European Commission

ENERGY **COMMUNITIES** REPOSITORY

BARRIERS AND ACTION DRIVERS FOR THE DEVELOPMENT OF DIFFERENT ACTIVITIES BY RENEWABLE AND CITIZEN ENERGY COMMUNITIES

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1. EXECUTIVE SUMMARY

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EXECUTIVE SUMMARY

This Report looks at the ability of energy communities to undertake activities that are envisioned in the Clean Energy Package (CEP), namely the Directive (EU) 2018/2001 (Renewable Energy Directive, or RED II) and Directive (EU) 2019/944 (Internal Market for Electricity Directive, or IMED). Renewable Energy Communities (RECs) and Citizen Energy Communities (CECs), defined by the RED II and IMED respectively, represent a different type of market actor in the energy system. As an organisational concept, RECs and CECs bring citizens, businesses (in particular small and medium-sized enterprises, or SMEs) and local authorities together (both as members and consumers) to take community ownership of clean renewable energy sources and services. They also promote more democratic participation and governance in decision making, and their primarily purpose is to generate environmental and socio-economic benefits to the community rather than profits.

While energy communities can provide added value to Europe's energy transition in terms of fostering social acceptance, private capital investment and flexibility, their unique characteristics also present specific challenges in trying to enter and participate in the market with larger commercial market actors.

The main focus of this Report is to identify and assess different barriers and action drivers that impact the development of energy communities at national level in the context of European Union (EU) legislation, including but not limited to the RED II and IMED. Specifically, this Report focuses on action drivers and barriers for energy communities to engage in:

- **Renewable energy production** – Community-owned energy production from various renewable sources including wind, sun, geothermic, biomass, micro-hydro, and biogas;

- **Sharing of renewable energy** – Through a community-owned production facility and the use of smart meters, members of the community can closely match consumption (e.g. 15 minutes to 1 hour) so that the production is treated as self-consumption and deducted from their metered supply coming from their traditional supplier;

- **Retail supply of electricity and gas** – the sale, including through power purchase agreements (PPAs) , and resale (using existing market structures such as the wholesale market) of electricity and gas by the community to its members and potentially other customers (e.g. households, other local SMEs and public authorities); and

- **Participation in flexibility** – Different business models where the community and its members can realise potential revenue streams or cost saving through the use of production and demand-side assets to increase, shift or reduce electricity consumption in response to time-differentiated price signals (e.g. for the purpose of peak-shaving) or to access different accessible flexibility markets (e.g. balancing, ancillary services, and capacity markets).

This Report also highlights cross-cutting drivers and barriers that impact an energy community's ability to operate across the market, regardless of the activity. For this Report, we define an 'action driver' as a factor that helps to push or propel forward a particular activity exercised by an energy community. Correspondingly, we define a 'barrier' as the counter-acting opposite of an action driver: something that disproportionately prevents or makes harder a particular activity from being realised.

This Report does not assume that the simple existence of a particular barrier or action driver requires a specific policy or regulatory response. Each barrier needs to be considered from a system and justice perspective to ensure a proper assessment of its justification and proportionality. Similarly, action drivers and responses to barriers need to be assessed depending on their potential environmental, economic and societal benefits compared to their potential cost implications. Depending on the Member State and the maturity of the energy community sector, and legal status as REC or CEC, barriers and drivers will vary in relevance and magnitude of impact. Different drivers and barriers need to be contextualised within a national market and system-perspective in order to identify unjustified and disproportionate barriers and develop tailor made effective solutions. Therefore, a national assessment of barriers and drivers is always recommended.

CROSS-CUTTING BARRIERS AND CORRESPONDING ACTION DRIVERS TO SETTING UP AN ENERGY COMMUNITY

First, the lack of a clear and uniform national legal definition for energy communities creates legal uncertainty. The REC and CEC definitions contain governance and participation principles (e.g. proximity, effective control, autonomy, and social, economic and environmental benefits) that have a multi-interpretational character, making translation and monitoring at the national level complex.

Second, citizens, businesses and local authorities may **lack awareness around energy communities**, requiring development of understanding and trust. Furthermore, they often lack technical expertise in project development or navigation of administrative and licensing procedures. Several Member States have addressed this by setting up one-stop-shops (OSS) and other networking platforms. These facilitators can act at the national, regional and local levels, either through public or non-profit entities, to **raise awareness, provide technical advice to starting energy communities**, set up workshops, provide guidance, and facilitate access to professional expertise. There are also a number of **tools available to help promote trust in energy communities**, such as online comparisons by National Regulatory Authorities (NRAs), support at the local level from trusted leaders (e.g. local authority), and rules to promote transparency and trust (e.g. allowing for the exit of members, handling internal disputes, and ensuring fair and democratic internal decision making).

Third, energy communities have trouble accessing finance for projects (particularly for early stages of project development) and are sensitive to frequent or abrupt changes in regulation and public support. Governments are increasingly setting up dedicated **public funding mechanisms at the national level to help energy communities**, in particular to de-risk preliminary and early stages of development, where private financing is most difficult to obtain. Local and regional authorities also can also set up their own forms of financial assistance, while energy communities have started **educating private lending institutions** and **innovating their own financing mechanisms**.

Fourth, while there is ambition to ensure energy communities are inclusive to all citizens, in reality **they are not very accessible to energy poor and vulnerable households**. There is still also a lack of awareness and knowhow from the energy community sector about how to engage with low-income and vulnerable households. Nevertheless, a number of frontier energy communities have developed replicable innovations to enhance inclusivity towards vulnerable and low-income households and cooperate with social service providing organisations. A few Member States are also starting to integrate energy poverty and vulnerability issues into policy supporting energy communities, for instance through finance provided by European funds (e.g. Recovery and Resilience Funds, or RRF).

BARRIERS AND CORRESPONDING ACTION DRIVERS TO COMMUNITY-OWNED RENEWABLE ENERGY PRODUCTION

A valuable policy tool that has been implemented at national, regional and local levels to promote the growth of community renewable energy production has been **high level targets or objectives for the development of energy communities**. These objectives have helped provide a policy basis for the development of a number of supportive mechanisms that are described in this Report.

Compared to larger market actors with more financial resources, energy communities experience challenges **securing space to develop projects** from private landowners and on public spaces (e.g. roofs and land). Using policy objectives to support the development of energy communities and citizen participation in the energy transition, local – and even national – authorities have begun to integrate supportive **provisions for energy communities into concessions and public procurement procedures**, as well as requirements for private developers to offer ownership to local citizens.

Energy communities are also uniquely impacted by **constrained grid connection capacity**. Limited options on where to connect local projects and lack of transparent rules and procedures can raise connection costs, while **communities are often unable to compete with other market participants to obtain a connection** (e.g. through first come first serve or auctions). To address this, Member States are starting to adopt various measures including socialising certain connection (grid reinforcement) costs, prioritising or simplifying grid connection processes for community projects, and ringfencing grid connection capacity.

And finally, as support schemes have evolved from more administratively-set, fixed forms of remuneration (e.g. Feed-in-tariffs, or FiTs) to more **market-based support mechanisms** (e.g. market premiums, auctions and tenders), these schemes have become more difficult for energy community projects to access. A number of Member States have integrated **special provisions in their national support schemes to enable access by energy communities**. These include exemptions from participating in tenders, as well as special tenders for energy communities so that they do not need to compete against commercial market actors.

BARRIERS AND CORRESPONDING ACTION DRIVERS TO ENERGY SHARING BY ENERGY COMMUNITIES

Due to the emerging nature of national legal and regulatory frameworks for energy sharing and energy communities, **most of the challenges energy communities face compared to non-energy communities pertain to the unclear relationship between energy sharing as an activity and energy communities as an organisational concept**. This has created a number of issues around perceived legal, regulatory and administrative complexity, and a perceived lack of added value to setting up an energy community versus an initiative facilitated by a commercial third party (e.g. leasing or renting). Some Member States have made conscious efforts to **clearly communicate distinctions between energy communities and energy sharing** activities to stakeholders to better understand the requirements for setting up organisational aspects of an energy community, as well as technical requirements to register and receive a licence to share energy.

There is also a **lack of clarity on how duties or responsibilities should be shared between market actors relevant for energy sharing**, including energy communities, system operators, suppliers and third party service providers. **Regarding the role of distribution system operators (DSOs), a number of challenges were identified including providing information and awareness around energy sharing, procedures to register initiatives, developing proper information technology (IT) infrastructure to allow for collection, validation and sharing metering data**, and **other technical limitations** (e.g. thresholds on the size of production facilities, eligible geographical scope, limitations on sharing coefficients that can be used, and requirements to use one supplier). Some Member States have put in place **regulations to help clarify administrative and licensing procedures for registering energy sharing projects by the DSO**, while others have evolved regulations to keep up with learning and improved technical capacities. Some Member States have also set up reporting obligations by DSOs, while some DSOs themselves have also started to collaborate around **updating IT systems to improve data management, registration and interoperability**.

The way in which traditional suppliers undertake their role in energy sharing can also result in barriers. **Some suppliers have charged high administrative fees**, while others **have caused delays in calculating shared energy and deducting it from the energy bill**. Suppliers have also been observed to **hesitate taking on balancing responsibility** on behalf of energy communities. Some Member States have put in place rules to **prevent commercial market actors from imposing discriminatory conditions** on energy sharing initiatives, including bans on disproportionate fees, while others have clarified roles for suppliers and/or DSOs in regulation. In addition, Member States are increasingly allowing **third party service providers** to take up facilitative responsibilities and roles. Nevertheless, the aim should also be to make the process of registering and engaging with the DSO easier, in order to prevent dependency on third party facilitators.

Lastly, **there are still limited pathways to effectively combine savings from shared energy with remuneration for selling excess production**, making it harder to finance energy sharing projects. Not all Member States allow for the remuneration of excess production, while others place a cap on remuneration or require negotiation with a supplier. To incentivise energy sharing, some Member States are experimenting with offering reduced network tariffs (for the volumetric part) that encourage close to real-time consumption close to production, essentially accounting for the reduced use of the grid at times energy is shared locally. To help further incentivise investment in energy sharing, Member States have also put in place varying types of **remuneration mechanisms to reward excess production from shared installations**.

The effects of network tariff reductions on the economic viability of energy sharing and the overall energy system are still unclear and need to be carefully monitored. Exempting active customers engaged in energy sharing from contributing to the recovery of related grid capacity costs while still allowing them to benefit from that capacity for excess production or demand risks socialising network tariffs to wider system users, also resulting in unfair discrimination to consumers that do not engage in energy sharing but consume close to production. This may disproportionately affect those consumers already struggling to pay their energy bills. Furthermore, it is important to contemplate and balance potential trade-offs between supporting investment in production versus the need to create a more flexible energy system based on the efficiency first principle.

BARRIERS AND CORRESPONDING ACTION DRIVERS TO RETAIL SUPPLY BY ENERGY COMMUNITIES

Energy communities often start small and need to find additional members in order to establish a sustainable supply business model that is not for profit. As such, **some financial** (e.g. costs associated with becoming a licensed supplier, and obtaining collateral to trade on wholesale markets) **and administrative requirements to obtain a supply licence are disproportionately high** for energy communities. Some Member States have already, or are in the process of, enacting regulations to make supply easier for energy communities and other small market actors. This includes experimenting with exemptions, or creating a **special designation for smaller suppliers or for suppliers that want to supply under limited conditions** (e.g. capped amount, certain categories of customers), while still complying with other professional, technical and consumer protections.

Furthermore, a number of regulations make it difficult to operate as a supplier, which have been exacerbated by the ongoing energy crisis. Community suppliers are often **too small to be able to access hedging products**. **In addition, the high amount of guarantees required to operate on the wholesale market poses a significant burden**, and finding a suitable balancing responsible party (BRP) can be difficult. Similar regulatory barriers also prevent energy communities from selling production directly to their members or to other off-takers through PPAs (e.g. local authorities and SMEs). National regulations may nevertheless provide **flexibility for how certain requirements are met**, taking into account the specificities of market actors such as energy communities. Energy communities can also **cooperate with existing service providers** in order to supply their members with renewable energy. In some countries outside the EU, including the United Kingdom (UK) and the United States of America (USA), decision makers are experimenting with imposing obligations on larger suppliers to help community-owned renewables projects supply back to their members.

BARRIERS AND CORRESPONDING ACTION DRIVERS TO COMMUNITIES PROVIDING FLEXIBILITY

Generally speaking, the regulatory frameworks for flexibility markets are still in their infancy, and most barriers are experienced by all market actors, particularly for smaller actors targeting households. As such, it is not yet possible to fully assess drivers and barriers specific to energy communities. For this Report, energy communities communicated that they experience a number of practical barriers when exploring flexibility-based activities: limited existing demand from energy community members, high cost for service providers, immaturity of markets, and insufficient IT and market skills. Research also uncovered a number of regulatory and market barriers that may impact energy communities and other smaller market actors including access to a smart meter, data access, contradicting economic incentives, lack of market access for (small consumer) aggregated loads, challenges to entering into long-term commitments to provide flexibility, lack of accessibility for low-voltage appliances in flexibility markets, lack of mechanisms to compensate BRPs for activating demand response, network regulation, net metering arrangements, and lack of options around a flexible connection agreement.

While most of the focus at the moment is towards removing the various barriers that prevent smaller actors from providing flexibility to the system, this Report identifies some potential action drivers that could help energy communities get more involved in flexibility. This includes making further use of dynamic and time of use tariffs, dynamic price contracts, and providing incentives to optimise individual, behind the meter self-consumption around times of production. Further access to information and communication technology (ICT) tools that are based on open source, through collaboration with other actors from the social economy, can also support the development of services that can provide a basis for providing flexibility. Markets can also open up to smaller aggregated loads by lowering minimum bid thresholds (e.g. 1 MW) or incentivising reduced consumption during peak hours. Regulatory sandboxes can also test out different innovative solutions around combining local supply with provision of flexibility services to system operators.

1.1 Recommendations

Based on the research conducted throughout the development of this Report and the barriers and action drivers that have been highlighted, this Report has developed a set of recommendations. These recommendations should be seen as ways to help Member States establish and implement enabling frameworks for energy communities so that they are capable of exercising new rights that were established under the RED II and the IMED.

1| A national authority should be assigned to undertake a holistic assessment of barriers and potential for energy communities (both RECs and CECs) to undertake different activities. Such assessments should fit the national context and should carefully assess not only whether certain barriers are proportionate or unjustified, but also the extent to which responses support delivery of policy objectives, and deliver intended benefits versus costs.

2| National, regional and local decision makers (taking into account the national context) should adopt policy objectives for supporting energy communities and citizen participation in the energy transition. Such objectives should be concrete and clearly articulated so they can provide an objective basis for developing supportive policies, as well as for measuring progress.

3| Ministries, NRAs (National Regulatory Authorities) and other authorities should clearly articulate and communicate governance and participation principles in the REC and CEC definitions to national stakeholders to create legal certainty. Ideally, a simple and transparent process to register energy communities should be put in place, along with monitoring to guard against abuse and to oversee delivery of policy objectives and removal of unjustified barriers.

4| Financing mechanisms should be set up at different levels (national, regional and local, depending on the national context), to help energy communities. Such mechanisms can focus on de-risking early stages of project development, access to expertise, awareness raising, and providing favourable loans for construction of projects. In particular, Member States can leverage European funds to support the development of the sector. Private financing institutions should also be a target for awareness raising in order to provide them with greater understanding of business models used by energy communities.

5| National and sub-national decision makers should coordinate actions, including with civil society and other actors such as network operators, in order to build

capacity of energy communities and raise awareness. This can be done through setting up OSSs or other dedicated information services at different levels in order to provide basic information, outreach, training, maps of existing and emerging initiatives, guidance on technical, legal, financial and administrative issues, and to facilitate access to expertise.

6| Collaboration between energy communities, public authorities and public/private organisations providing social services should be promoted to make community renewable energy more accessible to vulnerable and energy poor households. Member States should set policy objectives around these outcomes, and support their delivery with financial and other support.

7 | Public authorities (national and sub-national) should be able to make available public spaces, and leverage public resources for the purpose of achieving social objectives. National policy should also support local authorities by providing them with legal clarity and sufficient resources so that they are able to integrate energy communities into public procurement and concession rules and procedures in a proportionate way while ensuring non-discriminatory access.

8 | Where made available to market actors, national decision makers should design national renewables support schemes to allow energy communities to access such support on a level playing field with commercial market actors. In this regard, the Guidelines on State aid for climate, environmental protection and energy (CEEAG) provide Member States with several different options (e.g. exempting smaller 100% community-owned projects, energy community-specific tenders, reduced administrative requirements, and modified prequalification and award criteria).

9| Support schemes to incentivise renewables production should be properly monitored by a dedicated authority (e.g. NRA) over time. Monitoring should allow for appropriate modifications over time and ensure the provision of support balances the promotion of community benefits versus costs. They should be aligned with the development of other incentives, for instance to optimise consumption of self-production close to real time (i.e. energy sharing) and to provide flexibility to the energy system.

10 | System operators, with support from national regulation, should design grid connection procedures to allow energy communities to access the grid on a level playing field with commercial market actors. Depending on the national set-up of allocating available grid space for new renewables production installations, special procedures or ring-fencing should be designed to ensure energy communities can have access to the grid where there is interest in uptake, while responsibilities to finance necessary network reinforcements should be applied proportionately to energy communities, including through the potential to pay in instalments.

11 | National decision makers should clearly distinguish energy communities from energy sharing in national legislation and regulation. These two concepts should be defined distinctly, and rules and procedures for setting up and registering an energy community should be distinguished from registering an energy sharing project. Geographical limitations of both energy communities and energy sharing should be disentangled in terms of the purpose they serve.

12 | Public authorities (from national to local level), as well as DSOs, should develop mechanisms to reach out to and communicate with citizens, including to promote awareness around energy sharing, applicable administrative procedures and requirements (e.g. planning, project registration and grid connection procedures), available grid capacity, and potential projects they may be able to join in their area.

13 | National rules for energy sharing should ensure that energy communities are treated in a non-discriminatory way by other market actors that undertake roles to facilitate energy sharing. Where possible under national law, DSOs should be responsible for calculating shared energy for the purposes of deducting it from the bill to reduce administrative burden for suppliers of residual consumption needs and potential related conflicts of interest.

14 | Market actors should be encouraged to support energy communities that share energy by offering to undertake balancing responsibilities on their behalf. Where there is a lack of access to a service provider, Member States should ensure that at least smaller projects (up to 400 kW) can be exempted from balancing, and that the duty can be undertaken by another market actor (e.g. residual supplier or DSO).

15 | National decision makers, and NRAs in particular, should consider economic incentives, including time-differentiated network tariffs and incentives to sell production, as a tool to encourage the uptake of energy sharing. The design of incentives should look holistically towards supporting early-stage business models while taking into account the need to promote reduced use of the grid at peak times, fair shouldering of costs to maintain the network for all consumers, and in the long-term to align with incentives to provide flexibility to the system.

16 | NRAs should adapt regulations for engaging in retail supply to take the specificities of energy communities into account with the aim of removing, reducing or limiting unnecessary or disproportionate regulations (e.g. through a limited licence or a licence for smaller suppliers). Indispensable requirements should also be applied flexibly to energy communities where possible (e.g. hedging obligations).

17 | Market actors, including network operators, should be encouraged to support energy communities engaging in trading activities while respecting unbundling rules. For instance, through the development of digital platforms or exchanges and other supply related services. The provision of such services can be overseen by NRAs to avoid discriminatory treatment.

18 | Economic incentives should be developed to encourage energy communities to provide demand-side flexibility, including through a mix of dynamic and time **of use** tariffs, rewarding optimisation of self-consumption close to production when it has system value at peak times, increasing market access for aggregation of smaller consumer loads, and the development of local flexibility markets.

19 | Energy communities should be supported in developing ICT tools, which can be used as a basis for cooperation between different energy communities to undertake more responsibilities (e.g. balancing, supply, aggregation, services to other energy communities, etc.), through the use of open-source.

20 | NRAs should consider setting up regulatory sandboxes for energy communities to allow for experimentation between social and technical innovations, particularly around the provision of supply and flexibility services, and the application – or exemption/simplification – of different responsibilities and duties.

1.2 Summary list of barriers & action drivers

Cross-cutting barriers	
Barrier 1	Difficulties designing and monitoring a clear and uniform legal definition for energy communities
Barrier 2	Lack of certainty, predictability and accessibility of public and private financing
Barrier 3	Lack of awareness, trust, and access to technical expertise
Barrier 4	Lack of accessibility for energy poor and vulnerable households
Cross-cutting action drivers	
Action Driver 1	Dedicated finance arrangements to support investment
Action Driver 2	Tools to promote awareness, access to expertise and trust building
Action Driver 3	Facilitating access for vulnerable households Lack of awareness, trust, and access to technical expertise
Barriers to renewable energy production by energy communities	
Barrier 1	Lack of sites for production
Barrier 2	Auction-based procedures for accessing national renewables support schemes
Barrier 3	Difficulties obtaining a grid connection
Action drivers to renewable energy production by energy communities	
Action Driver 1	Policy objectives, goals or targets for energy communities

Action Driver 2	Providing space through public tenders
Action Driver 3	Integrating energy communities into the design of renewables support schemes
Action Driver 4	Measures to facilitate a grid connection
Barriers to energy sharing by energy communities	
Barrier 1	Lack of distinction between energy communities, active customers and energy sharing
Barrier 2	Lack of clear duties and roles of network operators
Barrier 3	Limitations for how energy sharing can be arranged
Barrier 4	Interdependencies with energy suppliers
Barrier 5	Limited sustainable remuneration pathways for excess production and knock-on effects for access to financing
Action Drivers to energy sharing by energy communities	
Action Driver 1	Creating a clear legal distinction between energy communities and energy sharing
Action Driver 2	Clarifying roles and duties for system operators in facilitating energy sharing
Action Driver 3	Providing flexibility to energy communities in the design and scope of energy sharing
Action Driver 4	Ensure fair cooperation between the supplier of residual energy and energy communities
Action Driver 5	Allowing for the use of third party service providers
Action Driver 6	Cost-reflective volumetric network charges

Action Driver 7	Investment support and remuneration for excess production
Barriers to retail supply by energy communities	
Barrier 1	Obtaining a supplier licence
Barrier 2	Operating as a supplier
Barrier 3	Selling production directly through PPAs
Action Drivers to supply by energy communities	
Action Driver 1	Exemption/simplification of regulation of electricity supply for energy communities
Action Driver 2	Provision of supply-related services by other market actors
Barriers to flexibility provision by energy communities	
Barrier 1	Barriers from the perspectives of energy communities
Barrier 2	Summary of regulatory and market barriers
Action Drivers of flexibility provision by energy communities	
Action Driver 1	Dynamic and time of use tariffs
Action Driver 2	Access to relevant ICT tools
Action Driver 3	Allowing aggregation of smaller consumer loads
Action Driver 4	Use of Regulatory Sandboxes
Action Driver 5	Development of local flexibility markets

2. INTRODUCTION

02

INTRODUCTION

As one of its tasks, the Energy Communities Repository (Repository) has carried out a study on existing barriers and action drivers for the development of energy communities across the European Union (EU). As its primary focus, the report looks at the ability of energy communities to undertake activities that are envisioned in the Clean Energy Package (CEP), namely the Directive (EU) 2018/2001 (Renewable Energy Directive, or RED II) and Directive (EU) 2019/944 (Internal Market for Electricity Directive, or IMED).[1] An assessment of societal, economic and social impacts of energy communities is also being developed as part of the Repository, for which the data collection process is ongoing.

The CEP, and the RED II and IMED in particular, introduced a number of new legal concepts acknowledging specific market actors and activities (active customers, individual renewables self-consumers and jointly acting renewables self-consumers, peer-to-peer-trading, and **Renewable Energy Communities (RECs) and Citizen Energy Communities (CECs)**. These concepts were elaborated in EU legislation in order to deliver the EU's Energy Union Strategy pledge to empower all consumers across Europe's energy transition and put them at the centre of the Energy Union.[2] The RED II and IMED acknowledge the added value of RECs and CECs in particular to Europe's energy transition in terms of fostering social acceptance, private capital and investment, more choice, greater participation in the energy transition, having a direct stake in producing consuming and sharing energy, providing affordable energy over profits, uptake of flexibility, advancing energy efficiency, and helping fight energy poverty.[3]

In their recitals, the RED II and IMED acknowledge RECs and CECs as a different type of market actor in the energy sector.[4] While there are noteworthy differences in terms of participation, governance, technology and geographical scope between the REC and CEC definitions, they both represent the same basic organisational concept **of bringing citizens, businesses (in particular small and medium-sized enterprises, or SMEs) and local authorities together around more democratic governance principles and a purpose that is primarily centred around generating community benefits rather than profits**.[5] In contrast to commercial market actors, energy communities promote citizen and community ownership of sustainable energy projects and participation in related decision-making. The community may be composed members that share a common interest and/or it may be bound by a common geographical location within and across State borders (e.g. a specific cross-border region) where it operates. By organising themselves in this way, smaller and local actors can come together to engage in various activities throughout the energy sector.

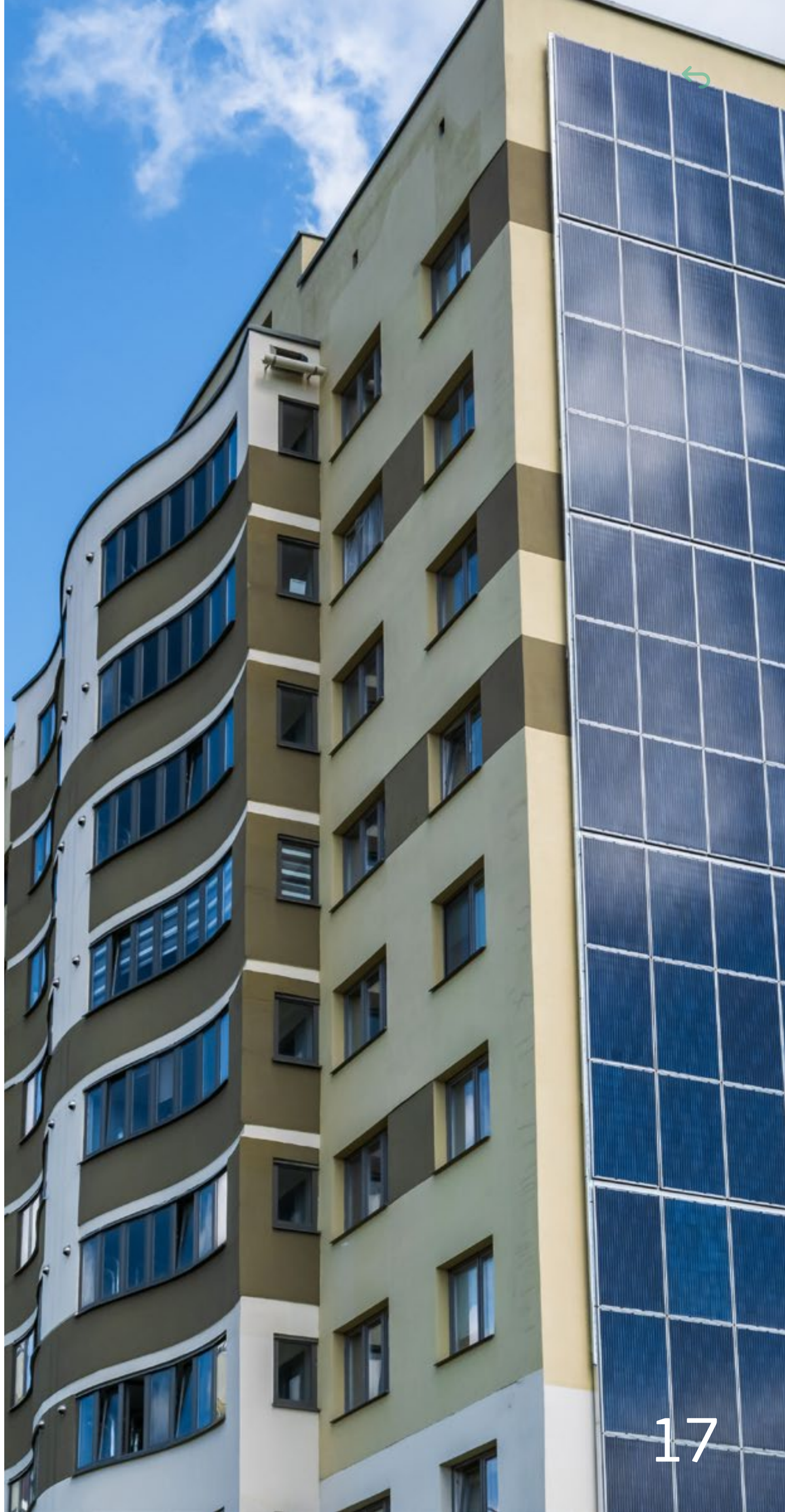
The Directives acknowledge that **the principles energy communities organise around can also hamper their ability to enter and participate in the market along with other larger commercial market actors. The intensity of these barriers often depends on the types of actors involved in or supporting the energy community**. RECs are distinguished from other market actors due to their size, ownership structure and number of projects.[6] They are also more strict in terms of accessibility to natural persons (i.e. households) and internal democratic control requirements.[7] Given these distinct characteristics, the RED II acknowledges the particular challenges that RECs face, including their inability to compete on an equal footing with large-scale players, namely competitors with larger projects or portfolios. As such, it calls for measures to offset such disadvantages for RECs through a set of privileges.[8]

The IMED also distinguishes CECs in terms of their membership structure, governance requirements and purpose. Nevertheless, they are seen as a broader, more flexible type of energy community that allows all categories of entities to participate, including organisations with more resources (such as cooperative investment banks, agricultural cooperatives, non-governmental organisations (NGOs), and universities), and for communities of local authorities or small businesses (such as small farmers and local shops) to be empowered.[9] As such, the IMED establishes a more general electricity market integration framework, recalling principles of non-discrimination, fair treatment, and transparency in the application of existing market regulation for the purpose of levelling the playing field.[10]

The general barriers that energy communities experience derive from their ownership model and consequent constraints in terms of accessing the market, financing projects and navigating regulatory and administrative procedures. For instance, their day to day operations are often undertaken by volunteers. In general, for both RECs and CECs, the RED II and IMED **call on Member States to address barriers at national level**. The Directives also establish the basis for the development of national enabling frameworks in order to remove barriers and provide communities across Europe with a real opportunity to collectively participate in, and benefit from, the energy transition.[11] The IMED also obliges National Regulatory Authorities (NRAs) to monitor the removal of barriers for CECs.[12]

Within the context of the CEP, **the main focus of this Report is to identify and assess different potential action drivers and barriers that may impact the ability of energy communities to engage in different activities across the energy sector**. This Report **also highlights cross-cutting drivers and barriers** that might impact an energy community's ability to operate, regardless its status as REC or CEC and regardless of which activity it is trying to undertake.

First, the Report establishes a framework for how to understand different drivers and barriers, including their relationship with each other. It also highlights the importance of assessing action drivers and barriers at the national level to contextualise which barriers and drivers are relevant to address through enabling frameworks that must be established to promote the development of energy communities and provide a level playing field.



Second, the Report focuses specifically on core activities that emerging energy communities are likely to be interested to pursue in developing different business models. In particular, this report focuses on the following activities:

1| Renewable energy production;

2| Energy sharing;

3| Retail supply of electricity and gas; and

4| Flexibility.[13]

While a number of business models already exist, more are still emerging, particularly those that utilise digital tools. Hence, with regard to flexibility, this Report aims to lay a foundation for further research as flexibility markets and community experiences become more developed and prevalent.

For each of the activities highlighted below, this Report explores **different inherent challenges that energy communities face compared to other commercial market actors.** This is an important distinction to make because in many cases all market actors face similar barriers. The Report then explains how these challenges are impacted by national energy policy, legal and regulatory frameworks, including the development of frameworks for energy communities as outlined in the RED II and IMED. This report also identifies **action drivers that can stimulate the development of energy communities**, stemming both from legal or policy measures intended to support energy communities at the national and sub-national level, as well as emerging practices or behaviours by different market participants (e.g. the provision of facilitative services for energy communities). Lastly, this Report provides some general recommendations that different actors (including national, regional and local decision makers, NRAs and other national authorities, network operators and other market actors) can follow in removing barriers for energy communities to create a more enabling framework.

2.1 Methodology

This Report has been carried out using the following methodology. First, as another sub-task under the Repository, we collected national legal and regulatory provisions from all Member States that relate to energy communities, particularly those that stem from the RED II and IMED. Based on an in-depth review of this national legislation, we identified and compared different aspects of regulations, policies and industry practices that could be seen as contributing to an identified cross-cutting, or activity specific, barrier or action driver. The Repository also conducted an extensive literature review on energy communities, including from European funded projects (e.g. Horizon, LIFE, Interreg, etc.).[14]

The Repository also conducted interviews with a broad set of actors from existing and aspiring national energy communities (e.g. energy cooperatives), civil society organisations, public authorities, energy community developers or facilitators, knowledgeable academics on the topic, and distribution system operators (DSOs). Two workshops were organised to share preliminary findings and enable input from traditional stakeholders within the energy sector to help shape the overall findings of the Report.[15] The views of the participants in these workshops provided further input and evidence into the Report. Discussions in these meetings were also used to challenge and/or validate the Draft Report's findings, to assess the proportionality and justification of barriers and/or solutions from a multi-stakeholder perspective, and to explore different avenues to address certain barriers and implement different action drivers.

The Repository also relied on input from local authorities through participation in an internal meeting of Energy Cities organised with its members to discuss the energy crisis and the electricity market design, as well as presentations at workshops during REScoop.eu's Spring Gathering in Athens, Greece, an event that brought together local actors from around the EU to share knowledge, experiences, challenges and opportunities around developing energy communities.

For the section on renewable energy production, Member State legislation and regulations that have been collected by the Repository have been supplemented by a literature review on relevant barriers and action drivers pertaining to renewable energy production. The Repository considered reports going back to the early 2010's, when community-owned renewable energy production first started gaining research focus at a European level. The Repository also undertook interviews with civil society, energy communities and academics, and produced a questionnaire on obtaining a grid connection and entering into power purchase agreements (PPAs), which was circulated to energy cooperatives operating in **Belgium, France, Germany, Greece, Ireland, Italy, Portugal, and Spain**.

For the section on energy sharing, based on the collection of legislation and national regulations by the Repository, we undertook an initial screening assessment to identify a sample size for comparing different frameworks for energy sharing. To do this, we assessed the legal developments for each Member State. As regards policy and legislative documents available at the national level, we looked at: 1) rules in national legislation on energy communities and energy sharing in relevant Member States; adn 2) related technical rules and regulations on energy sharing. From this screening process, we chose to look at the following Member States; **Austria, Belgium, Croatia, Denmark, Finland, France, Greece, Italy, Luxembourg, Portugal, Spain, and Slovenia**.

The analysis of Member State legislation and regulation was supplemented by a literature review on identified barriers and action drivers relating to the ability of energy communities to carry out energy sharing. We interviewed members of civil society and energy communities. Input was also provided by DSOs, both through several interviews and through a customer dialogue working group meeting with GEODE, one of the EU associations representing DSOs.

For the section on supply, the analysis of Member State legislation and regulation has been supplemented by a literature review on the regulation of retail electricity and gas markets, as well as literature on general market barriers for small and medium suppliers and energy communities, particularly cooperatives. A survey was also circulated to cooperative suppliers that operate in different national market contexts, including **Austria, Belgium, Germany, France, Ireland, Italy, , the Netherlands, and Portugal**. The reason for the specific focus on cooperatives is because they are the dominant legal form under which supply by energy communities takes place.

Regarding flexibility, there is still limited experience with energy communities participating in flexibility. While using energy communities to provide flexibility is seen as an ambition and is a topic of interest for energy communities, regulatory and market frameworks for involving households in providing flexibility are still in their infancy. Therefore, the Repository relied mainly on literature produced by EU projects (e.g. FLEXcoop, REScoop VPP and OneNet) focusing on energy communities and flexibility, and input from Florence School of Regulation (FSR) and REScoop.eu. The Repository also utilised reports from several BRIDGE reports, NGO thinktank Regulatory Assistance Project (RAP), reports, and position papers by smartEn, the main EU industrial association advocating for flexibility.

2.2. Framework for grouping and forming a correlation between different barriers and action drivers

For the purpose of this Report, we define an 'action driver' as a factor that helps push or propel forward a particular activity exercised by an energy community. Conversely, we define a 'barrier' as the counter-acting opposite of an action driver: something that prevents or makes harder a particular activity from being realised. Many, but not all, of the barriers and action drivers presented in this Report have a natural correlation with one another. That is, not every barrier correlates to a counter-acting driver, and vice-versa. Where relevant, we have tried to match the numbering for each corresponding barrier and action driver.

It is important to emphasise that the simple existence of a particular barrier, or even a driver, does not necessarily require action from a policy or regulatory point of view. Each barrier needs to be considered from a system perspective to ensure a proper assessment of its justification and proportionality. For example, rules around security of supply and consumer rights, while technically posing a barrier to becoming a supplier, at least in principle are justified based on the need to ensure secure operation of the system and to protect consumers. Similarly, drivers and responses to particular barriers need to be assessed depending on their potential environmental, economic and social or societal benefits in comparison to their potential cost implications.

From the literature, there are a number of frameworks that have been developed to describe different categories of drivers and barriers for energy communities.[16] These different frameworks have been summarised by Holstenkamp and Kriel in a background paper on the assessment of barriers and drivers for energy communities.[17] In this background paper, Holstenkamp and Kriel suggest their framework for categorising barriers based on a summary of relevant literature.

For the purpose of providing the reader with a contextual background of different categories of barriers or action drivers presented in this Report, we have slightly modified the framework created by Holstenkamp and Kriel to organise **action drivers and barriers for energy communities** in **four broad categories**:

1 | Business case and legal framework – These are factors that directly influence the profitability of projects. This includes policy, legislation and regulations that either support or undermine clarity, certainty and predictability for investment in, and by, energy communities. This approach acknowledges that legal and economic viability are intertwined due to the significant regulated nature of energy markets.[18]

2 | Market access and structure – These are factors that technically or economically impact the ability to access different markets. These factors may stem from the legacy nature of energy regulation evolving around a more centralised energy system, and the extent to which energy markets have been liberalised across Member States. This includes legal and economic factors that can facilitate or impede market access, including factors inherent to energy communities themselves such as their small size, organisation and value orientation. It also encompasses behaviour from other market participants that may help facilitate or otherwise restrict access by energy communities to the market, such as strategic dominance.[19] This could also include factors that limit or encourage households to be involved in an energy community, such as subsidised energy costs.

3 | Resources – These are internal, production factors and those relevant for the ability of an energy community to organise around a particular activity. This includes access to financial resources, such as disposable income to invest (i.e. capital), access to public and private financing, and physical and technical potential (i.e. availability of renewable energy sources and access to technology). It also includes human resources (e.g. willingness of individuals or public officials), and access to knowledge and expertise. These last descriptors of resources can also cover publicly provided technical and information support, and capacity building. In particular, involvement of local authorities is cited as a critical factor, whether it is acting as an intermediary/leader of an initiative to build trust among local members of the community, or to provide financial, technical or political support.[20]

4 | Organisational, informal institutions and conflicts – These are "social" or "cultural" and "behavioural" factors. This can include historical legacy around certain technologies or legal forms such as cooperatives, culture of local energy activism, social capital and trust, and local conflicts or acceptance.[21] Given the diversity of cultures, languages and experience with energy communities across the 27 Member States of the EU, organisational barriers and action drivers are more likely to contextualise the impact of national rules and regulations meant to facilitate access to the market and to resources.

Holstenkamp and Kriel acknowledge that there is no specific line of theory or scientific basis for creating any specific categorisation of different drivers and barriers for energy communities.[22] Indeed, drivers and barriers can be organised using different theoretical frameworks. As such, we have not used this framework as part of the methodology underpinning the development of our research; it is mainly for illustrative purposes to help contextualise or understand different barriers and drivers that are presented in this Report.

For the purpose of helping to facilitate the development of enabling frameworks for energy communities, this Report focuses mainly on barriers and action drivers that impact the development of energy communities at national level in the context of EU legislation, including but not limited to the RED II and IMED. Therefore, we focus mostly on the aspects of these four categories that intersect with relevant policy, legislation and regulation that governs the activities of renewable energy production, energy sharing, supply, and provision of flexibility by energy communities at national level and, where relevant, for new market entrants in general. We also acknowledge that regardless of the framework for categorising different barriers and drivers, there is likely to be some overlap between these categories.

2.3. How to approach different barriers and action drivers presented in this Report

In looking at barriers for any particular activity that an energy community may participate in, we distinguish between general barriers and specific barriers for energy communities. General barriers are likely to be experienced by all market actors, whether or not they are acknowledged as an energy community. Specific barriers are relevant when, because of an energy community's unique characteristics (e.g. legal form, non-commercial purpose), it faces a specific hurdle not experienced by other market actors. Generally speaking, these barriers apply across energy markets, although we do refer to electricity or gas markets where relevant.

For the reader, depending on the Member State and the maturity of its energy community sector, barriers and drivers will have different relevance and magnitude of impact. In Member States where no energy communities have previously existed, it is possible that the biggest barriers are very basic. For example, a study on barriers for energy communities in Bulgaria conducted on behalf of civil society concludes that the main factors holding up the development of energy communities is a lack of awareness, support and a clear governing framework for energy communities.[23] According to an energy community stakeholder, one of the founding members of a newly created Community Energy Union in the Czech Republic, the main barrier was the lack of a framework that provides basic definitions and technical details (e.g. eligibility criteria, modalities for energy sharing, and roles and responsibilities).[24] Hence, it is always important to contextualise each potential barrier or action driver to the national context of the Member State concerned.

Some barriers may be relevant regardless of the level of development of energy communities in a particular Member State.[25] Furthermore, studies show that certain drivers are likely to always be present in a successful initiative. According to a Synthesis Report of an assessment of 10 transferable best practices by COME RES, a Horizon 2020 project, the success of RECs depends on the existence of drivers across different categories. In particular, they pointed out that successful REC projects must:

1 | rely on some positive contextual conditions

2 | design financial and organisational models tailored to the specific local context

3 | receive some type of support from public authorities;

4 | ensure a degree of openness and inclusiveness; and

5 | incorporate some innovative aspect that creates added value.[26]

THE IMPORTANCE OF ASSESSING BARRIERS AND DRIVERS AT NATIONAL LEVEL

As considered above, different action drivers and barriers need to be contextualised within a national market and system-perspective in order to identify unjustified and disproportionate barriers and develop tailor made effective solutions. Therefore, a national assessment of barriers and drivers is always recommended.[27] As such, this Report should not be seen as a replacement for conducting an actual and thorough national assessment of barriers as well as options for their removal.

Before an enabling framework can be created, it is important to have a shared understanding between national decision makers, energy communities (where they exist), civil society, local and regional authorities, and other sector stakeholders and potential interest groups of the main challenges energy communities face, and different potential options to address them. Consulting different stakeholders is very important for identifying, clarifying, and validating different barriers and potential policy responses. Options need to be assessed for their potential impacts, both positive and negative. Such an assessment is necessary, regardless of whether energy communities are established or represent a new concept. In Member States that have little experience with energy communities, while these assessments are being carried out, temporary support measures can be put in place, for instance through pilots and/or Regulatory Sandboxes. Once finalised, a national assessment of barriers and drivers can provide the basis for more permanent policies and measures aimed to create an enabling framework as envisioned in the RED II and IMED. Furthermore, it is important to set up a monitoring process so that the effects of different policy objectives around energy communities, and resulting regulations, can be measured over time and adapted if necessary.

Member States can designate the undertaking of a national assessment of barriers, as well as monitoring their removal, to a responsible authority. So far, Member States have assigned these responsibilities either to a Ministry and/or the NRA or another national authority, such as an Environment or Energy Agency. To date, there are a few existing experiences from EU Member States and other countries that have taken steps towards such an assessment, as outlined below. These examples have been taken from EU Member States and other countries with existing energy community sectors, and those where energy communities are just emerging.

- **Finland** – In September 2022, the Ministry of Labour and Economy established a working group to identify necessary changes to regulation to develop coherent legislation on energy communities. The working group was chaired by the Minister and included electricity suppliers, distributors, consumers, authorities and research institutions. In April 2023, the working group presented its recommendations.[28]

- **Flanders Region, Belgium** – Stakeholders participated in a meeting with the Flemish Energy Agency. VITO also conducted a study on behalf of the Flemish Energy Agency where barriers were assessed.[29]

- **Ireland** – The Ministry commissioned an assessment in the context of the development and design of community-related elements of its Renewable Energy Support Scheme (RESS) Auction design for RECs. Furthermore, in a consultation on energy communities and active customers, the NRA, the Commission for Regulation of Utilities (CRU), was asked by the Ministry to ask respondents about existing barriers and measures that would be helpful in addressing such barriers. The responses to this consultation will feed into a further assessment by the Irish Government.[30]

- **Italy** - The Senate Commission on Industry, Trade and Tourism launched a public consultation to acquire information and assessments from interested parties. The consultation lasted from 1 to 31 October 2018.

- **Latvia** - In Latvia, the Government stated that it plans to use the assessments and findings from within an EU co-financed project (e.g. Co2mmunity).[31]

- **Lithuania** – To help in the preparation for the transposition of the RED II, the Ministry of Energy organised a public consultation and roundtable discussion with stakeholders interested in the uptake of RECs.[32] The consultation was aimed at getting answers from different interested groups on how to adapt the REC provisions into the national legal framework, and to identify factors that can promote the successful operation of RECs.

- **The Netherlands** – In 2019, the Ministry of Economic Affairs and Climate published a study "Exploring future potential citizen energy movement 2030: Energy owned by the local community".[33] The report looks specifically at the future potential of energy communities with a primary focus on cooperatives and their contribution to onshore wind and solar power generation, as well as in the heat transition.

- **Poland** – In 2021, the national government carried out an assessment within a project ("KlastER" - Development of distributed energy in energy clusters) to analyse and assess different business models and solutions supporting development of dispersed energy.

- **UK** – In 2014, the UK Government commissioned an assessment of potential community energy growth to 2020.[34] It informed the eventual "Energy Community Strategy" published by the Government, which detailed actions intended to expand the sector.[35] The assessment quantifies the national potential of community-owned renewable energy production and provides different scenarios for the sector's development.

3. BARRIERS AND ACTION DRIVERS FOR THE DEVELOPMENT OF DIFFERENT ACTIVITIES BY ENERGY COMMUNITIES

03

BARRIERS AND ACTION DRIVERS FOR THE DEVELOPMENT OF DIFFERENT ACTIVITIES BY ENERGY COMMUNITIES

3.1 Cross-cutting barriers and action drivers

While undertaking research for this report, the Repository identified a number of general cross-cutting barriers and action drivers that could pertain to an energy community regardless of whether it is trying to engage in production, sharing, supply or another activity. Indeed, there may even be factors that influence the ability of energy communities to explore and decide on a particular activity. Some of these factors are related to the newness of the concept and its framing in the EU framework.

3.1.1 CROSS-CUTTING BARRIERS

Barrier 1

DIFFICULTIES DESIGNING AND MONITORING A CLEAR AND UNIFORM LEGAL DEFINITION FOR ENERGY COMMUNITIES

Based on an assessment conducted by the Repository of all national legislation that has been passed so far in furtherance of the RED II and the IMED, 22 Member States have adopted a definition of REC, while 21 Member States have adopted a definition of CEC. The conceptualisation of energy communities at national level is not an easy endeavour with many of the governance and participation principles included in the EU definitions such as proximity, autonomy, and social, economic and environmental benefits having a multi-interpretational character.[36]

A clear articulation at the national level of the principles that make up an energy community is central to ensuring the democratic and social character of the concept, and the consequent justification for the removal of disproportionate barriers and application of a dedicated enabling and supporting framework. Stakeholders communicated that in Member States without an existing energy community sector or where it is still emerging, the lack of a uniform and clear legal definition creates legal uncertainty, preventing the development of investment expectations by potential market actors.[37] This is because market actors are waiting for the rules of the game to be established before they invest in projects. Stakeholders also communicated that while the EU definitions had been written into law, the principles contained therein still did not contain sufficient precision. An additional element of confusion that was communicated by stakeholders interviewed for this report was the lack of clarity between the definitions of CECs and RECs. In particular, the relationship and coherence between these two concepts has been difficult to interpret without further elaboration and communication. Furthermore, many Member States have written the definitions into national law through separate processes and according to different timelines without sufficiently communicating a clear relationship or an overarching narrative for energy communities.

If abstract governance and output criteria are not further defined at national level, regulators or other national authorities may experience challenges to effectively register and monitor energy communities, especially if they are not provided sufficient financial and human resources to perform such functions. Without a proper registration and monitoring system to oversee compliance with these principles at national level, energy communities may become driven by commercial actors with greater resources and experience at their disposal to navigate existing rules and operate on relevant national energy markets. This would lead to unfair advantages for traditional market actors, and undermine consumer trust and understanding of (the purpose of) energy communities.

The lack of clarity on the distinction between the two concepts may also pose challenges for different stakeholders to know in which type of energy community they can participate in or set up. For instance, some Member States have special legal forms that allow public authorities to engage in economic activities. In **France**, while local authorities use a special legal form called sociétés d'économie mixte (SEM, or Mixed Economy company), they have experienced challenges being acknowledged within the REC definition because they conflict with rules that define SMEs.[38] Such an issue does not exist for the CEC definition, which is open to all types of actors.

Furthermore, local authorities may face certain limitations under national law from participation in certain legal forms. In **Italy**, for instance, national law controls when, why and how public administrations can take part in and/or control private companies for their institutional purposes with the aim to safeguard market competition and rationalise and reduce (or at least keep under control) the use of public money.[39] Therefore, municipalities need to ask for permission by another public body called a Corte di Conti (an Accounting Court), which oversees compliance by public administration bodies with accounting rules, to become a member of a cooperative.

The importance of having clear and specific criteria and an effective registration system to ensure the authenticity of energy communities was illustrated by past experience of **Germany**. In its 2017 Renewable Energy Sources Act (EEG), Germany moved towards a tendering process for new onshore wind and solar photovoltaic (PV) projects above 750 kW. For wind projects, to make sure that citizen initiatives were not crowded out by the move to tenders, the EEG established a definition that contained specific yet broad criteria, and special rules for “citizens’ energy companies.[40] However, several aspects of the definition were too broad. First, only 10 natural persons were required to be members, with no requirement to be open. As such, developers often used their own employees and/or targeted communication with individuals to meet the requirement, closing the membership once the requirement was met. Furthermore, citizen energy companies could take any legal form, which allowed more traditional market actors to fit themselves in the definition. As a result, in the first three rounds of bids under the 2017 EEG, 97 percent of successful bids came from projects that were legally eligible to be considered citizens energy companies. After assessing the individual projects in detail, it was shown that nearly all of these projects were established by traditional market players, whereas only eight projects could be considered to be what the authors considered a real grass-roots, locally driven citizen energy project.[41]

Barrier 2

LACK OF CERTAINTY, PREDICTABILITY AND ACCESSIBILITY OF PUBLIC AND PRIVATE FINANCING

While most – if not all – market participants are impacted by unpredictability, energy communities appear to be particularly sensitive to instability. Frequent or abrupt changes in regulation and public support schemes render it difficult to develop and build a solid financing plan and business model as well as investor certainty.[42] This is due to a mix of factors that relate to the inherent characteristics of energy communities, including their choice of legal form and internal governance processes, their small size, lack of experience, and financing strategy.

Energy community projects are likely not to have significant finance available during the early stages of project development.[43] This is influenced by their value-based business models, limited equity, and small project portfolios.[44] This is also impacted by other horizontal barriers, including cultural factors, lack of knowledge and understanding of energy communities, and perceptions of legal forms used for energy communities (e.g. cooperatives).[45] Energy communities typically do not have difficulties raising capital from citizens after a project has been defined and is already moving forward. However, this often leaves a financing gap for initial, up-front investments in these projects.[46]

The first challenge is the pre-planning stage. At this point, an energy community cannot ask for financing because they still need to undertake business plan modelling, engage members of the local community, and validate the project. This stage also includes conducting a feasibility study, which requires expertise that community projects need to procure externally.

Once it is determined that a project can go forward, the community needs to successfully navigate complex and lengthy licensing and permitting procedures. Due to lengthy and unclear procedures and dependency on disaggregated and uncertain sources of private capital investment, before obtaining a building permit for their installation energy communities face difficulties accessing loans from financial institutions, which are reluctant to take on the associated risk.[47]

According to Compile, a Horizon 2020 project, traditional banks:

- Rarely accept giving small and medium loans less than 500 k€ / 1M €, because they are less profitable;
- Can require further due diligence by the project promoter to check relevant guarantees and the ability to lead the project, which can add an additional €20,000 – 30,000 to the project; and
- Are often less willing to finance projects that use legal forms having more complicated governance processes.[48]

In some countries, for instance Spain, equity capital from cooperative members is deemed volatile by financing institutions.[49] According to a survey conducted by the LIFE LOOP (Local Ownership Of Power) project, accessibility of bank loans to help finance projects early on is perceived especially as a strong barrier in southeast and central Europe.[50] Specifically related to energy sharing, the difficulty in accessing private financing can be partly attributed to the novelty of the concept and the legal entities used to create energy communities, which may increase perceived uncertainty in terms of bankability of investments for lenders. For instance, Hyperion, an energy community set up in Athens, Greece cited their not-for-profit purpose and focus on energy sharing as the main reason they experienced difficulty obtaining a bank loan to realise a virtual net metering project. Because energy sharing is not an activity designed to make profit, there was little that the bank felt it could secure in case of default. Inversely, if the main purpose of the energy community would have been mainly production of renewables for purpose of sale, a traditional bank would have been willing to provide a loan.

Barrier 3

LACK OF AWARENESS, TRUST AND ACCESS TO TECHNICAL EXPERTISE

In order for citizens, local authorities and other market actors to be able to exercise their new rights under the RED II and IMED, they need to be aware of the opportunities that exist. Furthermore, where energy communities are a new concept, trust needs to be built – otherwise, potential participants may be hesitant to engage or invest in an initiative. Energy communities often also need access to expertise, advice or assistance to realise different activities and initiatives.

LACK OF AWARENESS

There is still a lack of awareness and understanding of what energy communities are, how they operate, and their impact, especially in Southern, Central and Eastern Europe where energy communities are a novel concept. Stakeholders have raised to the Repository that there is **a lack of publicly provided information on what an energy community is, how to start an energy community, and where to access technical assistance or financial help.** Once an energy community has been started, it can also be difficult to reach a size big enough to sustain full-time employees. In France, this has been cited by energy communities as a potential risk to the long-term sustainability of an energy community.

Lack of awareness may also prevent energy communities from engaging in specific activities or technologies. This is particularly noticeable around bioenergy.[51] Bioenergy can be produced from a number of resources (e.g. wood, agricultural crops, organic waste) in a number of different ways, making it very complex and difficult to communicate. Furthermore, the emergence of examples of unsustainable exploitation of resources for bioenergy have made it a polarising topic, creating public acceptance issues. BEcoop, a Horizon 2020 project focusing on community bioenergy, cites lack of awareness as one of the main barriers to the uptake of bioenergy production and other related activities by energy communities. Specifically, they cite:

- A lack of awareness of national potentials for biogas and biomethane production, and the lack of transparency from the grid operator on the available grid connection points where biomethane production can be cost-effectively integrated into the grid;
- Uninformed or misinformed perceptions of the environmental impacts of bioenergy; and
- A lack of awareness around the concept of energy communities with activities related to bioenergy.[52]

LACK OF TRUST

Trust is a precondition for consumers to be willing to invest their money or time in developing an energy community, whether through collective investment in renewables production, an energy sharing project, or a more professionalised activity such as supply. **Energy communities are built by consumers as a form of self-ownership over the provision of energy services** (e.g. supply, sharing, aggregation, distribution, renovations, transport, etc), which **may impact the level of professionalisation**, implying the applicability of existing consumer rights law. **Information and transparency** are essential in helping consumers to understand the benefits and potential risks of becoming involved in an energy community. According to consumer organisations, it is important to **ensure a high standard in providing adequate pre-contractual information, including pricing, contract termination, and tariff changes**, for instance online. With digitalisation and the emergence of energy service providers and platforms, consumers need to **disclose their personal data**. As a corollary, consumers need to have comfort and trust based on their ability to control how that data is used. In this sense, energy communities have an advantage in building and maintaining trust, because they provide control to the users themselves of any service being provided. Nevertheless, it is important to ensure that consumer members within energy communities are adequately protected.

Cultural attitudes also play a significant role in the uptake of energy communities and trust does not come as natural for some cultures across Europe as for others. For example, an NGO-developed assessment of barriers to energy communities in Hungary cites the public's association of cooperatives with a soviet past, as well as patterns of state paternalism, individualism and market vulnerability, self-organisation, trust and cooperation as potential barriers that need to be overcome in order for energy communities to develop.[53]

LACK OF TECHNICAL CAPACITY AND EXPERTISE

Even where definitions, rights and obligations have been established, they can be difficult for market actors to interpret without proper guidance and communication from the appropriate authority (e.g. NRA, Agency, local and regional authorities, etc). This view was acknowledged in interviews with stakeholders from Member States still without a definition, or where further guidance on the established definition has not yet been communicated, particularly in Central and Eastern Europe. Energy communities also need to possess technical capacity to establish a legal entity, manage project development, navigate administrative procedures, and become licensed to perform various activities. In most cases, volunteers or part-time employees must carry this burden; otherwise, legal, financial and other expertise needs to be obtained from outside the energy community, which can be costly.

Barrier 4

LACK OF ACCESSIBILITY FOR ENERGY POOR AND VULNERABLE HOUSEHOLDS

Given that many of the action drivers proposed will bring about costs that will have to be carried by wider society, it is important to ensure that participation in an energy communities is as inclusive and accessible as possible, so that all citizens can benefit. As a broad objective, however, the ambition to ensure accessibility so that energy poor and vulnerable households can participate or benefit from community energy initiatives remains largely unrealised.

One of the main barriers faced by vulnerable consumers to participate in energy communities is the **financial entry barrier**: the requirement of minimum investment for members of most community energy projects makes it unrealistic for low-income households to participate as normal shareholders.[54] In Germany, the average minimum financial contribution – individuals buy shares to become members – amounts to €545. This minimum contribution will often determine who can benefit from energy communities' services.[55]

There is also a **lack of alignment between policies to promote energy communities and social policy**. In its research, the Repository found that where incentives exist to provide assistance in joining or financing membership in an energy community, they may still be inaccessible to low-income households or those that that are already receiving some type of social assistance. For example, in some Member States if an individual benefits from financial participation in an energy community (e.g., in the form of dividends as an extra income) this can potentially **reduce the amount of social welfare they are eligible to receive**. Furthermore, it may not be possible for low-income households to deduct investment expenditure from personal income tax, or they **may become ineligible to receive unemployment benefits** when investing in an energy community.[56] If the aim of policy is to empower vulnerable and low-income households through energy communities, their participation should not undermine their ability to continue accessing important social services.

In addition, there is **a lack of awareness and expertise by the energy community sector, as well as know-how in engaging with energy poor and vulnerable households**, who may also be harder to reach.[57] The CEES (Community Energy for Energy Solidarity) Horizon 2020 project recently conducted a survey that shows only a low amount (5%) of energy communities work on energy poverty as their main priority.[58] While another 25% of survey respondents said they carried out significant work on energy poverty, the respondents identified a number of barriers that prevent energy communities from engaging more with vulnerable households. Almost half of the respondents cited lack of awareness by energy poor and vulnerable households of support that is available to them, as well as a lack of knowledge and expertise by energy communities themselves to engage. Lack of funding and lack of staff were also cited as significant barriers.

There is also still a **lack of awareness by public and private (e.g. charities, NGOs, social enterprises) organisations that provide assistance to low-income and vulnerable households.** Furthermore, while these organisations are in a good position to help identify and effectively target low-income and vulnerable groups, there are still few examples of cooperation between them and energy communities.

3.1.2 CROSS-CUTTING ACTION DRIVERS

Action Driver 1

DEDICATED FINANCE ARRANGEMENTS TO SUPPORT INVESTMENT

Governments have increasingly set up dedicated public funding mechanisms to help energy communities overcome hurdles they experience in financing the first stages of the project. This can help to de-risk the preplanning stage, for instance to undertake feasibility studies and obtain legal and other technical expertise. Public funds can also be used to provide guarantees or low/zero-interest loans to energy communities for project development. Such financial assistance can be developed both at the local and national level. Below, we identify how public funds have been used to help energy communities overcome financing barriers.

Dedicated public financing mechanisms

Perhaps the most famous funding scheme for supporting energy communities is Scotland**'s Community and Renewable Energy Scheme (CARES).** CARES was set up a decade ago to support community renewable energy production. Currently, it provides grants to support feasibility studies for projects regarding renewables production, heat, shared ownership, local energy plans, and community buildings. In order to be eligible, the applicant must be a non-profit distribution community organisation, including charities and faith groups, that operate within a geographically defined area. CARES was modelled around the basic principle that if the project does not go forward, the community does not have to pay any of the money back, effectively de-risking the pre-planning phase of the project. If the project goes forward, the grant turns into a loan that must be paid back. It was the first of its kind and it has been replicated in the Netherlands, while similar revolving fund concepts have been adopted in Denmark, Germany and Ireland. The Government of Ireland actually cited CARES as an inspiration for a similar mechanism that it has placed in RESS to help facilitate the development of RECs.

In Denmark, in late 2021 the government published an Executive Order that it would provide support for local energy communities and local climate initiatives of about 5.0 million DKK (€0,672 million) annually between 2022 and 2025.[59] This funding, which is provided through grants, can finance dissemination of information, as well as the planning, establishment and organisation of production, storage, flexibility and energy efficiency projects.

In the Netherlands, the Ministry of Economic Affairs set up a revolving Development Fund in 2021 for energy cooperatives ('Ontwikkelfonds voor energiecoöperaties'). The Development Fund followed up the Stichting Doen, which ran between 2016 and 2019 and provided loans to cover development costs of mostly up to €5,000 to solar and wind projects. The Development Fund is managed by Energie Samen, in cooperation with regional umbrella organisations and project offices. The fund offers initial grants to cover staff support from a member project office, costs to conduct feasibility research, to assess the viability of the project's organisation and plans, and to go through the process of getting an eventual loan. The Development Fund is also now complemented by a separate Realisatiefonds, (or Realisation Fund), which provides preferential loans between €30,000 - 1 million to help build large-scale PV projects. The Realisation Fund covers up to 75% of the total realisation costs of the project.

In **Ireland**, grants are provided for early-, mid- and late-stage project development for renewable energy community projects under RESS.[60] Eligible costs include project design, planning, obtaining a grid connection, submission costs and obtaining advice for project financing. These grants are managed by the Sustainable Energy Authority of Ireland (SEAI), which also provides grants for community groups that want to engage in renovations. Ireland's RESS also includes the establishment of a Community Benefit Fund. Each project that receives subsidies through the RESS must contribute €2 per MWh. These Community Benefit Funds can finance, among other things, the establishment of community renewable energy projects.

Use of European funds

Many Member States are making use of European Funds to support the development of energy communities. For instance, **Spain's Recovery, Transformation and Resilience Plan** established an incentive program for singular pilot projects of energy communities.[61] €100 million is earmarked for energy communities, in the form of grants. Eligible projects include not just production, but also energy savings and renovations initiatives.

Latvia has also used EU Funds to help jump-start the energy community sector, which is still in early stages of development. In particular, Latvia's **Cohesion Policy Programme** for 2021–2027 will provide financial support to encourage the installation of PV systems and storage equipment by energy communities, particularly cooperatives, and households. The government also plans to provide investment support to energy communities under the multiannual operational programme of the **Modernisation Fund**[62].

Lithuania's Recovery and Resilience Plan explicitly mentions energy communities as potential beneficiaries. To help them access the funds, tenders provide bonus scoring to energy communities. The Fund also references the national law on energy communities, which provides a rather concrete definition of RECs. The Fund will provide grants for energy communities that address energy poverty, and €60 million will be provided in subsidised loans for municipalities to promote energy communities. These funds are intended to assist energy communities and prosumers so that they are able to develop 2 GW of additional production, which has been reserved for connection to the grid.

Under **Italy's Recovery and Resilience Plan**, €2.2 billion have been earmarked to provide financial resources for the establishment of RECs, focusing primarily on small municipalities with less than 5,000 inhabitants.[63] Grants of up to 100 percent can be provided for the development of production and consumption of renewable energy from electric and thermal sources[64]. Eligible expenses include technical and technical-scientific assistance for purchasing all the components that are essential to realise production, distribution and sharing facilities, the purchase costs of storage systems, and legal and administrative assistance for the definition of agreements.

Local and regional funds

In **Germany, the federal State of Schleswig-Holstein** has set up a revolving funding scheme (Burgerenergie.SH) to cover pre-finance costs in the start-up phase.[65] The intent was to reduce the financial risks during the startup phase

of the project, and to provide independent advice. It funds not only renewable electricity production, but also heat, mobility, energy efficiency in buildings, and digitalisation projects.[66] In 2022, the Federal State of Thuringia replicated this model, allocating €500,000 in loans to support community energy. Funds can be used for feasibility studies, site studies, surveys, environmental impact assessments, and other steps usually taken before building a renewable energy production facility.[67] These revolving funds have also helped inspire a national-level revolving fund for wind projects of citizen energy companies in Germany. In Italy, **Structural Funds** (primarily the ERDF and the ESF), have been utilised by a number of Regions, including Lombardy, Emilia Romagna, Lazio, Campania, Sicily, and Sardinia. These funds are primarily aimed at financing feasibility studies and establishment of the REC itself, much of which are targeted at municipalities.[68] Furthermore, in the Netherlands, the provinces of South Holland, Utrecht, Limburg, and Drenthe created a special development fund to provide start-up finance and risk capital to cover upfront costs.[69]

Municipal grants and other financial incentives to encourage investment are also a good and simple way to help finance community projects. For instance, in 2017, the City of Amsterdam, launched a rebate programme for community rooftop solar projects called “Dak voor de Stad” providing subsidies to help rooftop PV projects with at least 100 kW of installed capacity and “solar cooperatives” with a minimum of 10 members to cover the costs of purchasing and installing the PV systems.[70] In the UK, the City Council of Bristol set up a Bristol Community Energy Fund that provides grants and loans to local community groups to cover the development costs of their renewable energy projects.

Guarantees

Guarantees provide assurance to a lender that any finance provided will be paid back. Providing guarantees is already something that cooperatives do together. For instance, a Belgian cooperative, Ecopower, provided a guarantee to Enercoop, a cooperative in France, so that they could start supplying green electricity. It is also possible for governments to provide **State-backed guarantees**, for instance in order to help energy communities enter into a PPA. This has been put forward by the European Commission in its Electricity Market Design proposal.

Guarantees are also an increasingly popular way to finance larger infrastructure projects at the local level, particularly district heating networks. In the Netherlands, in 2009 a Dutch energy community, Thermo Bello, received a 100% **municipal guaranteed loan** from the **City of Culemborg** when it bought assets to establish a cooperative district heating company. More recently, a cooperative district heating project in the city of Haarlem received a municipal guarantee on a small part of the CAPEX investment for the project.

Other forms of finance

While public funding sources play a significant role in helping energy communities develop at the national level, particularly during the early stage, there are also a number of alternative ways to fund community projects, from renewable energy production projects to energy savings and other energy services. This can include sources such as:

- **Equity financing** – Equity financing implies providing an ownership stake in the energy community, through the issuing of shares to new and existing members. This funding strategy can be used to set up the community as an organisation (i.e. establish the legal entity), or as a way to fund projects. In Member States where energy communities are more mature, energy communities have been able to set up collective equity funds. For instance, in France, Énergie Partagée manages a cooperative revolving fund (Énergie Partagée Investissement). 90 percent of the fund is allocated to investments in implementation or operation stages of project development, while 10 percent of the fund is allocated to development and preparation stages of projects (through a separate fund called EnRciT).

- **Bank loans** – While obtaining bank loans can be complicated, both for community projects and financial institutions themselves, they can play a significant role in scaling up projects. As banks are generally risk averse and require a lot of information, it can be difficult to communicate community initiatives as a safe investment to a bank. Nevertheless, this hurdle can be overcome through education and outreach so that banks can become familiarised with the business model of energy communities. According to Centrales Villageoises, a French association representing locally governed renewable energy projects, accessing finance was a real barrier at the beginning. However, after training and education of banks on the specificities of the energy community model, and once the model began to spread, this barrier has become less of an issue. Furthermore, ethical or cooperative banks that already share similar values to energy communities can make good partners for obtaining loans. For instance, cooperative banks have often been involved in financing community renewables production projects. In Spain, a citizen energy community, Goiener, has entered into a sort of framework agreement to develop future renewable energy projects, even though such funding is not yet necessary.

- **Crowd investment** - Crowd investment is a form of debt financing. However, instead of going through a bank or another financial institution, it is made up of small individual loans by different actors. This type of funding can be provided by both members and non-members of an energy community. Crowd investment strategies have been successfully used by energy communities in Greece, Germany, and Croatia.

- **Bonds** – similar to crowd investment, bonds are a form of debt financing. In this case, an energy community, as a company, sells bonds to individual investors within a predefined fixed amount of time. At the end of the period, the bond is repaid by the energy community, with interest. While this financing strategy has been used by some advanced community energy organisations in the UK, it is still quite difficult for energy communities in Europe to access.

WHAT IS THE APPROPRIATE FINANCING STRATEGY FOR AN ENERGY COMMUNITY?

It is important to understand the various implications that different sources of funding can have for the energy community, including its independence and internal governance. While it is beyond the scope of this Report to identify all the pros and cons of each strategy, or whether they are suitable in a particular Member State, there are a growing number of resources published by NGOs and EU-funded projects that pool together experiences from energy communities across the EU that can provide inspiring examples and insights.

SCCALE 20 30 50 – Financing Guide for Energy Communities

ACCE – Best Practice Report on Access to Capital for Community Energy

Compile – Financing Guide

COMPILE – Report on Novel Financing Instruments for RECs

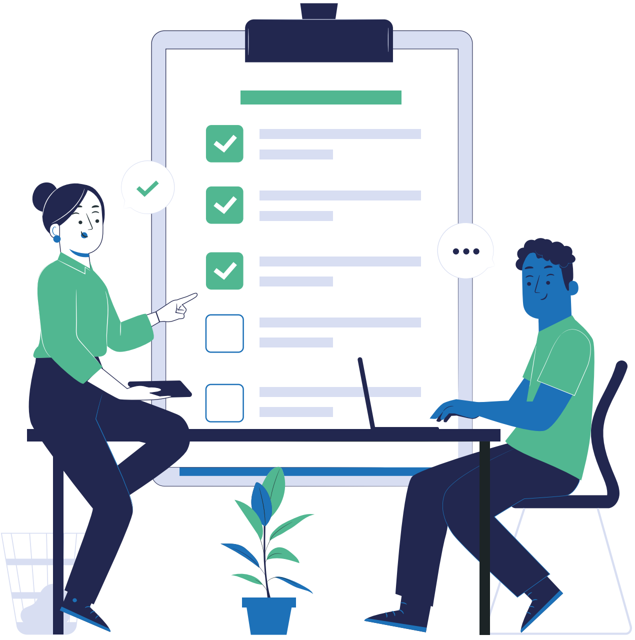
PROSPECT+ - Resources Section

Profundo and Friends of the Earth Europe – Energy Communities in the EU: Opportunities and barriers to financing

REScoop 20-20-20 – Handbook on Investment Schemes for REScoop Projects

Community Power Project – Community Power Financing: Mobilisation of public-private financing for community based sustainable energy projects in Central and Eastern Europe

Energy Cities – Investment Needs for the Local Energy Transition



These alternative sources of funding can be mixed with each other and combined with public funding. For example, in **the UK**, in 2021 community energy groups secured £12.2m in development funding from 12 different sources including public funds and other charitable or community-focused funding sources. While in **Scotland** a majority of funding came from CARES, in **Wales** there was a diverse set of funding sources from government funding to other sources.[71] This funding has come on top of £11.9m in investment raised for new projects, which include self-funding, community shares, grants, and bonds.[72]

Measuring the impact of financing schemes for energy communities

Where they have been put in place, they have helped support the growth of energy communities. For instance in Scotland, the CARES scheme helped the Scottish government meet its 2020 goal of 500 MW of local and community owned renewable energy production by 2016, only three years after its inception.[73] Concretely, it has helped the number of energy communities grow to 103 community energy organisations with 82 MW of installed capacity in 2022.[74] In the Netherlands, between 2016 and 2020, when the first public financing support mechanism 'Stichting Doen', was operative, the growth of energy cooperatives almost doubled from 304 to 584.[75] Furthermore, since the Realisation Fund's establishment in 2021, it has helped 43 energy community projects secure loans to build large-scale PV projects.[76]

Many of the more recent schemes that have been developed are still in the early stages of implementation. As such, it is difficult to measure their impact or how well they have helped energy communities develop. Nevertheless, some schemes, particularly those that are being set up under EU funds have been instrumental in supporting the first pilots in countries where energy communities did not yet exist. In any case, Member States should ensure that support contributes to the development of energy communities with a sustainable business model to make best possible use of public resources.

Action Driver 2

TOOLS TO PROMOTE AWARENESS, ACCESS TO EXPERTISE, AND TRUST BUILDING

Transparency and tools to communicate important information to different stakeholders can help address a number of barriers that energy communities face in terms of awareness and lack of capacity. These tools can help provide legal clarity, the development of reasonable investment expectations, as well as help build trust by citizens around the concept of energy communities.

Raising awareness around energy communities and facilitating access to expertise

Several Member States are creating different ways of supporting and raising awareness, and providing technical advice on how to get started with a project. A couple of different models have emerged so far, one based on **a government-backed entity (e.g. Agency), either at the national or local level**, while the other also relies on **civil society-based networks.** Such bodies, often called **one-stop-shops (OSS), can provide information and expertise covering many different topics ranging from renovations and energy efficiency savings measures to helping with developing renewable energy production projects.** They typically **provide technical, financial and legal services such as consultation, facilitation, legal advice, finance advice and provision, assessment, and assistance navigating administrative procedures.**[77]

Austria has assumed the first approach. As part of its transposition of the CEP, the national government set up the **Austrian Coordination Office for Energy Communities** (Österreichische Koordinationsstelle für Energiegemeinschaften) inside the Austrian Energy Agency.[78] The Coordination Office provides an online one-stop shop for information on energy communities and setting up a project. It provides a map to identify different energy communities, and includes information on obtaining funding, template contracts and agreements that must be entered into with different actors, as well as brochures and guides on specific topics. The Coordination Office also contains a help desk and serves as a link to experts. The Coordination Office is also responsible for making administrative procedures more efficient, faster and transparent. To accomplish this task, it coordinates vis-à-vis the Ministry of Climate (BMK), the NRA (E-Control), and regional governments ("Bundesländer"). The DSOs in Austria also work with the Coordination Office through the working group, as well as share information. SHAREs, a Horizon 2020 project, has also created a template that can be used to replicate an online one-stop shop, based on the model used by the Austrian Coordination Office. It can be rolled out in different countries, and is available in six different languages.[79]

Regulators and other Agencies can also provide a vital function for promoting clarity and guidance to stakeholders about new rules being put in place on energy communities. In the Brussels-Capital Region of Belgium, Brugel, the NRA, has developed a **guidance** document on the three different energy community definitions that exist for the region in order to help stakeholders understand how they can comply with the principles and successfully register an energy community.[80] It also presents explanations on its website to provide prospective energy communities with clarity around applicable rules, regulations, and procedures. In Portugal, **ADENE** (Agêcia para a Energy, or Energy Agency) **and DGEG** (Direção-Geral de Energia e Geologia, or Director General of Energy and Geology), have created a **legislative guide, or manual, on renewables self-consumption and energy communities** to help stakeholders understand and interpret legislation and regulations, the different concepts that exist, options for setting up initiatives, and practical procedures (e.g. registration, licensing, etc). [81]

Local and regional government bodies have a role in bringing community initiatives together, and to provide them with support. In Germany, NRW. Energy4Climate, the **regional energy agency in North Rhine-Westphalia set up a networking platform for community initiatives** to facilitate exchange, networking and cooperation, and to provide starter advice for new community initiatives.[82] In Belgium, **the City of Gent** provides **technical support to specific community projects.** Through the provision of funding, a REC, EnerGent, was able to hire an expert to support the development of a local smart grid project.[83] In the City of Valencia, Spain, an Energy Office was set up to provide support to citizens in different neighbourhoods so they could set up energy communities.[84] The Energy Office provides trained staff to discuss energy issues, an environmental educator, a social worker, an architect and an engineer. This team runs workshops, and supports starting initiatives to get going. **The City of Barcelona** also provides an **online map to highlight buildings that have potential for PV production.** The aim is that this will help energy communities in finding sites for new projects.[85]

Governments can also rely on civil society or non-profit organisations to disseminate awareness and provide advice. In Scotland, the **Government entrusted CARES to an independent non-profit organisation**, the Energy Saving Trust, which was set up in 1992 to promote awareness around energy conservation. Currently, CARES is managed by another non-profit organisation, Local Energy Scotland. In the Region of **Brussels-Capital Region of Belgium**, the **Ministry appointed an NGO that promotes the energy transition, Énergie Commune, as a 'Facilitator'** to provide technical, economic, legal, administrative expertise, and other tools to promoters of energy community and energy sharing projects in the region.[86] This also includes specific guidance and workshops for local authorities, so they can better understand how to support energy communities, as well as participate in their development. They have also organised a workshop focused on how to undertake energy sharing in social housing. In Slovakia, the **Ministry is supposed to designate an organisation** to act as a contact point for guiding projects through administrative procedures. The organisation should support project leaders, provide legal/technical/economic tools, inform potential stakeholders, and provide guidance and workshops to municipalities.

While providing finance or staff resources to provide expertise to community projects can act as a driver of such initiatives, it is important to acknowledge that many local authorities actually lack the staff resources and expertise themselves to undertake projects or help local communities get off the ground. In this regard, in its 10 Measures in Favour of Citizen Renewable Energy, the French **Ministry** committed itself to **increasing the number of advisors for locally-governed projects in the regions by 50%**, through ADEME (Agence de la Transition Ecologique, or The Ecological Transition Agency) and a new network of PV and wind advisors for local authorities.[87]

Tools to promote trust

Consumers often rely on resources provided online or through another trusted resource to help make decisions from choosing their supplier to becoming a prosumer. Comparison tools can be an important lever in this regard. In the Flanders Region of Belgium, the Regional NRA, **VREG** (Vlaamse Regulator van Elektriciteit en Gas), **includes energy communities in its online comparison tool** so citizens are aware, and can consult and compare the offer of energy communities vis-à-vis more traditional suppliers.

Elaboration and clear communication by energy communities to existing and potential new members helps to build the legitimacy of internal decision-making process, and the sharing of benefits and costs and potential liabilities. In this sense, involvement by local authorities (as a trusted local leader) has been shown to have an important effect of creating trust and confidence in local projects.[88] Some Member States have elaborated **rules for energy communities to ensure transparency and fair treatment of members. These rules sometimes require the development of internal standards within the energy community to allow for the exit of members, handle dispute resolution procedures, ensure fair internal decision making and voting rights of the members, and to protect data.** Several Member States, including all three regions of Belgium, and Croatia, require these terms to be elaborated in an agreement between the members, or through the founding statutes. A number of Member States, including **Flanders and the Brussels-Capital Regions of Belgium as well as Croatia, Greece, Germany, Greece, Lithuania, Sweden, and Ireland ensure internal decision-making is independent from private interests by placing limitations on the number of shares individual members may have**, imposing a one person - one vote principle, or by simply requiring the community to provide for autonomy in their founding statutes.

Action Driver 3

FACILITATING ACCESS FOR VULNERABLE HOUSEHOLDS

There is still not a lot of existing examples of policies or measures to help expand access to energy communities for vulnerable and low-income households. Nevertheless, it is worth highlighting some of the **innovative solutions that have** emerged through different energy communities:[89]

- Some energy communities **offer special share prices for vulnerable groups (e.g. below €50);**
- The **city can buy shares** in the energy community and hand them over to vulnerable households to enable their participation (e.g. the **City of Eeklo** in Belgium – see more below);
- **Municipalities can be required to share a designated amount of self-generated electricity** with low-income households. In **Italy**, local authorities that participate in CECs should adopt initiatives to promote participation of vulnerable customers, so that the latter can access the environmental, economic, and social benefits generated by the community;
- In cooperation with a local bank, the energy community can offer zero-interest loans to vulnerable households to finance their participation;
- Energy communities that provide concrete social benefits could gain access to an enabling framework that includes **tax benefits** and **access to subsidies**. On the contrary, those energy providers that do not provide such benefits would still carry the full tax burden;
- Low-income households could receive **social welfare payments** in the form of **energy bill subsidies to finance membership in an energy community**. A similar mechanism has been shown to be effective in Spain for unemployed individuals who received unemployment benefits as a lump-sum to set up or join Sociedades Laborales (a worker-owned company). It is important to note that this may create additional administrative burden for the supplier. It could also create issues around cross-subsidisation;
- Allow low-income households to **benefit from shared energy without the need for any financial investments**. In Greece, it is possible for an energy community to provide electricity for free to energy poor customers in the context of virtual net metering projects (a form of energy sharing), even if such consumers are not members of the community.

Energy communities are also developing or enhancing new ways of **cooperation with organisations that already provide assistance to low income and vulnerable households.** In the **City of Eeklo**, Belgium, Ecopower, a cooperative, is working on a way for vulnerable households to be able to become a member in the cooperative (allowing them to receive services including supply of electricity and advice on saving energy, and to participate in decision making) through prefinancing of shares by the Municipality. They are testing out this concept as a pilot project in a Horizon project called Power UP, which focuses on promoting social innovation.[90] Specifically, the City of Eeklo will finance the shares from the income it receives from one of the wind turbines partly owned by the City.

Energy communities are also testing out models to try **and facilitate access to energy sharing by vulnerable households.** With the help of the municipal

OCMW (CPAS), the Public Centre for Social Welfare, ECoOB, a cooperative **in the region of the City of Leuven** Belgium, is reaching out to vulnerable households (both renters and homeowners) to provide solar panels as a service. ECoOB, who maintains ownership of the installation, offers renewable electricity of up to 1500 kWh per family, invoicing residents/owners a monthly fixed amount, which is lower than the social tariff in Belgium. Another energy community from Mechelen, 'Klimaan', which has a similar model of developing energy sharing, is working through a LIFE funded project (Tandems) to **integrate co-ownership into the concept so that vulnerable households not only benefit from reduced renewable energy but also have the chance to take ownership.**[91]

Energy communities are also helping **spread awareness around energy communities to experts who advise vulnerable citizens.** In Scotland, ALIenergy, a charity, has been providing advice, training, mentoring and other support to people in West-Scotland experiencing fuel poverty for over 20 years. To help find connections with households experiencing energy poverty, ALIenergy has been training members of organisations that provide different social services (health, debt advice, addiction advice, food banks, literacy, etc) to citizens to identify fuel-poverty. This has resulted in a **networking and referral service** (Argyll and Bute Advice Network, or ABAN) that links back to ALIenergy. Through the Horizon-funded project, CEES (Community Energy for Energy Solidarity), ALIenergy is helping energy communities to develop their own referral services so that they can partner with other social services providers to identify and reach out to energy poor and vulnerable households. This approach is now being replicated in a pilot project by Zelena Energetska Zadruga (ZEZ, or Green Energy Cooperative) in Croatia through CEES.

In France, Enercoop, an energy community, established a fund called Énergie Solidaire in 2017 to collect microdonations, both from its members (through a small surplus on their energy bill) and from producers (through donating produced energy). The fund is jointly governed between Enercoop and Les Amis

d'Enercoop, an association focusing on energy poverty issues. The fund also has an Engagement Committee made of up of experts and partner organisations fighting against energy poverty. The Engagement Committee helps identify local organisations working around France that can receive funding for projects. This provides a solidarity mechanism whereby Énergie Solidaire provides support to organisations that are already experts in addressing energy poverty. As of 2021, €220,000 had been distributed to 10 different organisations around France.[92]

A few Member States have started to concretely integrate accessibility issues into supportive policies for energy communities at the national level. For instance, the Lithuanian **Recovery and Resilience Fund** will provide grants for energy communities that address energy poverty. The Italian Region of Sicily uses regional funds to provide financing for feasibility studies and the establishment of RECs. The eligibility criteria for accessing these funds include a requirement that at least 10 percent of the REC's members should be vulnerable consumers.[93]

3.2 Renewable energy production

Community-owned renewable energy production is one of the older and well-known activities of energy communities. Many energy communities across EU Member States produce renewable energy from various sources including wind, sun, geothermic, biomass, micro-hydro, and biogas. Production has always made up most of the activities of energy communities.[94] Producers can sell their energy to a supplier, directly to another consumer (in the case of supply), or even to another public off-taker (e.g. the TSO, the Transmission System Operator).[95] Production can also be used for collective consumption, or energy sharing, although this topic is covered more concretely in section 3.3 below. It is important to note that RECs are restricted to producing energy from renewable sources, while CECs are not bound by the same requirement. Nevertheless, for the purposes of this report, we only refer to technologies that qualify as a renewable energy source.

Given the extensive literature that exists on energy communities that engage in renewable energy production, particularly cooperatives, the barriers are rather well-known. Indeed, best practices around supporting community renewable energy production have been a topic of focus since 2013.[96] In its Impact Assessment accompanying its proposal for a Recast Renewable Energy Directive in 2016, the Commission cited specific issues including difficulties to face grid connection costs (especially non-shallow costs), participation in tender schemes, and an inability to overcome administrative barriers.[97] Below, we look at the main barriers and drivers to engaging in production of renewable energy.

3.2.1 BARRIERS TO RENEWABLE ENERGY PRODUCTION BY ENERGY COMMUNITIES

Barrier 1
LACK OF SITES FOR PRODUCTION

Energy communities have often faced challenges finding appropriate sites to install renewable energy production. Lack of space for siting production installations has been identified as a barrier in several Member States.[98] In general, this is a barrier that many project developers face. However, because of their unique characteristics, energy communities face a competitive disadvantage compared to larger commercial market actors. In particular, **commercial project developers are in a better position to leverage their market position to outcompete energy communities for access to land.** This has been well documented in countries like Germany and Denmark, which have a history of energy communities but have also faced growing competition from an increasingly professionalised and competitive sector over the last three decades.[99]

In some cases, for instance in Belgium, lack of sites for production has partly to do with a lack of available overall space with renewable energy production potential in combination with a wind rush of investors buying fiduciary rights over suitable sites to anticipate developing wind projects.[100] In Denmark, in the 1980's wind turbine owners were required to live within a 9 km radius from the turbine, resulting in between 120,000 and 140,000 local wind power shareholders.[101] With the abolition of this rule, the sector became much more commercialised and competitive. According to some national stakeholders, the development of onshore wind was slowed partly due to commercial project developers entering into leasing contracts with landowners to develop projects, which have since not been built due to, amongst other factors, public opposition.[102] While there is generally appetite for local communities to construct their own wind projects, the lack of local ownership has been cited as a reason for opposition.[103] This has resulted in communities being unable to develop their projects because the **land is still tied up in old lease agreements**, even though the leaseholder would not be able to get planning approval for the project due to local opposition.

In Germany, access to sites for production has been linked to **difficulties for community owned projects to compete against the price offered by larger project developers** to rent or lease land from private property owners. In Eastern Germany, the privatisation of formerly State-owned agricultural and forest areas was performed through auctions that designated suitable and priority wind areas. The larger investors were able to submit a higher bid than energy communities when securing land for wind turbines, which is cited as a reason why it has been difficult to create local/regional value from wind production by local citizens and municipalities.[104] Energy communities focusing on heating using forest biomass have also mentioned privatisation of local forest management, which can prevent access to resources.[105]

Due to the cost competitiveness of solar PV, energy communities often choose to develop PV projects on roofs and other local publicly available spaces. When a public authority allows for the exploitation of renewable energy production by a private actor on sites that it controls, it must do so through an open competitive bidding process that is governed by national and EU public procurement rules.[106]

Historically, public procurement and concession rules have focused primarily on looking for the **best possible value for the lowest possible price**, which creates struggles for an energy community competing against a larger commercial market actor. While **local authorities are allowed to integrate social criteria into procurement rules and procedures,** there is often a **lack of legal clarity around how to set up and implement such criteria**, making public authorities hesitant to do so.[107]

According to research from the COMPILE Horizon 2020 project, EU and national **procurement rules are highly complex**, and municipalities that are not well-resourced can experience difficulties navigating these rules.[108] Due to the complexity of the legal framework governing public procurement and the possibility for unsuccessful bidders to challenge public procurement decisions, there is often reluctance to take risk by incorporating social criteria in tendering procedures. In **Estonia and Poland**, national public procurement rules have been identified as a major barrier preventing municipalities from prioritising locally produced energy in public procurement.[109] This research is backed up by a study on perceptions of how public procurement rules impact the development of energy communities. According to a survey under the LIFE LOOP Live project,[110] **public procurement policies are strongly perceived as an outright barrier to community energy projects.** The same could be said about respondents' perceptions of whether public procurement policies are compatible with providing support to community energy projects.[111]

Barrier 2

AUCTION-BASED PROCEDURES FOR ACCESSING NATIONAL RENEWABLES SUPPORT SCHEMES

Much of the literature on energy communities points towards national renewables support schemes as one of the earlier drivers of community ownership of renewable energy production. Especially for non-traditional ownership models such as cooperatives, trusts or foundations, housing associations and other types of social enterprises, the ability to show a lender that the project has access to a fixed feed-in tariff or feed-in premium has helped to assure lenders of the predictability of recovering the loan amount.[112]

The risks that auctions pose to energy communities have been researched thoroughly.[113] A study by IRENA, the International Renewable Energy Agency, states that while auctions for renewable energy can be an efficient way to attract large-scale investors and bring down prices, **participating in these auctions includes high transaction costs, due to the administrative procedures involved, and relevant qualification requirements.**[114] Whereas energy communities already experience issues in raising sufficient finance for local projects due to their inherent characteristics, **participation in auctions can raise risk** by further increasing costs without any guarantee of securing operational support.

Furthermore, most auctions are determined based purely on price, which does not take into consideration other policy objectives that may be pursued, such as social acceptance, local benefits, or citizen participation. The IRENA study also finds that auctions that focus purely on price may result in geographical clustering, which can be understood as the concentration of installations in a particular geographical area that favours producing conditions (e.g. high wind). This can result in a high rate of construction of production installations in particular regions, creating potential public acceptance issues. Due to economies of scale, participation from large market actors crowd out small and medium-sized project developers, and potential exclusion of communities from the decision-making process.[115]

Participating in an auction requires the development of bidding strategies that rely on information on overall development of the market, bidding strategies of other market actors, relying on economies of scale, as well as hedging (i.e. bidding for multiple projects with the realisation that some will be successful).[116] These are all strategies that energy communities are unable to deploy.

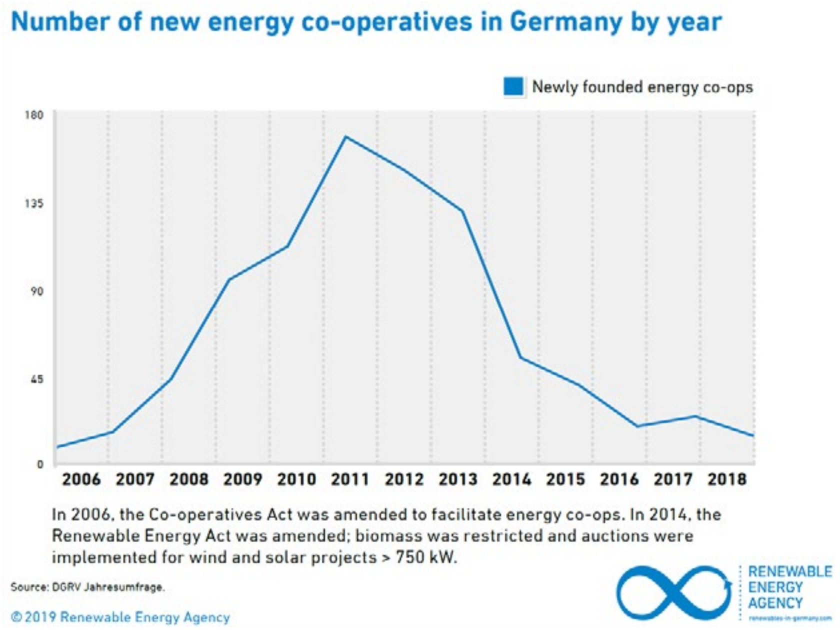
Germany is a good example of how moving to competitive bidding (e.g. tenders and auctions) can impact the ability of energy communities to access support schemes. At the height of the growth of community-owned renewable energy production in Germany, for instance, as of 2013 there were 942 officially registered energy cooperatives, 91 percent of which were registered after 2006.[117] This was enabled by the introduction of fixed feed-in tariffs (FiTs) in 2003, which provided a fixed incentive to anyone interested in constructing new renewable electricity production from wind, solar or biomass. This FiTs system incentivised investment in production by farmers and groups of ordinary citizens. A shift to competitive bidding as a precondition to access renewables support schemes in Germany placed a significant barrier on the further development of community renewables production, and their overall share of production continues to decrease.[118] In 2015, solar PV projects above 750 kW were required to participate in tenders, while the same requirement was adopted for onshore wind in 2017.[119] This coincides with a drop in citizen or cooperative investment from 36 percent in 2012 to only 15 percent in 2016.

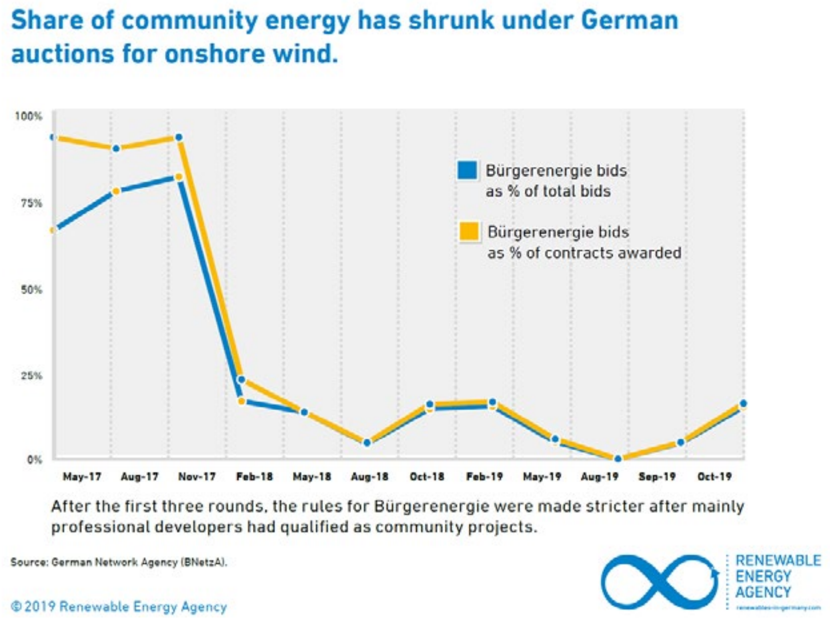
Even with the introduction of a special designation of 'citizen energy companies' in auctions for onshore wind, the number of new energy cooperatives continued to go down.[120] As explained in cross-cutting Barrier 1 of this report, to accommodate community projects in the onshore wind auction, citizen energy companies were provided with some special privileges. This included the ability to bid without having conducted an environmental impact assessment, and by being given an additional 24 months to complete projects compared to other bidders.[121] However, because of an overly-loose definition, many traditional market actors fit themselves into the definition. As a response, these privileges were withdrawn, although citizen energy companies could still benefit from a lower security requirement when placing a bid (€15 compared to €30 for other developers), and eligibility to automatically receive the clearing price rather than submit a bid price.[122]

In contrast to onshore wind, there were no preferential conditions included for community projects for solar PV. In eight bidding rounds, 11 bids were submitted by cooperatives (1.35 percent of the total bids) during the first four rounds, two of which were successful.[123] In the subsequent four rounds, no cooperatives submitted bids. Instead, cooperatives simply determined to construct projects below the threshold.

Data compiled below by the NRA, the German Network Agency (BNetzA), shows how the bids and contracts awarded to community onshore wind projects went down after the 2017 changes. This corresponds with data compiled by DGRV, the German Cooperative and Raiffeisen Confederation, a national representative and auditing organisation, showing the decline in new energy cooperatives during this time. Furthermore, according to an internal survey conducted by DGRV, the percentage of cooperatives stating that they planned to build more solar plants had gone down annually between 2018 and 2021 from 72% to 38%.

Figure 1: Data on the decreasing number of community and cooperative energy projects in Germany under competitive bidding[124]





Similar trends could also be seen in Denmark where after the introduction of auctions in 2018, the number of projects installed by communities as well as the number of established energy communities decreased. According to one study, between 1985-1994, local wind cooperatives installed the largest share of onshore wind power, and between 2008-2016, 61 percent of new onshore wind capacity was installed by local and collective citizen ownership models.[125] However, between 2019-2020, after auctions were introduced, only 11 percent of onshore wind capacity was installed by citizens, and only one out of seven wind projects granted in auctions between 2018-2019 had citizen ownership.[126]

There is even one case where a non-profit consortium, including a limited partnership, Wind & Welfare (made up of the NGO, Wind People, and local citizens), the Ærø Foundation, and another company, attempted to bid into a Danish nearshore wind tender. However, due to the framework conditions under which the tender was designed, a report found that it was not possible for non-profit organisations to participate in popular projects in connection with tenders for nearshore wind in Denmark.[127] In this particular instance, the consortium did not make it past the prequalification phase. This was mainly due to a requirement to have an average turnover of 4 billion DKK over the past three years, as well as the short time frame of three months between the publication of the tender and the deadline for submission of bids. Neither of these criteria accounted for the way in which the non-profit consortium organised itself. Furthermore, the report found that due to the market being dominated by a few large actors that have already established cooperation with turbine suppliers, advisors, lawyers, banks and other consultants, traditional participants in the tender were reluctant to collaborate with this consortium.[128]

Moves towards competitive procedures for supporting renewables production also correlate with another underlying challenge for bottom-up projects: the **stability of the regulation** as a key factor for successful community renewable energy projects.[129] While this is an issue all market actors face, due to their characteristics energy communities are more sensitive to changes. Examples of such practices may include the **regular changing of rules that set the economic conditions for investing in production, abrupt phase out of operational support,**[130] **or the transition towards competitive procedures.**[131] In the UK, the reduction, and temporary removal, of tariff subsidies for renewable electricity production was cited by the Energy Saving Trust of Scotland as likely one of the most significant causes of the slowing uptake of new community-owned renewable energy production capacity between 2016 and 2020. At the same time, it can be a driver for energy communities to develop business models that are less subsidy dependent and centred around the activity of energy sharing, supply and flexibility services, provided that necessary market conditions, private financing tools and regulatory frameworks are in place for energy communities to engage therein.

The above illustrates the importance of developing an enabling framework that provides energy communities with a viable pathway towards economically sustainable business models that are not entirely reliant on public support. Nevertheless, it also shows that, when designing public support schemes for renewables, market-based rules need to be designed to ensure smaller and non-commercial market actors can still access such support.

Barrier 3

DIFFICULTIES OBTAINING A GRID CONNECTION

Limited grid capacity has been a growing issue throughout the EU and impacts all project developers, creating issues around competition for grid connections. For example, in the Czech Republic, it is possible to get a grid connection, but this is under the condition that no electricity is injected into the grid. It is much more difficult to be permitted to feed into the network. With the increased integration of distributed renewables and electrification of demand, and limited available grid capacity, congestion issues have become a real concern for allowing for uptake of energy sharing. This can already be observed in countries like the Netherlands, Greece, Lithuania. In Greece, 49% of all requests for virtual-metering projects submitted by energy communities in 2022 were reportedly denied.[132]

While challenges related to grid constraints are faced by other market actors as well, they tend to be exacerbated for energy communities by the fact that their **projects are often rooted in and confined to a local context through their members.** Therefore, they have **limited options for where to connect**, because they **cannot simply relocate a project to an area where the grid is not constrained.**[133] Based on previous research conducted under the CO-Power Intelligent Energy Europe project and recent interviews with community groups, this can **increase the need for reinforcements to the network**, particularly for bigger energy community projects.[134] Furthermore, as with other activities, energy communities face distinct limitations due to their lack of human and financial resources, their lack of technical experience, their governance model, their community objectives, and the length of time it takes to set up their projects.

Taken together, these factors result in energy communities moving slower than other market actors, placing them in an inherent **disadvantage competing with other market participants to obtain a connection** to an increasingly congested grid. Typically, grid allocation is either determined on a first-come-first-served basis, or through an auction process. In Ireland, the first-come-first-served approach has prevented energy community projects in Galway and Mayo counties from getting into the queue to have a grid connection application considered, despite applications being submitted in 2016.[135] Through Ireland's RESS scheme, these projects have finally been able to enter into the administrative process. Nevertheless, grid congestion issues have still hampered their ability to obtain a connection. For example, **local contractual congestion**, which means that more grid capacity has been reserved than is actually used by the grid user, was cited as an issue for where a project could be sited. In Portugal, energy communities have stated that the auction process used to allocate grid connections is unfair to energy communities because they must compete with investors that want to sell the connection to another party, and it is **difficult for smaller non-commercial market actors to navigate the procedure and submit a bid that is competitive** compared to other larger commercial projects.

This issue is exacerbated, particularly in Member States where market actors have the right to sell their permit for a grid connection to other operators. This creates a situation where the grid is virtually occupied, creating more scarcity, and driving up the price. Such market arrangements inherently conflict with projects whose main aims are meeting consumption needs and pursuing community benefits.

Furthermore, navigation of grid connection and other related administrative procedures (e.g. to receive relevant permits) have been identified as a significant barrier to the development of renewables production projects by energy communities. In particular, there is often **a lack of transparency on information that community groups need at the outset of planning and developing a project.** This includes information on **available grid capacity at different connection points, and a lack of clear procedures.** Community groups also expressed that they experienced significant challenges in having basic questions answered by the DSO, the Distribution System Operator.

Furthermore, there may be a **lack of transparency on estimated costs** and the way in which costs for obtaining a grid connection are allocated. Communities often do not know when they apply for a grid connection how much it will cost, and finding information on this can be difficult. Furthermore, energy communities experience difficulty in meeting the terms set by the DSO to pay for the grid connection and any other related reinforcements that might be needed. For instance, the Repository interviewed several individuals involved in energy community projects under RESS in Ireland. They all acknowledged that RESS had helped them to get into the process of obtaining a grid connection. However, they highlighted that the process was not transparent and that they experienced uncertainty throughout the process, including on the costs of the connection. One of the projects highlighted that at the end of the process for a 5 MW PV project, the grid connection offer amounted to €4.5 million because the transmission grid needed to be upgraded. This has essentially halted a project that has been struggling for years just to enter the grid connection procedure with the DSO.

The lack of transparency exacerbates energy communities' challenges in financing their project. In order to secure a grid connection a large financial deposit is usually required. Otherwise, the project risks losing its place on the waiting list.[136] According to interviews with stakeholders, the cost for a grid connection may change as time goes by. For instance, the project might start with an affordable connection cost, but if the community does not accept and pay for a connection offer at the feasibility stage of the project, it could be three or four times the cost when they receive a final grid connection offer and therefore have a non-viable project.[137] This creates a double-sided problem for the energy community in that **they might not have enough financing to pay the grid connection cost upfront, which might make the project economically unviable at the end of the procedure.** Interviewees have communicated that combined the lack of clear procedures, these changing cost structures contribute to a high degree of investment certainty.

In the UK, the Office of Gas and Electricity Markets (Ofgem) identified the issues that community renewables projects face with the help of the sector. From its work, it concluded that **community groups face several challenges not experienced by other developers**, including the fact that they:

- Are unlikely to have significant finance available for the early stages of the project development;
- Are less likely to have expertise in grid connections; and
- Use democratic governance models, meaning that projects will typically take longer to develop and may therefore find it difficult to respond as quickly as commercial developers when capacity becomes available.[138]

3.2.2 ACTION DRIVERS FOR RENEWABLE ENERGY PRODUCTION BY ENERGY COMMUNITIES

Action Driver 1

POLICY OBJECTIVES, GOALS OR TARGETS FOR ENERGY COMMUNITIES

Targets or policy objectives for developing energy communities can be understood **as commitments provided by public decision makers to promote community ownership in renewable energy production.** Setting policy objectives for energy communities has several benefits. First, **it serves as a policy basis for developing supportive national and sub-national measures** for energy communities, (e.g. separate treatment in renewables support schemes, and in allocating space to construct production facilities through public tendering procedures). Second, they can help to anchor strategic thinking inside different government departments, develop priorities, demonstrate on-going commitment and aspiration, and create political pressure to provide continuing support.[139] Third, targets help promote investor confidence by providing a framework to support the development of different business models.

A growing number of countries within and outside of the EU have adopted policy objectives relating to energy communities. The first country to set an explicit community energy target was Scotland. Initially, in 2011 the government set out a target of 500 MW of installed production capacity of community or locally owned production by 2020. However, this target was quickly reached, and the target was adjusted to 1 GW by 2020. According to a report on the achievement of the target that was published in 2021, by the deadline the target had been 85% achieved.[140] The Government has also set a target of 2 GW by 2030.

In its Recovery and Resilience Plan, Italy aims to have 2 GW of renewable energy production capacity installed by RECs by 2026 in municipalities below 5,000 inhabitants.

In France, the Ministry has taken a slightly different approach. In 2021, it published a Roadmap for the development of energy communities, which sets an objective of 1,000 locally-governed renewable energy projects involving communities and citizens by 2028.[141]

In its Solar Strategy, the EU Commission set an objective that the EU and Member States work together to set up at least one renewables-based energy community in every municipality with a population higher than 10,000 by 2025.[142] Regional and local governments are also establishing their own policy objectives for the development of energy communities. In Spain, in May 2021 the **Valencia Climate and Energy Foundation** announced a goal of establishing one hundred energy communities within the city by 2030. The aim is to establish energy communities in each neighbourhood. In France, the **City of Strasbourg** adopted a target of installing 1 MWp through citizen-governed PV projects by 2030.

Some governments have taken a different approach to setting objectives for community-owned renewables production, placing minimum community participation obligations on commercial project developers. In the Netherlands, its National Climate Pact (Klimaatakkoord) contains a non-binding policy objective of including 50 percent ownership in all new onshore wind and PV projects. The objective has been given to the municipalities to interpret and implement, providing them with the basis for integrating criteria in planning policies to include citizen participation in the permitting process with project developers that want to build a project in the municipality. Local city and regional governments in Belgium have also adopted such standards. For instance, in the Wallonia Region, the regional government recently adopted a Wind Agreement (Pax Olienica) that will require new wind projects to be open for at least 24.999 percent, respectively, to citizens and municipalities.[143]

Action Driver 2

PROVIDING SPACE THROUGH PUBLIC TENDERS

While existing public procurement processes and associated criteria can pose a barrier for community energy projects, there are good practices that local authorities have begun to implement that, if shared, can inspire and mobilise similar actions by others across Europe.[144] These examples have been framed around the development of policy objectives to promote citizen engagement and participation in the energy transition, and the provision of local economic and social benefits.

Local support can be provided through using **public tenders that include criteria attached to objectives of promoting mandatory citizen participation in renewable energy projects.** This is now an established trend in Belgium at the local and national level. The original concept started in the small town of **Eeklo**, which included the social criteria grading the participation mechanism, in particular:

1 | The amount of ownership offered to local citizens and SMEs; and

2 | The credibility of the engagement plan.[145]

In the Belgian Region of Flanders, 10 municipal councils agreed together to require all renewable production installations on municipal land to offer 50 percent of its capital to investment by citizens. Furthermore, the **municipality of Saint-Gilles, in the Brussels-Capital Region** requires that a special purpose vehicle adopting the seven cooperative principles be set up to carry out solar PV projects on municipal roofs.[146] It also places a limit on the nominal price of the shares that can be issued to local citizens (€100). The objectives that frame the procedure are two-fold: 1) to develop solar PV production on municipal territory, and 2) to support the creation of energy communities in the municipality. At the national level, **the Federal Ministry of Belgium** recently drafted legislation incorporating RECs into bidding procedures for granting concessions to build wind projects within Belgium's territorial sea and exclusive economic area.[147] Specifically, a minimum of 1 percent of the CAPEX of the entire project should be opened to citizen participation. Different options for citizen participation, including direct financial participation and ownership participation are provided for. Nevertheless, one of the general conditions for the grant of the concession is a requirement for the tender to consider the extent to which citizen participation is provided for, and RECs are involved by the holder of the concession.[148] At the moment, the Federal government is finalising the legislation and considering the development of the concrete bidding criteria. However, many of the components of the tender process have already been communicated to market actors.[149]

Examples are now starting to emerge in other Member States. In the **City of Strasbourg, in** France, in its procedure to allocate concessions for development of solar PV on public roofs, the Metropolis of Strasbourg (a grouping of municipalities in the greater Strasbourg area) published an appeal for interested parties (Appel a Manifestation d'interets, AMI) to submit proposals for projects. The expressed objectives of the tendering procedure were to provide City roofs to accommodate PV production, along with a goal of installing 1 MWp through citizen-governed PV projects by 2030.[150] Importantly, citizen participation is acknowledged to have the following added value:

- New relationships between people and communities;
- Development of individual and collective skills around energy;
- The ability to contribute to more economic development of the territory, including job creation, than would be the case through conventional projects;
- Creating social links between citizens, elected officials, companies, associations and farmers; and
- Mobilising citizen investment.

To achieve these objectives, the Metropolis of Strasbourg applied the following criteria in assessing bids:

1 | Strategy to mobilise citizens to finance the project (25 points) – This included considerations around mobilising inhabitants of the buildings where the solar PV installations were to be sited, mobilisation of inhabitants of the neighbourhood, and general communication;

2 | Financing mechanism (20 points) – This included the return on investment, the use of own funds, and the number of planned investors;

3 | Governance mechanism to manage citizen participation in the operation of the project (20 points); and

4 | Technical aspects of the project (30 points).[151]

The volumes of PV capacity that could be bid upon were kept low in order to decrease market pressure on energy communities by other larger market actors. Furthermore, the Metropolis of Strasbourg helped provide capacity building to energy communities that participated in tenders to develop solar PV that were set up by the Municipality of Strasbourg, a separate entity from the Metropolis of Strasbourg.[152]

Local authorities have also created special **tenders to promote provision of services by energy communities**, combining them with renewables production. Examples also exist in other Member States where concessions may or may not include the provision of services by energy communities to the municipality. For instance, in **Crevillent**, Spain, COMPTEM-Enercoop, a historic cooperative that has transformed itself into a REC, was able to successfully bid to win the right to construct, operate and manage solar PV on 20 different municipal buildings.[153] A normal public procurement procedure was followed because the concessions for the installations also included the provision of services to the public buildings. Bids were considered around technical criteria related to delivery of co-benefits of the project rather than just the financial value. The objectives of the tender were framed around using public spaces to develop renewable energy production for sharing, including to municipal buildings, as

well as to improve energy literacy and to help provide a communication channel by the municipality with citizens. In particular, the specifications of the tender called for the development of a digital public display in each municipal building to provide citizens with information on local production and distribution, the energy communities involved, and other information. Bidders were also assessed based on demonstration of pre-existing positive experiences from the local area, the ability to enter into agreements with many different local participants, and the quality of the presentation of information to citizens. Because Enercoop is a long-standing cooperative in the area (°1925), it already had a good relationship with the municipality's residents. It had also already realised a successful pilot in the municipality, and it was able to put forward a successful bid.

It is worth noting that despite the emerging practices outlined in this report, there is still a lot of legal complexity around different procurement and concession procedures and rules that may be applied in the context of supporting citizen and community participation and benefits. In particular, there is a need to ensure equal treatment of economic actors, and to ensure that any special considerations for energy communities in procurement and concession procedures are proportionate and rationally connected to the objectives of the procedure.

At the EU level, some preliminary steps have also been taken to help support local authorities in tailoring public procurement to help with the deployment of energy communities. Specifically, as part of the Green Deal and REPower EU, **the recently updated Renewable Energy Directive contains new language that encourages Member States to promote cooperation between local authorities and renewable energy communities through the use of public procurement.**[154] Furthermore, the EU Commission has produced a guide so that public authorities can more easily take social considerations into public procurement.[155] Nevertheless, integration of sustainability and social elements into different aspects of public procurement procedures is still relatively new, and it remains a highly technical exercise that may expose local public authorities to legal risk. As such, there is a need for further legal clarity and guidance from Member States on their application towards promoting energy communities and delivery of social innovation generally.

Action Driver 3

INTEGRATING ENERGY COMMUNITIES INTO THE DESIGN OF RENEWABLES SUPPORT SCHEMES

Several Member States, including Austria, Belgium, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Slovenia, and Spain have explicitly integrated energy communities into their support schemes. In Germany, the Federal government reversed its requirement for RECs, or citizen energy companies as they are defined in Germany, to participate in auctions and tenders for onshore solar PV and wind projects. Instead, all **solar PV systems up to 6 MW and wind turbines up to 18 MW owned by citizen energy companies are exempt from tenders.** In order to prevent abuse by market participants, citizen energy companies must include a high level of citizen involvement, control, and democratic decision-making. The DSO is entrusted with the verification of these criteria. Due to its recent introduction, energy communities are still contemplating how to use the new framework and navigate the administrative procedures.

In Ireland, the Ministry set up a special support programme for RECs under RESS. Projects that qualify as a REC, with projects between 1MW and 5W, can qualify for a **ring-fenced tender reserved only for RECs.** To prevent abuse, projects must be 100% owned by a REC either by way of direct ownership of the project's assets or by direct ownership of the shares in the Generator. Furthermore, 100% of the profits, dividends and surpluses derived from the project must be returned to the REC. Qualifying projects also **do not need to submit a reservation fee or security and need not have planning permission to apply for a grid connection.** According to community groups in Ireland, RESS provided their projects, which had been stalled for years, the ability to start navigating the process towards getting a grid connection. However, now they are facing challenges navigating what they have said is a very uncertain and non-transparent process. This highlights that no one action driver is sufficient in itself – it needs to be complemented with other measures to effectively address the challenges energy communities face.

Austria has designed its schemes so that competitive bidding only applies to a limited extent to energy communities and wind projects under 20 MW. Furthermore, there is a **special support scheme available for energy sharing projects.** For all the shared production that is not consumed by the members of the energy sharing initiative, **up to 50% of that production can be supported through the issuance of a market premium.** The aim of this incentive is to improve the business case while also encouraging optimisation of production with consumption, for instance through storage.

It has been mentioned by stakeholders that the design of these subsidies could, in the long run, have a limiting incentive for the integration of complementarity technologies that can help balance solar PV, such as wind or biogas, which could be operated flexibly to provide balancing and other ancillary services. Moreover, there is less interest in energy efficiency and installing flexible assets behind the meter, and for communities to shift their demand when market prices are high. Austria's framework deals with this issue by limiting eligibility to receive market premiums for the sale of electricity production to 50%, as it encourages the rest to be self-consumed by the community. This shows the difficulty and need to balance different objectives when designing support schemes for production and energy sharing, in particular energy efficiency, self-sufficiency of communities, cost-efficiency of deployment of renewable energy, and deployment of flexibility to make optimal use of available grid infrastructure.

Action Driver 4

MEASURES TO FACILITATE A GRID CONNECTION

A number of measures have been identified as a solution to the problems communities face in obtaining a grid connection.

As it pertains to the grid connection costs, it could be possible to **socialise grid connection costs when upgrades are needed.** In Denmark, previously the network user was responsible for costs of connecting to the most technically suitable point, but no more than it would cost to connect to the 10-20 kV grid.[156] All other costs, including necessary reinforcements, were borne by the DSO. This obligation sat beside the grid operator's continuing duty to expand grid capacity for renewables.[157] These costs were then passed on to consumers in the form of a public service obligation (PSO) tariff, which was based on the amount of energy consumed.[158] Such a regime can apply for all project developers, not just energy communities only. This avoids differential treatment of any market actors. If specifically designed for energy communities, the impacts of such arrangements should be carefully monitored to ensure that they do not result in significant cost increases for energy poor and vulnerable households that do not have the capacity to invest in energy communities (See Section 3.1.2). Another potential solution is to develop suitable **flexible connection agreements** between energy communities and the DSO that include provision of services to the network when there are constraints such as congestion.

Furthermore, it could be possible to **re-arrange the payment of relevant grid costs to communities so that the payback period fits better with their financing models or their size.** For instance, payment plans could be spread further out in time, providing space for the community to raise the necessary funds to pay for reinforcement. Furthermore, zero interest loans could be provided through public finance, to help de-risk the cost of concluding a grid connection agreement. Otherwise, general estimations of costs of obtaining a grid connection could be communicated in advance, for instance online, so that energy communities can integrate grid connection costs at the earliest stage of their project development. Regarding competition problems over available grid capacity, solutions may include **prioritising or simplifying grid connection requests to community projects over other projects.** In principle, system operators are neutral facilitators that need to ensure maintenance, operation and security of the system and provide grid access on a non-discriminatory basis. However, as outlined above, because of their innate characteristics (e.g. voluntary or non-professional character, governance, and purpose) energy communities face unique challenges to compete for grid capacity with other market participants.

In Greece, under a 2022 law renewable energy production projects are placed into 4 categories that are distributed geographically, increasing priority for connection to the grid. Energy communities were placed in Category C and could upgrade to Category B if they have a Municipality or more than 60 members, at least 50 of which are natural persons.

Some Member States have also begun to **allocate or ring-fence grid connection capacity for energy communities as a supportive measure to help their development.** In Ireland, a grid connection process is essentially facilitated through the RESS, which is the national support scheme. There, grid connections are determined in batches, and within a batch only a limited number of applications can be processed and concluded. As a kind of first-come-first-served approach, this negatively impacts RECs, which have been defined under RESS. This issue was acknowledged by the Ministry of Environment, Climate and Communications (DECC), and was addressed by creating a separate 'non-batch' process to allow consideration of 30 applications only eligible to energy community and self-consumption projects.[159] The non-batch process is part of the Government's strategy to get community projects from conception to construction. 15 spots are reserved for community projects with projects between 500 kW and 5 MW, while the other 15 are reserved for self-consumption projects under 500 kW. These numbers align with the size of projects that are eligible for the energy community preference category under the RESS auctions scheme. Here, the grid connection process is a coordinated part of making sure community projects receive support throughout the project development process. RECs can also apply for a grid connection without first obtaining planning permission, although to obtain a final grid connection, permission must still be granted. If an assessment determines that the grid connection cost will make the project unviable, the REC is eligible to receive a refund of 75% of the initial application fees that have been paid. Furthermore, the grid capacity can be held by the REC for up to two years. The non-batch process is part of the government's strategy to get community projects from conception to construction.

Some Member States are starting to experiment with allocating grid connections for energy communities based on a percentage or fixed set of installed capacity. In Lithuania, the grid planning procedure has concluded that with available grid connection capacity, 4 GW of production can be installed in the next two years. To create equal opportunities for different types of grid users, the government proposed to reserve 2 GW of production potential for energy communities and individual prosumers through the grid connection process. This is underpinned by a national policy objective that one out of three Lithuanian consumers should be generating their own electricity by 2030. In Spain, in its draft Royal Decree, the government has proposed to move towards an auction process to allocate

grid connection capacity. Acknowledging that the specificities of RECs need to be taken into account in the design of competitive bidding processes, the Royal Decree also proposes to temporarily reserve 5% of the available grid capacity for energy communities. However, it is unclear how this reservation would work in practice.

Given the limited experience with reserving grid access for energy communities, there is still a need to assess the potential impacts and effectiveness of temporarily reserving grid access for communities and self-consumption projects. For example, commercial developers claim that reserving grid capacity at connection points aligned with the location of emerging energy communities could slow down deployment. Furthermore, where a fixed amount of grid space is allocated to energy communities, it is important to ensure that they are not spread too thin between different projects. Otherwise, they will remain artificially constrained and can work against energy communities, allowing only small-scale household/multi-apartment level projects. For example, in **Greece**, in areas where there is grid congestion, space has been reserved for net metering. However, it has been broken up into slices of 10 kWp per application, preventing energy communities from utilising it. In contrast, the non-batch process in **Ireland** is connected to the thresholds indicated under RESS, allowing for larger projects to be developed. This scheme could serve as an example of how to allocate grid access for energy communities in a proportionate, transparent, and non-discriminatory manner.

Furthermore, it is important to ensure that such mechanisms cannot be abused by market actors. In **Greece**, the previous law on energy communities, which has been replaced, contained provisions giving energy communities priority treatment in entering the grid connection process. However, it was restricted due to abuse by market actors that set up for-profit energy communities, which was allowed by the law.

The above highlights the need to think about how such schemes are developed, in order to ensure that they do not result in abuse, cause delays in deploying renewables, and ultimately to ensure they result in concrete benefits, either to the grid or through added value in terms of social considerations to the local community.

Another potential way is to provide transparency and clarity for energy community projects is through **grid planning**. Such planning processes could be linked up with studies around potential for the development of renewable energy production and energy communities, which can help system operators plan the future development needs of the grid. Furthermore, making sure that local actors have access to information about the grid, as well as ensuring available grid connection capacity for local community projects, can help establish certainty for such projects. Of course it is important to ensure confidentiality, where it is objectively justified.

In some Member States, network planning is forward-looking and transparent for all actors.[160] Where this works in practice, **energy communities have transparency around potential for developing projects in certain areas** before they even begin a project. In addition, more proactive engagement between DSOs and energy communities can help develop understanding of potential system benefits, mutual trust between the DSO and consumers, and even collaboration.

3.3 Energy sharing

Energy sharing is an emerging activity-based concept within the energy sector. While the EU Commission proposed to define energy sharing in its Electricity Market Design legislative proposal,[161] energy sharing is not defined in EU legislation, although the IMED provides a description of what the activity could look like. Recital 46 states that:

> "Citizen energy communities should not face regulatory restrictions when they apply existing or future information and communications technologies to share electricity produced using generation assets within the citizen energy community among their members or shareholders based on market principles, for example by offsetting the energy component of members or shareholders using the generation available within the community, ev over the public network, provided that both metering points belong to the community."

At the national level, there are somewhat diverging approaches towards conceptualising energy sharing. In a majority of Member States, energy sharing has emerged as a form of collective self-consumption within and beyond the building level that makes it possible for households, SMEs and local authorities to co-invest in local production capacity. From that production installation, and through the use of smart meters, members of the community are able to match close to real-time production with consumption so that it can be deducted from their metered supply coming from their traditional supplier (also known as 'residual supply'). To the extent that energy sharing can be steered towards matching simultaneous generation with nearby consumption in line with grid topology (i.e. collective self-consumption), it could contribute towards reducing grid congestion at higher levels during peak hours and more efficient use of the grid.[162]

The DSO is usually responsible for registering energy sharing initiatives, monitoring metering data, and transmitting it to the energy community and/or its members and the retail supplier whose portfolio is impacted by the participant whose metering point is included in the energy sharing initiative. The entity responsible for calculating the deduction of shared energy from metering data for the purpose of settling the energy bill vary between Member States. For instance, in **Austria, the Brussels-Capital Region of Belgium, Croatia, France, Luxembourg, and Portugal**, the system operator performs the function, while in

Denmark, Greece, Slovenia, and Spain, the retail supplier is responsible. In Italy, this function is performed by a special entity called the GSE (the Energy System Manager), while in Finland calculations should be performed by an independent datahub as of January 2023.

Building on experiences from Belgium, Spain and Portugal, the EU Commission's legislative proposal for a revised electricity market design also identifies one other use case for energy sharing, which consists of the transfer of self-produced electricity from an active customer to another final customer. This electricity can be shared based on a contractual arrangement between consumers, either for free or for a negotiated price. Where energy is shared against a price this can be done bilaterally; over the counter, or, alternatively, through a peer-to-peer trading platform, as is envisioned in the REDII, Article 2(18).

For the purpose of this document and to make a clear distinction with the barriers and action drivers related to supply, this report looks at energy sharing through collective self-production and consumption that takes place within a short time frame (15 minutes to 1 hour). **Where onsite or off-site production for energy sharing takes place through a legal entity that incorporates the criteria of a REC or CEC, it can be described as energy sharing undertaken by an energy community.** As peer-to-peer exchanges are currently under development, we do not focus on them at this moment.

3.3.1 BARRIERS TO ENERGY SHARING BY ENERGY COMMUNITIES

Because of the novelty of energy sharing as an activity, there are still many barriers. This report, and the deficiencies it identifies with regard to emerging frameworks for energy sharing, should therefore not be seen as an indictment. Rather, it should be seen as a learning tool to search for potential pitfalls in the development of frameworks, and to identify emerging good practices.

Due to the early development of national legal and regulatory frameworks for energy sharing and for energy communities, **most of the unique challenges energy communities face compared to non-energy communities pertain to the unclear relationship between energy sharing as an activity and energy communities as an organisational concept.** Organising an energy community is already a difficult task. On top of that, undertaking new roles as a non-commercial market actor competing in a rapidly growing sector within a heavily regulated environment represents an even larger challenge. While justified due to the scale of the activity, responsibilities and costs that come along with being a fully licensed energy trader and supplier are a barrier for non-professional and small market actors.[163] A report concluded that if energy sharing initiatives were to take over all responsibilities and costs of professional traders and suppliers, it would not lead to a reduction in the energy bill of the participants.[164] Furthermore, even though an energy community (as a legal entity) could act as a legal representative/facilitator that interacts with the DSO and other market parties on behalf of the members of the community, they are less professionalised than traditional actors such as energy suppliers.[165] This means that **an energy community that organises itself to share energy requires much more time and effort than for initiatives that are facilitated by a professional third party**. There is a risk that if energy sharing simply becomes another heavily regulated activity, it will be difficult for new market entrants such as energy communities and instead be dominated by commercial service providers.

We expect further differentiations to arise as energy sharing becomes more commonplace under the impulse of the proposed Reform of the Electricity Market Design.

Barrier 1

LACK OF DISTINCTION BETWEEN ENERGY COMMUNITIES, ACTIVE CUSTOMERS AND ENERGY SHARING

Understanding of new concepts such as energy sharing, active customers, renewables self-consumption (including jointly acting self-consumers), and RECs and CECs is still emerging, and national approaches to defining them differ. In France and Spain, where joint or collective self-consumption concepts already existed, the activity of energy sharing has been built off of these concepts. In these Member States, **energy communities may use the same regulatory framework for collective self-consumption, but there are no separate rules for them.**

On the other hand, **in most Member States where energy communities are new, there is a lack of understanding of what energy communities are as an organisational concept, and how they differ (or overlap) with energy sharing as an activity-based concept.** In some cases, energy communities are approached and defined from a legislative and regulatory perspective as an activity (i.e. collective self-consumption beyond the building level through energy sharing).

This has resulted in the following outcomes:

- It is **hard to see the difference between energy sharing and an energy community under national law.** This has created a feeling of legal uncertainty and complexity among stakeholders including energy community actors, commercial actors, and system operators.
- **The perceived added value of setting up an energy community is reduced.** The incentive to set up an energy community versus a commercially-facilitated energy sharing initiative is perceived as a burden without any tangible benefits. Where enabling and supportive frameworks are correlated with more commercially driven projects, instead of the organisational concept of energy communities unfair competition issues are amplified.
- The emergence of energy communities where production installations used for the purpose of energy sharing are not owned by the community, but instead by a third party.
- The emergence of industrial RECs that are not accessible to household consumers.
- The geographical scope for participants to be in effective control of an energy community as an organisation is aligned with the geographical scope allowed for energy sharing. Such alignment risks an **overly-technical approach to the delimitation of a geographical dimension of energy communities**, particularly RECs, as a social concept. This may lead to situations where the geographical proximity requirement for REC is either too strict (e.g., connected

to the same low-voltage sub-station) or too broad (e.g., at bidding zone level). Where geographical proximity for participating in a REC is defined too narrowly and technically, RECs can be kept arbitrarily small. On the other hand, where the geographical proximity is defined too broadly, it can diminish added value in terms of local social acceptance of RECs. For CECs, such a technical delimitation risks undermining the empowerment of communities-of-interest that are not bound by a common geographical location.

- Setting up an energy community becomes a regulated activity, for which a traditional licence is required. In this case, **registration of the energy community as an organisational entity is conflated with licensing for the activity of energy sharing**, supply, or other activities imposing high administrative and financial burdens at early development stages (e.g., set up of legal entity). This has resulted in disproportionate requirements (e.g. demonstrated competences around technical and financial capacities, the payment of a licensing fee, etc.) being imposed in order to register a legal entity as as an energy community.

To provide more clarity for stakeholders and highlight the social and technical distinctions between energy sharing and energy communities, in its Electricity Market Design legislative proposal the EU Commission proposed a definition of energy sharing that is framed as an activity whereby a group of neighbours, friends, family, public bodies or SMEs can directly share self-generated or jointly generated energy with each other as active customers, including through energy communities.

Barrier 2

LACK OF CLEAR DUTIES AND ROLES OF NETWORK OPERATORS

In many Member States, EU legislative provisions on energy sharing are still in the process of development. As such, they often leave out any detailed rules. Others give an NRA the duty to elaborate regulations further down the line. This has resulted in the **lack of clarity on how duties or responsibilities should be shared between market actors relevant in the energy system for energy sharing**, E.DSO, a European association of DSOs, has noted that responsibilities and role sharing between different stakeholders has not yet been defined clearly in many Member States, leading to a high level of complexity and unresolved questions.[166] This has led to a series of sub-barriers, which we outline below. Below, we focus on the role of system operators, particularly DSOs, in facilitating energy sharing, while in Barrier 4 we look at the role of the supplier of residual energy to the members of the energy community.

Lack of information and awareness on energy sharing

In many Member States, there is lack of official public communication or outreach on **how and where energy communities can start an energy sharing initiative**. For instance, in Luxembourg, even though energy communities existed before the CEP, there is a small demand for creating energy communities and there is little information that can be found about the topic in public sources. As such, it is not clear for prospective community initiatives how to take the necessary steps to undertake energy sharing. Even where official tools, such as online one-stop shops, exist to assist energy communities interested in setting up an energy sharing initiative, clear, transparent, and timely communication can be an issue.[167] It is not clear whether this role should be undertaken by the DSO or another public authority.

Lack of clear or transparent procedures to register and connect energy sharing projects

The main actor involved in the registration of an energy sharing project is often the DSO. Due to unclear regulatory situation in many Member States and novel character of energy sharing, the exact procedures and requirements have been articulated at the national level. This can lead to divergence of procedural requirements between DSOs even within the same Member States. For example, in Spain some DSOs have allowed a representative to enter into agreements on behalf of the participants, while other DSOs require a notarised signature of each participant of the initiative individually. Furthermore, the registration process may result in possible time delays, due to the treatment of the application and requests for additional information by the DSO.

Because of their characteristics, **it is more difficult for energy communities to navigate the process of registering an energy sharing project with the DSO** compared to a commercial third-party service provider, creating a competitive disadvantage. While complex procedures for registering an energy sharing project, including navigating the grid connection process, may be mitigated by the use of a **third-party service provider that manages energy sharing arrangements on behalf of the community**, this is not allowed in all Member States. Furthermore, as commercial party service providers become more commonplace, energy communities may face competition from better resourced market actors in having requests or applications considered by the DSO.

Lack of proper IT infrastructure for the collection, validation and sharing metering data

The need for DSOs to update their IT infrastructure has been cited by many stakeholders as a cause for delay in rolling out energy sharing. This is because DSOs need to have the capacity to read the meters on the production installations and the consumption meters of the participants in the initiative, as well as the ability to communicate this data with the relevant market participants impacted by the energy sharing activity (i.e. the community and its members, as well as the impacted retail supplier(s)). The DSO should also be able to monitor what is going on with the grid in real time so it can more actively manage the grid, for instance by procuring flexibility resources for congestion management. This is not necessarily a need that is specific to the emergence of energy sharing, but a natural consequence of moving towards a more digitalised, electrified and distributed energy system that requires more real-time operation by network operators, both at distribution and transmission level.

In some Member States, there is an obligation for DSOs to update their IT infrastructure within a certain amount of time (e.g. six months). However, energy communities surveyed still referred **to delays in IT infrastructure buildouts, including the rollout of smart meters.** Even where timelines are established, there can still be delays. For instance, a regulation in Austria that requires the grid operator to install a smart meter within two months only applies to the installation – not the operationalisation of the meter.[168] **While this does not prevent energy sharing per se, issues have also been reported with how often data is provided by system operators.** According to the DECIDE Project, DSOs provide data only once a day or even less frequently, preventing energy sharing projects from participating in peer-to-peer exchanges or providing flexibility.[169]

Barrier 3

LIMITATIONS FOR HOW ENERGY SHARING CAN BE ARRANGED

Due to the emerging nature of energy sharing, and the perceived limited technical capacities of DSOs, first generation rules and regulations for energy sharing have taken a rather conservative approach. While this can be easily explained as a natural consequence of introducing innovation into an already highly regulated environment, it has still resulted in limiting the technical potential of energy sharing projects.

Through research and interviews with stakeholders for this Report, the following limitations that were identified include:

- Restrictive thresholds on the size of production installations (e.g. 100 kWp, 200 kWp, 500 kW, 1 MW or 3 MW) that can be used for sharing.[170] This can limit the uptake of technologies such as wind (which can be complementary to solar PV production, allowing for further optimisation), both onshore and offshore;
- The ability for a household to only participate in one energy community;
- Difficulty in switching members (in the situation someone moves away and is no longer part of the initiative), which require amending the sharing key; and
- Limitations on the adoption of a dynamic sharing model amongst the community, and on the community's ability to modify the coefficient.[171]

In the Flanders-Region of Belgium, for example, the current regulation on collective self-consumption at building level is limited to installations certified after January 2021. Together with the 40 kVa maximum limit and the need for only one supplier, this requirement significantly limits potential for energy sharing in multi-apartment buildings, including through an energy community.

It is important to point out that some of these barriers are transitory in nature, meaning that they may be addressed and relaxed commensurate with further IT infrastructure updates.

Barrier 4

INTERDEPENDENCIES WITH ENERGY SUPPLIERS

Traditional suppliers are often impacted by energy sharing, rather than playing an active role in it, although in some Member States the retail supplier is responsible for calculating the consumers' shared energy. In any case, suppliers maintain their traditional relationship with the consumer by supplying electricity not provided through sharing, as well as continuing to bill the consumer. Concerns have been noted by suppliers that they are impacted by energy sharing due to increased difficulties in forecasting the consumption profiles of their clients, and administrative costs related to billing.

Consumers that share electricity buy less electricity from their normal supplier, which requires suppliers to rethink their sourcing strategies to ensure the consumer's profile is balanced, in addition to being responsible in some Member States for calculating the consumers' shared energy, collecting network charges, taxes and levies related to the total metered consumption. As regards the impact on sourcing strategy and potential imbalances, these concerns are similar as for active consumers that utilise home energy management tools or have the possibility to install distributed renewables production installations on their premises; as such, it can be perceived as a natural consequence of the energy transition and emergence of decentralised and distributed energy systems.

The Council of European Energy Regulators (CEER) acknowledges that due to these factors, suppliers could try to **charge more to customers that are part of an energy community, raising the risk that it could be difficult to find a satisfactory supplier** due to participating in an energy community.[172] In **Belgium**, some suppliers have charged consumers an administrative fee up to €150 for participating in an energy community.[173]

In other cases, **suppliers may cause delays in the calculation of shared energy**. For example, in **Greece**, the supplier is responsible for calculating and deducting the virtually net metered production from the bills of the participants. In some cases, the utilities did not deduct virtually net-metered production from the bills of their consumers until two years after the initiative was already operational. Until the oversight was corrected, the participating consumers were unable to realise the energy savings from their participation in virtual net metering projects. In the meantime, if the consumer changed supplier, this money would be lost. This illustrates the importance of a consumer-centric implementation of energy sharing where the system operator is responsible for calculating, deducting and communicating relevant metering data.

Becoming a Balancing Responsible Party (BRP) is often too risky for new entrants.[174] For community energy sharing initiatives where the members continue to meet the rest of their consumption needs through their normal supplier, unless the community engages in the market to sell excess production that is not shared, imposing balancing responsibility can also constitute a significant burden. Moreover, in **Poland**,[175] **suppliers have been observed to be hesitant to enter into an agreement to take on balancing responsibilities on behalf of energy communities.**[176]

In most Member States that have enabled energy sharing in national legislation, there are no exceptions and balancing responsibility applies fully to the energy community, although under Regulation (EU) 2019/943 (Internal Electricity Market Regulation, or IEMR), Member States may exempt production installations under 400 kW and 200 kW for installations commissioned after 1 January 2026.[177]

Barrier 5

LIMITED SUSTAINABLE REMUNERATION PATHWAYS FOR EXCESS PRODUCTION AND KNOCK-ON EFFECTS ON ACCESS TO FINANCING

In almost all Member States, collectively produced renewable energy must be shared within a 15 minute to 1-hour time period. However, this will normally only cover between 30-40 percent of production, according to those surveyed that were involved in setting up energy sharing schemes. Not all Member States allow for the remuneration of this excess production, while others place a cap on how much excess production may be remunerated. In some cases, suppliers are allowed to set the price for compensating injection of excess production. According to a survey of energy communities, before the latest energy crisis, FiTs, premium prices, or prices reflective of market value offered by suppliers did not always provide adequate remuneration pathways for excess produced electricity. This renders it **difficult for energy communities to:**

- **Access finance to develop energy sharing projects;**[178]
- **Build a business case around saving on energy bill due to very long payback periods;**[179] **and**
- **Develop larger projects/grow into new activities.**[180]

Similar to other types of renewable energy production projects, in order for energy communities to be able to invest in an installation for shared production, they usually need access to finance, such as a bank loan. Whether or not a commercial lender decides to invest depends on the project's ability to service the debt, which largely depends on future earnings capable of providing a high level of investment security and lower risk premiums.[181] In assessing the risk of lending to energy community projects, financial institutions see a fixed-price FiT as a fall back option that assures predictable revenue for the life of the loan.

3.3.2 ACTION DRIVERS FOR ENERGY SHARING BY ENERGY COMMUNITIES

The following are different drivers that can help with the roll out of energy sharing by energy communities. The options presented below attempt to present solutions that are not already provided for under EU legislation.

Action driver 1

CREATING A CLEAR LEGAL DISTINCTION BETWEEN ENERGY COMMUNITIES AND ENERGY SHARING

In some Member States, particularly where the concept of energy sharing through collective self-consumption beyond the building level was adopted before the CEP, **energy communities are just one way to organise the activity**. This is the case in France, the Brussels-Capital Region of Belgium, and in Greece, which has a virtual net metering (VNM) scheme for offsite production. In Greece, VNM was originally available as an activity eligible to city councils, schools, universities, farmers and farming associations. After legislation on energy communities was adopted, they also became eligible to engage in this activity.

A number of Member States have taken efforts to **make clear distinctions between the organisational aspects of energy communities and more technical rules for conducting various activities**. For instance, in the Brussels-Capital Region of Belgium, horizontal rules for energy communities including their organisation and governance have been established, while the Regulator has established a register for monitoring energy communities. In the Netherlands, in its proposed 2022 Energy Act, the government has included an explanatory note clarifying that energy communities can engage in all possible market activities, including supply, aggregation etc.

In Germany, the newly revised definition on citizen energy companies sets a proximity of 50 km radius (100 km circumference). At the moment, this definition is only applicable to eligible wind and solar PV production in the context of exempting citizen energy companies from tendering for public support. In Greece, recent revisions to the national law have disentangled geographical proximity for energy sharing (via virtual net metering) and RECs. For virtual net metering generally, the production installation used for the activity can be installed in any region, regardless of where consumption is located. However, to be considered an REC, at least 50 percent plus one of the members need to be located (for natural persons proximity is determined by permanent residence or ownership of property, while for legal entities proximity is determined by where it is registered) in the same region as the production installation (in the region of Athens, due to its limited production potential, the geographical proximity is expanded to neighbouring regions). In Belgium, which is divided (for the most part) into three regions, each region takes a slightly different approach. In the Brussels-Capital Region, because of its small size and limited space for installing renewable energy production, geographical proximity is established at the level of the Region. The Region of Wallonia takes a more bottom-up approach where RECs can determine participation based on technical or geographic proximity, taking into account the energy community's objectives. In Wallonia, the statutes that are submitted to the Regulator upon registration must state how the criterion of proximity will be evaluated to establish which members and shareholders have effective control of the REC. The government is also directed to set further technical and geographical criteria determining the notion of proximity.

Geographical proximity for both energy sharing and energy communities will naturally be determined based on the size of the Member State and how it is organised, either in terms of administrative units (local, regional, etc) or grid typology. Member States should disentangle geographical limitations of both energy sharing and energy communities in terms of their purpose. For energy sharing, there may be technical reasons why the geographical boundary should be set at bidding zone level or more in line with local grid topology, for instance where otherwise a grid connection cannot be granted. For RECs, proximity for effective control and/or participation should be based on social reasons: to ensure those that reside locally or within the region that are impacted by renewable energy projects can participate and exercise control over these projects.

Action Driver 2

CLARIFYING ROLES AND DUTIES FOR SYSTEM OPERATORS IN FACILITATING ENERGY SHARING

Tools to promote awareness and access to guidance and technical support on energy sharing

As highlighted in the cross-cutting action drivers section (ACTION DRIVER 2), a variety of tools to promote awareness and provide technical information and guidance have been established both by public authorities and civil society organisations. For instance, the Austrian **Coordination Office** has focused specifically on helping energy communities willing to engage in the activity of energy sharing. Furthermore, in Portugal, a legislative guide/manual developed by ADENE (Agêcia para a Energia, or Energy Agency) and DGEG focuse specifically on renewables self-consumption and energy communities.

System operators can also play a vital role in helping energy communities to plan their projects by providing more transparency and readily accessible (e.g. online) information for prospective energy sharing project applicants, for instance on different segments of the grid, areas of congestion and/or available connection capacity, grid development plans, as well as information meant to provide communication and outreach to local communities. Some local DSOs are also taking it upon themselves to simplify the process of helping citizens learn about energy sharing and become aware of an initiative to join. A DSO in Catalunya, Spain, L'ectra, has created a service company with a dedicated energy communities unit, Elecsum. This makes it much easier for L'ectra to connect its grid users to energy sharing projects, which mainly serve the local public administration and communities. The aim is to centralise all paperwork needed to register an energy sharing project into a digital tool. It also matches citizens with potential projects, so that it is easy to find an available initiative in the area. The digital platform also allows participants to see their data and calculate the amount of energy savings they are realising per month, as well as the payback period. Members are also able to see the generation and consumption of themselves and the community.

Putting in place appropriate procedures for registering energy sharing projects

Based on the Repository's assessment of national regulatory frameworks and the feedback expressed by energy communities, DSOs have a significant practical role to play in the establishment of energy sharing projects. The DSO is in charge of much of the administrative procedures for registering projects, along with authorising of grid connections. They can also serve as a feedback mechanism for NRAs in order to monitor the installed capacity of energy sharing across their management area, and its impacts on the grid and consumers (e.g. contributions to network costs).

Many of the issues that energy communities express with regard to DSOs pertain to administrative procedures and timelines. As such, developing a **simple, clear, and transparent process to register new community sharing projects** would help to establish more certainty. In Spain and in Portugal, if connections for self-consumption are not approved within the two-month deadline, the DSO has to pay for lost earnings (in this case savings on energy bills) from the project. DSOs could publish procedures and timelines so that energy communities have clarity on the process they need to follow. This information could be published on the DSO's website, or even included in guidance documents that are published through one-stop-shops or other facilitative organisations.

Given the fact that more commercial market actors are setting up service providers to facilitate energy sharing, it is important to ensure that energy communities do not face the same issues as are already experienced in obtaining a grid connection. To prevent such issues from arising, network operators, at distribution and transmission level, could consider setting up dedicated windows for 'do-it-yourself' styled projects by energy communities and other active customers.

Putting in place appropriate IT infrastructure to make energy sharing possible

DSOs have a significant practical role to play in the operationalisation of energy sharing, acting as a hub of information between all of the other market participants implicated by the activity. In particular, DSOs can be responsible for the following preconditions that allow energy sharing to take place:

1 | **Smart meter rollouts and establishing IT infrastructure** to allow for the provision of metering services, i.e. clear, transparent, and timely (as close to real-time as possible) monitoring, collection, validation and communication of metering data of the community's production installations, its members' consumption points, with the energy community, its members, and the incumbent supplier responsible for residual consumption needs;

2 | **Calculating shared production/consumption** of the members of the energy community and for the purposes of settling metered supply in the bill (in some Member States this responsibility may lie with a central data hub, the supplier, or the energy community itself).

Some Member States have established concrete deadlines for DSOs to take specific action on certain matters. For instance, in Austria consumers have a right to have a smart meter installed within two months upon request.

In other Member States, DSOs are coordinating with each other to upgrade their capabilities. In order to prepare themselves for energy sharing, the three main DSOs in the Czech Republic voluntarily created a new legal entity that will act as a service provider to help them fulfil their role in facilitating energy sharing. In particular, the new entity will focus on issues around data management, registration, and interoperability.

Given the fact that IT infrastructure is the backbone that will allow energy sharing and other behind-the-meter innovations to be possible, it would make sense to **establish data management and interoperability standards, as well as timelines for when IT infrastructure should be updated to allow energy sharing**. IT infrastructure buildouts are also likely to benefit DSOs in the long-term by allowing them to make use of local flexibility and other services (see the section on flexibility below). National regulations and data exchange protocols should also support upgrades in IT infrastructure by DSOs.

Action Driver 3

PROVIDING FLEXIBILITY TO ENERGY COMMUNITIES IN THE DESIGN AND SCOPE OF ENERGY SHARING ARRANGEMENTS

Enabling frameworks can allow energy communities to grow and develop by providing them with flexibility to develop their initiatives in a way that will maximise the impact for the participants. When it comes to energy sharing, energy communities have expressed the desire to be **able to determine how shared energy is allocated to the members** (through a dynamic coefficient, or energy sharing key versus one that is fixed) for the purpose of optimising self-consumption and reducing surplus. In a number of Member States, such as Portugal, the calculation method is determined by the energy community.

DSOs in Austria and Italy are also working to improve dynamism for energy sharing, so that, for instance, households may be able to participate in more than one community, and it is easier to change the energy sharing key over time (e.g. monthly, when old members leave and when new members come in, etc.).

Other Member States have evolved the limiting geographical area in which certain participants are eligible to join an energy sharing initiative, such as France. There, **the geographical proximity has been expanded over time**, and there is even an option in rural areas to expand the scope even further, upon request. The geographical scope has also evolved in Italy, in order to avoid arbitrary distinctions between which households (e.g. on opposite sides of the same street) may participate in an energy sharing initiative.

Monitoring and feedback mechanisms between all involved parties (i.e. system operators, national energy regulators and energy communities) is essential for allowing further learning. Some Member States require reporting by the DSO on the rollout of energy sharing. For instance, DSOs in Austria must notify the NRA on a quarterly basis of the number of running community energy sharing projects, the projects under development, and the number of members for each initiative. The DSO is also required to monitor the adequate contribution to network costs, which the regulator uses to analyse costs and benefits of the network incentives that have been developed for energy communities.

Action Driver 4

ENSURE FAIR COOPERATION BETWEEN THE SUPPLIER OF RESIDUAL ENERGY AND ENERGY COMMUNITIES

Suppliers should be able to recover their costs to the extent these are non-discriminatory and proportionate to costs effectively incurred. However, **unfair and disproportionate fees that do not fall within this scope could be explicitly banned** as is being considered in the Netherlands, where the proposed Dutch 2022 Energy Law already includes a provision that agreements that penalise participants in an energy community shall be null and void. To the extent that suppliers need to provide specific services to energy communities, particularly where choice of service provider is lacking, this **could be overseen by the NRA to ensure it is fair, proportionate, and non-discriminatory**. In addition, suppliers could be encouraged to invest in **IT to better forecast production patterns and sharing profiles of consumers** of energy sharing schemes to mitigate the potential impact that consumers sharing energy may have on their suppliers' balancing portfolios.

Furthermore, it may be preferential to **allocate the responsibility of calculating shared energy to the system operator**, which is already the case in many Member States. This would relieve the supplier from having to carry out this task, which may have an inherent conflict of interest in carrying out the duty anyway. The system operator is already responsible for processing, validating and communicating metering data in most Member States, and it is more likely to be neutral and independent when making calculations of shared energy.

It can also be considered to give energy communities **limited balancing responsibilities for projects of installed electricity capacity of less than 400 kW or 200 kW for projects commissioned from 1 January 2026, or to designate other third parties to take up this activity**. In Member States such as Spain and Slovenia, balancing responsibility of the active customer participating in an energy community may remain with the supplier. In Finland, balancing responsibility can be delegated to the system operator through a contractual arrangement.

action driver 5

ALLOWING FOR THE USE OF THIRD PARTY SERVICE PROVIDERS

Energy communities can also cooperate with other types of service providers to facilitate energy sharing by energy communities. In a few Member States, national legislation **designates a recognised third party that is eligible to organise** the allocation of quantities of shared energy between the members on the energy community's behalf. Such a managing entity exists in Luxemburg, as well as Portugal. In Portugal, legislation provides for a management entity, which is responsible for carrying out the operational management of production facilities, metering and other assets, communication with the electronic platform provided for in legislation, the connection with the network. The management entity also takes care of the communication with the respective system operator, namely in terms of production sharing and respective coefficients. It may also manage the commercial relationship, where surplus production is sold to the market. In Luxembourg, if the community does not want to perform this function, it will by default be carried out by the DSO using a standard energy sharing key.

This role may be played by a commercial third party service provider, by one of the members of the energy community, or even by another energy community. In Spain, cooperative suppliers Som Energia and Goiener provide this service to members and non-members that want to set up collective self-consumption projects. While it may be possible to have energy suppliers act as facilitators, however, audits and control should be utilised to check for correct implementation, to prevent misuse and to ensure that facilitation does not undermine effective control of the members, or prevent them from exercising their right to switch supplier or service provider.[182] Acknowledging these types of partnerships could help spur the development of service providers that can tailor to the needs of energy communities and other collective self-consumption initiatives, for instance to provide balancing responsibility.

Nevertheless, it is important to understand potential limitations or trade-offs in using professional market actors as facilitators. For instance, it is expected that **the use of a third-party facilitator will lead to more costs for energy communities** that share energy since it involves the procurement of a service to facilitate the exchange of information. This also raises potential issues around privacy and competition.[183] One of the small DSOs interviewed for this report, Elecsum, providing services for local energy sharing projects, emphasised that it is not sufficient to allow third party service providers to do everything for energy communities as it leads to less value creation for the community. The goal should be to make the energy sharing arrangement processes easier and to build capacity among energy communities to allow for smaller projects with less value creation to function independently.

Action Driver 6

COST-REFLECTIVE VOLUMETRIC NETWORK CHARGES

The grid is a vital public resource and backbone for ensuring the integration of renewable energy sources. As such, it must be adequately supported. Furthermore, to ensure a fair energy transition the general public should not have to disproportionately bear the costs arising from sharing of electrical energy while only a small proportion of network users can benefit from the possibilities of sharing.

First, it is worth acknowledging that NRAs have the discretion to set tariffs (methodologies) and structures to recover the costs incurred by system operators, including costs related to data management, provided they are in accordance with principles of cost-reflectivity, non-discrimination and transparency.

The network tariff structure is typically either or a combination of lump sum, capacity, or volumetric based. Volumetric based network tariffs recover the variable costs incurred related to actual use of the grid (i.e. tariff component that reflects the costs of the grid infrastructure usage).

When energy is shared locally within an energy community, the reduced use of higher voltage lines and network losses may justify lowering the volumetric tariff component.

Austria has taken action in this regard.[184] In a **Grid Usage Ordinance, grid use charges are based on different tiers broken down into seven different grid levels**. For 'local' RECs, which use levels six and seven, network charges are reduced by 57 percent because generation is very close to all of the consumption points of the members. For 'regional' RECs, which use levels four through seven, network charges are reduced by 28 percent for charges related to levels six and seven, and 64 percent for charges related to levels four and five. For CECs, which can compose members from across the country, no grid charge reductions apply because they are allowed to operate across the bidding zone.

Exempting active customers engaged in energy sharing from contributing to the recovery of related grid capacity costs **risks socialising network tariffs to wider system users**, also resulting in discrimination vis-à-vis consumers that do not engage in energy sharing. After all, consumers engaged in energy sharing still make use of the full capacity of the network for their excess demand or production and thus contribute to infrastructure investments (past ones prior to becoming active customers and future ones to accommodate peak capacity) at higher voltage lines and the fixed cost of the energy system.

This action driver will not always apply or have a variable degree of impact, depending on grid topology and how network charges have been structured by the NRA. While network tariff reductions are already included in several national regulatory frameworks, their **effects on the economic viability of energy sharing, the financial sustainability of the electric system or cost-effective deployment of renewable energy are still unclear.**

Action Driver 7

INVESTMENT SUPPORT AND REMUNERATION FOR EXCESS PRODUCTION

A number of Member States have put in place instruments to support the financing of installation of new production installations used for energy sharing. In Slovenia, it is possible to get investment grants for self-consumption operations, and to purchase and install storage. Furthermore, in Italy, under the National Recovery and Resilience plan, interest free grants representing up to 100% of eligible costs are available for the development of energy sharing initiatives by energy communities.

Denmark recently issued an Executive Order that provides grants for planning, establishing and organising projects around production, supply, storage, flexibility and energy efficiency.

A number of Member States have also put in place remuneration mechanisms to reward excess production from shared installations, although the details of these mechanisms vary. In France, energy sharing projects are eligible for FiTs for the surplus injection. In Italy, all injected energy is withdrawn by GSE (the Energy System Manager), who pays a market price for it. In Spain, surplus may be compensated through a discount from the supplier through a net-billing scheme. If the surpluses are compensated, each participant gets the discount for his or her own surpluses in the supplier invoice. Surpluses that exceed imported consumption are not compensated. In Slovenia, RECs with production facilities with an installed capacity below 500 kW are also eligible for guaranteed purchase of electricity fed to the grid.

In designing support schemes to guarantee remuneration for excess production, it important to contemplate and **balance potential trade-offs between supporting investment in production versus the need to create a more flexible energy system** based on the efficiency first principle. Price signals are essential in triggering the uptake of flexibility in order to make optimal use of renewable energy production capacity and create other value streams that reduce the need for public subsidies.

3.4 Retail supply

The RED II and IMED enable RECs and CECs to engage in supply. Under the IMED, 'supply' means the sale, including the resale, of electricity to customers.[185] This would also include power purchase agreements (PPAs), which are defined under the RED II as "a contract under which a natural or legal person agrees to purchase renewable electricity directly from an electricity producer."[186]

In practice, energy community suppliers often self-produce or buy renewable production collectively from member projects or local producers in order to supply renewable energy back to the members, using existing market structures such as the wholesale market. Energy communities also enter into PPAs with other local SMEs and public authorities, and in some cases even households.[187] This has two benefits, including setting a fixed price for the customer for an agreed timeframe, and allowing for financing larger projects.

To meet excess demand or sell excess production, these initiatives also operate on the wholesale market. To the extent energy communities allow consumers to take ownership over their own electricity, gas[188] and heat production and supply it – via the energy community supplier – back to themselves, they offer a unique service to their members. While this activity currently takes place primarily at the national or regional (e.g. in Belgium) level, the community energy sector has expressed a strong desire to be able to supply themselves more locally, or

regionally, where production and consumption can be matched as much as possible.[189]

3.4.1 BARRIERS TO SUPPLY

The RED II and IMED conceptualise RECs and CECs as undertakings that organise around a set of distinct principles: non-commercial purpose, open and voluntary participation, and ownership, control and governance by non-professional actors.[190]

It is important to acknowledge that many barriers currently exist for new market entrants working with a traditional supply model. However, these challenges are aggravated due to the organisational and governance characteristics of energy communities. Due to these characteristics, energy communities face inherent challenges in terms of time, financial and technical resources, which puts them in a situation that is distinct compared to commercial market actors.[191] Pursuant to the general EU legal principle of equality,[192] RECs and CECs benefit from an enabling framework in order to level the playing field with commercial market actors to engage in all market activities, including non-discriminatory, proportionate and transparent supply registration and licensing procedures need to be in place. The RED II goes even further, calling for removal of unjustified administrative and regulatory barriers.[193] NRAs have an important role in monitoring the removal of these barriers, and in many Member States they are also involved in identifying such barriers, also placing them in a role to help determine whether certain identified barriers are disproportionate.[194]

Below, we outline a number of barriers that have been identified for engaging in retail supply.

Barrier 1

OBTAINING SUPPLIER LICENCE

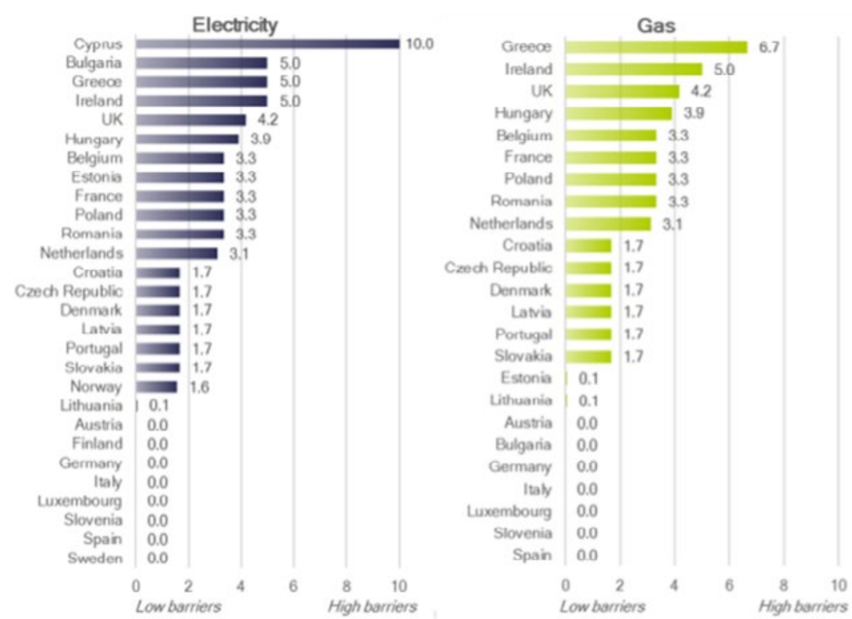
The oldest and most successful energy community suppliers were established at the beginning of the liberalisation process, when regulation was less stringent. They often start very small, and need to find additional members in order to establish a sustainable business model.

Some of the existing financial and administrative requirements to obtain a supply licence are disproportionate for energy communities that seek to engage in local supply of self-generated electricity to its members.[195] While regulation is intended to ensure that suppliers generally using the transmission grid are financially resilient, can perform system related responsibilities and ensure consumer protection, it is not tailored to allow smaller suppliers that set up simpler operations to supply a small amount of customers over a more limited geographical area. Instead, they are often based on the assumption of centralised production, having a large consumer base and the potential nation-wide supply.[196] Several studies point out that a main barrier for bottom-up initiatives such as energy communities is a consequence of centralised design and regulation of existing energy systems.[197] One study frames this as a capacity/scale barrier, citing two specific issues: costs associated with becoming a licensed supplier, and obtaining collateral to trade on wholesale markets. This barrier is specifically mentioned for municipality-backed businesses and new social enterprises.[198] The CEER has also noted that licensing and registration processes constitute a significant barrier to entry for new market entrants.[199] While this report pertains to entry barriers for new market entrants in general, they are also equally relevant for energy communities.

A project on European barriers in retail energy markets carried out by the European Commission comparatively assesses complexity in supply licensing procedures from the electricity and gas sectors, across Europe. First, the report cites heavy administrative processes for registration and licensing, high financial requirements, excessive reporting requirements, among others, as operational and procedural hurdles for new market entrants.[200] Overly complicated and time-consuming processes and requirements present a barrier in terms of time and money that new entrants must invest.[201] The amount of days ranges between one day (representing low barrier) and 60 days (representing a high barrier).[202] As is shown from the figure taken from the study, the length of licensing procedures varies greatly.

Length of licensing procedures in European Electricity and Gas Markets:

Figure 2: : European Commission (2021). European Barriers in Retail Energy Markets.



Barrier 2

OPERATING AS A SUPPLIER

Because of their small size, community suppliers are often **too small to be able to hedge on the markets**. For example, according to an existing energy community supplier in Ireland, the volumes of their production and supply are not sufficient to access hedging products. This is because the current minimum volume for accessing hedging products linked to the Day Ahead Market is 1 MW per hour, while the community's net volume of supply amounts to less than 1 MW per hour. During the energy crisis, because of the lack of volume, the community could not lock into fixed longer term prices (day ahead markets, or forward markets e.g. six months to two years), which left it exposed to volatile price fluctuations on wholesale and balancing markets. Even though large suppliers also struggle with volatility, as seen during the energy crisis for example, they have more tools at their disposal due to the large volumes in which they trade, which allows them to adopt trading strategies that minimise risk and maximise return.

In general, many energy community suppliers also cite the **high amount of guarantees required to operate on the wholesale market** as a significant burden for them. In Portugal, guarantee requirements in order to initiate activities as a supplier are around €200,000, too high for small suppliers.

Becoming a BRP is often too risky for new entrants.[203] While energy communities are entitled to delegate these responsibilities and many energy community suppliers use a third party as BRP, existing service providers may be hesitant to enter into an agreement to take on balancing responsibilities,[204] as has been observed in Ireland and Poland.[205]

According to a survey of community suppliers undertaken by the Energy Communities Repository, **the energy crisis that emerged after the COVID pandemic and exacerbated by Russia's invasion of Ukraine has made existing challenges more acute**. Specifically, the following challenges have been identified:

- **Liquidity issues** – Since the crisis started, the increase in the amount of financial guarantees required to trade electricity has made it more challenging for energy community suppliers. Many communities have responded by increasing the social contributions (capital investments) by the members. Because of the higher cost of operation caused by government interventions and higher market prices, many communities have in turn had to raise prices, resulting in a loss of membership. A number of community suppliers also cited market risk associated with required guarantees to be a barrier to obtain a gas supply licence, or even from exercising an existing licence.

- **Hedging** – While energy communities use a number of hedging strategies in order to make their business model sustainable (e.g. asset locks, matching production with consumption, etc.), they are **unable to access hedging products** on centralised energy markets similar to other commercial suppliers. This is due mainly due to their smaller size and limited volume of traded energy. While larger suppliers are able to hedge against high prices today by purchasing energy on futures markets, these are not markets that energy community suppliers are able to access. As such, they have experienced **increased exposure to the volatility of the wholesale market**. Furthermore, conversations at national level to consider imposing hedging requirements on suppliers also increases market risk for energy community suppliers, as they have no special acknowledgment at national level.

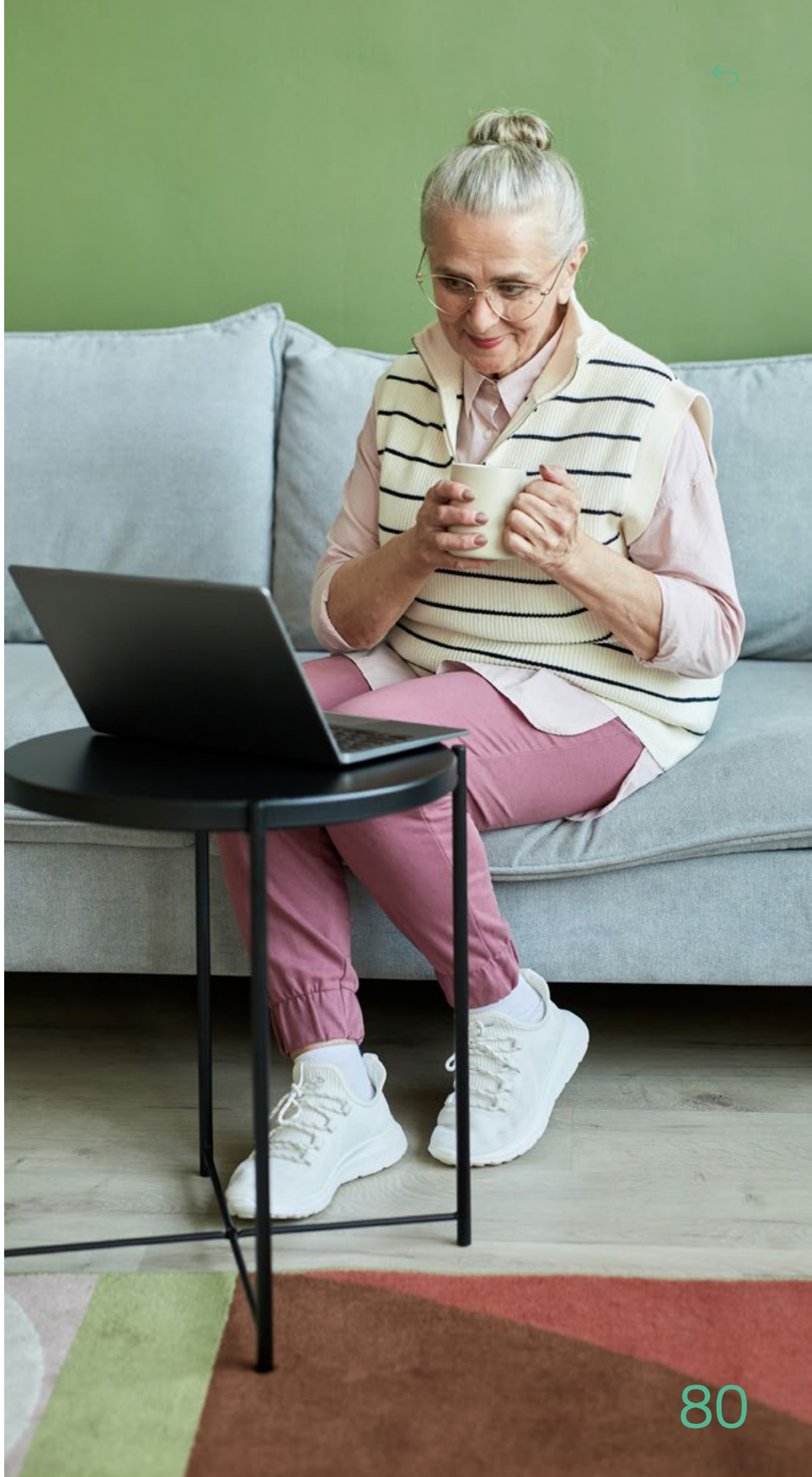
- **Administrative** – The energy crisis and some of the national government interventions in the market have resulted in **increased responsibilities of suppliers**. This includes necessary updates to IT systems to implement relief packages for consumers, additional communication and reporting requirements, and the rapid pace at which government decisions are taken. This ultimately means that already small suppliers must perform additional responsibilities with less revenue from providing a supply service to the members.

An important takeaway from the energy crisis thus is that national interventions to strengthen resilience amongst the supply sector can also impose barriers for new market entrants, a we have already seen in some Member States. It is important for governments and regulators to monitor the impacts that crisis-related interventions have on smaller suppliers that operating within a more limited scope, and to ensure that as energy communities such interventions do not pose additional barriers.

Barrier 3

SELLING PRODUCTION DIRECTLY THROUGH PPAS

Energy community projects that are centred around production may work with other local authorities or SMEs to provide, or sell, energy directly. However, as the European Commission has acknowledged in its Staff Working Document on permit granting, the barriers for SMEs to engage in corporate PPAs are still very high. Some of the main barriers expressed include limited visibility on their future electricity demand, lower credit ratings, creditworthiness of off-takers, and lower volumes of electricity consumption, which makes managing imbalances more difficult, and complexity of negotiating PPAs. In particular, with regards to energy communities, their projects are often too small to make it economically interesting for large off-takers to sign attractive PPAs. Second, because private lenders are not familiar with small market actors like energy communities, it is difficult to access financing from private banks in order to develop community projects using PPAs. Lastly, a supplier licence is often needed in order to enter into a PPA.



3.4.2 ACTION DRIVERS FOR ENERGY COMMUNITY SUPPLY

Action driver 1

EXEMPTION/SIMPLIFICATION OF REGULATION OF ELECTRICITY SUPPLY FOR ENERGY COMMUNITIES

One of the main barriers identified by the Repository is related to perceived disproportionate requirements imposed for obtaining a supply licence, as well as difficulties performing supplier responsibilities (in particular balancing) in relation to the size energy community suppliers plan to achieve. One way to address this issue could be by revisiting and revising certain obligations for smaller non-commercial suppliers. Some Member States have already enacted, or are in the process of enacting, regulations to make supply easier for energy communities and other small suppliers.

SUPPLY LICENCE EXEMPTION

In the Netherlands, under an Executive Order (Experiments Decentralised, Sustainable Electricity Production, or EDSEP), the Dutch government set up a regulatory sandbox, which allowed for self-contained experiments where, among other things, cooperatives were allowed to operate without a supply permit and to derogate from rules around transparency and liquidity of the energy market.[208] The Executive Order ran for four years. In turn, this influenced the subsequent proposed Energy Act in the Netherlands, which exempts 'smaller energy communities' from needing to obtain a supplier licence. In its Explanatory Note, the government acknowledges that a licence is in some cases too burdensome or, given the interrelationship between the supplier and the end customer, a licence is not always necessary. Criteria have also been established for eligible energy communities. This includes:

- Over the period of a year, the energy community does not supply more electricity or gas than it injects into the system on an annual basis;
- Energy is supplied to end customers with a small connection who are members or shareholders of the energy community; and
- The energy community does not have more members or individual shareholders than a specified number, which should be determined by ministerial regulation.[209]

One of the practical implications of this is that licensed exempted suppliers are not subject to the said bankruptcy and disconnection regime. The status of the proposed Energy Act is in doubt, so it is likely that the law will be redrafted. As such, the status of the proposal to exempt energy communities from needing a supply licence is unclear at the time of publication of this report.

LIMITED SUPPLY LICENCE AND RESPONSIBILITIES

Some countries acknowledge smaller supplier models in their regulatory frameworks. For instance, in Ireland it is possible to register as a small supplier, as long as the supplier has less than 200 customers.[210] The aim is to allow producers to enter into PPAs for the direct sale of production to a final consumer without having to become a fully-licensed supplier. This arrangement requires a fully licensed counter-party that can provide services such as balancing.

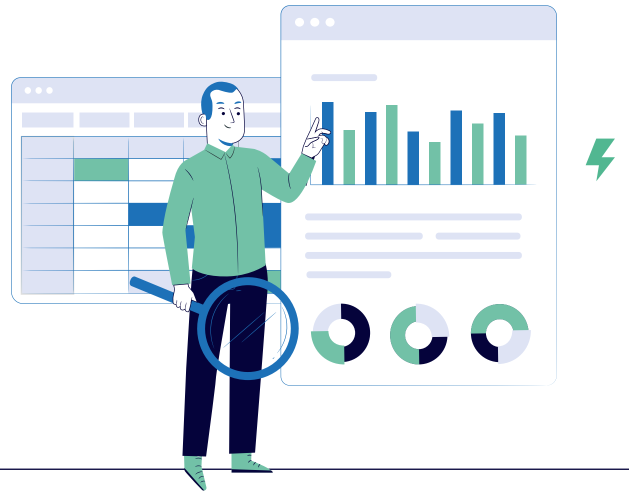
It is important to note that the energy community that described using this mechanism was not ultimately able to because the financial institutions approached to finance the production installation insisted that the community negotiate a PPA with an established large utility supplier before they would lend the money. The financial institution perceived the newly established supply company with no trading history as a risk to their investment. This relates back to the challenge of entering into PPAs for the direct sale of production by smaller projects such as energy communities. The ability to access financing is an issue for SMEs in general, and for energy communities in particular. The EU Commission's Electricity Market Design proposal aims to address this by calling on Member States to facilitate and ease access to PPAs by SMEs.

In the Brussels-Capital Region of Belgium, recent legislative changes to the Electricity Market law allow for suppliers to obtain a limited supply licence. Under Article 21, suppliers may obtain a limited supply licence under three alternative conditions:

- To supply a capped amount of electricity (this may limit the financial guarantee they need to provide);
- To supply certain categories of customers; or
- To supply themselves or their subsidiaries.

The limited supply licence allows an energy community to combine energy sharing activities with supply of production that cannot be shared within the netting period (e.g. 15 minutes) while reducing the amount of guarantee that is required. They also do not need to be responsible for security of supply, because the residual supply that is not provided by the energy community is already guaranteed by the classical supplier.

To be eligible for the limited licence, the energy community must not supply beyond its own members/customers, the supply must come from renewable electricity, and the community must demonstrate that it applies the requisite criteria stated in the legislative definition of energy communities for the Brussels-Capital Region of Belgium. For example, the applicant must show that the activity of supply is in furtherance of an objective to provide environmental, social or economic benefits to members and the local community rather than



financial profits. Applicants are also expected to meet certain criteria in order to demonstrate a good reputation and professional capacity, knowledge of the Brussels market, and technical and financial capacities. This means that the applicant must demonstrate that they are capable of maintaining a minimum quality of supply, and that they have the technical capacity (i.e. IT infrastructure and operations) to interact with the distribution network (i.e. the DSO). The applicant must also be capable of invoicing and managing its members/consumers, for instance through communications, transparency and a complaints mechanism.

These criteria are currently under review by the government in order to provide more specificity around the categories of limited licence and the requirements under the adapted regime. These criteria should be further specified by the end of 2023. In the meantime, the NRA, **Brugel, oversees applications** to become a limited supplier on an ad-hoc basis, as well as operations under the limited licence. To help applicants understand these new rules, in May 2023 Brugel **published advice on obtaining a supply licence**.[211]

While the new rules on a limited supply licence do not pertain only to energy communities, these rules have been adopted in order to facilitate the emergence of energy communities, as well as offer a path towards professionalisation. It provides a model regulatory approach to helping energy communities take steps towards combining energy sharing activities with supply back to members

without having to take full steps towards setting up a fully licensed supplier.

PROVIDING FLEXIBILITY IN COMPLYING WITH REGULATORY REQUIREMENTS

Without creating exemptions, regulation can acknowledge the specific challenges energy communities face based on their unique characteristics that hamper their participation in the market. For instance, without doing away with hedging requirements, energy communities can be given flexibility in how they hedge themselves against risk. Energy community suppliers use a number of different hedging strategies. A few energy communities use PPAs to hedge against high prices for their members, but most energy community suppliers aim to be able to match their members' consumption with the renewable energy production of the energy community. Using the wholesale market to sell surplus electricity not used in real time, as well as buying when community-owned production is not available, a community supplier can meet its members' consumption needs over an entire accounting year. During an energy crisis where spikes rise, this business model is resilient against volatile wholesale market prices, because it limits how much it needs to buy on the wholesale market.

In its Electricity Market Design legislative proposal, the EU Commission proposed to give suppliers different options, including but not limited to the use of PPAs, for hedging, and to endeavour to make hedging products accessible for energy communities. Some energy community suppliers have expressed concerns that if PPAs were required as a hedging strategy, large utilities could benefit because smaller market actors cannot access PPAs, as mentioned above. As such, it is important to look beyond guarantees, PPAs and forward markets, when assessing whether energy community suppliers are properly hedged, including their installed production capacity that can be used before going to the wholesale market.

PROVIDING ASSISTANCE TO BECOME AND OPERATE AS A SUPPLIER

Aside from looking at the substantive obligations that apply to energy communities, national authorities could potentially **provide capacity building, expertise, or other assistance to energy communities that wish to become licensed to engage in supply**

and perform market and consumer responsibilities. In the same way that energy communities are able to access expertise to develop renewable energy production projects, regulators could help to facilitate professionalisation, potentially with assistance from existing utilities. In the Brussels-Capital Region of Belgium, the Regulator, Brugel, has published a guidance document intended for new market actors so that they have a better understanding of how to become a limited supplier.[212]

At the moment, the Repository is unaware of any national authorities that provide this specific service. CEER's Monitoring Report on the Performance of European Retail Markets in 2018 notes that Spain has developed procedures to facilitate obtaining a licence.[213] While such procedures are intended to reduce barriers for new market entrants in general, they can be particularly relevant and useful for energy communities that want to engage in supply activities.

ACTION DRIVER 2

PROVISION OF SUPPLY-RELATED SERVICES BY OTHER MARKET ACTORS

Energy communities can also **cooperate with existing service providers in order to supply their members with renewable energy**. For example, larger suppliers can enter into commercial arrangements with local production projects and through a process called 'sleeving', the producer can sell its production to the end-user.[214] Most energy communities also contract third parties to trade on the wholesale market on their behalf.

FACILITATING UPTAKE OF RESPONSIBILITIES TO PLAY A LARGER ROLE IN THE ENERGY SYSTEM

System operators can make available **online platforms to facilitate energy trading**. For example, in the Netherlands, the DSO network company Alliander, which contains several companies, including the DSO, Liander, formed ENTRNCE.[215] Acting as a separate company, ENTRNCE is **an electricity exchange that enables producers and consumers to directly exchange electricity with each other**. The ENTRNCE Exchange functions within the current market design and cooperates with all relevant market parties involved (suppliers and balance responsible parties). As such, it does not replace any market roles. Dutch energy communities approached ENTRNCE to see if they could use the platform to supply electricity produced from their production installations to their own members. Because of this service, energy communities in the Netherlands which, like other market parties, remain responsible for imbalances, do not experience issues with being financially responsible for balancing by their supplier. Alliander also recently committed to develop an additional 'cooperative' layer within ENTRNCE. This will allow energy communities to exchange surplus energy between their own members and other energy communities before trading it on the wholesale market.

Such platforms do not need to be controlled by a DSO per se. In principle, energy communities, suppliers, and aggregators could develop peer-to-peer trading platforms and products for their customers.

FACILITATING THE SUPPLY OF COMMUNITY-OWNED RENEWABLES PRODUCTION

In order to ensure and mainstream accessibility of these services, some jurisdictions outside of the EU are now either imposing, or looking at imposing, obligations on larger suppliers to help community-owned renewables projects supply the electricity back to their members.

In California, legislation (Assembly Bill 2316)[216] was passed in 2022 that **requires suppliers to set up subscription services so that any customer can request to 'subscribe' to receive renewable electricity from local renewables installations**. Compensation for community solar will be pegged to the actual value of electricity at the time it is delivered to the grid. At least 51% of subscribers to a project will have to be low-income, ensuring that such production does not simply end up serving businesses.

In the UK, a 'Local Electricity Bill' is currently under consideration in the House of Commons. It would do two things to support growth of energy communities:

1 | Guarantee small energy generators a stable tariff for selling their energy based on current market rates - All licensed energy suppliers with more than 150,000 customers ("eligible licensed suppliers") would be required to purchase electricity exports from sites, including those operated by community groups, that generate low carbon electricity with a capacity below 5 MW. Specifically, they would be required to:

- offer a minimum export price set annually by the Gas and Electricity Markets Authority ("GEMA"),
- offer a minimum contract period of five years, and
- allow the exporting site to end the contract after no more than one year.

2 | Establish a local energy supply mechanism to enable community renewable generation schemes to sell directly to local people – Large energy suppliers with more than 150,000 customers must offer a service agreement to energy community projects so they can sell electricity to local members. The service agreement would require the supplier to make a special energy community tariff available to consumers local to the production facility. The total number of consumers the community energy tariff is available to may be limited in order to match local production with consumption. The supplier remains the registrant for the meters of participating consumers, and the supplier may charge a reasonable fee for the provision of services, which would be subject to regulatory approval and oversight.

3.5 Participation in providing flexibility

Given the emerging nature of activities around flexibility, it is not yet possible to fully assess drivers and barriers specific to energy communities compared to commercial market actors that might impact their ability to engage. As such, **the purpose of this chapter is to explore potential revenue streams that energy communities can realise from providing flexibility to the benefit of the energy system, and to identify potential drivers and barriers that currently exist for smaller actors that might want to provide flexibility to the energy system.**

A number of different business models have been identified under the heading of providing flexibility to the energy system.[217] Because energy communities bring citizens together, they have potential to help unlock an untapped resource of flexibility: households. The Regulatory Assistance Project (RAP) points out that "compared to commercial aggregators, [energy communities'] bottom-up, mission-driven, local organisations might be better at mobilising small consumers to participate in aggregated demand response. Their knowledge of the local situation may also make them better able to resolve local grid issues".[218] RAP has also identified business cases in terms of potential revenue streams that energy communities might be able to realise from flexibility. These include arbitrage, balancing, ancillary services, capacity markets, and deferment of grid investments.[219]

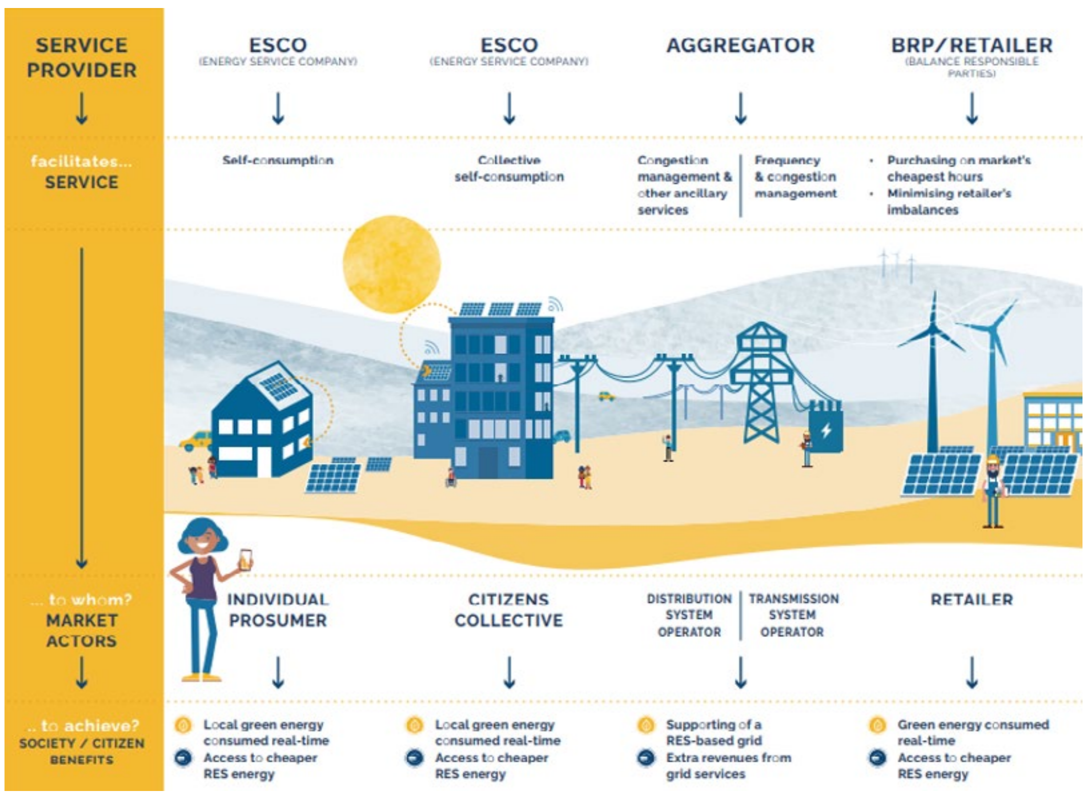
According to smartEn (2022)[220], 'flexibility' is the ability of electrical generators and consumers to alter their output or consumption on demand. Flexibility can be provided by assets ranging from large front of meter generation to residential appliances. The different flexibility markets where demand response can be traded include all electricity markets as required by the IMED.[221] A study performed by VasaaETT and Joule Assets shows that in Germany, households could annually save €1.11 billion and provide an estimated flexible capacity of 1.7 GW to the system. This has the potential to lower the payback period of their smart appliances considerably and eventually be a profitable revenue stream.[222]

When referring to flexibility markets, smartEn (2022)[223] lists the following, taking the point of view of potential service providers: ancillary services, DSO flexibility, and local energy systems (i.e. through a market offer to incentivise optimisation of collective self-consumption, i.e. implicit demand response) at different levels of the grid. Local flexibility markets are emerging schemes tailored for the needs of DSOs. While older ancillary services markets have traditionally been used by TSOs, local flexibility markets are tailored to meet the flexibility needs inherent to the DSO (e.g. they are more specific towards a location and directly involve the DSO as a buyer).[224]

Energy communities may use production and demand-side assets such as electrical vehicle (EV) batteries, or heating devices (domestic hot water, heat pumps or hybrid heating) to increase, shift or reduce their electricity self-consumption. Individual and joint self-production could provide the basis for providing flexibility to the power system if equipped with the proper equipment and appliances (i.e. matching consumption with local production in both space and time using ICT (Information and Communication Technology) during peak congestion, or reducing consumption and injecting local production into the wider grid), and exposed to time-differentiated price signals or accessible flexibility markets (i.e. to know when to provide which flexibility service).[225] At the transmission level, energy communities may also have a role to provide balancing and ancillary services (e.g. congestion management) to their BRP or system operators.[226]

The FLEXCoop H2020 project provides an illustration of flexibility services and of their related service providers:[227]

Figure 3: Overview of flexibility services according to the H2020 FLEXCoop project



Energy communities may also be active in flexibility through mobility services. For instance, car sharing could be complemented with revenues from electricity markets or from optimisation of charging patterns. As the DECIDE project points out, e-mobility cooperatives, such as Som Mobilitat in Spain have been created to provide community car-sharing services. Using EV batteries from these fleets could be used to reduce grid connection costs through peak shaving, or to create additional revenues by providing grid services that provide peak electricity or minimise the need for curtailment.[228] Smart EV charging can be used to perform and improve all types of flexibility services.

Whenever relevant as a demand-response service, self-consumption optimisation may be performed at different levels, including a single house, collective building, or neighbourhood. In that case, the energy community can provide ESCO (Energy Services Company) services to its members, automating and scheduling devices in order to match times of self-production. Energy communities that take on the role of retailer can also provide demand response services. They can propose to automate appliances of the member/customer to facilitate consumption at the time when the retailer's resources are the most abundant and/or the cheapest. If the community owns its production, this can help optimise consumption at the time of production. If purchasing from the wholesale market, this can help match energy usage to hours where the price is generally cheaper and offer dynamic price contracts.

Explicit demand-side flexibility through aggregation corresponds to the situation when a consumer agrees to respond to BRP, DSO or TSO requests to adjust their load or generation profile.[229] In this case, an aggregator acts as the intermediary between the members of the community that own the resources and the party requesting the response, for instance the DSO. Energy communities (RECs and CECs) could collectively reach out to aggregators and negotiate the participation of the whole pool. For example, the energy community (as ESCO) can optimise self-consumption within the energy community upon request of an aggregator in response to implicit or explicit demand response. The community itself may also take on the role of an aggregator, either as a retailer or as an independent aggregator[230]. One can also imagine an ecosystem of energy communities with one of them playing the role of an aggregator for smaller energy communities. This may be performed directly or through an ESCO tailoring the service to react to price signals (implicit demand response).

3.5.1 BARRIERS TO PROVIDING FLEXIBILITY FOR ENERGY COMMUNITIES

When looking at barriers to energy communities in flexibility, it is important to separate out the challenges that relate back to the business model chosen by energy communities from the legal and regulatory framework that all market actors currently operate under. Generally speaking, the regulatory frameworks for flexibility markets are still in their infancy, particularly for household markets. As such, theoretical value propositions have not yet become concrete in reality.[231] Below we present challenges that energy communities have communicated experiencing with regard to participating in different flexibility-related activities. However, it is worth noting that most barriers energy communities face with regard to participating in flexibility are experienced by the sector as a whole.

BARRIERS FROM THE PERSPECTIVES OF ENERGY COMMUNITIES

From the perspective of the community itself, the following practical barriers currently prevent energy communities from venturing into more flexibility-based activities:

- **Limited existing demand from energy community members** – Flexibility services are complex services for residential users. Until recently, they were providing unclear benefits. The increased and more volatile energy market prices may affect this situation.

- **High cost for service providers** – To be effective, flexibility services may require device automation. However, residential sector loads are small and protocols remain fragmented. Hence, the installation costs of home automation strongly affect any possible business case.

- **Immaturity of markets** – Markets for flexibility are still in early stages of development, resulting in the following barriers:

  - Providing frequency services as a BRP requires significant loads and is very demanding in terms of pre-qualification and reliability;
  - The provision of congestion management services and participation in "local flexibility markets" are not possible in most EU Member States;[232] and
  - While energy sharing can be a good basis for providing flexibility services when exposed to implicit or explicit incentives, the rules are slowly being put in place and require efforts from all stakeholders (communities, DSOs and technology service providers)to be successful.

- **Insufficient IT and market skills** – As SMEs, while energy communities are agile and closer to their members than traditional utilities, they have limited resources for innovation activities like flexibility services. All flexibility services require significant investment in IT capabilities. Moreover, depending on the service, energy communities may be required to engage in new markets with complex rules that are hard for SMEs or citizen-led initiatives to participate in.

SUMMARY OF REGULATORY AND MARKET BARRIERS

Based on a review of sources from EU-funded projects involving energy communities with flexibility, and reports from the sector, the following regulatory and market barriers could be found:

- **Access to a smart meter** – In some EU countries like Germany, smart meters may not be rolled out. In these countries, flexibility services may therefore require additional metering equipment.

- **Data access** – According to the DECIDE project, DSOs often provide data only once a day or even less frequently, which will not be suitable for peer-to-peer trading or flexibility provisions.[233] In Belgium and Austria, smart meters will have an interface through which the energy community can read out real-time data, but energy communities will have to pay for the interfaces and communication infrastructure.

- **Contradicting economic incentives** – If not properly designed with complementarity in mind, FiTs could, in the medium to long run, represent a counter-incentive to engage in implicit demand side response, to the extent they do not provide spot-based price signals.

- **Lack of market access for aggregated loads** – Many balancing markets managed by TSOs do not properly allow aggregated loads to participate.[234] For instance, according to experience gained by the FLEXCoop pilot project in the Netherlands, the Dutch TSO requires the collection of metered data every 4 seconds for all participating units for settlement purposes. Collecting and keeping such data for all grid connection points of small distributed energy resources makes residential devices aggregation difficult.

- **Aggregation of small consumer loads** – Minimum bid thresholds for participating in balancing markets (e.g. 1 MW) requires the aggregation of thousands of residential loads. These thresholds can make participation difficult For energy communities and other smaller aggregator. This is the case in the Netherlands and in Spain, and has been confirmed both by energy communities and DSOs engaged with by the Repository.

- **Challenges to entering into long-term commitments to provide flexibility** – Participation in bidding periods beyond one day (e.g. day-ahead contractual bids) is difficult for households. According to the FLEXCoop Project, if the service has to be committed a whole day in advance, only limited flexibility can be guaranteed compared to a scheme where flexibility is committed closer to real-time (e.g. a few hours in advance).[235]

- Flexibility markets for low voltage appliances are not well accessible even if in principle possible in some EU Member States, making it hard to valorise small-scale flexibility.[236]

- The lack of mechanisms to compensate balance responsible parties for activation of demand response.

- **Network regulation** – The grid financing model is still largely based on capital expenditures (CAPEX) by network operators, whereas purchasing flexibility services would require more recovery of costs around operational expenditures (OPEX). As such, even for congestion management, the market is still at an early stage of development and a majority of network operators do not have the capability of exploiting flexibility.

- **Net metering arrangements** – if self-production of renewables is not incentivized to be responsive to real-time grid conditions, it can become a strain on the grid.

- **Lack of options around a flexible connection agreement** – Flexibility agreements offered by DSOs to energy communities currently take the form of agreements for voluntary curtailment. More structured incentive-based schemes around provision of flexibility could make it easier for energy communities to connect local production to the grid where capacity is limited while also providing an opportunity to help network operators avoid or delay network reinforcement.

3.5.2 ACTION DRIVERS OF FLEXIBILITY BY ENERGY COMMUNITIES

Action driver 1

DYNAMIC AND TIME OF USE TARIFFS

Supply contracts of electricity may provide a different price for different periods reflecting either energy-related costs (e.g. day ahead market prices) or infrastructure (e.g. network congestion). This may result in time-of-use (e.g. day/night tariffs) or dynamic (e.g. hourly) tariffs. In Spain, all supply contracts for under 15 kW will be exposed to three different grid tariffs broken up between different time slots. This results in a new price signal for domestic users to move loads to hours with less electricity demand.[237]

Action driver 2

ACCESS TO RELEVANT ICT TOOLS

Some energy communities are developing innovative services by developing their own ICT tools (e.g. The Mobility Factory). Among them, some are significantly based on open source. In the UK, Carbon Co-op is developing flexibility services to reply to requests from DSOs using Home Assistant and complementary tools promoted by the Linux Foundation for Energy.[238] In Spain, Som Energia is co-developing a multi-service platform for energy communities including energy sharing.[239] This platform benefits from the support of local authorities and is being developed as an open source tool with licensing allowing only actors from the social economy to use it.

While the landscape of energy communities appears quite fragmented, open source software may provide a way for them to benefit from their non-competitive nature and to collaborate on tools in a decentralised manner.

Action driver 3

ALLOWING AGGREGATION OF SMALLER CONSUMER LOADS

The possibility for small assets to participate in energy markets using aggregation provides the

opportunity for energy communities to contract with (or to become) aggregators. In Spain, aggregation of demand, generation or storage has been allowed with a minimum threshold of 1 MW. This provides an opportunity for energy communities with residential loads to contract with commercial aggregators.

In the UK, increased financial benefits have been created to incentivise consumers to reduce electricity use during peak hours. In trials related to the National Grid Demand Flexibility Service (DFS) scheme over the winter of 2022-2023, participants were paid between £3 - £5 per kWh (sic) for flexibility provided. Members may therefore be interested to participate in these schemes via an energy cooperative acting as an aggregator.

Action driver 4

USE OF REGULATORY SANDBOXES

A regulatory sandbox can be defined as a closed environment, based on agreed rules with the NRA, granting some exceptions in order to run experimental activities in close-to-real life conditions. The Florence School of Regulation (FSR) provides a clear description of their purpose:

> “The motivation behind setting up a regulatory sandbox is two-fold. First, allow innovators to test new technologies and business models that are only partially compatible with the existing legal and regulatory framework. Second, allow regulators to learn about particular innovations. As such, regulators can develop the right regulatory environment to accommodate them.[240]”

Within the FLEXCoop project, the citizen cooperative, Endona, benefited from being able to perform several experiments within a regulatory sandbox around the area of Heeten, Netherlands. Through their participation in the regulatory sandbox, Endona was enabled to provide local supply services and to experiment flexibility services in direct contact with system operators (DSO and TSO).

Action driver 5

DEVELOPMENT OF LOCAL FLEXIBILITY MARKETS

A number of local flexibility markets are currently under development across different countries. Within the INTERRFACE project, the FSR has provided an overview of four pioneering initiatives:[241]

- Piclo Flex (UK) – a flexibility platform for DSOs. Six DSOs in the UK are Piclo Flex members.
- Enera (Germany) – a joint project between the power exchange EPEX SPOT, one of the German TSOs TenneT DE and the German DSOs Avacon Netz and EWE NETZ.
- GOPACS (Netherlands) stands for Grid Operators Platform for Congestion Solutions. GOPACS is owned and operated by the Dutch TSO and four DSOs.
- NODES (Nordic countries) – a joint venture between the Norwegian utility Agder Energi and the European power exchange Nord Pool[242] (since then, Agder Energi has bought all shares of NODES).

Local flexibility markets are not standardised, and FSR has identified six questions related to their design:

1 | Flexibility market may or may not be integrated in the existing sequence of EU electricity markets?

2 | Is the flexibility market operator a third party?

3 | Is there a reservation payment?

4 | Are products standardised in the flexibility market?

5 | Is there TSO-DSO cooperation for the organisation of the flexibility?

6 | Is there DSO-DSO cooperation for the organisation of the flexibility market?

The report highlights the differences in the answers provided, as well as pros and cons of the different approaches. The table below summarises answers provided by the FSR in its report to these questions.[243]

Table 1: Overview of the four [flexibility market] projects for the six design controversies according to FSR study.

	YES	NO
1. Is the flexibility market integrated in the existing sequence of EU electricity markets?	GOPACS and NODES	Piclo Flex and Enera
2. Is the flexibility market operator a third party?	All projects. GOPACS is not a market platform operator but an intermediary. Currently, the market platform is ETPA.	/
3. Is there a reservation payment?	Piclo Flex	Enera, GOPACS and NODES (all projects envision to integrate reservations)
4. Are products standardised in the flexibility market?	Piclo Flex, Enera and GOPACS (IDCONS product)	NODES
5. Is there TSO-DSO cooperation for the organisation of the flexibility market?	GOPACS (TSO and DSOs use the same intermediary). Enera and NODES (soon also the TSOs will be active).	Piclo Flex is solely a DSO platform
6. Is there DSO-DSO cooperation for the organisation of the flexibility market?	Piclo Flex (6 DSOs), GOPACS (4 DSOs), Enera and NODES (one DSO active per installation, soon more will join)	/

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[4] RED II, Recitals 70-71; and IMED, Recitals 43, 44 and 46.

[5] For the purposes of this Report, we refer to RECs and CECs collectively as energy communities, unless specific reference of either REC or CEC is warranted.

[6] RED II, Recital 71.

[7] RED II, Article 2(16) subparagraph (a); and Article 22 paragraph 5 subparagraph (f).

[8] RED II, Recital 71.

[9] IMED, Recitals 44 and 46.

[10] IMED, Recital 43.

[11] RED II, Article 22 paragraph 4; and IMED, Article 16 paragraph 1.

[12] IMED, Article 59 paragraph 1 subparagraph (z). In practice, this should also apply to RECs.

[13] We also identify the following activities available to energy communities, but do not cover them here: and production and distribution of heating and cooling community-owned electricity infrastructure, and acting as a service provider (e.g. mobility, energy efficiency or renovation services). It is important to highlight that depending on their aims and professional maturity, energy communities are capable to and will often integrate more than one activity into a particular business model.

[14] COME RES, Community Power Project, CEES, Co2mmunity, SHAREs, EC2, mPOWER, DECIDE, COMPILE, cVPP Project, REScoop VPP, FLEXcoop, ALPGRIDS, BEcoop, REScoop 20-20-20, BRIDGE, LIFE LOOP, NEWCOMERS, NRG2 PEERS, UPSTAIRS, SCCALE, ACCE, OneNet, COMETS, TANDEMS, LIGHTNESS, INTERRFACE, Clean Energy for EU Islands, AURES II, and the Renewables Networking Platform.

[15] The first workshop was held online on the 22nd of February 2023, which was more informal, brought together energy communities and traditional energy sector stakeholders, and focused on communicating and debating initial findings of the report with regard to the activities of energy sharing and supply. The second workshop was held in a hybrid format on the 5th of

July 2023 in a more formal setting, where findings of the overall report were presented, and a dialogue was held between energy communities, Member States' representatives, regulators, the European Commission, and sector stakeholders.

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[18] Id, at p 11.

[19] Id, at p 12.

[20] Maleki-Dizaji P, and Rueda F (2022). Synthesis Report based on in-depth assessment of 10 transferable best practices - D5.3 (Ecorys), pp 31-32.

[21] Holstenkamp and Kriel (2022), n 17 at p 15.

[22] Id, at p 4.

[23] Couture, T et al (2021). Scaling up Energy Communities in Bulgaria (E3 Analytics: Berlin), p 15.

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[35] DECC (2014). Community Energy Strategy: Full Report. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/275163/20140126Community_Energy_Strategy.pdf.

[36] The recitals and existing definitions in IMED and RED II provide some further guidance to Member States. For example, control is defined in Article 2 (56) of the IMED as meaning rights, contracts or other means which, either separately or in combination and having regard to the considerations of fact or law involved, confer the possibility of exercising decisive influence on an undertaking, in particular by: (a) ownership or the right to use all or part of the assets of an undertaking; (b) rights or contracts which confer decisive influence on the composition, voting or decisions of the organs of an undertaking. The principle of autonomy is clarified in Recital 71 of the RED II to mean that RECs should be capable of remaining autonomous from individual members and other traditional market actors that participate in the community as members or shareholders, or who cooperate through other means such as investment.

[37] Magyar Természetvédők Szövetsége (MTVSZ) (2021). Megújulóenergia-közösségek akadályai és lehetőségei Magyarországon: Értékelő tanulmányp (Barriers and opportunities for renewable energy communities in Hungary: Evaluation study).

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[151] Herbemont, S and Roberts, J (2020), n 108 at p 29.

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[153] Ecorys (2022), n 88 at p 21.

[154] Directive (EU) 2023/2413 of the European Parliament and of the Council of 18 October 2023 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources. OJ L, 2023/2413, 31.10.2023 (RED III), Article 15a(3).

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