Empowering youth for energy community actions

D2.1 Analysis of the barriers and local conditions for youth ECs

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Abbreviations and acronyms

Abbreviation	Elaboration
ACC/CSC	Collective Self-Consumption
ACI/ISC	Individual Self-Consumption
CEC	Citizen Energy Community
CEP	Clean Energy Package
CIEG	(Portuguese) Costs of General Economic Interest
CCP	(Portuguese) Public Procurement Code
CNPD	Comissão Nacional de Proteção de Dados (Portuguese data protection authority)
DAPEEP	(Greek) Renewable Energy Sources Operator & Guarantees of Origin
DGEG	(Portuguese) Directorate-General for Energy and Geology
DPO	Data Protection Officer
DSO	Distribution system operator
EAG	(Austrian) Renewable Energy Expansion Act
EC/ECs	Energy Community / Communities
EGAC	Collective Self-consumption Management Entities
EKII	(Latvian) Emission Allowance Auction Instrument
ElWOG	(Austrian) Electricity Industry and Organisation Act
EMD	Electricity Market Directive
EPAH	Energy Poverty Advisory Hub
ERDF	European Regional Development Fund
E-Redes	(Portuguese) Distribution System Operator
ERSE	(Portuguese) Energy Services Regulatory Authority
EU	European Union
GDPR	General Data Protection Regulation
FEK	Government Gazette Issue of the Hellenic Republic
HE	Higher Education
HEDNO	Hellenic Electricity Distribution Network Operator
IEMD	Internal Electricity Market Directive
IGAP	(Portuguese) Institute of Management and Public Administration
IMI	(Portuguese) Municipal Property Tax
IT	Information Technology
IU	Installation of Use

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Abbreviation	Elaboration
MoU	Memorandum of Understanding
NECP	National Energy and Climate Plan
NGO	Non-governmental organisation
NPO	Non-for-profit organisation
NSRF	National Strategic Reference Framework
PEER	Porto Energy Elevator project
PEH	Porto Energy Hub
PPA	Power Purchase Agreements
PV	Photovoltaic
Q&A	Questions & Answers
REC	Renewable Energy Community
RED II	Renewable Energy Directive
RES	Renewable Energy Sources
RESP	(Portuguese) Public Service Electricity Network
RRF	Recovery and Resilience Facility
SME	Small and midsize enterprises
UPAC	Self-Consumption Production Units
VET	Vocational education and training

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Executive Summary

The POWERYOUTH project aims to empower young people to play an active role in Europe's energy transition. To this end, it will develop the appropriate tools and methods, as well as a capacity-building programme, to foster dialogue between youth and local stakeholders and encourage their participation in Energy Communities (ECs). The POWERYOUTH approach is piloted in Austria, Greece, Latvia, Poland and Portugal, with a target of establishing at least 10 empowered youth ECs and involving more than 1,000 engaged young people and other stakeholders. This deliverable provides an in-depth assessment of legal and contractual frameworks, financial and market barriers, warranty, safety, and data issues, social barriers, and local conditions shaping youth ECs across the five pilot countries and at EU level.

To achieve that, a mixed-method approach was used, by combining an online survey and qualitative evidence from desk research, expert interviews and co-creation workshops. A total of 560 people contributed to the assessment, ensuring the diversity and validity of the results. The questionnaire captured the participants' awareness, attitudes, motivations and perceived barriers, while the qualitative work explored common issues concerning the legal, financial, contractual, social and local contexts through a shared set of guidelines to ensure comparability.

According to the EU results of the assessment, the awareness of ECs among young people remains moderate, but predisposition to engage is high: 54% declared that they would join a local EC, while 40% would consider making a micro investment. Confidence in youth leadership is strong (68%), and social media is widely seen as a critical engagement lever (78%). The most frequently cited impediments included a lack of accessible information (36%), limited support from municipal authorities (23%), and a perceived lack of community interest (14%). The policy priorities highlighted were youth tailored finance (27%) and simpler regulations (23%). These patterns underscore the need for targeted information, streamlined administrative procedures, proactive involvement of local authorities, and accessible financing pathways for first time participants.

The comparative analysis across Austria, Greece, Latvia, Poland, and Portugal reveals both shared and context-specific barriers and opportunities for youth engagement in ECs. While the legislative and policy environments differ, youth across all five countries demonstrate a strong willingness to participate in ECs, provided that legal, financial, and operational barriers are addressed.

In Austria, a well-established legal framework under the Renewable Energy Expansion Act (EAG) and Electricity Industry and Organization Act (ElWOG) supports the formation of ECs. However, procedural complexity and legal requirement, such as such as age-related legal restrictions, effectively exclude individuals under the age of 18 from formal participation. Despite these limitations, interest among young people is high: 70% of the survey participants expressed a willingness to join an EC, and approximately 88% would consider making a micro-investment. Nevertheless, young people remain underrepresented in existing ECs. Grid operators are commonly perceived as gatekeepers, and this perception further limits access. To improve youth participation, stakeholders recommended promoting alternative financing tools (e.g., crowdfunding), simplifying administrative procedures, and introducing standardised contracts.

In Greece, the EC landscape is comparatively mature, with more than 1,600 communities already registered. However, the recent legislative transition from the 2018 Energy

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Communities model to the Citizen Energy Community (CEC) and Renewable Energy Community (REC) framework, introduced by Law 5037/2023, has created considerable ambiguity and legal uncertainty. At the same time, operational bottlenecks, such as grid congestion, lack of timely supplier cooperation, and the introduction of the virtual net billing model, have further complicated the situation. Nevertheless, youth interest remains strong: approximately 74% would be willing to join an EC while almost 53% would micro-invest. Additionally, 77% of respondents expressed trust in youth leadership within ECs. To harness this potential, it is essential to clarify the transition rules between legislative models, address grid saturation issues, and develop youth-specific incentive schemes that reduce financial and bureaucratic hurdles.

In Latvia, the absence of a dedicated legal framework for ECs at the time of the study significantly limited both awareness and activity. A law was under development, but the lack of legal clarity has hindered local initiatives. Only 41% of respondents indicated a willingness to join an EC, and a large proportion remained undecided, pointing to uncertainty and unfamiliarity with the concept. Interestingly, Latvian youth were less inclined than their European counterparts to see social media as an effective communication channel for ECs. This suggests that alternative outreach mechanisms, such as school-based education and municipal-level information campaigns, may be more effective in this context. Priority actions for Latvia include finalising the legal framework, developing simple cooperative models to enable entry-level engagement, and investing in broad energy literacy initiatives.

In Poland, although a legal basis for ECs exists, it is fragmented and imposes significant limitations. The framework is heavily oriented toward rural areas and restricts the range of permissible EC activities. As a result, only around 35 ECs had been established nationwide at the time of the study. Connection applications are frequently denied due to grid capacity, and the administrative burden on communities is high. Municipalities often lack the capacity or mandate to support EC development, which further slows progress. Despite these obstacles, there is clear latent demand among youth: nearly 48% of the respondents would be willing to join an EC and make a micro-investment. To unlock this potential, targeted reforms are needed to simplify legal procedures, enable urban and youth-focused participation, and reduce technical bottlenecks related to grid access.

In Portugal, the legal framework for ECs is considered one of the most comprehensive in the EU. However, its effectiveness is limited by several technical and administrative constraints. The most significant of these are the restrictive proximity rules, the requirement for quarter-hourly metering, and the bureaucratic delays caused by capacity limitations at regulatory bodies such as the Directorate-General for Energy and Geology (DGEG) and the Distribution System Operator (DSO). Nevertheless, Portugal, and specifically Porto, offers some promising innovations, including municipal incentives like property tax reductions (IMI) and support services offered through one-stop shops (OSS) such as the Porto Energy Hub (PEH). Among youth, 58% indicated willingness to join an EC and 51% would make a micro-investment. Key recommendations for Portugal include standardising contract templates, relaxing or adapting metering and proximity requirements, and accelerating digitalisation efforts to streamline administrative processes.

The analysis reveals that all pilot countries face recurring systemic barriers that affect youth participation in ECs. Although the specific regulatory, financial, technical, and social contexts vary, several cross-cutting patterns have emerged.

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One of the most common challenges is regulatory and contractual complexity. Across all countries, procedures for establishing or participating in ECs are either overly burdensome, legally ambiguous, or unclear, particularly for young people. In places, where the legal framework is still in development, such as Latvia, or fragmented and restrictive, such as Poland, the growth of ECs remains particularly constrained. Even in countries with well-established legal systems, like Austria and Portugal, the absence of streamlined administrative pathways and standardised legal templates continues to create confusion. Simplifying procedures and providing greater legal clarity, especially in terms of how individuals under 18 can participate, are widely needed.

Financial barriers are similarly prevalent. High upfront costs, limited youth-specific incentives, and a lack of accessible public funding mechanisms make participation difficult for young people, even when their interest is high. Although tools like crowdfunding, municipal bonds, and community share models are known, they are rarely utilised or tailored to youth. Where such mechanisms do exist, they often involve bureaucratic application processes that discourage engagement. Across all pilot countries, there is a strong need to develop financial tools that are better suited to the needs and realities of younger participants.

Grid readiness poses another significant constraint. In Greece and Poland, grid congestion and outdated infrastructure hinder new EC connections. Portugal is technically capable of accommodating new connections, but distributed generation requires network upgrades and better access to grid data. Austria has incorporated grid development into its national renewable energy plans, while in Latvia, limitations mainly affect high-capacity connections. In all cases, access to accurate, publicly available information on hosting capacity and a simplified procedures for connecting small or community-led projects would substantially improve feasibility, particularly for youth-led initiatives.

Lack of awareness and social perception also play a major role in shaping engagement. Misconceptions about ECs being too expensive, time-consuming, or inaccessible to young people are common. These misconceptions significantly reduce the likelihood that youth will explore or pursue involvement in ECs. Across the pilot countries, the absence of proactive communication, relatable role models, and targeted capacity building on the topic of ECs has reinforced these views. However, in cases where municipalities, schools, universities, and youth organisations actively engage with communities, awareness and trust levels tend to increase. Visibility of successful and locally-led initiatives also contributes to normalising participation and inspiring action.

A comparison of the five countries showcases that contexts with clear and practical regulatory frameworks, supportive municipal involvement, and accessible finance experience higher levels of willingness to engage, even when initial awareness is limited. Conversely, where legal ambiguity, administrative burden, and infrastructural limitations is evident, young people are far less likely to move from interest to action. Despite these challenges, interest for ECs among young people remains consistently high; the key factor influencing youth engagement is the extent to which the enabling environment fosters or hinders that interest.

Findings from surveys, expert interviews, and co-creation workshops point to several promising strategies. These include simplifying legal and administrative processes through standardised documentation and single-window registration systems; developing youth-specific financial mechanisms such as micro-grants, matched savings schemes, and low-interest loans; and supporting local authorities to offer replicable models of engagement, including templates, supplier lists, and agreements for the use of public land. Access to the

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grid can be improved by publishing hosting capacity maps and introducing fast-track connection procedures for small-scale or community-led projects. Capacity building and education remain vital, whether through integrating energy topics into school curricula, launching campus-based demonstration labs, or running youth ambassador programmes that combine digital outreach with in-person engagement.

For the POWERYOUTH project, these insights provide a clear strategic focus. Project activities and tools should prioritise the provision of clear, accessible information, the development of youth-friendly financial models, the enablement of municipal support, and advocacy for improved grid access and transparency. These pillars should guide the creation of training materials, replication toolkits, and business models in future work, ensuring that lessons from pilot countries translate into scalable, inclusive, and youth-driven energy communities across diverse local contexts in Europe.

Beginning with a brief introduction to the topic, this report proceeds to provide a detailed description of the methodology applied for data collection and analysis across the five pilot countries (Chapter 2). It presents a synthesis of the qualitative and quantitative findings derived from surveys, expert interviews, co-creation workshops (Chapter 3) and desk research (Chapter 4). These country-level insights are consolidated into a comparative analysis that identifies common trends, shared barriers, and enabling conditions for youth participation in energy communities (Chapter 5). The document concludes with a set of evidence-based recommendations (Chapter 5) aimed at fostering a more supportive and inclusive environment for youth-led energy community initiatives, forming the foundation for the design and implementation of the POWERYOUTH approach.

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1. Introduction

The purpose of D2.1 "Analysis of the barriers and local conditions for youth Energy Communities" is to analyse the regulatory and contractual aspects according to European and national legislation in participating countries. More specifically, it includes an in-depth assessment of regulatory, policy, financial and market design barriers, as well as advice on the contractual relationship between the community and its members (with due consideration of young people) in Austria, Greece, Latvia, Poland and Portugal. Warranty, safety and data security issues were also assessed.

The main objectives of the assessment are to:

- analyse the legal and regulatory framework in all five (5) participating countries and at European level,
- assess financial and market design barriers,
- examine the contractual relationship and conditions between the ECs and their members and other relevant stakeholders,
- explore issues related to warranty, safety, and data security,
- identify the social barriers and local conditions for creating youth ECs.

During the process, 560 people were involved to ensure the equal representation and the validity of results.

The assessment took into account the different target groups that the POWERYOUTH project aims to engage actively during the project's life cycle. The primary target group is young people between the ages of 15-30 and more specifically:

- 15-18: School students will be engaged in Austria, Latvia and Portugal.
- 18-24: College students will be engaged in Austria, Greece, Poland and Portugal.
- 25-30: Young citizens will be engaged in Austria, Greece and Poland.

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2. Methodology

The analysis of barriers and local conditions for youth ECs of each country was conducted using both a quantitative and a qualitative approach. The activities related to this task involved:

1. a quantitative analysis, carried out through an online survey (see Annex I);
2. a qualitative analysis, conducted through:
   - bilateral interviews with relevant experts;
   - a desk research;
   - physical workshops / co-creation events with stakeholders.

The results of the survey (questionnaires) and the desk research were consistently reported through template files, following the guidelines suggested by the Lead Partner of the T2.1 and included in the final document.

The pattern adopted for data collection and analysis appeared coherent and operational and the method of combining the qualitative and quantitative approaches was particularly effective. In fact, a mixed and convergent method was used, which allowed the researchers to channel the data towards a single interpretative framework in order to obtain a more comprehensive analysis of the phenomena (Creswell J. W., 2009; Creswell & Cresswell, 2018).

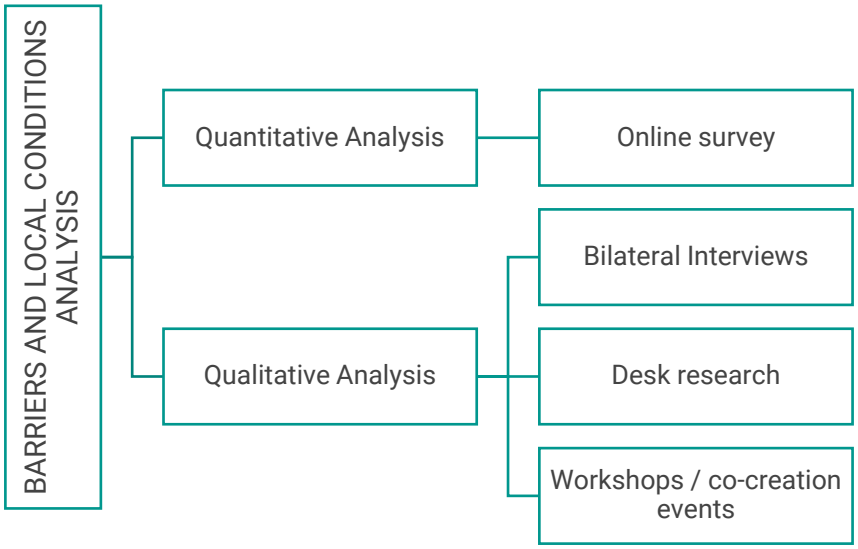

Figure 1: The Framework of the barriers and local conditions analysis

2.1. Quantitative Analysis

The well-structured Online Questionnaire used, consisted of closed-ended survey questions that supported the collection of numerical data, by deploying the CAWI[1] method. The layout of the online questionnaire was organised using “smart branching” to reduce complexity.

The Google Forms tool was used to collect the responses from the online questionnaire, which included 27 questions (demographic information question included) of the following types:

- Dichotomous;

[1] Computer Assisted Web Interviewing

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- Multiple choice;
- Single choice;
- Check-list style (Checkboxes);
- Likert scale (Linear scale);

The online questionnaire consisted of the following sections:

- Introduction (providing information regarding the project and the purpose of the survey);
- Data of respondents (country, working sector, education level, age group, gender);
- Introductory questions (including questions regarding ECs);
- Social Barriers (including questions that help define the social barriers and conditions of youth participation in ECs);
- Opinions and views (including questions that help map the attitudes of the participants towards youth participation and leadership);
- Final communication (personal details of those who wish to be kept informed on the progress of the project).

The questionnaire was shared with the project target groups (as mentioned above) through:

- newsletters and/or personalised emails/messages;
- posts on the project's and/or the partners' social media pages;
- direct communications.

For analysing the quantitative data, descriptive statistics were deployed so as to summarise and organise them in a way to be easily understood. In addition, cross-tabulation analysis (the use of data tables displaying the results of survey respondents) and cohort analysis (identifying groups of respondents who share common characteristics) were deployed (Amaresan, 2021; Mason & Wolfinger, 2001). Even though, Google Forms offers automated responses' summaries and graphical representation of the responses data, these were not considered adequate and, as the surveys were translated into the partners' languages, could not be used in the final deliverable. Therefore, other tools such as Excel or other programmes for statistical analysis were the main tools used for the data processing.

2.2. Qualitative analysis

Qualitative data collection was used to obtain detailed, subjective and individual knowledge on various topics.

The methods deployed in order to collect the data for the qualitative research were:

- Interviews: experts and parties relevant to ECs were interviewed by using 15 open-ended questions in a semi-structured way, focusing on the topics of:
    - Legal and regulatory framework and policy;
    - Financial and market design barriers;
    - Contractual conditions;
    - Social barriers;
    - Local conditions;

The interviews were implemented individually, physically or online (via appropriate platforms such as Zoom). The answers were recorded, using the note-taking method, in an excel file that was provided by the Lead Partner in order to achieve homogeneity of responses.

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- Review-based scientific and grey literature research, guided by the 15 open-ended questions used while implementing the interviews and the sections of the present deliverable:
    - Internal Desk Research: part of the information was generated internally within organisations;
    - External Desk Research: this type of research conducted refers to research done outside the organisational boundaries.
      The outside resources used are described below:
        - Online Desk Research: data available online on the internet collected by directly browsing the specific information from platforms providing scientific papers and from industrial, marketing or business sites by using search engines. The search was refined in such a way that the results were promising, accurate and relevant.
        - ECs and relevant initiatives websites: data were collected by accessing their websites and/or through interviews/discussions with professionals and experts working at these organisations.
        - Government published data: Ministries of Energy, Business, Environment etc., other governmental bodies, Chambers of Commerce.

The Qualitative data analysis methods (5 qualitative data analysis methods, 2024) was based on content analysis, which refers to the process of categorising verbal or behavioural data to classify, summarise and tabulate the data, and discourse analysis, which is a method of analysis of naturally occurring talk and all types of written text.

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3. Data and Results

For the assessment of the local conditions and barriers, an online questionnaire was distributed to a wider audience from all the participating countries and in EU level, to gather information and opinions on the situation of youth ECs.

3.1. EU

A total of one hundred (100) respondents from across Europe participated in this survey. Most of them come from Italy, Germany and Belgium, countries that are not included in the local contexts of this deliverable. The main key points of their answers are summarised below.

The majority of the participants either work for the NGOs/NPOs (33%) or are students (33%). There are also a few working for either the private sector (17%) or the public sector (14%). The participants were notably well-educated holding a master's degree (45%), while many of them were also college/university students (20%).

In terms of age, the survey was mainly completed by people who fall in the category of young adults, as most of the respondents belong either to the 18-24 years old age group (39%) or the 25-34 age group (39%), indicating a relatively young yet active audience. The remaining 22% were distributed as follows: under 18 years old (4%), 35-44 years old (11%), 45-54 years old (5%), and over 55 years old (2%).

Demographically, the survey sample was predominantly female, with 65% of respondents identifying as such, while 33% identifying as males. There was also a 2% that either preferred not to answer or identified as gender-fluid.

Most respondents (45%) were unaware of the concept of ECs and their potential benefits before reading the survey's provided text, while 35% were already aware. Additionally, 20% expressed uncertainty about their level of knowledge. Consequently, it is to be expected that only small proportion (6%) were members of ECs or other initiatives. The majority of the respondents (79%) was not familiar with the definitions of the different EC types (REC/CEC) before taking this survey, while only 13% were previously aware of them and 8% were unsure.

The demographic data collected, gives a distinct profile of the audience, which is comprised of female individuals who lack sufficient knowledge regarding the topic of ECs. It is essential to interpret the following survey results within the socioeconomic context of the respondents' backgrounds.

The survey reveals important insights regarding European young adult's perceptions and attitudes towards ECs and initiatives.

A minority of respondents (28%) were aware of specific examples of community energy projects in their country, whereas the majority (56%) had no such knowledge. Furthermore, only a small percentage (19%) were aware of active ECs or other initiatives, with 61% reporting no knowledge on this subject and 20% remaining uncertain.

Regarding the respondents' views on the ease of young people becoming members of ECs, most of them (51%) expressed uncertainty, while 27% indicated that it was difficult and 22% that it was easy.

Yet, awareness of the benefits of being part of an EC was high, with 53% acknowledging their advantages. There is also a solid percentage that remains undecided (29%). This positive

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attitude towards ECs is reflected also on the 54% of all respondents who indicated willingness to join an EC if available in their region. However, the average of 20-30% of people on multiple questions that remain undecided indicates a necessity for awareness raising and provision of support.

Despite this higher willingness, most of the respondents have no opinion on whether the state or the municipality provides enough financial incentives for the establishment of ECs (45%) or consider that they should provide more (35%). A percentage of 20% finds the financial incentives provided sufficient.

Regarding the facilitation of operation and energy production of ECs, most of the respondents (50%) remain undecided. A further 25% argue that the current situation is not sufficient, while 22% consider it adequate.

As for willingness to invest, although the majority of respondents expressed eagerness to make a micro-investment in an EC project (40%), the percentage of people who were undecided (36%) was roughly as high, while the percentage of those who were against the idea (24%) was lower. This indicate that many people are considering the investment with some doubts but not outright rejecting it.

When asked about their confidence in young people to set up and run ECs, the majority of respondents (68%) expressed confidence, while some (26%) were undecided. It is worth noting that only a few respondents disagreed (6%), indicating a high level of trust in youth leadership. In addition, a high level of trust was noted when asked about feeling safe and confident in providing personal information to ECs, as the majority (43%) declared they felt confident in doing so, while 38% were undecided and only 19% were unsure.

Most of the respondents (78%) strongly agreed that social media and online platforms can be play a significant role for engaging young people in ECs, whereas over than half of them (58%) declared that anyone can participate in an EC, regardless of their socio-economic background. There were also a number of people who were undecided (24%) or who did not agree with this statement (18%).

Based on the respondents' opinions, the main reasons preventing young people from participating in ECs is the lack of information (36%), the lack of support from the local authorities/municipalities (23%) and the lack of interest from the community (14%). At the same time, they believe that the main misconceptions of young people that prevent them from becoming members of ECs, are that ECs do not directly affect their daily lives (28%), that the investments required by them or their participation in general is expensive (22%) and that their voice will not be heard during the decision-making process (17%).

The main motives for young people to participate and lead ECs were the environmental protection (34%), being helpful to the community and making positive impact (23%) and the opportunity to make positive impact in their communities (17%). According to them, the educational institutions (24%), the local authorities (23%) and the national government (22%) are the most appropriate bodies and organisation for promoting the benefits of ECs and informing the public. However, NGOs/NPOs (15%) and ECs' members (15%) are not so far behind.

As effective economic strategies to stimulate youth participation the respondents favoured financial support or incentives specifically for young people (26%), accessible funding mechanisms tailored for young people (21%), cost reduction measures to make participation

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in energy projects more affordable (20%) and facilitating the establishment of peer-to-peer support networks (18%).

Looking at policy changes, respondents highlighted the importance of financial mechanisms such as subsidies, grants, or low-interest loans tailored for young people (27%), simplifying regulatory processes (23%) and fostering a supportive market environment (18%). For the participants, the most important elements of the contractual relationship between an EC and its members are the definition of membership criteria, rights and obligations (27%), the specification of financial contributions and rights (22%), the agreement on the conditions of energy supply and distribution within the community (20%) and the specification of ownership structure of the EC.

3.2. AUSTRIA

Questionnaire summary

A total of forty (40) participants took part in the survey, reflecting a diverse but primarily urban, well-educated, and predominantly male demographic. The majority of respondents (60%) live in urban areas, with smaller percentages residing in suburban (15%) and rural (25%) areas.

Participants were notably well-educated, with 60% holding either a Bachelor's, a Master's or Doctorate degree. Demographically, the survey sample was predominantly male, with 65% identifying themselves as such. In terms of age, a significant portion of the respondents (45%) were between the ages of 25 and 34 years old, reflecting a younger, yet mature audience.

A significant majority of the participants (87.5%) were aware of the concept of ECs and their potential benefits before reading the provided text. This high level of awareness is likely due to their connection with the OurPower Community through whose channels the respondents were sampled. However, it's interesting to note that less than half of the respondents (42.5%) were actively involved in ECs themselves.

These demographics paint a clear picture of an engaged, educated, and predominantly urban and male audience with a strong awareness of ECs. The following survey results must be understood within the socio-economic context of the respondents' backgrounds.

The survey reveals several insights into young people's perceptions and attitudes towards ECs. Respondents had mixed feelings about the ease of joining an EC. While 42.5% found it relatively easy, 37.5% disagreed, indicating perceived challenges. A significant proportion remained undecided, reflecting a need for better information and support. However, awareness of the benefits of being part of an EC was high, with 90% acknowledging the advantages. Only a small fraction was undecided or disagreed, indicating effective communication about the benefits. This positive attitude towards ECs continues with 70% of all respondents indicating willingness to join an EC if one was available in their region.

As for the willingness to invest, a strong majority of respondents expressed their willingness to make a micro-investment in an EC project, with 87.5% agreeing or strongly agreeing. Only a small percentage (5%) were undecided or disagreed, indicating a high level of financial commitment among participants. When asked about their trust in young people to create and manage ECs, 75% of respondents expressed trust, while 25% were undecided. Notably, none of the participants disagreed, demonstrating confidence in youth leadership. This is further supported by the fact that 77.5% of respondents feel safe and confident in providing personal information to ECs.

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Given that more than half of the respondents (57.5%) agree that anyone can participate in an EC regardless of their socio-economic background, what are the factors that prevent young people from participating in them and setting up their own projects?

The main barrier identified was a lack of information (35.8%). Other significant barriers were lack of incentives (20%), community interest (17.9%), and local authority support (15.8%). Smaller percentages cited issues like insufficient participatory decision-making, lack of interest across age groups, and lack of capital or awareness (10.5% combined). The most common misconception was that participating in ECs is time-consuming (28.4%). Many also believed it is expensive to invest in ECs (27.3%). Overall, these findings emphasise the importance of environmental concerns, financial incentives, and innovative opportunities in motivating young people to participate in ECs. Additionally, targeted financial support, accessible funding, supportive networks, and policy changes are key strategies to facilitate their participation.

Respondents favoured financial support or incentives specifically for young people (30%) and accessible funding mechanisms like crowdfunding or microfinance (22%) as effective economic strategies to stimulate youth participation. Peer-to-peer support networks and mentoring programmes were also seen as effective (23%). In terms of policy changes, respondents highlighted the importance of financial mechanisms such as subsidies, grants, or low-interest loans tailored to young people (22.9%) and creating stable revenue streams through mechanisms like feed-in tariffs or power purchase agreements (24.1%). Simplifying regulatory processes (22.9%) and fostering a supportive market environment (16.9%) were also considered crucial. Lastly, a large majority of 92.5% agreed that social media and online platforms could be useful tools to bring more young people on board.

Bilateral Interviews with experts and relevant stakeholders

During the assessment of the local conditions and barriers in Austria, four (4) experts were interviewed and provided their valuable insights. The key findings are presented below.

Table 1: Composition of interviewed participants in Austria

Details	Position/Expertise of the interviewees
4 interviews	Mayor of a small town in Upper Austria
	Representative of the Austrian Coordination Office for ECs
	Researcher from the Austrian Energy Agency
	Representatives (2) of the Chamber of Labour Vienna (Arbeiterkammer Wien) working on energy poverty, energy justice and environmental right

Legal and regulatory framework and policy

Generally, the regulatory and legal framework for setting up ECs is in place and makes it easy for anyone to do so. However, the process is quite complex and cumbersome under the current legislation, and one has to be a legal person. This excludes young people under the age of 18. It was noted that the Austrian government has specifically established a

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coordination office for ECs that offers informational and procedural assistance. The experts did not identify any pressing legal and regulatory barriers to the establishment and operation of ECs.

Financial and market design barriers

The establishment and operation of ECs is partially supported by scattered and special funding programmes, such as a programme offered by the National Agency for Climate and Energy for ECs with innovative character. The interviewees noted that creating an EC without already having own energy generation is a barrier. Because setting up PV panels on houses is easier than in apartments, house owners are in an advantageous position for creating and operating ECs than people living in rented apartments. However, existing funding schemes for solar panels make it easier to install them, produce and share. Other economic barriers include lack of time and know-how or their uneven distribution in the society.

All interviewees agreed that alternative financing mechanisms could simplify and therefore boost the creation and operation of ECs because it could create a community feeling in contrast to single individuals owning the power plant. People are more likely to start if the benefits and efforts are shared. It was noted that there is still a need for a dedicated person to take responsibility for moving the project forward.

Contractual conditions

The Renewable Energy Act[2] (EAG) sets out legal requirements, such as that ECs must consist of at least two legal persons. Grid operators are central actors in the establishment of ECs; however, the interviewees identified them as gatekeepers for ECs. Collaborations between municipalities and private individuals is less attractive due to expected conflicts of interest. Therefore, ECs between municipalities and/or municipalities and businesses are preferred by the municipalities. The interviewees had no experience with agreements with energy suppliers.

Social barriers

Although ECs have recently gained in popularity and numbers in Austria, their members do not mirror a representational share of the Austrian society. It was mentioned that those interested in ECs tend to be cohorts over 40 years old, while younger people do not show interest yet. There is also a stark bias towards rural regions. The National Coordination Office for ECs promotes the concept while it seems that more local municipalities are informing rather that promoting. Due to the early stage of the wider implementation of ECs, the interviewees were not aware of any training modules related to ECs. Nevertheless, they all agreed that such events, especially informational events to spark interest could help to kickstart engagement.

Local Conditions

The creation of many large community energy projects in Austria is possible due to the respective legislation of the Renewable Energy Act[3] (EAG) for example nation-wide citizen

[2] https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20011619
[3] https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20011619

ECs. No experts with a technical background were interviewed, therefore detailed insights about grid capacities could not be yielded. However, the integrated Austrian Grid infrastructure plan foresees an influx of additional renewable energy. Ultimately, this is necessary to reach the national target of 100% renewable energy by 2030.

None of the interviewees emphasised a single project as a best practice. Notwithstanding, the following were mentioned as successful examples: REC Göttweitblick, REC Premstätten and REC Viere in Waizenkirchen.

Co-creation day / Workshop summary

In addition to the questionnaire and the interviews, a co-creation workshop was organised to discuss about local conditions and barriers for ECs, focusing on youth ECs.

For young people in particular, establishing an EC presents few barriers, mainly revolving around the legal capacity requirement. Further streamlining would be advantageous if it circumvents bureaucratic involvement. The Electricity Industry and Organization Act[4] (ElWOG), a new law, aims to facilitate this by enabling the formation of ECs without the need for a legal entity. While the timeline for its enforcement remains uncertain, implementation is on the agenda.

From a political standpoint, genuine commitment, not mere rhetoric, is crucial. Long-term benefits could accrue from integrating this topic into school curricula to address the current lack of awareness among young people. Targeted educational initiatives for specific groups are pivotal. In the short term, educational workshops could be held in local schools. Offering subsidies to housing developers who provide energy consultations would bolster efforts. Moreover, tailored information for young renters about energy considerations could prove invaluable.

Utilising public land poses challenges due to insurance and liability issues, as well as financing concerns. However, these sites offer potential for larger renewable energy installations such as PV, wind, hydro, or biomass generation.

Improving access to information and streamlining follow-up processes are essential. Training government personnel in energy matters and establishing a central point of contact for reliable information would enhance efficiency.

As for financial incentives, participants highlighted government subsidies for building PV panels as well as an example of an eco-social EC called Robin Powerhood. Its mechanism is to distribute electricity from those who produce a lot to energy-poor people. In general, it is possible for local authorities to support such initiatives, but it was noted that local authorities are often under-funded and would therefore need to apply for additional funding to provide support and set up financial incentives. It was noted that alternative financing mechanisms such as crowdfunding could attract more young people if investment amounts were offered at lower entry levels. Another important distinction was mentioned between types of crowdfunding: Setting up their own projects and financing them through crowdfunding involves a high workload and could discourage young people. However, participating in energy projects through crowdfunding with the possibility to invest smaller amounts was seen as more attractive for young people. Another alternative financing mechanism was highlighted: Compensating the founders of energy projects with free electricity.

[4] https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20007045

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Regarding the contractual conditions between ECs and other relevant stakeholders, there is a need for standardisation of digital processes among network operators. Structured guidelines outlining the contractual steps that need to be fulfilled should be provided. Additionally, there should be a focus on the most important points in a contract, making them shorter and more concise.

With regard to allocating space for community energy projects on public land, it is challenging due to various insurance issues and liability questions. Additionally, the question of financing arises—who will cover the costs? The advantage is that such areas are suitable for larger PV installations or other types of generation like wind, hydro, or biomass.

Utilise existing associations with established structures, such as football clubs, fire brigades, and brass bands as a contractual basis for creating ECs. Criteria for this include admissions must specifically include young people, and providing additional value would certainly help, such as offering some free usage of the produced energy. Social media competitions could also be an option to attract more members for ECs.

Every institution or private person is bound to the Austrian General Data Protection Regulation. This also applies to all IT-processes within an EC, regardless of whether the members are private persons or local authorities. To the best of the participants knowledge, there are no specific security requirements for local authorities to grant an EC access to public sites.

After discussing the social barriers to a broader participation and awareness of ECs among younger cohorts, the participants collected a wide array of possibilities to raise awareness of ECs and energy issues.

Starting with awareness-raising campaigns in schools, the participants stressed that fostering energy literacy from an early age helps younger people to develop an understanding of the energy system but also of their own energy consumption. Another cornerstone was cooperation with youth networks. Here, cooperations with student associations or other youth associations was highlighted as a promising channel to reach young people.

All participants agreed that social media can help as a channel to reach younger people but also as a medium to convey energy-related content in an accessible, inclusive and attractive way. It can be used to engage with young people at eye-level and provide helpful guidance such as a "how to create your own EC".

In terms of local authority activity, none of the participants were aware of any past or ongoing campaigns. However, they discussed creative ideas ranging from "get together" breakfasts to talk about energy topics, community building and neighbourhood meetings to Q&A sessions organised as parties or festivals.

3.3. GREECE

Questionnaire summary

A total of fifty-three (53) respondents participated in the survey that was conducted in Greece. The majority of them live in the city (54.7%), while only a few come from rural areas (17.0%), the suburbs (15.1%) and islands (13.2%). Participants were particularly well-educated holding either a bachelor's (26.4%) or a master's degree (20.8%). Many were also college/university students (22.6%) or people with a trade/technical/vocational training (18.9%). Only a few were

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high school students/graduates (9.4%), while the smallest category was those holding a doctorate degree (1.9%).

Demographically, the survey sample was predominantly female, with 58.5% of respondents identifying as such and the remaining 41.5% identifying as males. Most of them are working in the private sector (47%), while only a few (11%) are working in the public sector. Also, 28% of them were students or did not work in the provided sectors (private, public, NGOs/NPOs).

In terms of age, the survey was mainly completed by people who fall in the category of young adults, as most respondents were in the 18-24 years age group (35.8%), followed by the 25-34 age group (26.4%), indicating a relatively young yet active audience. The remaining 37.8% were distributed as follows: 45-54 years old (15.1%), 35-44 years old (11.35%) and over 55 years old (11.35%).

Most respondents (58.5%) were aware of the concept of ECs and their potential benefits before reading text provided by the survey, while 32.1% were not. However, it was interesting to note that only a handful (6%) were members of ECs or other initiatives. The majority of the respondents (71.7%) were not familiar with the definitions of the different EC types (REC/CEC) before the survey, while only 22.6% were aware of them and 5.7% were not sure. This may be due to the fact that these definitions are relatively new in Greece.

The demographic data collected, gives a distinct profile of the audience: it consists of female people who appear to be involved, educated and predominantly urban with a keen interest in ECs. It is essential to interpret the following survey results within the socioeconomic context of the respondents' backgrounds.

The survey reveals important insights into young adult's perceptions and attitudes towards ECs and initiatives.

Many of the respondents knew specific examples of community energy projects (52.8%) in their country, while at the same time, only some of them (37.7%) were aware of active ECs/cooperatives in their area, compared with the majority (58.5%) who were not aware.

Regarding the respondents' opinion on the ease of young people becoming members of ECs, it was evident that most of them (50.9%) found it relatively easy, while a notable proportion remain undecided (32.1%). Yet, awareness of the benefits of being part of an EC was high, with 71.7% acknowledging their advantages. There is also a solid percentage that remains undecided (24.5%). This positive attitude towards ECs is reflected also on the fact that 73.6% of all respondents indicated their willingness to join an EC if existed in their region. However, the percentage of people who remain undecided on multiple questions highlights the need for awareness-raising campaigns and support.

Despite this high level of willingness, most of the respondents have no opinion on whether the state or the municipality provides enough financial incentives for the establishment of ECs (47.2%) or consider that they should provide more (37.7%). Only a small proportion (15.1%) felt that the financial incentives provided were sufficient.

Regarding the facilitation of operation and energy production of ECs, most of the respondents (35.85%) argue that the current situation is not sufficient, with a corresponding percentage of 35.85% remaining undecided and 28.3% considering it adequate.

As for willingness to invest, although the majority of respondents expressed their eagerness to make a micro-investment in a community energy project (52.8%), the percentage of those

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who were undecided or disagreed was roughly as high (47.2%), indicating that there may be financial challenges that need to be addressed.

When asked about their trust in young individuals to create and manage ECs, the majority (77.4%) of respondents expressed trust, while some of them (15.1%) were undecided. It is worth mentioning that only a few of the participants disagreed (7.5%), which suggests a strong level of confidence in youth leadership. However, when asked if they felt and confident in providing personal information to ECs, the majority remained undecided (43.4%), while some either felt confident (35.8%) or uncertain (20.8%).

Most of the respondents (92.5%) strongly agreed that social media and online platforms can play a significant role for engaging young people in ECs, whereas more than half of them (62.3%) stated that anyone can participate in an EC, regardless of their socio-economic background. The same proportion of respondents were undecided (18.9%) or disagreed with this statement (18.9%).

According to the respondents, the main reasons preventing young people from participating in ECs are the lack of information (32.6%), the lack of support from the local authorities/municipalities (24.4%) and the lack of incentives (17.8%). At the same time, they believe that the main misconceptions of young people that prevent them from becoming members of ECs, are that ECs do not directly affect their daily lives (24.3%), that the investments they need to make or their participation in general is expensive (21.7%) and that their voice will not be heard during the decision-making process (20.9%).

The main motivators for young people to participate and lead ECs were environmental protection (29.1%), helping the community and making a positive impact (23.6%), financial incentives (20.5%), and implementing innovative ideas (20.5%). Local authorities (31.3%), national government (26.9%) and educational institutions (19.4%) are the most appropriate bodies and organisations to promote the benefits of ECs and informing the public.

As effective economic strategies to stimulate youth participation, the respondents favoured financial support or incentives specifically for young people (32.1%), cost reduction measures for making participation in energy projects more affordable (19.7%), accessible funding mechanisms tailored for young people (17.5%) and advocacy for policy changes to remove economic barriers faced by young people (17.5%).

Looking at policy changes, respondents highlighted the importance of establishing financial mechanisms such as subsidies, grants, or low-interest loans tailored for young people (28.9%), simplifying regulatory processes (22.7%) and fostering a supportive market environment (18.8%). For the participants, the most important elements of the contractual relationship between an EC and its members are the definition of membership criteria, rights and obligations (29.9%), the specification of financial contributions and rights (29.1%) and the agreement on the conditions of energy supply and distribution within the community (20.9%).

Bilateral Interviews with experts and relevant stakeholders

During the assessment of the local conditions and barriers in Greece, four (4) experts were interviewed and provided their valuable insights. The key findings are presented below.

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Table 2: Composition of interviewed participants in Greece

Details	Position/Expertise of the interviewees
4 interviews	Financing Policy Advisor at REScoop.eu - Board member of an EC
	Research Associate at National Technical University of Athens - Academic expert in ECs
	Board member of ChalkiOn Energy Community - Representative of the Municipality of Chalki
	Legal advisor in Electra Energy Cooperative

Legal and regulatory framework and policy

Greece has established a comprehensive regulatory framework for ECs through laws such as Law 4513/2018[5] (FEK A 9/23.01.2018 *"Ενεργειακές Κοινότητες και άλλες διατάξεις"*). and Law 5037/2023[6] (FEK A 78/28.03.2023 *"Μετονομασία της Ρυθμιστικής Αρχής Ενέργειας σε Ρυθμιστική Αρχή Αποβλήτων, Ενέργειας και Υδάτων και διεύρυνση του αντικειμένου της με αρμοδιότητες επί των υπηρεσιών ύδατος και της διαχείρισης αστικών αποβλήτων, ενίσχυση της υδατικής πολιτικής - Εκσυγχρονισμός της νομοθεσίας για τη χρήση και παραγωγή ηλεκτρικής ενέργειας από ανανεώσιμες πηγές μέσω της ενσωμάτωσης των Οδηγιών ΕΕ 2018/2001 και 2019/944 - Ειδικότερες διατάξεις για τις ανανεώσιμες πηγές ενέργειες και την προστασία του περιβάλλοντος"*). These laws support the creation of ECs, entities that allow citizens, businesses, and local authorities to collaborate on energy production and consumption. This framework has led to the registration of over 1,600 ECs (The Green Tank, 2023). Many of these communities were set up by private investors to take advantage of initial benefits like high feed-in tariffs. Law 5037/2023[7] introduces new categories of ECs, namely Renewable ECs (RECs) and Citizen ECs (CECs), while phasing out the previous model that was established by Law 4513/2018[8]. This law aims to align Greek legislation with EU directives, but the coexistence of three different EC models is causing confusion. The transition from the old to the new frameworks is unclear, posing difficulties for communities looking to adapt to the evolving legal environment.

The absence of specific incentives and support mechanisms hampers the growth of ECs. There is a call for a well-defined legal and technical framework to support new activities beyond energy production, such as demand-side management and capacity building, especially for youth-led initiatives that require financial support.

However, with the introduction of virtual net billing in 2024 (Law 5106/2024[9] established by FEK A 63/01.05.2024 *"Ρυθμίσεις για την αντιμετώπιση των πολυεπίπεδων επιπτώσεων της κλιματικής αλλαγής στους τομείς: α) της διαχείρισης υδάτων, β) της διαχείρισης και προστασίας των δασών, γ) της αστικής ανθεκτικότητας και πολιτικής, δ) της καταπολέμησης της αυθαίρετης δόμησης, ε) της ενεργειακής ασφάλειας και άλλες*

[5] FEK A 9/23.01.2018
[6] FEK A 78/28.03.2023
[7] FEK A 78/28.03.2023
[8] FEK A 9/23.01.2018
[9] FEK A 63/01.05.2024

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επείγουσες διατάξεις" and Ministerial decision *ΥΠΕΝ/ΔΑΠΕΕΚ/93976/2772/2024*[10]), replacing the virtual net metering model, there has been a push for closer temporal alignment between energy production and consumption. This shift has been abrupt, has added complexity to the legal framework and the transition is complicated by the lack of necessary infrastructure, such as smart meters and affordable batteries, which are essential for effective implementation.

The process of securing land and establishing the community has involved navigating time-consuming bureaucratic procedures, highlighting the need for clearer and more supportive regulations.

There is a proposal to incentivise youth participation in ECs by linking public funding to social criteria that favour youth engagement. This is crucial as young people often face financial constraints that limit their ability to participate in such initiatives.

Financial and market design barriers

As ECs in Greece diversify into new areas there is a pressing need for financial support. The Greek government is being urged to utilise European Union public funds, such as the European Regional Development Fund (ERDF), the Recovery and Resilience Facility (RRF) and the Cohesion Fund to launch dedicated calls for funding ECs engaged in these costly activities.

The financial and market barriers identified by the experts in the interviews include high initial investment costs, complex funding processes, long waiting times for grid connections and volatile market conditions. While crowdfunding is seen as a potential solution for financing small projects, it has not yet gained traction in the energy sector in Greece. The only crowd-investment platform in Greece for ECs is currently offline as it tries to comply with the new crowdfunding regulations in the country. The lack of active alternative financing mechanisms, such as crowdfunding, limits the ability of ECs to finance their projects, highlighting the need for increased support and the development of new financial tools. One of the experts leading an EC explained that the PV park owned by the EC was built with sponsorship, but neither the municipality nor the community members can afford new projects due to high installation costs and the absence of government subsidies.

Another barrier to funding community energy projects has been the difficulty of accessing capital. Banks typically do not support projects for collective self-consumption, preferring instead to focus on projects for the sale of energy. In addition, the ECs do not receive any support especially during their start-up phase, which requires financial assistance to cover legal, technical, and accounting services.

Contractual conditions

Currently, ECs must be established as separate legal entities, a process governed by Law 5037/2023[11]. This includes registering with the local business registry, opening a bank account, and notifying the tax authority. They can engage in activities such as producing and consuming energy and selling excess electricity through Power Purchase Agreements (PPAs).

[10] FEK B 5074/05.09.2024
[11] FEK A 78/28.03.2023

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The ECs established by the Law 4513/2018[12] and especially the RECs and the CECs prioritise local participation and democratic governance, with strict proximity requirements and voting rights designed to ensure community control and engagement.

The main characteristics of the ECs are: the membership is open to natural persons, local authorities, SMEs, cooperatives, and non-profit legal entities; members should not belong to another EC in the same region, with some exceptions; members may hold multiple shares, but participation is capped at 20% of the cooperative's capital, with the exception of local authorities, which may hold up to 40%; regardless of the number of shares, each member has only one vote in the general assembly, thus ensuring democratic control.

Some key differences between the two are that in RECs at least 50% plus one of the members must be in proximity (by residence, property ownership, or registered seat of a legal entity within the REC's region) to the area where the REC operates or the renewable energy project is being developed and in CECs for private companies, their participation in a CEC should not be their main commercial or professional activity. The community has provisions for the transfer of shares to allow new members to join. It also maintains a contract with the solar park developer for emergency maintenance and safety, and the park is insured.

One of the experts leading an EC stated that the members are the municipality individuals, companies, and legal entities connected to the municipality. Due to the specificities of the island members from neighbouring areas also participate as the EC can implement energy projects across the region. The community handles only personal data and not energy data.

The regulatory framework requires the Distribution System Operator (DSO) to send production data to energy suppliers. The suppliers must then reconcile this data with the consumption of individual members. However, suppliers have been either unwilling or unable to fulfil these obligations, leading to advocacy campaigns ECs. In many cases, data management for energy consumption is handled by energy suppliers, who report annual consumption data, which is then offset against the community's production via virtual net metering.

Social barriers

As of October 2023, there are over 1,600 ECs in Greece (The Green Tank, 2023), indicating widespread, though not comprehensive, engagement. There is a significant gap in government-led efforts to promote and support ECs through information campaigns and training programmes, despite the Renewable Energy Directive highlighting their importance especially for municipalities. Neither community leaders nor members have received formal training on ECs. Communities often rely on neighbouring groups for guidance, and some members take the initiative to seek training independently.

Awareness is mainly localised and educational resources and capacity building for new ECs are provided by independent organisations often through EU funded projects. Key stakeholders, including DSOs, energy suppliers, and even the Ministry of Energy, are not fully aware of the critical role of ECs in promoting a just and clean energy transition. They often perceive these communities as conventional businesses rather than citizen-led, socially driven initiatives. In parallel, many people are sceptical about ECs due to a general mistrust of groups resembling associations. Initially, ECs had few members, but tangible benefits from projects have encouraged more people to join.

[12] FEK A 9/23.01.2018

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Young people often participate in workshops or initiatives related to energy issues but face a lack of political or financial incentives to join ECs. The educational gap in understanding energy transition concepts and ECs is significant, with some communities having no members under the age of 30. The majority of participants tend to be middle-aged men.

The newly founded Cluster for Greek ECs is crucial for the exchange of knowledge and expertise among its members. It serves as a forum where ECs can share experiences, address regulatory and contractual challenges, and collectively advocate for supportive policies.

Local Conditions

According to the experts the main challenges that the ECs are facing at the local level are the grid capacity and connectivity constraints, network saturation, infrastructure and software limitations.

The Greek electricity grid is currently highly congested, result in long waiting times for grid connection approvals and unclear timelines. The congested and saturated network is a significant barrier to new energy projects, including those by ECs. At the same time, the existing grid infrastructure has limited capacity to accommodate the intermittent and variable nature of renewable energy sources. This creates a bottleneck, that leads to delays in obtaining grid connection approvals and making it difficult for ECs, especially smaller ones or new entrants, to navigate the regulatory landscape. In one example of an existing EC, despite significant reductions or eliminations of electricity bills for community members, there has been an increase in energy consumption, possibly due to a lack of cost awareness.

Some best practices, that often face the aforementioned barriers, come from all over the country:

- Chalkion EC[13] (Chalki): An example of a community energy project on a small island, showcasing local efforts to engage in renewable energy despite systemic and grid challenges. Established under the 2018 law, the Chalkion EC (EC) operates as a non-profit entity under older legislation governing associations. The transition to the new regulatory framework for ECs has not been clearly outlined, making it challenging for entities like Chalkion to adapt without jeopardising their existing projects. Chalkion EC has 178 members, including the Municipality of Chalki, individuals, companies, and legal entities associated to the municipality. Despite the island's small population, members from neighbouring areas also participate.
- Minoan EC[14] (Crete): With substantial participation from local citizens and municipalities, more than 1,000 local citizens participate, 10 local municipalities and the Region of Crete, Minoan stands out as the largest EC in Greece both in terms of numbers and installed power capacity, reflecting the collective commitment to sustainable energy on the island. Minoan demonstrate the potential for community-driven renewable energy projects to succeed despite systemic challenges.
- Hyperion Solar Community[15] (Attica): This is a non-profit EC founded in 2020 and based in Athens. Its members are households, organisations and local businesses. It has completed the licensing process of the first 500KW PV power plant in Corinthia.

[13] https://www.chalkion.gr/index_en.html
[14] https://minoanenergy.com/en/
[15] https://hyperion-community.gr/en/

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The project is currently under construction and will use the virtual net metering model. This community in contributing to the broader energy transition through community-led projects.

- CommonEn EC[16] (Epirus): Despite operating two 100 kWp solar parks for over a year, the supplier refused to cooperate on metering, forcing members to continue paying their bills without receiving any benefits. This changed in February 2024, when members started receiving negative energy bills, signifying the successful implementation of virtual net metering, granting them independence from market forces and the ability to produce their own clean electricity.

In addition to the questionnaire and the interviews, a co-creation workshop was organised to discuss about local conditions and barriers for ECs, focusing on youth ECs.

Co-creation day / Workshop summary

The workshop was attended by 47 people from 26 different organisations; the largest group of participants were civil servants or elected representatives from local and regional authorities, followed by university members and students, and local businesses.

During the workshop, an online platform was used to pose some key questions to the participants, followed by a discussion based on the most common and/or interesting aspects raised in the answers.

Based on the above, participants believe that the main benefits of ECs are economic growth and energy savings/carbon footprint reduction. Some participants mentioned the mobilisation of citizens and the alleviation of energy poverty. Notably, most respondents said that they were not benefitting either because there are no ECs operating in their area or because the infrastructure to support the projects was not in place.

Most local and regional representatives felt that there are regulatory gaps that need to be addressed to make it easier for young people to participate in ECs, and that there is insufficient government support to promote renewable energy and community energy projects.

In terms of the support that a municipality can provide to ECs, most of them mentioned raising awareness, reducing bureaucracy and political support as the most important. Especially for the implementation of energy projects by ECs, the local representatives considered the allocation of space to be important. Few participants mentioned financial support, direct participation of municipalities and political pressure to upgrade grid networks for project implementation. Throughout the discussion it became clear that there is a serious problem of saturation of the networks, but they believe that the government should take the initiative and put pressure on the central provider or reallocate resources to upgrade the networks.

When asked about the incentives that should be given to young people to become more actively involved in ECs, the vast majority said that financial incentives were the most important and, to a much lesser extent, clear operating conditions and information. In the same vein, the main barriers preventing the widespread adoption of collective energy initiatives by the younger generation are lack of funding, with many believing that lack of information, or rather misinformation, and indifference towards the community combined with complex legislation and bureaucracy are equally important.

[16] https://www.commonen.gr/en/

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In terms of the EC's contractual relationship with its members, the definition of financial obligations and rights, membership criteria and the handling of personal data are considered to be the most important. Equally important are the determination of ownership and the terms of supply and distribution of the energy produced.

Opinions were divided on the handling of personal data, indicating that the municipal social services in particular are familiar with their management.

All participants agreed that the Peloponnese region at local level has both geographical characteristics and great solar and wind energy. However, it also has many protected areas and rugged terrain. The vast majority of RES projects, especially small ones, are PV. Wind farms or harnessing other forms of energy are hardly feasible for the ECs due to the huge investment costs.

Finally, they believe that the main reasons why very few of the many ECs that have been established are active is that setting them up is a time-consuming but simple process. Then there is the need for financial resources, commitment and infrastructure to make the ECs operational and successful.

3.4. LATVIA

Questionnaire summary

In order to find out more about the attitude of young people towards the creation of ECs, a survey was conducted in which forty-four (44) respondents participated. The main data and the results obtained after conducting the survey are summarised below.

The participants consisted mainly of male (52.3%) high school students (65.9%) aged up to 18 (70.5%) that live in urban (50%) or suburban areas (29.5%).

Most of the respondents are not familiar with (47.7%) or not sure of (36.4%) the concept of ECs, while just 15.9% mentioned that they are familiar, all of whom (15.9%) were also familiar with the REC/CEC definitions of the various ECs. The vast majority do not know (56.8%) or are not sure (25.0%) of any examples of community energy projects. Only 18.2% of respondents knew some examples of community energy projects and the same proportion is aware of ECs and cooperatives operating in their country. On this basis, it is not surprising that only 9.1% were members of an EC or other citizen-led initiatives.

The majority of respondents had no opinion on whether it is easy for young people to become members of ECs (68.2%), while only a few find it either easy (13.6%) or difficult (18.2%). Most of the respondents did not know whether the state/municipality provides sufficient financial incentives for the establishment of ECs (56.8%), while only 13.6% considered these incentives to be sufficient and 29.6% stated that they were insufficient. In terms of awareness of the benefits of EC membership, 25% of respondents indicated that they were aware of the matter, while 31.8% indicated otherwise and 43.2% indicated that they had no opinion on the subject.

With regard to the question of whether the prevailing circumstances facilitate the operation of ECs and the production and use of energy, the majority of participants (59.1%) remained undecided. Conversely, 22.7% agreed with this assertion, whilst 18.2% disagreed. Despite the high proportion of respondent who declared no knowledge or remained undecided throughout the survey, the majority expressed a high level of willingness to become an EC member

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(40.9%), while the proportion who remained undecided was lower at 31.8% and those expressing unwillingness were at 27.3%.

As for willingness to invest, it is evident that the majority of respondents (40.9%) remained undecided. However, a slightly higher percentage of respondents (31.8%) indicated a lack of interest for making a micro-investment in an Energy Community project than those who expressed a willingness to invest (27.3%). Furthermore, it is surprising that a mere 6.8% of respondents consider social media and online platforms to be an adequate means of promoting ECs. In contrast, 63.6% of respondents view these platforms as ineffective, while 29.5% have no opinion on the matter.

When asked about their trust in young individuals to create and manage ECs, the majority (43.2%) of respondents remained undecided, while 36.4% expressed trust and 20.5% expressed distrust. This suggests that younger individuals themselves lack self-confidence and self-assurance in their capacity to assume leadership roles. However, when asked regarding feeling safe and confident in providing personal information to Energy Communities, the majority remained undecided (40.9%), while some of them either felt confident (36.4%) or uncertain (22.7%).

Only 18% of the respondents believe that anyone can participate in the EC, regardless of socioeconomic status, while 50% disagree with this statement. There is also I solid 32% of the respondents that remain undecided.

Consequently, the majority of young people in Latvia expressed no opinion regarding ECs, the activities designed to introduce and promote them.

The respondents identified lack of information (34.7%) and a lack of community interest (22.8%) as the primary reasons preventing young people from participating in ECs. Moreover, the primary misconceptions that prevent young people from participating in ECs are the belief that ECs do not directly affect their daily lives (27.8%) and the perception that participation is expensive (21.1%) or time-consuming (17.8%).

The participants identified three main motivators for young people's participation and leadership in ECs: environmental protection and the production of clean, green energy (23.6%), financial incentives (23.6%), and the opportunity to make a positive impact in the community (19.1%). Educational institutions (29.2%), national government (20.8%) and local authorities (18.8%) were seen as the most appropriate bodies and organisations to promote the benefits of ECs and inform the public.

In order to overcome economic barriers to youth participation in ECs and community energy projects, the main strategies that were preferred among the respondents were: the implementation of cost reduction measures for making participation in ECs affordable (23.1%); the provision of financial support specifically for young people (22%); and the creation of accessible funding mechanisms (22%).

Looking at policy changes, respondents highlighted the importance of simplifying regulatory processes (23%), introducing financial mechanisms such as subsidies, grants, or low-interest loans tailored for young people (19.5%), creating stable revenue streams for energy projects (19.5%) and allocating land or resources for youth-led energy projects (19.5%). For the participants, the most important elements of the contractual relationship between an Energy Community and its members are the specification of financial contributions and rights (29.5%), the agreement on the conditions of energy supply and distribution within the community (22.1%) and the definition of membership criteria, rights and obligations (29.9%).

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Bilateral Interviews with experts and relevant stakeholders

During the assessment of the local conditions and barriers in Latvia, four (4) experts were interviewed and provided their valuable insights. The key findings are presented below.

Table 3: Composition of interviewed participants in Latvia

Details	Position/Expertise of the interviewees
4 interviews	Head of department of Energy market at the Ministry of Climate and Energy
	Head of the Energy Efficiency Information Centre of Riga Energy Agency
	Head of The Eco-School programme
	Project Manager (Project Rural Energy Communities in Latvia - Catalysing and Building Capacities for Renewable Energy Communities in Rural Latvia) Latvian Rural Forum

Legal and regulatory framework and policy

In Latvia, current regulations allow individuals to install energy production systems on their own property and use the energy produced in another property they own. However, there is no specific regulation for ECs. Amendments to the Electricity Market Law[17], which are currently under public consultation, signal that legal regulation for ECs will be introduced soon.

Currently, it is possible to establish ECs under general regulations[18], but they are not popular due to a lack of incentives and legal support. There are no plans to establish youth ECs; they will be considered under the general regulations. This lack of a clear legal definition for youth ECs complicates policy development and support and affects their ability to access funding and enter into contracts. In addition, young people often lack the knowledge and motivation to participate in ECs.

Future prospects indicate that the legal regulation for ECs could be implemented by July 2024. Despite the Ministry's assertion that it is currently legal to establish and operate ECs, there are practical challenges due to low interest from energy suppliers. Overall, while there is recognition of the need for a clearer and more supportive legal framework to encourage the formation of ECs, specific incentives and clarity are still lacking.

Financial and market design barriers

In Latvia, the existing regulations do not provide significant incentives for the development of ECs. These regulations take into account the interests of producers and traders, not only communities. Funding schemes cannot be established without a clear legal basis, and no funding offers are available until such a basis is developed.

[17] https://likumi.lv/ta/id/108834-elektroenergijas-tirgus-likums
[18] https://likumi.lv/ta/id/347235

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While Latvia has good support and available financing for the purchase of renewable energy technology, this depends on the solvency and creditworthiness of the buyer. There are no specific subsidies or financial support for youth ECs, as the law does not address any specific groups. In general, there are no significant financial or economic barriers, although price fluctuations in the energy market can pose a barrier.

The main factor influencing the activity of ECs is not financial mechanisms, but the willingness of communities or users to invest together, analyse the market and evaluate benefits and obstacles. Currently, there are no incentives or subsidies for the establishment of ECs, either in general or specifically for young people. Targeted support for specific age groups, such as young people, is not planned.

Contractual conditions

In Latvia, there is currently no legal regulation for ECs, so it is premature to assess specific contractual conditions and requirements. If users have the appropriate household or business status, they can easily enter into contracts. However, ECs lack a legal basis for concluding cooperation agreements. Despite this, there is considerable interest among municipalities in establishing ECs.

Social barriers

In Latvia, the formation of ECs requires the involvement of all interested parties and extensive education and information campaigns. Current regulations allow municipalities or legal entities to establish communities, enabling efficient use of the energy produced. For example, excess energy from installed panels can be used by nearby shops, promoting energy independence and reducing dependence on energy suppliers.

Dialogue has begun with local authorities, retailers and building managers, although immediate widespread adoption is unlikely due to practical challenges of cooperation, such as resistance from owners of multiple dwellings. The creation of ECs will be voluntary, with local authorities playing a key role in stimulating their formation. Information and awareness are essential for successful implementation.

While no special incentives for youth ECs, young people are open to new opportunities and receptive to information campaigns. Eco-schools in Latvia are already educating young people about energy efficiency and green communities.

Public interest in ECs is growing, driven by the increasing popularity of renewable energy sources. NGOs, such as the Latvian Rural Forum, and regional partnerships are informing the public and receiving EU funding to support these initiatives. Overall, the combination of stakeholder involvement, community support and educational efforts is key to the development of ECs in Latvia.

Local Conditions

In Latvia there are restrictions on high power connections in certain geographical areas, but these do not apply to small producers. The legal framework for ECs is still under development, so it is still early to assess any technical limitations or obstacles. Large-scale EC projects are theoretically possible, and the current grid system supports their implementation. Historically,

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Latvia has more negative examples related to energy cooperatives, especially small garden cooperatives, which have influenced views on common energy distribution. A notable example of an EC in Mārupe was not successful due to limited participation.

Good examples and clear cooperation models are essential for the successful implementation of ECs, emphasising transparency and mutual benefit. ECs need to be non-commercial to avoid mutual competition. There are currently no youth ECs in Latvia, but young people, especially students, can act as ambassadors to educate other social groups about the principles of energy sharing. Working with young people is necessary to promote understanding and participation.

No specific incentives or additional benefits are planned for ECs. The country currently shows a tendency to prioritise individual benefits over a broader approach to renewable energy resources. Overall, the combination of good practices, non-commercial cooperation models and youth involvement is crucial for the future development of ECs in Latvia.

Co-creation day / Workshop summary

In addition to the questionnaire and the interviews, a co-creation workshop was organised to discuss about local conditions and barriers for ECs, focusing on youth ECs.

The regulations for energy sharing and ECs in Latvia are still under development, and the first public hearings on the law are scheduled for this spring. According to the Ministry of Climate and Energy, the forthcoming regulation will be both foundational and forward-looking, aiming to increase the number of active customers and support renewable energy projects that emphasise environmental benefits and social inclusion. Key criteria for EC projects will include a 1 MW limit on installed capacity and business models focused on self-consumption.

The main findings of the co-creation session highlighted that the legal regulation of ECs, including youth ECs, is not yet complete in Latvia. While young people are more open to participate, they often lack the time and interest to be actively involved. Other barriers to increasing interest in ECs are consistent with general challenges: legislation, financial support, lack of information and benefits, and integrating sustainability into lifestyles and long-term perspectives.

Key recommendations from the session included working with eco-schools to use existing programmes to raise environmental awareness, and implementing additional education, campaigns and events to encourage young people to consider renewable energy and ECs. In addition, best practices from other European countries as well as communication and information campaigns are essential to promote and activate new ECs.

3.5. POLAND

Questionnaire summary

For the assessment of the local conditions and barriers, an online questionnaire was distributed to a wider audience, to gather information and opinions on the situation of youth ECs. The main data and results of the forty-two (42) responses are summarised below.

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The participants consisted mainly of females (52.4%) who were well-educated holding a master's degree (54.8%) aged from 18 to 34 (69%). They live in urban areas (69%) and work for either the private (33.3%) or the public sector (28.6%).

The majority of respondents lacked awareness (40.5%) of the concept of ECs and their associated benefits before taking the survey. However, 33.3% of respondents demonstrated awareness of the concept, while 26.2% expressed uncertainty. Additionally, a significant proportion of respondents (64.3%) were not familiar with the REC/CEC definitions before the survey, while some of them expressed a degree of familiarity (21.4%) and only a few expressed uncertainty (14.3%). Many of them (47.6%) also indicated that they were unaware of the existence of active ECs or other cooperatives in their regions. Conversely, 33.3% of participants reported having knowledge of such initiatives, while 19% expressed uncertainty. In contrast, most participants demonstrated familiarity with specific examples of community energy projects, with 40.5% indicating such knowledge. However, a notable proportion (38.1%) indicated a lack of such familiarity, while a further 21.4% expressed uncertainty. A mere 4.8% of respondents declared themselves to be members of ECs.

These data suggest a necessity for enhanced information and education activities with the objective of reaching a greater number of young people. It should be noted that the percentage of people who remain undecided on multiple questions highlights this need. Furthermore, the awareness of the people who participated in the survey was influenced by the provided text, as evidenced by a declaration of a higher level of awareness (61.9%) at a later stage of the survey compared to the beginning.

The survey showed that young people are clearly interested in participating in ECs. Almost half of respondents (47.6%) expressed a willingness to become actively involved in such initiatives, subject to the availability of appropriate support and information. Moreover, 47.6% of respondents indicated that they would micro-invest in local energy projects, while 45.2% declared their trust in young people for the creation and management of ECs. Most participants also feel confident in providing personal information to an EC (40.5%). Despite this level of willingness, most of the respondents have no opinion on whether the state or the municipality provides enough financial incentives for the establishment of ECs (50%) or consider that they should provide more (26.8%). A smaller but significant proportion (23.8%) felt that the financial incentives provided were sufficient.

Most of the respondents (88.1%) strongly agreed that social media and online platforms can play a significant role for engaging young people in ECs, whereas more than half of them (59.5%) stated that anyone can participate in an EC, regardless of their socio-economic background. A significant proportion of respondents were undecided (19.1%) or disagreed with this statement (21.4%).

Moreover, according to their answers, the bodies and organisations that should promote the benefits of ECs are distributed as follows:

- Local authorities/municipalities (32.3%): Indicated as the key actor responsible for spreading the word about ECs. Respondents believe that local governing bodies should play an important role in promoting these initiatives.
- National government (22.2%): Indicated as the second responsible entity for promoting ECs. This suggests that national level initiatives can have a significant impact on young people's awareness and engagement and highlights the need for cooperation between the national government and local authorities.

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- Educational institutions (17.2%): Recognised as important educational centres that can effectively communicate information about ECs. This highlights the role of formal education in raising awareness of the benefits and opportunities associated with such initiatives.
- Local initiatives/NGOs (17.2%): Local initiatives and NGOs are seen as key partners in the promotion of ECs, highlighting the importance of grassroots activities and collaboration with local communities.

According to the respondents, the main reasons preventing young people from participating in ECs are the lack of information (30.2%), the lack of interest from the community (23.3%) and the lack of incentives (20.9%). At the same time, they believe that the main misconceptions of young people that prevent them from becoming members of ECs, are that their voice will not be heard during the decision-making process (25.9%), that the investments they need to make or their participation in general is expensive (22.2%) or time-consuming (18.5%) and that ECs do not directly affect their daily lives (18.5%).

The main motivators for young people to participate and lead ECs were environmental protection (35.6%), financial incentives (23%) and implementing innovative ideas (19.5%).

Regarding the facilitation of operation and energy production of ECs, most of the respondents (33.3%) argue that the current situation is not sufficient, with a percentage of 42.9% remaining undecided and 23.8% considering it adequate.

With regard to the ease of young people becoming members of ECs it was evident that most of them (57.1%) have no opinion on the matter, while only 16.7% found it relatively easy and 26.2% found it difficult.

As effective economic strategies to stimulate youth participation, the respondents favoured financial support or incentives specifically for young people (28.9%), cost reduction measures for making participation in energy projects more affordable (20%), accessible funding mechanisms tailored for young people (18.9%) and advocacy for policy changes to remove economic barriers faced by young people (17.8%).

Looking at policy changes, respondents highlighted the importance of establishing financial mechanisms such as subsidies, grants, or low-interest loans tailored to young people (30.3%), simplifying regulatory processes (30.3%) and creating stable revenue streams through mechanisms like feed-in tariffs or power purchase agreements (16.9%). For the participants, the most important elements of the contractual relationship between an EC and its members are the definition of membership criteria, rights and obligations (30.6%), the specification of financial contributions and rights (25.5%) and the agreement on the conditions of energy supply and distribution within the community (22.4%).

Bilateral Interviews with experts and relevant stakeholders

During the assessment of the local conditions and barriers in Poland, four (4) experts were interviewed and provided their valuable insights. The main findings are presented below.

Table 4: Composition of interviewed participants in Poland

Details	Position/Expertise of the interviewees

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4 interviews	Member of the Skawina Energy Cooperative
	Legal counsel from the Frank Bold Foundation
	EU climate policy expert in Polish Green Network
	Senior Project Manager (Energy & Regulatory) in CoopTech Hub (cooperative technology centre)

Legal and regulatory framework and policy

The Polish regulatory framework provides the basis for the creation of different forms of ECs. The first regulations on ECs were created in 2016, introducing energy cooperatives into polish legal framework, by the Act of 22 June 2016 amending the Renewable Energy Sources Act and certain other acts[19] (Parliament of Poland, 2016). Further regulations were introduced in 2019 by the Act of 19 July 2019 amending the Renewable Energy Sources Act and certain other acts[20] (Parliament of Poland, 2019) that created a new support system for energy cooperatives. Nevertheless, the first community was not established until 2021, and as of 16 September 2025, there are 135 such ECs registered, most of which operate in the field of PVs due to a favourable billing net metering system. The Polish legal framework is generally supportive of energy initiatives such as ECs, but it is also complex, fragmented, and incomplete. The regulations are spread across several laws (e.g., the Energy Law Act of 10 April 1997[21] [Parliament of Poland, 1997] and the Renewable Energy Sources Act of 20 February 2015[22] [Parliament of Poland, 2015]), which creates confusion and hinders the development of ECs. Barriers related to legal clarity, administrative complexity, and grid connection issues that slow down the growth and development of ECs. To address these challenges, there is a clear need for legal reforms, educational efforts, and systemic investment in infrastructure to support the integration and expansion of ECs and foster a more inclusive and dynamic energy sector.

The legal framework restricts the activities of ECs to generating energy solely for their members only, limiting their potential and attractiveness. Communities are unable to engage in broader activities, such as selling energy or providing services like electric vehicle charging, which could increase their financial viability and overall attractiveness. This restriction reduces communities to a narrow operating model focused primarily on energy savings, rather than allowing them to operate as multifaceted entities that meet diverse social and environmental needs while generating revenue.

Another important issue is the exclusion of urban areas from the scope of ECs, contrary to European Union directives, such as Renewable Energy Directive[23]. This limitation is a major barrier to engaging urban communities, which is essential for Poland to meet its renewable energy targets and align with the EU's 2030 targets. Current regulations only allow communities to operate in rural and rural-urban municipalities, excluding cities, which limits the potential impact and expansion of energy initiatives. Furthermore, there is a risk that rural

[19] https://isap.sejm.gov.pl/isap.nsf/download.xsp/WDU20160000925/T/D20160925L.pdf
[20] https://isap.sejm.gov.pl/isap.nsf/download.xsp/WDU20190001524/T/D20191524L.pdf
[21] https://isap.sejm.gov.pl/isap.nsf/download.xsp/WDU19970540348/U/D19970348Lj.pdf
[22] https://isap.sejm.gov.pl/isap.nsf/download.xsp/WDU20150000478/U/D20150478Lj.pdf
[23] https://energy.ec.europa.eu/topics/renewable-energy/renewable-energy-directive-targets-and-rules/renewable-energy-directive_en

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communities could be absorbed into expanding urban boundaries, raising questions about their future operation and sustainability.

Grid connection issues are also a considerable challenge for ECs. Many communities face refusals from distributors to connect to the grid, citing inefficiencies and potential attempts to monopolize the market. The high cost of connecting to the grid and the lack of systemic investment in grid modernization further hinder the integration and operation of ECs.

To address these challenges, political will and investment are urgently needed to upgrade the grid infrastructure, enabling more efficient and widespread use of renewable energy sources by communities.

Financial and market design barriers

Energy communities in Poland encounter substantial financial and market design barriers that impede their growth and effectiveness. These include complex access to financial support, bureaucratic hurdles in government programs, and challenges in negotiating with energy operators. Moreover, unclear regulations and limited involvement of local governments and residents pose additional obstacles.

Energy billing methods within cooperatives offer significant savings, potentially eliminating the need for subsidies. However, the initial investment costs of RES installations and the bureaucratic procedures for obtaining grants remain barriers. Solutions could include low-interest loans and simplified financial instruments to support community investments, especially in the early stages.

Reforms are needed to streamline funding mechanisms, simplify the regulatory framework and enhance cooperation between ECs and local authorities. Ensuring clearer legal guidelines, facilitating easier access to grants, and fostering a supportive environment for citizen-led initiatives are essential steps towards achieving a sustainable and inclusive energy transition in Poland. This can be achieved through municipal advisory bodies, education, and building the capacity and knowledge of local communities.

Contractual conditions

There are three main challenges to the contractual terms of ECs:

1. Complexity in Energy Community Establishment Procedures: The procedural complexity of setting up ECs in Poland has resulted in many registered communities not being connected to the grid or signing distribution network contracts. Frequent refusals by distributors to connect to the grid are justified by grid inefficiencies, which may indicate attempts to monopolize the market.
2. Focus on Legal Entities Over Natural Persons: There are currently no ECs in Poland that are open to natural persons other than declarations. Most are aimed at companies and local authorities. This limits access for individual participants and may restrict the cooperative development.
3. Lack of Regulations on Member Rights in Energy Communities: Poland lacks regulations on the rights of EC members as consumers, such as the ability to switch energy suppliers. There is also controversy over the net metering system, which is not always economically justified and may conflict with EU directives.

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Social barriers

Energy communities in Poland face challenges due to insufficient promotion and public awareness. The early stages are crucial, and early lighthouse communities need to demonstrate tangible benefits to encourage replication elsewhere. There is a need for educational campaigns that highlight more than just cost savings, explain concepts, and emphasise the wider benefits of community energy initiatives.

Psychological barriers, including perceptions of complexity and cost associated with EC projects, pose significant challenges. While funding opportunities exist, such as those from EU Recovery instrument, lack of awareness and guidance on how to access these funds deters participation. Programs like the Energy Communities Incubator provide valuable support but need to be more widely implemented.

These social barriers significantly hinder the development and expansion of ECs in Poland. These barriers include insufficient promotion and awareness, particularly among young people, and challenges in effectively engaging local authorities. Mental barriers related to perceptions of complexity and cost also inhibit participation, despite the availability of funding opportunities.

Comprehensive education and awareness campaigns targeting both the general public and youth are essential. Strengthening the role of local authorities through clearer support mechanisms can encourage community engagement. Simplifying access to funding and providing mentoring programs can empower citizens to participate more actively in community energy initiatives.

Social media could be a valuable tool in this regard, but there is a need for deep research to understand where young people get their information and who they trust. Incorporating climate and energy education in school curricula could also increase awareness and participation.

In addition, efforts are still needed to involve local authorities more actively in the growth of ECs. They have a crucial role to play in promoting and supporting these incentives. Individual efforts by NGOs are necessary but their impact is currently limited compared to that of municipalities.

Local Conditions

The local conditions for ECs in Poland reveal a mixed landscape of challenges and opportunities. Ging forward, there is a clear need for strategic planning at the national level to effectively integrate citizen energy into the Polish electricity system. Simplifying grid connection procedures, improving the regulatory framework, and fostering cooperative governance models are essential steps to enable more communities to participate in local energy production and consumption.

Poland's electricity grid is currently overloaded and relies on outdated infrastructure, making it difficult to integrate new renewable energy sources. Distribution Network Operators (DNOs) are often hesitant to facilitate new connections. Working with them is challenging due to technical complexity and lack of transparent data on grid availability.

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The practical establishment of many or big-scale community energy projects in Poland faces significant challenges. Energy communities often rely heavily on dedicated individuals and face hurdles such as legal barriers, complex technical requirements, and varying levels of support from energy companies and local authorities. The emphasis on balanced energy production and consumption within communities suggests that while smaller-scale projects are feasible with proper planning and support, large-scale projects like extensive PV farms might not align with the cooperative nature of ECs in Poland.

However, the experts provided examples that can serve as lighthouses for the new ECs:

- Lidzbark Warmiński and Lądek Zdrój are successful examples where local initiatives have led to the establishment of ECs or clusters. These projects have managed to navigate legal and technical challenges in order to implement renewable energy solutions for the benefit of local communities.
- Zgorzelec Energy Cluster is recognised for its innovative approach to integrating electric cars, wind energy, and PVs, demonstrating a diverse energy mix within a community context.

There were also the ECs that were not successful. Two of the examples provided faced bankruptcy or operational difficulties due to regulatory issues and lack of support under the RES Act. These cases underscore the pitfalls of inadequate legal frameworks and financial sustainability in early community energy projects. It was also mentioned that there are registered ECs, that do not complete the procedure to produce their own energy.

Co-creation day / Workshop summary

In addition to the questionnaire and the interviews, a co-creation workshop was organised to discuss about local conditions and barriers for ECs, with a focus on youth ECs.

The participants of Polish Co-Creation Workshop agreed that the current situation does not support the functioning of ECs as well as the production and use of energy from RES. The process of establishing and operating ECs is too complicated, especially for the young people. Simplification of regulatory processes and streamlining of administrative procedures is crucial to eliminate barriers and ensure people's involvement in ECs. In addition, clear and reliable financial benefits and wide information campaigns can support these energy projects.

Local authorities and communities' leaders have a key role to play in decentralising the electricity system. Without them, the involvement of citizens in the energy transition will not be possible. In addition to legal barriers, they pointed to problems such as a lack of awareness among residents about energy cooperatives, a lack of model solutions or a lack of trust in the new incentives. People need an authority among the community, who can convince them to take citizen energy actions. In order to engage people, it is important to show them the benefits of citizen energy actions, i.e. the reduction of their electricity bills, the possibility to obtain external funding and the environmental aspects.

The aspects regarding the legal and regulatory framework are summarised below.

1. <u>Local authority support for energy initiatives:</u>
    - Local authorities, as the example of the city/municipality of Niepołomice shows, actively support initiatives promoting renewable energy and community energy projects.

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- Making property available for energy infrastructure. Both the cities/municipalities of Niepołomice and Serock are working on the possibility of regenerating an old landfill site on which to build an EC.
- Administrative and technical support during the initial period of operation of the projects. Promoting activities to raise awareness among residents about the benefits of renewable energy sources - this is being done especially in Niepołomice in connection with the municipality's participation in EPAH projects.

2. Making public land available:

- Local authorities have the possibility to make public land available to ECs through both formal and informal mechanisms:
- Formal mechanisms: Examples include leasing land on preferential terms or transferring land for longer periods. Problematic in this aspect from the point of view of local authorities is the impossibility of combining private and public budgets. Therefore, a municipality cannot be a member of an EC in which private individuals have shares. In this case, the municipality can only support the formation of such a community and set up a separate one for its own purposes.
- Informal mechanisms: The possibility of drawing up a memorandum of understanding that sets out the terms of cooperation between the local authority and the EC. Such a document could include rules on land use and common objectives for the implementation of energy projects. This modus operandi is used in particular by the municipality of Serock when overseeing the process of establishing an EC and recruiting participants and founders of the cooperative.

3. Public tenders and youth participation:

- Local authorities can support the creation of ECs involving young people by organising public tenders or other selection procedures that include criteria that promote the participation of young people. Local government officials emphasise, that involving young people is difficult and has not been a focus of their work in practice so far.
- There is the need for financial support for dedicated young people through grants, subsidies or preferential loans and the provision of adequate technical support.

In addition, the very fact that the municipalities have to purchase energy through a public procurement office is problematic, which may discourage self-consumption on site of the energy they produce (which is the cheapest and most cost-effective solution).

Regarding the financial and market design barriers, there are local authorities, that actively support renewable energy and community energy projects. Administrative and technical support during project initiation phases is well seen and necessary, especially when it is accompanied by awareness-raising efforts among residents about renewable energy benefits. Some cities try to facilitate this by providing property for energy infrastructure, such as old landfill sites.

Various incentives and subsidies are available for setting up ECs, both in general and for young people, despite of tax exemptions (benefit from excise duty exemptions if their total installed capacity remains below 1 MW) and billing terms. The crucial is technical and educational support for local authorities and residents, enhancing awareness of renewables and ECs. For example, Niepołomice is implemented pilot programs aimed at recruiting participants or establishing communities.

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While there are incentives and subsidies available for ECs, addressing financial barriers and leveraging alternative financing mechanisms are crucial for wider adoption of ECs. Strengthening support programs, simplifying administrative processes, and exploring innovative funding avenues can enhance the feasibility and sustainability of community energy initiatives across different localities.

Several financial and economic barriers hinder widespread adoption of community energy initiatives, which are:

- High Initial Costs of installation for renewable energy sources can be prohibitive, particularly for young people with limited financial resources.
- Limited Financial Support, where not all interested parties can access sufficient funds to implement projects despite existing support programs.
- Concerns about high accounting costs can reduce overall project profitability and deter potential participants.
- Complicated administrative procedures discourage engagement in energy projects.

Alternative financing mechanisms such as municipal green bonds or crowdfunding can positively impact the feasibility of ECs. The example of Serock was notable, for its use of crowdfunding, which allows residents to contribute funds to cover investment costs and encourage community involvement.

It is seen that collaboration with local authorities and established local businesses and support from them builds trust and attracts more investors. Municipal representatives are beginning to realise this. That would be useful to show the option by subsides as of Renovation Funds. For instance, Niepołomice residents plan to utilise renovation funds for PV installations, demonstrating how internal financial resources can support energy projects.

Local authorities play a crucial role in the development of ECs and the contractual requirements. By leveraging formal agreements like Memorandums of Understanding (MoUs), facilitating space allocation through flexible mechanisms, and providing non-legal and non-financial support such as education, administrative aid, and community engagement, municipalities can significantly support the formation and sustainability of ECs. Despite challenges like integrating private and public resources and navigating complex bureaucratic processes, proactive efforts from local authorities can overcome these barriers and promote the widespread adoption of renewable energy initiatives.

Local authorities can allocate public land for community energy projects and RES installations. Some municipalities have explored using old landfill sites for building energy cooperatives, demonstrating a proactive approach to making public land available for such initiatives. Authorities can use both formal mechanisms (like leasing and transferring land) and informal agreements (like MoUs) to facilitate space allocation for community energy projects. This approach allows flexibility in how public spaces are utilised for energy initiatives.

Clear protocols for data sharing between the community and third parties, including local authorities, are crucial to ensure that data is handled securely and in accordance with legal requirements.

ECs must comply with legal requirements, implement robust technical and organisational measures, and establish clear data sharing protocols. For granting access to public sites, local authorities need to enforce comprehensive access control policies, conduct security assessments, ensure regulatory compliance, and prepare for potential emergencies. Taken

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together, these measures enhance the security and trustworthiness of community energy projects, fostering a secure and supportive environment for their development.

The operation of an EC involves the exchange of data between participants and the distribution system operator, particularly for billing energy production and consumption. Compliance with data protection regulations, especially the GDPR, is essential to protect sensitive data and maintain trust among stakeholders. GDPR requires that personal data be processed lawfully, fairly, and transparently. This includes ensuring that data collection and processing activities are lawful, secure, and respect the privacy of individuals involved in the community.

Local authorities must ensure that all agreements for site access comply with relevant security regulations. This may involve conducting background checks on individuals with access, setting security standards for equipment and infrastructure, and ensuring that the EC complies with these requirements.

Information campaigns and training can be beneficial to increase awareness and involvement of young people in renewable energy projects. Municipalities can use this approach with the support of local organisations and communities. It is aimed at all residents with rights to inhabited property, including those at risk of energy poverty - not just young people.

Continuous support is essential to increase awareness. Municipalities should inform citizens about the opportunities. Universities and research institutions could be involved in raising broader community awareness.

Meeting with residents and sharing knowledge play a crucial role in changing the mindset. Good examples from success incentives can help people see the benefits and motivate them to make changes in their communities. However, there is a need to involve a local leader (either a representative of the local authorities or a private individual) in the entire process.

The public lacks knowledge about ECs. The topic is just emerging among citizens as an unfamiliar but promising option.

Participants agreed on the need to engage social media as a tool to support education and promotion of energy initiatives.

3.6. PORTUGAL

Questionnaire summary

The survey conducted in Portugal involving forty-three (43) respondents aimed to analyse the barriers and local conditions affecting youth participation in ECs. The respondents were predominantly urban dwellers (86%), with a significant proportion being college/university students (44.2%) and highly educated, including individuals with bachelor's (19.6%), master's (23.3%), and doctorate degrees (14%). The age distribution showed that 55.8% were between 18 and 24 years, 20.9% between 25 and 34 years, and the remaining 23.3% spread across older age groups. Gender distribution included 41.9% of female and 58.1% of male respondents.

A notable finding was the general lack of awareness about ECs, with 46.5% being unaware and 11.6% being unsure of the concept. Only 23.3% were familiar with the definitions and potential benefits of REC and CEC. Furthermore, 58.1% did not know any examples of community energy projects, while just 25.6% were aware of active ECs in their region.

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Engagement in ECs was minimal, with only one respondent (2%) being an active member. Opinions on the ease of joining ECs differed, with 53.5% having no opinion and another 20.9% finding it easy. Additionally, 25.6% found it difficult. Regarding financial incentives from state or municipal authorities, 34.9% had no opinion, and 44.2% found it difficult or very difficult to obtain support.

Awareness of the benefits of ECs was split, with 41.9% of the respondents feeling adequately informed and 30.2% disagreeing. Similarly, opinions on the operational facilitation of ECs were divided, with 23.3% of respondents seeing it as favourable. Despite these challenges, 58.1% expressed willingness to join an EC if one were available locally, and 51.2% were ready to make micro-investments.

Social media and online platforms were seen as effective tools for engaging youth (76.7%). Trust in young leadership was relatively high, with 65.1% supporting young people in managing ECs. However, confidence in data security within these communities was split, with 39.5% feeling confident and an equal percentage unsure.

The primary barriers to youth participation were identified as lack of information (36.5%) and misconceptions about the cost (24.7%) and influence within ECs (24.7%). Environmental protection (34.7%) and community impact (20.4%) were the main motivators for youth participation. Effective promotion of ECs was attributed to local authorities (28.8%) and national government (23.1%).

To overcome economic barriers, respondents suggested accessible funding mechanisms (27%), cost reduction measures (24%), and specific financial support for youth (23%). Simplifying regulatory processes (32.9%) was also deemed crucial. Clarity in membership criteria (28.1%), transparency on the conditions of energy supply and distribution (22.5%), and specification of financial contributions, fees and rights (22.5%) in membership contracts were highlighted as essential for ensuring successful engagement in ECs.

The survey highlighted significant gaps in awareness and engagement among Portuguese youth regarding ECs. While there is potential interest, evidenced by the willingness to join and invest in such initiatives, there are clear barriers related to information, financial incentives, and regulatory complexities. To foster greater participation, efforts should focus on education, tailored financial mechanisms, and streamlined administrative processes. Local authorities and national government agencies play a crucial role in promoting and facilitating youth engagement in ECs, leveraging platforms like social media to reach and mobilize young people effectively. Addressing these barriers and enhancing support structures can unlock the potential for youth-led energy initiatives, contributing to sustainable energy practices and community development.

Bilateral Interviews with experts and relevant stakeholders

During the assessment of the local conditions and barriers in Portugal, five (5) experts were interviewed and provided their valuable insights. The main findings are presented below.

Table 5: Composition of interviewed participants in Portugal

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Details	Position/Expertise of the interviewees
5 interviews	Assistant Professor at the Department of Electrical and Computer Engineering of the School of Engineering of the University of Porto, specialised in power systems and renewable energies
	Marketing Director and Strategic Partnerships Director at a Climate Tech Company
	CEO at one of Europe's largest companies in the development of large-scale solar and wind projects
	Partner at a major Law Firm, responsible for the Environment & Climate Change and Energy & Natural Resources practices
	Coordinator at a Sustainable Development Cooperative

Legal and regulatory framework and policy

The current legal framework for ECs in Portugal, namely Decree-Law No. 15/2022[24], of 14 January, Regulation No. 815/2023[25], and Decree-Law No. 99/2024[26], of 3 December, has several advantages. It incorporates the concept of virtual allocation, a critical technical basis for operationalizing information flows within an EC. This is particularly effective in promoting energy efficiency and reducing losses in the network by ensuring that production is located within consumption zones. Additionally, Portugal boasts one of the most comprehensive legislative frameworks in Europe for ECs, which is well-regarded conceptually even at the European level. This framework allows for the sale of surpluses with provisional licenses and recognizes different legal entities, such as RECs and Collective Self-Consumption (CSC), providing a robust legal structure for ECs to operate.

Despite its strengths, the framework is fraught with complexities and ambiguities that hinder the practical creation and operation of ECs. One major issue is the proximity restrictions and the requirement for quarter-hourly metering with smart meters, which are deemed unnecessarily stringent. One of the experts suggested that a less frequent measurement, such as a four-hourly monthly measurement, would suffice for adequate valuation of solar production standards. Additionally, the distinction between REC and CSC is confusing, and the definitions of which entities can be a REC, CSC, or Collective Self-consumption Management Entity (EGAC) are unclear. This lack of clarity extends to the business models that these entities can adopt and their profit-making capabilities.

Moreover, the legislation's vague nature leads to restrictive interpretations, which complicate the registration and operational processes for ECs. Another expert highlighted the bureaucratic, administrative, and informational barriers, which are significant enough to discourage potential participants, especially those without prior experience in forming associations or cooperatives. The poor transposition of the European Renewable Energy Directive also means that starting a REC without an associated CSC project is not feasible under current national legislation, thereby limiting the scope of EC activities.

[24] https://diariodarepublica.pt/dr/detalhe/decreto-lei/15-2022-177634016
[25] https://diariodarepublica.pt/dr/detalhe/regulamento/815-2023-216251911
[26] https://diariodarepublica.pt/dr/detalhe/decreto-lei/99-2024-898705893

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Operational challenges are exacerbated by the lack of resources and capacity within the Directorate-General for Energy and Geology (DGEG) and the DSO. These entities struggle to meet the deadlines mandated by the European Renewable Energy Directive, leading to delays in project approvals. The directive stipulates a one-month approval period for typical EC projects, a target that has yet to be met due to insufficient means and resources within these organizations.

Additionally, there is a significant disparity between the comprehensive nature of the legislation and its practical implementation. One expert noted that while the legislation is conceptually strong, the actual implementation has fallen short of the expectations of promoters. This is partly due to the lack of platforms, human resources, and other necessary means within DGEG to support full legislative implementation.

To address these issues, several improvements are recommended. Firstly, simplifying the legal requirements, such as removing the proximity restrictions and easing the metering frequency, would make the framework more practical. Clarifying the distinctions between different types of ECs and the roles of various entities involved would reduce confusion and facilitate smoother operations.

Furthermore, enhancing the capacity and resources of DGEG and DSO is crucial to meet the directive's deadlines and improve the efficiency of the project approval process. This could involve developing automated mechanisms to ensure timely follow-up and dispatch of projects.

Finally, better information dissemination and support for citizens, especially young people, are essential. Simplifying the registration process and providing clear, accessible information can encourage broader participation and help realize the full potential of ECs in promoting sustainable energy practices.

In conclusion, while the current framework has a solid foundation and significant potential, addressing its complexities and ambiguities is vital for the effective creation and operation of Energy Communities in Portugal.

Financial and Market Design Barriers

Despite the numerous advantages of ECs in terms of scalability and cost reduction, several financial and market design barriers persist that hinder their creation and operation.

Experts identified a significant gap in the accessibility and effectiveness of national financial incentives and subsidies. While there are incentives available, they often fail to reach those most in need due to a lack of information and bureaucratic hurdles. This issue is exacerbated by the complexity of existing financial mechanisms, which tend to favour well-informed entities over those with less access to privileged information. One expert emphasised that while incentives exist, the dissemination and utilisation of these incentives are inadequate, leading to social disparities.

For instance, subsidies for solar PVs, particularly for emerging technologies like batteries, are available but come with lengthy and cumbersome application processes. This delays implementation and causes potential investors to miss out on timely opportunities, as noted by one expert. There is also a notable difference in the ease of accessing financing for well-established technologies versus innovative solutions, which further complicates the financial landscape for ECs.

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Despite these challenges, alternative financing mechanisms show promise. Experts suggest that large-scale financing funds, potentially managed by local authorities, could significantly boost the development of ECs. Crowdfunding models, while effective on a small scale, may not suffice for larger projects, but they still represent a viable option for initial stages or smaller initiatives. One expert proposed that reducing network access tariffs and exempting ECs from certain cost components could provide an equitable financial boost without direct subsidies.

Private financing options also offer flexible solutions. As highlighted by one of the experts, private companies can mitigate initial investment burdens by offering models where the customer pays only for consumption, making ECs financially viable for those who lack upfront capital. This model aligns with collective self-consumption benefits, where savings from shared renewable energy production enhance the financial attractiveness of ECs.

A recurring theme among the experts was the need for improved financial literacy and information dissemination. As one expert pointed out, a lack of understanding about business models and financial planning significantly hinders the establishment of ECs. Financial literacy is crucial, particularly for young people and communities new to the concept of ECs. Simplifying the process of forming cooperatives, including reducing registration costs and legal requirements for accounting, could lower entry barriers and encourage wider participation.

The role of municipalities and integrated support entities, as suggested by another expert, is vital in bridging the information gap. These entities can serve as one-stop-shops, providing essential guidance and support to communities looking to leverage available financial mechanisms.

In conclusion, while the economic viability of ECs is supported by their inherent cost advantages and the potential for scalable solutions, several financial and market design barriers need to be addressed. National financial incentives are not effectively reaching those who need them most, and there is a critical need for more accessible and streamlined financing mechanisms. Alternative financing models and enhanced financial literacy can play a pivotal role in overcoming these barriers. By leveraging both public and private financing options and improving informational outreach, the creation and operation of ECs can become more inclusive and widespread, fostering a more sustainable energy transition.

Contractual Conditions

The process of forming contractual agreements with various stakeholders, energy suppliers, and grid operators presents several challenges and complexities in Portugal's context. While there are efforts to streamline these processes, significant barriers remain.

A major issue identified by one expert is the lack of clarity and fulfilment in contracts drawn up by organisations promoting RECs. These contracts often lack standardisation, leading to confusion and potential disputes. To address this, there is a need for Contractual Relations Regulations similar to those applied to electricity distribution companies. Standardised contracts and billing models, monitored and regulated by the Energy Services Regulatory Authority (ERSE), could enhance transparency and reliability.

Consumer literacy is another significant barrier. According one expert, many consumers struggle to understand their energy bills, differentiate between suppliers and distributors, and assess supplier proposals. This lack of knowledge hampers their ability to engage effectively in REC projects. There is a pressing need for educational initiatives to improve consumer

understanding across different age groups, thereby facilitating more informed decision-making.

While there have been important strides in digitalisation, such as the implementation of smart meters and data hubs by distributors, more progress is needed. The DGEG is making efforts to improve licensing and registration processes, but these need to be accelerated to reduce administrative barriers. One expert points out that the administrative component, including registration and implementation, remains a significant hurdle. The DGEG aims to have a functional platform by mid-2024, which could streamline these processes.

The market for energy providers is highly competitive, which can be both a strength and a challenge. According to one expert while this competition drives better offers and services, it also complicates the regulatory landscape. The success of energy companies like Greenvolt relies heavily on their ability to attract customers by offering cost-saving solutions. Ensuring regulatory improvements and efficient administrative processes will be crucial to maintaining this competitive edge.

Contracts with E-Redes, particularly for CSC systems using the Public Service Electricity Grid (RESP), are pre-drafted and relatively straightforward to sign. However, another expert notes that the E-Redes portal is not user-friendly, and the contracts are often difficult to read, presenting another layer of complexity. While these contracts are not the primary obstacle, improving their accessibility and comprehensibility would benefit users.

Forming contracts is perceived as one of the easier parts of establishing an EC, especially with the support of one-stop-shops. One expert emphasises the importance of these entities in helping consumers analyse adhesion contracts and navigate potential risks. They can simplify complex relationships and ensure that companies providing these contracts are reliable and financially stable.

Municipalities face additional challenges due to compliance requirements with the CCP. This makes their processes more complex compared to private entities. One expert suggested that simplifying these processes and providing better information could enhance the participation of municipalities in EC projects.

In conclusion, while forming contractual agreements in the Portuguese energy sector has its challenges, particularly regarding clarity, consumer literacy, and administrative processes, there are ongoing efforts to address these issues. Standardising contracts, improving consumer education, accelerating digitalisation, and leveraging one-stop-shops can significantly enhance the ease and reliability of forming agreements with stakeholders, energy suppliers, and grid operators.

Social Barriers

The concept of ECs in Portugal is still in its nascent stages, with varying levels of awareness and support across the country. While there have been some efforts to publicise and promote ECs, significant social barriers persist.

Central and local governments, along with other public organisations, have shown interest in promoting ECs. However, their efforts have not always been effective. According to one of the experts, entities like the DGEG and the ERSE often act as barriers rather than facilitators. Their role should be to create conducive conditions for private initiatives rather than directly managing these projects.

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Another expert highlighted that there is great interest from central and local governments in training and promoting collective self-consumption. Local authorities have significant potential for implementing RECs due to their access to infrastructure like schools and public buildings, which have variable consumption patterns that can benefit from collective self-consumption.

Training and education are crucial for the proliferation of ECs. One expert emphasised the need for increased literacy and knowledge about energy efficiency and management at various educational levels, including secondary schools. Integrating these topics into the curriculum can foster a better understanding of sustainability and energy use from an early age.

Higher education institutions have begun to incorporate related content into their programmes. For instance, the Faculty of Engineering at the University of Porto (FEUP) has been training students in CER projects since 2020, and there have been numerous dissertations and scientific papers on the subject (Expert 1). Additionally, Coopernico and Institute of Management and Public Administration (IGAP) are running courses for municipal technicians to cover various aspects of community energy projects.

Despite these efforts, the diffusion of knowledge and awareness remains limited. One expert noted that there is a lot of confusion between RECs and CSCs, and very few RECs have been legally registered. The lack of widespread training and capacity-building programmes hinders the growth and implementation of these communities.

Knowledge sharing and capacity building are essential to overcoming social barriers. One expert suggested that energy agencies could play a significant role in creating a network for sharing information about RECs. Some municipalities and organisations, like AdEPorto, have established one-stop shops to provide information and support for these initiatives. However, these efforts are still sporadic and not widespread.

Another expert stressed the importance of sharing and information in ensuring an inclusive energy transition. Agencies can help meet the needs of municipalities, but their support is often limited and occasional. For municipalities to transition from energy consumers to providers of green energy services, consistent and comprehensive support is necessary.

In conclusion, while there are some awareness and interest in ECs in Portugal, significant social barriers remain. The central government and other public bodies need to play a more supportive role by facilitating conditions for private initiatives and enhancing educational and training programmes. Knowledge sharing and capacity building through a network of energy agencies and one-stop shops can address many of these barriers, paving the way for a more inclusive and widespread adoption of ECs.

Local Conditions

The establishment of many or large-scale community energy projects in Portugal is technically feasible, provided that the necessary infrastructure and regulatory support are in place. However, several local conditions must be considered to ensure the successful implementation and sustainability of these projects.

Experts agree that the existing grid can accommodate new connections and the increased demand from ECs, though some adjustments and upgrades are necessary. One expert highlights the importance of defining connection percentage limits and ensuring the DSO

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defines the available connection capacity at the distribution network level. Problems such as high voltages from distributed generation need to be addressed through proper voltage regulation.

Another expert emphasised the urgency of reinforcing the grid to meet the demands of electrification, industrial needs, and decentralized production. The grid's capacity to respond to these needs is crucial for the energy transition. This sentiment is echoed by another expert, who notes that the grid must be prepared for distributed generation, a responsibility that lies with E-Redes.

Best practices:

1. REC Miranda do Douro and CER Asprela+Sustentável: These projects have been successful in terms of implementation and community impact.
2. Creche de Bicesse: This project, done with Santa Casa da Misericórdia, provided almost free energy to 15 families and reduced energy costs for the institution by 50%.
3. Industrial Project in Braga (DST): This is a good example of an industrial-scale EC.
4. LIPOR and its Municipalities: This project focuses on sharing surplus energy within municipalities, integrating energy transition with a circular economy approach.

Practices to avoid:

1. Licensing Delays: Some pioneering projects have faced significant delays, with license applications launched in 2021 still awaiting responses from DGEG.
2. DSO Obstacles: Projects in Trás-os-Montes have been fully installed for two years but have not received positive responses from the DSO, leading to abandoned and unused equipment.
3. Incompetent Promoters: There have been cases where promoters failed to deliver on their commitments, leading to community disillusionment and legal disputes. These incidents have significantly tarnished the credibility of ECs.

Experts suggest that it is possible to create a significant number of energy projects on a large scale. One expert recommended starting with virtual ECs that leverage existing individual self-consumption setups and then expanding to physical installations. The scalability of these projects is crucial, as highlighted by another expert, who points out that collective self-consumption inherently supports growth and improved network performance.

However, one of the experts noted that the proximity requirement for REC members limits the size of these projects to the local population. This means that while large-scale projects are technically feasible, their practical implementation will depend on local conditions and population density.

In conclusion, the potential for creating large-scale ECs in Portugal is promising, but it requires a well-prepared grid, regulatory clarity, and serious and capable promoters. Successful examples demonstrate the feasibility and benefits of these projects, while failures highlight the importance of addressing regulatory and operational challenges. With proper planning and support, Portugal can significantly advance its energy transition through the widespread adoption of ECs.

Co-creation day / Workshop summary

In addition to the questionnaire and the interviews, a co-creation workshop was organised to discuss about local conditions and barriers for ECs, focusing on youth ECs.

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Local authorities in Porto have shown varying degrees of support for initiatives promoting renewable energy and community energy projects. Key observations include:

- Policy and Strategic Framework: Porto's local government has developed policies and strategic plans aimed at increasing renewable energy adoption and promoting sustainability, such as the Municipal Climate Change Adaptation Strategy[27] (*Estratégia Municipal de Adaptação às Alterações Climáticas*, 2016), Porto Climate Pact[28] (*Pacto do Porto para o Clima*, a commitment signed by local stakeholders to fight climate change and reach climate neutrality), Porto's Municipal Climate Change Adaptation Plan[29] (*Plano Municipal de Ação Climática,* 2025), and Porto's Climate City Contract[30] (2024).
- Collaborative and R&I Projects: There are instances of the local authorities collaborating with private and public sectors to support renewable energy projects, reflecting a willingness to engage with community energy initiatives (e.g. Asprela+Sustentável, ASCEND).

Porto's municipal government could eventually enact specific policies or bylaws that allow RECs to lease or purchase public land for renewable energy projects. Launching public tenders or other similar procedures that include criteria for youth participation could incentivise the creation of youth-led ECs, ensuring young people are integral to renewable energy initiatives. This hasn't been done exactly but several energy education activities for youngsters have been implemented (e.g., At the speed of the sun initiative, Education Program for Sustainability)

The local authorities in Porto are willing to provide incentives for setting up Renewable ECs, recognising their importance in achieving sustainability and engaging the youth. Besides educational programmes, and supportive policies mentioned above, financial incentives are among the measures are already in place to promote these initiatives. For instance, the installation of PV panels in residential, commercial and industrial buildings in the city of Porto, with renewable energy production units for self-consumption (individual or collective) and renewable ECs, will now benefit from a reduction in the municipal property tax (IMI) for at least three years.

Additionally, alternative financing mechanisms like crowdfunding, cooperative models, and public-private partnerships are viable in Porto's socio-economic landscape.

The municipality of Porto is supportive of Renewable ECs and is willing to allocate space for community energy projects, such as solar panels, namely in public facilities and other municipal buildings and social housing neighbourhoods.

Additionally, the municipality offers substantial non-legal and non-financial support, including technical assistance, capacity building, awareness campaigns, partnership facilitation, and administrative support, partnering up with Porto Energy Agency and Águas e Energia do Porto. A good example is the Porto Energy Hub. The Porto Energy Hub was created as part of the Porto Energy Elevator (PEER) project, which was funded by the European Commission (EC) under the Horizon 2020. The aim of the project was to remove barriers to energy efficiency.

[27] https://ambiente.cm-porto.pt/files/uploads/cms/1599064372-nVMQOn04Ez.pdf
[28] https://pactoparaoclima.portodigital.pt/
[29] https://ambiente.cm-porto.pt/files/uploads/cms/PMAC%20Porto_%20vers%C3%A3o%20para%20discuss%C3%A3o%20p%C3%BAblica.pdf
[30] https://netzerocities.app/resource-4452

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The Porto Energy Hub (PEH) supports energy efficiency and renewable energy projects in the northern region. These projects will help to reduce energy poverty and improve living conditions (comfort and health). The PEH initially focused on the Porto Metropolitan Area north of the River Douro and intends to extend its support to the entire Northern Region and other territories wishing to benefit from this approach.

The PEH functions as a one-stop shop for integrated services that will support the implementation of energy efficiency measures by helping to identify business models, the financing to be used and contractual models. Its objective is to provide support for energy efficiency and renewable energy projects, with the aim of alleviating energy poverty and improving living conditions (comfort and health) in the northern region.

Maintaining public trust is crucial. The municipality ensures transparency about data collection practices and provides assurances that data is used responsibly and securely.

To raise awareness regarding ECs in Porto effectively, a multifaceted approach that includes public education campaigns, workshops, school programmes, community events, and partnerships with local organisations is recommended. The local authorities have already initiated various awareness activities and are committed to expanding their efforts to ensure broader community understanding and participation in energy matters and RECs (see examples above).

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4. Barriers and local conditions

4.1. EU Level

4.1.1. Legal and regulatory research (local conditions and barriers)

Since 2018, the EU has developed a comprehensive legal framework to support ECs, collective energy actions, and renewable energy development. The objective of this framework is to facilitate the transition to a sustainable energy system by empowering citizens, local authorities, and businesses to participate actively in energy generation, consumption, and management.

The Clean Energy for All Europeans package[31], which was adopted in 2019, introduced the concept of ECs into EU legislation. These communities may be CECs or RECs. The Directive concerning common rules for the internal market in electricity [Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU (recast)][32] aims to support the adoption of ECs. The legislation introduced new rules to facilitate the active participation of consumers, individually or through citizen ECs, in all markets. This includes the generation, consumption, sharing or sale of electricity, as well as the provision of flexibility services through demand response and storage. The Renewable Energy Directive [Directive (EU) 2023/2413 of the European Parliament and of the Council of 18 October 2023 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652][33] reinforces the role of self-consumers of renewable energy and RECs. EU countries are encouraged to facilitate this through the implementation of available support schemes, ensuring that ECs are able to participate equally with larger participants. The Electricity Market Regulation is designed to foster the integration and competitiveness of the EU's electricity market, ensuring that ECs and small-scale generators can participate without undue barriers. Furthermore, it supports mechanisms that enable ECs to contribute to grid stability and flexibility through demand response and energy storage. The Governance Regulation also emphasises the important role of ECs in achieving the EU's energy and climate objectives by increasing local energy production and community participation in the energy transition.

The formation of ECs facilitates collective and citizen-led energy actions, with the objective of supporting the transition to clean energy. Such initiatives can contribute to enhancing public acceptance of renewable energy projects and facilitating the attraction of private investment in the clean energy transition.

In accordance with EU legislation, ECs may assume any legal form, including that of an association, a cooperative, a partnership, a company, a non-profit organisation or a limited liability company. This enables collaboration and joint investment in energy assets by its citizens and other market participants. This, in turn, contributes to the development of a more decarbonised and flexible energy system, as ECs can act as one entity and have access to all appropriate energy markets on a level playing field with other market players.

[31] https://commission.europa.eu/news-and-media/news/clean-energy-all-europeans-package-completed-good-consumers-good-growth-and-jobs-and-good-planet-2019-05-22_en
[32] https://eur-lex.europa.eu/eli/dir/2019/944/oj/eng
[33] https://eur-lex.europa.eu/eli/dir/2023/2413/oj

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The EU legislative framework for ECs acknowledges the significance of inclusivity and citizen participation. The Renewable Energy Directive (RED II) promotes the concept of RECs, which are designed to be inclusive and open to all potential members, including young people. It also encourages member states to promote awareness and understanding of renewable energy among all citizens, which includes the implementation of educational campaigns and the dissemination of information that can be targeted towards younger demographics. The Electricity Market Directive encourages the inclusion of new entrants in the energy market, can be attractive avenues for young entrepreneurs and innovators to contribute to and lead community energy projects. Moreover, the EU Youth Strategy 2019-2027[34] supports initiatives that empower young people to engage in sustainable development and community energy projects.

The EU's legislative framework provides a robust framework for the development of ECs and collective energy actions as key elements of its renewable energy strategy. This legislative approach reflects a commitment to not only meet ambitious renewable energy targets but also to ensure that the benefits of the energy transition are widely shared and that citizens have an active role in shaping their energy future. Although there are no specific EU legislative provisions that are solely dedicated to the participation of young people in ECs, the overarching framework provides substantial opportunities for youth engagement. The EU's directives and regulations, which promote inclusivity, education, and active participation, encourage young people to become integral parts of ECs. The emphasis on public engagement, educational initiatives, and the advancement of local energy projects fosters a conducive atmosphere for young people to contribute to and benefit from the energy transition.

4.1.2. Financial and market design barriers

In theory, there are many EU funds for which ECs could be eligible, but whether ECs can actually access them remains uncertain. In practice, few member states have used EU funds to develop specific support schemes for ECs.

Given the many competing energy-climate priorities and the lack of human resources and expertise within ECs to respond to calls, the lack of national earmarking of EU funds for ECs is a real barrier. When dedicated funding is available, it is often insufficient in comparison to the potential of ECs to unlock private capital and general local revenue. Alongside financial support, access to technical assistance is crucial for ECs.

At the EU level, this is already being addressed through the EC Repository, the Rural EC Advisory Hub, and new initiatives such as Citizen-Led Renovation (which directly targets ECs), as well as the European Energy Poverty Advisory Hub and the EU Technical Support Instrument (which target local and national governments). Indicative examples of some financial mechanisms are:

- European Investment Bank (EIB): EIB provides financial assistance for large-scale energy projects, including community energy initiatives. Indicatively, the support could be loans and advisory services to help with project development and implementation.

[34] https://eur-lex.europa.eu/EN/legal-content/summary/eu-youth-strategy-2019-2027.html

- European Regional Development Fund (ERDF): ERDF allocates funds specifically for low-carbon projects. ECs can apply for these funds to support renewable energy and energy efficiency projects.
- Horizon Europe/LIFE Programme: These funding mechanisms provide grants for projects that contribute to environmental protection, including renewable energy initiatives driven by ECs and research projects on renewable technologies, energy efficiency, and community-led energy projects.
- InvestEU Programme: It provides significant opportunities for ECs to access funding for projects that align with the EU's policy goals in sustainable energy, innovation, and social inclusion.
- Just Transition Fund: This mechanism provides financial support to regions transitioning from fossil fuels to greener energy sources, which can include ECs aiming to create local jobs and sustainable energy sources.

Crowdfunding and crowdlending have emerged as significant financial instruments for community energy projects across Europe. These methods enable local communities to raise funds directly from individuals who are interested in supporting renewable energy initiatives. The trend has grown due to the increasing awareness of sustainability issues and the desire for community-driven solutions to energy production. These models democratise funding by allowing individuals to invest in projects that align with their values, often with lower entry barriers compared to traditional investment mechanisms. Energy projects that might struggle to secure traditional funding can access new sources of capital through crowdfunding platforms.

The main challenges with this type of funding are the regulatory barriers, as the regulations vary across different countries and can make cross-border investments complicated and the risk that these projects are associated with, such as the project failure or lower-than-expected returns.

4.1.3. Contractual conditions

Creating and implementing ECs involves establishing contractual relationships both between the community and its members and between various stakeholders involved in community energy projects, including utilities and energy service companies (ESCOs). These contracts are crucial for defining rights, responsibilities, financial obligations, and operational procedures, ensuring clarity, transparency, and legal protection for all parties involved.

The main characteristics of the contractual relationship between the community and its members include membership criteria and rights, financial contributions and obligations, governance and decision-making, legal and regulatory compliance, protection of personal data, financial transparency and accountability, exit and dissolution clauses. The aim is to promote community involvement in renewable energy projects while ensuring legal clarity, transparency, and protection for all members, including young people who may be new to such contractual arrangements.

At EU level there are two types of ECs; CECs and RECs. Their primary purpose is to provide environmental, economic or social community benefits for its shareholders or members or for the local areas where it operates, rather than financial profits.

The Citizen ECs are legal entities, based on voluntary and open participation, effectively controlled by shareholders or members who are natural persons, local authorities, including

municipalities, or small enterprises, and micro-enterprises. The CECs can be engaged in electricity generation, distribution and supply, consumption, aggregation, storage or energy efficiency services, generation of renewable electricity, charging services for electric vehicles or provide other energy services to its shareholders or members.

The Renewable ECs are legal entities that, in accordance with the applicable national law, are based on open and voluntary participation, autonomous, effectively controlled by shareholders or members that are located in the proximity of the renewable energy projects that are owned and developed by that legal entity. The shareholders or members of these communities can be natural persons, SMEs or local authorities, including municipalities. The RECs can engage in activities based on renewable energy sources, including generation, energy efficiency, supply, aggregation, mobility, energy sharing, self-consumption, and district heating and cooling.

RED II encourages member states to establish clear rules on the membership of ECs and their governance structures. This includes defining membership criteria, rights, and responsibilities, emphasising on transparency and fair participation in decision-making processes. EMD promotes non-discriminatory access to the electricity market for community energy projects, ensuring they have fair opportunities to sell their electricity production and includes provisions to protect consumers' rights, which are relevant when community members consume or sell electricity within the community framework.

EMD establishes rules for contractual agreements between electricity market participants, ensuring transparency and fair competition. At the same time, protects consumer rights and ensures that consumers have access to clear information regarding energy contracts, prices, and terms. RED II provides guidelines on the contractual framework for renewable energy projects, including obligations and benefits for involved parties.

In line with Article 6 of the Electricity Directive [Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU (recast)][35], all users of the electricity system are entitled to request a connection and to conclude a contract regarding transport capacity. This rule establishes the right of European citizens and businesses to non-discriminatory access to electricity networks. Grid operators may only refuse access if they lack the necessary capacity. In EU member states, the European right of access to networks has been largely defined through connection and transport rights for users. The right to a connection ensures that system users are connected to the network in an equitable manner and within a reasonable timeframe. The right for transport provides for an impartial right to transport for all system users unless there is no transport capacity available.

EU directives are implemented into national legislation by member states, allowing flexibility in adapting specific contractual provisions to local contexts while maintaining alignment with EU principles. This is the reason why specific details and implementation may vary across member states.

4.1.4. Warranty, safety and data security information

While EU legislation does not have specific directives solely dedicated to warranty and safety provisions for community energy projects, the consumer protection laws, health and safety

[35] http://data.europa.eu/eli/dir/2019/944/oj

regulations, and grid connection standards that collectively ensure the reliability, safety, and operational integrity of community energy installations across Europe.

The specific safety instructions for the installations and use of equipment, the accountability lies with the equipment manufacturers. The same can be said of the guarantee of equipment.

Regarding the collection of energy consumption data, it can be stated that the same principles apply at a national and European levels. However, it should be noted that data collection is always subject to the European Data Protection Law known as EU Regulation 2016/679[36] (General Data Protection Regulation - GDPR). GDPR ensures that personal data collected from members of ECs is handled securely and with transparency. ECs and ESCOs must comply with GDPR when managing member data, ensuring privacy rights are respected.

The objective of data collection is to enable the measurement of the final energy consumed and produced by renewable energy sources. Nevertheless, the fundamental objective is to measure the energy produced and consumed by ECs to provide more detailed information in a database that any potential EC can access.

4.2. AUSTRIA CONTEXT

4.2.1. Introduction

Amidst a growing awareness of environmental conservation and sustainable energy sources, interest in ECs in Austria is on the rise. These communities not only offer the opportunity for local energy generation but also promote self-responsibility and communal exchange. In 2019, the European Union introduced a comprehensive update to its energy policy framework aimed at facilitating a sustainable energy transition. This new set of regulations is known as the Clean Energy Package for all Europeans (CEP) (European Commission, 2019). As of July 28, 2021, the Renewable Energy Expansion Act[37] (*"Erneuerbaren-Ausbau-Gesetz"* – EAG) came into force in Austria, which also regulates the establishment of ECs (Austrian Parliament, 2021). Additional framework conditions for ECs are defined by the Electricity Sector Act 2010[38] (*"Elektrizitätswirtschafts- und –organisationsgesetz 2010"* – ElWOG 2010). From now on, energy consumers can act as active participants ("prosumers") in the energy transition. Since the enactment of the legal provisions in, they can proactively engage in this transformation through ECs.

4.2.2. Legal and regulatory research

In Austria, energy legislation has undergone significant developments, particularly in response to EU directives such as the Renewable Energy Directive[39] (RED II) and the Electricity Market Directive[40] (EMD). The legislator has established robust regulatory frameworks overseen by "Energie Control Austria" (E-Control), ensuring compliance with European standards and promoting competition within the electricity market. The E-Control Act[41] (*"Energie-Control-Gesetz"* - E-ControlG) solidifies E-Control's authority as the main regulatory body in Austria.

[36] https://www.consilium.europa.eu/en/policies/data-protection-regulation/
[37] https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20011619
[38] https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20007045
[39] http://data.europa.eu/eli/dir/2018/2001/2024-07-16
[40] http://data.europa.eu/eli/dir/2024/1711/oj
[41] https://ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20007046

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Amendments to EAG and the ElWOG 2010 have facilitated the establishment of RECs and CECs since July 2021. These legislative changes aim to incentivise collective generation and promote community involvement in renewable energy projects. Additionally, the System Charges Ordinance outlines grid charge reductions for RECs, further encouraging their formation and operation (SHAREs, 2022a).

Austria's legal framework allows for the formation of ECs in various legal structures, from associations to cooperatives or corporations, promoting inclusivity and flexibility. Furthermore, the establishment of a Coordination Office for ECs and funding programs from the Austrian Federal Climate and Energy Fund demonstrate the government's commitment to supporting community energy initiatives and fostering their development.

According to a recent report on the barriers and enablers for ECs identifies several regulatory barriers and policy inconsistencies hinder the widespread adoption of RECs and CECs in Austria. Firstly, incomplete IT processes on the grid operator's side impede the assignment of participants to multiple generation plants within RECs, delaying their full operation. Additionally, while the installation of smart meters is regulated, the lack of guidelines for their activation delays the involvement of consumers in ECs. Furthermore, the absence of professional communication materials limits consumer engagement in established RECs. Moreover, restrictions on the subsidy of generated green electricity to 50% under the market premium scheme may deter EC formation. Lastly, complexities in understanding regulatory frameworks and network area information act as barriers to entry for potential participants (SHAREs, 2022b).

Addressing these barriers requires comprehensive policy adjustments, improved communication strategies, streamlined processes to facilitate consumer involvement, and reduced costs to promote the growth of ECs in Austria. Overall, Austria's legislation reflects a proactive approach to promoting renewable energy and community participation in the energy transition.

4.2.3. Financial and market design barriers

ECs in Austria may have access to various funding sources, including government grants, subsidies, and financing programs aimed at supporting renewable energy projects. Currently the Austrian government and regional authorities provide financial support to promote the development of renewable energy and energy efficiency initiatives (Austrian Administration, 2024). But these funding programs are only targeted towards concrete, implementable ECs with an innovative character that go beyond the current standard of ECs (e.g. “billing for a generation facility within the community”) and therefore require increased planning efforts (Kommunalkredit Public Consulting, 2023).

In general ECs have opportunities to participate in the Austrian energy market, particularly through feed-in tariffs, net metering schemes, and participation in local energy markets (Austrian coordination office for ECs, 2024b).

The cost of renewable energy technologies, including PV systems, has been decreasing steadily in Austria and the rest of the world due to technological advancements and economies of scale. However, upfront investment costs can still be a barrier for some ECs, particularly those with limited access to financing or economies of scale (Wien Energie, 2024).

The Austrian state offers various financial incentives. These include feed-in tariffs, investment subsidies, tax credits, and low-interest loans. Additionally, ECs may benefit from community

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funding programs and support from local governments or utilities. Based on the Eco-social Tax Reform Act 2022 Part I[42] (*"Ökosoziales Steuerreformgesetz 2022 Teil I"* – ÖkoStRefG 2022 Teil I), an amendment to the Electricity Levy Act[43] (*"Elektrizitätsabgabegesetz"* – ElAbgG) would be established. In general, the ElAbgG regulates electricity levies on the supply and consumption of electrical energy. The amendment introduced the requirement for renewable electricity generated in "communal generation plants" or RECs were produced and consumed within the same EC, the electricity tax applies to this amount of electricity (§ 2 Para. 1 ElAbgG).

Regarding the discounts, the electricity levy (only for renewable energy production) and the network usage fees are waived for electricity generated and consumed within the community in "community generation plants" (since the use of the network operators' network systems is excluded under this concept). RECs do not have to pay the renewable subsidy, the electricity tax and, to a certain percentage, the network usage fees. However, there are no reductions in this regard for CECs. The work prices for the network usage fee are calculated for participating network users of a REC in relation to the consumption that is due to the allocated energy fed into a generation plant in accordance with Section 16c ElWOG 2010. In the local area for network levels 6 and 7 it is by 57%, in the regional area it is reduced by 28% for network levels 6 and 7, and by 64% for network levels 4 and 5. These reductions are defined by Section 5 Paragraph 1a System Usage Charges Regulation 2018[44] (*"Systemnutzungsentgelte-Verordnung 2018"* – SNE-V 2018).

Market design constraints in Austria may include regulatory barriers, grid connection challenges, and limitations in market structures that affect the participation of ECs. Addressing these constraints often requires regulatory reforms, infrastructure investments, and stakeholder engagement to create a more conducive environment for EC development. Also setting up an EC can be very complex for someone new to this field, since there are different specialities, one must dive in. Additionally, there are many stakeholders involved in the development and implementation of the community.

In general, crowdfunding is a possibility for financing ECs in Austria. For example, the OurPower energy was financed through crowdfunding, and we are working on a service to offer crowdfunding of commonly owned PV panels on our platforms. Despite the possibility to use it, we do not see crowdfunding as a wide-spread practice of financing citizen-energy projects.

4.2.4. Contractual conditions

The implementation of ECs according to Austrian law requires contracts between several parties (Austrian coordination office for ECs, 2024c):

- Document of foundation: To set up an EC in Austria a legal entity is required for most instances. Depending on the legal form chosen statutes or other founding agreements are necessary.
- DSO: After the legal entity of the EC is established, it has to register with the DSO. The contract with the DSO establishes the technical foundation for energy sharing through the grid. Supplementary agreements to the existing network access contract between individual participants and the DSO need to be made where necessary.

[42] https://www.ris.bka.gv.at/eli/bgbl/I/2022/10/20220214
[43] https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=10005027
[44] https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20010107

- Participants of the EC: For participation in an EC the participants need to become a member. In the membership agreement conditions, rights and obligations are determined.
- Energy supplier: All participants need to have a contract with a traditional energy supplier to secure full coverage of demand when the EC cannot meet the demand of its participants. Likewise, all energy producing participants must have a feed-in contract for excess energy supply. If the EC itself operates powerplants, it needs to have a feed-in contract with the energy supplier.

In addition to the listed contracts, many others can be necessary given the specific resources and scale of the EC. For example, a service provider may be used for billing, rental or lease agreements can be established or financial services used. (Austrian coordination office for ECs, 2024c)

Regarding young people, it has to be considered that they need to have legal capacity to enter into these types of contracts. ECs can determine on their own in their respective statutes if they want to implement any specific regulations, benefits etc. for younger people. From the legal/state side, there are no requirements for ECs to be more inclusive or accessible for young people.

4.2.5. Warranty, safety and data security info

Warranties and safeties are agreed in accordance with the current Austrian law for ECs and are individually resolved with the various participants on a case-by-case basis.

Warranties provided for equipment or installations used in energy projects may cover aspects such as the duration of the warranty, what is covered (e.g., equipment defects, performance issues), and procedures for making warranty claims. Safety involves measures taken to ensure the safety of individuals and property associated with energy projects. It encompasses safety protocols, emergency response plans, and measures to mitigate risks such as accidents or environmental hazards. Safety considerations are crucial for both the construction and operation phases of energy installations and are also considered under current Austrian law.

In operating an EC, data exchange between participants and the operator is necessary, for instance, for billing traded or generated energy or for controlling flexible consumers. Whether this exchange is required during operation or can be based on periodic meter readings depends on the purpose of the EC and the requirements of the participants (Austrian coordination office for ECs, 2024a). Provisions for measurement and billing are set out in Section 16e of the ElWOG 2010. It is sometimes described here that the measured quarter-hour values of the participating generation systems and consumption systems must be transmitted to the ECs by the network operators (§ 16e Para. 1 ElWOG 2010). These quarter-hour values should be made available via a web portal. In Austria, the data is made available via the EDA user portal (ebUtilities.at as the associated information platform).

The Austrian coordination office for ECs states that for all communication systems, it's crucial to consider multiple factors for their security (2024a). The international standard IEC 62351 outlines how cybersecurity should be addressed in the realm of energy management systems, including within the domain of ECs. If an EC system meets all the requirements described in this standard, it can be assumed to be adequately secure against current threats such as theft

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of personal data or network attacks that could disrupt the operation of the EC (Austrian coordination office for ECs, 2024a).

In summary, ensuring warranty coverage, implementing robust safety measures, and maintaining stringent data security protocols are essential components of energy projects in Austria. Compliance with regulations, particularly GDPR, is critical for protecting sensitive data and maintaining trust with stakeholders.

4.2.6. Social barriers

Demographics play a significant role in shaping EC membership. The predominant age group within ECs tends to be individuals aged 40 and above, with a conspicuous absence of younger members. Moreover, gender imbalances are evident, with men overrepresented both among current members and founding members (based on internal data analysis & Friederichsen (2023)). This disparity highlights a lack of inclusivity within ECs, contradicting the notion of being "open for everybody" (Lazoroska et al., 2021).

Awareness and education also pose barriers to broader participation. A survey from Friederichsen (2023) indicates that members primarily hold educational backgrounds in vocational secondary and higher schools, with limited representation from other educational levels. This suggests a potential gap in reaching individuals with diverse educational backgrounds who may contribute valuable perspectives to ECs and confirms findings from other countries such as Germany (Radtke & Ohlhorst, 2021).

Community dynamics further influence participation. The concentration of power and responsibility in a few individuals raises concerns about inclusivity and democratic decision-making processes. The reliance on a single person or a small group to manage ECs may lead to exclusivity and hinder the engagement of marginalised groups. Social networks play a crucial role in information dissemination and participation within ECs. On the flipside, the reliance on informal networks may inadvertently exclude individuals who lack such connections (Szulecki & Overland, 2020; Wahlund & Palm, 2022).

Young people, in particular, face significant barriers to participation within ECs. The absence of members younger than 30 suggests a disconnect between EC initiatives and younger demographics (Friederichsen, 2023). Efforts to engage young people should consider their unique perspectives, preferences, and communication channels.

Addressing these social barriers requires proactive measures to enhance inclusivity, awareness, and community engagement within ECs. Initiatives such as targeted outreach campaigns, educational programs, and diversification of leadership roles can foster a more inclusive and participatory environment. By addressing these social barriers, ECs can better fulfil their potential as drivers of sustainable energy transition and community empowerment.

4.2.7. Local Conditions

Austria’s geographical location influences factors such as solar radiation, wind patterns, and topographical features. The topography is characterised mountainous regions, valleys, plains, and lakes. Austria has a temperate continental climate with four distinct seasons. Climate conditions vary across the country, with alpine regions experiencing colder temperatures and higher precipitation compared to lowland areas. Understanding climate patterns is important

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for assessing the potential of solar, wind, and biomass resources for energy generation. Austria benefits from a robust network of geographical and environmental data sources, including government agencies, research institutions, and international organisations. These data sources provide valuable information on factors such as land use, land cover, elevation, climate, and renewable energy potential, which are essential for planning and decision-making in energy projects.

ECs have been able to be founded in Austria for 2.5 years. More than 1,000 ECs are currently in operation. This number splits up on the three possibilities to participate in an EC (Klima und Energie Fonds, 2024). Community generation facilities: around 1,720 participants; ECs: around 1,180 participants; and CECs around150 participants (data retrieved on 29/02/2024).

The 2030 target of 100% renewable electricity in Austria entails an increase of +27 TWh, with contributions from various sources: +11 TWh from PV, +10 TWh from wind, +1 TWh from biomass, and +5 TWh from hydropower (Neyer, 2024). The "Integrated Austrian Grid Infrastructure Plan" sees the following potentials for renewable energy electricity generation: entails an increase of +39 TWh, with contributions from various sources: +19 TWh from PV, +14 TWh from wind, +1 TWh from biomass, and +5 TWh from hydropower (Neyer, 2024).

Energy savings and increased self-production result in significant reductions in energy consumption (on an annual basis). There is an increasing trend towards decentralised feed-in and local storage, allowing for greater flexibility in energy distribution. This shift enables communities to generate and store their own energy, reducing reliance on centralised power sources (Emberger, 2024). Both supply and demand-side flexibility are becoming more prevalent. This means that not only are renewable energy sources like solar and wind being integrated into the grid, but consumers are also adjusting their energy consumption patterns to better align with renewable energy availability. The ongoing rollout of Smart Meters plays a crucial role in this transition. These advanced metering systems provide real-time data on energy consumption, enabling more efficient energy management and optimization of renewable energy usage (Emberger, 2024).

4.3. GREECE CONTEXT

4.3.1. Introduction

Despite the establishment of numerous ECs in Greece following the introduction of relevant legislation in 2018, only a small number of these have become operational and are currently undertaking community energy projects. To date, there are no youth-focused ECs in the country.

Although progress has been made, significant challenges have been encountered due to administrative hurdles, a lack of available funding and competition with private investors. The recent legislative changes have further complicated the legal framework associated with ECs, which hinders the growth of such initiatives, especially the youth ECs.

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4.3.2. Legal and regulatory research

The concept of ECs was first introduced to the national legislation with the enactment of Law 4513/2018[45] (FEK A 9/23.01.2018 *"Ενεργειακές Κοινότητες και άλλες διατάξεις"*). The legislation included specific provisions for island regions that are not connected to the mainland, as well as measures for net metering and virtual net metering. Furthermore, the legislation addressed the role of local authorities in ECs. A particular focus was placed on the lignite regions, which must transition to a more sustainable energy model and ensure a fair energy transition, given that local communities are financially dependent on the energy sector (The Green Tank, 2023). Two distinct types of EC were established: profit and non-profit ECs. This legislation was in alignment with the National Energy and Climate Plan (NECP), which was introduced in 2019.

The Law 4513/2018[46] preceded the European Directives, thus necessitating an update. In 2023, Law 5037/2023[47] (FEK A 78/28.03.2023 *"Μετονομασία της Ρυθμιστικής Αρχής Ενέργειας σε Ρυθμιστική Αρχή Αποβλήτων, Ενέργειας και Υδάτων και διεύρυνση του αντικειμένου της με αρμοδιότητες επί των υπηρεσιών ύδατος και της διαχείρισης αστικών αποβλήτων, ενίσχυση της υδατικής πολιτικής -Εκσυγχρονισμός της νομοθεσίας για τη χρήση και παραγωγή ηλεκτρικής ενέργειας από ανανεώσιμες πηγές μέσω της ενσωμάτωσης των Οδηγιών ΕΕ 2018/2001 και 2019/944 - Ειδικότερες διατάξεις για τις ανανεώσιμες πηγές ενέργειες και την προστασία του περιβάλλοντος"*) amended the preceding legislation and introduced the definitions of the REC and the CEC. This legislation is in alignment with the EU Directives and the Clean Energy for All Europeans Package. Based on the new legislation ECs are civil cooperatives:

i. based on voluntary and open participation and under the effective control of its members, who are natural persons, local authorities, and enterprises that are one hundred percent (100%) owned by first or second-degree local authorities, or small enterprises,
ii. with the primary purpose of providing environmental, economic and social benefit, not financial gain, at community level for its members or local areas of operation.

The main alterations introduced by the new legislation concerns definitions, minimum number of members, activities, area of operation, new provisions for self-production, participation of enterprises, locality and proximity, surplus use, available network and available resources.

At this point it is important to note that, for the time being, all three definitions of ECs coexist, while the transition regime of the ECs established by the Law 4513/2018[48] to those provided for in the Law 5037/2023[49] (RECs/CECs) it remains unclear.

In addition, there are some complementary laws that specify the provisions concerning the establishment and operation of ECs:

- Law 4821/2021[50] (FEK A 134/31.07.2021 *"Εκσυγχρονισμός του Ελληνικού Κτηματολογίου, νέες ψηφιακές υπηρεσίες και ενίσχυση της ψηφιακής διακυβέρνησης και άλλες διατάξεις"*): Indicatively, there is a provision for the exemption of small PV power plants from competitive procedures, providing the

[45] FEK A 9/23.01.2018
[46] FEK A 9/23.01.2018
[47] FEK A 78/28.03.2023
[48] FEK A 9/23.01.2018
[49] FEK A 78/28.03.2023
[50] FEK A 134/31.07.2021

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possibility for natural or legal persons to install PV systems up to 500 KW, under specific conditions.

- Law 4843/2021[51] (FEK A 193/20.10.2021 *"Ενσωμάτωση της Οδηγίας (ΕΕ) 2018/2002 του Ευρωπαϊκού Κοινοβουλίου και του Συμβουλίου της 11ης Δεκεμβρίου 2018 «σχετικά με την τροποποίηση της Οδηγίας 2012/27/ΕΕ για την ενεργειακή απόδοση», προσαρμογή στον Κανονισμό 2018/1999/ΕΕ του Ευρωπαϊκού Κοινοβουλίου και του Συμβουλίου της 11ης Δεκεμβρίου 2018 σχετικά με τη διακυβέρνηση της Ενεργειακής Ένωσης και της Δράσης για το Κλίμα και στον κατ' εξουσιοδότηση Κανονισμό 2019/826/ΕΕ της Επιτροπής, της 4ης Μαρτίου 2019, «για την τροποποίηση των Παραρτημάτων VIII και IX της Οδηγίας 2012/27/ΕΕ του Ευρωπαϊκού Κοινοβουλίου και του Συμβουλίου σχετικά με το περιεχόμενο των περιεκτικών αξιολογήσεων του δυναμικού αποδοτικής θέρμανσης και ψύξης» και συναφείς ρυθμίσεις για την ενεργειακή απόδοση στον κτιριακό τομέα, καθώς και την ενίσχυση των Ανανεώσιμων Πηγών Ενέργειας και του ανταγωνισμού στην αγορά ηλεκτρικής ενέργειας, και άλλες επείγουσες διατάξεις"*): Indicatively, there is a provision for the increase of the capacity limit for virtual energy clearing stations from ECs.
- Law 5106/2024[52] (FEK A 63/01.05.2024 *"Ρυθμίσεις για την αντιμετώπιση των πολυεπίπεδων επιπτώσεων της κλιματικής αλλαγής στους τομείς: α) της διαχείρισης υδάτων, β) της διαχείρισης και προστασίας των δασών, γ) της αστικής ανθεκτικότητας και πολιτικής, δ) της καταπολέμησης της αυθαίρετης δόμησης, ε) της ενεργειακής ασφάλειας και άλλες επείγουσες διατάξεις"*) includes specifications regarding self-production. It foresees a restriction of net metering, and specifically for the largest number of households, and all businesses and ECs will deploy self-consumption systems only through net billing or without grid injection.

The legislative frameworks in question are designed to facilitate the growth of ECs in Greece, with the intention of ensuring that they play a vital role in the country's energy transition and compliance with EU legislation, while simultaneously addressing social and economic goals. Despite the supportive intentions of the aforementioned frameworks, the complex and fragmented regulatory environment has posed significant challenges for ECs, including high administrative costs and difficulties accessing financing and information. To address these challenges and ensure that these communities can effectively compete and contribute to the national energy landscape, ongoing adjustments and support are needed.

4.3.3. Financial and market design barriers

From 2018, that the concept of ECs was introduced into the legislation, the Greek state, from national or European funds, provided funding for the formation of ECs and implementation of community energy projects. These are often co-financed by the EU, such as the National Strategic Reference Framework (NSRF), the European Regional Development Fund (ERDF), Horizon 2020 and the Just Transition Mechanism.

The Green Fund is an autonomous entity established by the Ministry of Environment and Development for the purpose of financing sustainable projects. It has become a prominent funding body over recent years, providing support for a wide range of initiatives related to sustainability and energy. It also provides funding especially for the territories in transition

[51] FEK A 193/20.10.2021
[52] FEK A 63/01.05.2024

from fossil fuel to renewable energy. In addition, the Greek Ministry of Finance, through the Special Unit for a Just Development Transition, has published at the end of 2023 a funding programme entitled "Support to ECs for the Development of Self-Generation Activities (ECs)", which concerns the Just Transition areas and three additional regions of the country.

Another source of funding for community energy projects is the Development Law 4887/2022[53] (FEK 16/A/4-2-2022 *"Αναπτυξιακός Νόμος - Ελλάδα Ισχυρή Ανάπτυξη"*). The various types of assistance mainly include grants, tax exemptions and subsidies for the cost of the employment created. ECs as legal entities can submit investment projects for energy production from renewable sources for the development of local energy projects.

In 2023, the Greek Ministry of Environment and Energy issued a public call for its EUR 238 million subsidy programme for rooftop photovoltaics[54] (Ministerial Decision ΥΠΕΝ/ΥΔΕΝ/47129/720). This programme concerns the installation of photovoltaic systems with a storage system in households and the installation of photovoltaic systems with or without a storage system for self-consumption with the application of virtual net metering by farmers. The subsidy of the PV system reaches 75% for households and 60% for farmers, while the subsidy of the battery is from 90% to 100%.

Bank loans represent another potential source of funding, although at the moment it is quite challenging for an EC, especially those led by citizens, to obtain financing for virtual net metering projects. This represents a significant barrier, as it deprives local communities of the opportunity to access these resources and support their projects. Crowdfunding and crowdlending, as a funding source for community energy projects, is not widespread in Greece.

In the aforementioned financial sources, unfortunately there are no financial incentives provided by the state or local authorities to encourage youth participation in ECs.

The access to the Market and the grid is specified by the legislative framework and refers to the ability of ECs to participate in the electricity market either as producers (through the sale of electricity) or as self-consumers (using the energy they produce). With the Law 4685/2020[55] (FEK A 92/07.05.2020 *"Εκσυγχρονισμός περιβαλλοντικής νομοθεσίας, ενσωμάτωση στην ελληνική νομοθεσία των Οδηγιών 2018/844 και 2019/692 του Ευρωπαϊκού Κοινοβουλίου και του Συμβουλίου και λοιπές διατάξεις"*) was established the first phase of re-simplification of licensing procedures for photovoltaics and with the Law 4951/2022[56] (FEK A 129/04.07.2022 *"Εκσυγχρονισμός της αδειοδοτικής διαδικασίας Ανανεώσιμων Πηγών Ενέργειας - Β' φάση, Αδειοδότηση παραγωγής και αποθήκευσης ηλεκτρικής ενέργειας, πλαίσιο ανάπτυξης Πιλοτικών Θαλάσσιων Πλωτών Φωτοβολταϊκών Σταθμών και ειδικότερες διατάξεις για την ενέργεια και την προστασία του περιβάλλοντος"*) was established the second phase simplification of licensing procedures for PVs and the and the regulatory framework for energy storage was also clarified. The increasing demand for renewable energy in Greece and ambitious NECP targets require significant grid upgrades to handle the growing RES capacity and ensure stability.

[53] FEK 16/A/4-2-2022
[54] Ministerial Decision FEK B 2903/02.05.2023
[55] FEK A 92/07.05.2020
[56] FEK A 129/04.07.2022

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4.3.4. Contractual conditions

Creating and implementing ECs in Greece requires a clear understanding of regulatory frameworks, access to funding, and effective management of contractual relationships.

The key provisions for creating ECs, are included in Law 5037/2023[57], as mentioned above. Both RECs and CECs are based on the principles of open and voluntary participation, democratic governance, effective control and autonomy, with RECs have an extra requirement of proximity. Their primary purpose is to provide environmental, economic, and social benefits at community level for their members or the local areas where they operate, rather than financial profits.

The legislation set some more requirements. Indicatively:

- sets a minimum of members,
- specifies the process of establishing RECs and CECs,
- specifies their legal and commercial status,
- elaborates the activities of the RECs and CECs,
- specifies the use of surpluses.

In general, the contractual relationship between supplier and consumer of electricity is defined in the Greek Supply Code (Μπορoδήμου, 2022).

The contractual agreements can be divided into two main categories:

- Between the EC and its Members through a Statute and/or Membership Agreement: It defines the rights and responsibilities of community members, including financial contributions, administrative bodies, voting rights, decision-making process, shares and capital and access to energy.
- Between the EC and Utilities and/or Energy Service Companies through operating aid agreement with DAPEEP or HEDNO, Electricity Supply Contract and/or Power Purchase Agreements (PPAs) with electricity suppliers.

Although Law 5027/2023[58] (FEK A 48/02.03.2023 "*Σύστημα Καινοτομίας στον δημόσιο τομέα - Ρυθμίσεις Γενικής Γραμματείας Ανθρωπίνου Δυναμικού Δημοσίου Τομέα - Ρυθμίσεις για τη λειτουργία των Ο.Τ.Α. α' και β' βαθμού και των αποκεντρωμένων διοικήσεων και για την ευζωία των ζώων συντροφιάς - Λοιπές επείγουσες ρυθμίσεις του Υπουργείου Εσωτερικών και άλλες διατάξεις*") has introduced a regulation, mainly due to the energy crisis, for the elimination of the cap on PPAs for physical delivery, many problems remain, mainly financing, bureaucratic procedures and the conditions for a substantial boost to this alternative way of energy supply.

The application is being submitted to HEDNO (Hellenic Electricity Distribution Network Operator). Subsequently, must be submitted the application of the connection contract to the relevant authority in the region and the relevant costs must be paid.

There is a lack of concrete data on the participation of young people in ECs. Consequently, there are no specific contractual agreements between the relevant parties and youth ECs.

[57] FEK A 78/28.03.2023
[58] FEK A 48/02.03.2023

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4.3.5. Warranty, safety and data security info

While there is a substantial body of literature on the establishment and operation of ECs, there is a deficiency of knowledge regarding the collection and management of energy data among community members. In addition to the activities ECs can perform (produce, consume, store and share energy), a number of other energy-related services can be provided. One of these services is the measurement of data on the provision and consumption of energy within the community. The most efficient way is by installing energy meters, because HEDNO, as the primary administrator of net metering projects in Greece, to date is responsible for the collection and utilisation of such data. This data is used to measure consumption and to provide in-depth measurements to prevent blackouts.

As energy data considered personal, it is subject to the provisions of the GDPR, as incorporated into Greek legislation by Law 4624/2019[59] (FEK A 137/29.08.2019 *"Αρχή Προστασίας Δεδομένων Προσωπικού Χαρακτήρα, μέτρα εφαρμογής του Κανονισμού (ΕΕ) 2016/679 του Ευρωπαϊκού Κοινοβουλίου και του Συμβουλίου της 27ης Απριλίου 2016 για την προστασία των φυσικών προσώπων έναντι της επεξεργασίας δεδομένων προσωπικού χαρακτήρα και ενσωμάτωση στην εθνική νομοθεσία της Οδηγίας (ΕΕ) 2016/680 του Ευρωπαϊκού Κοινοβουλίου και του Συμβουλίου της 27ης Απριλίου 2016 και άλλες διατάξεις"*).

4.3.6. Social barriers

The concept of establishing an EC is a widely supported throughout the country. It is important to note that legislative changes occur on a regular basis, and potential changes may arise during the process of establishing an EC. Nevertheless, the majority of individuals outside the energy market, NGOs, and relevant stakeholders, as indicated also by the respondents, are unaware of the definitions of ECs, community energy projects, and active ECs in their region. In some cases, misinformation about community energy projects, or opposition from local communities, based on the results of commercial projects, as to where to install the projects or how to manage the energy produced, has led to delays or obstruction of renewable energy projects.

Unfortunately, there is no data available from the Hellenic Statistical Service or other sources on the age groups or socio-economic background of those involved in ECs. But based on the responses from the Greek survey, the majority believes that anyone can participate in an EC regardless of their socio-economic background and that they would trust a young person to create and manage an EC.

The Greek government has not implemented an extensive information campaign on ECs aimed at the public or capacity building programmes for municipalities and citizens, as stipulated in RED II. Instead, intermediary organisations are addressing the gap by providing training and capacity building to civil servants and members of ECs. These capacity building programmes are frequently developed within the framework of European programmes.

The proactive efforts by young people to organise and advocate for their needs highlight the potential for positive change. However, there is a clear need for more robust institutional interventions and support from national and local authorities to empower the youth and secure a sustainable future for the region.

[59] FEK A 137/29.08.2019

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4.3.7. Local Conditions

Greece is characterised by a diverse topography, with a mountainous landscape comprising approximately 80% of the country. This is accompanied by fertile plains and an extensive coastline. The coastal areas of Greece, typically experience a Mediterranean climate, characterised by hot, dry summers and mild, wet winters. The interior and mountainous regions may exhibit climates more continental and alpine in nature, with colder winters and significant snowfall at higher elevations. Given the climate and topography of Greece, solar power and wind power are the most effective and widely implemented renewable energy sources. Solar power is benefitted by the abundance of sunshine, while wind power takes advantage of the robust and consistent winds, particularly in mountainous and island regions.

Topography and climatic conditions provide the impetus for the establishment of ECs and the implementation of community energy projects. Between the years 2018 and 2023, as evidenced by recent data (December 2023), 1,689 ECs were established, while according to data from the General Commercial Registry, the total number of applications exceeded 6,000. Of the total number, 1,673 are ECs established under the Law 4513/2018[60], while 16 are ECs (5 RECs and 11 CECs) established under the revised Law 5037/2023[61] (The Green Tank, 2024).

It is observed that the ECs are distributed throughout the Greek territory, with the northernmost regions of Greece exhibiting the highest concentration of ECs and renewable energy production.

Although the overall impression is positive, there is a general sense of dissatisfaction in local ECs, particularly regarding community energy projects. In certain cases, such as in the Region of Western Macedonia, the lack of availability of grid space represents a significant obstacle in the implementation of large community energy projects. Furthermore, the period of connection to the grid can be lengthy, often taking many months to complete. In many cases, HEDNO has indicated that grid connection is not feasible. The result has been an increased number of cancelled applications from producers who have been discouraged by the prospect of being unable to connect their projects to the grid. Regarding renewable energy technologies, the majority of projects submitted by ECs are PV projects. The production of wind-powered renewable energy is constrained to large-scale commercial projects, and the implementation of analogous initiatives by ECs is impeded by numerous challenges.

While there are currently no youth ECs, there are associations or rural cooperatives involving young people that could serve as a basis for future actions in the energy sector. The future of youth ECs will be promising if bureaucratic and financial barriers are removed, and youth-oriented initiatives take place.

4.4. LATVIA CONTEXT

4.4.1. Introduction

Latvia is currently developing regulations for ECs, including youth ECs. These regulations aim to create a favourable environment for citizens' participation in the energy market and strengthen self-consumption of renewable energy.

[60] FEK A 9/23.01.2018
[61] FEK A 78/28.03.2023

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The new draft regulation was published for public hearings in May (23-TA-691, 2024) and is expected to have regulations for the registration and operation of ECs[62] (Regulations of Minister Cabinet) by July 2024.

Latvia has two types of ECs:

1. Electricity Communities: These have members who are natural persons, local authorities, or small and micro-enterprises. For example, apartment owners in a building can establish a citizen EC to receive state support for installing alternative means of generating electricity.
2. RECs: These have members located near renewable energy projects owned and developed by a legal entity. Members can be natural persons, companies, or local authorities, including municipalities. ECs allow citizens to get involved in the energy sector and offer benefits such as increased energy efficiency, reduced electricity bills, lower carbon emissions, and support for the local economy.

4.4.2. Legal and regulatory research

National legislation on energy, renewable energy, community energy and consumer protection is as follows.

1. The National Energy and Climate Plan[63] (NECP) 2021-2030

The NECP sets out Latvia's targets and performance indicators in different sectors. The main objectives include reducing greenhouse gas emissions, increasing the share of renewable energy, improving energy efficiency and fostering innovation and competitiveness. The updated version of the NECP and the overview of policies to promote citizen engagement in energy transition will be published in June.

2. The Energy Law[64] and the Electricity Market Law[65]

Their main objective is to promote the efficient functioning of the electricity market and to ensure a reliable and high-quality supply of electricity to all users.

So far, there are no specific regulations of ECs in Latvia, but on 16 June 2022, the Saeima (Latvian Parliament) conceptually supported amendments to the Energy Law and the Electricity Market Law, which aim to promote public involvement in the production of electricity from renewable energy sources and to establish principles for the operation of ECs. The regulation of ECs in Latvia will include registration in a register of ECs, which will be administered by the State Control Office for Construction. In addition, amendments to the Electricity Market Law will introduce a net billing and metering system for electricity, in which both households and self-consumers of electricity produced from renewable energy sources will be able to participate.

As of 1 January 2023, amendments to the Latvian Energy Law and the Electricity Market Law have entered into force, defining ECs as new participants in the energy system. These amendments have now been put out for public consultation, which will allow ECs to operate

[62] https://likumi.lv/ta/id/357125-energokopienu-registresanas-un-darbibas-noteikumi
[63] https://commission.europa.eu/energy-climate-change-environment/implementation-eu-countries/energy-and-climate-governance-and-reporting/national-energy-and-climate-plans_en
[64] https://likumi.lv/ta/id/49833-energetikas-likums
[65] https://likumi.lv/ta/id/108834-elektroenergijas-tirgus-likums

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on a legal basis. This is a step towards sustainable energy use and community participation in the energy sector.

At the end of 2023, amendments were made to the Electricity Market Law[66], which introduces a new net settlement system. The new net billing system is based more on market principles, and the essential difference is that the value of the surplus electricity produced will be accounted for in monetary terms, not in kilowatt-hours. A green energy producer is defined as an "active user" in the new system. The new system also includes other innovations: the produced electricity will be able to be used in other objects as well; not only households, but also companies will be able to participate in the net settlement system in accordance with the procedures established by the Cabinet of Ministers; participation in the system will not be automatic, the customer will have to agree with one of the electricity traders about using the service. These amendments open up new opportunities for the creation of ECs.

Although there are limited incentives for community energy projects in Latvia, RECs are emerging, with apartment buildings equipped with solar panels for water heating, or public buildings equipped with solar panels, collectors or heat pumps. However, despite progress, various regulatory barriers remain, such as the lack of specific incentives for community energy, limited support for renewable electricity generation and local heating systems, as well as challenges in funding and coordination.

4.4.3. Financial and market design barriers

Experience shows that one of the most important factors in the development of ECs is the creation of favourable financial or market mechanisms. Financial mechanisms can be, for example, various grants or loans for the start-up or general support of communities. Market mechanisms can be, for example, the mandatory purchase component or market premiums (known as market premium or feed-in-premium). One of the reasons why Latvia is experiencing a passive development of ECs is that the government has not created financial support mechanisms for the establishment of ECs to integrate this participation model into the national energy system. Currently in Latvia, support for citizens' participation in the energy sector is limited to individual households for solar panels, co-financed by the Ministry of Environmental Protection and Regional Development and ALTUM (national development finance institution). Financial support is also provided to private houses in urban areas to replace heating equipment and systems with more energy-efficient ones or for establishing a connection to centralised heat supply, which also includes support for the installation of solar panels if a heat pump is installed to form a combined system. Thus, there are no financial instruments to support and promote the creation of ECs. State financial support is available for individual companies or households, but here again, given that Latvia, compared to other EU countries is characterised by a relatively low level of income in relation to expenditure, the less financial capacity to set up such projects.

Although subsidies for ECs are not planned, there is a very important aspect - when the regulatory framework for ECs is finalised, public funding will also be available for the development of various projects, here the cooperation of municipalities with citizens will play an important role, informing about possible financial tools and providing support both in the development of projects and in cooperation.

[66] https://likumi.lv/ta/id/108834-elektroenergijas-tirgus-likums

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Support for ECs is foreseen in the recently approved provisions of the Modernisation Fund and financial instruments are planned in the EU Cohesion Programme. The popular Emission Allowance Auction Instrument[67] (EKII) funding for households is also likely to be opened up to wider community projects. The EKII is a national funding programme that aims to contribute to the prevention of global climate change, adaptation to the effects of climate change and the reduction of greenhouse gas (GHG) emissions, for example through improving the energy efficiency of buildings in both the public and private sectors; the development and deployment of renewable energy technologies; and implementing integrated solutions to reduce GHG emissions.

No specific subsidies for youth ECs have been or will be provided, as the law will not make distinctions between target groups. In general, there are no financial/economic barriers. Barriers may be fluctuations in the energy market price. Financial mechanisms are not the primary influence on the activity of ECs, the main issue is the willingness of the communities or users themselves to make joint investments, to carry out market analysis, to assess benefits, obstacles, etc.

In Latvia, alternative financial schemes such as crowdfunding and crowdlending have not yet been used to finance community energy projects.

4.4.4. Contractual conditions

To date, there is no specific regulation on ECs in Latvia. The Electricity Market Law has been amended, and a public consultation is currently underway. Progress has been made, and ECs will soon have a legal framework for their operation. Collective action and ECs are currently possible, but ECs are not popular in Latvia due to a lack of incentives and legal support. Even under the current general framework, ECs are allowed. The support of the municipality, the cooperation of the municipality, from awareness campaigns on renewable energy and its benefits, including the establishment of ECs, to support in contracting, including legal support, plays an important role in the establishment of ECs. Municipalities need to develop a clear structure or roadmap.

Latvian legislation does not and will not create separate youth ECs, which would somehow bring young people together to produce energy together. Education, knowledge transfer and interest-building among young people play a key role.

4.4.5. Warranty, safety and data security info

Although the legislation does not provide any special cases in determining the warranty, to protect consumer rights, producers need to provide equipment warranty that ensures warranties are in place for all installed equipment within the EC. Standard warranty periods typically range between 1-2 years, but this may vary depending on the specific equipment. Negotiate extended warranties if necessary. As well there are installation warranty that allows to obtain a warranty from the installation company for any defects in workmanship or materials related to the installation process.

Installation of energy equipment, such as solar panels and inverter, can only be carried out by a certified specialist, so that the works are accepted for operation. This reduces the possibility

[67] https://ekii.lv/index.php?page=about-ekii

that a low-skilled workforce may violate safety regulations while performing work. Safety protocols are implemented to protect personnel during operation and maintenance of the EC's infrastructure. This may include adhering to electrical safety regulations, having proper training for personnel, and having emergency shut-off procedures in place. In order to put the equipment into operation, it is necessary to develop emergency response plans for various scenarios, such as fire, power outages, or equipment malfunctions. These plans should outline clear steps for personnel to take to ensure safety and minimise damage.

Taking into account negative examples in the past with small garden cooperatives that have already tried to set up something similar to ECs, there is a need to define a clear policy for what data will be collected from EC members (e.g. energy consumption data, personal identification information) by outlining how this data will be stored, used and protected. Data accessibility also needs to be improved by establishing protocols for how members can access their data within the EC. This may include providing an online portal or a designated point of contact for data access requests.

4.4.6. Social barriers

Dialogue with local authorities and traders, building managers is essential. It is likely that regulation will be adopted soon, but it is unlikely that there will be a massive creation of ECs. The historical failure of allotment cooperatives and the difficult experience of building management also play an important role. The establishment of ECs will be based on free choice. Municipalities can be an important player in the creation of ECs, which will be able to incentivise citizens to create communities. Information and evaluation will be more important for the States. The best way to build ECs is through good practice examples. Although there are no rebates or other stimulation planned for youth ECs, this target group is very responsive and not based on negative experiences, it is open to new possibilities. This is where information campaigns - a long-term effort - would be needed. Young people can act as ambassadors to other groups in society - parents, grandparents - to educate and help understand the principles of sharing through themselves.

Since the legal regulation has not finished in order to clarify legal status of ECs in Latvia, there have no awareness campaigns by the state, local authorities or other stakeholders done yet.

The data showed that the most active target groups were 26-49 years old who are interested in energy saving and sustainability.

4.4.7. Local Conditions

Latvia is the central country of the Baltic States (Estonia, Latvia and Lithuania) and is located in north-eastern Europe on the east coast of the Baltic Sea. It has a relatively flat terrain with forests, lakes and rivers. Latvia has a 498 km long coastline, half of which is on the Baltic Sea and half on the Gulf of Riga. The Latvian climate reflects its geographical location in north-eastern Europe, with a temperate seasonal climate with distinct seasons. Almost half of the electricity consumed in Latvia comes from renewable energy sources - more than 43% of annual domestic energy consumption comes from renewable energy sources, including hydropower, which is Latvia's main renewable energy resource. Wind, solar, geothermal and biomass are also used. Wind power plants, hydroelectric power plants and solar installations

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make up Latvia's renewable energy mix. The existing grid can accommodate new connections and the increased demand from ECs.

There are two real ECs established in Marupe by Interreg Baltic Sea Region project Co2mmunity[68] as the pilot projects which helps to promote idea for others, but these are not involved by youth.

4.5. POLAND CONTEXT

4.5.1. Introduction

Poland's main energy goals are outlined in the Energy Policy of Poland until 2040[69] – EPP 2040 (Ministry of Climate and Environment, 2021). This document provides a clear vision of Poland's energy transition strategy. The objective of the Energy Policy of Poland until 2040 is energy security, taking into account the optimal use of own energy resources, while ensuring the competitiveness of the economy, energy efficiency and reducing the environmental impact of the energy sector. EPP 2040 indicates that the decarbonisation of the energy sector will be possible, among other things, by increasing the role of distributed and citizen energy. Creating a prosumer market and stimulating the development of ECs will also contribute to the use of local potential and influence more conscious and rational energy management.

Act of July 28, 2023, amending the Energy Law Act and certain other acts[70] (Parliament of Poland, 2023a) defines CECs, in general, and CECs that operate exclusively in the field of renewable energy sources, which could be considered as RECs. This is because the law includes several criteria from the RED II[71] [Directive (EU) on the promotion of the use of energy from renewable sources (recast 2018] that apply to RECs. It is important to note that in the current Polish legislation, the concepts of CEC and REC are combined – civic EC is a broader definition and REC is its subcategory. Consequently, RECs are integrated into Polish law as a sub-set of CECs.

The current legal framework in Poland allows also the establishment of other types of ECs, e.g. energy clusters, energy cooperatives, collective prosumers. However, regardless of the type, there are few of them. Youth ECs do not function in Poland. Currently, there is also no legal framework dedicated to youth ECs nor any programmes that encourage young people to set them up or participate in existing ones.

4.5.2. Legal and regulatory research

In the Polish legal order, the development of citizen energy is influenced by two main laws – the Renewable Energy Sources Act[72] of 20 February 2015 (Parliament of Poland, 2023b) and the Energy Law Act of 10 April 1997[73] (Parliament of Poland, 1997). The first one indicates five organisational and legal forms of the citizen energy. The first group includes individuals and other entities that are end-users of electricity, which are entitled to generate and feed energy generated in specific installations into the electricity grid. In the case of business

[68] https://interreg-baltic.eu/project/co2mmunity/
[69] https://www.gov.pl/web/climate/energy-policy-of-poland-until-2040-epp2040
[70] https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20230001681
[71] http://data.europa.eu/eli/dir/2018/2001/2024-07-16
[72] https://isap.sejm.gov.pl/isap.nsf/download.xsp/WDU20150000478/U/D20150478Lj.pdf
[73] https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=wdu19970540348

entities, energy generation must not be the object of their predominant activity. This group includes renewable energy prosumers, virtual prosumers of renewable energy and collective prosumers of renewable energy. The second group consists of energy clusters and energy cooperatives.

As mentioned, an Amendment to the Energy Law in Poland (Parliament of Poland, 2023a) established general CECs and CECs that operate exclusively in the field of renewable energy sources. The objective of CEC may be the generation, distribution, trading, aggregation, storage of electricity, the implementation of energy efficiency projects and the provision of electric vehicle charging services to its members. The updated legislation for ECs is a step forward in establishing clear guidelines and regulations for their operation. By defining participation criteria, decision-making processes, and allowable activities within the electricity, gas, and heating sectors, the legislation provides clarity and structure for those involved in ECs. Expanding the list of legal entities that can establish ECs opens up opportunities for a wider range of stakeholders to participate in these initiatives. However, the restriction limiting CECs to operate within a single distribution network area may pose challenges in terms of scalability and reach. The Energy Law Act also establishes a registration system, and regulatory oversight. While this legislation represents progress, it's noted that there's still room for improvement, particularly in establishing a comprehensive enabling framework to further support the growth and effectiveness of ECs.

Unfortunately, setting up ECs can create barriers to participation, especially for individuals with lower incomes and young people who may have limited access to capital or experience in such endeavours. Poland can break down these barriers by encouraging young people to become actively involved in the green transition, for example, through the implementation of education and information campaigns.

4.5.3. Financial and market design barriers

PVs are becoming increasingly accessible due to the drop in the price of their components. However, initial investment costs are still a barrier to potential users and especially to the creation of ECs (especially by young people). It is crucial to provide financial support at all stages, i.e. from the preparation of pre-investment documentation to the operation of the installation.

There are many funding opportunities for citizen energy projects in Poland related to both energy efficiency improvements and the construction of micro and small-scale RES installations. Sources of funding include, for example:

- National Recovery Plan[74] (Ministry of Funds and Regional Policy, 2025) provides funding for direct support to ECs – at the turn of 2023/2024, the Ministry of Development and Technology in Poland was calling for applications for the second phase of a new subsidy programme for ECs. Financial support was available to energy clusters, energy cooperatives or local authorities that have the potential to play a significant role in Poland's energy transition. The Ministry divided the funds that could be granted into two groups: support for pre-investment projects and those more advanced – at the investment stage. Pre-investment support included activities to develop the optimal legal, organisational and business model needed to launch or develop an EC. This option was intended for energy clusters and local authorities.

[74] https://www.kpo.gov.pl/

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Stage I focused on developing or updating the development concept. Stage II was based on stimulating the development of the EC – developing pre-investment documentation, analyses, implementing IT systems, hiring additional staff, etc. Investment support, on the other hand, included existing advanced ECs. Energy clusters and energy cooperatives could apply for funding for steps related to the implementation of specific projects, such as the construction or expansion of stable sources of energy generation from RES.

- RES grant[75] (National Development Bank, 2024) allows 50% of the costs of a project involving the purchase, installation, construction or modernisation of a renewable energy source installation to be financed. It can be used by administrators and owners of multi-family buildings. Entities eligible for the grant include housing communities and cooperatives, local authorities, social housing associations, social housing initiatives, commercial companies and individuals.
- Loans offered by commercial banks on preferential terms – environmental projects can count on more favourable lending conditions. For example, beneficiaries from the Lubelskie Voivodeship can obtain a loan from the Environmental Protection Bank[76] (specialising in supporting activities contributing to environmental protection) for the construction and expansion of renewable energy installations. Preferential loans with a fixed interest rate may be applied for by, among others: local authorities, municipal companies, schools, universities, hospitals, cultural institutions, housing cooperatives (Enironmental Protection Bank, 2024)
- Funds from the Regional Funds for Environmental Protection and Water Management – for example, the Regional Environmental Protection and Water Management Fund in Krakow[77] provides support in the form of loans to cover up to 100% of net eligible costs. Loans may be obtained by local government units, entrepreneurs, state budgetary units, individuals, other entities. Investment financing applies to, among others, photovoltaic panels. In the context of the development of ECs, it is possible to cancel the loan in the amount of 30% maximum. A mandatory condition for obtaining cancellation is timely completion of tasks and achievement of planned effects. Loans for the financing of tasks on investments with photovoltaic panels in the case where energy production exceeds annual demand by 10% are not subject to redemption (Regional Environmental Protection and Water Management Fund in Krakow, 2025).
- ESCOs provide energy services or other energy efficiency improvement services to an energy consumer and assumes some financial risk. This type of entity commits its financial resources to carry out a retrofit project for the customer, and recovers the costs incurred (including remuneration) through staggered payments. The customer covers these from the savings generated by the project. A key form of cooperation with an ESCO in the context of ECs is the Energy Delivery Contract (EDC). Under the contract, the ESCO installs or retrofits an energy source (e.g. photovoltaics, cogeneration, heat pumps) and then provides energy delivery services at a preferential price and maintains and operates the equipment (CoopTech Hub, 2023).

Despite the variety of funding sources, their complexity is discouraging for many stakeholders. Methods such as crowdfunding for community energy projects in Poland are not currently used, as the concept of ECs is not widespread. Overcoming these barriers requires innovative approaches to create projects and an environment favourable to the development of ECs.

[75] https://www.bgk.pl/produkty/grant-oze/
[76] https://www.bosbank.pl/pozyczkiunijne/lubelskie-pozyczka-ee
[77] https://www.wfos.krakow.pl/

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Connection of PV installations to the grid can also be a barrier to the development of ECs. Energy infrastructure may often need to be upgraded, requiring additional investment and discouraging potential stakeholders.

4.5.4. Contractual conditions

As already mentioned, in Poland there are distinguished forms of citizen energy initiatives such as:

1. Energy Clusters – a community focused on producing electricity and heat and reselling them to its members at an attractive price. It takes the form of a civil law agreement and may include, among others, municipalities, municipal companies, local companies, housing cooperatives, individuals or research units. The process of establishing a cluster can be divided into several stages, the most important are: decisions on its legal form, strategy for its development, method of financing the cluster and profit sharing, conclusion of the cluster agreement, agreement with DSO/electricity seller and obtaining a license appropriate to the operation.
2. Energy Cooperatives – to form an energy cooperative a minimum of 10 individuals or three legal persons are needed, which is governed by cooperative law, does not need to have an energy trading licence, does not have to cover energy distribution costs and is not subject to excise duty (up to 1 MW). This form makes it possible to commit less money than with an individual RES investment. Steps to be taken to set up a cooperative: determination of the amount of the registration fee to cover the start-up costs of the cooperative and the expenses incurred in the pre-investment phase, adoption of statutes, Registration with the National Court Register, conclusion of a distribution agreement with the DSO, obtaining contracts with cooperative members and registration in the National Agricultural Support Centre register.
3. Collective Prosumer – group of shareholders owning one generation installation together (final customer) generating electricity based exclusively on RES in a micro (up to 50 kW) or small installation (from 50 kW to 1 MW) in a multi-apartment building. In the case of several prosumers using the same installation, a contract is concluded specifying, for example, the share or rules for bearing the costs associated with the maintenance of the installation. Each member of the group owns a share in the installation and is entitled to a corresponding share of the energy produced according to that share. Collective prosumers are subject to registration in the register of small-scale energy producers (for a small installation 50 kW-1 MW) and sells surplus energy to an energy seller.
4. CECs – it requires registration in the list of CECs, supervised by the President of the Energy Regulatory Office[78], to begin its activities. The regulations for this list will come into force on August 24, 2024. In addition to meeting this condition, operating a citizen EC requires obtaining the appropriate legal status, confirmed by entry in the National Court Register. If the scope and scale of operation of the new entity requires a license or entry in the register of regulated activities, it is necessary to meet these conditions.

[78] https://www.ure.gov.pl/

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4.5.5. Warranty, safety and data security info

There are several types of warranties for an investment, such as a PV installation:

- warranty for PV panels (the product itself in terms of workmanship + power warranty),
- warranty for the inverter,
- warranty on the construction of the mounting system,
- warranty for the installation (i.e., properly performed installation service).

The warranty duration of the panels will vary depending on the manufacturer and model, including the technology used to produce them. What is important, the warranty for PV panels means with many manufacturers that they undertake to correct the defect (repair/service the defective panels), you can count on a free replacement of the defective goods, or you can get your purchase money back (partially, which depends on how many years your installation worked - i.e. a price reduction applies here). Peak power guarantee for PV panels is the manufacturer's assurance to the user that the PV module will retain its high-power rating after many years of operation. Most panel manufacturers provide a 25-year warranty on the performance of the installation, with the standard promise that during the first year the panels will not lose more than some 1-2% of peak power, and each subsequent year no more than 0.5-0.6%. This means that in the 25th year of the installation's use, the PV cells should still be operating at no less than approximately 84% of peak power. Every warranty document from a PV panel manufacturer also includes a second type of warranty, the so-called product warranty. It covers manufacturing and material defects - cracks, scratches and mechanical damage. Most PV panels are covered by a product warranty for a minimum of 10-12 years. The warranty duration for inverters is shorter than for PV panels and is often 2-5 years. The warranty for PVs is also a warranty for the installation service. It is not given by the equipment manufacturer, but by the PV company. The PV installer, thus, undertakes that he has properly installed the system and, in case of problems with its operation, will perform a free inspection and repair. Unfortunately, the standard on the Polish market is still only a 2-year installation warranty, although larger companies sometimes offer 5-10 years. In the Polish legal order, there is also a statutory warranty for PV installation defined by the Civil Code Law[79]. It is a non-transferable and mandatory 2-year warranty from the installer and covers non-compliance of goods with the contract. The statutory warranty covers the entire installation, i.e. modules, inverter, wires, but also the quality of the service (Otovo Sp. z o.o., 2021).

Installation safety is a key issue in the operation of PV panels. In this context, it is important to understand the potential risks and take appropriate preventive measures to ensure that the PV installation is not only efficient, but also safe for users and property. Preventive measures include compliance with building and electrical codes and standards, appropriate labelling of installations, regular technical inspection and maintenance, insurance of the PV installation.

The operation of an EC requires the exchange of data between its participants and the DSO, among other things, in order to bill the energy generated. Therefore, compliance with data protection regulations, in particular the General Data Protection Regulation[80], is crucial to protect stakeholders' sensitive data and thus maintain their trust.

[79] https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=wdu19640160093
[80] https://eur-lex.europa.eu/eli/reg/2016/679/oj/eng

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4.5.6. Social barriers

The low awareness among people in Poland about available forms of citizen energy results in a lack of broader community involvement and discussion about the opportunities offered by ECs. There are only 35 registered and functioning ECs. Although there were awareness campaigns organised by polish NGOs. One, more widely recognised, is currently a nationwide public awareness campaign entitled "OZE? Każdy może!"[81] (RES? Everyone can!). However, it focuses more on prosumers and does not mention ECs. The campaign aims to raise awareness of RES and encourage Polish people to participate in the energy transition. The campaign also promotes the financial benefits of the energy transition, such as lower energy bills, independence from imported fossil fuels and increased energy security.

There are no ECs involving young people in Poland, nor a legal framework dedicated to them. Eliminating social barriers by involving young people in ECs requires understanding their specific needs, as well as offering appropriate educational opportunities. The implementation of information campaigns and educational programmes can significantly enable young people to actively engage in energy projects. Capacity building, skills development and support networks are therefore crucial. Young people can also play a key role in the energy transition by transferring knowledge and promoting practical sustainable energy measures to older generations, thus having the opportunity to build a more informed and sustainable community. In addition, cooperation with local authorities in the context of encouraging citizens to create ECs seems essential.

Energy communities are currently a popular topic at energy transition conferences, which is an encouraging indication. However, these conferences are usually attended by representatives of local government authorities. This suggests that the recognition of this idea among the citizens may increase in the near future.

4.5.7. Local Conditions

Poland is located in Central Europe between the Baltic Sea and the Carpathian Mountains and Sudetes, in the basin of the Vistula and Oder rivers. Poland's climate is temperate warm transitional and is characterised by high degree of weather variability. It is harsher in the east and in the mountains and milder in the west and by the sea. The precipitation is highest in the mountains and by the sea, the lowest in the Central Polish Lowlands (Kondracki J., 1994).

Poland has significant potential for RES. Good wind conditions along the coast and in inland areas allow wind power generation. In addition, the country has favourable insolation conditions, which influences the dynamic development of solar energy (Polish Economic Institute, 2020). Moreover, polish rivers have the potential to create small hydropower plants (UN Global Compact Network Poland, 2022). Due to its extensive agricultural and forestry resources, Poland has significant biomass energy potential. It can be extracted from a variety of organic materials, including wood waste, agricultural by-products and dedicated energy crops. Biomass can be used to generate heat and electricity in residential, commercial and industrial buildings, as well as to produce biofuels (Biomass Media Group Sp. z o.o., 2023). Poland has moderate potential for geothermal energy, mainly in the form of low-temperature geothermal resources suitable mainly for the development of recreational tourism. The Podhale region in southern Poland is one of the most promising areas for geothermal

[81] https://ozekazdymoze.pl/

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development with existing geothermal wells and use for heating purposes (Kępińska B., 2018). Overall, Poland's RES potential, coupled with growing investments and social initiatives, is preparing the country for a significant transition to sustainable energy.

In recent years, Poland has seen a growing interest in RES. In 2023, the number of renewable energy micro-installations increased to more than 1.4 million, with installed capacity exceeding 11.3 GW (Energy Regulatory Office, 2024). Prosumer PV installations dominate in Poland. Problematic is the frequent refusal to connect ECs installations to the grid from the distributor, as they are justified by the inefficiency of the power grid.

Current legislation in Poland allows for the creation of several possible forms of citizen energy initiatives, such as energy clusters, energy cooperatives, and collective prosumers. However, no matter of the type, there are few of them. As of 28 August 2025, there are 126 ECs in Poland (National Support Centre for Agriculture, 2025). In 2024, the first three micro-installations used by collective prosumers of renewable energy appeared (Energy Regulatory Office, 2025). The number of energy clusters is known by the energy regulatory office and not open to the public. Reasons for this situation include problems in obtaining energy distribution licenses, delayed regulations and low awareness of the advantages of these solutions among potential stakeholders.

4.6. PORTUGAL CONTEXT

4.6.1. Introduction

Portugal has made an ambitious commitment to the energy transition with the aim of achieving carbon neutrality by 2050. The main energy and climate objectives outlined in the main strategic documents – the revised National Energy and Climate Plan 2030[82] (Portuguese Parliament, 2024), the Roadmap to Carbon Neutrality 2050[83] (Portuguese Environment Agency, 2019) and the Framework Climate Law[84] (Law 98/2021) - point to an electricity sector based on greater decentralisation of production and a focus on renewable sources.

ECs are emerging as pivotal players in the transition towards a sustainable and decentralised energy system. As this transition gains momentum in Portugal, it is important to find out how citizens can take advantage of these forms of decentralised electricity production and thus ensure a more inclusive and effective energy transition. This section explores the landscape of ECs in Portugal, with a special emphasis on the challenges and opportunities faced by young ECs.

4.6.2. Legal and regulatory research

Portugal has made significant strides in promoting renewable energy and community participation in energy generation. The main documents that regulate decentralised production in Portugal are the following:

[82] https://apambiente.pt/sites/default/files/_Clima/20241118_pnec2030_para_aprov_ar.pdf
[83] https://www.portugal.gov.pt/download-ficheiros/ficheiro.aspx?v=%3D%3DBAAAAB%2BLCAAAAAAABACzMDexBAC4h9DRBAAAAA%3D%3D
[84] https://files.dre.pt/1s/2021/12/25300/0000500032.pdf

- Decree-Law 15/2022[85] of January 14th, which establishes the organisation and operation of the National Electricity System, defining, among other things, the legal framework for RECs and citizens;
- Decree-Law 30-A/2022[86] of April 18th, which approves exceptional measures to simplify procedures for the production of energy from renewable sources, as amended by Decree-Law 72/2022 of October 19th, which amends the exceptional measures for the implementation of projects for the production and storage of energy from RES;
- Regulation (EU) 2022/2577[87] of December 22nd establishing a scheme to accelerate the deployment of renewable energy;
- Energy Services Regulatory Authority (ERSE) Regulation 373/2021[88] of May 5th, which regulates the self-consumption of renewable energy and the activity of RECs that carry out self-consumption activities.

As far as regulatory barriers are concerned, lengthy and complicated permitting processes for renewable energy projects can create barriers to entry, especially for smaller community energy initiatives, even despite important steps that have been taken to overcome this (e.g. Porto Energy Hub and associated one-stop-shops). Additionally, the development and integration of renewable energy projects can be hindered by delays or restrictions in obtaining grid connection permits. Also, limited access to financing for community energy projects, can be a barrier to their development.

There are no policy inconsistencies per ser, but rather a mismatch between the ambitious national renewable energy targets and the intricacy of operationalisation of RECs. Finally, the complexity of consumer information regarding energy pricing, contracts, and rights can leave consumers with a feeling of vulnerability to unfair practices.

In Portugal, RECs do not yet exist. Self-consumption based on PV generation installations that harness solar energy to produce electricity is the most common form of using RE as individuals.

Self-consumption activity refers to the production of renewable electricity by one or more Self-Consumption Production Units (UPAC) for their own consumption and carried out by one or more energy self-consumers. A self-consumer thus corresponds to a consumer who produces renewable energy for their own consumption, and who can store or sell electricity from their own production, provided that, for non-domestic renewable energy self-consumers, these activities do not constitute their main commercial or professional activity.

Self-consumers can carry out their self-consumption activity individually - Individual Self-Consumption (ISC/ACI) - or by organising themselves collectively - Collective Self-Consumption (CSC/ACC). In both cases, the UPAC installed in or near the Installation of Use (IU) are connected to each other via the public service electricity network (RESP) and/or an internal network.

The main difference between an CSC and a REC is that the former is designed to meet the electricity needs of the self-consumers that make up the CSC and must share energy according to coefficients defined by them. On the other hand, the REC is intended to meet the

[85] https://diariodarepublica.pt/dr/detalhe/decreto-lei/15-2022-177634016
[86] https://diariodarepublica.pt/dr/detalhe/decreto-lei/30-a-2022-182213906
[87] https://eur-lex.europa.eu/eli/reg/2022/2577/oj
[88] https://diariodarepublica.pt/dr/detalhe/regulamento/373-2021-162753427

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electricity needs of its members and does not necessarily have to own the consumption facilities it must supply, bringing with it the advantages of cost and operational segregation that come with being a legal person.

Analysing national legislation reveals a supportive framework for ECs, including provisions for renewable energy integration and consumer protection. However, regulatory barriers and policy and implementation mismatch still exist, hindering the full realisation of community energy projects. Addressing these gaps is crucial to foster a conducive environment for young ECs to thrive.

4.6.3. Financial and market design barriers

One of the most significant obstacles to implementing ACI and REC projects is obtaining funding for all phases of the project, from the initial feasibility studies to implementation and operation. Therefore, access to funding and the market poses significant challenges for young ECs in Portugal. While financial incentives exist, navigating the complexities of funding sources and market mechanisms remains daunting. Moreover, the cost of technology and market design constraints can impede the scalability of community energy projects. Overcoming these barriers requires innovative financing models and tailored market designs that prioritise inclusivity and sustainability.

To make the implementation of self-consumption projects more attractive from a financial point of view, the CIEG (costs of general economic interest) corresponding to the electricity consumed and transported by the RESP may be fully or partially deducted from the grid access tariffs by means of a government decree to be issued by 15 September each year, after hearing ERSE. In the absence of a decree, ERSE is responsible for determining the share of the CIEG to be deducted annually from the network access tariffs and to be considered in the tariff calculation. The exemption shall be granted for a period of seven (7) years from the date of commissioning of the self-consumption and/or REC project and shall be deducted from the network access tariffs.

- 50 per cent of CIEG costs in the ACI;
- 100 per cent of CIEG costs in the ACC and REC.

Bank loans: This is the most conventional way of acquiring finance for a project, but it only covers 80% of the total investment. Recently, and because of some European directives, banks have been more receptive to providing financing for renewable energy projects. However, there may still be some resistance. As an alternative to these 'traditional' entities, ethical or cooperative banks are beginning to emerge, which are more open to projects of this nature. In Portugal, however, the options are relatively limited, with only one cooperative bank.

Institutional funds: From time to time, there are community development funds, e.g. administered by the government, that can cover initial costs. Most of these funds require a REC to be in place when the application is formalised. In some cases, these funds can directly finance 70% to 80% of the investment. They sometimes have a complex administrative process, but the criteria are relatively simple. For example, the Recovery and Resilience Programme, which includes building efficiency as one of its priorities, as well as the use of renewable energy, has funding lines for the creation of RECs and collective self-consumption, which are likely to continue.

Collective financing: Energy cooperatives operate by issuing share capital. In so doing, those who invest can control the decisions made in terms of investment, operation, and

management of the REC. This model already exists in Portugal, although it is not very common. Crowdfunding in this type of project generally works in a credit mode. Individuals outside the REC contribute part of the total investment and are entitled to a return, usually a percentage of the financial return generated. In Portugal, there are already some platforms that allow you to participate in crowdfunding for projects specifically related to the sustainable energy sector.

Third-party funding: One of the simplest ways to finance such projects is to sign a contract with a company that can manage the REC, act as an investor, and pay for all the costs of maintaining and operating the system. REC members simply pay a lower tariff. Although this is not as cost effective as managing the process directly, it takes advantage of the experience and efficiency of these companies and eliminates much of the time and complexity associated with the process.

4.6.4. Contractual conditions

Creating and implementing ECs necessitates clear contractual agreements among stakeholders, including young people. These agreements must align with existing power system regulations while ensuring fair participation and benefits for all members. Developing robust contractual frameworks is essential to foster trust and accountability within ECs, enabling effective collaboration towards shared energy goals.

According to Decree-Law 15/2022[89], which establishes the legal framework for RECs, a REC is a legal entity characterised by the open and voluntary membership of its members, partners, or shareholders, who may be natural or legal persons, public or private, including small and medium-sized enterprises or local authorities, which cumulatively:

- The members or participants are in the vicinity of the renewable energy projects or carry out activities related to the renewable energy projects of the respective EC.
- These projects are owned and developed by the REC or by third parties, if they benefit and serve the REC.
- The primary objective of the REC is to provide environmental, economic, and social benefits to its members or the communities in which it operates, rather than financial profits.

In addition to the need for constitutive documents, which are essential for the creation of a legal entity in accordance with the CSC, a REC needs internal rules that define the conditions for joining and leaving the REC, the majorities required for decisions, the way in which the energy produced in the REC is shared, the destination of the surpluses produced in the REC, the payment of the tariffs due and the commercial relations policy to be adopted.

The REC itself, in accordance with the obligations of the EGAC, is responsible for the operational management of the day-to-day activity, including the management of the internal network (if any), the link with the electronic platform, the link with the RESP and the link with the respective operators, in particular with regard to the sharing of production and the respective coefficients (if any), the commercial relationship to be adopted for surpluses and other acts entrusted to it by the participants.

The lack of clarity in contracts between organisations promoting REC projects and REC members constitutes a significant issue. These organisations often fail to fulfil the ambiguous

[89] https://diariodarepublica.pt/dr/detalhe/decreto-lei/15-2022-177634016

agreements they establish. Therefore, it is imperative to implement Contractual Relations Regulations akin to those governing electricity distribution companies. Such regulations should mandate standardised contracts and billing models, which can be effectively monitored and regulated by the ERSE.

4.6.5. Warranty, safety and data security info

Ensuring warranty, safety, and data security is paramount in community energy projects. Equipment and installation warranties provide reliability and assurance to members, while stringent safety measures mitigate risks associated with energy generation and distribution. Compliance with data protection regulations, particularly GDPR, is imperative to safeguard sensitive information and maintaining trust within the community. Prioritising warranty, safety, and data security instils confidence among stakeholders, fostering a conducive environment for youth engagement in energy initiatives.

The warranty framework applicable to photovoltaic installations in Portugal is governed by European Union legislation, Portuguese national law, and contractual guarantees provided by manufacturers and installers. The following categories of warranty coverage are applicable:

1. Product Warranty

- PV Modules: Manufacturers typically provide a 10 to 12-year warranty against defects in materials and workmanship. Certain manufacturers extend this warranty period up to 15–25 years, depending on the product line.
- Inverters: Warranty coverage usually ranges from 5 to 10 years, with optional extensions available up to 20 years.
- Balance of System Components (mounting structures, cabling, monitoring devices): Warranty coverage typically ranges between 2 and 10 years, depending on supplier conditions.

2. Performance Warranty

PV modules are accompanied by performance guarantees that ensure a minimum level of energy output over time. The prevailing industry standard in Portugal, in alignment with EU practice, stipulates:

- A minimum of 90% of nominal output after 10 years of operation;
- A minimum of 80–85% of nominal output after 25 years of operation.

These warranties safeguard the long-term energy yield and economic sustainability of the installation.

3. Installation and Workmanship Warranty

Installers are contractually obliged to provide a warranty against defects related to installation and workmanship. In Portugal, such warranties generally cover a period of 2 to 5 years, ensuring protection against issues such as incorrect mounting, cabling defects, or inadequate sealing that may affect system safety and performance.

4. Legal Framework

The relevant legal provisions include:

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- Directive 2019/771 of the European Parliament and of the Council of 20 May 2019[90] on certain aspects concerning contracts for the sale of goods (OJ L 136, 22.5.2019, p. 28–50), which repealed Directive 1999/44/EC[91] and entered into application in Member States from 1 January 2022;
- Decree-Law 67/2003[92], of 8 April, transposing Directive 1999/44/EC into Portuguese law, establishing a minimum legal warranty period of 2 years for consumer goods;
- Decree-Law 84/2021[93], of 18 October, which transposes Directive (EU) 2019/771 into the Portuguese legal framework, reinforcing consumer rights in the context of warranty claims;
- Technical and safety requirements enforced by the DGEG and compliance obligations with the national distribution system operator (E-Redes).

5. Warranty Claims and Maintenance Obligations

- To preserve warranty validity, manufacturers and installers generally require adherence to preventive maintenance schedules.
- Warranty claims shall be submitted either through the installer (acting as intermediary) or directly with the manufacturer, depending on the contractual framework.
- Many Portuguese installers offer maintenance and monitoring contracts, which often include support in warranty management and facilitation of claims.

The establishment and operation of ECs in Portugal involve the collection, processing, and exchange of personal and technical data related to members, consumption, and production profiles. As such, compliance with data protection and cybersecurity regulations is essential to ensure the lawful, fair, and secure management of information.

6. General Data Protection Regulation (GDPR)

The General Data Protection Regulation (Regulation (EU) 2016/679[94] of the European Parliament and of the Council of 27 April 2016, OJ L 119, 4.5.2016, p. 1–88) establishes the legal framework for the processing of personal data within the European Union.

In the context of Energy Communities, the following obligations are particularly relevant:

- Lawfulness, fairness, and transparency: Data subjects (community members) must be informed about the purposes, scope, and duration of data processing.
- Purpose limitation: Personal data (e.g. names, addresses, consumption profiles, billing data) must only be collected for specific and legitimate purposes directly related to the functioning of the Energy Community.
- Data minimisation and storage limitation: Only strictly necessary data may be collected, and retention periods must be limited.
- Security and integrity: Appropriate technical and organisational measures (e.g. encryption, access control, anonymisation/pseudonymisation) must be implemented to prevent unauthorised access, disclosure, or loss of data.

[90] https://eur-lex.europa.eu/eli/dir/2019/771/oj/eng
[91] https://eur-lex.europa.eu/eli/dir/1999/44/oj/eng
[92] https://diariodarepublica.pt/dr/detalhe/decreto-lei/67-2003-223630
[93] https://files.dre.pt/1s/2021/10/20200/0000400029.pdf
[94] https://eur-lex.europa.eu/eli/reg/2016/679/oj/eng

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- Data subject rights: Members retain rights of access, rectification, erasure, restriction of processing, data portability, and objection, which must be operationalised by the community's governance structure.

7. Portuguese National Framework

The GDPR is complemented at national level by Law 58/2019[95], which ensures its execution in Portugal, defining the competences of the national supervisory authority. The Comissão Nacional de Proteção de Dados (CNPD) acts as the supervisory authority responsible for ensuring compliance with data protection obligations.

Energy Communities must therefore establish clear governance rules to designate data controllers and data processors, and to define the procedures for obtaining consent, managing rights, and handling potential data breaches.

8. Cybersecurity and Energy Sector-Specific Regulations

The security of digital platforms and smart metering infrastructure us ed by Energy Communities is subject to the Directive (EU) 2022/2555[96] (NIS2 Directive), of 14 December, on measures for a high common level of cybersecurity across the Union, which Member States, including Portugal, are required to transpose. Additionally, Energy Communities must ensure compliance with DGEG and ERSE requirements concerning the management of energy data, in accordance with Decree-Law 15/2022[97], of January, which establishes the legal framework for renewable energy self-consumption and energy communities in Portugal.

9. Practical Implications for Energy Communities

To ensure regulatory compliance, Energy Communities in Portugal should:

- Appoint a Data Protection Officer (DPO) where the scale or sensitivity of data processing requires it.
- Develop and implement internal data protection policies covering consent, data retention, and breach notification procedures.
- Adopt cybersecurity standards for digital platforms, data sharing tools, and monitoring systems.
- Ensure transparency by providing members with accessible privacy notices and consent forms.
- Establish clear contractual arrangements with third-party service providers (e.g. aggregators, IT providers) ensuring compliance with GDPR and Portuguese law.

4.6.6. Social barriers

Addressing social barriers is crucial for fostering inclusive and participatory ECs, particularly among young people. Implementing targeted awareness raising and education programs can enhance skills and capacity building, empowering youth to actively engage in energy projects. It is essential to understand community dynamics and socio-economic characteristics to develop engagement strategies that resonate with diverse demographics. Utilising social

[95] https://diariodarepublica.pt/dr/detalhe/lei/58-2019-123815982
[96] https://eur-lex.europa.eu/eli/dir/2022/2555/oj/eng
[97] https://diariodarepublica.pt/dr/en/detail/decree-law/15-2022-177634016

networks and community-based approaches can facilitate grassroots mobilisation, driving collective action towards sustainable energy development.

While REC are currently well-publicised, their widespread recognition will likely increase significantly once Collective Self-consumption Management Entities (EGAC) service providers expand their operations to achieve coverage and density comparable to existing electricity sales and individual self-consumption solutions. Encouraging consumer participation in ECs can be effectively achieved by offering them lower electricity costs and mechanisms for selling their excess self-generated power to their neighbours.

Although technical training may not be deemed essential from REC members' standpoint, sharing knowledge with consumers remains important. It is anticipated that the commercial chain will fulfil this role as service providers become more active in the field.

4.6.7. Local Conditions

Portugal, situated in southwestern Europe, occupies the westernmost part of mainland Europe and includes the Azores and Madeira archipelagos in the Atlantic Ocean, possessing a diverse geography and climate, making it suitable for various RES. The country's topography varies widely, encompassing coastal plains, mountainous regions (such as the Serra da Estrela), and river valleys. Portugal's climate ranges from Mediterranean in the south to temperate maritime in the north. Southern regions typically experience hot, dry summers, while the north is cooler and more humid, although Portugal is increasingly enduring extreme weather events. As result, this diversity enables the exploitation of multiple RES.

Wind Energy: Portugal has significant wind energy potential, particularly along its coastal areas and high-altitude regions. Wind farms, both onshore and offshore, contribute significantly to the country's renewable energy mix.

Solar Energy: With its abundant sunshine, solar energy plays a crucial role in Portugal's renewable energy portfolio. The country has been investing in large-scale solar farms as well as distributed solar installations on rooftops, especially in public buildings and social housing.

Hydropower: Portugal has exploited its rivers for hydropower generation for decades. While large-scale hydroelectric dams exist, there is also potential for smaller-scale run-of-the-river and pumped-storage hydro projects.

Biomass and Bioenergy: Portugal utilises biomass resources, including agricultural residues, forestry, and food waste, for energy generation. Biomass power plants contribute to the country's renewable energy goals.

Ocean Energy: Given its extensive coastline, Portugal is exploring ocean energy technologies such as wave energy converters and tidal turbines.

Portugal's commitment to renewable energy, coupled with its favourable geographic and climatic conditions, positions it as a leader in the transition towards sustainable energy.

Empowering youth through ECs holds immense potential for driving the transition towards a sustainable energy future in Portugal. By addressing legal, financial, contractual, safety, social, and local barriers, youth ECs can emerge as catalysts for innovation and change. Collaboration among stakeholders, coupled with targeted interventions, supportive policies, and clear and speedier processes, is essential to harnessing the collective energy of youth

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and realising the full transformative potential of youth community-driven energy initiatives in Portugal.

According to the ERSE Open Data Portal[98], Mainland Portugal currently has 434 CSCs and 2 RECs. One of the RECs is located in the parish of Palmeira, Braga, while the other is active in the parish of Lumiar, Lisbon: the Telheiras/Lumiar Renewable Energy Community, promoted by the Telheiras Local Partnership. In addition, although certain projects are already technically operational, they are still awaiting formal approval from the DSO, which has caused significant delays in their integration into the energy grid. At this stage, the difficulties are not related to grid capacity constraints (such as lack of available connection points), but rather to procedural bottlenecks stemming from limited resources.

[98] https://e-redes.opendatasoft.com/explore/dataset/comunidades-de-energia/custom/?dataChart=eyJxdWVyaWVzIjpbeyJjaGFydHMiOlt7InR5cGUiOiJjb2x1bW4iLCJmdW5jIjoiU1VNIiwieUF4aXMiOiJjb250YWdlbV90aXBvX2FjY19jZXIiLCJzY2llbnRpZmljRGlzcGxheSI6dHJ1ZSwiY29sb3IiOiIjRkZEQzAwIn1dLCJ4QXhpcyI6ImRhdGEiLCJtYXhwb2ludHMiOm51bGwsInNvcnQiOiIiLCJ0aW1lc2NhbGUiOiJtb250aCIsImNvbmZpZyI6eyJkYXRhc2V0IjoiY29tdW5pZGFkZXMtZGUtZW5lcmdpYSIsIm9wdGlvbnMiOnt9fX1dLCJ0aW1lc2NhbGUiOiIiLCJkaXNwbGF5TGVnZW5kIjp0cnVlLCJhbGlnbk1vbnRoIjp0cnVlfQ%3D%3D

5. Analysis and results

5.1. Local Conditions Assessment and Barrier Analysis

For the assessment of the local conditions and analysis of the barriers in the five pilot countries and at the EU level, 560 individuals were involved in the process, as respondents in the survey, as experts or participants in the workshop that took place. The data collected from this process and the data from the desk research were combined, analysed and compared in order to provide tangible recommendations on how to overcome the barriers that young people face and facilitate their participation and leadership in ECs.

5.1.1. EU

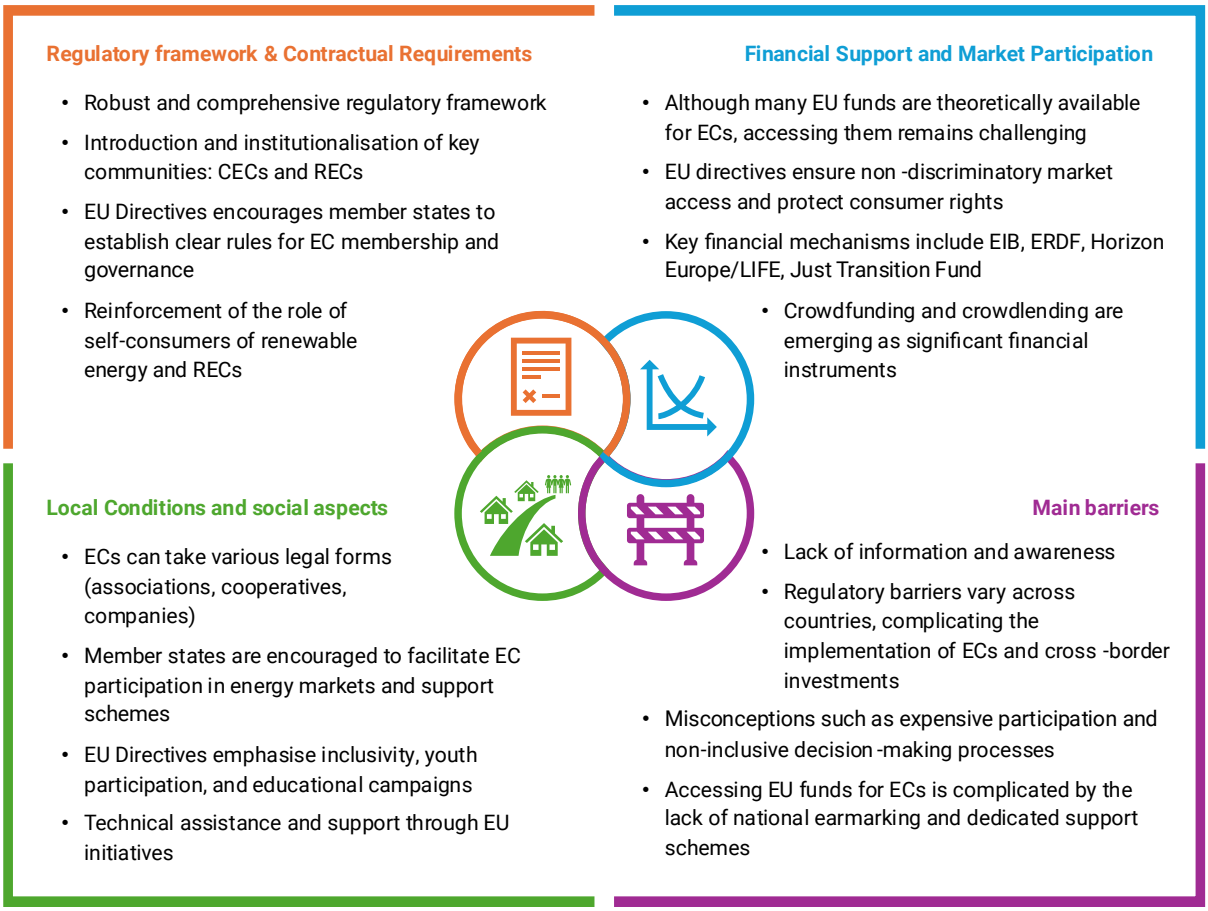

Figure 2: Summarised assessment results for Europe

The EU has established a robust legal framework to support ECs, which aims to empower citizens and local authorities to participate in the energy market, support renewable energy projects and enhance grid stability. Member states are encouraged to implement support schemes to ensure that ECs can participate equally in energy markets alongside larger entities. However, the implementation at the national level varies, with regulatory barriers hampering the establishment of ECs and cross-border investments. Security and data protection are also critical, with EU regulations ensuring the reliability and operational integrity of energy installations. GDPR mandates secure handling and transparency of personal data within ECs.

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Accessing EU funds remains challenging for ECs due to the lack of specific national support schemes and the earmarking of funds. While many EU financial mechanisms theoretically support ECs, such as the EIB, ERDF, Horizon Europe, LIFE programme, InvestEU programme, and the Just Transition Fund, practical access is limited. Additionally, crowdfunding and crowdlending have emerged as alternative financial instruments but face regulatory barriers and associated risks. The need for technical assistance is critical and is being addressed through initiatives such as the EC Repository and the Rural EC Advisory Hub.

Effective contractual relationships are essential for the success of ECs, based on the existing EU Directives. Contracts must clearly define membership criteria, rights, obligations, financial contributions, and the conditions of energy supply and distribution. The EU framework ensures non-discriminatory market access and protects consumer rights, emphasising transparency and fair competition. Governance structures should be clearly defined and promote fair participation in decision-making processes. Compliance with EU consumer protection laws, health and safety regulations, and GDPR standards is mandatory to ensure reliability and legal protection for all parties involved.

The survey participants were predominantly well-educated young adults, primarily from Italy, Germany, and Belgium, and provided important insights into the awareness and attitudes towards ECs. Despite this well-educated demographic, the survey revealed a significant lack of awareness of ECs among young Europeans. Most respondents were unfamiliar with the concept prior to the survey, and misconceptions about the relevance, costs, and impact of ECs appear to hinder their participation. Actual participation in ECs was extremely low, but a high proportion of the respondents expressed willingness to participate or invest in a local initiative. This indicates a substantial need for awareness-raising campaigns and education. The primary motivators of those who were willing to participate were found to be environmental protection, production of clean, green energy and community impact. Another positive finding of the survey was the high level of confidence in young people to establish and operate an EC. However, the lack of information, the insufficient support from local authorities, and community disinterest were indicated as major barriers. Effective strategies to stimulate participation include the provision of financial support tailored to the needs of young people, the establishment of accessible funding mechanisms, and the implementation of cost reduction measures.

The main barriers identified in the survey include a lack of awareness and information, insufficient local support, and financial concerns. The respondents expressed uncertainty about the adequacy of the financial incentives provided by the state or municipalities; many respondents indicated that they were undecided or felt that more support was needed. The desk research identified further obstacles, such as difficulties in accessing EU funding, regulatory challenges, and the need for technical assistance. While the EU framework is designed to promote inclusivity and encourage youth participation, the absence of specific provisions for youth ECs limits targeted youth engagement and support.

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5.1.2. Austria

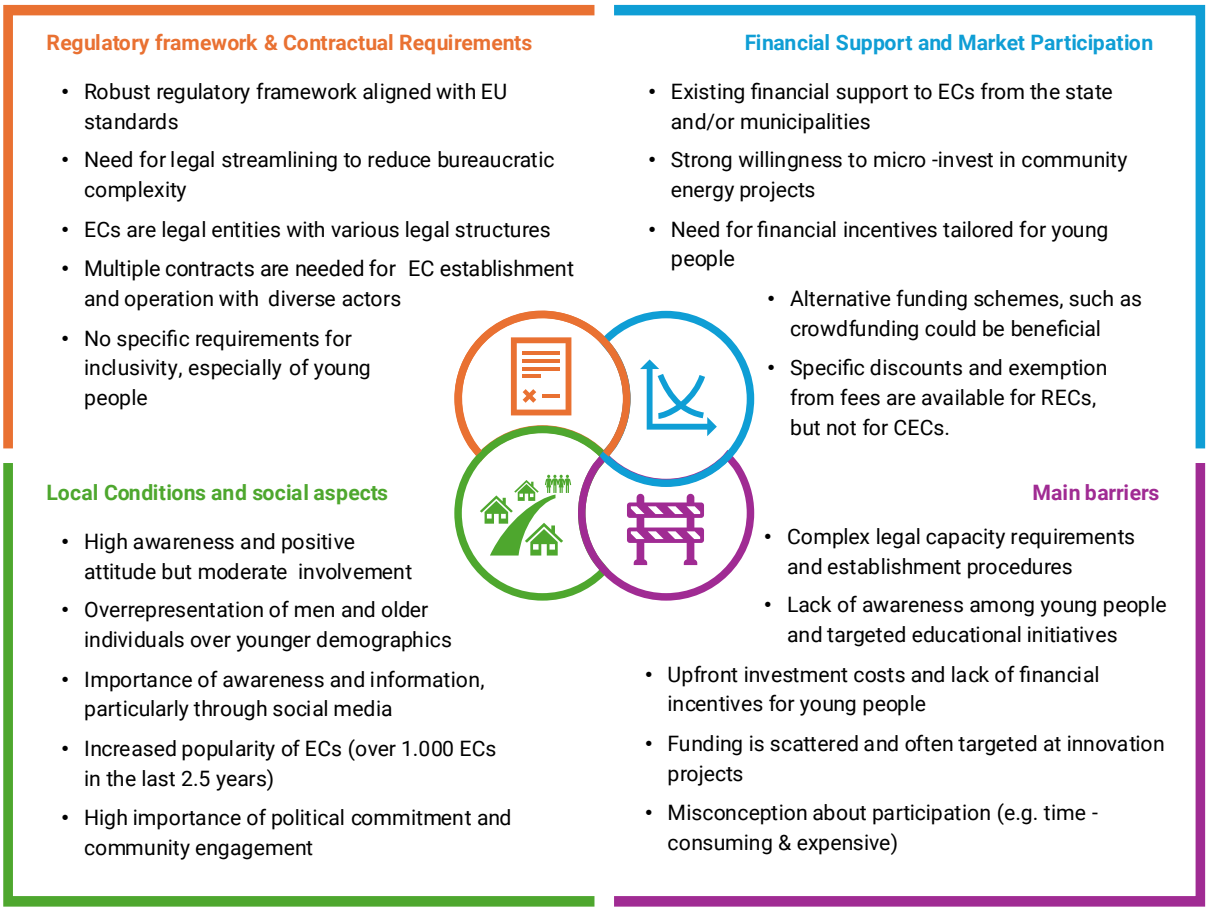

Figure 3: Summarised assessment results for Austria

Austria has a robust regulatory framework aligned with EU standards, but complexities exist. Most of the people engaged in the process were well aware of the regulatory environment for ECs in Austria, as evidenced by the survey. While there was a high awareness and positive attitude toward ECs and confidence in youth leadership by the participants, their involvement was found to be moderate and opinions differed regarding the ease of participation of young people in ECs. Furthermore, the workshop participants supported that streamlining legal procedures to reduce bureaucratic complexity could overcome policy barriers for young people.

Regarding the financial aspects of ECs, it was observed that financial incentives and funding are in place, although they were characterised as being scattered. A review of the literature reveals that significant financial barriers include the upfront investment costs, as well as the fact that funding is targeted at innovative projects, which does not apply to ECs. Additionally, the survey participants highlighted that financial misconceptions could pose a significant barrier, while the workshop participants identified financial concerns and insurance/liability issues when public land is utilised for community energy projects. The survey results indicate a willingness to invest in ECs, yet the introduction of financial incentives and alternative financing mechanisms is essential for facilitating the participation of young people in ECs. A noteworthy outcome of the survey is that the overwhelming majority of respondents expressed a willingness to make micro-investments in community energy projects.

Regarding the contractual relationships of an EC, although the legal requirements are clearly defined, multiple contracts are necessary for the establishment and operation of an EC.

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Consequently, people had mixed feelings about the ease of joining an EC, with a notable proportion remaining undecided. It is evident that the complexity of the process presents a challenge for the creation and operation of ECs, especially youth-led ones.

The lack of information and education was identified as a principal barrier to youth participation in ECs, as evidenced by the literature and confirmed by the majority of participants. The necessity for awareness campaigns, educational training/events and engagement strategies utilising social media for reaching young people is emphasised throughout the entirety of the research. The survey also identified the lack of incentives and lack of interest for the community as the most significant barriers to young people's participation, while the environmental protection and production of clean, green energy were identified as the main motivators. Additionally, financial incentives and the implementation of new innovative ideas were highlighted as major motivators for young people to participate and lead ECs.

The research revealed that participants identified several strategies to overcome existing barriers and facilitate the participation of young people in ECs. The survey results indicate that the most effective strategies are the simplification of regulatory processes, the provision of financial incentives and accessible funding mechanisms, including alternative funding schemes, and the establishment of peer-to-peer support networks or mentoring programmes. The experts and the workshop participants agreed that legal streamlining to reduce bureaucratic complexity and provision for financial support are necessary to support and facilitate the participation of young people.

The diverse topography and climate conditions of Austria provide an optimal environment for the generation of renewable energy from a range of sources. Currently, there are over 1,000 ECs in Austria. In the social context, it is evident that demographic imbalances exist, with an overrepresentation of older males. Conversely, inclusivity and engagement of younger demographics are low.

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5.1.3. Greece

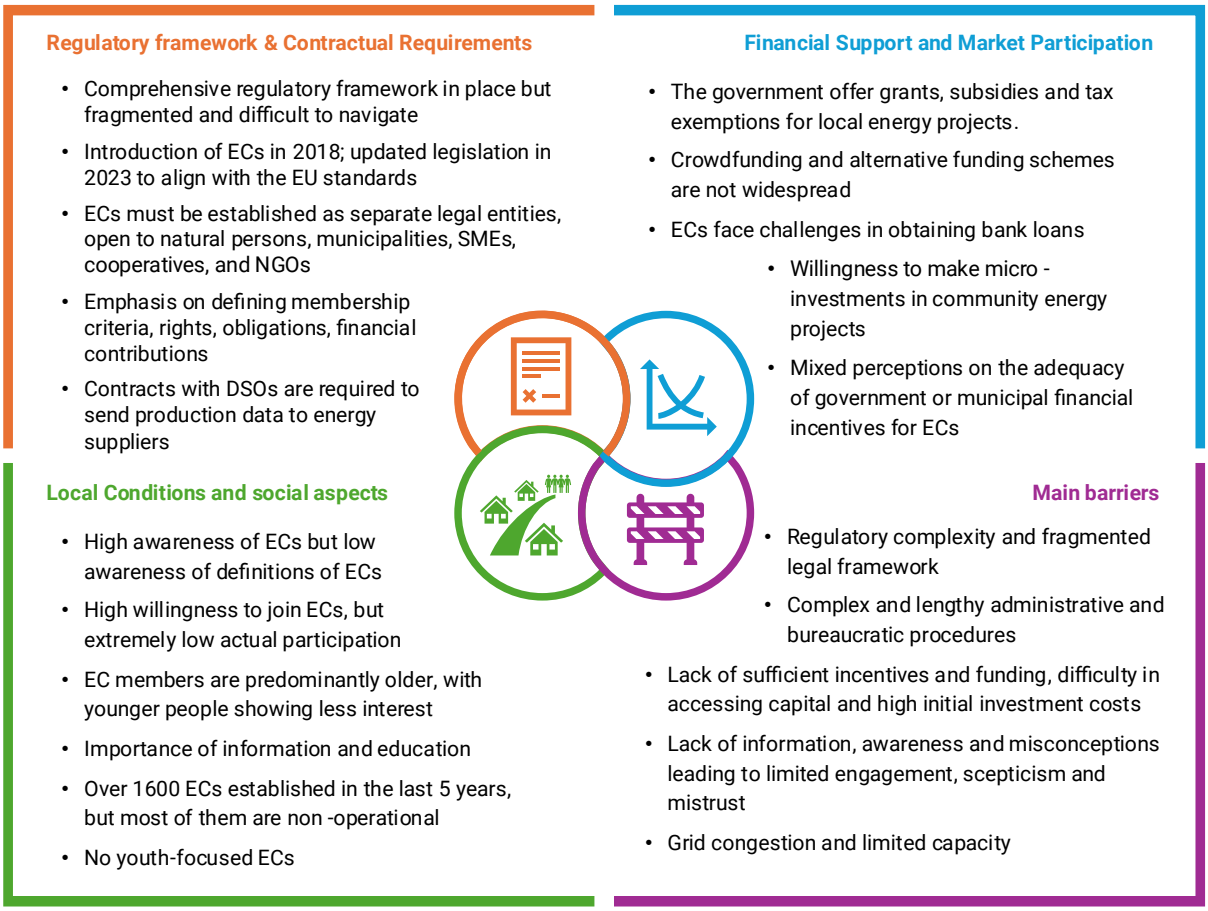

Figure 4: Summarised assessment results for Greece

Greece has a comprehensive regulatory framework in place, aligned with the EU directives, but it is characterised as fragmented and complex. The coexistence of three different EC models creates confusion and difficulties for communities wishing to adapt to the evolving regulatory environment. Many respondents of the survey were aware of ECs and their benefits, but the majority was unaware of the definitions of RECs and CECs. In the same context, willingness to join ECs and trust in youth leadership were high, but the actual participation was extremely low. Furthermore, opinions differed regarding the ease of participation of young people in ECs. The experts and the workshop participants highlighted the need to simplify the legal and bureaucratic procedures.

The desk research showcased that state and EU funds have been used for ECs and community energy projects. However, the survey revealed mixed perceptions of the adequacy of state or municipal financial incentives for ECs, while the workshop participants highlighted that the available funds are not sufficient. This is complemented by the experts' opinion that the state should provide more financial incentives, especially for young people. In many cases, young people lack the financial capacity to engage in such activities, while ECs face difficulties in accessing capital, as banks are often reluctant to support projects focused on collective self-consumption. This is a major obstacle for new community energy projects. Conversely, the survey results indicate that there is a willingness among a wider audience to invest in community energy projects.

Regarding the contractual relationships of an EC, the legal framework has established specific criteria and registration requirements, but as the survey and the workshop have pointed out,

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there is a need to define membership criteria, rights, obligations and financial contributions, which indicates a need to simplify administrative procedures. Contractual agreements are divided into those between the EC and its members (Statutes or Membership Agreement) and those with utilities or energy service companies. Bureaucratic procedures and funding conditions pose challenges to the establishment and maintenance of these contracts.

The lack of information and education was evident in the desk research and confirmed by the survey and workshop participants. In particular, workshop participants emphasised the role of municipalities and government in promoting ECs and conducting information campaigns that could address misinformation and misconceptions, which are a major barrier to participation, especially among youth. Furthermore, the survey indicated that scepticism and mistrust of groups that resemble associations is a significant barrier to the establishment and promotion of ECs. The survey also identified the lack of information, support from local authorities and absence of incentives as the most important reasons preventing young people from participating in ECs, while the environmental protection, production of clean, green energy and opportunities to make a positive impact on their communities were identified as the main motivators.

Financial incentives and putting, new innovative ideas into practice were also highlighted as major motivators for young people to participate and lead ECs, by a large proportion of the respondents. A significant gap in government-led efforts to promote and support ECs through information campaigns and training programmes was also emphasised by the experts. It is noteworthy that the grid capacity and network saturation were highlighted by the experts and workshop participants as major obstacles, since grid connection is a prerequisite for the implementation of community energy projects. The survey results also indicate that the vast majority of respondents believe that the current situation does not facilitate the operation of ECs.

During the research, participants identified several strategies to overcome existing barriers and facilitate the participation of young people in ECs. The survey results indicate that simplification of regulatory processes, financial incentives, cost reduction measures to make participation affordable and a supportive market environment for youth-led initiatives are the more efficient strategies. The experts proposed the linkage of public and EU funds to social criteria that favour youth engagement as a means of overcoming the financial constraints faced by younger individuals. They also suggested crowdfunding as a viable solution to finance small community energy projects.

The diverse topography and climate of Greece provide an ideal environment for the development of solar and wind power as primary sources of renewable energy. Currently in Greece, approximately 1.700 ECs have been established, but only a small proportion of them are operational and generate energy.

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5.1.4. Latvia

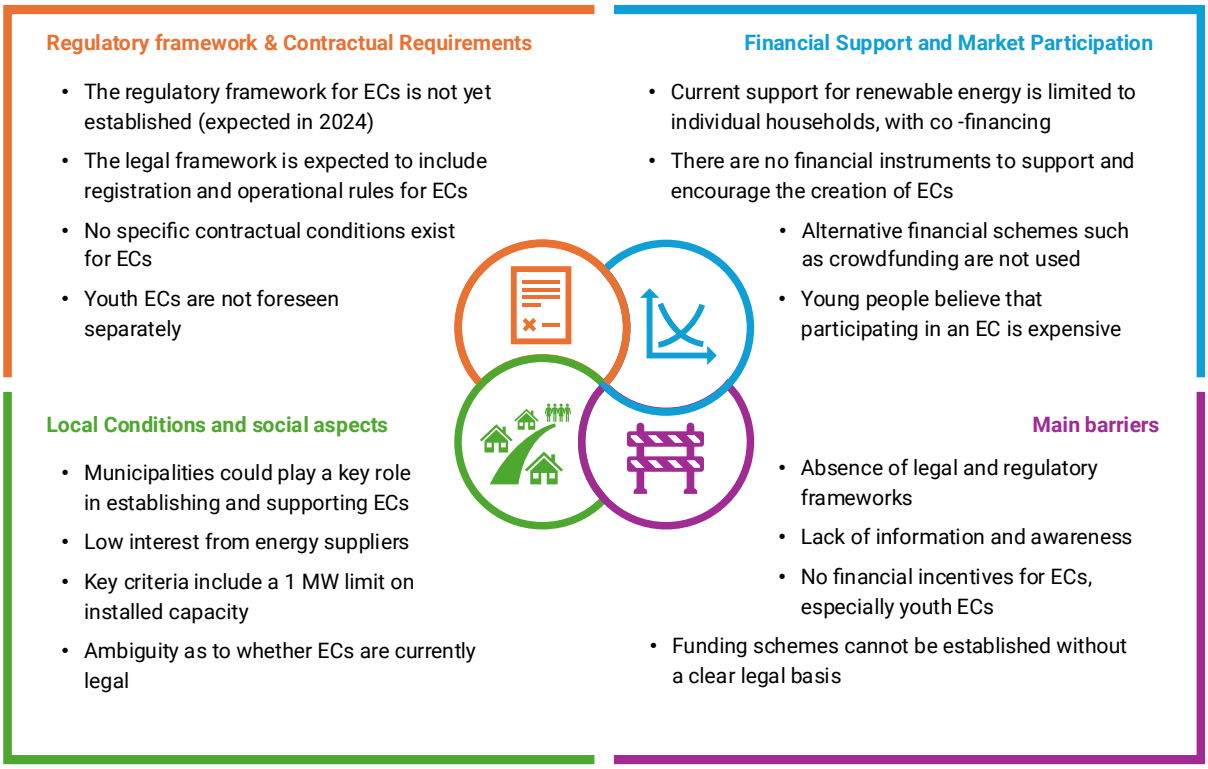

Figure 5: Summarised assessment results for Latvia

Currently, there is no specific framework for ECs in Latvia, however amendments to the Electricity Market Law are under public consultation and are expected in 2024. The new regulations aim to be both foundational and forward-looking, with the objective of fostering the growth of active customers and facilitating the development of renewable energy projects. The existing regulations permit the establishment of ECs under general laws, yet specific support and incentives are lacking. The establishment of ECs is hindered by the lack of clear contractual terms and practical cooperation issues, although general household and business contracts are possible. The survey respondents believe that the specification of financial contributions, financial rights and responsibilities, and the establishment of mechanisms to ensure revenue sharing to be the most important elements in the contractual relationship of ECs. Existing legislation allows individuals to install energy systems on their property and utilise the energy elsewhere. However, a comprehensive legislative framework specific to ECs is still under development.

The development of ECs in Latvia is hindered by the lack of financial support mechanisms and targeted subsidies. The current financial mechanisms and market support for ECs are insufficient, with no specific subsidies for youth ECs. It is anticipated that future funding will be provided by public sources and EU programmes. Potential future support includes funding from the Modernisation Fund and the EU Cohesion Programme. Current support includes financing for the purchase renewable energy technologies, but this is dependent on the solvency of the buyer, is limited to individual households and does not extend to ECs. The main barriers include the lack of a clear legal basis for support schemes, limited financial instruments, and misconceptions about the cost of participating in ECs. It is anticipated that public funding and support will become available once the regulatory framework is finalised.

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A further crucial factor influencing the development of ECs is the willingness of communities or individuals to invest and cooperate. The survey results indicate a moderate level of awareness of the concept of ECs and a willingness to participate, although actual participation remains low. The vast majority of the respondents remains undecided as to whether it is easy for young people to participate in ECs and whether the current situation facilitates the establishment and operation of such activities. There is considerable interest from municipalities, but practical challenges remain, such as low interest from energy suppliers and the need for a clearer legal framework. Youth involvement is crucial, but young people often lack time, knowledge, and interest in ECs. The survey participants indicated that social media and online platforms are not particularly effective in engaging young people, while workshop participants asserted that Eco-schools are instrumental in raising awareness.

Additionally, the survey identified a lack of information, the perception that these initiatives do not affect their daily lives, and a lack of interest in the community as the main barriers to young people's participation. In contrast, environmental protection, the production of clean, green energy, and financial incentives were identified as the main motivators. Previous initiatives, such as the Energy Cooperatives in Mārupe, have shown limited success due to low participation. Positive examples and clear models of cooperation are needed to foster successful ECs.

The research identified several strategies that could be employed to overcome existing barriers and facilitate the participation of young people in ECs. The survey results highlighted the simplification of regulatory processes, the provision of financial support and incentives, including alternative funding schemes, such as crowdfunding, and the implementation of cost reduction measures to make participation affordable as the more efficient strategies. In this context, the recommendations from the workshop participants include working with eco-schools, implementing awareness-raising campaigns, and learning from best practices in other European countries.

Latvia's geography and climate are favourable for renewable energy, with a significant share of electricity coming from renewable sources. Currently, there are only two (2) ECs operating as pilot projects to promote the idea of ECs, but unfortunately there is no involvement of young people.

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5.1.5. Poland

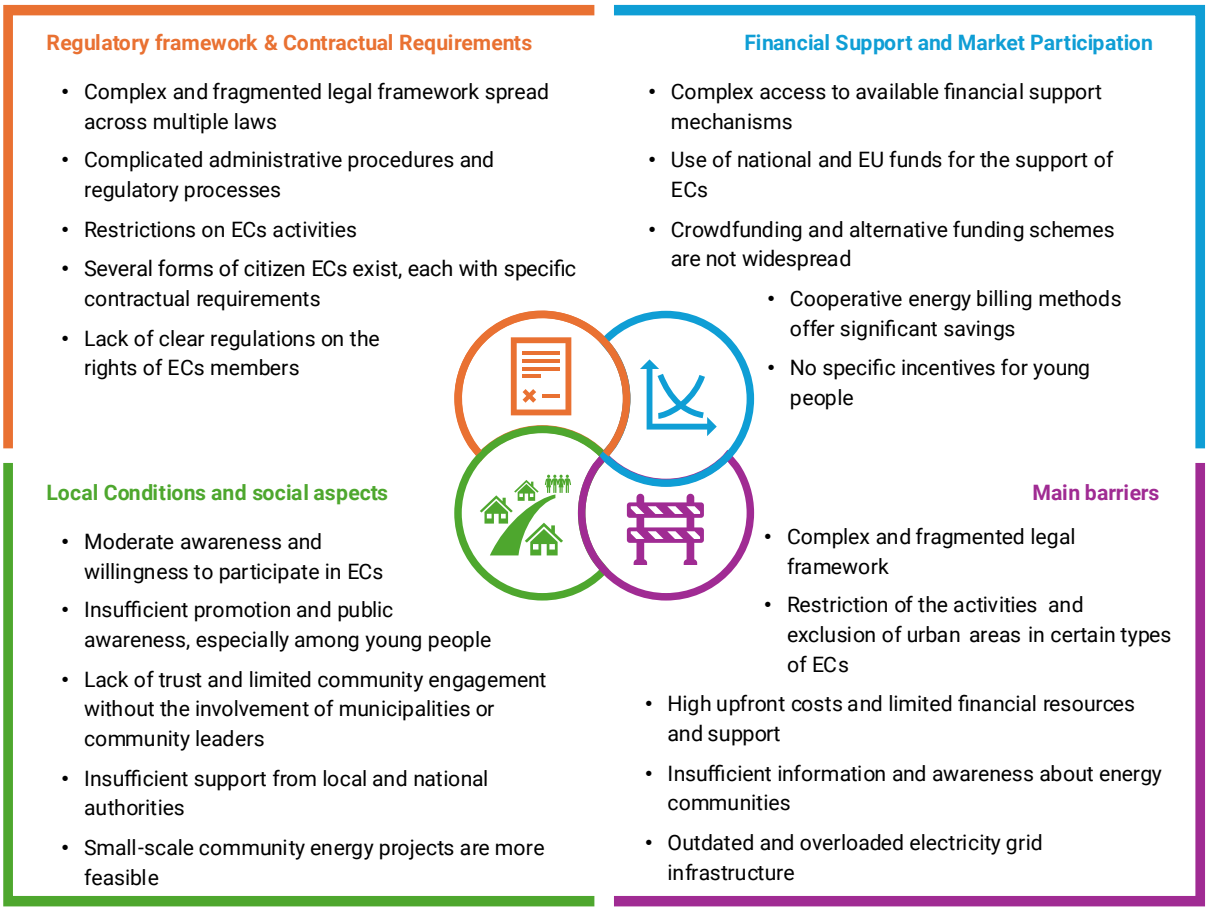

Figure 6: Summarised assessment results for Poland

The Polish legal framework, while supportive, is complex and fragmented across multiple laws, making it challenging for ECs to navigate. It is noteworthy that the current regulations exclude urban areas in certain types of ECs, which limits their potential reach and impact, contrary to EU directives. Additionally, ECs are confined to the generation of energy only for their members, which restricts their financial viability. It is evident that the legal framework requires an update to become aligned with EU directives and to simplify the regulatory processes. Furthermore, the workshop participants emphasised the necessity of streamlining regulatory processes and administrative procedures to reduce the complexity of establishing and operating ECs. The results of the survey indicated differing opinions on the willingness of respondents to join an EC and on the trustworthiness of young people in creating and managing such an initiative. Furthermore, the majority of respondents indicated that it is not easy for young people to participate in ECs.

The research highlighted the fact that the high upfront costs associated with the installation of renewable energy (RES) technologies represent a significant obstacle to the implementation of community energy projects. While various funding sources are available, accessing financial support is challenging due to bureaucratic procedures and complex regulations. Suggestions from the people engaged in the research include low-interest loans, simplified funding mechanisms, and financial instruments to support initial investments, especially for young people. Alternative funding schemes could also facilitate the implementation of community energy projects.

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Regarding the contractual relationships, the absence of clear regulations concerning the rights of ECs members, such as the ability to switch energy suppliers, represents a significant challenge. Currently, there are multiple forms of ECs in Poland, with distinct contractual obligations associated with each specific form. In each case, there is a number of different steps and processes that must be followed. This further complicates an already fragmented legal framework. Additionally, other formal or informal agreements are utilised, such as Memoranda of Understanding in cases of space allocation.

The survey results also demonstrated a lack of awareness and trust among residents regarding ECs and minimum participation. The lack of information and education was identified as a principal barrier to youth participation in ECs, as evidenced by the literature and confirmed by the majority of the survey participants, the experts and people engaged through the workshop. Social media could be utilised to reach out young people, while incorporating educational programmes into schools could reach the younger demographics. The survey also identified the lack of information and lack of interest for the community as the most important reasons that prevent participation from young people. Additionally, the survey revealed that many young people believe that they cannot be involved in the decision-making process and that it is expensive to invest in or participate in ECs. On the other hand, environmental protection, production of clean, green energy and financial incentives were identified as the main motivators. The crucial role of local authorities in fostering community engagement and providing support through the allocation of space and the creation of public tenders that include criteria that promote the participation of young people was also highlighted by the workshop participants. Furthermore, it was proposed that the national government and local authorities should adopt a more proactive approach to the promotion of ECs and the provision of educational opportunities.

Another obstacle for ECs is the outdated infrastructure, which hinders the integration of new and emerging renewable energy sources into the existing grid. The infrastructure constraints were examined in detail during the desk research. The respondents of the survey and the experts also highlighted this issue. Additionally, the survey results indicate that the majority of respondents believe that the current situation does not facilitate the operation of ECs or remain undecided.

The research identified several strategies to overcome existing barriers and facilitate the participation of young people in ECs. The survey results indicated that simplification of regulatory processes, financial support and incentives, and cost reduction measures to make participation affordable were the more efficient strategies.

Poland has significant potential for renewable energy sources, including wind, solar, biomass, and geothermal energy. Although the legal framework for the ECs was first introduced in 2016 and updated in 2019, the first EC was established in 2021. Currently there are 35 ECs in Poland, all of which operate in the field of PVs, while no youth ECs exist.

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5.1.6. Portugal

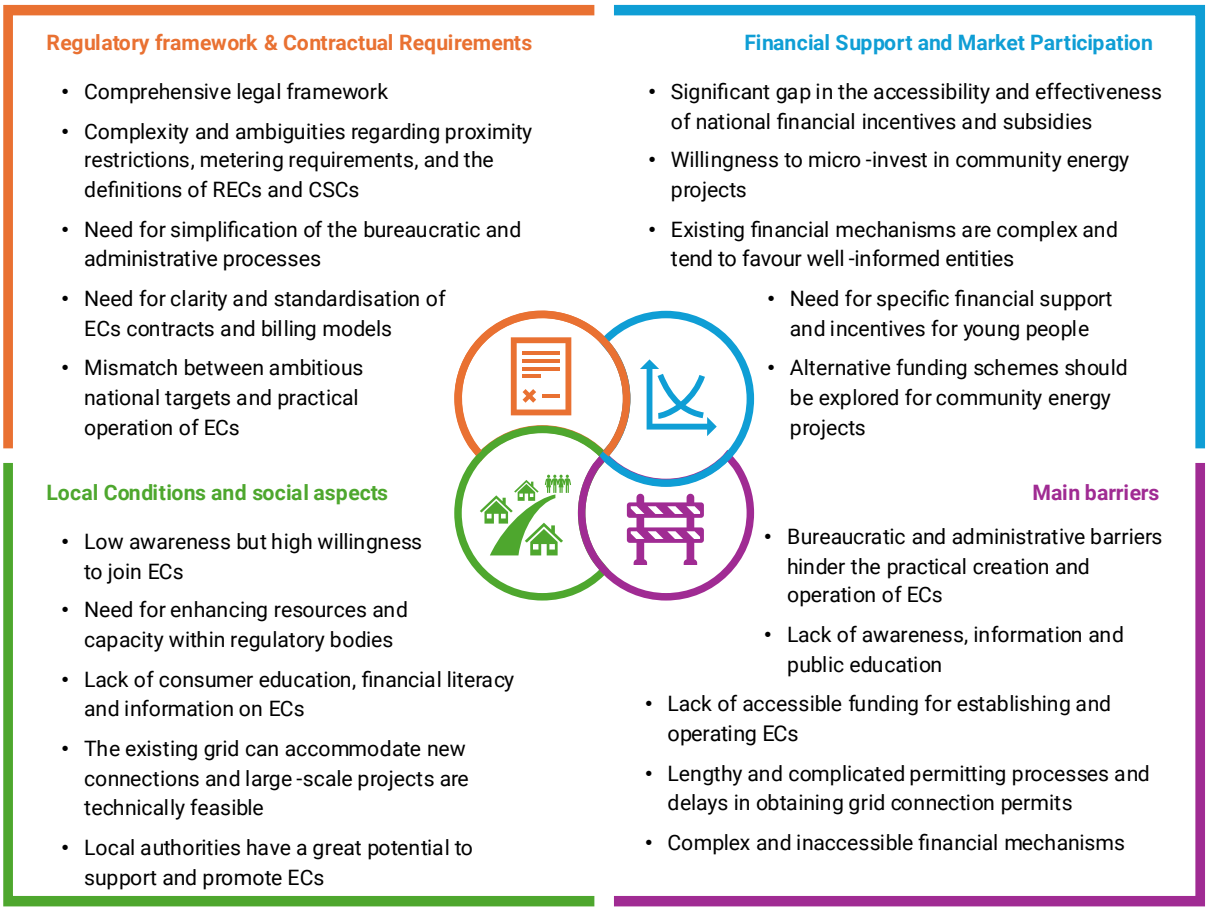

Figure 7: Summarised assessment results for Portugal

Portugal has a comprehensive legal framework for ECs, but complexity and ambiguities are observed with issues such as proximity restrictions, metering requirements, and unclear definitions of RECs and CSCs. There is a consensus that the regulatory and administrative processes are too complex and need to be simplified to encourage participation. The desk research notes the lengthy and complicated permitting processes, while the experts suggest clarification and simplification of legislation. Furthermore, the workshop participants highlighted the need for streamlined administrative support and many survey respondents also suggested the simplification of regulatory processes. In addition, the survey results and expert interviews revealed a critical aspect of the contractual conditions of the ECs with all relevant stakeholders; the need for clarity and standardisation in contracts to reduce confusion, ensure trust and minimise disputes. In this regard, experts proposed the implementation of Contractual Relations Regulations similar to those applied to electricity distribution companies.

The research additionally identified complex financial mechanisms and initial costs as significant barriers to the participation and development of ECs. The need for accessible funding, alternative funding schemes, and tailored financial support is evident. The experts also highlighted that the complex financial mechanisms favour well-informed entities, creating social disparities. A noteworthy outcome of the survey is the high proportion of respondents who expressed a willingness to engage in micro-investments in community energy projects.

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The research findings indicate a significant lack of awareness and understanding of ECs among the general public, particularly among young people. The majority of the survey respondents was either unaware or unsure of the concept of ECs, while the engagement with them was minimal and opinions differed as to whether it is easy for a young person to join an EC. Despite the lack of awareness, a significant proportion of the respondents expressed willingness to join an EC, should one become available locally, and expressed confidence in young people to create and manage ECs. In the same context, the experts and workshop participants emphasised on the importance of information dissemination, public education campaigns and awareness activities. Training programmes and educational initiatives aiming to promote awareness, participation and financial literacy, provide consumer education and capacity building. The results of the survey indicate that social media and online platforms are perceived as the most effective tools for engaging young people by the vast majority of the respondents.

The survey also identified the lack of information and incentives as the most important barriers to young people's participation. Additionally, the survey revealed that many young people perceive themselves to be excluded from the decision-making process and hold the view that it is expensive to invest in or participate in ECs. On the other hand, environmental protection, production of clean, green energy, opportunities to make a positive impact in their communities and financial incentives were identified as the main motivators. Nevertheless, the majority of the respondents either does not believe that the current situation facilitates the operation of ECs or remains undecided.

The research participants identified several strategies that could be employed to overcome existing barriers and facilitate the participation of young people in ECs. The survey results indicate that the most effective strategies for increasing participation are the simplification of regulatory processes, the provision of financial support and incentives, the facilitation / establishment of accessible funding mechanisms, including alternative funding schemes, and the application of cost reduction measures to make participation affordable. In this context, the experts proposed streamlining the legal framework and bureaucratic processes, establishing large-scale financing funds, facilitating crowdfunding for smaller projects, and exploring private financing options as potential solutions.

Local authorities are perceived by the majority of those involved in the research as key promoters that must adopt a proactive approach and facilitate community energy projects and ECs. The city of Porto provides an illustrative example of a municipality that engages in collaborative projects with both the private and public sectors, offers financial incentives, supports alternative financing mechanisms and provides substantial non-legal support, including technical assistance, capacity building, and administrative support. These practices could be considered a best practice for municipalities across the country. Currently, the existing grid can accommodate new connections, but some adjustments and upgrades are necessary to handle high voltages from distributed generations.

Portugal's diverse geography and climate are suitable for various renewable energy sources, including wind, solar, hydropower, biomass, and ocean energy. Solar energy through PV installations is the most common at the moment.

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5.2. Comparative Analysis

This analysis compares the quantitative and qualitative data and information collected from the research in the five pilot countries and at EU level to identify commonalities and differences.

Legal and regulatory frameworks and contractual conditions

Regulatory frameworks vary widely across the EU, with some countries having comprehensive frameworks that require simplification and other having frameworks that require updating or establishing the rules.

Austria, Greece and Portugal have established legal frameworks for ECs that to a greater or lesser extent are in line with EU directives. However, these frameworks face challenges due to their complexity and fragmentation; in Greece, the transition from the old to the new legal framework is causing confusion; Austria faces challenges due to complex legal capacity requirements and establishment procedures; Portugal's regulations are sometimes complex and ambiguous. The need to simplify bureaucratic procedures and administrative processes in order to make them more efficient and accessible it is recognised in all countries. Poland, on the other hand, has a complex and fragmented legal framework that requires updating and simplification to align with EU directives. The legal framework needs to remove restrictions on activities and exclusion of geographical areas. Latvia is the only country that does not yet have a legal and regulatory framework for ECs. The framework is under development and is expected to be finalised in 2024.

The contractual conditions reflect the varying degrees of regulatory and contractual complexity faced by ECs in different countries, which have an impact on their establishment and operation.

In Austria, ECs require multiple contracts for their establishment and operation involving different actors. There are no specific inclusivity requirements, particularly for young people, and the complexity of legal capacity requirements and establishment procedures is a significant barrier. In Greece, ECs must be separate legal entities open to natural persons, municipalities, SMEs, cooperatives, and NGOs, with required contracts DSOs. While specific criteria and registration requirements are established, there is a need to simplify administrative procedures. In Latvia, no specific contractual conditions exist for ECs, mainly due to the lack of a legal and regulatory framework. Poland faces a complex and fragmented legal framework spread across multiple laws, with several forms of citizen ECs each having specific contractual requirements. There is a lack of clear regulations on the rights of EC members, such as switching energy suppliers, and the multiple forms of ECs with distinct contractual obligations further complicate the legal landscape. Portugal has a comprehensive legal framework but faces complexities and ambiguities in the definitions of RECs and CSCs. EC contracts and billing models are clear and standardised.

Financial support and market design

Financial support and market restrictions for ECs in Austria, Greece, Latvia, Poland, and Portugal reveal several common trends and noteworthy differences.

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The lack of dedicated financial support and incentives is a common challenge for almost all pilot countries. In many countries, incentives and support from the state and/or local authorities were found to be insufficient or inaccessible. Complexity in accessing funds was a common trend in Greece, Poland and Portugal. Even in the case of Austria, although financial support exists, it is scattered and often targeted at innovation projects. In Latvia there are no financial incentives for ECs, mainly due to the lack of legal and regulatory frameworks for these communities. The high initial costs for establishing ECs are a common barrier in all countries, which is particularly pronounced in Greece and Poland.

In most countries, there is also a lack of financial incentives for young people, although this was identified by the survey and workshop participants as one of the main motivations for young people to join or lead ECs. Based on the survey, one of the main misconceptions young people have about ECs is that it is expensive to participate. This is also a barrier that hinders participation.

Alternative sources of financing for community energy projects are not yet widespread. While funding schemes such as crowdfunding are promising, they are underutilised. Portugal demonstrates potential in this area, but bureaucratic hurdles limit the effectiveness of existing financial incentives.

Of course, each country faces specific financial barriers.

Austria has existing financial support from state and municipal sources. There is a strong willingness to micro-invest in community energy projects, but there is a need for tailored financial incentives for young people. Alternative funding schemes such as crowdfunding could be beneficial, but the current support is scattered and often targeted at innovation projects rather than community energy projects.

Greece offers national and EU funding for community energy projects, but perceptions of adequacy vary. The country faces challenges in obtaining bank loans and requires more financial incentives for young people. Alternative funding schemes such as crowdfunding could be beneficial with a moderate willingness to micro-invest in community energy projects. Crowdfunding is seen as a viable solution for small projects.

Both Latvia and Poland have limited financial support mechanisms, and accessing available financial support is complex due to bureaucratic procedures and regulatory barriers. In Latvia, current support is limited to individual households with a low willingness to micro-invest in community energy projects, while in Poland, the willingness was moderate. The country's cooperative energy billing methods offer savings, but the overall financial mechanisms are complex.

Portugal faces significant gaps in the accessibility and effectiveness of national financial incentives and subsidies. Existing financial mechanisms are complex and tend to favour well-informed entities. There is a strong willingness to micro-invest in community energy projects, but there is a clear need for specific financial support for young people and exploration of alternative funding schemes.

Demographics

The demographic characteristics refer to the survey respondents from the five pilot countries (Austria, Greece, Latvia, Poland and Portugal) and at European level. The demographic data shows several commonalities and differences between the countries.

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Commonalities include a significant proportion of the respondents being in the 18-24 age group, with high representation in Greece (36%), Latvia (41%), Portugal (56%), and the EU average (39%). Similarly, the 25-34 age group is well represented in Austria (45%), Poland (50%), and the EU average (39%). In terms of educational attainment, a substantial proportion of the respondents holds a Master's degree, especially in Austria (35%), Poland (55%), and the EU average (45%). In terms of employment, the private sector employs the majority of respondents in Austria (53%), with significant proportions in Greece (47%) and in Poland (33%). Additionally, there is a high representation among students in Latvia (64%) and Portugal (63%), and the EU average (33%).

Differences are also evident. Latvia has a particularly high percentage of individuals under 18 years old (30%), compared to significantly lower or non-existent percentages in other countries. The 65+ age group is only present in Austria (13%) and Greece (4%). In terms of educational attainment, Latvia has an extremely high percentage of high school students (66%), contrasting with very low percentages elsewhere, and Greece has a notable proportion of participants with Bachelor's degrees (26%). Portugal stands out with a high percentage of individuals aged 18-24 (56%) and college/university students (44%). Poland has a high percentage of individuals with a Master's degree (55%) and significant representation of the public sector (29%). Austria has a considerable proportion of the population in the 25-34 age group (45%) and those with a Doctorate degree (13%).

Awareness and Youth Participation

Awareness and youth participation levels differ across countries. Austria has high awareness and a positive attitude but moderate involvement, highlighting the need for youth engagement and simplification of procedures. Greece has high awareness but face low participation due to regulatory, bureaucratic and financial barriers. Portugal and Poland, despite lower awareness, shows high willingness to join ECs, indicating growth potential with proper education and support. Latvia has moderate awareness but low engagement, requiring more clarity and support.

This lack of information is a major barrier to participation. There are also notable gaps in education and training related to ECs. Many potential participants, especially young people, lack the necessary knowledge and skills to engage effectively in EC initiatives. Another common trend is the limited interest from young people in participating and leading ECs. Youth engagement is generally low, often due to a lack of awareness or misconceptions about ECs. In Greece and Latvia, there are substantial gaps in education and training for new ECs. Similarly, in Poland, a lack of knowledge and awareness deters youth participation. Cultural scepticism towards collective initiatives like ECs affects participation rates. In Poland and Greece, there is a general mistrust of associations resembling ECs, which further hinders participation. Digital tools and social media are seen as effective means of engaging young people, suggesting that digital strategies may be crucial to increase youth participation in ECs, in Austria, Greece, Poland and Portugal.

The importance of increasing public awareness and education to facilitate the participation and engagement of communities, especially young people, in ECs was recognised in all pilot countries, especially from the participants of the survey and the workshops.

Motivators and Strategies

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The key aspects motivating young people were almost the same in all countries, with slight differences in their ranking. The protection of the environment and the production of clean, green energy were identified as the main motivators for youth participation in ECs in all pilot countries. In Austria and Poland, financial incentives come in second place and the implementation of new innovative ideas in third place. In Greece and Portugal, the opportunity to have a positive impact on their communities comes second and financial incentives third, while in Latvia the reverse is true. It is noteworthy that at EU level, while protecting the environment and producing clean, green energy remains the most important motivator, with the opportunity to make a positive impact coming in second, equal participation in the activities of the ECs and in the decision-making process comes in third.

Infrastructure and RES potential

Available infrastructure and grid capacity for ECs among countries. In Greece and Poland, the existing grid infrastructure is outdated, hindering the integration of new and emerging renewable energy sources. Significant upgrades and investments in grid infrastructure are necessary as both countries face grid congestion and limited capacity, which are major obstacles for the proper operation of ECs.

The existing grid in Portugal can accommodate new connections, making large-scale projects technically feasible. Despite feasibility, enhancements and upgrades are necessary to handle increased capacity and distributed generations.

Each country has unique geographical and climatic advantages that can be exploited for renewable energy production. Austria has an optimal environment for generating renewable energy from a variety of sources due to its diverse topography and climate conditions. Greece offers an ideal environment for the development of solar and wind power as primary sources of renewable energy, with its diverse topography and climate being highly favourable. Latvia benefits from favourable geography and climate for renewable energy, with a significant share of its electricity already coming from renewable sources. Poland has significant potential, including wind, solar, biomass, and geothermal energy. Portugal possesses a diverse geography and climate suitable for various renewable energy sources such as wind, solar, hydropower, biomass, and ocean energy, with solar energy through PV installations being the most common.

Local conditions

Some unique local conditions are observed per country. Austria has seen successful EC projects in rural areas, such as REC Göttweitblick and REC Premstätten, despite the challenges the ECs face. There is a focus on utilising public land for ECs, which helps mitigate some of the space-related issues faced in urban areas and there is a relatively higher level of political commitment to supporting ECs. In Greece there are notable disparities in EC success and participation between different regions. ECs face significant grid capacity constraints and long waiting times for grid connections. Although the challenges exist, successful ECs like ChalkiOn and Minoan Energy, highlight the potential for overcoming these barriers with strong community and stakeholder engagement. Latvia's lack of a specific legal framework for ECs adds to the infrastructure challenges, making it difficult to establish new projects. While there are restrictions on high-power connections, smaller producers face fewer hurdles, allowing for some level of participation. Poland has specific legal and contractual challenges that hinder

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the development of ECs, impacting local conditions negatively. Urban areas face more significant challenges due to higher bureaucratic and regulatory hurdles compared to rural areas. Initiatives in cities like Niepołomice show potential despite the general challenges faced by ECs. Portugal has stringent proximity restrictions and metering requirements that complicate the establishment and operation of ECs. While the existing grid can support new ECs, substantial infrastructure upgrades are needed to fully realise this potential. The two renewable energy projects in Trás-Os-Montes show potential despite the delays in their integration into the energy grid.

5.3. Recommendations

Based on the Local Conditions Assessment, Barrier Analysis and Comparative Analysis, some recommendations and strategies are proposed in order to overcome identified barriers and capitalise on opportunities for youth engagement in ECs, prioritising the actions based on their potential impact, feasibility, and alignment with local conditions and stakeholders' interests.

Awareness and education:

1. Continued efforts in education, capacity building, upskilling and policy support are essential to increase awareness and promote the adoption of ECs, which include:
    - Developing training programs for the establishment and operation of ECs, which currently do not exist in the short, medium, or long term.
    - Organising workshops and webinars focusing on energy literacy, renewable technologies, and sustainability practices.
    - Comprehensive training for both potential young members and community leaders can foster greater participation.
    - Integrate topics related to ECs, sustainability, and renewable energy into school and university curricula across the EU.
    - Early education can foster interest and understanding among young people.
2. Run awareness campaigns:
    - Use compelling messages, hopeful storytelling and interactive content.
    - Use social media platforms to promote success stories and educational content about youth energy projects.
    - Publish case studies and success stories of youth-led energy projects, highlighting achievements that could motivate others to participate.
3. Dissemination:
    - Effective dissemination of information about the regulatory framework, legal requirements, incentives, and compliance procedures is crucial. This helps stakeholders, including community members, energy suppliers, and grid operators, to navigate the complex landscape of EC regulations.
    - Establishment of Information Centres or One-stop-shops with the aim to provide resources like tools, materials, and training for energy projects, targeting especially to young people.
    - Battling misinformation and misconceptions around the idea of ECs, could lead to their active participation and leading of ECs.

Financial support:

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1. Providing subsidies, grants, and low-interest loans specifically for young people can reduce financial barriers. This could be achieved by:
    - Ensuring access to financing, by creating a specific fund for the creation of ECs and implementation of community energy projects.
    - Making the application processes for financial support more straightforward and accessible is crucial.
    - Establish EU-wide funding mechanisms specifically aimed at supporting young people in setting up and joining ECs, could also be beneficial.
2. The Regional Development Fund, the Just Transition Fund and the Recovery and Resilience Fund could be used to support the creation of youth ECs or facilitate the involvement of young people in existing ones, especially in rural and remote areas.
3. Introducing small-scale investment opportunities and promoting crowdfunding and other innovative financing methods can help young people invest in ECs and lower financial barriers they face. These methods could make participation feasible for young individuals without substantial capital. There are several best practices, showcasing how to finance small community energy projects using alternative financing mechanisms.

Engagement:

1. Active support and promotion from government bodies can foster youth participation. Local authorities and community leaders should actively engage with young people. Also, policy advocacy and support are also key actions to overcome the identified barriers, especially in cases where the grid is outdated, saturated or uncapable to connect new projects.
2. Foster community engagement by involving local leaders and organisations in promoting ECs.
    - Build trust and demonstrate the social and economic benefits of participating in energy initiatives.
    - Establish councils or committees within communities that focus on energy projects led by young people and/or create a network of Ambassadors. Micro-grants or scholarships could be used for this purpose.

Legal and regulatory framework:

1. Simplify and streamline the legal processes and providing clear guidelines can make it easier for youth to participate. Develop inclusive policies that allow young people under 18 to participate in ECs, potentially through guardianship or mentorship programs.
2. Simplify administrative procedures to avoid delays and high administrative costs.
3. Establish mechanisms for monitoring and evaluating the effectiveness of these incentives, ensuring they meet the needs of young people and driving participation in ECs. The Coordination Office for ECs that Austria has established represents a really good example

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Local Conditions and Infrastructure:

1. Replication of successful models can provide a pathway to overcoming local barriers. Some effective initiatives could be:
    - Identify and showcase successful EC projects across the EU that have effectively engaged young people.
    - Use these examples as models to inspire and guide new initiatives.
    - Beneficial is also the showcasing of projects and ideas that failed, the challenges that many ECs face and the possible solutions.
2. Invest in upgrading grid capacity and infrastructure to support the integration of new ECs. Ensure that regulatory processes for grid connections are efficient and transparent.

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6. Conclusion

As Europe's energy transition progresses and ECs gain momentum and popularity across an increasing number of European countries, it is evident that young people should not only actively participate in, but also lead such initiatives and benefit from the opportunities they offer. This deliverable has revealed that although awareness of ECs is gradually improving, significant barriers continue to hinder youth engagement. These barriers are multifaceted and include the lack of accessible information, fragmented and often complex legal frameworks, bureaucratic administrative procedures, limited financial incentives, difficulties in accessing the available funding, high upfront costs for project installation, insufficient use of alternative financial instruments, inconsistent support from national and local authorities, and unclear contractual requirements, all of which are compounded by infrastructural limitations.

As the legislative frameworks in the EU countries are beginning to take shape, the most critical obstacles to youth participation are still concentrated in two key areas: access to funding and access to information. These challenges, which emerged as important in both the quantitative and qualitative research conducted, illustrate that without dedicated measures to improve transparency, simplify procedures and expand financing options, young people will continue to encounter disproportionate barriers to becoming active contributors in the energy transition.

This report is the result of an extensive effort combining desk research, expert interviews, survey analysis and stakeholder workshops, reflecting contributions from more than 500 participants primarily from from five (5) EU countries (Austria, Greece, Latvia, Poland and Portugal). The extensiveness of evidence ensures that the findings not only capture the perspectives of young people themselves but also the insights of experts, municipalities, cooperatives and policy actors who are actively shaping the energy transition. The comparative approach has revealed both common European trends and country-specific particularities, showing that although the drivers of youth participation are similar, their expression and weight vary according to local, institutional, social and infrastructural conditions.

A key objective of this work has been to provide a comprehensive baseline for identifying and removing unjustified barriers to youth participation in ECs. The findings highlight that fostering youth-led ECs requires a holistic strategy that integrates education, information provision, financial support, local authority involvement, and the streamlining of regulatory and administrative frameworks. This report has emphasised that municipalities, in particular, can serve as crucial enablers by providing space, technical assistance and financial or in-kind support, while also acting as intermediaries between young citizens and the broader cooperative sector. Equally important is the need to tailor communication strategies to highlight not only environmental benefits but also the economic and social value of ECs, since the prospect of creating local jobs, retaining resources within communities and strengthening social cohesion has been shown to resonate strongly with younger audiences.

The conclusions of this study go beyond a simple identification of barriers. They also illustrate that the active engagement of young people in ECs contributes to a more democratic and inclusive energy transition, one that strengthens civic participation, fosters innovation, and enhances the resilience of local communities. The analysis has shown that when youth engagement is supported by enabling conditions (e.g. transparent policies, financial accessibility, strong local leadership) participation rates rise, trust in collective initiatives increases, and the sustainability of ECs is reinforced.

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Looking forward, the work carried out for this deliverable will directly feed the POWERYOUTH approach, which aims to convert these findings into actionable tools, policy recommendations, and capacity-building activities. The insights gained, provide a roadmap for overcoming existing barriers as well as a call to action for European and national institutions, municipalities, and community leaders to recognise young people as indispensable partners in the energy transition. By doing so, Europe can ensure that the momentum towards renewable energy and community empowerment is accompanied by intergenerational fairness, inclusivity and long-term sustainability.

In conclusion, youth-led ECs represent more than an energy model; they embody a wider social innovation that integrates climate action with community empowerment and democratic governance. The implementation of the recommendations proposed in this deliverable, at both national and EU level, will be decisive in transforming interest into concrete participation, and participation into leadership. By enabling the younger generation to play a meaningful role, the energy transition can be accelerated in a way that is fair, participatory and future-oriented, laying the foundation for resilient, inclusive and sustainable communities across Europe.

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Annex I: Questionnaire

This survey is launched as the first consultation activity of the project "Empowering Youth for Energy Community Actions (POWERYOUTH)", a three-year project co-funded by the European Union under the LIFE Programme under the European Climate, Infrastructure and Environment Executive Agency (CINEA).

The project aims to empower young people to play an active role towards the energy transition. The cornerstone of the POWERYOUTH concept is a participatory approach that establishes a dialogue between youth and local stakeholders (such as local authorities, policy makers) and empowers young people in actively participating in energy communities.

The survey takes about 10 minutes. Responses will be treated anonymously and the results will be used for research purposes only.

1. Please indicate your country:
   - ○ Austria
   - ○ Greece
   - ○ Latvia
   - ○ Poland
   - ○ Portugal
   - ○ Other: _____

2. Please indicate the sector in which you work:
   - ○ Private sector
   - ○ Public sector
   - ○ NGO/ Not-for-profit organization
   - ○ None of the aforementioned / I am a student
   - ○ Other: _____

3. Please indicate your level of education:
   - ○ High school student
   - ○ High school graduate, diploma or equivalent
   - ○ College/University student
   - ○ Trade/technical/vocational training
   - ○ Bachelor's degree
   - ○ Master's degree
   - ○ Doctorate degree
   - ○ Other: _____

4. Age group:
   - ○ under 18 years old
   - ○ 18-24 years old
   - ○ 25-34 years old
   - ○ 35-44 years old

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- ○ 45-54 years old
- ○ 55-64 years old
- ○ 65+ years old

5. To which gender identity do you identify most?
   - ○ Female
   - ○ Male
   - ○ Transgender Female
   - ○ Transgender Male
   - ○ Genderfluid / Non-conforming
   - ○ Prefer not to answer

Information regarding Energy Communities

Before you proceed, please read some information regarding Energy Communities and Initiatives:

Energy Communities are:

Citizen-driven energy actions that contribute to the clean energy transition, advancing energy efficiency within local communities.

Citizen Energy Community (CEC)

A legal entity that is based on voluntary and open participation, effectively controlled by shareholders or members who are natural persons, local authorities, including municipalities, or small enterprises, and micro-enterprises.

Renewable Energy Community (REC)

A legal entity that is based on open and voluntary participation, autonomous, effectively controlled by shareholders or members that are located in the proximity of the renewable energy projects that are owned and developed by that legal entity. The shareholders or members can be natural persons, SMEs or local authorities, including municipalities. The activities of a REC have to be RES-based, either engaging in generation, or supply, aggregation etc.

Example of a community energy project

Community solar projects enable multiple households, businesses, or organizations within a community to collectively share the benefits of solar energy generation, even if they cannot install solar panels on their own properties. An EC installs a solar PV (PV) array on a community centre roof. The generated solar electricity will be shared among participating community members, allowing them to benefit from clean, renewable energy while reducing their electricity bills and carbon footprint.

Introductory questions

6. Before reading the above text, were you aware of the concept of Energy Communities and their potential benefits?

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- ○ Yes
- ○ No
- ○ Maybe / I am not sure

7. Before reading the above text, did you know the definitions of the different types of Energy Communities (REC/ CEC)?
   - ○ Yes
   - ○ No
   - ○ Maybe / I am not sure

8. Are you familiar with examples of community energy projects?
   - ○ Yes
   - ○ No
   - ○ Maybe / I am not sure

9. Do you know of any Energy Community/Cooperative active in your region/country?
   - ○ Yes
   - ○ No
   - ○ Maybe / I am not sure

10. Are you a member of an Energy Community or other citizen-led initiative?
    - ○ Yes
    - ○ No

Social barriers

Please indicate your level of agreement with the following phrases.

1 = Strongly Agree, 2 = Agree, 3 = Undecided/I don't know, 4 = Disagree, 5 = Strongly Disagree

11. It is easy for a young person to be part of an Energy Community.

Strongly agree □ □ □ □ □ Strongly disagree

12. The national/local government provides financial incentives for the establishment of Energy Communities.

Strongly agree □ □ □ □ □ Strongly disagree

13. I am aware of the benefits of being part of an Energy Community.

Strongly agree □ □ □ □ □ Strongly disagree

14. The current situation facilitates the operation of Energy Communities and the production and use of energy.

Strongly agree □ □ □ □ □ Strongly disagree

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15. I would become member of an Energy Community, if there was an active one in my region.

Strongly agree ☐ ☐ ☐ ☐ ☐ Strongly disagree

16. I would make a micro-investment in an Energy Community project.

Strongly agree ☐ ☐ ☐ ☐ ☐ Strongly disagree

17. Social media and online platforms could be useful tools to engage young people in Energy Communities and community energy projects.

Strongly agree ☐ ☐ ☐ ☐ ☐ Strongly disagree

18. I would trust a young person with the creation and management of an Energy Community.

Strongly agree ☐ ☐ ☐ ☐ ☐ Strongly disagree

19. I feel confident in providing personal information (personal data, financial records or proprietary information) to the Energy Community of which I am a member of and/or wish to apply for membership.

Strongly agree ☐ ☐ ☐ ☐ ☐ Strongly disagree

20. Anyone can participate in an Energy Community, regardless of their socio-economic background.

Strongly agree ☐ ☐ ☐ ☐ ☐ Strongly disagree

Please, select up to three (3) choices per question.

21. In your opinion, which of the following are the main reasons preventing young people from participating in Energy Communities:
    - ☐ Lack of information.
    - ☐ Lack of support from the local authorities/municipalities.
    - ☐ Lack of interest from the community.
    - ☐ Lack of incentives.
    - ☐ Lack of participatory decision-making.
    - ☐ Other: _____

22. In your opinion, which of the following are the main misconceptions that prevent young people from being part of Energy Communities?
    - ☐ Young people believe that Energy Communities do not directly affect their daily lives, especially if the community energy project is not located close to their community.
    - ☐ Renewable energy technology is not very widespread and young people tend to distrust it due to the lack of information.

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- ☐ Young people believe that it is expensive to invest or participate in an Energy Community.
- ☐ Young people believe that it is very time-consuming to participate in an Energy Community.
- ☐ Young people believe that they will not be heard or be able to participate in the decision-making process within an Energy Community.
- ☐ Other: _____

23. In your opinion, which of the following are the main reasons for motivating young people to participate and lead Energy Communities?
    - ☐ Protecting the environment and producing clean, green energy.
    - ☐ Opportunities to help the community / make a positive impact in their communities.
    - ☐ Equal participation and participatory approaches to decision making.
    - ☐ Financial incentives.
    - ☐ Putting new, innovative ideas into practice.
    - ☐ Other: _____

24. In your opinion, which of the following bodies/organisations should ideally promote the benefits of Energy Communities and inform the public, especially young people?
    - ☐ The national government.
    - ☐ The local authorities/municipalities.
    - ☐ Educational institutions.
    - ☐ Local initiatives/NGOs.
    - ☐ Members of energy communities.
    - ☐ Other: _____

25. In your opinion, which of the following strategies could be more effective in overcoming the economic barriers to youth participation in Energy Communities and in community energy projects?
    - ☐ Provide financial support or incentives specifically for young people to facilitate their participation (e.g. grants or subsidies).
    - ☐ Create accessible funding mechanisms or alternative financing options tailored to the needs of young people (e.g. crowdfunding or microfinance initiatives).
    - ☐ Implement cost reduction measures to make participation in energy projects more affordable for young people (discounts or specialised purchasing agreements).
    - ☐ Facilitate the establishment of peer-to-peer support networks or mentoring programmes within energy communities or provide subsidised and/or free educational opportunities for young people interested in participating in energy projects.
    - ☐ Advocate for policy changes at the local, regional, or national level to address economic barriers faced by young people in energy projects (e.g. tax incentives or regulatory reforms targeted at young people).
    - ☐ Other: _____

26. In your opinion, which of the following policy changes or government interventions could address barriers to youth engagement in Energy Communities?
    - ☐ Introducing subsidies, grants, or low-interest loans specifically targeted at young people to help cover the initial costs of participating in energy projects or other

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financial mechanisms, such as revolving funds or crowdfunding platforms tailored to young entrepreneurs or community groups.

- ☐ Creating stable revenue streams for energy projects through mechanisms such as feed-in tariffs, power purchase agreements (PPAs) or community-based financing models.
- ☐ Simplifying regulatory processes and streamline administrative procedures to make it easier for young people to initiate and participate in energy projects.
- ☐ Allocating land or resources for youth-led energy projects.
- ☐ Fostering a supportive market environment for youth-led energy initiatives by using government procurement policies, preferential tariffs, or green energy mandates to create demand for renewable energy products and services.
- ☐ Other: _____

27. In your opinion, which of the following are the most important elements of the contractual relationship between an Energy Community and its members to ensure clarity, transparency, and legal protection?
    - ☐ Definition of membership criteria, description of membership rights and obligations.
    - ☐ Specification of the ownership structure of the energy community and establishment of governance and election mechanisms.
    - ☐ Agreements on the conditions of energy supply and distribution within the community.
    - ☐ Specification of financial contributions, fees, or dues, description of the financial rights and responsibilities of the members and establishment of mechanisms for sharing the revenues generated.
    - ☐ Establishment of protocols for data collection and provision for confidentiality and privacy measures to protect sensitive information shared among members of the community.
    - ☐ Other: _____

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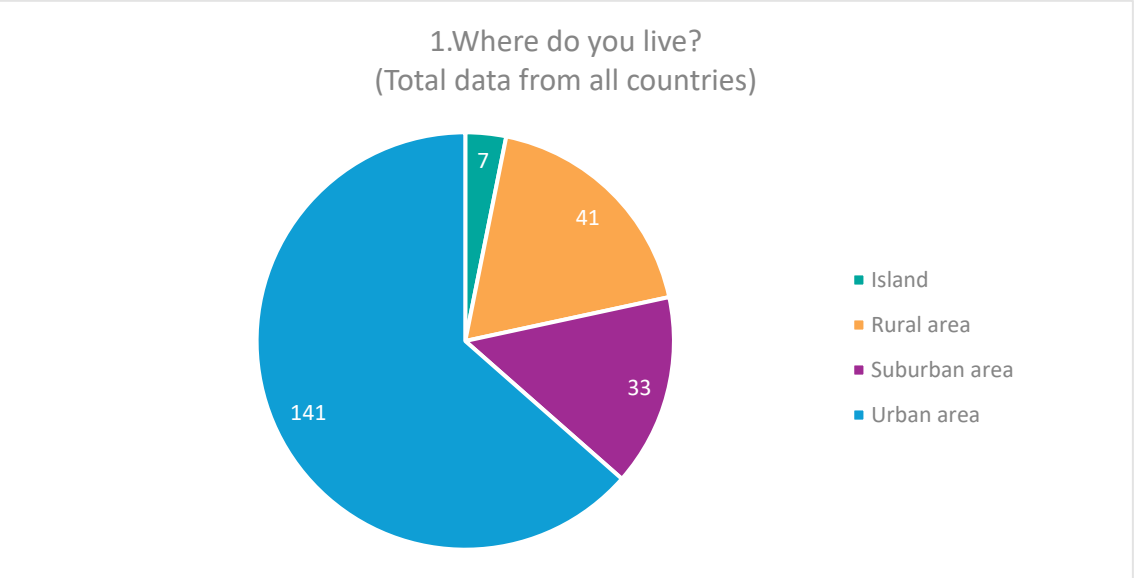
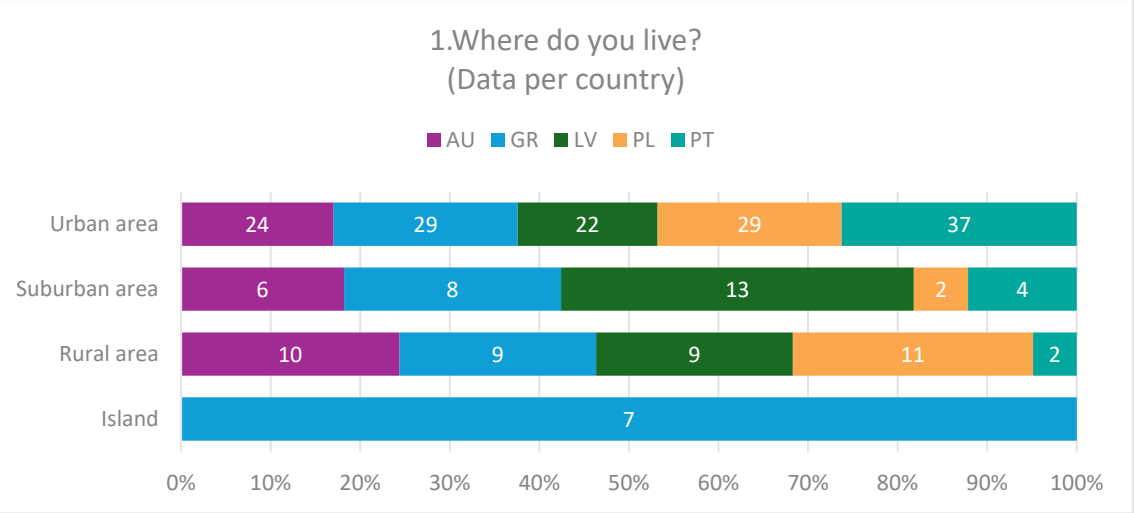
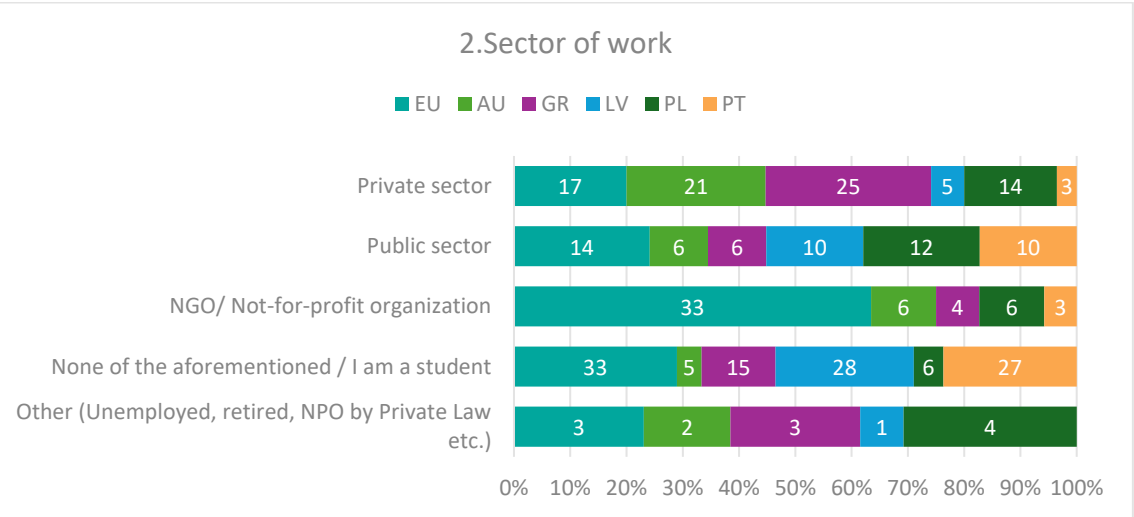
POWER youth

Annex II: Results from the surveys







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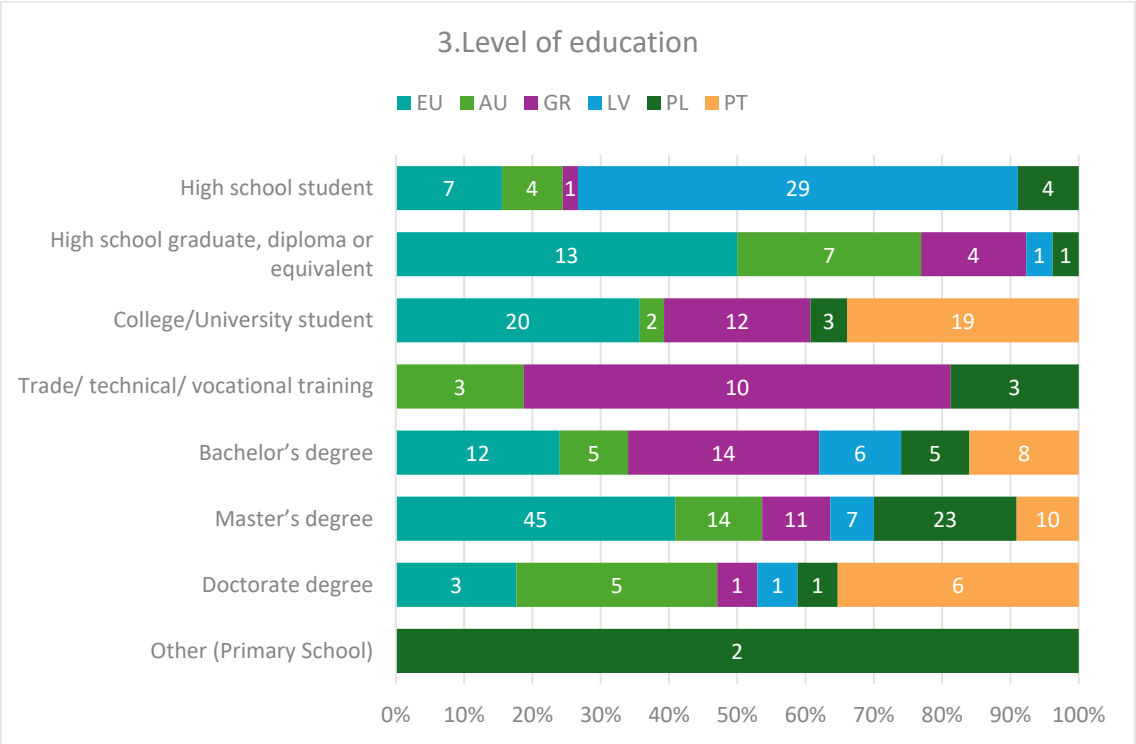

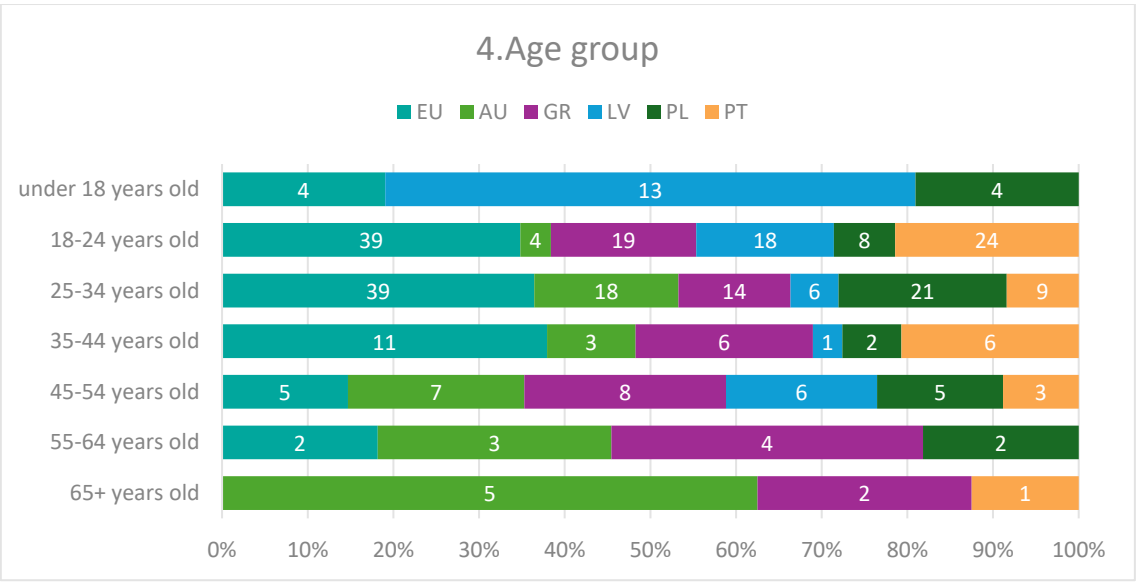

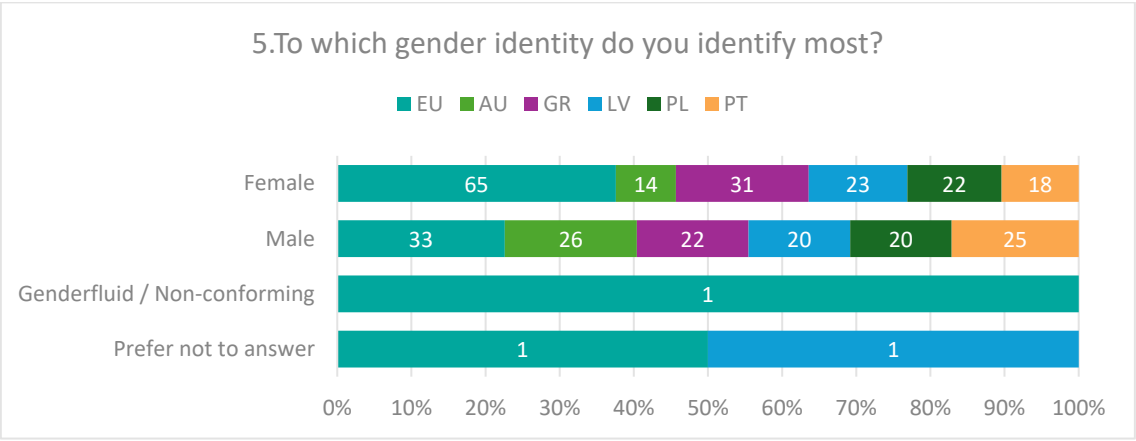

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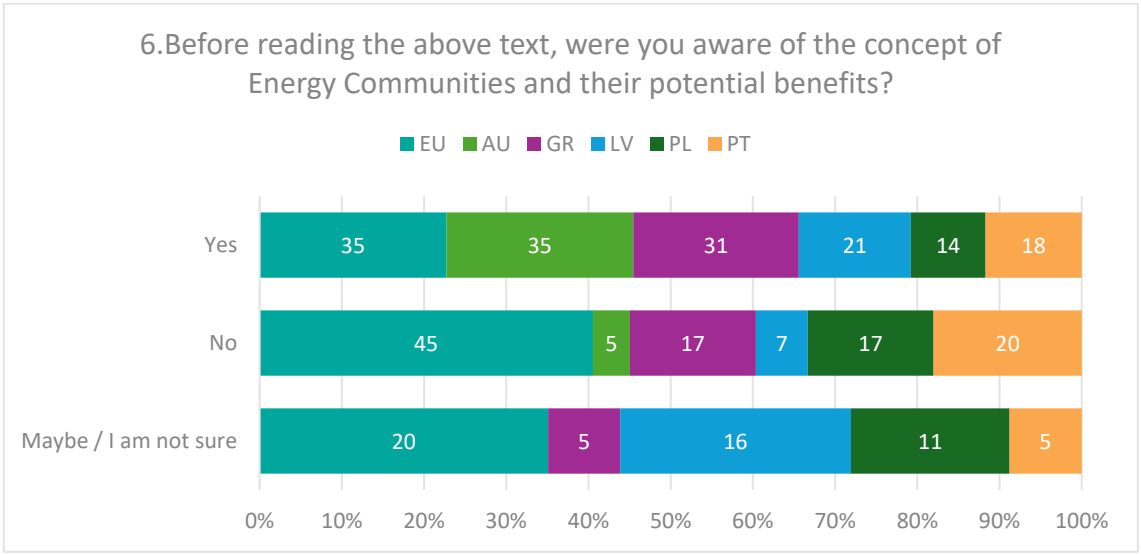

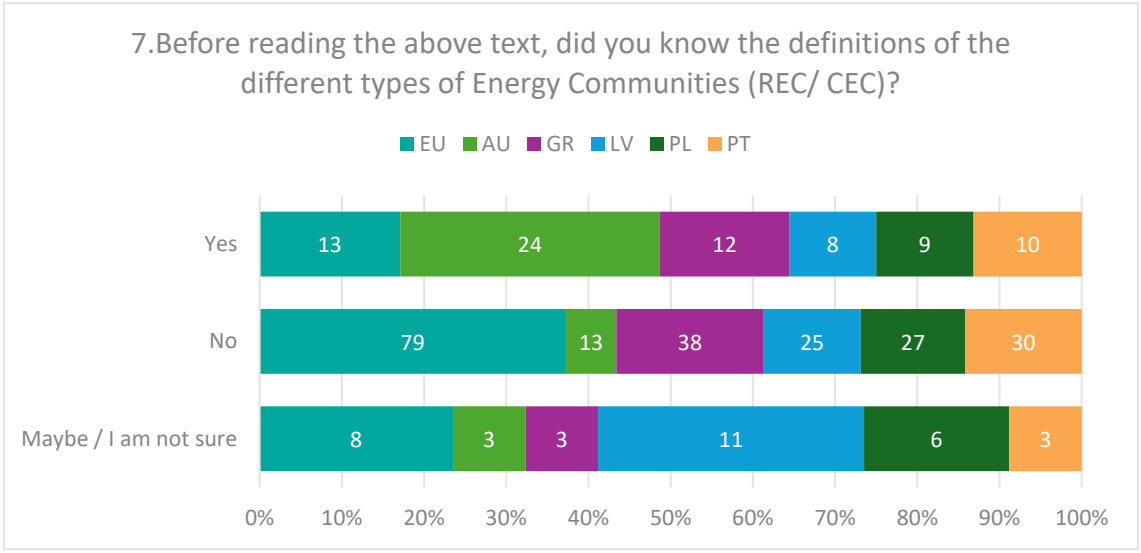

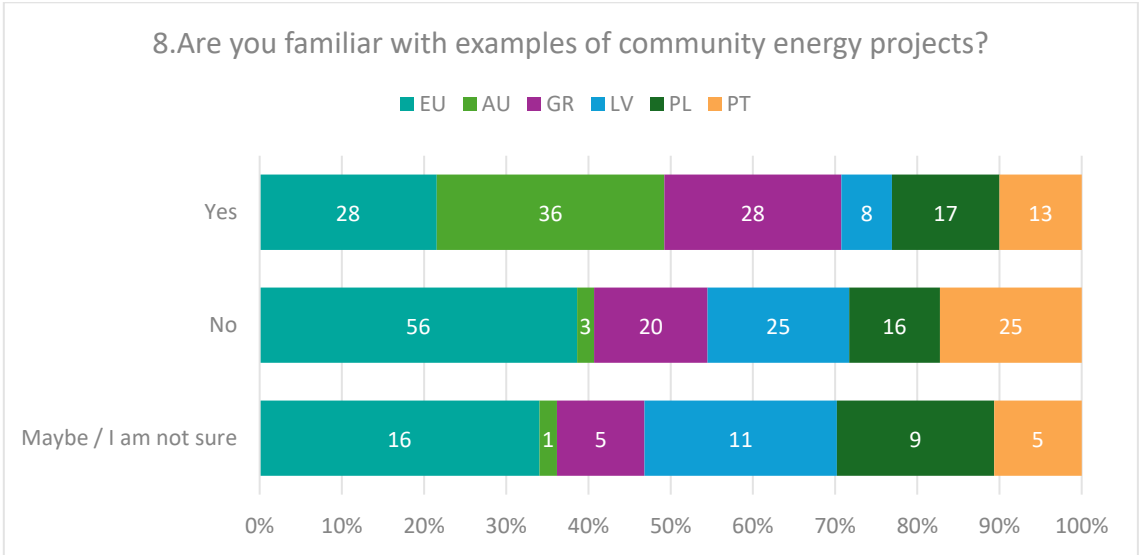

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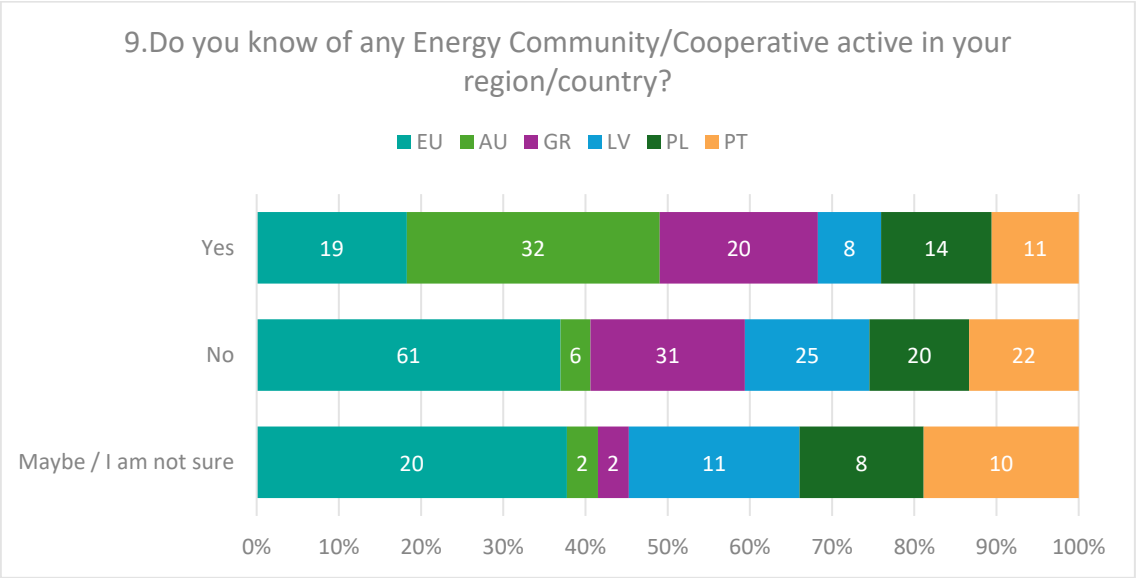

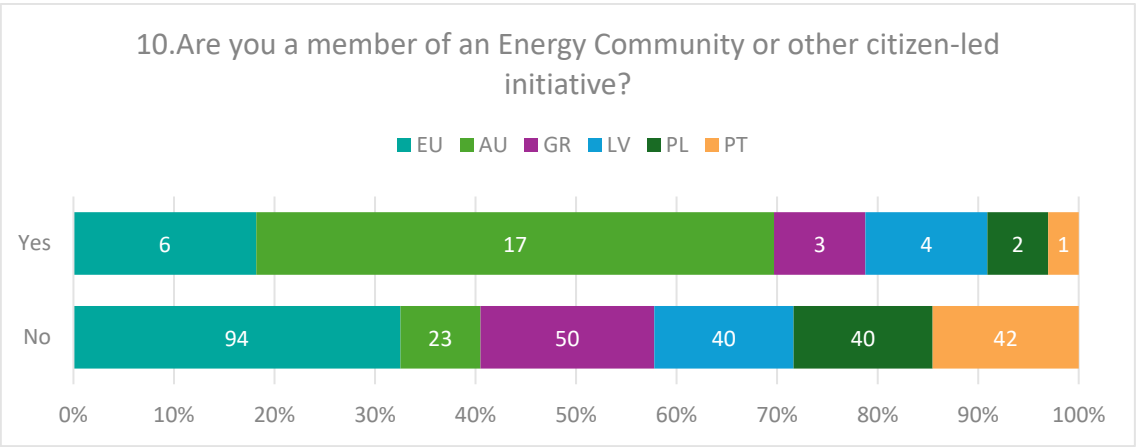

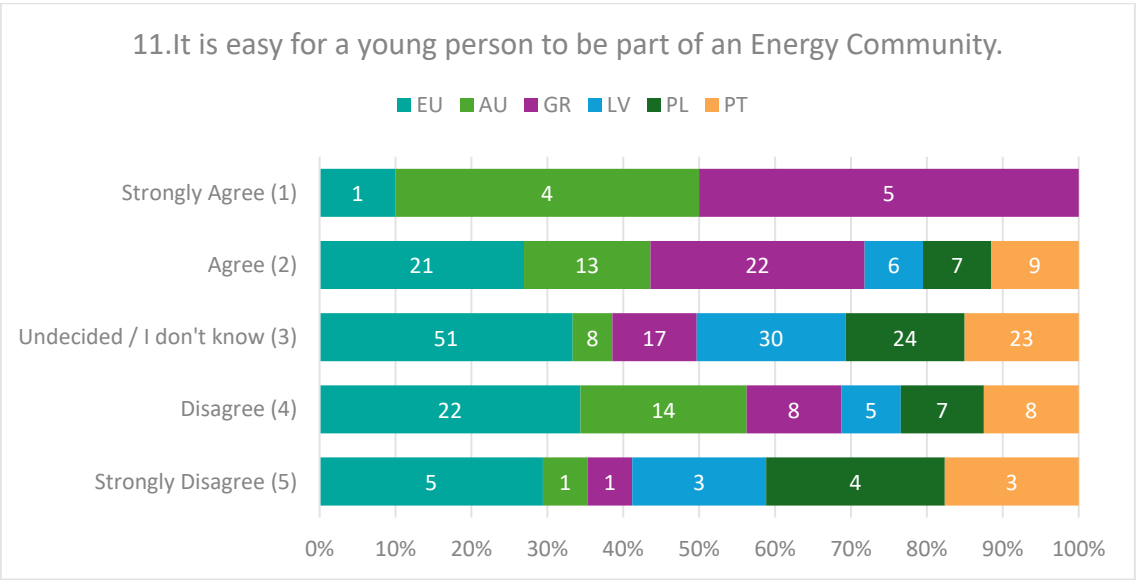

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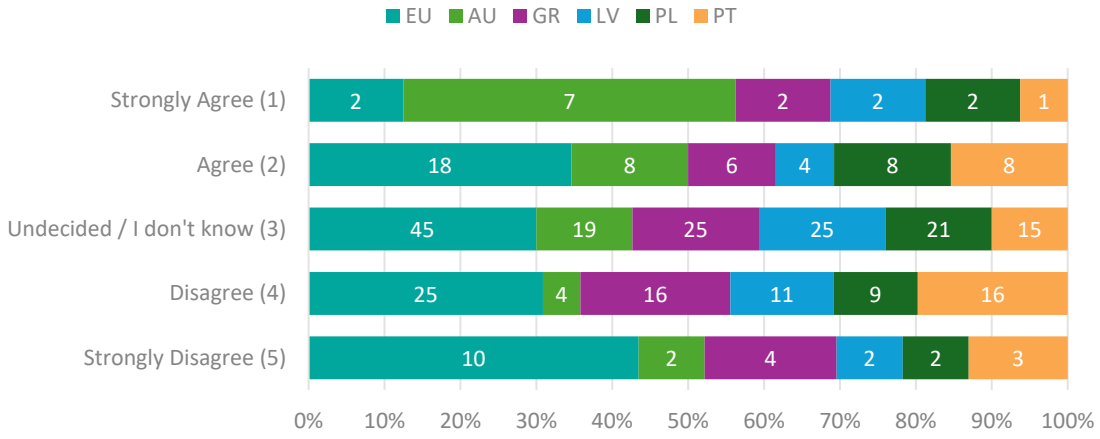
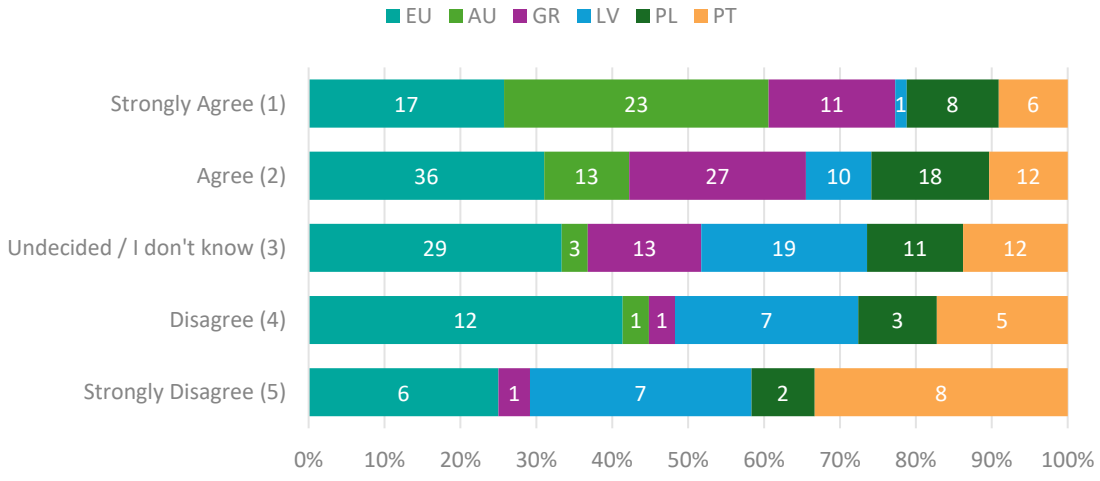
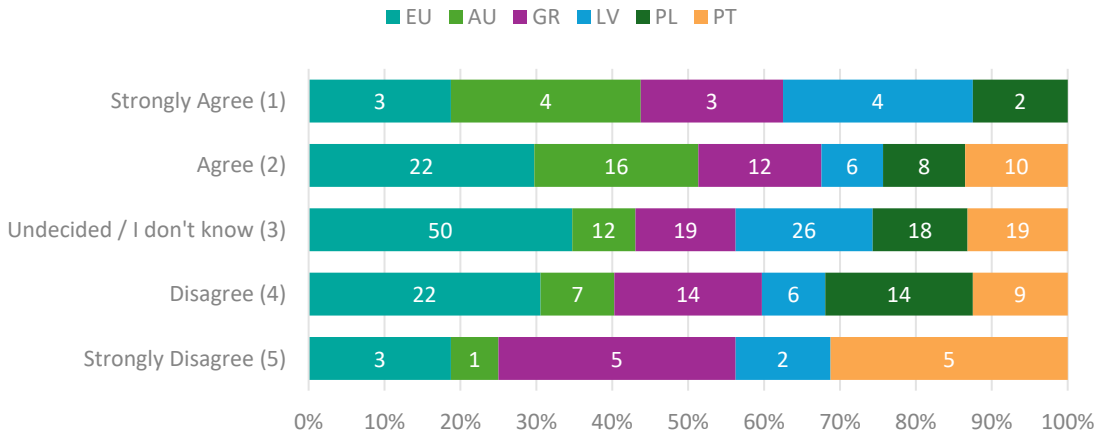
12.The national/local government provides financial incentives for the establishment of Energy Communities.



13.I am aware of the benefits of being part of an Energy Community.



14.The current situation facilitates the operation of Energy Communities and the production and use of energy.



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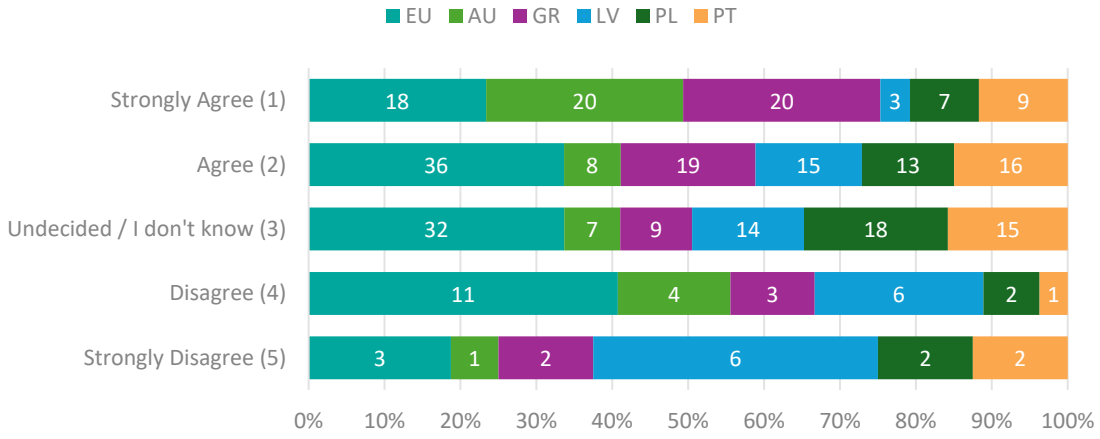
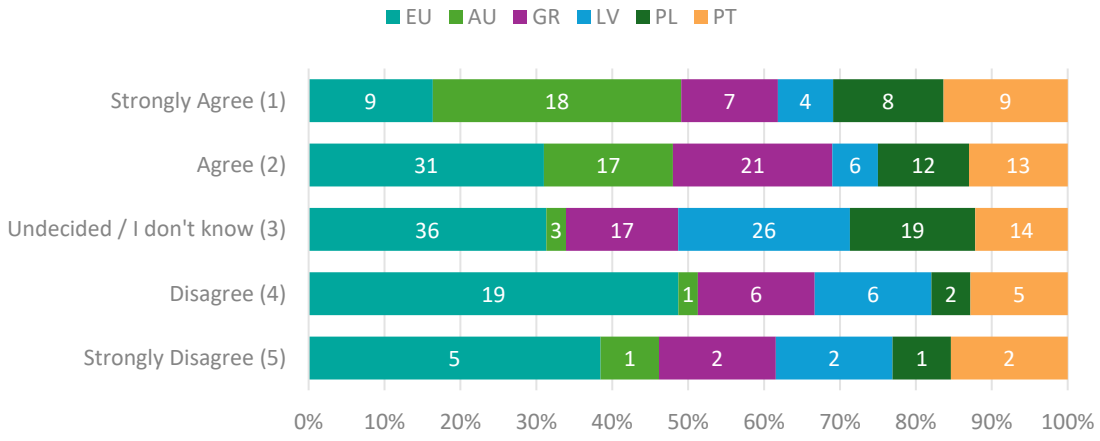
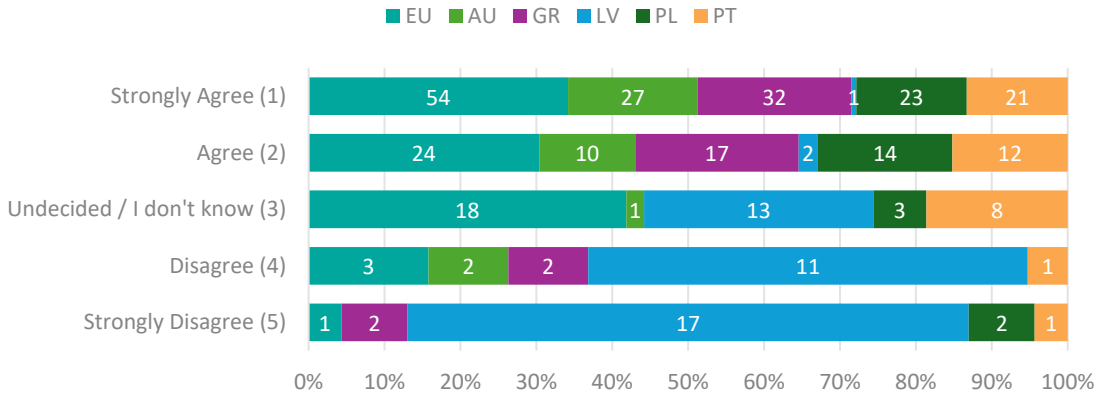
15.I would become member of an Energy Community, if there was an active one in my region.



16.I would make a micro-investment in an Energy Community project.



17.Social media and online platforms could be useful tools to engage young people in Energy Communities and community energy projects.



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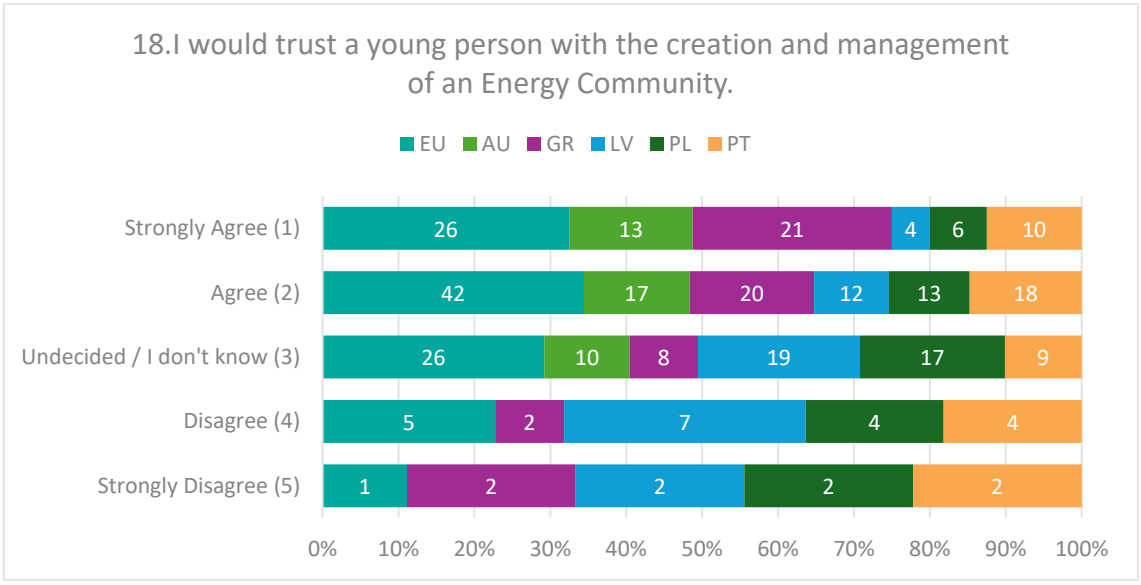

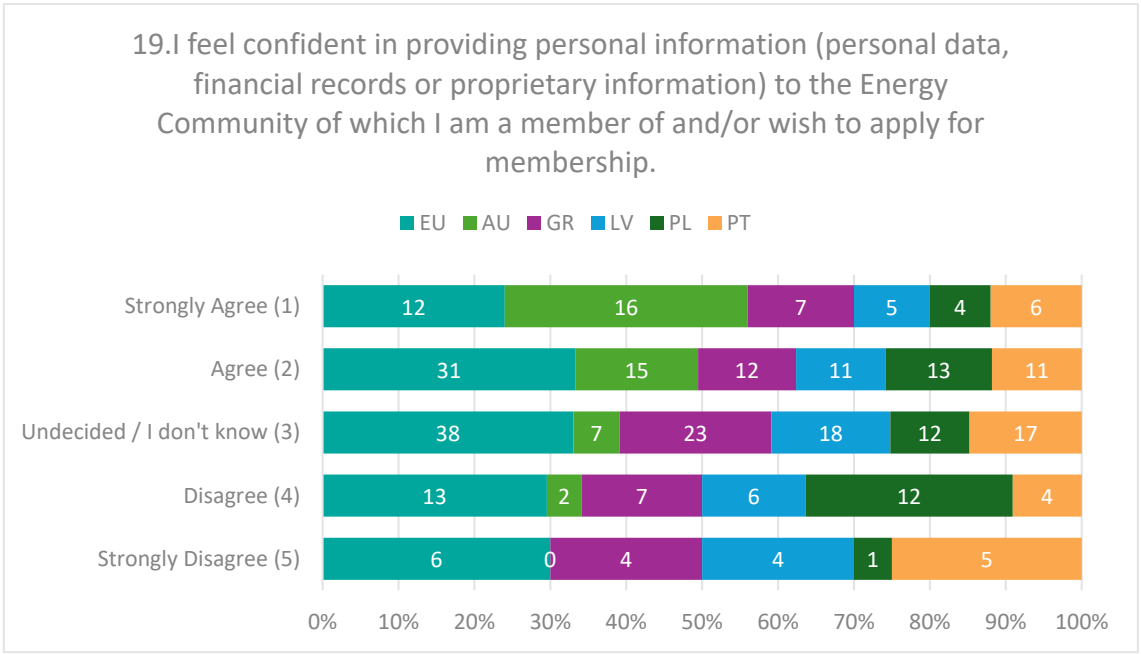

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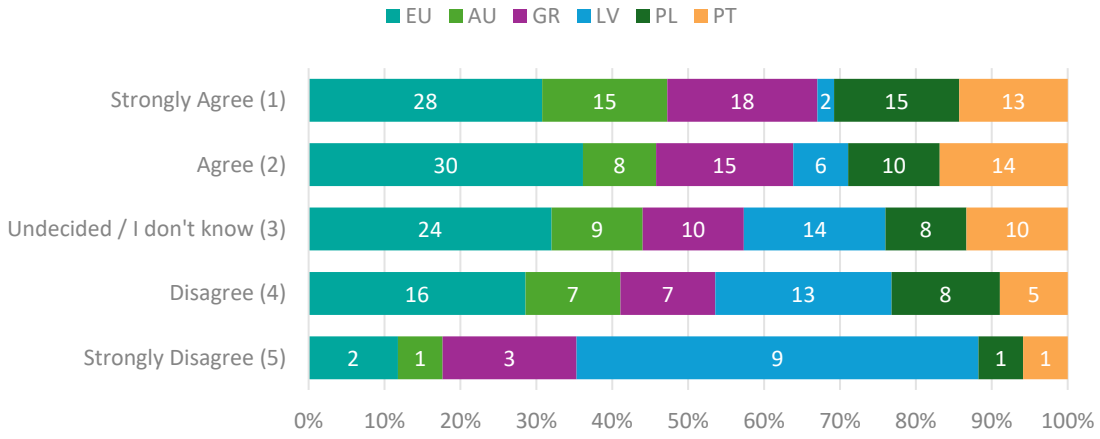
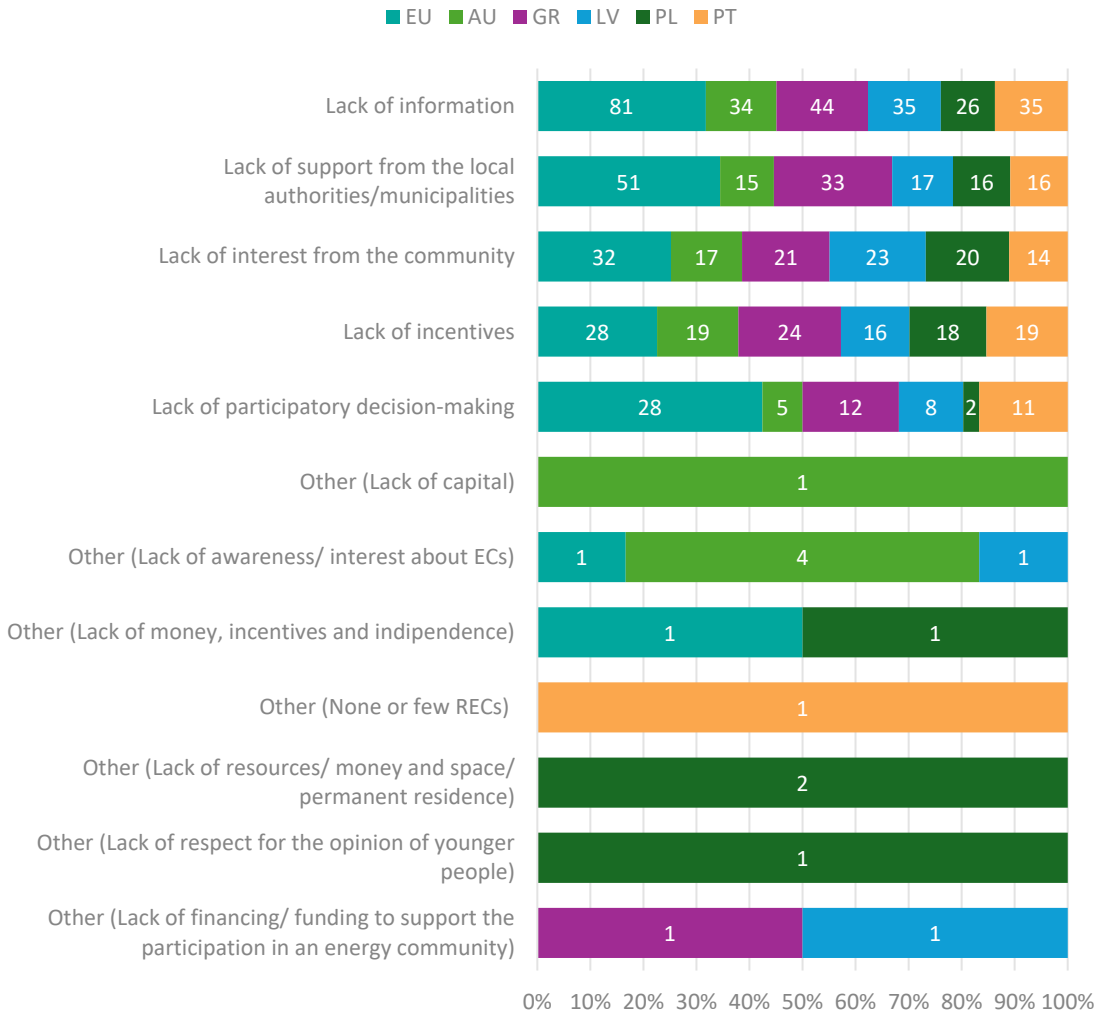
20.Anyone can participate in an Energy Community, regardless of their socio-economic background.



21.In your opinion, which of the following are the main reasons preventing young people from participating in Energy Communities.



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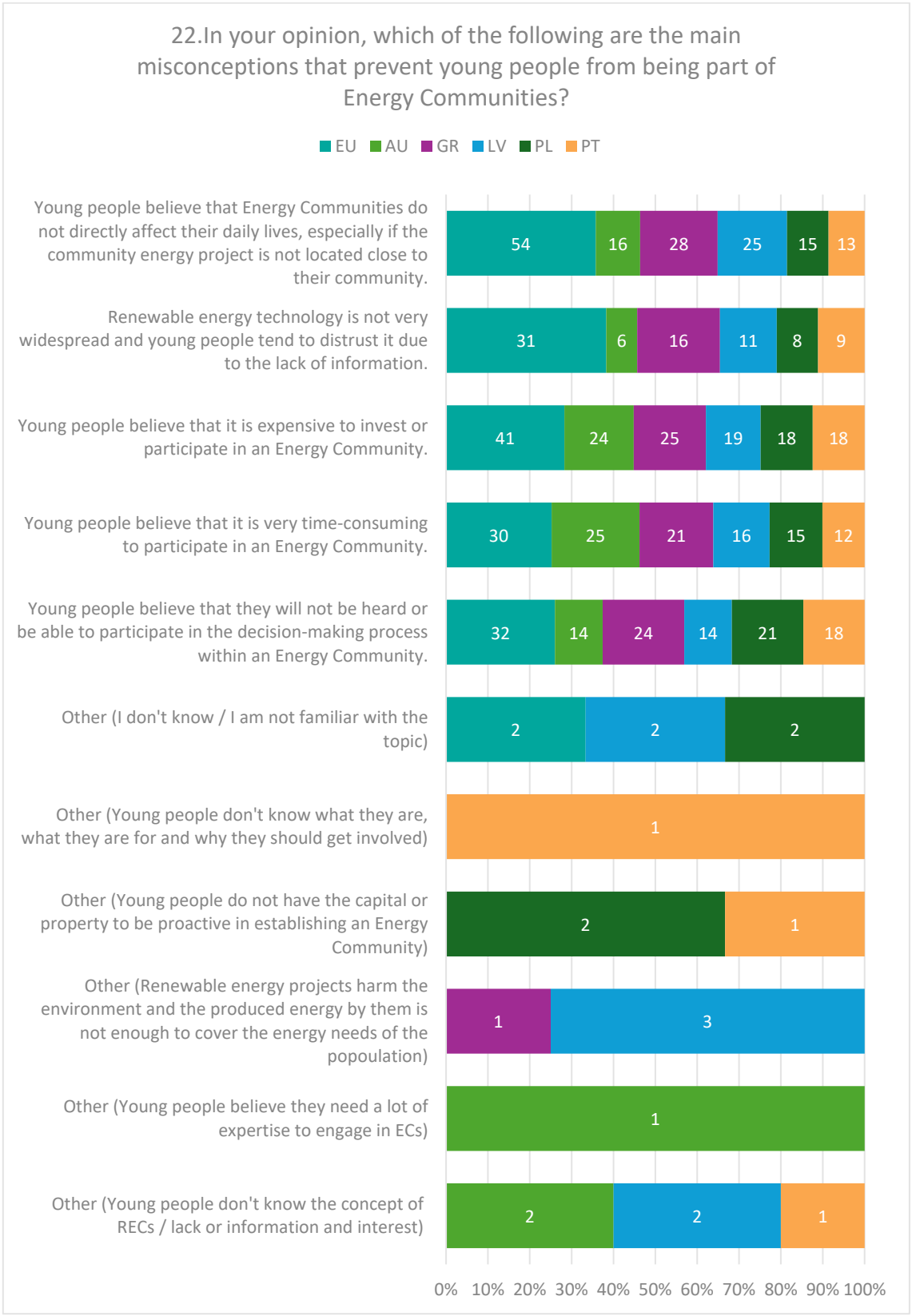

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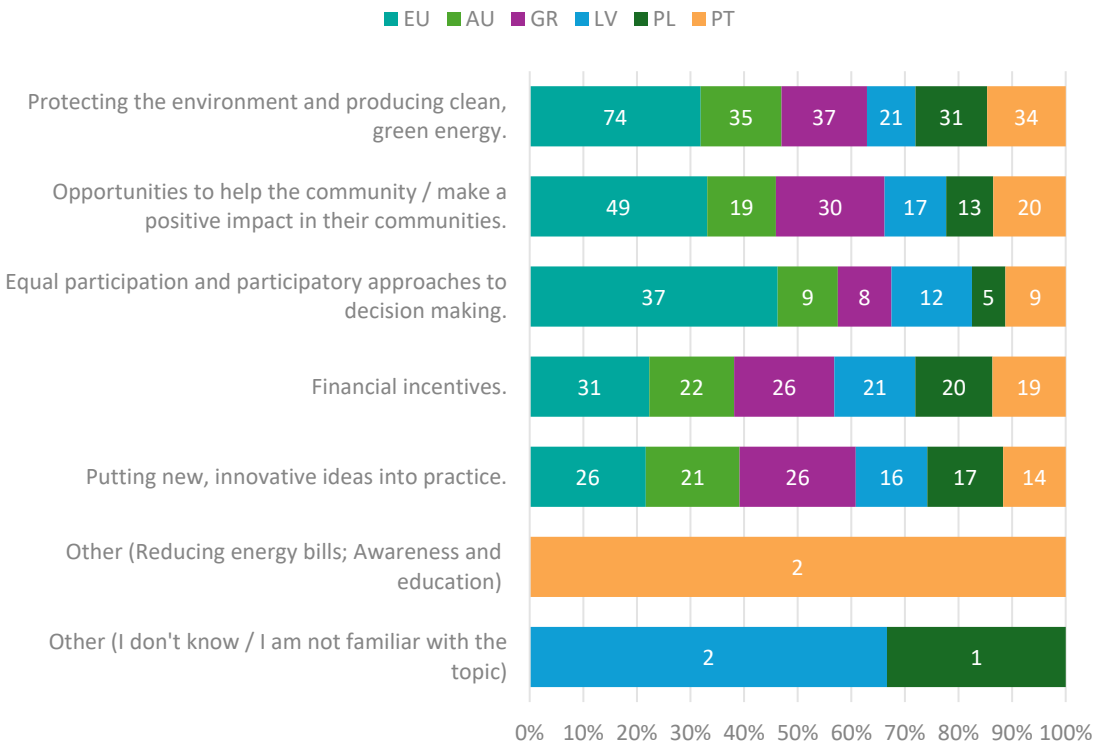
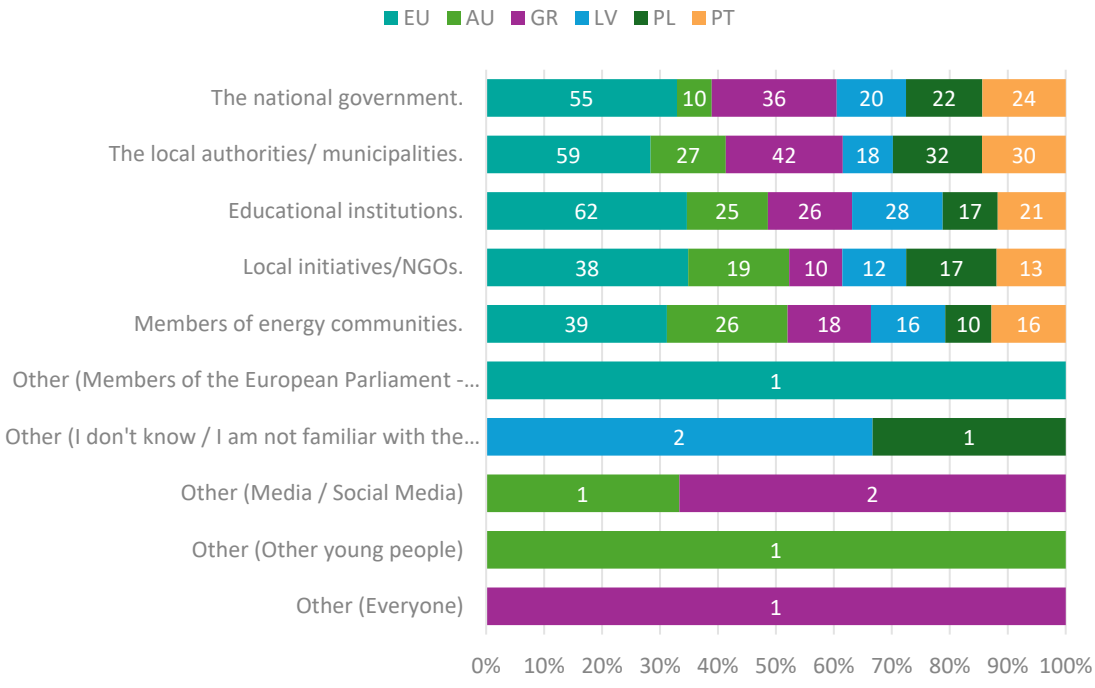
23.In your opinion, which of the following are the main reasons for motivating young people to participate and lead Energy Communities?



24.In your opinion, which of the following bodies/organisations should ideally promote the benefits of Energy Communities and inform the public, especially young people?



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Annex III: Minutes of the co-creation days / workshops

Empowering youth for energy community actions

D2.1 Analysis of the barriers and local conditions for youth energy communities

Co-creation Workshops Minutes

Date: Wednesday, 19th June 2024

Country: Austria

Location: OurPower Office, Lindengasse 65, Vienna

Organised by: OURPOWER

Other partners participation: n/a

Prepared by: Paula Friederichsen & Nepomuk Harmer, OURPOWER

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1. Agenda

Time	Brief Description	Presenter
09:00 – 09:30	Arrival & Breakfast	Paula Friederichsen, Nepomuk Harmer, Hemma Bieser
09:30 – 09:45	Presentation of OurPower	Hemma Bieser
09:45 – 10:15	Get-to-know-you round	Paula Friederichsen
10:15 – 10:30	Presentation of POWERYOUTH and first results of the analysis of the barriers and local conditions for youth energy communities in Austria	Nepomuk Harmer
10:30 – 11:00	Moderated small group discussions on the different areas of analysis: Legal and regulatory framework and policy; Contractual conditions; Warranty, safety and data security information; Social barriers; Financial and market design barriers	Paula Friederichsen, Nepomuk Harmer, Hemma Bieser
11:00 – 11:30	Presentation of the results from the small group discussion in the plenary and discussion thereof in the whole group	Paula Friederichsen
11:30 – 12:00	Checkout round and networking	Paula Friederichsen

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2. List of Participants

Total Number of Participants	Number of Engaged Organisations
18	16

Male	Female
9	9

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3. Description of Co-creation Workshop

The workshop on "Young People and Energy Communities", hosted by OurPower, took place on June 19, 2024, from 9:00 AM to 12:00 PM at Lindengasse 65 Top 6, 1070 Vienna. This engaging event combined a networking breakfast with in-depth discussions aimed at empowering young people to actively participate in the energy transition.

The workshop attracted around 20 dedicated professionals from diverse fields such as practice, policy, and research. Participants included:

- Young members of the OurPower community and other youth interested in energy topics as well as members of other ECs.
- Representatives from governmental and non-governmental organizations supporting ECs, NGOs, and networks related to education, youth, and energy (e.g., Genossenschaft für Gemeinwohl, Attac and Green Energy Lab).
- Representatives from local and regional authorities and practitioners from the ministry of climate action and the climate and energy model region of Baden.
- Researchers from institutions and universities like the Austrian Institute of Technology, Austrian Energy Agency, University of Applied Sciences Technikum Wien, Blueprint Energy, Forschung Burgenland and BOKU University.
- Practitioners like installer of PV panels from “Wir mieten dein Dach” and Georg Stögerer.

The diversity of the participants facilitated a rich and interdisciplinary exchange of ideas and perspectives, crucial for addressing the multi-faceted challenges of the energy transition. The workshop was structured to maximise engagement and facilitate meaningful discussions. First, participants were welcomed with a networking breakfast, providing an informal setting for initial interactions. The event began with an overview of the OurPower initiative and the EU research project POWERYOUTH, setting the stage for the day's discussions. Initial findings from the analysis of barriers and local conditions for youth ECs were presented. Participants engaged in an interactive session, providing valuable insights in the areas legal, regulatory, financial, market design, and social barriers. The discussions centered around key questions essential for empowering young people in the energy transition. Highlighted aspects were: simplification of the legal and regulatory framework; directly approachable and responsible public officials who can support the founding process of youth ECs; advertising and awareness campaigns for less investment-heavy participation opportunities in ECs; creating contact points to young people’s everyday life such as popular platforms but also in-person events such as festivals to make the topic of energy more approachable; providing educational programs for fostering energy literacy already at younger ages. It was also emphasised that most of the discussion points come from highly privileged positions and that accounting for less privileged perspectives must be done more explicitly. The workshop concluded with a summary of key points and an outline of the next steps in the project. In addition, the participants were asked if and how they can imagine continuing cooperating in the project over the next years, considering future activities such as the Liaison Group or the capacity building programme.

The workshop successfully gathered comprehensive feedback from participants, which will be instrumental in refining the ongoing analysis of barriers and local conditions. The insights gained will help in accurately depicting the challenges and opportunities for young people in

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Austria's energy transition. After this inspiring and connecting session, all participants of the workshop were invited to a kick-off meeting of the Liaison Group in October 2024.

4. Photos of the Workshop

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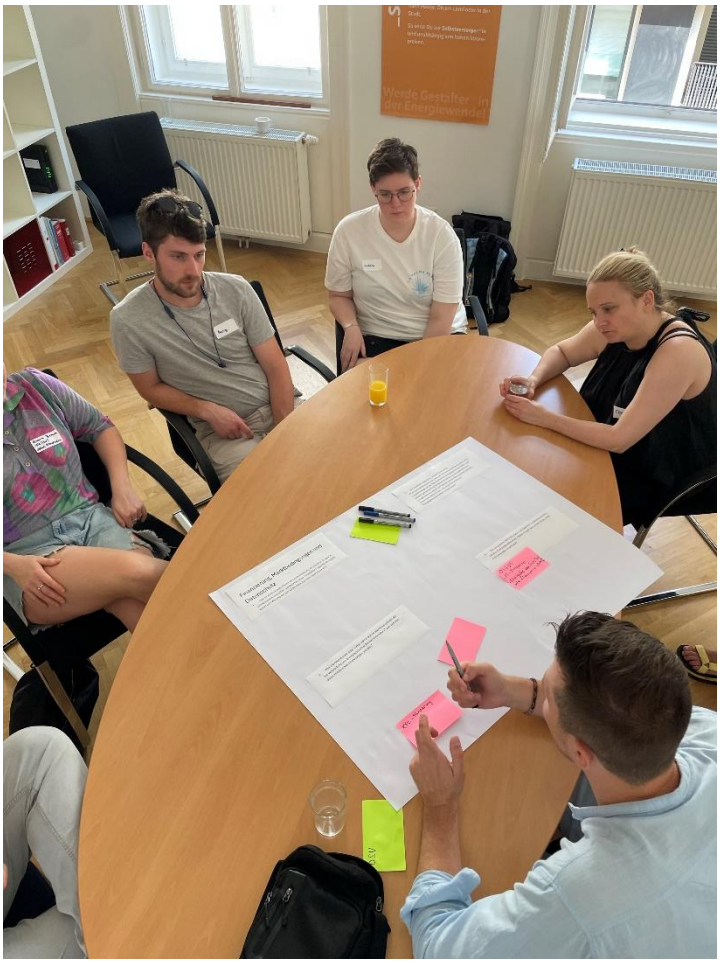

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POWER youth

Empowering youth for energy community actions

D2.1 Analysis of the barriers and local conditions for youth energy communities

Co-creation Workshops Minutes

Date: Thursday, 17th May 2024

Country: Greece

Location: Municipality of Tripolis, Apostolopoulio Cultural Centre

Organised by: SCN

Other partners participation: SLG

Prepared by: Panagiota Kazaki, SCN

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1. Agenda

Time	Brief Description	Presenter
17.30 – 18.00	Registration & Welcome Coffee	
18.00 – 18.30	Welcome Notes	• Vicky Inglezou, Head, EUROPE DIRECT Peloponnisos • Alice Corovessi, EU Climate Pact Country Coordinator for Greece, Managing Director INZEB • Ioannis Georgizas, General Director of "SUSTAINABLE CITY" Network • Dimitris Kafantaris, Secretary General of KEDE • Christos Lampropoulos, Deputy Regional Governor with responsibility for Coordination-Finance-Planning subjects • Ioannis Chasapis, Deputy Mayor of Villages and Primary Sector Municipality of Tripoli
18.30 – 19.30	**SESSION 1** ***Energy Communities and their contribution to Energy Transition*** This session will explore the current state of energy communities, particularly the aspects of creating energy communities and implementing collective energy actions, focusing on the participation and inclusion of young people in these initiatives. ***Power Youth – workshop*** A participatory approach will examine the regulatory framework and financial and social barriers to the evolution of energy communities, considering the local conditions of the cities in the Peloponnese Region.	• Panagiota Kazaki, Project Manager of the PowerYouth project, SCN (Moderator) • Antonia Vronti, Power Youth Coordinator, Project Manager SLG (Speaker)
19.30 – 20.15	**SESSION 2** ***Circular Economy: The role of cities and citizens***	• Alice Corovessi (Moderator) • Maria Loizidou, Professor, Department of Chemical Engineering, NTUA, Head of Unit Environmental

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POWER youth

	The session aims to explore innovative circular economy strategies through presentations and discussions. Delving into sustainable practices that reduce environmental impact and reinforce local economies, the identification of actionable solutions that can be implemented in the Region of Peloponnese will be discussed in view of a more resilient and sustainable future for the region and its citizens.	Science and Technology "Bio-waste Management and Product Manufacturing" • Nasos Makios, EU Climate Pact Ambassador, Environmental Manager "KLIMIS", Physicist-MSc in Bioeconomy, Circular Economy and Sustainable Development "Circular Economy in Action!"
20.15 – 21.00	**SESSION 3** ***Navigating Climate Challenges in Modern Agriculture*** The session will delve into the complex relationship between contemporary agriculture and climate change, focusing on the challenges and opportunities of the field. Insights and examples will be presented by field experts who will discuss innovation and new technologies in agriculture that can enhance resilience in climate change and increase productivity concerning the environment and natural resources.	• Vicky Inglezou (Moderator) • Dr Gavriil Xanthopoulos, Forester, Senior Researcher, Hellenic Agricultural Organization "DEMETER", Institute of Mediterranean Forest Ecosystems. "The Need to Improve Landscape Resilience to the Effects of Climate Change: The ResAlliance Project". • George Prokopos, EU Climate Pact Ambassador, PhDc - Agricultural Cybernetics & Machine Assisted Production - Clean Energy & Renewable Resources. "Building an Innovative and Sustainable Agricultural Ecosystem in the Face of Climate Change & Crisis".

2. List of Participants

Total Number of Participants	Number of Engaged Organisations
47	26

Male	Female
28	19

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3. Description of Co-creation Workshop

The event was organised in cooperation with EU Climate Pact Country Coordinator for Greece and Europe Direct Peloponnisos and was hosted by the Municipality of Tripoli at the Apostolopoulio Cultural Centre. The purpose of the co-organisation was to combine in one event various issues of direct concern to the municipalities of the region.

The main theme of the event was the energy transition and environment in the Peloponnese region. The first section was dedicated to the POWERYOUTH project and the youth ECs, the second to the role of the cities and citizens in the circular economy, and the third to the challenges that climate crisis poses to modern agriculture. The speakers were prominent academics and EU Climate Pact Ambassadors from the private sector. They all analysed critical issues and focused on sustainable practices that contribute to the energy transition and the protection of the natural and man-made environment.

The largest group of participants were civil servants or elected representatives from local and regional authorities, followed by university members and students, and local businesses.

The presentation of the POWERYOUTH project and the workshop, as well as the whole event, were conducted in a face-to-face format to maximise the engagement of the participants. The session was divided in three (3) different sections.

In the first part, SLG, as coordinator of POWERYOUTH, presented the main objectives of the project and SCN presented the aim of the Greek pilot, which is part of the project. In the second part, an online platform was used to pose some key questions to the participants, related to the legal framework for ECs, financial, market and social barriers, as well as local conditions in the Peloponnese region that may negatively affect or hinder the creation of ECs and implementation of community energy projects. The last part was a discussion was conducted between the participants and the moderator, based on the most frequent and/or interesting aspects raised in the answers.

Municipal and regional officials and representatives focused on the lack of funding for the creation of ECs and implementation of community energy projects. Another important barrier, in their opinion, is the lack of information for young people about the benefits of participating in ECs, prioritising the community and the environment and not the profits. Some stressed that information should not only focus on young people, but also on younger age groups to familiarise them with these concepts and increase their chances of participating or leading ECs in the future.

The social aspects from them are really important. Almost everyone agreed that when an initiative is successful and have tangible results many more will follow through; at the beginning people are suspicious and, in many cases, misinformed.

Another issue of particular concern to them is the difficulty or inability in many cases to connect community energy projects to the grid and the lengthy licensing process. In their opinion this is an issue which is not within their jurisdiction and should be addressed by the national government.

The overall impression was that all recognise the challenges around the issue and acknowledge that there are solutions that need to be implemented, but it is unclear who should take the initiative and press for their implementation.

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4. Photos of the Workshop

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Empowering youth for energy community actions

D2.1 Analysis of the barriers and local conditions for youth energy communities

Co-creation Workshops Minutes

Date: Wednesday, 21st February 2024

Country: Latvia

Location: Bureau complex Verde, Roberta Hirsa Street 1, (konference hall MEDUS), Riga

Organised by: RPR

Other partners participation: n/a

Prepared by: Sanita Paegle, RPR

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1. Agenda

Time	Brief Description	Presenter
13:00 – 13:10	Workshop opening, introduction	Iveta Skilina, Riga Planning Region, project coordinator "ShareRES"
13:10 – 13:45	Irish Sustainable Energy Administration Energy Communities Programme	Gillian Baker, Electricity Energy Community Support Program Manager
13:45 – 14:00	Business cards for new energy community projects	Ilvija Ašmane, Latvian Rural Forum, Project Manager project Strengthening Energy Communities in Rural Areas of Latvia Sanita Paegle, Rigas Planosanas regions, project Empowering Youth for Energy Community Actions //POWERYOUTH"
14:00 – 14:30	*Coffee break, networking*	
14:30 –16:00	Data services for energy community billing and energy management. In the second part of the meeting, we will discuss what data are needed for energy community settlement and energy management systems, and how the needs of different energy communities would differ – municipally driven projects, apartment buildings, etc.	Krista Petersone, Riga Planning Region, expert in project ShareRES Sadales tikls AS representatives, all participants

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2. List of Participants

Total Number of Participants	Number of Engaged Organisations
28*	21

Male	Female
13	15

**Without online attendance*

3. Description of Co-creation Workshop

In order to look for project synergies, the POWERYOUTH project representative S. Paegle attended the ShareRES project meeting organised by the Riga Planning Region on 21.02.2024, where she took the opportunity to present the Poweryouth project and discuss the development of ECs in Latvia and youth participation in ECs. The meeting was attended by almost 50 online and in-person stakeholders representing public institutions, municipalities, NGOs, businesses and academic institutions. The main recommendations were to work with eco-schools, taking into account existing school programmes to raise awareness of the environment and related issues, and the need for additional education, campaigns and events to encourage young people to think about renewable energy and ECs in general.

The first part was dedicated to experience exchange and enabling frameworks presented by Gillian Baker from Sustainable Energy Authority of Ireland. Also, representatives from related initiatives used the platform to pitch their projects. S.Paegle and I.Asmane presented new projects on ECs in Latvia. The second part was a roundtable discussion.

The regulation for energy sharing and ECs in Latvia is a work in progress and the first public hearings of the bylaw will take place this spring. According to the Ministry of Climate and Energy, the regulation will be both basic and forward-looking, aiming to support growth of the number of active customers and facilitate renewable energy projects that focus on environmental benefits and social inclusion. The main criteria for energy community projects will be the 1 MW limit of the installed capacity and business models centred on self-consumption.

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4. Photos of the Workshop

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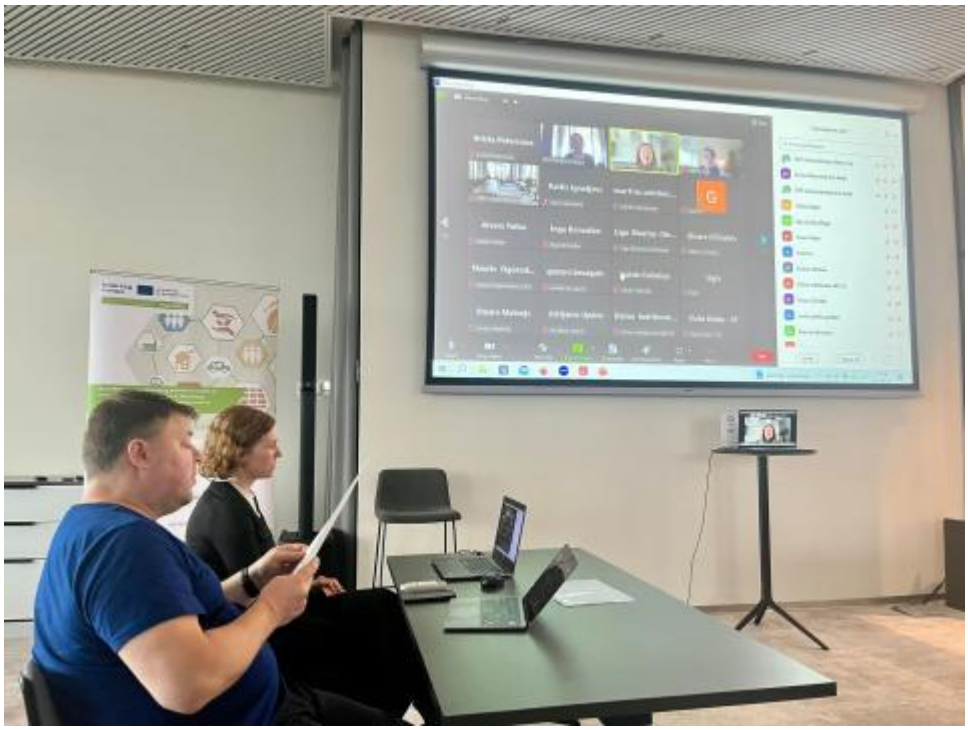

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Empowering youth for energy community actions

D2.1 Analysis of the barriers and local conditions for youth energy communities

Co-creation Workshops Minutes

Date: Thursday, 13th June 2024

Country: Poland

Location: Jadwisin, Geovita Training and Conference Centre

Organised by: PNEC

Other partners participation: n/a

Prepared by: Justyna Janosz-Klus, PNEC

Katarzyna Brawiak, PNEC

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1. Agenda

Time	Brief Description	Presenter
14:30 – 14:50	Citizen energy for local authorities – forms available under law	Agnieszka Stupkiewicz, Frank Bold Foundation
14:50 – 15:10	Energy communities in urban areas – successful realisations	Rafał Krenz, CoopTech Hub; PLZ Cooperative
15:10 – 15:20	Analysis of the barriers and local conditions for the creation of energy communities	Justyna Janosz-Klus, Association of Municipalities Polish Network “Energie Cités”
15:40 – 16:40	How to involve citizens in the development of energy communities?	Zuzanna Sasiak, Polish Green Network

2. List of Participants

Total Number of Participants	Number of Engaged Organisations	Number of Engaged Municipalities
82	16	32

Male	Female
52	30

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3. Description of Co-creation Workshop

More than 70 representatives of Polish cities and municipalities took part in a seminar entitled “Cities and municipalities on the road to climate neutrality”, organised by the Association of Polish Municipalities Network “Energie Cités” in the middle of June 2024 in Jadwisin near to Warsaw. Participants had the opportunity to listen to invited experts and participants of the debate on accelerating the energy transition at the local level, as well as to take part in good practice sessions in small groups.

The POWERYOUTH co-creation workshop, which was the part of the seminar, was focused on the topic of ECs and their important role in a successful energy transition process. It intends to assess the feasibility of creating and running ECs under existing legislation in Poland, as well as identify and address barriers for implementation.

Firstly, the space for sharing information on collective energy actions, highlighting the financial, technical, regulatory, contractual and socioeconomic challenges was provided. The external experts on the field presented the key aspects of Polish circumstances: Agnieszka Stupkiewicz, legal advisor from the Frank Bold Foundation, discussed the forms of CECs available for local government authorities under Polish law. Next, Rafał Krenz of the CoopTech Hub presented the benefits of setting up energy cooperatives and their financing options, as well as the process of setting up the first urban energy cooperative in Poland - Otwarty Jazdów. Next, Justyna Janosz-Klus from the Association of Municipalities Polish Network “Energie Cités” delivered the information and introduction to analysing the barriers and local conditions for creating ECs, especially focused on youth.

The second part was focused on the discussing the current situation and the future of ECs in Poland. The participants were invited to take part in a good practice session, during which they could benefit from the experiences of the invited guests and discuss contractual conditions, regulatory, policy, financial and market design barriers, relationship between the community and its members (with due consideration of young people and process of engagement) and share opinions and show their perspectives. While moderating that discussion, Zuzanna Sasiak, the expert from the Polish Green Network, addressed the topic of involving citizens in the development of ECs.

All participants agreed that the current situation doesn’t support the functioning of ECs as well as the production and use of energy. The process is too complicated, especially for the young people. The simplification of regulatory processes and streamlining administrative procedures is crucial to eliminate the barriers and ensure people’s involvement in ECs. In addition, clear and certain financial benefits as well as wide information campaigns can support the energy projects.

Workshop participants emphasised the key role of local authorities and local communities in decentralising the electricity system, without whose involvement the energy transition will not be possible. In addition to legal barriers, they pointed out problems such as lack of awareness of residents about energy cooperatives, lack of model solutions or lack of trust for the new incentives. Participants were consistent with the need to engage residents by finding a local leader who has authority among the community and who will be able to convince them to take citizen energy actions. In order to engage people, it is important to present them the benefits of citizen energy actions, i.e. lowering their electricity bills, possibility to obtain external funding and environmental aspects.

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The event underscored the significant challenges faced by ECs, including complex regulatory frameworks and financial barriers, which are particularly daunting for young people. Participants highlighted the critical need for simplifying regulations and offering clear financial incentives to boost local involvement in energy projects. Emphasizing the importance of local authorities and community leaders, the seminar concluded that successful energy transition hinges on widespread awareness and trust in energy cooperatives.

4. Photos of the Workshop

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Empowering youth for energy community actions

D2.1 Analysis of the barriers and local conditions for youth energy communities

Co-creation Workshops Minutes

Date: Thursday, 20th June 2024

Country: Portugal

Location: Agência de Energia do Porto

Organised by: AdEPorto

Prepared by: Sílvia Sousa, Ana Silva, Rita Alonso, AdEPorto

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1. Agenda

Time	Brief Description	Presenter
13h15-13h30	Registration	AdEPorto/Porto Digital
13h30-13h35	Welcome	AdEPorto/Porto Digital
13h35-14h30	Presentation and Debate about Renewable Energy Technologies	Prof. João Peças Lopes (INESCTEC) All participants
14h30-14h45	Informal discussion about barriers and local conditions for youth energy communities	All participants

2. List of Participants

Total Number of Participants	Number of Engaged Organisations
19	5

Male	Female
6	13

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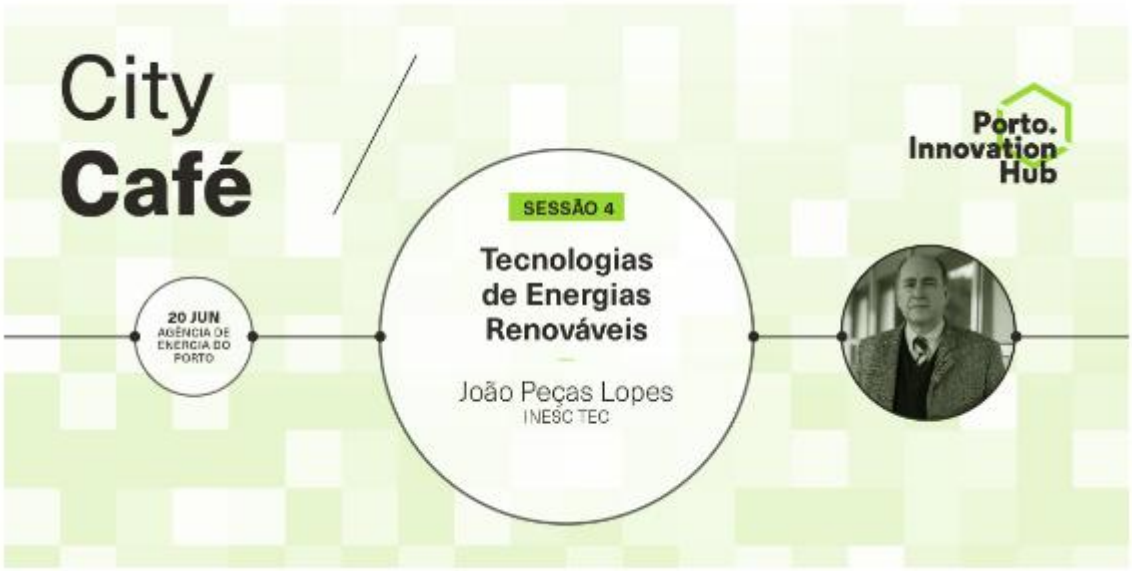
3. Description of Co-creation Workshop

The co-creation event happened on the 20th of June in association with the Porto's City Café. This initiative is promoted by Porto Digital Association and aims to create an informal moment of collaborative dialogue between speakers and guests at the Porto Innovation Hub (PIH). This activity, inspired by a coffee break, is participatory in nature and aims, above all, to foster collaboration between its participants.

In 2024, the City Café activity kicked off with an eye on sustainability and the need to create bridges between innovation, development and sustainability. The novelty of this cycle is that two of the four sessions were held in a different location than usual (PIH).

Thus, the City Café took innovation to the "home" of the Porto Energy Agency on 20 June, with the usual participation of the municipal ecosystem. The City Café session on Renewable Energy Technologies, organised by guest João Peças Lopes. João Peças Lopes has a PhD in Electrical and Computer Engineering from the Faculty of Engineering of the University of Porto and is a Full Professor at this Faculty, where he teaches undergraduate and postgraduate courses in Electrical and Computer Engineering. For 7 years he was Director of the Doctoral Programme in Sustainable Energy Systems and Director of the Advanced Studies Course in Sustainable Energy Systems at FEUP, among extensive professional experience in the field.



The session included a presentation on renewable energy technologies and a discussion on this topic and related local conditions and barriers for ECs. The results of the session directly related to POWERYOUTH are described in detail in D2.1, under the title "Co-creation day / Workshop summary".

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