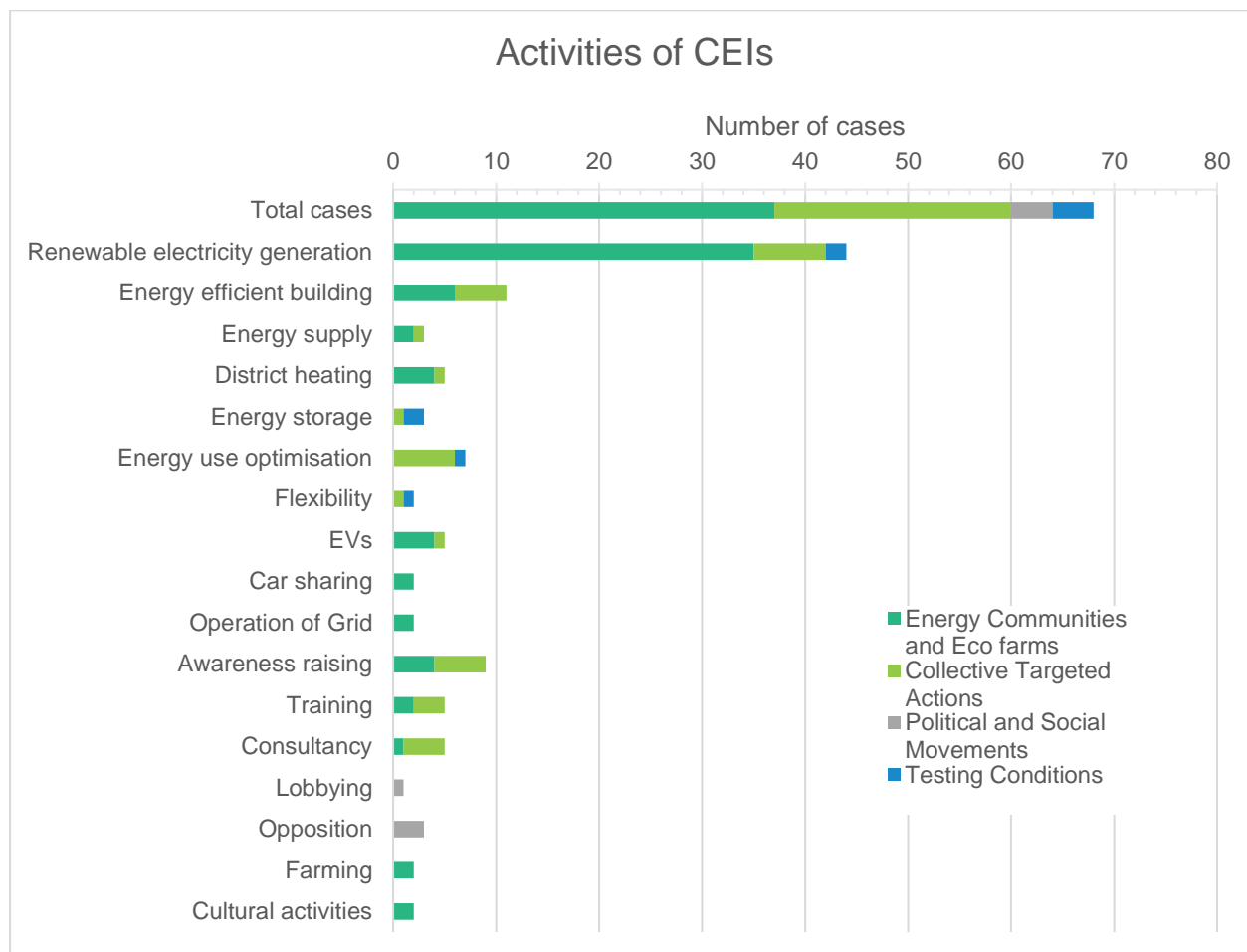


Figure 8 Most common types of CEIs' activities

As shown in Figure 8, a majority of cases (44/68) has renewable electricity generation of some form as main source activity. However, many cases report combining several activities. This is particularly true for cases that do not have as main activity renewable electricity generation (21 cases only mention renewable electricity generation as their activity).

Further, Eco-farms or villages (a sub-category of ECs) where certain specific activities are commonly found, such as permaculture, biodiversity actions, land management, ecological building practices, general sustainable lifestyle actions, and water or waste management systems.

Several cases (18/68) include awareness raising and information campaigns, (9), consultancy (5) or educational activities (5), such workshops and other trainings. These cases concern primarily CTAs, two of which have educational activities as their main purpose.

Five CEIs mentioned electromobility as one of their activities, two of which include car sharing. four of these five cases are EC. Only one EC has electromobility as the only activity. Two cases mentioned social and cultural activities as part of their main activities.



Various activities and/or energy sources reported by the CEIs were further grouped into the following types of actions:

- RES: production, supply, storage, self-consumption, P2P exchange, or activities related to renewable energy handling in general,
- Energy efficiency: incl. building renovation, optimisation of energy use, smart or efficient systems, consumption-side measures in general,
- Mobility: EV purchase, EV charging infrastructure, car sharing, bike sharing, etc.,
- Political activities, opposition to projects, lobbying,
- Awareness raising and trainings: including information campaigns, workshop organisation, awareness via monitoring of the energy use.,
- Other: if none of the above, e.g., sustainable farming, water treatment.

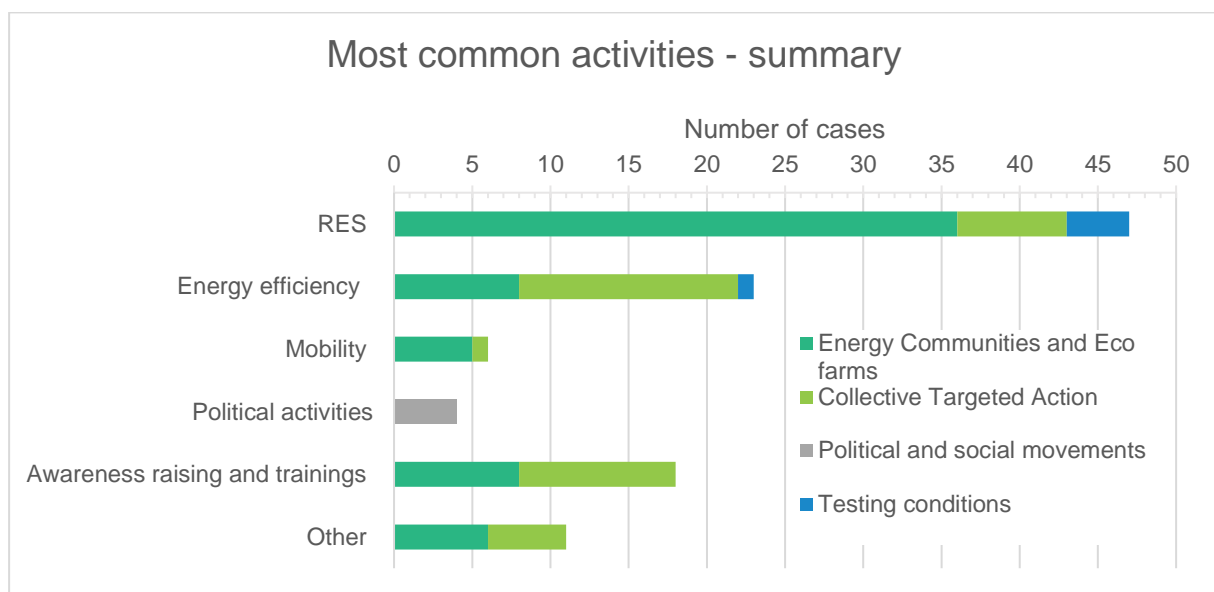


Figure 9 Summary of the most common types of CEIs' activities

While most of ECs declare renewable energy production as their main activity, CTAs focus rather on the energy efficiency related activities. A lot of them focuses also on awareness raising and trainings. Unsurprisingly, PM are occupied with what we classified as “political activities”. TC are mainly testing renewable energy production solutions.

4.3.1.2 Technologies

To assess whether there are technologies which are most used and thus well suited to certain types of Collective Energy Initiatives, and whether this aspect has an impact on the initiatives' emergence or consolidation, we asked the case studies representatives' “which technologies are used [by their CEIs]?”.

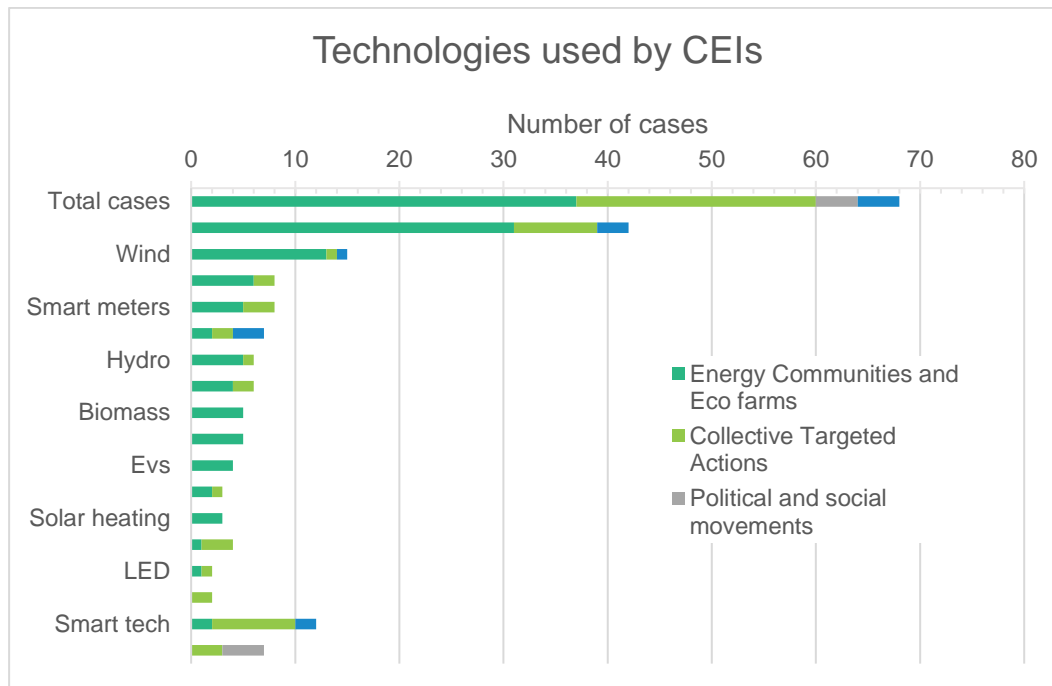


Figure 10 Technologies used by CEIs

Figure 10 depicts that the most common used technology by all the CEIs is the photovoltaic (PV) system. A large majority (31/37) of the ECs uses solar systems as the main technology. 17 CEIs mention only PV as used technology.

Wind turbines are also common (14 on-shore, one off-shore in planning phase), especially in EC (13), but they are most often combined with other renewable energy technologies, such as PV.

Other technologies for electricity or heat production at large scale were present in fewer cases, including hydro power plants (6), biomass and biogas plants for energy production (7, some including production of biomass or biogas), hydrogen production (1), tidal wave energy use (1), run-of-river power plant (1), as well as district heating networks (6).

Solar heating systems (3) and heat pumps (8) are also used in some case studies, as well as batteries (7, usually in combination with PV).

8 CEIs reported the use of smart meters (in combination with other measures and technologies), while 12 CEIs include different types of other smart technologies, such as Energy Management Systems, IoT hardware and software, data platforms, smart monitoring equipment and smart household appliances. The latter technologies were mainly used in CTA that specifically focused on the implementation of such smart systems or awareness raising via monitoring of energy.

Further, renovations are more common in CTAs than ECs (3 vs 1). These may include insulation of the building, improvements to the HVAC systems, LED lighting, etc. Four cases include electromobility technology, while only one of them has it as its primary focus. One includes electric bike sharing.

Various technologies reported by the CEIs were further grouped into the following types:

- PV: solar photovoltaic, either household level or larger-scale installations,
- Wind: wind turbines (only one offshore),



- Other production or District heating: other large-scale electricity/heat/fuel production, such as hydro, geothermal biomass, biogas, tidal or wave energy, hydrogen, and/or district heating systems,
- Batteries: electric energy storage, any scale,
- HVAC, heat pumps: household-level energy systems other than PV, including heat pumps, solar heating or other household-level appliances,
- Renovation: building renovation, including insulating, replacement of lamps with LED, *etc.*,
- Smart systems and monitoring: monitoring devices, smart meters, energy management systems, IoT hardware or software, smart appliances,
- Electromobility-related: Electric vehicles, EV chargers, EV bikes,
- Other non-energy: related for instance to water management or eco-farming.

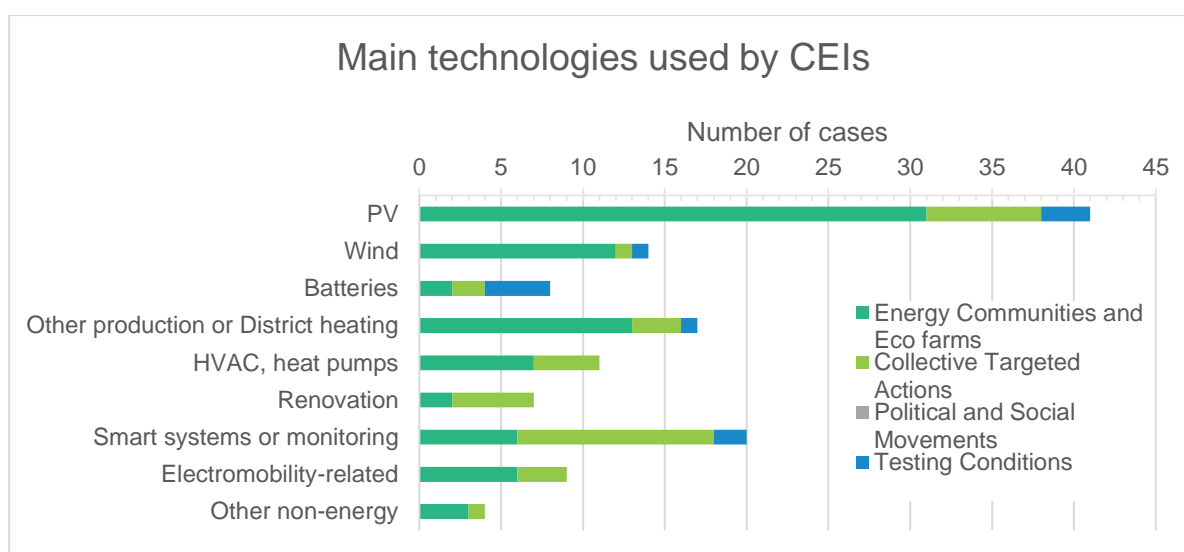


Figure 11 Main technologies used by CEIs

4.3.1.3 Key Insights: Technologies

Of all the CEIs, most of ECs declare renewable energy production as their main activity, CTAs focus rather on the energy efficiency related activities, followed by awareness raising and trainings. PMs focus on “political and social activities”. TC are mainly testing new renewable energy production solutions.

Regarding the technologies used by different initiatives, the collected data shows that PV power, similarly to wind power, is the leading source of renewable energy transition amongst the CEIs¹⁵. This is not surprising, as solar PV technology is mature, but obviously dependent on the availability of sunlight. These results differ from the global data provided by the IEA report which states that “Solar PV accounted for 3.6% of global electricity generation, and it remains the third largest renewable electricity technology behind hydropower and wind”. However, IEA emphasises that globally, power generation from PV increased by a record 179 TWh in 2021, marking 22% growth in 2020.

Further, according to the International Renewable Energy Agency (IRENA), “the cost of producing electricity from photovoltaics has fallen by 82% in the last decade. And the outlook is

¹⁵ IEA (2022), Solar PV, IEA, Paris, <https://www.iea.org/reports/solar-pv>.



even more promising: with the latest generation technology, it will be possible to increase efficiency of solar panels by 30% compared with today's levels and productivity by more than 20%"¹⁶. It can be thus concluded that the type of technology chosen by a CEI and various aspect related to this choice i.e. maturity of technology, costs and subsidies available for their application, as well as technological advancements play a role in the emergence of CEIs focusing on the renewable energy generation (mostly ECs in the case studies' pool).

4.4 Other aspects

This section of the report provides insights on other key elements that might influence the emergence or consolidation of the CEIs, namely Impact Related Issues, Influencing Events and the topic of Energy Poverty.

4.4.1 Impact Related Issues

4.4.1.1 Goal

To assess whether the CEIs have clearly established goals to achieve, we questioned the case studies' representatives „what is the goal of the [CEI]?” e.g., optimising energy production and/or use and/or making it more sustainable, etc. We assumed that the initiatives with a clear vision are more likely to further develop and consolidate. Similarly, common goals between the members/ participants of a CEI, should facilitate the establishment of a coherent initiative.

The case studies representatives' answers were grouped into the following categories:

- General sustainability and climate goals: carbon neutrality, emission reduction, eco-farming, sustainable mobility, etc.,
- RES production goal: Produce or supply renewable/sustainable energy, increase the penetration of RES technology, produce RES for self-consumption or for energy autonomy or security,
- Energy efficiency and energy savings goal: reduce or optimize energy use, perform measures of energy efficiency, incl. building retrofit, etc.,
- Monetary benefits goal: reduce the cost of energy, reduce energy bills, get a return on investment,
- Research, technology testing or development goals,
- Awareness raising and behavioural change goals: aiming to induce change in behaviour or perceptions, educate or train people,
- Political goals: change legislation or policy, oppose a project or legislation, lobbying,
- Social goals: community building, citizen participation in the energy system, enhance democracy, justice, address energy poverty.

We have noted that 29/68 CEIS mentioned general goals related to sustainability, clean energy transition, climate protection, carbon emission reduction, sustainable mobility, etc. Additionally, many cases (39) have goals related specifically to renewable energy production, optimisation of energy production, energy autonomy at household or local level.

A quarter of cases (18/68) mentioned awareness raising and/or aiming to induce behavioural change as one of the goals. Specifically, eight cases aim to influence the behaviour of citizens towards energy savings.

¹⁶ IRENA (2021), *Renewable Power Generation Costs in 2020*, International Renewable Energy Agency, Abu Dhabi. https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2021/Jun/IRENA_Power_Generation_Costs_2020.pdf



Further, other than the four PMs, only one EC mentioned as a goal to change legislation related to energy. A quarter of CEIs (18/68) mentioned social goals, such as building the community, strengthening the role of citizens in the energy system, ensuring a just transition, or addressing energy poverty. four CEIs specifically stated as a goal addressing energy poverty, two of which are Greek ECs where legislation requires that they fulfil such purpose.

Finally, three CEIs reported profit as one of the goals, two of which are ECs. 12 CEIs mention monetary benefits for the participants/members by reducing energy bills.

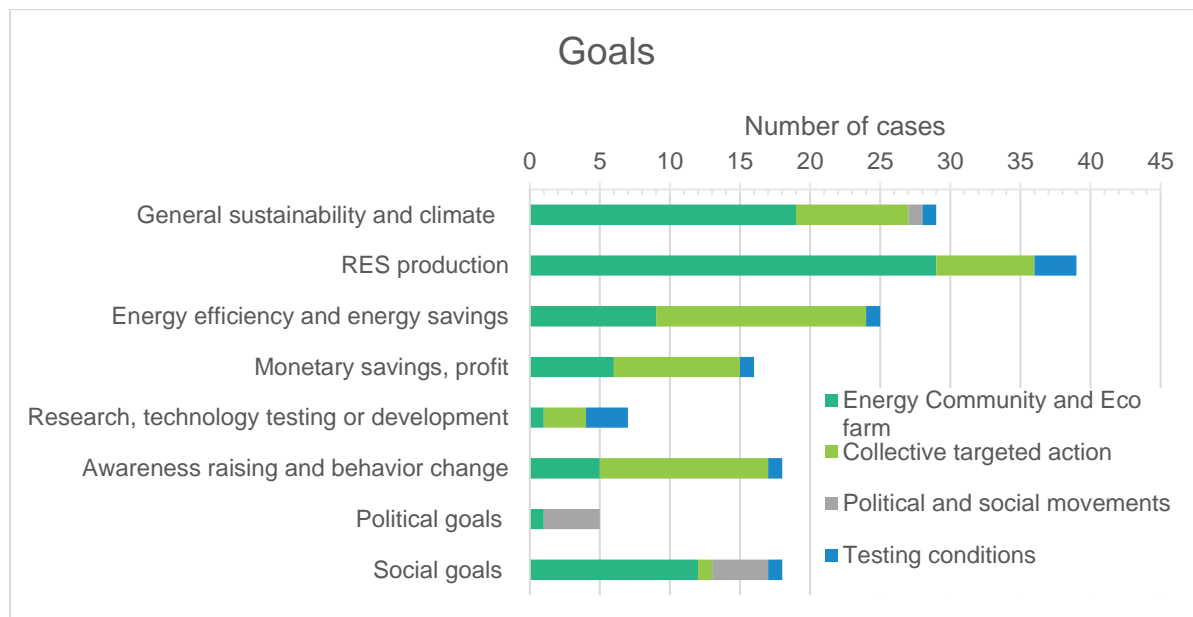


Figure 12 Goals of CEIs

Figure 12 depicts that while the ECs reported „RES production“ as their primarily goal, CTAs focus mostly on „energy efficiency and energy savings“ as well as on „monetary savings and profit“. Unsurprisingly political and social goals are important for PMs and TCs focus primarily on „RES production“ and „research, technology testing and development“. These results coincide with the outcomes of the „Activity“ section. It seems that while the ECs focus more on social and environmental goals, financial aspects seem to be more important for CTAs. It seems that most of the CEIs have a common goal, which facilitates the establishment of a coherent initiative.

4.4.1.2 Plan

To assess whether the CEIs work with an established plan, we inquired the case studies' representatives „is there a plan on what should be achieved and how it should be achieved ?“. Concretely, our intention was to examine if the CEIs have a written, agreed-upon plan, and whether this would have any impact on their achieved impacts and consolidation.

However, some respondents might have confused this question to mean what they plan to do in general. As such, this answer could be combined with the questions regarding the goals of the CEI, and the planned impacts (since planned impacts were also not often specifically quantified). In this section we will only examine the existence or not of a written plan, while answers describing general plans in the sense of goals were incorporated in the analysis of goals (previous section).

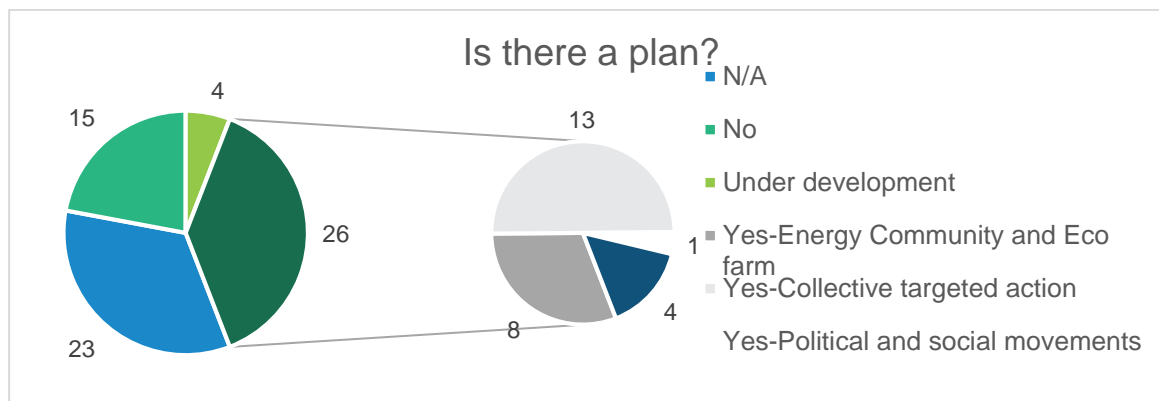


Figure 13 CEIs and their plans

As depicted in the Figure 13 above, only 26 CEIs declared having a written plan, a half of which (13 CEIs) are cases where there is a strategy inherently as part of the (often EU-funded) project that started the initiative. In these CEIs, the project plan is the inferred plan. The majority (10) concerns cases in the Testing Conditions or Collective Targeted Action categories, which are primarily linked to projects.

Further, four CEIs referred to plans that are defined at the local level, e.g., for the energy transition of the municipality in which or for which the initiative operates. As such, the existing plans are valid more generally for the region rather than only the initiative.

All four CEIs with a plan “under-development” are ECs, two of which are just starting their activities. One 10-year-old EC from the Netherlands, reported not having a written plan, however mentioned that they attempted to make one in the past, but the fast-changing context and opportunities did not allow sticking to the plan, but rather “grabbing available opportunities on the fly”.

Contrary to what we have assumed, it does not seem that having a written or a clearly established plan “on what should be achieved and how it should be achieved” impacts the emergence or consolidation of a CEI.

4.4.1.3 Planned and Achieved Impact

In this section, we hypothesised that CEIs with a clearly defined plan and objectives are more likely to achieve any social, environmental or economic impact in the local, regional and/or national context. To examine whether the CEIs achieved a planned goal, we firstly asked the case studies’ representatives “What were the expected impacts at the start of the project (e.g. reduction in greenhouse gas emissions, energy savings, number of houses retrofitted, people adopting a practice ...)?” and “what are the actual impacts so far?”.



Expected/ planned impact

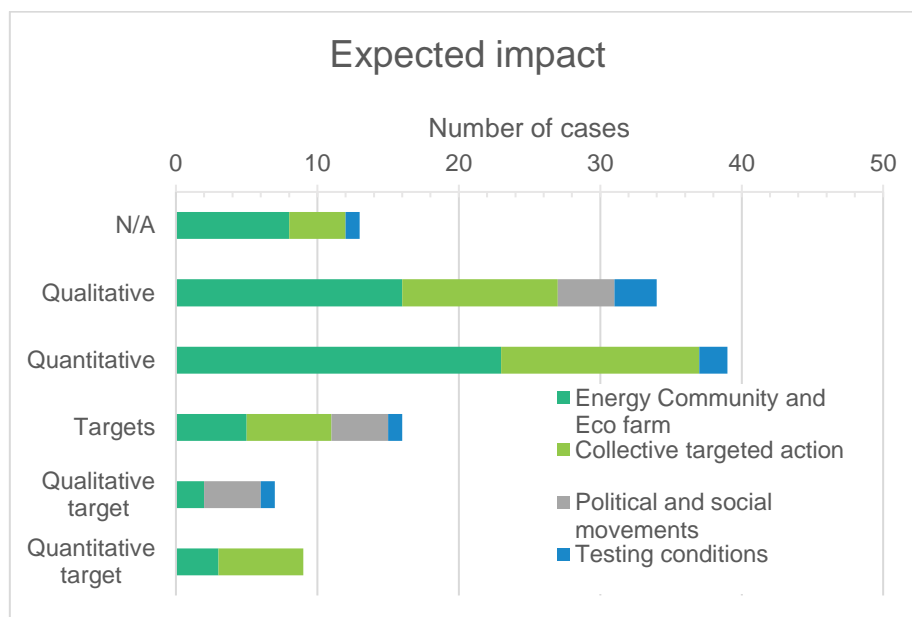


Figure 14 Expected impacts of CEIs

Regarding the expected impacts of the CEIs, 13/68 CEIs have not reported any planned impacts. 34 CEIs reported qualitative planned impacts in a vague way (as a goal or plan): e.g., study a technology, training, raise awareness, influence policy, increase sustainability, provide clean water, establish virtual net metering, promote car sharing, optimize energy use, implement RES projects in general. Four of them stated that their impact would be achieving an energy autonomy, seven of them planned to establish a well rooted citizen engagement.

Further, 39 CEIs reported quantitative planned impacts (in theory measurable) but in a vague way: increase RES penetration, produce electricity, save energy, reduce emissions, reduce energy bills, renovate buildings, achieve carbon or energy neutrality. 19 CEIs mentioned energy savings, 19 CEIs related to RES production, 11 CEIs related to emission reduction and five CEIs related to reduction of energy bills or generally economic benefits.

Only 16 CEIs reported specific targets, nine of which quantitative (e.g. specific number of wind turbines, specific amount of PV installed, cover energy demand with RES, offset emissions) and seven qualitative (e.g. stop specific project from happening, connect batteries to grid).

PMs only had qualitative planned impacts, such as to prevent the development of a project or change in some policy. These are also considered as specific targets (a given project or policy). For the TCs, two of three cases reported both qualitative and quantitative impacts, related to the purpose of each project (e.g. energy savings and provision of flexibility).

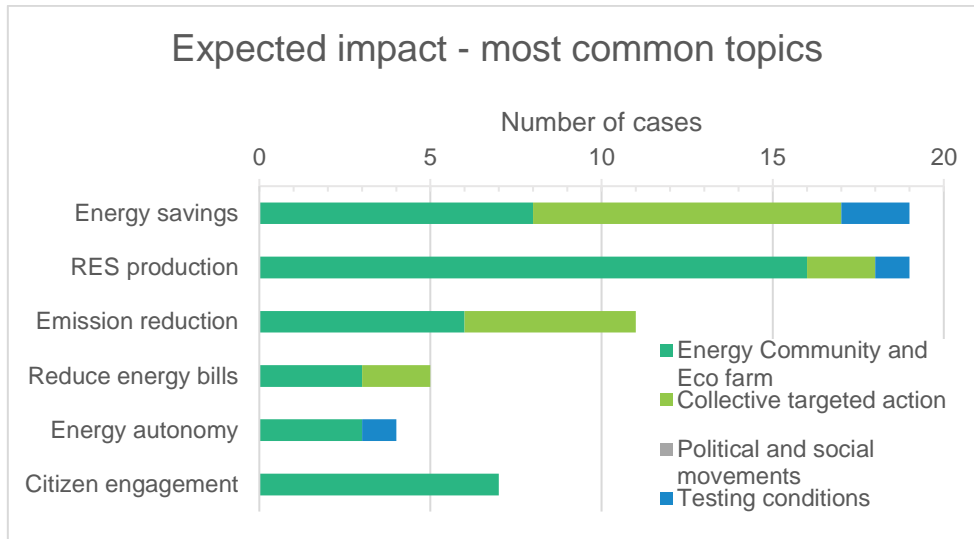


Figure 15 Most common topics in the "planned impact" category

As depicted in Figure 15 above, most common topics of expected impacts include energy savings, RES production, emission reduction, citizen engagement, reduction of energy bills and energy autonomy. ECs' primary focus is on RES electricity (or heat) production, while for CTAs it's on energy savings.

Achieved impact

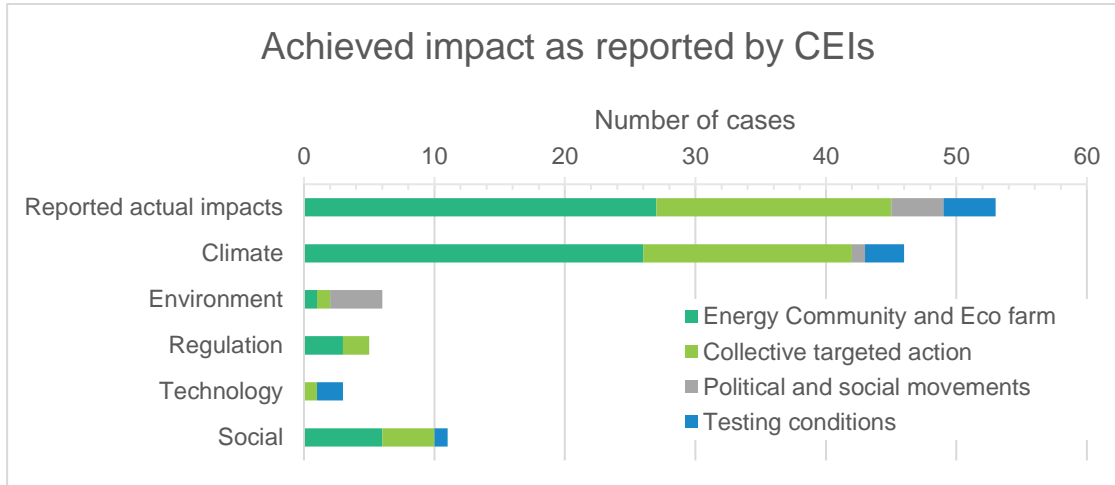


Figure 16 Achieved impact as reported by CEIs

Regarding having any social, environmental, economic or other type of impact, out of 53 cases reporting actual impacts, the majority (46) focused on impacts related to the climate, including energy savings, energy production, emission reduction or more general actions aimed at these impacts (renovations, RES projects, forming of ECs, training about energy savings, etc.).

Some case studies' representatives mentioned also other types of impacts. Three CEIs emphasized other than the immediate energy and emission-related impacts the contribution towards developing technology and concepts that can further be beneficial. These are project-based cases whose aim was to test these technologies.

Environmental impacts were mentioned in six CEIs, half of which are the political or social movements aiming to stop certain projects or change regulations to preserve protected areas.



Some cases also report as impact changes to the regulation and subsidies, including introducing a special loan scheme (energy efficiency loan) on particularly favourable terms in Estonia or impact on regional strategies in the Netherlands.

Social and financial impacts were reported by 11 CEIs. These mainly include reduction of energy costs for citizens or specifically vulnerable households, general citizen involvement and community building achievements or community benefit projects.

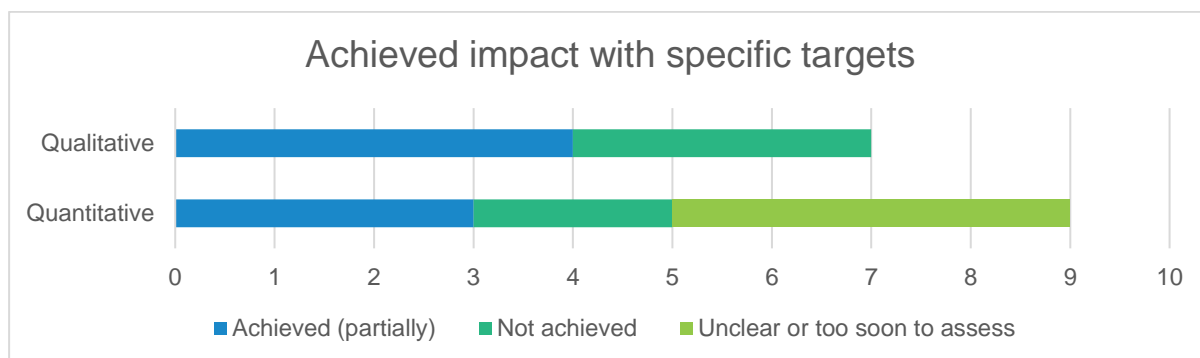


Figure 17 Achieved impact with specific target

Further, 16 CEIs have planned impacts with specific targets, nine of them quantitative and seven of them qualitative. Regarding quantitative impacts, it is noteworthy that three of them achieved the planned target, such as number of participants in CTA, carbon neutrality in given time period, RES production target of specific project reached. Two CEIs have not achieved the planned targets. In case of four CEIs it is still too early to assess whether the impact could be achieved, i.e., “share of renovated buildings by 2030”. In case of qualitative targets, only four CEIs reached their targets such as succeeding in a protest.

Last but not least, there are 29 CEIs with quantitative planned impacts without specific targets that reported some actual impact indicating they are moving towards a good direction. However, as no specific targets were set, it’s not possible to assess if it’s “sufficient” or how well they perform. Furthermore, while 24 of 29 provide some quantification of the impacts (in terms of RES electricity produced, carbon emissions avoided, energy saved, houses retrofitted, etc.), in seven of them these concern indicators that are not relevant to the planned impacts (e.g. planned impacts were about energy savings and actual impact is the setting up of a company that installed hydro and provided advice etc.).

4.4.2 Influencing events

To examine potential processes and factors affecting the emergence and/or consolidation of CEIs, we asked the case studies’ representatives whether, to their knowledge, “The case is impacted/influenced by a particular event (such as a flood, or a heat wave, or a natural disaster)”.

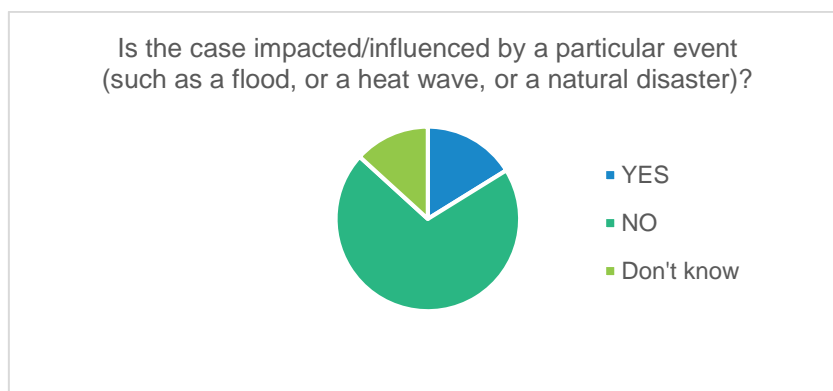


Figure 18 External factors influencing emergence and consolidation of CEIs according to the case studies' representatives

As shown in the Figure 18 above, out of 68 European CEIs, only 11 of the case studies' representatives confirmed that the CEIs were influenced by a particular event, 48 indicated that their CEIs were not influenced and nine interviewees did not answer the question. Table 14 provides further specifications on the type of the event which, according to the respondents, have impacted the creation of the nine CEIs.

Winning a competition sponsored by the Ministry of Environment and Energy that was looking for a showcase to prove the Kyoto's target to cut greenhouse gas emissions by 21%	1 CEI
Political decision of being climate neutral	2 CEIs
Plans for building a large hydropower plant	2 CEIs
Signing the National Climate Agreement	1 CEI
Resistance against nuclear power after the Chernobyl disaster	1 CEI
No further details provided	2 CEIs

Table 14 Events leading for the creation of CEIs according to the CEIs' representatives

However, while 48 case studies' representatives stated that their CEIs were not influenced by any specific political/ climate related event, the following demographic/social/economic trends were mentioned by them as "having played an important role":

- Desire to be independent (two cases)
- General concern for climate change (three cases)
- Rising energy prices, financial crisis and other economic reasons (five cases)
- Perturbation in local job market (one case)
- Energy poverty (one case)
- Technical issues – weak connection to the energy grid (one case)

Regarding the ECs, only six of them stated that their emergence was influenced by a particular event, including political events (such as winning a national competition to become climate neutral, implementing the governmental energy master plan, resisting against nuclear disaster in Chernobyl) or environmental (such as wildfires) reasons.

However, out of 28 case studies' representatives who indicated that their EC were not influenced by any particular event, specified the cases were influenced by the following demographic/social/ economic trends:

- Willingness of being independent (one EC)



- General concern for climate change (two ECs)
- Rising energy prices, financial crisis and other economic reasons (three ECs)
- Technical issues – weak connection to the energy grid (one EC)

It is noteworthy that the topics of “concern for climate change” and “willingness of being independent” were reported only by the respondents from ECs. In case of CTAs, only three respondents stated that their CTAs were influenced by a particular event. However, out of those who indicated that their CTAs were not influenced by any particular event (16), two respondents specified the cases were influenced by the rising energy prices, financial crisis and other economic reasons. None of the cases classified as Political and Social Movements (PM) were caused by any particular natural event, however three of them were initiated as a protest action against the plans of building large hydropower plants. None of the cases classified as testing conditions were impacted/ influenced by any particular event.

4.4.3 Energy poverty

There is no common European definition of the “energy poverty”, but many Member States (MS) acknowledge the scale of this socio-economic situation and its negative impact translated into severe health issues and social isolation. Different terms are used to describe affected persons: fuel poor, energy poor, vulnerable energy consumers or, to a larger sense, at-risk-of-poverty or low-income people¹⁷. To assess whether the energy poverty topic has been taken into consideration and/ or addressed by the different types of CEIs, we asked the case studies’ representatives whether their CEI “include vulnerable groups”.

Out of 68 European CEIs, 22 case study representatives answered that their initiatives include vulnerable groups. Amongst these, there are ten ECs, eight CTAs, two PMs, two TCs. 33 CEIs indicate not including any vulnerable groups in their activities. Four CEIs are planning such activity in the future. Four CEIs indicated supporting energy poverty initiatives indirectly, including by financing and/or consulting support of other projects. For example, one respondent indicated that *“the case is not specifically targeting vulnerable groups, but these groups can apply for financial support to cover training costs, usually from the municipality or from the national Unemployment Insurance Fund (state subsidies for unemployed persons to attend trainings)”*. Another respondent stated that *“the people who are currently living in the CEI are not experiencing the energy poverty. However, there’s a plan to reserve a percentage of the remaining unbuilt sites for people experiencing energy poverty. That would be through working with social housing (they would build low cost, high energy houses and make them available to people who are experiencing energy poverty)”*. Five cases did not answer this question.

4.4.4 Key Insights Impacts and Influencing Events

Regarding the CEIs goals and planned and achieved impact and contrary to what we have initially assumed, a lot of CEIs have not clearly set out their objectives or defined them in a vaguely manner. This made the assessment of potential efficacy of the CEIs inconclusive. However, it seems that a lot of CEIs (53 out of 68) reported having an impact in the local, regional or national environment, most of them related to the climate.

Almost 75% of the European CEIs were not influenced by any particular natural or political event. However, six other demographic/social/economic trend were listed, the most important of which were “Rising energy prices, financial crisis and other economic reasons”. It seems that while the emergence of ECs was influenced by the “Desire to be independent” and by a “General concern for climate change”, these factors were not mentioned by the CTAs. The

¹⁷ https://ec.europa.eu/energy/eu-buildings-factsheets-topics-tree/energy-poverty_en



most important factor for the latter were the “Rising energy prices, financial crisis and other economic reasons”.

Regarding the Energy Poverty issue, the data gathered through the interviews with the case studies’ representatives suggests that the socio-economic vulnerability of members or participants of the CEIs is not a driving force of the emergence or consolidation of the initiatives. The ECs seem to address the topic slightly more than the CTAs.

4.5 Conclusions and Outlook

For the emergence and consolidation of CEIs, it is important to understand their functioning from the perspective of a collective action. It is relevant to identify what key factors influence the appearance of the specific type of CEIs in certain contexts, as this could potentially help the policy makers better target and promote the creation various forms of sustainable energy initiatives. For the consolidation, it is key to understand what factors allow the communities to further develop, as this could guide the local, regional, national and European support actions for the CEIs.

The “typical” CEI, based on the desktop research and interviews with the case studies’ representatives can be described as follow:

Energy Community and Ecofarm: is a rather small initiative with a principal goal of renewable energy production. The importance of both the decision-making processes and communication emphasises the key role of community in an EC. The latter thus needs to ensure clear and transparent rules it that regard to satisfy the members’ needs. Because of the sense of community, EC seem more suitable in local contexts and rural regions. ECs use more legal and financial expertise than other types of CEIs, which might be connected with the membership status of the citizens – the ownership of assets is rather equally shared between members of the case. ECs seem to plan their investment activities by mobilization of private capital. Even though they use public funding at the initial phase, a business model on a shareholder basis or other type of financial participation is generally foreseen. Regarding their emergence, ECs score the highest amongst all the CEIs in terms of gaining independence and being concerned for climate change. This type of CEI seem to be address the energy poverty issue the most.

Collective Targeted Action: is a relatively big initiative, operating at local but also regional or even national level, focusing on the energy efficiency related activities, followed by awareness raising and trainings. The emergence of new CTAs might be more suitable if several hundred people are involved. Contrary to an EC, CTA does not interact closely with its participants or locals outside of the initiative. The sense of community is less important than in the ECs. This type of an initiative seems thus more suitable to urban regions. To integrate new participants, a CTA should ensure in time establishing functional interaction channels to the outside. Conflicts in CTAs seem to be more strongly connected to money-related issues, which means that CTAs ensure transparent rules on distribution of resources. The most important emergence factor of the CTAs was the “Rising energy prices, financial crisis and other economic reasons”.

Political and Social Movement: is a rather small and local initiative focusing on political and/ or social activities aiming at changing the planned or already introduced decision. The only type of the CEIs which openly acknowledges taking part in lobbying activities. Community aspects and regular interaction between members and participants are important.

Testing Condition: is an initiative with no or very limited citizen participation. It aims at testing new renewable energy production solutions. Typically for the testing environment, it has appropriate monitoring and evaluation procedures in place.



5. Survey analysis

5.1 General results

All together we received 280 responses that could be used for the analysis (232 completed questionnaires and additionally 48 questionnaires completed to a degree that allows for analysis). The final number of returned questionnaires was lower than originally planned. This is because many collective energy initiative representatives refused to forward the questionnaire to their members in order not to overburden them, given that they are part of other scientific projects as well and therefore regularly investigated. Furthermore, some of the initiatives have not seen any benefit in participating in our study.

The responses come from 32 European case studies and 14 European countries:

Country	Number of Respondents
Austria	1
Belgium	19
Denmark	1
Estonia	11
Germany	11
Greece	63
Ireland	8
North Macedonia	101
Netherlands	47
Portugal	4
Romania	6
Slovenia	6
Spain	1
United Kingdom	1
Total:	280

Table 15 Origins of the respondents

This uneven distribution needs to be kept in mind when analysing the results. If separated by the abovementioned different types of energy initiatives, 63% of answers come from Energy Communities and Ecofarms, 14% from Collective Targeted Actions, 23% from Political Movements and none from Testing Conditions. Furthermore, it can be seen, that most of the studied ECs come from three countries, with Greece (35% of all respondents), the Netherlands (27% of all respondents) and North Macedonia (20%). Responses for CTA come mainly from Belgium (59%) and Estonia (34%). Responses for PM come exclusively from North Macedonia.



5.2 Characterising members of different forms of initiatives

5.2.1 Sociodemographic background

Looking at gender distribution, we see an imbalance in favour of male respondents, especially in ECs and PMs, but not in Collective Targeted Actions.

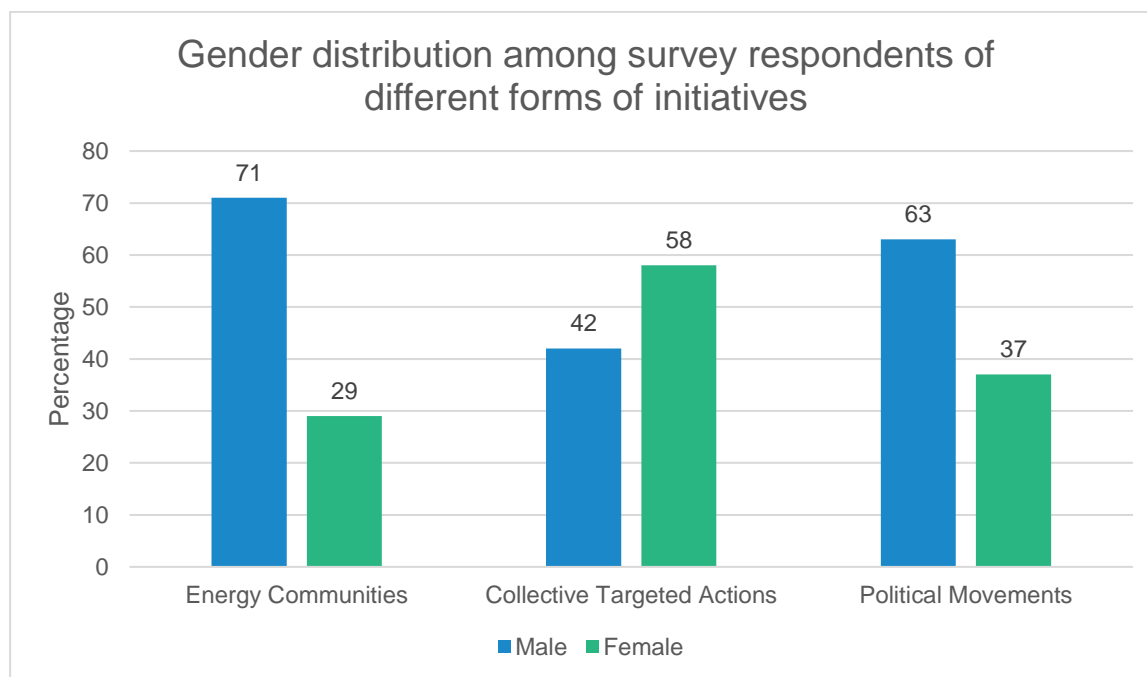


Figure 19 Gender distribution among survey respondents of different forms of CEIs

Age distribution is relatively even in general. When differentiating between types, the age group 19-34 is stronger represented in political movements (35% versus 21 in CTAs and 14 in ECs), whereas for people 65+ it is the other way round (25% in ECs, 13 in CTAs and eight in PMs).

The majority of members are from villages or small towns (160). If we differentiate, villages are the strongest group in ECs (49% of all answers) and especially in PMs (99%). In CTAs the majority lives in small to medium cities (55%).

With regard to education, 60% of all respondents have a higher education (university, college or equivalent). Separated by the type of initiative, higher education is the strongest group in ECs and secondary education in the PMs.

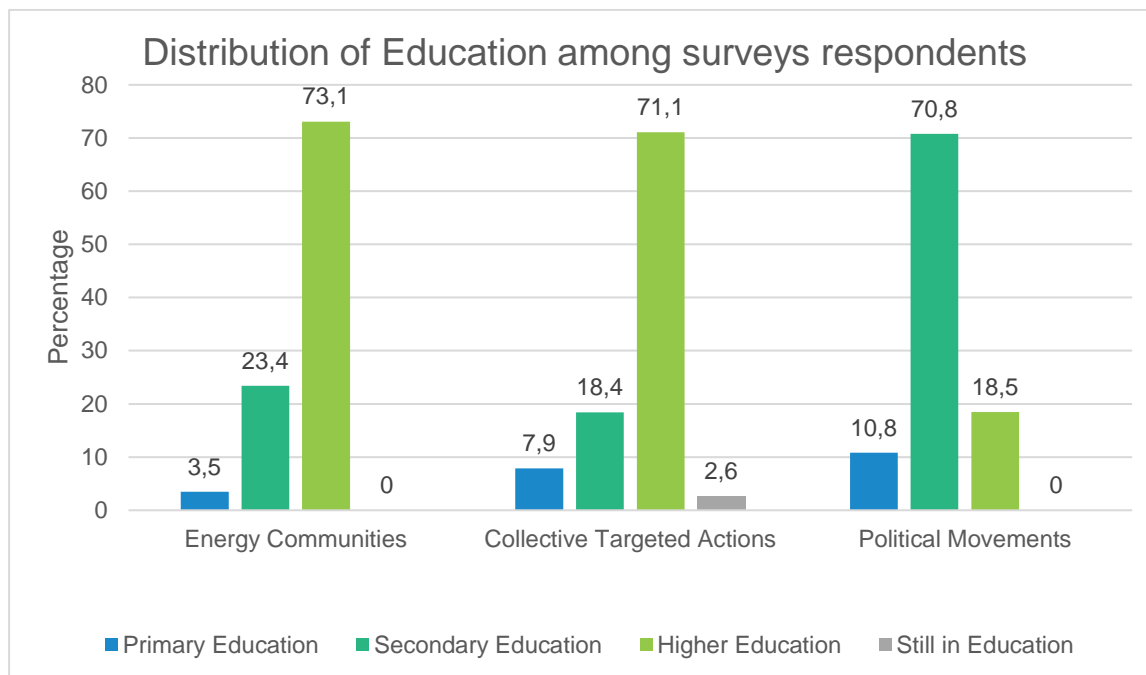


Figure 20 Distribution of Education among survey respondents

With regards to occupation, full time employment is dominant in all three types, but ECs have by far the highest share of retired members (27%, versus 14 in CTAs and 12 in PMs). Income is highest in EC members (55% indicating high or very high income), followed by CTAs (43% high or very high income) and PMs (15,7% high or very high income).

To conclude, ECs' and CTAs' members and participants are strongly dominated by well educated, high income people in full employment or retired in contrast to members of the political movement, with less highly educated and less rich people. This is also reflected regarding the answers about energy poverty: In general, around 200 respondents never or rarely have difficulties paying their bills or consider their homes uncomfortable with regards to temperature in summer or winter, meaning that 70 to 80 respondents at least sometimes have problems. Again, there are considerable differences between the groups, with 43% of PM members indicating that they have at least sometimes difficulties to pay the bills versus 23% for ECs and 13,5% for CTAs).

5.2.2 Material Culture

To better understand the material culture, meaning the perception and use of different technical applications connected to the energy and climate transformation, which is expected to guide the energy-related behaviour of citizens, we asked several questions regarding modes of transportation, energy use in the households and dietary choices. With these answers, we first applied a factor analysis (rotated component matrix with varimax rotation, criterium for determining number of factors: Eigenvalue >1).

The result implies a 3-factor solution with the factors 1) Energy Use and Mobility, 2) Diet and 3) Thermal Comfort. One statement (it is natural for humans to eat meat) was indifferently attributed to two factors (energy use and diet).

D3.1 – Report on survey and structured interview results for identifying potential emergence and consolidation



	Component		
	1) Energy Use and Mobility	2) Diet	3) Thermal Comfort
[Having a car is simply part of being an adult.] Please indicate how much you agree or disagree with the following statements.	0,623	-0,083	0,229
[Electric cars are no real alternative to fossil fueled cars.] Please indicate how much you agree or disagree with the following statements.	0,649	-0,04	-0,084
[Public transport is no real alternative to driving your own car.] Please indicate how much you agree or disagree with the following statements.	0,751	0,062	-0,02
[Heating with fossil fuels is a good energy solution.] Please indicate how much you agree or disagree with the following statements.	0,598	-0,275	-0,178
[A reliable supply of electricity to private households can only be provided by companies.] Please indicate how much you agree or disagree with the following statements.	0,612	-0,42	-0,005
[Investing in energy efficiency is beneficial for my household.] Please indicate how much you agree or disagree with the following statements.	-0,102	0,203	0,844
[Improving living conditions (e.g. thermal comfort) is as important for me as reducing energy consumption and bills.] Please indicate how much you agree or disagree with the following statements.	0,072	-0,05	0,863
[A vegetarian or vegan diet is sufficient for humans to have good health.] Please indicate how much you agree or disagree with the following statements.	0,099	0,825	-0,006
[Eating less meat would have a positive impact on the environment] Please indicate how much you agree or disagree with the following statements.	-0,336	0,767	0,236
[We are human and it is natural for us to eat meat every day.] Please indicate how much you agree or disagree with the following statements.	0,57	-0,572	0,016

Table 15 Rotated Component matrix - 3 factors solution



We created the three scales “Energy Use and Mobility”, “Diet” and “Thermal Comfort” by calculating the means of the relevant variables, whereby the question with no clear factor assignment was left out. Furthermore, for easier reading, the questions about diet were inverted, so that always a higher score means a stronger affiliation with the less climate-friendly solutions.

On average, respondents answered on a medium level for “Diet” (Mean 2.7, SD 1.1) and for “Energy Use and Mobility” (Mean 2.6, SD 0.9) with higher values indicating less climate-friendly material culture. For “Thermal Comfort” on the other hand, there was a very high agreement with a mean of 4.2 and an SD of 0.9, meaning that thermal comfort is very important for almost all respondents. If we separate the groups according to types of initiatives, we see almost identical numbers for ECs and CTAs with medium agreement with fossil-based solutions in energy and mobility, a meat-based diet, and high agreement with importance of thermal comfort. In contrast, PMs have a higher agreement with fossil-based energy and mobility solutions and an even higher with meat-based diet, but a lower agreement with the importance of thermal comfort.

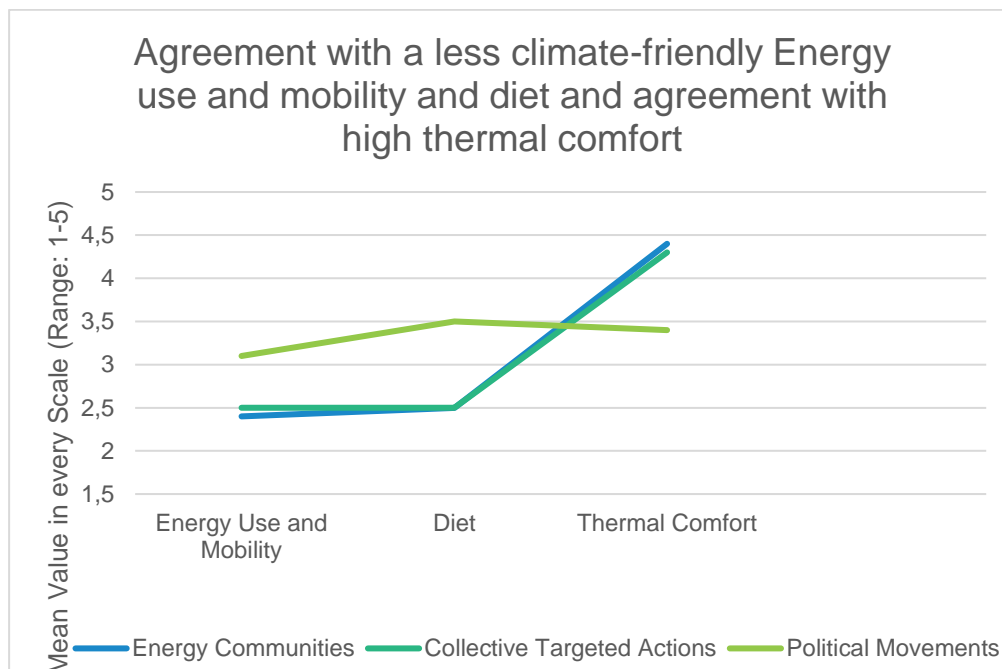


Figure 21 Agreement with less climate-friendly energy use and mobility and diet and agreement with high thermal comfort

5.2.3 Climate Change Perception

With regards to climate change, 171 respondents indicated that they think it is caused mostly by humans, 80 say both by humans and nature and 22 say mostly natural causes. Around 200 people indicate that they perceive climate change definitely or probably in their local area, 38 are not sure and 36 don't see that.

If we differentiate between the types of initiatives, we see that 75% of EC members and 64% of CTA participants, but only 29% of participants of PM see humans as the main cause of climate change. Vice versa, 29% of participants of PM see nature as main cause for climate change versus 6% of CTA and 1% of ECs.

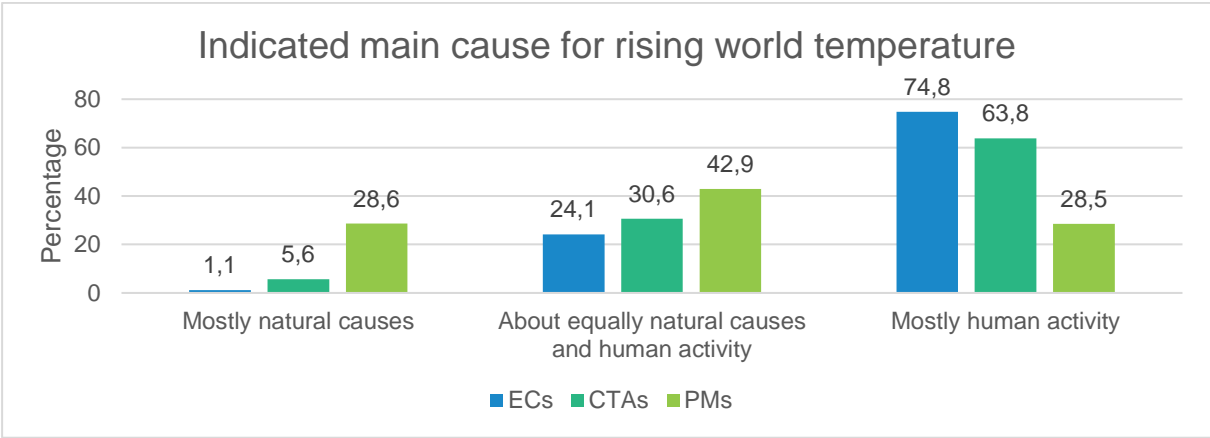


Figure 22 Indicated main cause for rising world temperature of members of the different types of CEIs

5.2.4 Psychological Traits

Overall, when looking at collective versus individual attitudes, on average the respondents score medium in Individualism (3.4 on a scale from 1 to 5), and in Competitiveness (2.7), high in Collegueship (4.1) and little high on Carefulness (3.5).

If we differentiate between the different types of initiatives, we see that while EC and CTA participants give similar answers, PM members score lower on individualism, competitiveness and collegueship, while there are (almost) no differences in carefulness.

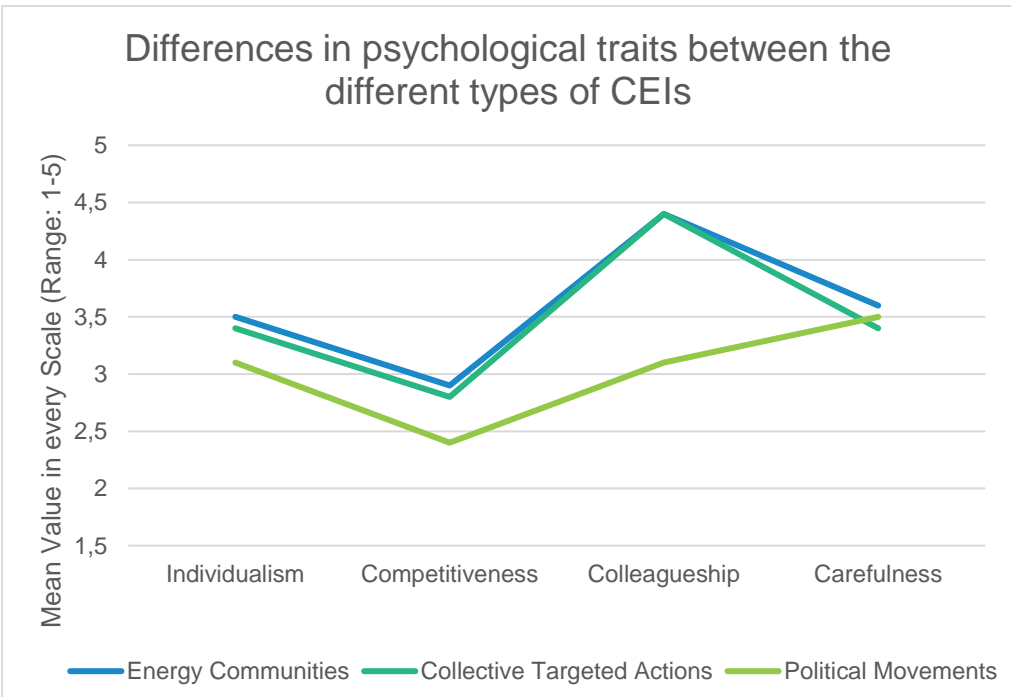


Figure 23 Differences in psychological traits between the different types of CEIs



5.2.5 Pro-environmental identity

Being pro-environmental is an important aspect of nearly all members of ECs and CTAs, less for PM members. This is not related to social norms, since all types perceive a similar amount of social action in their neighbourhoods.

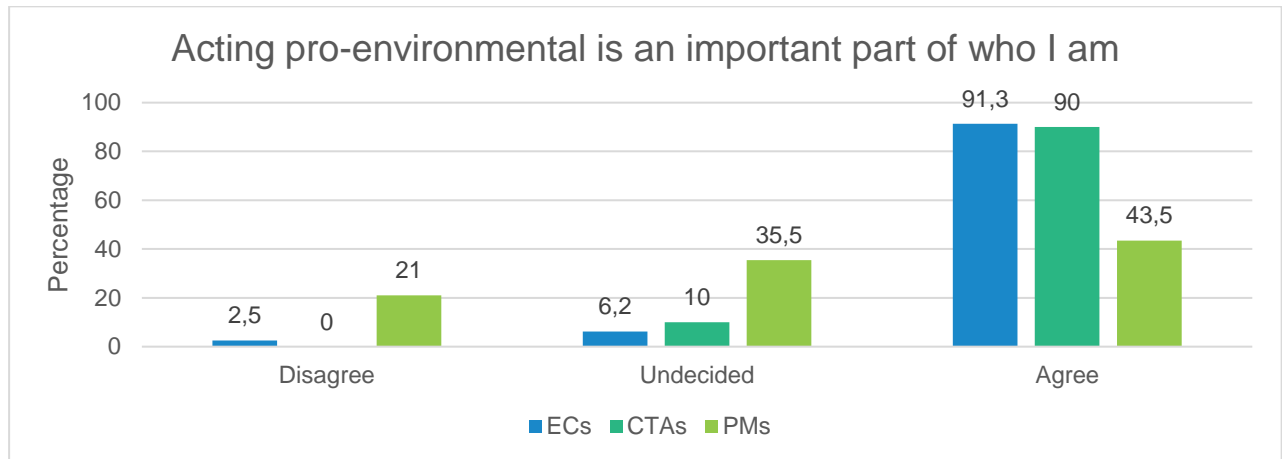


Figure 24 Respondents' pro-environmental behaviour

The abovementioned environmental identity is not related to social norms, since all types perceive a similar amount of social action in their neighbourhoods.

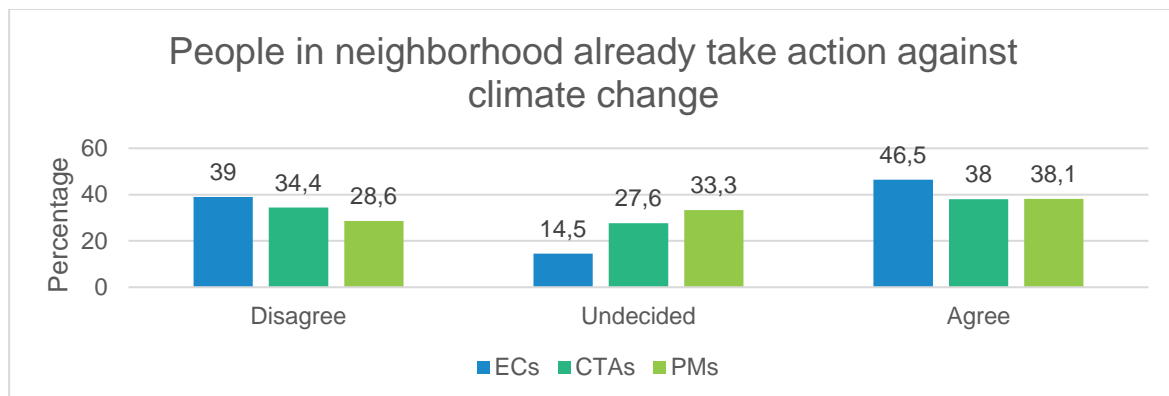


Figure 25 Respondents' opinion regarding taking action against climate change

5.2.6 Key Insights: Members' Background

For the emergence and consolidation of CEIs, it is important to understand the background and needs of their members and participants. For the emergence, it is relevant to identify those people in a target community that might be most willing to become members and to concentrate goals and communication on aspects that seems to be relevant for them. For the consolidation, it is important to expand to other target groups and address their needs and ideas.

The “typical” member of the three different types of initiatives, based on the survey responses can be described as follow:

Energy Community and Ecofarms members: Male, higher age, from a village or small town, higher educated, full time employed or retired with high income. Perceives the impact of humans on the climate, wants to act pro-environmentally and sees renewable energy use in heating and mobility as well as a sustainable diet positive, but also values living comfort. They value collegueship rather strongly and are on average slightly individualistic and careful.



This means that for the foundation of energy communities, potential founders using “traditional” concepts of ECs might have an advantage if they search for partners matching this profile and setting the benefits of the community for the climate in the centre of their communication. If the aim is to engage new target groups, founders probably need to think about how the concepts need to be adapted to be attractive for other citizen groups. However, for both approaches it applies that for the consolidation and expansion later on, it might make sense to think about addressing new groups of citizens like females, people of younger age, and people with less education and income, and to think about how they can be attracted to the community. Also, it might be beneficial, to focus less on climate-benefits but also on other advantages of an energy community (self-sufficiency, financial profits, social aspects, etc.).

Collective Targeted Actions participants: Relatively even in gender distribution, medium age, lives typically in a city, well-educated and with higher income. Climate perception and psychological traits are very similar to those of EC members. So, for the emergence of CTAs, targeting people from cities (of all gender and age groups) with a climate-issue focus seems promising. For the consolidation and expansion, in terms of sociodemographic characteristics there seems to be not a big need to adapt apart from reaching out to attract more people from the countryside. Furthermore, as for energy communities, offering advantages apart from becoming more sustainable might be beneficial.

Political Movement participants: Survey participants from PMs can be characterised as very different in comparison to the other two groups. They are male dominated, on average considerably younger than participants from the other two groups, less educated and less wealthy. They believe more often that climate-change is not induced by humans, do not consider pro-environmentalism as an important part of their personality and are stronger in favour of fossil-based energy and mobility options, but on the other hand attach less importance on thermal comfort. Furthermore, they are stronger collectivistic oriented, less competitive and less collegial than the other groups.

Interpretations of these results should be treated carefully, since all members of PMs come from North Macedonia. Some of the attributes associated here with the membership in a PM, might also be a manifestation of Macedonian culture and structure. To further elaborate on that, we compared the answers of the participants from what we classified as a Macedonian EC with the answers of the members of the PMs. In comparison we see a similar distribution of gender and education and a similar affiliation to use fossil fuelled solutions for heating and mobility. These three aspects might indeed be mainly caused by the country of origin and not so much by the membership in certain types of initiatives. Nevertheless, that leaves us with the notion, that especially climate-change issues do not seem to play an important role for the PM members. To understand that, a closer look at the two initiatives considered here might help: Both of them have the main goal of preventing the construction of two (water) power plants in the region where the initiatives are located. So, the main goal very clearly is to preserve nature in the own living region as it is. For the emergence of future PMs that deal also with such local issues we nevertheless can derive that the topic of climate-change in general should not be stressed too much, since it might not be an important issue for potential members.



5.3 Perception of initiatives from the point of view of members and participants

5.3.1 Reasons for joining a CEI

Saving money:

29% of all respondents identified saving money as their main reason to join an initiative. From ECs 32% agreed to the statement, from CTAs 21% and from PMs 23%.

Live more climate-friendly

42% of all respondents identified living more climate friendly as a main reason to join. Distinguished between type of initiative, in ECs 48% indicated climate friendliness as a main reason, versus 45% of CTAs and only 23 % of PMs.

Be together with other people

Overall 31% indicated social reasons as main reason for joining their initiative. Regarding types, this is true for 35% of ECs, 15% of CTAs and 30% of PMs.

Energy self sufficiency

Overall self-sufficiency was named by 29% of respondents as main reason. Differentiated by type, the numbers are 29% for ECs, 24% for CTAs and 31% for PMs.

Healthy life

Changing to a more healthy lifestyle was a main reason for 15% of respondents. Separated by type of initiative, 15,5% of EC members, 9% of CTAs members and 19% of PMs participants choose this option.

Comfort improvement

This option was chosen by 9% of respondents. Separated by type, it was selected by 5% of EC members, 12% of CTA participants and 16% of PM participants.

Legal obligations

Legal obligations were only chosen by three people, two of them from a PM, one from an EC.

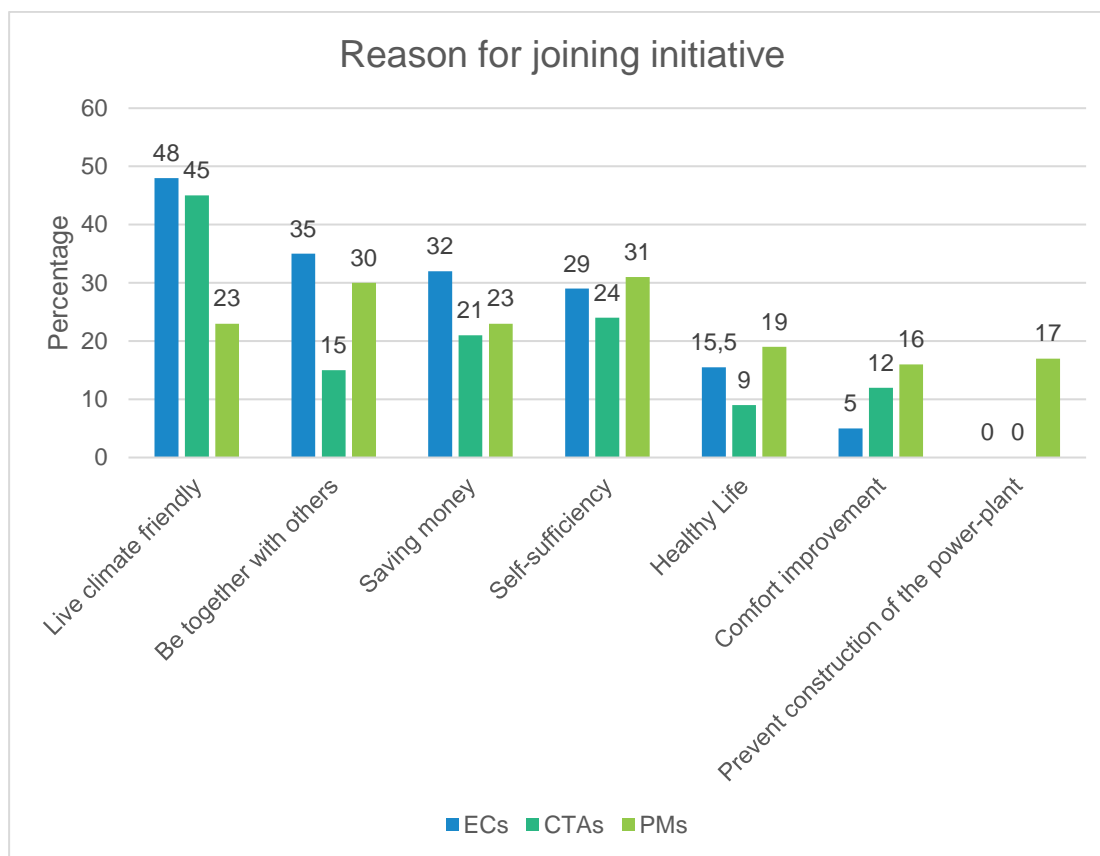


Figure 26 Reasons for joining a CEI

5.3.2 Internal organisation of the initiative as seen by the members

Communication

Regarding communication, 60% of respondents somewhat or fully agree that communication channels used by their CEI are sufficient. Separated by age, people 65+ agree the most (70% agreement), the youngest the least (51% agreement). Differentiated by type of initiative, 74% of EC members agree fully or somewhat that the channels are sufficient, 70% of CTA participants and only 22% of PC participants.

Knowledge provision

Overall, 54% of respondents fully or somewhat agree that the initiative provides them with sufficient knowledge or that they could gain such knowledge by contacting the experts. Divided by age, again people 65+ are the most satisfied (64% agreement), the youngest the least (48% agreement).

Differentiated by type of initiative, 69% of EC respondents fully or somewhat agree, compared to 56% in CTAs and only 23% in PMs.

Perceived Conflicts

Overall, conflicts are perceived rather as rare with only 15% of all participants indicating any kind of conflicts. The picture is relatively consistent across CEI types.



If conflicts are mentioned, the following reasons are reported as the main conflict topic: For ECs, main conflicts are about decision making and financial issues. For CTAs, resource distribution and financial issues are very central. For PMs, decision making, engagement of members and resource distribution are most important.

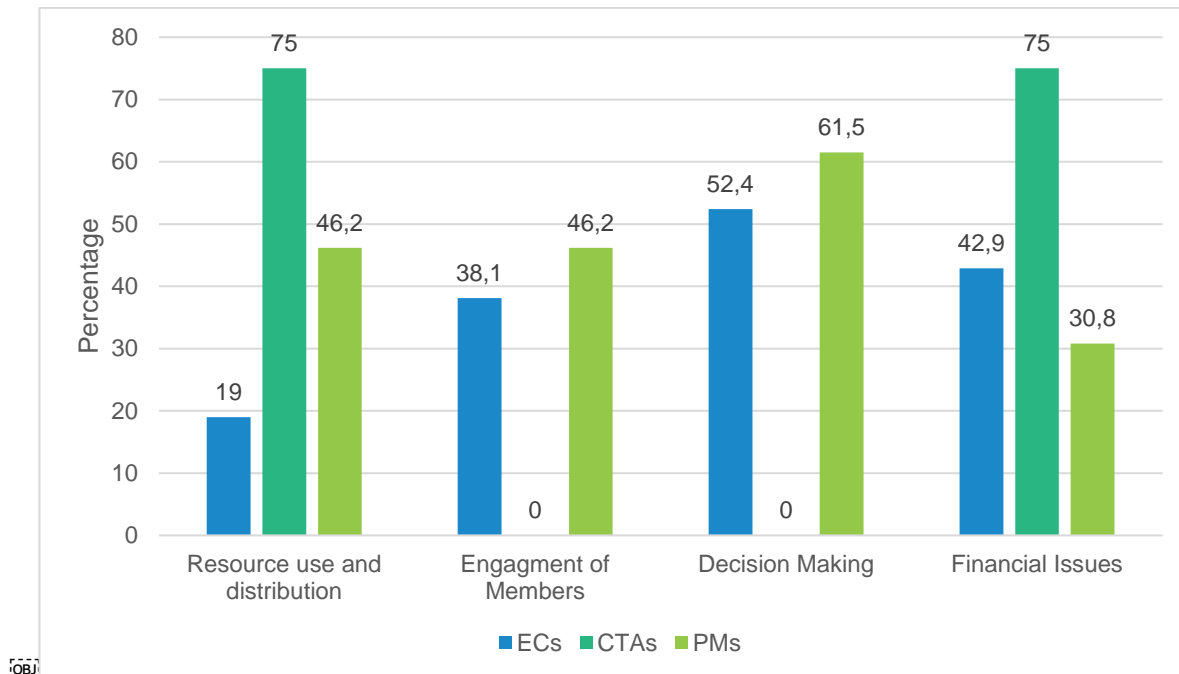


Figure 27 Conflicts in CEIs

Perceived transparency of decision making

Regarding decision making, 90% of EC members consider decision making moderately or highly transparent in comparison to 68% of CTA and 52% of PM members.

Trust in others in initiative

Overall, 43% of respondents state that they fully or somewhat agree with the statement that they can count on others in the initiative. Differentiated by age group, the agreement is the strongest in the oldest age group (60%) and the lowest in the age group 35 to 49 (34% agreement). Differentiated between types of initiatives, 57% of EC members trust others, 44% of CTA participants, but only 22% of PM.

Attachment to initiative

A scale was created consisting of four questions regarding the attachment to the initiative (“initiative means a lot to me”, “I am very attached to the initiative”, “I identify strongly with the initiative”, “I feel the initiative is part of me”, Cronbach’s Alpha 0.953): Overall, participants score with 3.4 on a scale from 1 to 5 (SD=1.2). Differentiated by age, the highest attachment can be seen for the oldest age group (3.9, SD=1.0), the lowest for the age group of 35-49 (3.2, SD=1.1). Differentiated by type of initiative, attachment is the highest in EC members (3.8, SD=1.0) and lowest in PM members (2.4, SD=1.1).



5.3.3 Barriers, improvement potential and future prospects for CEIs as seen by the members and participants

Barriers

The main barriers seen by the initiatives' members (independent from type) are bureaucratic barriers (seen by 43% of all respondents), not enough support by authorities (41%) and lack of access to public funding (38%). Other named barriers are lack of technical knowledge, low engagement of key personnel, lack of volunteers, high fluctuation of members, problems with suppliers, lack of public awareness. 14,5% indicate that they see no barriers at all. Separated by type of initiative, CTA participants report the least barriers and PM members the most. More concretely, EC members especially see lack of support by authorities, bureaucratic barriers and lack of funding as most relevant problems. The same three barriers are most prominent for CTA participants, but on a much lower level. Members of PMs name the most barriers as relevant, especially bureaucratic barriers and a lack of technical knowledge.

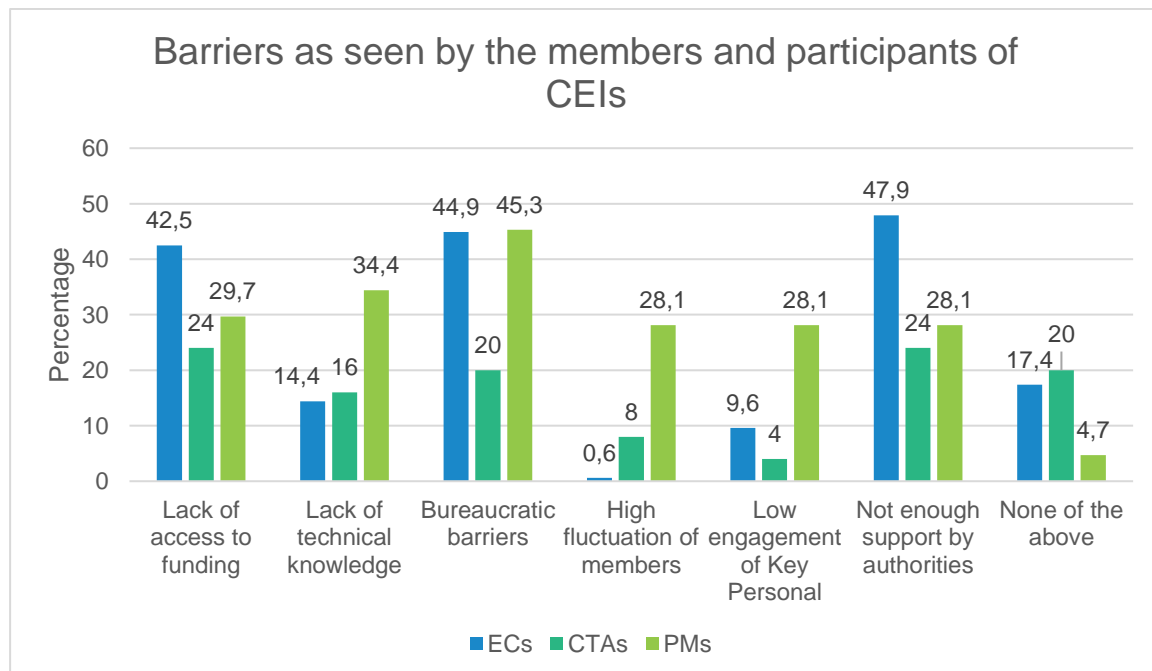


Figure 28 Barriers as seen by the members and participants of CEIs

Improvement potential

If asked to name the three areas with the greatest improvement potential for their initiative, EC members name on first place higher financial support, followed by help with bureaucratic barriers. For CTA participants it is higher financial support and better external visibility. PM members see the most improvement potential in help with bureaucratic barriers and increased transparency.

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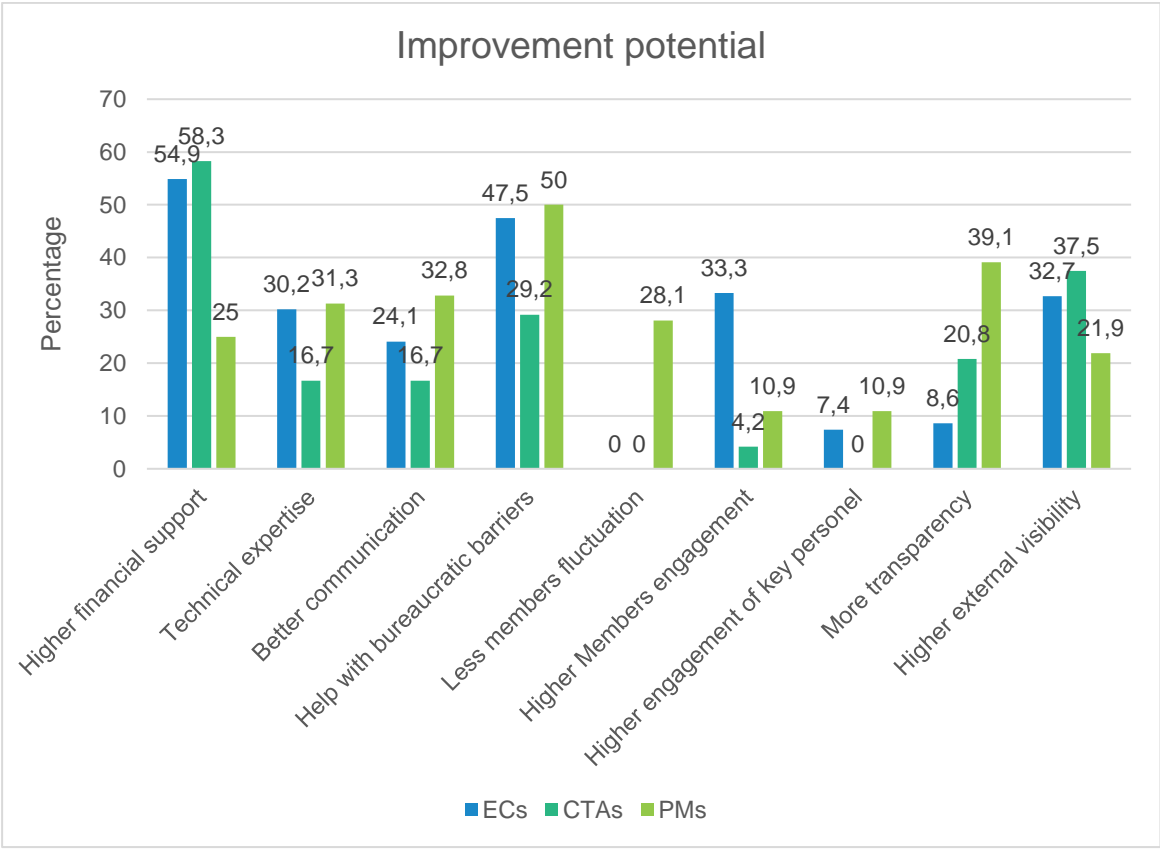


Figure 29 Improvement potential

Future development

Asked for the most likely state of the initiative in ten years, 87% of EC members think that their initiative will have become larger, compared to 83% of CTA participants and only 14% of PM members. Only two EC members and one CTA participant think that the initiative will not exist anymore (14 members of PMs).

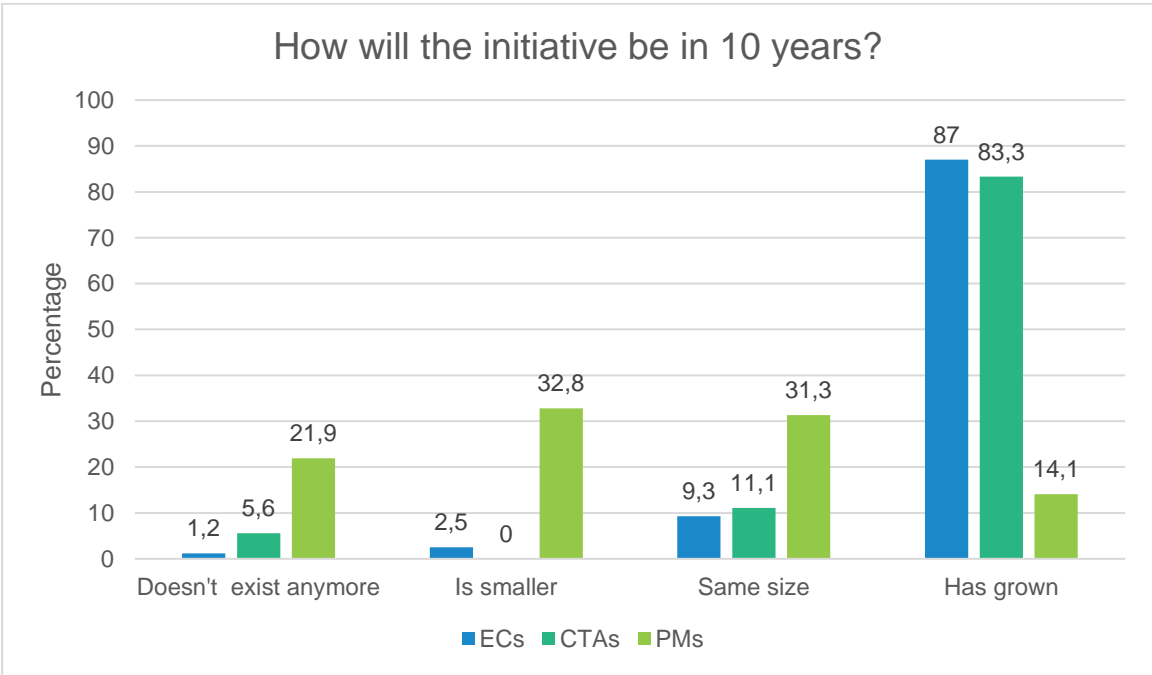


Figure 30 Future development of the CEIs



5.3.4 Key Insights: Perception of Initiatives by Members

Perception of the initiatives by its members and participants allows to better understand which aspects might contribute (or have contributed) to the emergence and consolidation of initiatives and where more focus should be put on in the future.

Energy Communities and Ecofarms: The main motive for the EC members to join their respective initiative was to become more climate friendly, followed by the wish to be together with others and – only on third position – to save money. This emphasises that, other than often assumed, money is not necessarily the main motive when new initiatives are founded. So, at first it might be more promising to focus on other aspects. In terms of internal communication and procedures, members of ECs are mostly satisfied with communication, knowledge provision and transparency. This implies that the established models of ECs (strong focus on democratic processes and transparency) seem satisfying in terms of participation of members and should be kept (or even expanded). However, younger members are on average less satisfied with communication and knowledge provision. Especially initiatives aiming at consolidation should therefore pay attention to establish communication and knowledge provision channels that also satisfies the needs of the younger generations. Conflicts are reported very rarely. If they occur, decision-making processes, financial issues and members engagement are seen as the main topics.

In terms of trust in each other and general attachment to the initiative, EC members score higher than the other types, emphasising once again the importance of the social aspect.

If asked about barriers they encounter in the initiative and improvement potential, they name most often lack of support by authorities, bureaucratic barriers and lack of access to funding and corresponding a wish for more financial support and help with bureaucratic barriers. That stresses the importance of support by regulatory and financial partners for emerging as well as established ECs. Nevertheless, EC members have very positive future expectations with almost 90% expecting their initiative to grow in the next ten years.

Collective Targeted Actions: The main reason for joining the initiative was to live more climate friendly, followed by becoming more self-sufficient and saving money. So, for EC as well as for CTA participants living climate friendly is the main motive (and therefore should be featured the most by emerging initiatives). This indicates a stronger focus on personal gains which should also be in the focus of (especially consolidated) initiatives.

Generally, CTA participants are satisfied with the communication of their initiative and with transparency of decision making, but to a lesser degree with the knowledge provision. Especially consolidated CTAs should therefore put a stronger emphasis on this aspect (probably also learning from ECs). Trust in others and attachment to the initiative is lower than for ECs, indicating that participants perceive CTAs more as a service provider than a social community. Emerging as well as established CTAs should therefore keep in mind, that, at least those members and participants that stayed long enough in the initiative to fill out this survey, social aspects are no central need that should be addressed by the initiative.

Regarding barriers, CTA participants name considerably less barriers than the other two groups. If they do, lacking funding and missing support of authorities and bureaucratic barriers are seen as most relevant. The most improvement potential they see for higher financial support and higher external visibility. Outlook into the future is similarly positive as for EC members, with over 80% of respondents expecting their initiative to grow within the next ten years.

Political and Social Movements: Main reasons for participants from PM members to join their initiative was self-sufficiency and being together with others. However, we should keep in mind that the prevention of the construction of the power plant was no predefined answer option (but



still named by 17% in an open answer format), which might have led to a too small rate for this answer. Nevertheless, it is remarkable that being together is a strong motive for members of PMs.

Regarding internal communication, PM participants are by far least satisfied with communication and knowledge provision as well as with transparency of decision-making, have the lowest trust in each other and the lowest attachment to their initiative. Conflicts are nevertheless reported infrequently but if, the decision-making process is most often the reason for conflict. Given the desire to socialise with others and the dissatisfaction with communication it can be derived that representatives of PMs should put a special focus on communication and giving the people the possibility to express themselves, to discuss relevant topics and to build trust among each other and attachment to the initiative.

Main barriers seen by the participants are bureaucratic barriers, where they also see the most improvement potential, and a lack of technical knowledge. Bureaucratic barriers in this kind of movements must probably be considered somehow natural in these kind of citizen movements, since the aim of them is to prevent measures that the state wants to implement.

Lack of knowledge also corresponds with the indicated dissatisfaction with knowledge provision. Considerable improvement potential is seen in nearly all areas, but especially in help with bureaucratic barriers and in elevating the transparency of the initiative. This again emphasises the importance of communication for these kinds of projects.

5.4 Benefits of membership and participation

5.4.1 Becoming more sustainable and energy efficient

ECs and CTAs both seem suitable to have an effect on the sustainability of the members' lives. Around half to 2/3 of the participants of these groups indicate, that since joining the initiative, they took actions to become more sustainable and/or reduced their energy use. This is only the case for around 20 to 25% of PM participants.

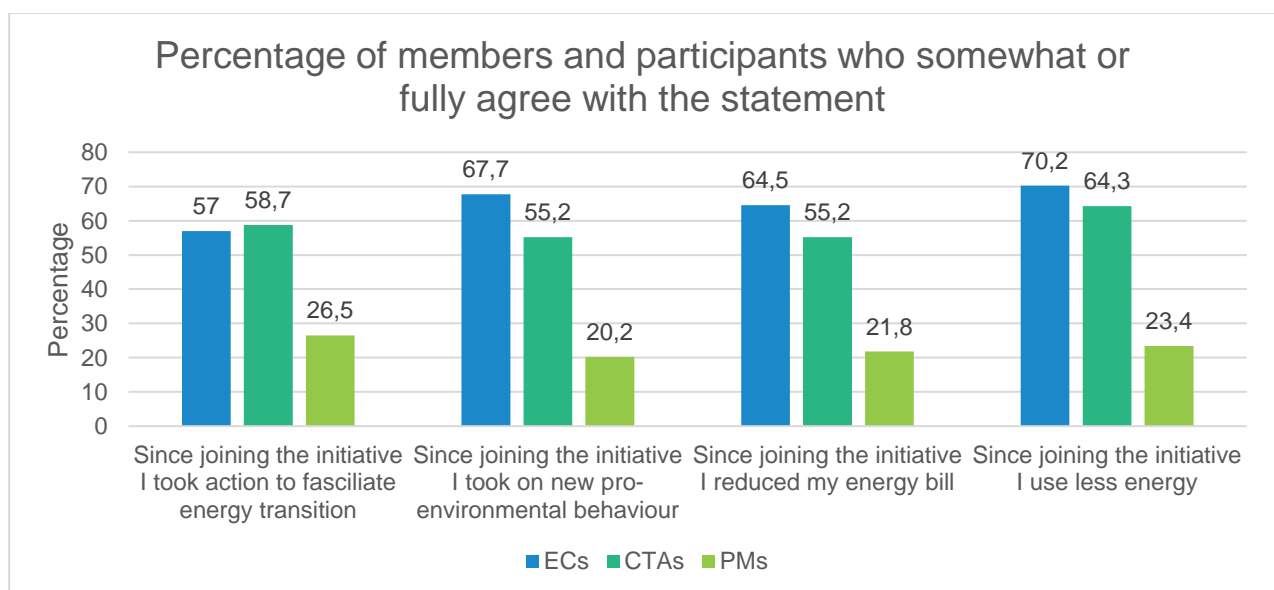


Figure 31 Percentage of members and participants who somewhat or fully agree with the statement

When asking more concretely about areas of behaviour that might have changed, overall 200 respondents changed at least one aspect of their climate-related behaviour towards a more

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climate-friendly lifestyle. Differentiated by type of initiative, 79% of EC and CTA members and participants changed at least one aspect, compared to 47% of members of PMs.

Regarding the number of changes, on average of all respondents, three aspects of behaviour have changed. If the types of initiatives are compared, EC members changed on average 3.1 behaviours, while CTA participants 4.0 and PM members 2.2.

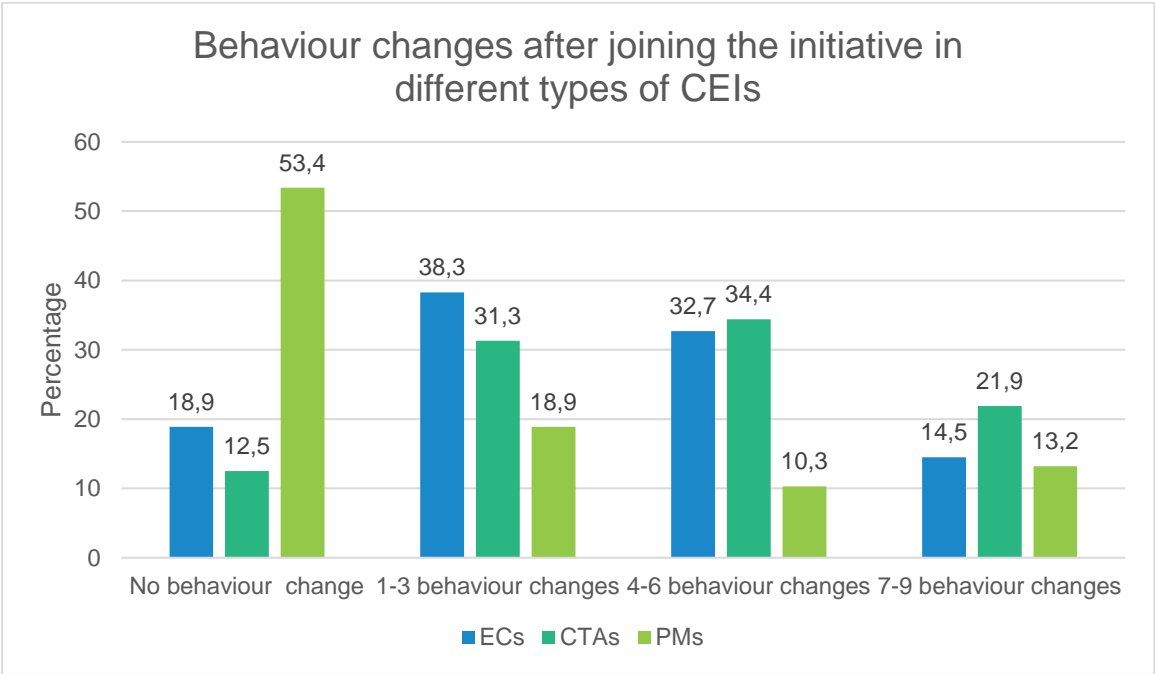


Figure 32 Behaviour changes after joining the initiative in different types of CEIs

5.4.2 Contributing to Health in the region

50% of EC members and CTA participants agree that the initiative contributes to general health benefits versus 39% of PM members. 47% of PM members explicitly disagree with this statement.

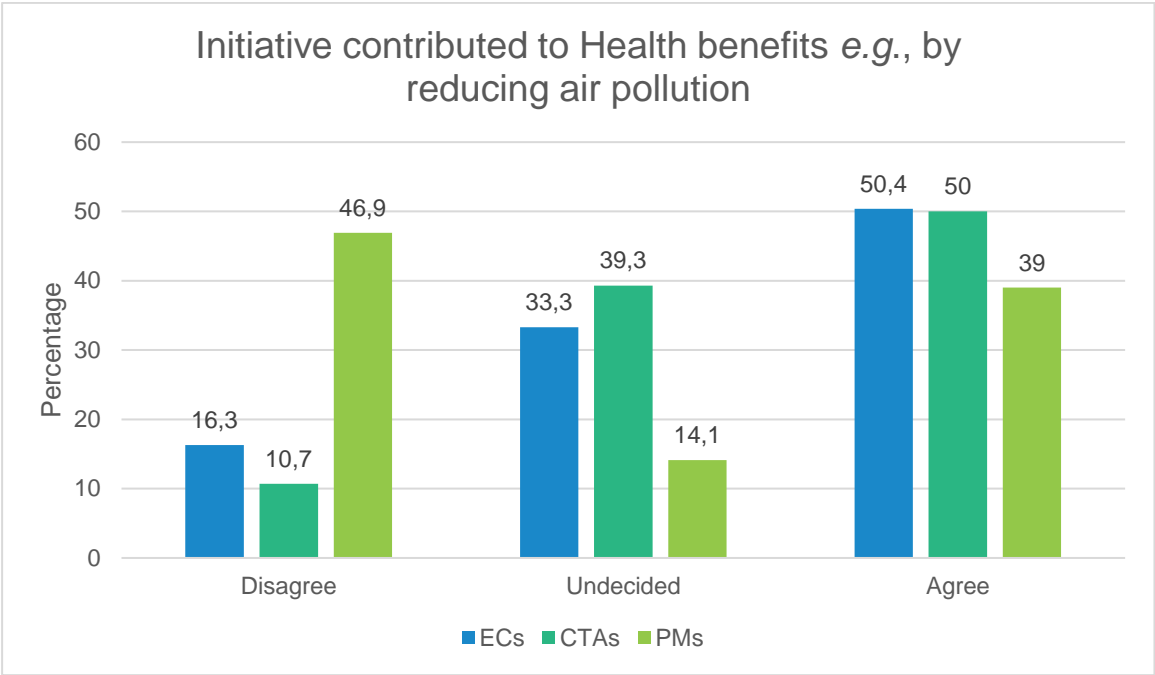


Figure 33 CEIs contributing to health benefits

5.4.3 Social benefits

In terms of social benefits, ECs and CTAs helped to establish a better relationship to the own community as well as to the other members and participants of the initiative. This is not the case for PMs, where only a third respectively a quarter of the survey participants reported improvement in the relationship to either the community or the initiative’s participants.

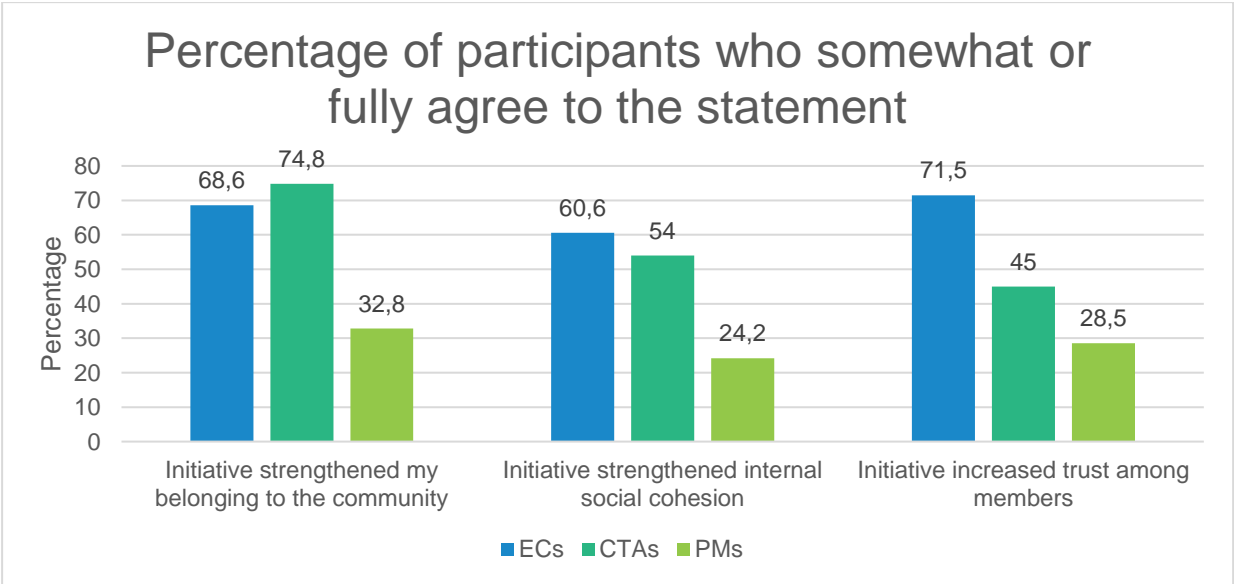


Figure 34 Social benefits as seen by the members and participants of CEIs

5.4.4 Knowledge

In terms of knowledge gain, 78% of EC members, 83% of CTA participants and 48% of PM members reported an increase in technical knowledge. In terms of practical knowledge on how to work with people, 63% of EC members reported an increase compared to 48% of CTA



participants and 42% of PM members. Similarly, 69% of EC members reported an increase in the capability to solve problems compared to 40% of CTA participants and 36,6% of PM members.

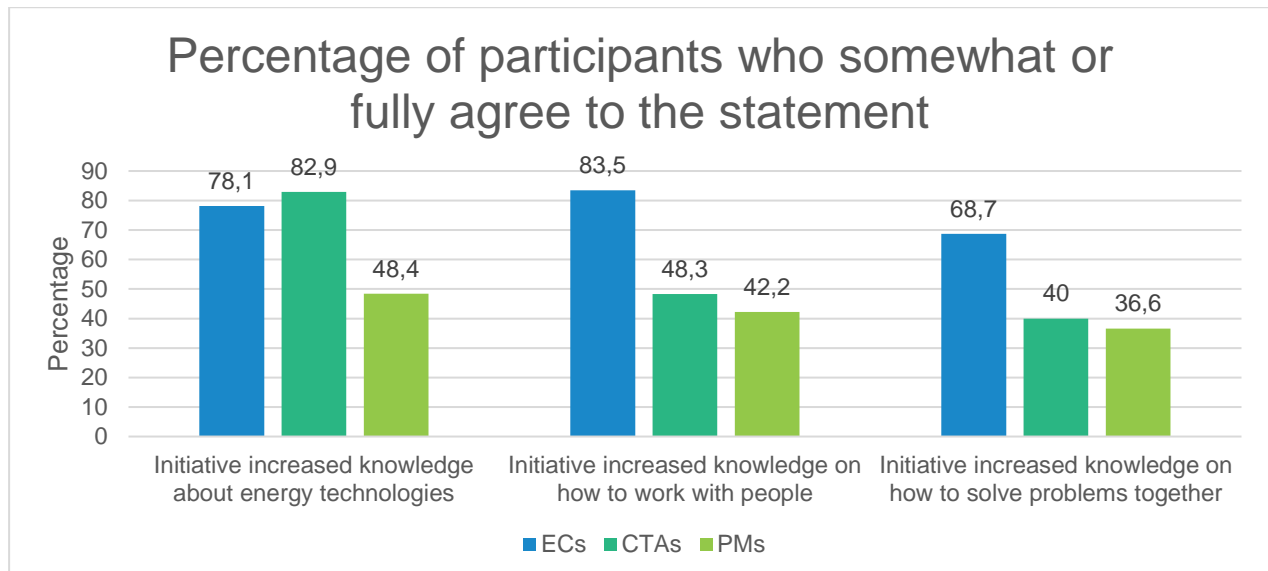


Figure 35 Knowledge increase as seen by the members and participants of CEIs

5.4.5 Key Insights: Benefits for Members and Participants

Energy Communities and Ecofarms: ECs can offer various benefits for their members and the communities they are located in. First, the membership obviously had consequences for the general lifestyle of most members, since around 2/3 shifted to a more sustainable lifestyle since joining the initiative. The membership also increases the technical knowledge, as well as skills on how to work together and solve problems. Furthermore, the membership also produces social benefits by strengthening the members' relationship with the local community. Emerging as well as established ECs can argue with these additional benefits, to get support by local communities and authorities and to secure funding.

Collective Targeted Actions: CTAs generally offer similar benefits as ECs. The main exception is that CTA members (mainly) don't see that the CTA increases trust among its members and that it provides opportunities to increase skills to work with people and solve problems.

Political Movements: Benefits of PMs for participants as well as for the regional community are far less pronounced as it is the case for the other groups, even with regards to social aspects, where, given the strong focus of the members on social aspects, one might argue that the members should benefit more strongly. PMs with a clear and narrowly defined goal seem to be best off, if they really focus on this single goal.

5.5 General Survey Conclusions

The analysis of the survey provided remarkable insights. Most prominently, it shows that the different identified groups of CEIs are distinguishable in terms of the composition of their members and participants, as well as in their internal organization and communication and the recognised benefits and barriers. Choosing the fitting combination of target group, goals, commu-



nication approaches and organizational form therefore seems important for emerging initiatives, to attract people. Already consolidated initiatives on the other hand can think about ways to modify their original structure to attract new citizen groups or to extend their range. More concretely, we see that ECs as well as CTAs seem to be more attractive for higher educated people with good income who are caring about the climate, whereby ECs seem to be more attractive for people living in rural areas and CTAs for people living in urban areas. In terms of a just energy transition, more emphasis should be put on the inclusion of stronger marginalised people. PMs on the other hand attract also not so well-educated people who don't care so strongly about the climate. So, under this light they are more inclusive, but strongly focused on the primary goal of the movements, whereas ECs and CTAs should focus more on and communicate more actively even more general goals and adapt to new (even) more climate-friendly solutions once they are available.

In terms of communication, exchange, and organization, the social component seems to play a more important role in ECs and PMs and less in CTAs, which more strongly takes the form of a service offer to its members. This also corresponds with the urban-rural differentiation we see and confirms the results of the case studies' analysis.



6. Conclusions and outlook

It is remarkable that both, the analyses of the cases from an organisation-based perspective, as in the case study part and from members’/ participants’ based perspective yield very similar results. It seems that understanding of the initiatives’ functions, organisation and goals is well aligned between those organising the initiatives and the majority of the members and participants.

It is also remarkable that based on the analysis the different types of initiatives seem to focus on citizen groups with different goals and wishes and different backgrounds, covering a broad variety of citizen groups, but not all. Whereas ECs and CTAs seem to fulfil the needs of mostly higher educated and better paid citizens who want to contribute to the energy transition, PMs in the special form we have studied in this analysis (as organizations to fight specific governmental measures) also attract less educated and wealthy people who care less for climate protection in general. For the further expansion of initiatives it seems to become important, how more people from less privileged socioeconomic background (including education) as well as people who are less interested in climate-protection can be activated to become active energy citizens.

Furthermore, ECs and PMs, but not so much CTAs also fulfil a social mission in their communities, which needs to be respected by emerging initiatives and not forgotten by consolidated ones.

However, some aspects occurred, that need further analysis to gain more insights.

First of all, to ensure a just and inclusive energy transition, we need to better understand how can integrate new and broader groups of citizens in these initiatives.

Further, we need to comprehend what additional or already addressed factors contribute to the emergence and consolidation of Collective Energy Initiatives as well as what are the most important criteria of success for different types CEIs. In that regard, T3.3 “Ground-truth potential emergence and consolidation factors” will focus on the following core topics:

- Energy Poverty – to better understand how we can “activate” citizens who are unable to access essential energy services and products to participate in energy initiatives, which could help alleviate the energy poverty at a small scale.
- Political, social and economic setting, special focus energy prices – to gain better knowledge about the general role of energy prices for the CEIs activities. Based on the data collected up till now, it seems that the financial issues play more important role for the participants of CTAs, even though the members of ECs seem to invest more private capital in their initiatives. We want to investigate what kind of dynamics can be observed in concrete cases.
- Planned and achieved impact – we found 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 hinder 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).
- Regulation – we have concluded that regulations and their implementation are one of the main barriers initiatives encounter when establishing as well as consolidate their initiatives. These barriers were also mentioned by the survey respondents. Thus, we



want to better understand what aspects of regulation seem the most problematic in specific cases.

- Funding / subsidies / business model – we observed 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. We want to understand what role do public and private funding play for the future in CEIs.
- Community Culture – we noticed 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 members or participants and stay in an initiative and with that for the consolidation of that initiative. We want to see whether the community culture aspect can be decisive while creating or consolidating specific types of CEIs.
- Barriers faced by the community – the survey's respondents names various barriers, among which bureaucratic and financial barriers scored the highest, which according to them hinder the progress and consolidation of their initiatives. We want to confront these findings with the insights given by other types of stakeholders (i.e. local authorities) further research activities.
- Technical aspects – we observed that some technologies, especially Photovoltaic applications, are very often chosen as main technical feature in many initiatives, which makes us wonder, what aspects, apart from the maturity and availability of this technology, makes this application more interesting for energy initiatives and probably most suitable for the emergence and consolidation of initiatives. We want to further investigate what are the members' / participants' relations with different technologies used by the initiatives.



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Appendix: Survey

General Introduction: ENCLUDE – Energy Citizens for Inclusive Decarbonization

Thank you for your readiness to participate in this survey! Your answers will contribute to bring forward the research on the development of collective energy initiatives. To find out more about those initiatives, we ask members and users from around 80 energy initiatives from Europe, Africa and Canada to take part in this survey. You are one of them.

Please note, that your participation is voluntary. Nevertheless, to give you a little bit more of motivation, we will award the initiatives with the highest response rates. Furthermore, you can track your contribution to the survey after you completed it.

You can fill out this survey either on a PC or laptop, a tablet or a smartphone, but we recommend to use a PC or laptop because of the bigger screen.

To be as transparent with you as possible, please click on the following link which will guide you to a document where we give you further information about the project and the survey and how the data will be used (which will be only for scientific purposes of this project).

If you have further questions, don't hesitate to contact either the person indicated in this document or the person who forwarded this survey to you.

Here: [Link to informed consent](#)

To progress and start with the survey, please indicate that you have read the information provided in the link and that you agree with the processing of the data.

I have read the information provided by the linked document and agree that my answers are used in the way indicated in this document

Yes No [If no participant is directed to a closing page stating that participation without consent is not possible and that he or she now can close the survey]



Your personal background

To start with some easy to answer questions, first of all we want to learn more about the people engaging in [name of energy initiative]. Please answer all questions honestly by checking the box most fitting for you. Once again, we ensure you that we will use your answers only in a way that allows no tracing back to you.

Please indicate your gender: Female Male Other/non-binary I prefer not to respond

How old are you? <18 19-34 35-49 50-65 >65

How many people live in your household (including yourself)?

- Number of people 14 or older (including yourself): ____
- Number of people under 14 ____

Which of the following best describes where you live? Please select one.

- Town/city (with more than 10,000 inhabitants)
- A village or small town (with less than 10,000 inhabitants)

What is your nationality?

Drop Down

How would you define your ethnicity? Please indicate

My nationality is: _____ I don't know

Where were your parents born?

- Both in [country]
- One in [country]
- Both outside of [country]
- Don't know for one or both parents

How long have you lived in your current place of residence?

- < 1 year

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- 1-5 years
- 6 –10 years
- Longer than 10 years

Which of the following is your highest level of education?

- Less than primary education
- Primary education
- Lower secondary education
- Upper secondary education
- Post secondary, non-tertiary education
- Tertiary education
- Other: _____

Which of the following describes your current occupational situation best?

- Paid employed (30 hours a week or more)
- Paid employed (less than 30 hours a week)
- Self employed
- Non-continued employment (day- or seasonal working)
- Retired/pensioned
- Not in paid employment and seeking paid employment
- Not in paid employment and not seeking paid employment
- Unpaid voluntary work
- Full time student
- Not able to work due to illness or disability
- Other: _____

How would you describe your household income in comparison with average households in your country?

- Much higher
- A bit higher
- Similar to the average
- A bit smaller
- Much smaller

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	Never	Rarely	Sometimes	Often	Always
Have you ever had difficulties paying your bills for heating or electricity?					
During the last winter, did you perceive your home as comfortable in terms of temperature?					
During the last summer, did you perceive your home as comfortable in terms of temperature?					

In political matters, people talk of the “left” (liberal/progressive views) and the “right” (conservative views). [Use left/right conservative/liberal according to your country]

Do you have an idea about where to locate yourself on this range?

- Yes
- No [skip following 2]

How would you describe your political outlook with regard to **economic issues** (e.g., taxes, cooperative vs. protective foreign economic policy, etc.)?

- Left
- Center-left
- Center
- Center-right
- Right

How would you describe your political outlook with regard to **social issues** (e.g., family, religion, traditional values, etc.)?

- Left
- Center-left
- Center
- Center-right
- Right

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In the next block we are going to ask you some questions about your thoughts on different aspects of living and moving. Don't think too much about it, simply answer what comes first into your mind. There are no wrong or right answers. Please indicate how much you agree or disagree with the following statements.

	Fully agree	Some-what agree	Neutral	Some-what disagree	Fully disagree	Not applicable for me
Having a car is simply part of being an adult.						
Electric cars are not real alternative to fossil fueled cars.						
Public transport is no real alternative to driving your own car.						
Heating with fossil fuels is a good energy solution.						
A reliable supply of electricity to private households can only be provided by companies. .						
Investing in energy efficiency is beneficial for my households.						
Improving living conditions (e.g. thermal comfort, etc.) is as important for me as reducing energy consumption and bills.						
A vegetarian or vegan diet is sufficient for humans to have good health.						
Eating less meat would have a positive impact on the environment but we are human and it is natural for us to eat meat.						

Do you think the rising world temperature is caused mostly by natural causes, about equally by natural causes and human activity, or mostly by human activity?

- Mostly by natural causes About equally by natural causes and human activity
 Mostly by human activity

Have you perceived changes in your local area that you think are connected to climate change?

- No, definitely not Probably not Maybe, I do not know
 Probably Yes, definitely

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How much do you agree with the following statements?

	Fully agree	Some-what agree	Neutral	Some-what disagree	Fully disagree
I'd rather depend on myself than others.					
I rely on myself most of the time; I rarely rely on others.					
I often do "my own thing."					
It is important that I do my job better than others.					
Winning is everything.					
Competition is the law of nature.					
If a co-worker would get a prize, I would feel proud.					
The well-being of my co-workers is important to me.					
To me, pleasure is spending time with others.					
Parents and children must stay together as much as possible.					
It is my duty to take care of my family, even when I have to sacrifice what I want.					
Family members should stick together, no matter what sacrifices are required.					

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Now we want to know more about your personal behavior. Please think about the **time since you joined [CEA]**. Look at the following statements and indicate what applies to you:

	Yes	No
My dwelling/home was upgraded (e.g., by retrofitting insulation or windows).		
My heating system was significantly modernised		
A photovoltaic system or solar heating was installed at my dwelling/home.		
I changed my room temperature setting to a more comfortable level.		
I don't know if anything was changed in my home during the last five years.		
I changed my main mode of transportation to a more sustainable one (e.g., from driving a car to using public transport, a bike or car sharing).		
I changed my consumption behaviour by reducing the number of products/ services (for example clothing or electronic devices) purchased.		
I changed my consumption behavior by substituting certain products/services by more sustainable alternatives (for example clothing or electronic devices)		
I changed my diet to less meat.		
I changed my leisure activities from activities that need more infrastructure and equipment to activities that need less infrastructure and equipment (for example from motor sports to hiking)		
I reduced the number of my holiday flights		

[This question is asked for every indicated behaviour change, if “yes” is clicked]. What do you think was the main reason for your change in [fill in from above]?

- Save money Improve comfort Improve health I want to live more climate-friendly
 The Covid-19 situation More energy self-sufficiency
 Legal obligations Because many people around me also changed this behaviour
 Other: _____

Congratulations! You already made it through more than half of the survey! Just some more questions and you are helping your [CEI] in the race towards the award and you can see how you contributed to the result.

In the next section, we want to learn more about how you view [CEI]. Remember once again, that all answers are completely anonymous and other members of [CEI] will not find out what you answered.

First think about the time when you started participating in [CEI]. What were your main reasons to join (indicate a maximum of two):

- I wanted to save money
 I wanted to live more climate-friendly

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- I wanted to be together with the people of the [CEI]
- I wanted to become more energy self-sufficient
- I wanted to live more healthy
- I wanted to improve my comfort
- I had legal obligations to do so
- Other: _____

How much do you agree with the following statements

	Fully agree	Some-what agree	Neutral	Some-what disagree	Fully disagree	Not relevant in [CEI]
The existing channels of communication in my initiative are sufficient?						
When needed, my initiative provides me with technical and legal knowledge or contacts to experts						
I can really count on the people in [CEI] when I have a great personal problem.						
[CEI] means a lot to me.						
I am very attached to [CEI].						
I identify strongly with [CEI].						
I feel [CEI] is a part of me.						

Are you a member of other climate-related initiatives apart from [CEI]?

- No
 Yes of one other initiative
 Yes of two other initiatives
 Yes of three or more other initiatives

Which barriers do you see in your [CEI] group? Please mark all options you feel are fitting to your [CEI].

- Lack of access to funding
- Bureaucratic barriers
- Low engagement of the key personnel
- Other: _____
- Lack of technical knowledge
- High fluctuation of the number of members
- Not enough support by authorities
- None of the above

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[Filter] Have you perceived any conflicts between the members of [CEI]? (e.g. a clash of interests, opinions or principles)

- Yes No [skip the following 3 questions]

How do you perceive the frequency of conflicts within [CEI]?

- High conflict frequency (nearly all the time) Moderately high conflict frequency (not all the time, but more often than not) Moderately low conflict frequency (not often but still sometime) Low conflict frequency (never or nearly never)

How do you perceive the intensity of conflicts in [CEI]?

- High conflict intensity Moderately high conflict intensity
 Moderately low conflict intensity Low conflict intensity

What are the main reasons for conflicts you perceive within [CEI]?

- Resource use and distribution Engagement of members
 Decision making Financial issues Other: _____

How transparent do you perceive the decision making in [CEI]?

- High transparency Moderately high transparency
 Moderately low transparency Low transparency

Now think about [CEI] in 10 years from now. What do you think is most likely?

- It still exists and has grown It still exists and has the same size
 It still exists but has become smaller It does not exist any more

How much do you agree with the following statement?

Only certain groups in society (e.g. middle-aged white males) engage in collective energy actions

- Strongly agree Moderately agree Neither disagree nor agree
 Moderately disagree Strongly disagree

If you would be able to improve [CEI] in a maximum of three aspects, which of the following would you choose?

- Higher financial resources More technological expertise

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- Better communication in the [CEI]
- Higher support in dealing with bureaucratic barriers
- Less fluctuation of members
- Higher engagement of members
- Higher engagement of the key personnel
- More transparent decision making
- Higher external visibility of the [CEI]

Since joining the [CEI], I...	Strongly agree	Agree	Some what agree	Neither agree nor disagree	Some-what disagree	Disagree	Strongly Disagree
...contributed to my own health benefits (e.g., by reducing air pollution)							
...strengthened my belonging to (link with) the community							
...increased my knowledge of how renewable energy technologies work and their potential benefits							
...gained practical skills in how to work with other people to bring change							
...took action to facilitate the low carbon/green/clean energy transition in a field different to [CEI]’s activity area							
...have taken new pro-environmental actions and/or behaviours							
...reduced my energy bills							
...started to use less energy							

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Since forming the [CEI], the community has...	Strongly agree	Agree	Some what agree	Neither agree nor disagree	Some-what disagreed	Disagree	Strongly Disagree
...established a greater social cohesion (support and empowerment)							
...increased the trust among its members							
...improved its resilience (against extreme weather, energy price fluctuations, etc.)							
...improved its capability to solve problems together							
...increased access to renewable energy technologies							
...increased uptake of renewable energy technologies for electricity generation							
...increased uptake of renewable energy technologies for heating/cooling							
...increased uptake of renewable energy technologies for mobility							

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You are only a view questions away from the finish! In this last part we want to know more about you, and how you see the world: How much do you agree to the following statements?

Acting pro-environmentally is an important part of whom I am.

- strongly agree moderately agree neither disagree nor agree
- moderately disagree strongly disagree

How much do you agree with the following statement?	0 not at all	1	2	3	4	5	6	7	8	9	10 very much
One can trust most of the people in our country.											
One can trust most of the people in our region.											
One can trust most of the people in our local area.											

How engaged do you perceive the following actors in tackling climate change?	Very engaged	Moderately engaged	Neither unengaged nor engaged	Moderately unengaged	Very unengaged
My closest neighbours					
My other neighbours					
Representatives of the municipality					
Local politicians					
Businesses in the neighbourhood					
Organisations active in the neighbourhood (sports clubs, etc.)					
Religious aggregations					
Citizen organisations					
National authorities					

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In relation to climate change, how important do you think are the following challenges in the country in which you live?	Much more important than climate change	Slightly more important than climate change	Equally important as climate change	Slightly less important than climate change	Much less important than climate change
Poverty					
Lack of Social Cohesion					
Low economic development					
Education					
Decreasing or low standard of living					
Traffic					
Lack of safety					
Poor infrastructure					
Not enough access to green space					
Demographic challenges					
Environmental degradation / destruction of nature					

I have the impression that most people in my neighbourhood already take action against climate change.

- Fully agree
- Somewhat agree
- Neutral
- Somewhat disagree
- Fully disagree

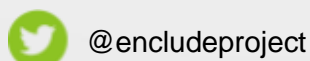
PARTICIPANTS



ENCLUDE project has received funding from the European Union's Horizon 2020 Research and Innovation programme under grant agreement No 101022791



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