

Handbook of Identified Barriers and Enablers - Update

Report D3.2b

Project Coordinator | Austrian Energy Agency – AEA

Work Package 3 Leader Organization: AYPEG

October 2023



This project has received funding from the European Union's Horizon 2020 Research and innovation program under grant agreement No 101033722.

Authors

Angela Holzmann, AEA

Herbert Tretter, AEA

Kerstin Schilcher, AEA

Martina Krenn, AEA

Mariya Trifonova, BSERC

Lyubimka Georgieva, BSERC

Thekla Heinel, B.&S.U.

Avigdor Burmeister, B.&S.U.

Benjamin Dannemann, DGRV

Eszter Süle, AYPEG

Nikoloz Sumbadze, AYPEG

Zviad Gachechiladze, AYPEG

Ivane Pirveli, AYPEG

Irakli Galdava, AYPEG

Slavica Robić, REGEA

Tijana Simek, REGEA

Bence Kovács, MTVSZ

Agnes Gajdics, MTVSZ

With contributions by all project partners

Manuscript completed in October 2023

This document is available on: www.shares-project.eu

Document title	Handbook of identified barriers and enablers
Work Package	WP3
Document Type	Report
Date	October, 2023
Document Status	Final version

Acknowledgments & Disclaimer

This project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement No 101033722.

Neither the European Commission nor any person acting on behalf of the Commission is responsible for the use which might be made of the following information. The views expressed in this publication are the sole responsibility of the author and do not necessarily reflect the views of the European Commission.

Reproduction and translation for non-commercial purposes are authorised, provided the source is acknowledged.

Preface

SHAREs supports the set-up of new and the expansion of existing energy communities, as well as collective actions, by providing local heroes with the framework and communication tools to reach out to those without the time, resources, information or digital skills to be an early adopter.

This reports aims to support policy developers in turning legal and regulatory frameworks friendlier for energy communities by providing a profound literature review on enablers and barriers to energy community development, including academic papers and related project reports, as well as an overview of country-specific enablers and barriers identified in the SHAREs partner countries.

Table of Contents

Executive Summary.....	2
1 Introduction.....	3
1.1 The SHAREs project – an overview	3
1.2 Scope of this report	3
2 Literature review	5
2.1 Summary of Literature Review	13
3 Input from pioneers.....	15
4 Summary of barriers and enablers in the SHAREs countries.....	17
5 Austria	18
6 Bulgaria	23
7 Croatia	28
8 Germany.....	31
9 Georgia	37
10 Hungary	41
11 Conclusions and Recommendations.....	44
12 References	46

Executive Summary

Energy communities offer the unique opportunity for consumers to form a critical mass, become renewable energy producers and offer their demand flexibility to the market. Consequently, there is a clear need to support local heroes (i.e., those interested in setting up collective actions) in setting up energy communities and enable them to motivate and target consumers directly. However, many potential prosumers lack the time, resources, and information to participate in and benefit from the energy transition. The objective of the SHAREs project is to cover a great variety of collective actions that will contribute to increased energy efficiency, optimised energy management and/or the integration of a higher share of renewables. Thus, SHAREs supports the set-up of new and the expansion of existing energy communities, as well as other collective actions by providing local heroes with the framework and communication tools to overcome these hurdles.

This report aims to identify barriers and enablers at legal, regulatory, and socioeconomic levels for those establishing energy communities in the target countries of SHAREs (AT, DE, HU, HR, BG, GE). Initially, the report offers a detailed literature review on energy community developments and identifies barriers that impede their large-scale implementation. The literature review suggests that barriers to energy community development across European states are common and largely call for significant policy support at national and municipal levels. In many countries reviewed, energy communities and community-driven actions face a wide range of barriers and challenges that hinder their potential. However, there are also opportunities and enablers that support the development of energy communities. These enablers highlight the need for a common approach in the EU Member States to incorporate them into their national energy policies and legislation to empower citizen-driven actions.

Simultaneously, the report illustrates the results of the SHAREs project's communication with pioneer energy communities. A diverse group of pioneers supporting SHAREs on multiple levels provided feedback on the legal framework, as well as regulatory and socioeconomic barriers for energy communities.

Furthermore, the report presents a summary analysis of barriers and enablers in the project countries and delineates the barriers and enablers specific to each country. Each of the SHAREs target countries possesses distinct characteristics and policies that influence their stance toward energy communities and cooperation in general, including citizen preferences and other factors affecting energy community development. While the enablers and barriers can be categorised into common themes, the underlying reasons for each may vary by country. Based on the analysis, the most prevalent barriers in the SHAREs target countries include **limited access to financing, policy-related obstacles, low electricity prices**, and issues related to **citizen awareness** and **capacity building** for energy communities.

In conclusion, the report emphasizes the need for a closer examination of various barriers for effective resolution. These barriers may have political, economic, social, technological, or legislative origins. However, to address these challenges, the report identifies several recommendations aimed at practically implementing energy communities in the project countries.

This **handbook on barriers and enablers** for the implementation, establishment, and adoption of energy communities aims to assist policy developers in creating legal and regulatory frameworks that are more easily understood by energy communities (D3.2). The handbook covers legal, regulatory, and socioeconomic challenges, providing suggestions on how to efficiently overcome them. The handbook is country-specific and is distributed to each policy-developer working group in SHAREs, as well as being broadly disseminated in WP7.

1 | Introduction

1.1 The SHAREs project – an overview

The SHAREs objective is to cover a great variety of collective actions that will contribute to increased energy efficiency, optimised energy management and/or the integration of a higher share of renewables. Thus, the term “energy communities” in SHAREs refers to all forms of collective actions by and for consumers such as cooperatives, collective purchase groups or other consumer-driven initiatives. In countries that have already transposed European law regarding energy communities, the focus lies on renewable and citizen energy communities. Pioneers pass on their first-hand experience to aspiring energy communities through a mentoring scheme. This ensures the establishment of a strong network. In addition, the materials developed in the project support pioneers. At least 20 emerging energy communities (pilots) in the six partner countries will be directly supported in setting up their energy communities (ECs) or any type of collective action. Through their feedback, the materials developed in the project will be tested and improved. The pilots cover various forms of energy communities. Potential communities drive the successful realization of the SHAREs project. They are approached through various multipliers in partner countries and on a European Union (EU) level. The partners’ strong national networks and European outreach ensure that the SHAREs Gateway can be strategically placed to reach the next local heroes that aim to found their energy community. SHAREs supports local heroes in establishing/expanding their energy community by creating a country-specific platform (SHAREs Gateway), which consists of two parts:

- ▶ A country-specific implementation toolkit to equip local heroes with the technical and logistical capacity to set up their energy community (such as legal framework, model contracts, technical and IT solutions, business models, etc.); and
- ▶ The building blocks of a tailored “pick-and-mix” communication campaign to enable local heroes to promote their energy community or collective action effectively to their most relevant consumer groups.

Rather than starting from scratch, SHAREs will make the most of existing initiatives, project results, open-source solutions, existing data standards and national as well as European tools, and will compile them into one single gateway. Where possible, SHAREs builds upon existing platforms and initiatives. To ensure the applicability of the results in practice, SHAREs envisages regular input from and exchange with relevant policy makers. The SHAREs Gateway combines the knowledge and tools of existing initiatives with the input of established energy communities and policy makers. After being tested by at least 20 energy communities in the six European countries and improved afterwards based on their feedback, the SHAREs Gateway will be made available to all relevant stakeholders across Europe.

1.2 Scope of this report

Task 3.2 aims at spotting inhibitive legal, regulatory and socioeconomic aspects within the overall frameworks regarding energy communities in the target countries of SHAREs (AT, DE, HU, HR, BG, GE). In order to get a complete picture of obstacles in founding, preserving and expanding energy communities several methodological approaches need to be applied. Therefore, Task 3.2 consists of two parts: (1) the pioneer circle is interviewed to gather international hands-on experience with legal and socioeconomic restrictions and pioneers’ opinions on possible solutions. (2) Simultaneously, desk research is conducted and comprehensive dialogues with policy developers are initiated. This allows complementing the experience of energy communities with the perspective of the policy developers who determine the frameworks in which energy communities operate.

This handbook of barriers and enablers for the implementation, build-up and uptake of energy communities aims to support policy developers in making legal and regulatory frameworks more easily understood by energy communities (D3.2). The handbook consists of legal, regulatory and socioeconomic challenges as well as suggestions on how to overcome these efficiently. The handbook is country-specific and is provided to each policy-developer working group in SHAREs and disseminated broadly in WP7.

2 | Literature review

Energy communities and community-driven actions have become an important part of the European energy landscape through the Clean Energy for all Europeans package since it ensures reaching overall EU energy targets. Having started at a small, mainly voluntarily scale, the recent growth in feasibility of decentralised renewable energy technologies has made the large-scale implementation of renewable energy communities possible. Best practice projects boosting renewable energy utilization on a large scale are the result. This section provides a literature review on enablers and barriers to energy community development, including academic papers and related project reports.

The literature review suggests that barriers to the energy community development across European states are common and largely call for significant policy support on national or municipal level. In many countries reviewed, energy communities and community-driven actions face a wide range of barriers and challenges that block their potential from being unleashed. However, there are also opportunities and enablers that support the development of energy communities.

Khadem Sh. et al. (2020) developed a report on community energy policy and barriers in the frames of the **Pan European Technology Energy Research Approach (PANTERA)** project under the European Union's Horizon 2020 Coordination and Support Action Programme. The project covers the following countries: **Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia**. The report focuses on identifying the **key policies for consumers' empowerment** and the missing links/barriers in related policies of the low spending countries according to their National Energy and Climate Plans (NECP). The main outcome of PANTERA's report is of high importance for providing recommendations. The findings include profiles on the project countries and contribute to the PANTERA RICAP process in relation to the community energy policy and barriers.

The report concludes that the **EU targets in emission reduction** of 55 % by 2030 and 100 % by 2050 in the European **electricity markets** compared to the emissions in 1990 will be **achieved mainly through energy citizens' empowerment**. Hence, it demonstrates the necessity of developing an effective framework for the establishment of local energy markets. The report calls for revisions of both the Electricity and the Renewables Directives, which should shape the introduction of local energy markets in the European energy system. Therefore, the report contains a detailed analysis of the EU member states approach to their community energy policies and requirements of the European legislation, which the selected member states are obliged to transform into national legislation.

The report analyses energy policies including NECPs and other EU relevant documents in the PANTERA target countries considering aspects of consumer engagement and citizen empowerment in the energy field. Through this analysis, the **relevant barriers and gaps are spotted, highlighted and linked to identified technology gaps**. The report is based on surveys of PANTERA target countries and benchmarking of the current state of policy and thus identifies barriers. At the same time, a review on recent initiatives to empower citizen-driven energy projects at national level has been conducted. The report also delves into the alignment of NECPs and associated policies with EU definitions, such as energy communities (REC and CEC), or other community models, to meet both national and EU targets.

According to the analysis, a **significant number of EU member states, especially low activity countries (i.e., low spending countries in smart grid investments according to PANTERA project), do not have policies and measures for renewable energy communities in the national legislation**. They only introduce such policies in their NECPs without further operationalisation. Only a few member states explicitly provide some targets for renewable energy communities in their NECPs.

The study claims that **one of the barriers are administrative burdens related to the framework for the self-consumption of electricity from renewable sources and the energy community**. Other challenges related to the integration of RES concern demand-side response, energy storage or flexibility aggregation and prosumers. There is no clear separation between the description of local and wholesale energy markets in the EU directives on the one hand. Regulations for energy consumers and communities to participate in these market mechanisms, on the other hand, are lacking as well.

The assessment of the related policies of the study's project countries concludes that **a common understanding of the potential role of energy communities is missing. It is also unclear which national energy transition objectives can be reached through energy communities (especially CECs)**. Even though it is promising that most member states positively acknowledge the role of energy citizens, local energy markets and energy communities, **their understanding on the role of these players in the markets is very limited**. This becomes more obvious when considering that most NECPs are not accompanied by concrete policies and effective measures. Additionally, policy details are not provided and they are usually vague or incomplete. The main outcome of this report is of high importance for providing recommendations, building a profile of the countries and contributing to the PANTERA RICAP process.

Below is a summary of identified gaps with recommendations:

- ▶ Moderate awareness among policymakers in these Member States, which is sometimes acceptable, but it is still not sufficient;
- ▶ Lack of support from local authorities and/or local energy agencies to empower and incentivise citizens to establish energy communities;
- ▶ The policies presented in most of the NECPs suffer from a lack of clarity, leading to a low level of citizen engagement;
- ▶ An effective mechanism is lacking to adjust tariffs in order to promote the usage of various RES technologies. Financial incentives are essential to increase consumer acceptance of changes and the energy transition;
- ▶ Almost none of the member states for which energy policies are analysed, have targets directly related to the engagement of empowered energy citizens in energy markets and the energy transition or regarding the local energy market mechanisms;
- ▶ A significant weakness is the lack of consistent terminology usage across the NECPs provided by Member States;
- ▶ There is a lack of clear regulation of aggregator business models. For instance, it is possible for medium and small consumers equipped with electric heating and air conditioning, as well as consumers with their own energy storage capacity, to be aggregated. However, as the number of such consumers increases, there is a need for a robust model that provides details of potential gains, energy savings, and procedures for communication with respective operators for aggregation, including automation and remote control;
- ▶ In some cases, consumers have no free access to their data, which would enable them to manage and control their consumption and production;
- ▶ The analysis also deems the development of smart metering and advanced data management systems to be inadequate.

Based on the gap and barrier analysis, the report defines enablers that should empower energy communities, energy sharing and collective actions of consumers. The potential enablers are summarized below:

- ▶ Introduce quantitative policy targets to assess the effective contribution of empowered energy citizens in energy markets;
- ▶ Define detailed measures to facilitate the role of energy communities as a key component of a customer-centric energy transition;
- ▶ Place greater emphasis on energy efficiency, energy storage, the development of market instruments, and new models and mechanisms to facilitate the involvement of energy citizens in the energy transition and to achieve the goals outlined in the Clean Energy for all Europeans package;
- ▶ To promote a competitive market structure, an effective tariff mechanism with a plan to gradually transition from a supportive tariff scheme to a competitive tariff mechanism should be provided, as renewable technologies become more mature and economically viable;
- ▶ An appropriate regulatory framework should be in place to promote the development of smart metering and data management.
- ▶ Establishing aggregators and energy communities will enable electricity consumers to reduce both the electricity costs of the system and the costs for consumers which are engaged in the aggregation;
- ▶ Day-ahead and intra-day markets with an appropriate regulatory framework will ensure the access of all participants (individual or aggregated) to the market.

Vasco Brummer (2018) reviewed the experience of the **UK, the USA and Germany** to summarize the benefits and barriers for energy communities in those countries. Due to the lack of a common definition, the author defines the meaning of an energy community for the purposes of the paper as “any activity that involves the generation or distribution of heat or electricity with the involvement of any of the forms of community”.

The information on benefits and barriers was primarily gathered by analyzing existing peer-reviewed articles. These articles were selected from Google Scholar, WorldCat, and JSTOR using specific keywords, and non-relevant ones were subsequently excluded. Once all the relevant articles were compiled, the author conducted content analysis to identify the benefits and barriers in each of the three selected countries.

The identified benefits and barriers are summarized in the table below:

Table 1: Summary of benefits and barriers identified by Vasco Brummer (2018)

Benefit	Barrier	
Economic benefits	Organizational issues / Legal framework / Planning requirements	
Education and acceptance		
RE generation targets	Lack of resources / expertise / resilience	Relevant for all selected countries
Climate protection and sustainability	Discrimination against incumbents	
Community building and self-realization	Lack of institutional and political support	
Participation	Scepticism about community energy	Relevant for some selected countries
Innovation	Saturation effect	

Lazdins. R et al (2021) conducted a review of scientific literature published between 2015 and 2021 to identify solutions for PV energy communities. The analysis is based on 64 publications and focuses on several barriers for energy communities: policy, trading model, economic assessment, business models, energy management, demand response, modelling tools and consumer adoption. In conclusion, there is a need for substantial improvements to promote energy communities in each area. This necessitates a community-focused policy that addresses issues such as non-motivating tariff systems, enhanced communication among stakeholders, and the

challenge of lobbying by large companies. Additionally, the implementation of peer-to-peer trading solutions is vital to establish an efficient trading model. The author's conclusion highlights that PV energy communities are cost-efficient, with their benefits contingent on market remuneration, the tariff system in place, and the utilization of PV energy for self-consumption. Notably, not all existing business models are suitable for PV energy communities; the chosen business model should be straightforward to engage consumers and enhance social acceptance. From a technical perspective, energy management and demand response, along with modeling tools, play a pivotal role in reducing costs and enhancing the efficiency of PV energy communities. Moreover, a significant barrier lies in consumer adoption, which is influenced by social and financial factors, political viewpoints, the availability of information, and the level of education.

As policy is essential for developing energy communities, it is important to fit the target society. The role of societal priorities when crafting policies for energy community development is considered as an important factor by **Alexander Stauch and Karoline Gamma (2020)**. The authors assessed the impact of two distinct solar remuneration models on the willingness to pay of Swiss electricity customers (n = 496). In the first model, solar power was directly provided to customers for consumption, whereas the second model involved financial compensation instead of direct electricity consumption. The findings indicate that the first model was well-received by environmentally conscious electricity customers, who were less inclined to accept the offer when financial compensation was presented as an alternative. Conversely, customers with a lower pro-environmental stance expressed greater interest in financial benefits.

Friends of the Earth Ireland in collaboration with other organizations have analysed barriers of developing energy communities across **Ireland** and recommended specific and national policy measures to address those barriers.

Their report describes four identified barriers and policy recommendations to overcome them. The first barrier is related to the procedure for the **connection to the national electricity grid**, which the authors describe as complicated, long, costly and risky. Suggested actions include grid connection prioritization for community owned projects. The second barrier concerns the **unsecure and unfair electricity uptake prices** from the community owned energy projects. To address this barrier, the report suggests several measures, including the establishment of dedicated renewable energy support schemes for community-owned microgeneration and self-producing renewable energy sources, customizing net-metering programs, and mandating electricity utilities to enter into fair Power Purchase Agreements (PPAs). The third identified barrier is the **lack of national support measures** to support community owned project development. The recommended steps include the creation of grant programs for developing community owned projects at the initial stage, support programs to enhance access to finance, the promotion of tax incentives, and the revision of existing grant aids to support all forms of renewable energy, including solar, biomass and heat pumps. The last and fourth barrier relates to the **regulatory hurdles preventing local grids and off-grid communities**. The authors recommend the relaxation of regulations, the promotion of smart grids, and thereby facilitating the development of community-owned micro grids.

In conclusion, the report offers national policy measures to foster energy community development in Ireland. These recommendations encompass the formulation of a National Community Energy Strategy, the determination of the energy communities' role in achieving national renewable energy targets, the establishment of intermediary local authorities to aid potential energy community developers in navigating the process, the formulation of local renewable energy strategies for each county, and lastly, involving the public in every stage of decision-making.

Aoidh A. et al, developed the Local Energy Community (LECo) policy paper identifying common barriers to community energy development through the PESTLE (Political, Economic, Social, Technological, Legislative and Environmental) analysis, covering 5 European countries: **Finland, Ireland, Norway, Sweden and Germany**.

Based on individual country PESTLE analysis, the policy paper identifies common barriers preventing the development of community energy projects. Common political barriers primarily revolve around the absence of

prior experience, insufficient political support from local representatives, uncooperative energy agencies, the absence of renewable energy support schemes, and the lack of national strategies and targets for energy communities. Common economic barriers primarily include limited access to financing and grants, unfair and inadequate feed-in tariffs, non-standardized Power Purchase Agreements (PPAs), the unavailability of third-party offtake agreements, insufficient incentives for renewable heat projects, complex tax regulations, and the absence of tax exemptions. Social barriers involve a lack of experience with cooperatives and civic activism, as well as a general lack of trust in cooperative models. Technological barriers relate to insufficient knowledge and experience in designing, planning, procuring, implementing, and commissioning community energy projects, and a lack of expertise for their operation and maintenance. Common legislative barriers encompass a complex legal framework, cumbersome bureaucracy, administrative obstacles to grid connection, which encompass complicated application procedures, high costs, time-consuming processes, and complexity for the average citizen. It can also be challenging to fairly operate micro-grids within these legislative frameworks. Lastly, common environmental barriers primarily revolve around low environmental awareness and conflicts between biodiversity protection and renewable energy source (RES) development.

Apart from those common and general barriers, the policy paper describes specific PESTLE barriers for each observed country. Some of the country specific barriers are:

- ▶ Increasing share of elderly people in remote areas, who are less interested in long-term investments (case of **Finland and Sweden**);
- ▶ Low electricity prices creating less interest in communities to invest in community energy (case of **Norway**);
- ▶ Lack of support schemes for renewable energies in the heat and transport sectors (case of **Germany**).

Furthermore, the report on barriers and threats to the people-owned energy revolution by **Friends of the Earth Europe (2021)** provides an analysis of barriers for community energy projects in **Germany, France, the Netherlands and Denmark**. According to the report, a community energy project refers to any project that establishes collective or public (i.e., municipal) ownership of renewable energy by a community or a group of citizens, including municipal and cooperative projects. The primary findings of the report identify barriers and threats based on the analysis, and it offers solutions and recommendations for overcoming these challenges.

The first identified barrier is related to grid access. According to the report, community energy projects should have the capability to **access the grid for selling their energy, but this access is often hindered**. To overcome this barrier, the recommendation is to treat the grid as a common asset and manage it as a public good. Simultaneously, municipalities, which oversee the operation of grids, should guarantee decentralization of the grid to support locally owned energy systems. The second barrier is associated with access to financial capital. Individuals looking to initiate collective actions often face a shortage of funds. This problem is even more pronounced in vulnerable groups residing in low-income areas, as they lack the necessary financial capital for investment. Additionally, this barrier is interconnected with the previous one, as financial institutions are reluctant to provide credits for collective actions when they perceive grid access as uncertain. As a solution, the report recommends the development of seed funds or loan guarantee mechanisms to address this issue. The third barrier pertains to the legal framework. In numerous countries, a specific legal framework for Renewable Energy Communities (RECs) is lacking, which obstructs their development. The report underscores the significance of fully incorporating the legal requirements for RECs from the directives into national legislation.

The fourth identified barrier concerns bureaucracy and permissions. New community projects frequently encounter bureaucratic hurdles during the project's development phase, particularly in obtaining permits and grid connections. These procedures often overwhelm community projects and lead to their cancellation. **The report suggests the establishment of a single national contact point at the governmental level to assist**

community projects in the country. This central point would serve as a comprehensive resource, providing all necessary information in one place and guiding community projects through the various processes.

The report from Friends of the Earth Europe also highlights threats faced by community energy, which can have a detrimental impact on existing projects. One such threat is the replacement of feed-in tariffs with auctions. This shift introduces competition among community projects to secure auction-based financial support, which can impede the large-scale development of community initiatives. The authors propose the adoption of dedicated feed-in tariffs for RECs. In cases where auctions are deemed necessary, they should be designed to incorporate the social and economic benefits that RECs bring to the local area.

A report on "Energy Communities in Different National Settings – Barriers, Enablers, and Best Practices" has been developed by the New Clean Energy Communities project as part of the Changing European Energy System (**NEWCOMERS**) initiative under the European Union's Horizon 2020 research and innovation programme. This report draws from prior research and the distinctive national characteristics of the six countries examined in the NEWCOMERS project, which are **Germany, Italy, the Netherlands, Slovenia, Sweden, and the United Kingdom**. The primary objective is to compare these six countries with the aim of identifying the barriers and enablers for new clean energy communities to emerge in various national settings and to explore the potential for sharing insights. The analysis focuses on socio-economic conditions, the technical system, the institutional framework, and key actors in the electricity market.

This report highlights important aspects for the emergence of ECs and explains socio-economic conditions such as urban and rural aspects, education, trust, GDP and the economic status of households in relation to electricity prices. In the technical systems section, the authors provided an overview of each country's electricity generation mix, associated emissions, and the electricity grid. This information is used to identify barriers and enablers in diverse national settings and to uncover opportunities for sharing cross-country experiences. Within the institutional setting, the report delves into the necessity of implementing policies and regulations specifically designed for energy communities. Furthermore, it presents details about each country's existing subsidy schemes and support mechanisms for renewables and energy communities. Lastly, the report describes the main government actors and institutions responsible for energy policy and regulation within the electricity market in all six countries.

Based on the conducted analysis the report identifies the following barriers and enablers under the above mentioned four main categories:

Table 2: Summary of enablers and barriers for socio-economic conditions identified by the report of NEWCOMERS

Enabler	Barrier
Trust	Lack of knowledge
Access to financial support such as subsidies or grants	Low disposable income
Corporate banks; low interest loans	High membership fee
Crowdfunding	
Values such as self-ownership and locally produced energy	

Table 3: Summary of enablers and barriers for technical systems identified by the report of NEWCOMERS

Enabler	Barrier
Dependency on foreign fossil fuel resources	Availability of cheap domestic central energy sources

Decentralized system	Centralized energy production systems
Prosumerism	Individual ownership of PVs
Reduction in carbon emissions	No incentives for DSOs to connect small operators to the grid
Renewable energy technology options available	High grid connection costs
Micro grids facilitating peer to peer market	
Smart meters and/or regulation allowing shared electricity in a block of flats	
Net metering, virtual net metering, virtual power plant	

Table 4: Summary of enablers and barriers for institutional settings identified by the report of NEWCOMERS

Enabler	Barrier
A clear definition will enable policies and incentive programmes specifically targeting ECs	Narrow definitions will exclude initiatives and discourage newcomers
Liberalized markets	Too broad definition will include everything, also those with multi-national companies
Regulations exclusively for ECs that allow for special treatment	Closed monopolised markets
Stable regulatory framework for ECs	Lack of tailor-made policies for ECs
Policies and outcomes promoting ECs at all levels	Lack of financing for ECs
State funding and subsidy mechanisms, state or municipality provided debt securities	Strict regulations, e.g. requirements on bank license
CO ₂ taxation	Energy prices set by market mechanisms, no correlation for externalities
Low installation costs of RES compared to conventional energy	Bureaucracy and administration

Table 5: Summary of enablers and barriers regarding actors identified by the report of NEWCOMERS

Enabler	Barrier
Multitude, variety of actors on the market	Few dominating market actors
SME economy, small energy companies, consumer-owned companies and competition and unbundling	Large energy companies and state owned energy companies
Active consumers	Lack of access to politicians and policy makers
Collaboration and networks	
Advisory service centres and umbrella organizations	

Peeters L. et al (2021) reviewed existing literature on barriers and challenges of local energy communities (LEC). The authors present successful cases of energy communities in Europe and provide an analysis of the barriers and enablers in the context of realized projects. Barriers are grouped into three major categories: socio-economic, technical, and institutional and regulatory. Each category of barriers is discussed in detail based on existing literature and the authors' examination of whether these barriers and challenges are specifically faced

by local energy communities or are generic and could be applicable to other business models of renewable energy production and consumption. The authors discuss the following barriers in each category:

Socio-economic: community engagement and buy-in, obstacles in engaging vulnerable customers, lack of expertise and professionals, absence of cognitive legitimacy, limited access to finance, absence of successful business cases, organizational issues related to insufficient volunteers, inadequate available public space for energy projects, and inflexible corporate laws

Technical: Lab-tested solutions are not always feasible in real-life applications, intermittency of local production, and the need for expensive storage solutions, inadequate remuneration for local grid balancing, and the slow roll-out of smart meters

Institutional and legal: non-supportive network tariffs, lack of incentives for collective storage, exclusion of vulnerable customers from private grids, lengthy tendering processes, the need for new administrative rules to accommodate the needs of local energy communities, and inflexible permits for new technologies and business models.

Following the detailed examination of barriers, Peeters L. et al present enablers in an innovative manner: instead of describing enablers for each barrier, the authors analyze four best practices of implemented local energy communities in Europe and discuss enablers for each particular project. In doing so, the authors also evaluate whether those enablers were specific to the considered projects or could be replicable for other local energy communities as well. They conclude that the three analyzed cases - Ecopower (Belgium), ElektrizitätsWerke Schönau eG (Germany), and Amelander Energie Coöperatie (Netherlands) - are replicable given their business models, initial funding arrangements, inclusiveness, and other factors. The fourth case, Samsø Island (Denmark), is a fascinating story to be shared worldwide for promotional purposes. It is less replicable due to the exceptional funding and support the project received at each stage.

Though written several years ago, **the “Financial Barriers and Existing Solutions” report** provides an in-depth overview of barriers faced by local energy communities that are still relevant today. Additionally, it contends that the primary barriers to financing renewable energy community projects are not primarily financial but are indirectly or directly linked to cultural, political, economic, legal, and administrative obstacles. The report was developed by the partners of the REScoop (Renewable Energy Sources Cooperatives) 20-20-20 project in collaboration with financial operators, REScoop project developers, energy experts, and cooperative model experts. The study covers ten European countries, including seven REScoop 20-20-20 project consortium members: Belgium, Denmark, Germany, France, Italy, the Netherlands, and the United Kingdom, as well as three selected countries: Croatia, Greece, and Spain. Even though the report discusses legal frameworks for RES and energy communities and citizen-based investment features in selected countries, our report summarizes only their identified barriers and proposed solutions. The study distinguishes three main categories of the factors that translate into financial barriers:

- ▶ Cultural and political;
- ▶ Economic and management;
- ▶ Legal and administrative.

Cultural and political factors have a significant negative impact on the financing of renewable energy communities. Under cultural factors, the authors highlight that in some European countries, the lack of experience and knowledge in establishing cooperatives discourages citizens from joining efforts to develop cooperatives and makes financial operators hesitant to trust such business models. In certain countries, local governments are reluctant to support REScoops, which ultimately reduces opportunities for financing cooperatives. The lack of strong national or local political support is often, if not always, reflected in the available

funding and financial support mechanisms for renewable energy projects. Economic and managerial factors mainly concern the following issues:

- ▶ The lack of capital and knowledge available during the pre-planning (project planning and identification of RES site/type) stage;
- ▶ The lack of financial guarantees that is crucial for citizens to obtain loans;
- ▶ The size of the project. In some cases, projects are small and, therefore, not interesting for financial operators to evaluate. On the other hand, sometimes projects are large and require the involvement of several financial operators.

As with political and economic factors, legal and administrative factors directly and/or indirectly affect the financing of a REScoop. One of the common and major challenges is access to the grid, which is often time-consuming and costly. The authors point out that frequent changes in regulations, especially regarding RES support scheme terms and conditions, are major factors influencing financial operators to hesitate in issuing loans or imposing stricter requirements. Finally, legislative hurdles include the main shortcomings of public offering regulations in several countries that are not favorable for REScoop initiatives, thereby limiting their access to equity capital.

To overcome these financial barriers, the authors suggest convincing citizens to invest in a REScoop, thus encouraging them to share risks across several REScoop projects. Once there is strong demand from citizens to develop REScoops and invest in them, proper policies, support schemes, and streamlined grid access will unlock further funds to realize citizen-driven renewable energy communities.

2.1 Summary of Literature Review

The literature review of selected academic papers and related project reports on factors enabling or hindering energy community development reveals that interested stakeholders at the national level require greater support to facilitate the large-scale adoption of energy community models across Europe. Currently, the expansion of energy communities is still hindered by various country-specific challenges. Furthermore, the analysis of effective enabling conditions demonstrates potential solutions and recommendations. While some country-specific enablers and barriers are observed across the literature, most of them are common or have been common for the majority of European countries. The most common barriers and enablers are summarized, grouped into categories, and provided in Table 6 below.

Table 6: Overview of common barriers and enablers

Category	Barriers for the implementation or expansion of energy communities/collective actions	Enablers for the implementation or expansion of energy communities/collective actions
Political	Factors that a national government may influence, which, in turn, affect the development of the economy or a particular industry in general and/or the implementation, establishment, or adoption of energy communities	
	Lack of clear polices and measures for energy communities in the national legislation	Robust and clear energy policies and measures
	Lack of support from local authorities and/or local energy agencies to empower and	Establishment of national and/or local energy agencies for the support of citizens

Category	Barriers for the implementation or expansion of energy communities/collective actions	Enablers for the implementation or expansion of energy communities/collective actions
	incentivise citizens for establishing energy communities	
	Lack of institutional and political support	
	Lack of support through local representatives, non-supportive energy agencies, no RES support schemes, lack of national strategies for energy communities and targets.	
Economic	Factors that directly impact energy communities or consumers and have resonating long term economic effects	
	Lack of financial incentives due to non-cost reflective energy prices	CO ₂ taxation
	Lack of access to finance, grants, not fair and insufficient feed in tariffs	
Social	Factors that influence the development of energy communities from a societal perspective, including cultural trends, demographics, population analysis, acceptance of technologies, and more	
	Lack of understanding of the potential role of energy communities in the energy transition	Building trust and knowledge on energy communities and RE technologies
	Lack of knowledge and trust	
	Lack of experience with collective actions and/or energy communities	
Technological	Factors that can impact the operations of energy communities and the energy sector in general, as well as factors related to technological innovations	
	Lack of smart metering and advanced data management systems.	Deployment of smart meters
	Grid connection, encompassing complicated application procedures, expenses, time, and complexity.	Low installation costs of RES compared to conventional energy sources
Legislative	Factors that influence the legal and regulatory framework of the energy sector and the implementation, establishment, or adoption of energy communities	
	Administrative burdens associated with the framework for self-consumption of electricity from renewable sources and renewable communities	Regulations specifically for energy communities that enable unique treatment
	Centralized energy production systems and a limited number of dominant market players	Decentralized energy production system
Environmental	Factors that influence or are determined by the surrounding environment	
	Low environmental awareness, conflict between biodiversity protection and RES development	Reduction goals for carbon emissions

3 | Input from pioneers

A strong transnational network of pioneers, who have expertise in building up energy communities, supports the SHAREs project on multiple levels. One important task is to provide their input on existing barriers and enablers on the European and national level.

The role of the pioneers is very diverse. To get the best output for SHAREs, the pioneers will be divided into two groups:

- ▶ The first group of pioneers forms the **transnational pioneer circle**. They take part in the pioneer circle kick-off meeting, give their feedback on the legal framework, the regulatory and socioeconomic barriers for energy communities and help to find the most appropriate transnational platforms and tools through participation in the round table. They are also involved in transnational and national communication activities.
- ▶ The second group contributes to the **pioneer mentoring scheme**, helps finding the right tools on national or even local level and takes part in national communication activities.

During the **kick-off meeting** the transnational pioneer circle worked on the legal, regulatory, and socioeconomic barriers that they encountered. The aim was to supplement an inventory of real-life challenges faced by energy communities. These obstacles were identified by gathering international hands-on experience about legal and socioeconomic restrictions and pioneers' opinions on the matter/possible solutions. In order to get hands-on experience, three phases were considered: Start-up / planning phase, Implementation phase, Expansion/growth phase. For the first two project phases the Strengths / enablers (the enabling environment) Weaknesses/barriers (hampering the action); and for the growth phase any Opportunities and Threats (mid-to long-term perspective) were discussed. The results of the inputs from the pioneers are listed in the same structure in Table 7.

Table 7: Summary of inputs from pioneers

Start-up / planning phase	Implementation phase	Expansion / growth phase
Strengths/ Enablers	Strengths/ Enablers	Opportunities
<ul style="list-style-type: none"> • Strongly motivated and engaged local people, groups, companies and municipalities; • Examples from other communities in Europe provide valuable insights, serving as visionary examples/pioneers; • Attractive incentives, such as financial support mechanisms, tax benefits, and regulatory frameworks that facilitate the establishment energy communities 	<ul style="list-style-type: none"> • Sufficient incentives in place (tax breaks, grid fee reductions, feed-in tariff, market premium); • Existing network of support groups to obtain information and provide assistance to new communities; • Regional/local authorities that support the implementation 	<ul style="list-style-type: none"> • New business models (e-mobility, energy sharing, tenant model, PPA etc.) increasing awareness in target groups beyond the usual actors ("RECs reaching the mainstream"); • A competent network with the ability and willingness to cooperate across company borders; • Energy sharing can garner strong support for new RES installations. This involves replicating successful models in other locations. Establishing renewable energy sharing targets for 2030 can provide a clear direction for collective efforts and sustainable growth

Weaknesses / Barriers	Weaknesses / Barriers	Threads
<ul style="list-style-type: none"> • Limited number of motivated and engaged local people, groups, companies and municipalities; • Lack of trust; • Lack of Information; • dependency on established companies; • RECs want to save the climate and save money. The latter often is not possible due to a missing framework; • General political framework not implemented in many countries; • Inertia of citizen engagement; • Low GDP independency from fossil fuels; • Cheap domestic energy sources; • Inconsistency with national social policies; • Insecurity about legal forms or business models applicability; • High insecurity due to auctioning system/tenders 	<ul style="list-style-type: none"> • Insecurity - incentives could be lowered, tenders, no grid access, low electricity prices; • Lack of legal framework for next steps of cooperatives (producing electricity in community, using it and selling it = energy sharing); • Citizen engagement must be kept high; • Financing needs; • Lack of clarity on possible business models; • High membership fee; • Inadequate grid access; • (Missing) definition of REC/CEC; • Difficulty accessing financial capital; • Bureaucracy and authorisations too complex • Authorities unfamiliar with topic; • Stop-and-go with available funds for investment grants; • Complicated subsidy schemes 	<ul style="list-style-type: none"> • Complex business models (smart meter needed, complicated subsidy schemes, complicated REC/CEC definition); • market disruptions; • Finding a good balance between voluntary and professional work; • Finding qualified personnel; • Generation gap: retired people are often who work voluntarily but need to find young successors; • Lack of resources: staff, trained and engaged people; • Lack of knowledge; • Lack of smart meter rollout; • Incentives could be lowered, e.g. investment subsidies, when RECs or CECs are successful; • High financing costs due to investment insecurities or because of being an SME compared to utilities
Needs / Solutions to overcome barriers	Needs / Solutions	Needs / Solutions
<ul style="list-style-type: none"> • A network of experts/ practitioners willing to mentor new communities; • A gateway / network to find visionary PIONEERS; • Legal and technical support for initial due diligence and to kick-start the projects; • Public awareness/education campaigns; • Commitment from local authorities to support energy community (spatial plans, council decisions) = "Covenant of Mayors 2.0"; • Mentorship programme/support to guide local initiatives. • One-Stop shop offering information; 	<ul style="list-style-type: none"> • RED II transposed into national law public awareness/education campaigns; • 2-3 robust viable business models that are easy to set up, which could be easily replicated; • Expert business model discussions and service partners with the parallel mindset; • One-stop shop for licensing and or for incentive schemes. 	<ul style="list-style-type: none"> • Market actors cooperate or offer professional services needed public awareness/education campaigns information exchange on peers level with groups in the same business; • Fast track for energy communities. Experienced peers to discuss challenges like crazy EPEX with fair competition between energy utilities, SMEs, associations.

4 | Summary of barriers and enablers in the SHAREs countries

Each of the SHAREs countries has its own characteristics and policies in place, which determine the attitude toward energy communities and cooperation in general, preferences of its citizens and other factors that affect their development. While the enablers and barriers for the energy communities can be grouped in a few common categories, the reasons behind each of those might differ by country.

Table 8 below summarizes the key enablers and barriers faced by the SHAREs target countries. It shows that technological barriers related to DSOs (distribution system operators), as well as access to financing and policy related barriers are common in all countries, while specificities are different. Low electricity prices appeared to be a significant barrier in three countries, which makes RES projects less financially attractive. The barriers associated with citizen awareness and capacity building, crucial for involving them in coordinated actions, are another challenge that needs to be addressed.

A detailed summary of identified enablers and barriers in each SHAREs target country is provided in chapters 5-11. In addition to describing these enablers and barriers, the report offers possible solutions to overcome the barriers or enhance the enablers.

Table 8: Summary of barriers and enablers in the SHAREs target countries

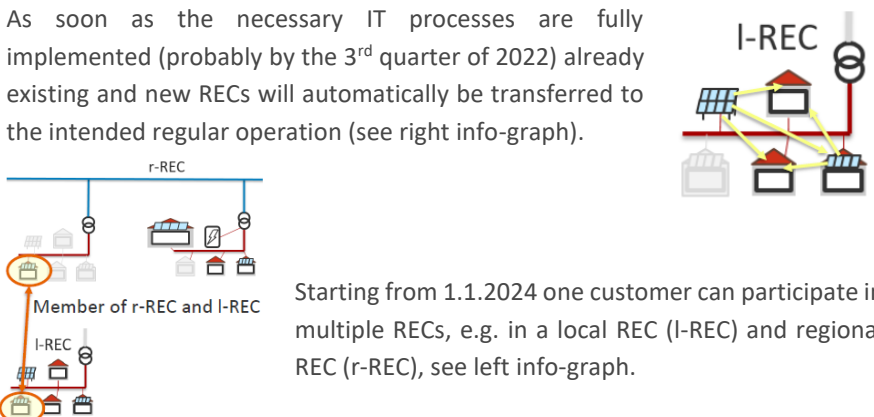
	Austria	Bulgaria	Croatia	Germany	Georgia	Hungary
DSO related technical barriers (connection, metering and IT systems)	B		B	B	B	B
Communication	B			B		
Access to finance and support schemes	B	B	B	B	B	E
Entry barrier - complexity	B					
Qualified personnel	B					
Legislation as a barrier		B	B		B	B
Lack of awareness, resources and experience among citizens		B	B	B		B
Citizen involvement		B	B		B	E
Low electricity prices				B	B	B
RES potential					E	
Net-metering experience					E	E

5 | Austria

In Austria, the European legislation, i.e. the RED II and the Internal Electricity Market Directive (EMD), have been implemented regarding to energy communities. The provisions relevant for RECs (in the EAG and EIWOG) came into force in July 2021. Since then, the establishment of energy communities has been possible. With the entry into force of the amendment to the System Charges Ordinance (November 2021), the reductions in grid charges for RECs were defined. Thus, all legal framework conditions are in place to establish and operate an REC.

Nevertheless, some barriers exist that hinder the final uptake of RECs/CECs on a large scale. Based on the desk research done in Chapter 2, the pioneer interviews described in Chapter 3, and intensive dialogues with pilots and other relevant stakeholders, the following barriers have been identified as the most urgent ones in Austria.

Barrier 1: IT processes on the DSOs side (multiple generation plants per REC)

Type:	Technical
Stakeholders:	DSOs, policy developers
Description of the barrier:	<p>Since important IT processes still have to be adapted on the grid operator side, it is currently not possible that participants of an REC can be assigned to more than one generation plant.</p> <p>As a transitional solution for the operation of RECs with multiple generation plants, participants still can only be assigned to one specific plant. However, RECs with multiple plants can already be established and put into operation using this transitional solution.</p> <p>As soon as the necessary IT processes are fully implemented (probably by the 3rd quarter of 2022) already existing and new RECs will automatically be transferred to the intended regular operation (see right info-graph).</p>  <p>Starting from 1.1.2024 one customer can participate in multiple RECs, e.g. in a local REC (I-REC) and regional REC (r-REC), see left info-graph.</p>
Possible solution:	<p>Stakeholder processes are ongoing. According to the current plan, the implementation of the missing IT-processes should be completed in October 2022. The implementation process of IT solutions should be closely monitored by political decision-makers. If possible or necessary, measures should be taken to move the process forward.</p>

Barrier 2: Smart meters – putting into operation

Type:	Technical
Stakeholders:	DSOs, policy developers

Barrier 2: Smart meters – putting into operation

Description of the barrier:	<p>In Austria, the local grid operator (DSO) shall, irrespective of the project plan on the roll-out of smart meters, provide end consumers with a smart meter upon request. If the installation of a smart meter is requested in connection with the establishment of an energy community, the grid operator shall install smart meters within two months (§ 16e par 1 ElWOG 2010).</p> <p>However, the ElWOG unfortunately only regulates the installation, not the putting into operation of the smart meter. The mere installation, without putting into operation, naturally has no added value for the customer and thus delays the establishment or participation in an energy community.</p>
Possible solution:	<p>The ElWOG should be adapted accordingly and, in addition to the installation, should also specify a time frame for the putting into operation.</p>

Barrier 3: Non-availability of professional communication material

Type:	<p>Social, economic</p>
Stakeholders:	<p>Local heroes, supporting organisations</p>
Description of the barrier:	<p>According to dialogues with Austrian pilots, the non-availability of professional communication material to engage more consumers to take part in RECs once they are established is a barrier that hinders RECs to grow. Generally, local heroes are no communication experts, but more technical focused people. Creating target-groups specific material to convince big parts of the neighbourhood to take part in the action can be quite expensive and time consuming.</p>
Possible solution:	<p>This is a gap we can close within the SHAREs project. We develop and offer target group specific communication strategies and white-label materials for free.</p>

Barrier 4: Smart meters – Opt-in

Type:	<p>Social</p>
Stakeholders:	<p>DSOs, policy developers, supporting organisations</p>
Description of the barrier:	<p>In order to participate in an energy community, the transmission of quarter-hourly values to the network operator is a prerequisite. In Austria, this requires not only the installation of a smart meter, but also a so-called "opt-in", i.e. the active consent to the transmission of quarter-hourly values, see options below:</p> <p>Standard: The electricity meter measures the electricity consumption once a day and sends the total daily electricity consumption to the respective network operator once a day. The data is stored and can be viewed by the consumers.</p> <p>Opt-out: Electricity consumption is measured once a year and transmitted to the respective network operator. Data storage is deactivated. Grid feed-in, e.g. via a PV system, is not possible in this case.</p> <p>Opt-in: The electricity meter measures the electricity consumption every 15 minutes and sends these quarter-hourly values to the respective network</p>

Barrier 4: Smart meters – Opt-in

	<p>operator all at once every day. The data is stored and can be viewed by the consumers.</p> <p>This could possibly hamper the expansion of energy communities. Consumers could have reservations regarding the transmission of quarterly hour values (uncertainty regarding possible costs, data security, etc.). Furthermore, the necessity of a proactive action on the side of the consumer is always an additional barrier.</p>
Possible solution:	Information campaign to increase knowledge about smart meters and to reduce reservations regarding the use of smart meters.

Barrier 5: 50 % market premium

Type:	Economic
Stakeholders:	Policy developers
Description of the barrier:	<p>Renewable-energy-sources-based electricity generation plants of RECs and CECs are (partly) eligible within the market premium support framework.</p> <p>The market premium is calculated based on the amount of electricity fed into the public electricity grid. No market premium is granted for electricity allocated to the members of the energy community [EIWOG §80 (2)]. I.e. electricity quantities generated (from a generation plant eligible for a market premium) but not consumed within an energy community can be subsidized.</p> <p>However, RECs and CECs, unlike all other plant operators, would not receive the market premium for 100% but only for a maximum of 50% of the energy generated (per plant).</p> <p>This restriction of the subsidy to 50% of produced green electricity not used in the energy community could hamper the set-up of energy communities.</p>
Possible solution:	Open stakeholder discussion if 100% of generated green electricity should be subsidized in the market premium scheme. If considered useful, adapt respective regulations.

Barrier 6: Ensuring competition and price transparency

Type:	Economic
Stakeholders:	Local heroes, supporting organisations
Description of the barrier:	Service providers skim off possible profits generated by reduced network tariffs and other socialised cost reductions for energy communities.
Possible solution:	Develop and offer tariff calculator for energy communities to compare service providers and their costs.

Barrier 7: Complexity as entry barrier 1/3 – How to start?

Type:	Social, economic
Stakeholders:	Local heroes, supporting organisations
Description of the barrier:	The legal and regulatory framework for energy communities in Austria has already been largely clarified. However, it is not always easy for local heroes to find out which type of energy community/collective action is suitable for them, and which regulations are relevant for them. Despite the existing legal framework, initiators of collective actions are often overwhelmed or confused by the complexity of these regulations and do not know where to start.
Possible solution:	Tool developed within the SHAREs project This is a gap we can close within the SHAREs project. The idea is to develop an online query tool which leads local heroes through the most important initial questions when thinking about setting up an energy community (type of generation, number of members, proximity of members, etc.). The tool should help local heroes to identify the optimal type of energy community/collective actions for their specific conditions. The results could also contain a list of Austrian service providers that can help with the implementation of the respective type of energy community.

Barrier 8: Complexity as entry barrier 2/3 – Finding your energy community

Type:	Social
Stakeholders:	Policy developers, supporting organisations
Description of the barrier:	Currently, there is no easy way to find out for citizens where they can find the next energy community in their proximity. Thus, if they are interested to take part in an energy community they have to rely on hearsay, newspaper articles, or google search.
Possible solution:	An easy-to-use tool that shows you all possible energy communities based on postcode (or address) or metering point number. The DSOs could establish online tools, which show potential REC members in real-time, via entering their metering point number, to which 400 V low voltage side of a certain/clearly defined transformer station (“Trafo- bzw. Transformatorstation”) and to which 1 kV to 36 kV medium voltage side of a certain/clearly defined transformer substation (“Umspannwerk”), and which bus bar of this Umspannwerk the metering point is allocated to. Furthermore all already existing local or regional RECs and contact possibilities relevant for that metering point should be shown automatically too.

Barrier 9: Complexity as entry barrier 3/3 – Information on network area

Type:	Technical
Stakeholders:	Policy developers, DSOs
Description of the barrier:	When founding an energy community in Austria, there are two possibilities depending on the proximity of the members: the local REC (generation and

Barrier 9: Complexity as entry barrier 3/3 – Information on network area

	<p>consumption installations can be connected to network levels 6 and 7 only) or the regional REC (generation and consumption installations can be connected to grid levels 5 to 7 and the bus bar of network level 4).</p> <p>The information on which part of the distribution network the respective generation and consumption installations are located must be made available by network operators within 2 weeks. The network operator should also provide information on whether the connection is located in the local or regional area of a specific energy community.</p> <p>Asking the network operator for information, waiting for two weeks, ask again if the information is not provided on time: all this could hamper citizens from taking part in an energy community. The necessity of a proactive action on the side of the consumer is always an additional barrier, furthermore communication with the network operator often is seen as complicated and bureaucratic, overall for a first information.</p>
Possible solution:	<p>Online tool, that gives details on the part of the distribution network ones generation or consumption installation is located; this tool could also give information on existing energy communities in my regional or local area (see also barrier 8; these tools already exist for some network areas, overall solution see barrier 8 above).</p>

Barrier 10: PV modules: lack of qualified staff, long delivery times

Type:	Social
Stakeholders:	Policy developers
Description of the barrier:	<p>Triggered by the currently very high energy prices, the already high demand for roof-top PV plants has risen even further. Further intensified by the shortage of skilled workers (especially PV module mounters), REC members are currently waiting for several months up to more than a year from ordering to installing a PV system.</p>
Possible solution:	<p>Counteracting the shortage of skilled workers (especially PV module mounters) with appropriate measures. An example is the "Elektropraktiker" training program.</p>

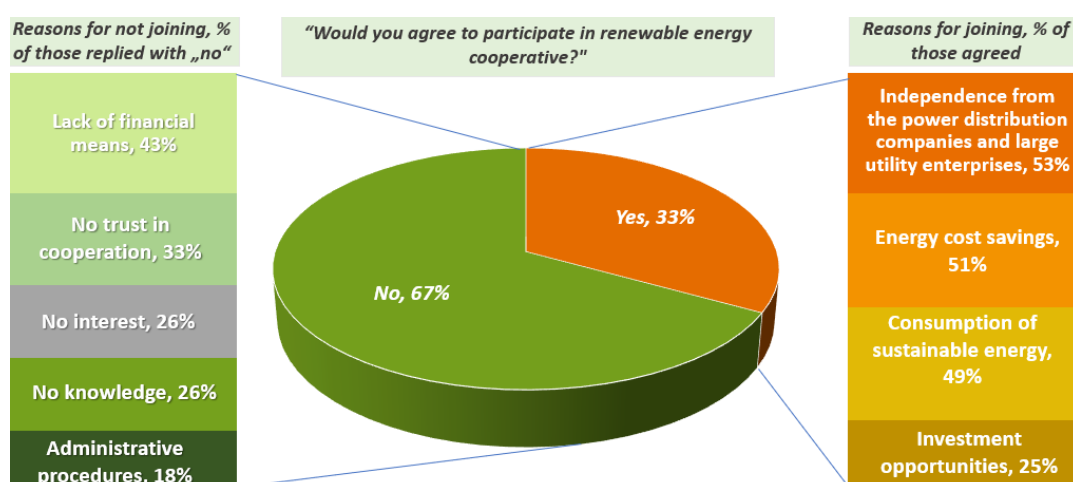
6 | Bulgaria

All categories of pre-defined barriers pertain to the energy community framework in Bulgaria as of the beginning of 2022. Although national legislation does not prohibit any type of collective action, the current legal and regulatory provisions create a number of hurdles for potentially interested parties. The first and foremost issue hindering citizens, small businesses, and municipal actors from taking the risk associated with the creation of an energy community is the absence of a legal definition for CEC/REC models, as RED II and IEMD directives have not been transposed yet. The delay in the transposition of both directives, which were expected to initiate the first legislative changes for energy consumer empowerment by the end of June 2021, as per the official deadline, along with the absence of community-related targets or support schemes in recent Bulgarian policy planning documents (such as the NECP, the National Recovery and Resilience Plan, or the Territorial JTP), highlights the lower priority that policymakers in the country assign to citizen participation in the energy transition process.

To a great extent, political barriers justify the existence of economic ones, such as the absence of public or private sources of financing at preferential conditions. Given that Bulgaria is one of the poorest member states in the EU, the lack of financial resources to cover the initial investment share in energy communities is understandably a significant obstacle. A national representative study on the social acceptance of renewable energy in Bulgaria, conducted by Trifonova (2021)¹ at the beginning of 2021, substantiates this expectation. According to the data collected, only 33% of the 1034 respondents would participate in a renewable energy community. The primary reason for not supporting such an initiative lies in the unavailability of financial resources, as illustrated in Figure 1 below. Furthermore, social and cultural barriers should not be underestimated. The lack of trust in cooperation or insufficient knowledge ranks among the possible motives for abstaining.

Due to the high degree of centralization in the planning and dispatching of national energy networks, coupled with financial constraints, there are several technological barriers that considerably impede the connection of new distributed renewable energy capacity in general. Specific provisions regulating grid connection priorities for energy communities or the flexible management of energy flows among their participants are not currently in place.

Figure 1: Willingness to participate in a renewable energy community and reasons for (not) joining (results of national representative survey among Bulgarian citizens)



¹ Trifonova, Mariya (2021): Social acceptance of renewable energy sources and the technologies for their utilization. Available at https://www.uni-sofia.bg/index.php/bul/content/download/248293/1637967/version/1/file/Report_RES.pdf

Barrier 1: Lack of long-term and consistent national policy incentivizing citizens participation in the energy transition

Type:	Political
Stakeholders:	Policy developers, citizens organizations, media
Description of the barrier:	<p>Most strategic documents concerning the energy sector which are in place in Bulgaria put their focus on large-scale capital-intensive projects. The Integrated National Energy and Climate Plan of the Republic of Bulgaria 2021-2030 encourages on paper the establishment of local energy communities and recommends the adoption of legislative measures that allow more active participation in the energy market. However, the document does not introduce specific indicative targets towards collective models or citizens/renewable energy communities. The National Recovery and Resilience plan which was approved by the EC in April 2022 distributes more than 20 % of its overall funds for investments in new large-scale RES capacity, but only 1 % will support citizens to equip their homes with installations utilizing renewable energy for water heating or power generation needs. No specific schemes for social innovation and community action in the process of the energy transitions are available in the country.</p>
Possible solution:	<p>Increased pressure by citizens' organizations, the media, and EU institutions on Bulgarian authorities and the government is needed to prompt policy actions facilitating the engagement of Bulgarian society in a just and inclusive transformation of the energy sector.</p>

Barrier 2: Lack of legal provisions and framework regulating ECs

Type:	Legislative
Stakeholders:	Policy developers, administration, energy regulator and energy agencies
Description of the barrier:	<p>The current energy legislation lacks provisions on the establishment, legal form, and functioning of energy communities (e.g., it does not define rights and obligations of producers, consumers, aggregators).</p> <p>Peer-to-peer market and community owned micro grids need to be facilitated through additional legal provisions.</p> <p>Additionally, there are no adequate governmental incentives that encourage the investment in renewable energy sources.</p>
Possible solution:	<p>Establishment of a comprehensive regulatory framework for energy communities in line with the European RED II directive, and regulatory and legal certainty for the sector.</p> <p>Introduction of net-metering scheme</p>

Barrier 3: Conflicting legal provisions currently in place

Type:	Legislative
Stakeholders:	Policy developers, energy communities, citizens
Description of the barrier:	There are several legal provisions that give rise to controversial situations. For instance, if an economically or energy-poor household receiving social or energy benefits becomes a co-owner of a photovoltaic installation supplying electricity to the grid, earning even 1 cent from the electricity supplied to the grid could result in the loss of its entitlement to social and energy benefits.
Possible solution:	Revision of regulations

Barrier 4: Tax complexities

Type:	Legislative , economic
Stakeholders:	Policy developers, citizens
Description of the barrier:	Owners of installations generating electricity from renewable energy sources are subject to numerous taxes, fees, and administrative payments. At times, the total sum of these obligations surpasses the profit derived from the sale of surplus energy produced. Investors with installations connected to the grid must settle various fees and taxes, including an access fee, a 5 % tax on proceeds from the sale of surplus energy, and a 10 % corporate tax on income from electricity sales.
Possible solution:	Adoption of clear rules governing tax rates and possibilities of taxing individual members of an energy community

Barrier 5: Shortage of financial incentives

Type:	Economic
Stakeholders:	Pilots, pioneers
Description of the barrier:	The high levels of upfront investment, lack of public funding for support or specialized non-financial assistance programs are among the main barriers. Unfortunately, a small proportion of individuals and households have a sufficiently high disposable income to invest in renewable electricity installations with entirely own funds. Additionally, community energy projects are rarely supported by banking institutions.
Possible solution:	Mobilizing financial instruments (for example in the form of low-interest loans or grants) or direct public funding to help low- and

middle-income households and small and medium-sized enterprises support investment and participation in energy communities

Introducing net-metering scheme

Barrier 6: Lack of public awareness about socio-economic impact

Type:	Social
Stakeholders:	Citizens
Description of the barrier:	Citizens are not sufficiently informed about the benefits of renewable energy technology. In particular, renewable energy is mainly associated with positive environmental effects and less often with its socio-economic impact. This can partially be explained by the lack of expert information in the public sphere as well as the lack of public awareness about the governmental institutions that manage the transition to low-carbon technologies and their wider use.
Possible solution:	Development of information campaigns to inform and educate citizens, SMEs, and municipalities about the benefits of energy communities; Introducing mentoring programs

Barrier 7: Lack of knowledge about the technology

Type:	Social
Stakeholders:	Citizens
Description of the barrier:	On the one hand, citizens have difficulties in understanding the process of energy production and storage. On the other hand, there is a lack of knowledge and experience in energy community management technologies. The absence of pioneers in the country that could explain firsthand the technical methodology further demotivates citizens to take the first step.
Possible solution:	Creation of a “one-stop shop” center in each municipality

Barrier 8: Lack of administrative capacity

Type:	Social
Stakeholders:	Administration, citizens
Description of the barrier:	Citizens mainly rely on the assistance of their municipality to find structured and up-to-date information on how they could benefit from renewable resources for energy production. At the same time, local authorities lack knowledge and expertise on this subject matter, which prevents the establishment of energy communities.
Possible solution:	Active participation of municipalities in international educational programs and seminars for knowledge exchange.

Barrier 9: Complex bureaucracy

Type:	Legislative
Stakeholders:	Administration, citizens
Description of the barrier:	The current legislation gives power to multiple state bodies with competence in the development of renewable energy projects. Therefore, the process of initial installation requires serious expert knowledge to navigate the network of administrative and regulatory procedures. For this reason, many potential investors are discouraged feeling lost among the many institutional requirements.
Possible solution:	Introduction of a single administrative contact point throughout the process

Barrier 10: Historical burden

Type:	Social
Stakeholders:	Citizens
Description of the barrier:	Historical burdens and worldviews significantly affect the interest in participating in an energy community. These problems are particularly critical for the citizens of post-communist countries like Bulgaria, where communities and cooperatives often evoke memories of the violent collectivization of the communist regime.
Possible solution:	Promotion of good practices of voluntary cooperative ownership and governance initiatives developed in post-communist countries

7 | Croatia

In Croatia RED II and EED have been transposed in terms of CEC and REC. However, there are still many barriers impeding the development of community energy. CEC are currently limited to only not for profit legal forms, and geographically to one local authority and one low voltage transforming unit. Furthermore, the legal procedure for acquiring the status of CEC is complex, expensive and time consuming. Laws are currently in the process of revision. Other barriers include notably slow response from relevant actors such as DSO, and very low roll out rate of the smart meters.

In general, there is also a lack of awareness on benefits of community energy such as CEC and REC amongst the general population, and there are very limited resources available to help change that situation. EU funded projects, such as SHAREs offer unique and extremely valuable opportunities to help inform the public and stakeholders and to contribute to changing the policy landscape.

Barrier 1: Lacking and missing legislation

Type:	Political
Stakeholders:	Policy developers (experts and state institutions), supporting organizations, pioneers
Description of the barrier:	Current legislation (as of end 2021) considers Citizen Energy Communities and Renewable Energy Communities. However, CEC are currently limited to only one transformer and one local authority. Furthermore, it is only possible to establish CEC under the non-profit legal entity type. This limits scope and reduces the interest of citizens. Secondary legislation is still pending for both CEC and REC.-
Possible solution:	Change definition and scope of CEC with the main Electricity Market Act to be fully in line with the EU Directive. Promptly develop needed secondary legislation. Include citizens and relevant stakeholders in the process.

Barrier 2: Lack of smart meter rollout

Type:	Political, social
Stakeholders:	Pilots, pioneers, policy makers
Description of the barrier:	The rollout of smart meters in Croatia is currently limited in scope, lacking a clear strategy or indication of when a comprehensive deployment will be completed nationwide. The implementation is typically carried out on a case-by-case basis, based on specific requests. The primary constraints are the associated costs and a lack of clear political will.
Possible solution:	Changes in legislation requiring faster rollout of smart meters by suppliers/DSOs.

Barrier 3: Limited access to finance and support schemes

Type:	Social, economic
Stakeholders:	Pilots, pioneers, policy developers

Description of the barrier:	Due to the economic situation and average income, citizens generally have limited resources to invest in renewable energy sources and energy efficiency, regardless of the estimated payback period. Some limited financing support mechanisms exist, typically in the form of direct grants (up to a certain percentage of the total investment). However, these usually necessitate upfront financing by the investors themselves. Currently, there are no tax deductions, favourable loans, or long-term financing support mechanisms available in the sense of continuous accessibility to investors, such as low-interest rate loans.
Possible solution:	Increase awareness among financial institutions, change national and regional financing approaches from intermittent schemes focused only on co-financing investment to long-term approaches such as tax deductions, lower VAT, favourable interests on loans, and supporting collective actions over single large investor's projects.

Barrier 4: Limited experience with citizen energy in general

Type:	Social, economic
Stakeholders:	Pilots, pioneers, policy makers, supporting organizations
Description of the barrier:	Croatia has very limited experience with citizen energy. In recent years there have been some, however, limited developments primarily linked to energy cooperatives. No formal energy communities or other forms have been up to date established and operational (linked to Barrier 1). There is an issue that with some segments of the public, there is still a negative connotation to the concept of collective actions/cooperatives due to historic circumstances.
Possible solution:	Large-scale communication and awareness campaigns. Transparency and access to information from relevant institutions and stakeholders (Gateway development). Removal of barrier 1.

Barrier 5: Lack of resources (time, knowledge and base financing) to kick-off with collective actions

Type:	Social, political
Stakeholders:	Pilots, Pioneers, supporting organisations
Description of the barrier:	In the initial phase, collective actions are typically dependent on voluntary efforts and support from external organisations. The entire process, especially in the context of a country like Croatia where no energy communities have been established yet, is time-consuming and requires specific expertise, which often becomes a limiting factor. Furthermore, progress is frequently hindered by a lack of understanding among crucial local stakeholders and support groups, such as local authorities.
Possible solution:	Creating strong partnerships and motivation campaigns. Policy developers need to develop support schemes to facilitate the establishment of energy communities.

Enabler 1: Citizens as active market actors (aggregation)

Type:	Social, economic
Stakeholders:	Pilots, pioneers, supporting organisations
Description of the enabler:	Given the current situation concerning energy supply/demand and rising prices, aggregation emerges as an innovative solution to stabilise and minimise the risk of failure when the energy system is under pressure. Additionally, it facilitates the integration of renewable energy technologies. Forms of collective action, such as aggregation, can add value by consolidating supply and demand, either separately or in a single portfolio. Furthermore, energy cooperatives/communities supported by aggregators can sell the generated electricity in the wholesale energy market, achieving more competitiveness and, consequently, providing more affordable electricity for their members.
Possible solution:	Creating strong partnerships with the pioneers in this area with possible replication of good practice examples from the EU through synergies with other successful projects.

8 | Germany

So far, the European legislation has not yet been fully transposed into the German law. Although the definition of the Bürgerenergiegesellschaften (BEG), which is based on the European definition of the Renewable Energy Community (REC), has been introduced, it is not yet possible for the energy communities in Germany to share the self-generated electricity with the members, in addition to owning renewable energy plants. Legally enabling energy sharing would address a number of obstacles in the German energy transition, such as acceptance and participation in the construction of renewable energy projects and incentives for greater flexibility on the part of consumers, which would benefit the grid and the market.

However, there are also other obstacles for the energy communities. Given the fact that energy communities often work on a voluntary basis, various obstacles arise. These include a lack of time to develop communication strategies to attract new members, a low compensation for the produced energy and missing the experience to deal with technical, legal, and financial issues. Often, those responsible have to deal with complex bureaucratic procedures and complex business models, like as can be seen in the case of the tenant model. The fact that the roll-out of smart meters in Germany has not yet worked makes these problems even more challenging. There are also problems at other levels, as can be seen above all in the weighing up of climate protection and other issues such as economic efficiency and nature conservation. The latter can cause delays in the construction of wind turbines, for example, which can result in additional costs, that may be difficult to handle, especially for small players. For this reason, an exemption from tendering has been agreed for BEGs, but this is not yet sufficiently extensive to accelerate the expansion of citizen-owned renewable energy.

Barrier 1: Low electricity prices at the stock exchange

Type:	Social
Stakeholders:	Pilots, pioneers, policy makers
Description of the barrier:	If electricity is currently sold on the market, the low electricity exchange price is not sufficient to refinance new RE plants.
Possible solution:	As long as it is not possible to refinance economically via the electricity market or another market instrument, the further expansion of renewable energies is dependent on the existing support system. This could be the existing feed-in tariff or market premium.

Barrier 2: Complex structures in the financing of projects

Type:	Social
Stakeholders:	Pilots, pioneers, policy makers
Description of the barrier:	The structuring of projects and project financing require very detailed financial and contractual preparatory work. Many collective actions like to resort to project financing. It has the advantage that the financing decision can be based on a transparent structure of a financial body created for this purpose. This can be assessed more easily within the framework of forecast calculations. In the meantime, shades of grey are mingling into the supposedly purely segregated world of financing between "project financing" and "corporate financing". Up to now, the imbalance of project financing and the associated support measures, such as the injection of fresh money from outside, were regarded as a clear default event, but recently there have been signs that the principle of a "limited recourse" (limited recourse to the initiators during the term of the loan) is also being accepted as a

	third way. This plays a role, for example, in project financing of collective actions, when joint venture structures develop between a project financing structure (the citizen project) and a strong creditworthiness provider (for example, the municipal utility).
Possible solution:	Joint venture structures between a strong creditworthiness provider and the collective actions should be easily possible and transparent.

Barrier 3: Necessary collateral in the event of financing bottlenecks

Type:	Social
Stakeholders:	Pilots, pioneers, policy makers
Description of the barrier:	The possibility of preventing defaults in cases of financial bottlenecks in a regulated manner and long before the loan is terminated and collateral realised is often a decisive argument for many banks in favour of granting a loan.
Possible solution:	Energy community funds could be a solution for collective actions to have a secure ground for new projects.

Barrier 4: Voluntary structure

Type:	Social
Stakeholders:	Pilots, pioneers
Description of the barrier:	Due to the voluntary structure of collective actions, many participants lack the scope to get involved beyond their membership. Diverging ideas among the members can be a limiting factor for the further development of an energy community. For example, members sometimes prefer to maintain proven business areas rather than develop new and complex business models.
Possible solution:	Creating capacities for member activation and public relations is a prerequisite for tapping into further target groups and successfully introducing new business models. (employee structure)

Barrier 5: Lack of time to acquire the necessary strategic knowledge

Type:	Social
Stakeholders:	Pilots, pioneers
Description of the barrier:	Many collective actions are looking for new fields of business that they can develop despite the fact that they are mostly volunteers. However, they often lack the time to acquire the necessary strategic knowledge. Although an internal strategy development with the active involvement of the members would be desirable, it often fails due to the workload of the board through everyday tasks. The development potential of collective actions therefore often remains untapped. These questions are usually accompanied by the desire for further diversification of business models: breaking new ground and implementing business areas that are detached from the previous business model.
Possible solution:	For the expansion or diversification of the business areas, the development of full-time structures or the establishment of strategic cooperation is therefore important.

Barrier 6: Lack of time to establish strategic partnerships

Type:	Social
Stakeholders:	Pilots, pioneers
Description of the barrier:	Time and energy are often not enough for more extensive activities, such as the interactive design of the general assembly, updating the website or creating a new flyer.
Possible solution:	The extent to which members are prepared to support changes or become more involved in the collective actions can be determined through surveys.

Barrier 7: Lack of time to communicate

Type:	Social
Stakeholders:	Pilots, pioneers
Description of the barrier:	Time and energy are often not enough for more extensive activities, such as the interactive design of the general assembly, updating the website or creating a new flyer.
Possible solution:	The extent to which members are prepared to support changes or become more involved in the collective actions can be determined through surveys.

Barrier 8: Lack of smart meter rollout

Type:	Social
Stakeholders:	Pilots, pioneers, policy makers
Description of the barrier:	The technological factors differ depending on the business models. In general, it can be said that technical barriers can usually also be solved technically but can have an impact on the economic viability of the projects. However, especially for new business models such as energy sharing, the rollout of smart meters is lacking in Germany. This barrier is about to change with the Law to Relaunch the Digitalization of the Energy Transition that was passed in May of 2023.
Possible solution:	Incentives for flexible electricity use and production

Barrier 9: Produce and forget mentality

Type:	Social
Stakeholders:	Pilots, pioneers, policy makers
Description of the barrier:	The electricity market currently does not promote the use of electricity on site. Due to a lack of economic incentives, the electricity from community plants is largely fed directly into the grid and sold according to fixed compensation rates. This promotes a produce and forget mentality. New technological solutions are not stimulated.
Possible solution:	Incentives for regional electricity use

Barrier 10: Environmental protection vs. climate protection

Type:	Social
Stakeholders:	Pilots, pioneers, policy makers

Description of the barrier:	In the past, environmental protection has always moved people when the environmental problem was easily perceivable, when it affected many people and when there was a small and clearly definable group of polluters. In many respects, all of this is missing in climate protection, which is why climate-damaging emissions are hardly decreasing. A hopeful development is that more and more people see climate change as problematic.
Possible solution:	Communication about climate crisis

Barrier 11: Economical benefits vs. climate protection

Type:	Social
Stakeholders:	Pilots, pioneers, policy makers
Description of the barrier:	Growing awareness of the problem is an essential prerequisite for the willingness to change in politics and society. In 2016, for example, more than half of the people were still opposed to higher taxes on fossil fuels to promote climate protection. In 2019, fewer people, 42%, rejected this. Nevertheless, a majority is not yet in favor of such measures, and there is considerable dissent about sensible ways forward. In many cases, the activities required for climate protection are in direct conflict with societal notions of economic growth and prosperity.
Possible solution:	It is therefore important to find ways to support the willingness of the general population to support the necessary changes and to implement them on a personal level. Due to their regionality and proximity to citizens, energy communities are well placed to implement climate protection measures together with their members and citizens. (communication about regional value creation)

Barrier 12: Global climate crisis vs. regional climate protection

Type:	Social
Stakeholders:	Pilots, pioneers, policy makers
Description of the barrier:	Many options for action at the political and individual level are perceived as irrelevant because their contribution to solving the global problem is only small and they are still politically unpopular.
Possible solution:	Communication about local emissions

Barrier 13: Tenders

Type:	Legislative
Stakeholders:	Pilots, pioneers, policy makers
Description of the barrier:	The main activity of collective actions in Germany was and still is the project planning and operation of photovoltaic plants. In recent years, the legal framework has been changed several times to the disadvantage of collective actions. Especially for photovoltaic projects, a downturn is to be expected since mid-2019. This year's survey of energy cooperatives by the DGRV, for example, shows, that only 54 % of respondents still want to be active in small and mediums sized photovoltaic plants up to 750 kW (compared to 71 % in 2018), due to the special cutback in the photovoltaic segment. In the tenders for wind energy and large-scale photovoltaic

	plants, collective actions are still hardly given a chance and, in addition to administrative hurdles, they are also deterred by the high economic risk.
Possible solution:	De-minimis regulations

Barrier 14: Expiration of the feed-in tariff

Type:	Legislative
Stakeholders:	Pilots, pioneers, policy makers
Description of the barrier:	<p>At the end of 2021, the first systems that were remunerated under the Renewable Energy Sources Act (EEG) will cease to receive statutory subsidies. This mainly affects private system operators with small photovoltaic systems with an installed capacity of up to approx. 5 kW. But also collective actions will soon have to decide on the future use of their systems and the marketing of the electricity. For all renewable energy plants, there are essentially three options available: Continued operation of the existing plant, construction of a new plant at the same location or sale or decommissioning of the plant.</p> <p>It remains to be seen whether the envisaged market value will enable continued economic operation. This would be particularly important for cooperative local heating networks, as the majority of the main heat sources are bioenergy plants subsidised under the EEG.</p>
Possible solution:	Establish new business models

Barrier 15: No energy sharing

Type:	Legislative
Stakeholders:	Pilots, pioneers, policy makers
Description of the barrier:	Alternative marketing options, as specified by the EU, have not been taken into account so far. In the Renewable Energies Directive, for example, "energy sharing" - the joint generation, distribution and consumption of energy - was stipulated. The EEG 2021 did not include that.
Possible solution:	Development of clear regulations and models is needed

Barrier 16: Project development costs for participation in tenders

Type:	Legislative
Stakeholders:	Pilots, pioneers, policy makers
Description of the barrier:	Before a company can participate in a tender, it has to incur considerable project development costs - for example for expert opinions or permits. These costs are lost if the company is not awarded a contract. Since most collective actions only plan one larger project, e.g. a wind turbine, they cannot compensate for a total loss with other, successfully awarded projects. In this respect, the risk of losing the citizens' capital entrusted to them is far too high for those responsible.
Possible solution:	Energy community funds

Barrier 17: Joint supply via the public electricity grid is not possible

Type:	Legislative
--------------	-------------

Stakeholders:	Pilots, pioneers, policy makers
Description of the barrier:	Another problem for collective actions: they can rarely use the electricity from their solar power system directly from their own roof. The members often do not live in the same building but are widely scattered. The public grid cannot be used to distribute the electricity either. Therefore, not only the generation, but also the communal supply of electricity from smaller local suppliers and thus the cooperative supply of members must be facilitated.
Possible solution:	Equalisation of joint self-sufficiency and individual self-sufficiency

Barrier 18: Complex structure of the tenant model

Type:	Legislative
Stakeholders:	Pilots, pioneers, policy makers
Description of the barrier:	Although the tenant model is promoted by legal framework conditions, the number of projects implemented remains below expectations. Tenant models are often seen as "complicated". This is due to the wide range of tasks from the necessary property, energy and customer data management, tariff and meter recording and contract management to billing or switching processes, or the customer communication associated with all these points.
Possible solution:	Development of clear regulations and models is needed

9 | Georgia

In Georgia, legislation regarding energy communities has not yet been transposed. As a contracting party of the EU Energy Community, Georgia is obligated to transpose the legislation and implement it in the coming years. Nevertheless, Georgia has successfully implemented net-metering regulations, including group net-metering allowances (commonly known as virtual net metering). This represents the sole initiative of collective action in the energy sector involving final consumers. Several factors contribute to the popularity of net-metering in Georgia, but simultaneous significant barriers hinder further development. The implementation of European-style regulations for energy communities is anticipated to bring new opportunities but also pose challenges. The current barriers and enablers for energy communities, based on the experience of net-metering and existing circumstances, are summarized below.

Barrier 1: Lack of clear national legislation

Type:	Political
Stakeholders:	Policy developers, supporting organizations, pioneers
Description of the barrier:	Although net-metering regulations are in place, the current legislation in Georgia does not account for energy communities. Under the existing legal framework, it is not possible to define the organizational structure that would enable a company to efficiently undertake collective actions in the energy sector.
Possible solution:	Georgia has to transpose the EU legislation related to energy communities and adapted for the contracted parties of the EU Energy Community.

Barrier 2: Access to finance

Type:	Social, economic
Stakeholders:	Pilots, pioneers, policy developers
Description of the barrier:	<p>Access to finance is limited for several reasons:</p> <ul style="list-style-type: none"> • Project has a long payback period and financial institutions are not interested; • Financial institutions ask for collateral with a value significantly higher than the asset to be created; • Capacity to create bankable product.
Possible solution:	A series of measures should be implemented to reduce barriers. Among the measures can be: increase awareness among financial institutions, state policy to promote financing energy communities and providing collateral.

Barrier 3: Connection to the grid

Type:	Technical
Stakeholders:	Pilots, pioneers, DSOs, policy developers

Description of the barrier:	The distribution grid code of Georgia defines easy procedures for distributed RES connection to the distribution grid (for microgenerators up to 500 KW). There exists a so called one-stop-shop approach, with short deadlines and reasonable connection fees that makes microgeneration development and connection to the grid feasible for businesses and households. However, the procedures and IT systems to be developed might create barriers for the integration of generation capacities. The integration of renewable energy sources into the network under an energy community arrangement is a critical aspect. DSOs do not welcome the integration of prosumers in the network.
Possible solution:	The regulation needs to address the challenge and regulate the connection in a manner that avoids unnecessary costs and bureaucracy for energy communities. The technical readiness of Distribution System Operators should be guaranteed.

Barrier 4: Low electricity price

Type:	Social, economic
Stakeholders:	Pilots, pioneers, policy makers
Description of the barrier:	Georgia is in the process of market liberalization; however, price regulation, including preferential pricing for household customers, remains in place. The persistence of low prices makes renewable energy projects financially less attractive.
Possible solution:	Policy developers have to rethink price regulation and define adequate support schemes to make RE projects profitable.

Barrier 5: Experience with communities

Type:	Social, economic
Stakeholders:	Pilots, pioneers, policy makers, supporting organizations
Description of the barrier:	Georgia lacks experience, and it even has a negative historical experience from the Soviet Union, with regard to communities. This holds true in various sectors, including agriculture, where despite efforts to promote cooperatives, significant progress has not been achieved.
Possible solution:	An awareness campaign is crucial to highlight the benefits of collective action. Demonstrations and successful projects have proven to be efficient tools in convincing people to get involved.

Barrier 6: Lack of support schemes

Type:	Political
Stakeholders:	Pilots, pioneers, policy makers, supporting organizations
Description of the barrier:	At present, there is no support scheme in the country to promote energy communities. There are no consulting, financial, price, or other mechanisms in place to facilitate the establishment of energy communities.

Possible solution:	Policy developers need to develop support schemes to facilitate the establishment of energy communities.
---------------------------	--

Enabler 1: Dependency on imported energy

Type:	Social, economic
Stakeholders:	Policy developers, supporting organizations
Description of the enabler:	Energy import dependency in Georgia has increased over the years. The growth in electricity generation has not kept pace with the rate of demand increase. While there are significant challenges in the construction of centralized RES plants in Georgia, distributed generation is gaining additional value.
Possible solution:	Georgia needs to support the development of distributed generation, collective actions, and energy sharing to compensate for the growth in energy demand at consumption points.

Enabler 2: Significant RES potential

Type:	Technical
Stakeholders:	Pilots, policy developers
Description of the enabler:	Georgia possesses a significant volume of RES potential. In hydro, only 20 % of the economic potential is currently utilized, while for wind and solar, there is approximately a 1 % utilization rate. In the realm of distributed generation, solar energy is more accessible for businesses and the population, with a higher value of annual irradiation. This makes solar PV projects economically more feasible in comparison to central European states.
Possible solution:	Widespread development of small-scale PV generation must become part of national policy and accessible for a wider range consumers.

Enabler 3: Net metering experience

Type:	Legislative
Stakeholders:	Pilots, pioneers, DSOs, policy developers
Description of the Enabler:	Georgia has achieved success in implementing net-metering regulation, including a group net-metering allowance (commonly known as virtual net metering). The liberal approach in this regard has led to the creation of up to 20 MW capacity of micro solar PV plants in the period 2020-2021. This increased interest is observed both from businesses and households. Notably, the maximum allowed capacity threshold for micro power plants in Georgia, eligible to participate in net-metering, is set at 500 KW.
Possible solution:	Net metering regulation (mostly group net metering) must be developed and enhanced for local energy communities.

Enabler 4: Market liberalisation

Type:	Political
Stakeholders:	Pilots, pioneers, policy makers
Description of the Enabler:	Georgia is in the process of market liberalization, with plans for a competitive market launch in 2022, featuring hourly trade on the Georgian energy exchange. This initiative aims to enhance price formation in Georgia based on actual conditions and increase the roles of new market players.
Possible solution:	Gradual market opening to be continued, not only on wholesale but also on retail markets.

10 | Hungary

In Hungary, the EMD and RED II directives have been transposed by the amendment of the existing national legislation governing the national electricity market. However, a REC has been defined as a sub-type of CECs in the national law and the scope of its activity is limited to electricity. Hence, relevant gaps in the legislation concerning their establishment and operation should be filled. The possibility to produce and consume renewable electricity by customers has already been regulated by the VET under the term of household sized power plants which is a micro power plant connected to a low voltage system with an interconnection capacity of less than 50 kVA at any given connection point. Detailed rules of energy sharing are missing.

It should be noted that various support schemes will be available for consumers aiming to establish collective actions. However, recently, there is no advantage for a community energy initiative to register as an energy community and, therefore, no incentive. In addition to subsidies, specific financial measures need to be rethought and dismantled to promote community energy more effectively.

Barrier 1: No energy sharing

Type:	Legislative
Stakeholders:	Pilots, policy makers, DSOs
Description of the barrier:	Only the definition of energy sharing was accepted in the transition process, details are missing. The energy authority and DSOs are not motivated to define detailed rules.
Possible solution:	Detailed rules in favor of energy sharing should be required, referring to the RED II and EMD directives. This may also require broad social support.

Barrier 2: Improper definition of energy communities

Type:	Legislative
Stakeholders:	Pilots, policy makers
Description of the barrier:	Renewable energy communities are defined as a special case of citizen energy communities limited to the field of electricity. The possible legal form of CECs is limited to cooperatives and not-for-profit companies which narrows the scope of cooperation. However, the participation of large companies in energy communities is not restricted, contrary to the directives.
Possible solution:	The possibility of a regulatory sandbox could be extended to the legal form of energy communities, so the definition could be revised according to good practice.

Barrier 3: Low energy prices for households and local authorities

Type:	Economic
Stakeholders:	Pilots, policy makers
Description of the barrier:	Social tariffs or “universal” utility prices are defined by the government and available for every household, local municipalities and public institutions. This artificially low price discourages consumers saving energy or investing in energy efficiency or renewable energy. Keeping energy prices artificially low is very costly for the state, as the losses of state and municipal energy companies have to be compensated.

Possible solution: The social tariff system must be revised and should focus on energy poor households. The saved public expenditure could be reallocated to support collective actions on energy efficiency and renewable energy.

Barrier 4: No practice of cooperation

Type: Social

Stakeholders: Pilots, policy makers, local heroes

Description of the barrier: For some segments of the public, there is still a negative connotation to the concept of collective actions/cooperatives.

Possible solution: Large-scale communication and awareness campaigns.

Barrier 5: Lack of smart meters

Type: Technical

Stakeholders: Pilots, DSOs, potential communities, local heroes

Description of the barrier: Very few smart meters are in use and very few people know about them. There is currently no tariff to take advantage of it.

Possible solution: An information campaign and support scheme on smart metering would help the penetration of smart meters. New tariffs for flexible consumption would also help.

Barrier 6: Unjustified grid tariff

Type: Legislative, economic

Stakeholders: Pilots, policy makers, DSOs

Description of the barrier: The grid tariff is the same for local sharing and feeding into the high-voltage system, indicating that it is not proportional to the usage of the grid.

Possible solution: A new tariff system is needed that incorporates justified grid costs and incentivizes the local sharing of energy.

Barrier 7: New installation of wind power plants is banned

Type: Legislative

Stakeholders: Pilots, policy makers

Description of the barrier: A government decree in Hungary has rendered it impossible to install new wind power plants by stipulating a minimum distance of 12 kilometers from any settlements. Such a requirement poses a significant challenge as there is no location throughout Hungary that meets this criterion.

Possible solution: The governmental decree should be revised and allow local communities to build their own wind power plants. They would complement solar power generation, increasing security of supply.

Enabler 1: Regulatory sandbox

Type:	Legislative
Stakeholders:	Pilots, policy makers
Description of the enabler:	A regulatory sandbox will be available from September 2022 onwards to test new regulations
Possible solution:	Pilots can apply for a regulatory sandbox, allowing the testing of new regulations for a maximum of 3 years. The energy authority will assess the applications and subsequently evaluate the tests. If successful, the new regulation will come into force and be made available for all other energy communities and collective actions.

Enabler 2: Support schemes for energy communities

Type:	Economic
Stakeholders:	Pilots, policy makers, potential communities, local heroes
Description of the enabler:	Calls for pilot projects starting energy communities are and will be available in the following years.
Possible solution:	Innovative pilot projects have already started establishing and operating the first energy communities in Hungary. RRF, Cohesion Fund and Modernisation Fund calls will be coming in the following years supporting energy communities to start.

Enabler 3: Closure of annual net metering

Type:	Economic and regulatory
Stakeholders:	Pilots, policy makers, local heroes
Description of the enabler:	By the end of 2023 the annual net metering will not be available for new PV installations.
Possible solution:	Annual net metering is currently very favorable and popular for individual prosumers, allowing them to feed their surplus production into the grid and later consume it for free. However, starting from 2024, this option will no longer be available for newly installed systems. Prosumers will instead be encouraged to share their surplus energy within the local grid.

11 | Conclusions and Recommendations

Energy communities, as defined in the European Clean Energy Package, are not a new arrangement. Various forms of energy communities already exist in the majority of European countries. However, establishing a regulatory framework in European legislation will promote the larger-scale development of these jointly acting consumer forms in a more harmonized way. To achieve the targets set in EU legislation, a level playing field must be created for the establishment of local energy communities by consumers, and undue barriers must be removed at the national level. This report focuses on identifying barriers and enablers for the development of local energy communities, and the following recommendations are based on the main findings stemming from the literature review and country analyses.

As for the conclusions, there are different barriers that must be analysed and overcome, such as: political barriers mainly related to missing prior experience, lack of political support from local representatives, non-supportive energy agencies, absence of RES support schemes, and lack of national strategies for energy communities and targets. Common economic barriers mainly relate to the lack of access to finance, grants, unfair and insufficient feed-in tariffs, unstandardized Power Purchase Agreements (PPAs), impossible third-party offtake, insufficient incentives for renewable heat projects, complicated tax rules, and no tax exemptions. Common social barriers identify a lack of experience with cooperatives and civic activism, as well as a lack of trust in the cooperative models. Common technological barriers concern the lack of knowledge and experience to design, plan, procure, implement, and commission community energy projects, as well as a lack of expertise for operation and maintenance. Common legislative barriers include a complicated legal framework, lengthy and tiring bureaucracy, administrative barriers to grid connection including complicated application procedures, costs, time, complexity for an ordinary citizen, and the impossibility to fairly operate micro-grids. Lastly, common environmental barriers mainly relate to low environmental awareness and conflicts between biodiversity protection and RES development.

Recommendations:

- ▶ Policies and measures for renewable energy communities need to be incorporated into national legislation. This involves not only transposing Clean Energy Package requirements into national legislation but also introducing energy community development policies in National Energy and Climate Plans with further operationalization. This may include explicitly providing targets for renewable energy communities in NECPs. Additionally, state policies must be clear about which national energy transition objectives energy communities might be able to contribute to.
- ▶ Awareness among policymakers is moderate; however, it is promising that most member states positively acknowledge the role of energy citizens, local energy markets, and energy communities. It is evident that there is a need to enhance understanding among member states regarding the role of these players, and efforts should be increased to improve awareness at both the policy-making and local authority levels.
- ▶ To establish a competitive market structure, an effective tariff mechanism must be introduced, transitioning gradually from a supportive tariff plan to a competitive mechanism as the respective renewable technologies mature and become economically more viable. The conclusion is that there is a need for significant improvement to promote energy communities by introducing motivating tariff systems and enhancing communication between involved parties.
- ▶ Important enablers that grant energy communities access to the market and allow them to perform their core functions include smart metering and advanced metering data management. An appropriate regulatory framework should be in place to promote the development of smart

metering and data management. Therefore, without the proper development of smart metering and advanced data management systems, the full-scale utilization of the overall functionalities of energy communities is not possible.

- ▶ One of the widespread barriers identified is related to bureaucracy and permissions, particularly in new community projects. These projects often encounter bureaucratic challenges during the development phase, especially concerning permits and grid connections. Such complex procedures can overwhelm community projects and lead to their cancellation. The related recommendations are as follows:
 - Establish one national contact point on the governmental level to support community projects in the country, providing all necessary information in one place and guiding them through the process.
 - Implement grid connection prioritization for community-owned projects, ensuring that community energy projects have access to the grid to sell their energy.
 - Treat the grid as a common asset and operate it as a public good. Municipalities, which operate grids, should ensure the decentralization of the grid for the benefit of locally owned energy systems.
- ▶ Addressing the issue of insecure and unfair electricity export prices to the grid from community-owned energy projects requires a comprehensive solution. This includes the establishment of specific renewable energy support schemes for community-owned microgeneration and auto producer RES, tailoring net-metering programs, obliging electricity utilities to sign fair Power Purchase Agreements, and allowing a Peer-to-Peer trading solution for an efficient trading model.
- ▶ Access to financial capital is identified as one of the main barriers. Interested parties intending to develop a collective action typically face a lack of funds. This issue is even more severe in vulnerable groups in low-income areas, as they simply do not have the financial capital to invest. Furthermore, national support measures to assist in community-owned project development must be enhanced. Recommended steps include the creation of grant programs for developing community-owned projects at the initial stage, support programs for access to finance, promoting tax incentives, and amending existing grant aids to support all forms of renewable energy, including solar, biomass, and heat pumps.
- ▶ Off-grid and local smart grid solutions have the potential to be driving forces for the development of local energy communities. However, regulatory hurdles currently impede the establishment of local grids and off-grid communities. It is recommended to lift these regulations, promote smart grids, and thus enable the development of community-owned microgrids.

12 | References

Doukas, H., Karakosta, C., Flamos, A., Psarras, J. Electric power transmission: An overview of associated burdens (2011) *International Journal of Energy Research*, 35 (11), pp. 979-988.

Karakosta, C., Pappas, C., Marinakis, V., Psarras, J. Renewable energy and nuclear power towards sustainable development: Characteristics and prospects (2013), *Renewable and Sustainable Energy Reviews*, 22, pp. 187-197.

Oikonomou, V., Flamos, A., Spijker, E., Spyridaki, N.-A., van der Gaast, W. Domestic offset projects in the built environment (2012) *Energy Efficiency*, 5 (3), pp. 335-350.

Khadem Sh., Nouri A., Papadimitriou Ch., Efthymiou V., Report on community energy policy and barriers (2021), Deliverable D3.3 , Pan European Technology Energy Research Approach.

Brunner, V., Community energy – benefits and barriers: A comparative literature review of Community Energy in the UK, Germany and the USA, the benefits it provides for society and the barriers it faces (2018), *Renewable and Sustainable Energy Reviews*, Elsevier, vol. 94(C), pages 187-196.

Lazdins, R., Mutule, A., Žalostība, D., PV Energy Communities—Challenges and Barriers from a Consumer Perspective: A Literature Review (2021). *Energies*. 14. 4873. 10.3390/en14164873.

Stauch, A., Gamma, K., Cash vs. solar power: An experimental investigation of the remuneration-related design of community solar offerings (2020), *Energy Policy*, Elsevier, vol. 138(C)

Friends of the Earth of Ireland, Community Energy for Ireland Executive Summary

Aoidh A., et al., PESTLE analysis of Barriers to Community Energy Development, LECO policy paper, Northern Periphery and Arctic Programme 2014-2020

Friends of the Earth Europe, Barriers and threats to the people-owned energy revolution (2021)

Palm, J. Energy communities in different national settings – barriers, enablers and best practices (2021), Deliverable D3.3 developed as part of the NEWCOMERS project, funded under EU H2020 grant agreement 837752, May 2021

Peeters L., Protopapadaki C., Vandamme L., Most Prominent barriers and best practices (2021), LECSea Project, European Regional development Fund

Partners of the REScoop 20-20-20 project, Report on financial barriers and existing solutions, REScoop project Co-funded by the Intelligent Energy Europe Programme of the European Union

Figures

Figure 1: Willingness to participate in a renewable energy community and reasons for (not) joining (Results of national representative survey among Bulgarian citizens)	24
---	----

Tables

Table 1: Summary of benefits and barriers identified by Vasco Brummer (2018).....	7
Table 2: Summary of enablers and barriers for socio-economic conditions identified by the report of NEWCOMER.....	10
Table 3: Summary of enablers and barriers for technical systems identified by the report of NEWCOMERS.....	11
Table 4: Summary of enablers and barriers for institutional setting identified by the report of NEWCOMERS.....	11
Table 5: Summary of enablers and barriers Actors identified by the report of NEWCOMERS.....	11
Table 6: Overview of common barriers and enables.....	14
Table 7: Summary of inputs from pioneers.....	16
Table 8: Summary of barriers and enablers in the SHAREs countries.....	18



share Renewables.eu