ENERGY COMMUNITIES AND COLLECTIVE ACTIONS: YEARLY POLICY BRIEF ON REGULATION

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ABSTRACT

Aim of this policy brief is to provide insights on how the EU Member States' frameworks have led to a development of energy communities and collective actions. Focus is on the DECIDE pilot countries (Austria, Belgium, Estonia, Germany and Greece), but also information from other EU countries that were retrieved via interviews or via communication with DECIDE replicants are considered. Next to an overview of all EU 27 Members States' transposition status, detailed insights into the DECIDE pilot countries are provided accompanied by an analysis of barriers. Barriers identified include issues related to data access and allocation of energy, limitations regarding grid access, fast-paced changes and inconsistencies in current legislation or immature flexibility markets. Overall, the policy brief concludes that energy communities are only one piece of a comprehensive EU package, the partial or selective transposition of elements of this package hinders energy communities and other collective actions to achieve their full potential.

CONTENTS

1. INTRODUCTION AND OVERVIEW

The road towards the implementation of a legal framework that will allow energy communities and other collective actions by the EU Member States proved to be complex. However, the current climate and political emergency might accelerate the clean energy transition and implementation of energy communities.

While the last IPCC report restates how urgent we need to speed up action to reduce the impact of climate change on the global scale, the political crisis made evident the still existing and strong dependency of the EU on fossil fuel resources. In response to the current situation, the EU proposed a package of measures, called REPowerEU[1], aiming at rapidly decreasing dependence on Russian fossil fuel, which currently counts for around one-third of EU total imports, while aiming at accelerating the clean energy transition. The plan, presented on 18th May 2022, therefore combines the will to increase European energy self-sufficiency with the need to reduce GHG emissions and deliver on the climate targets. The boost of renewable energy roll-out is one of the three pillars of this ambitious set of measures that aims to increase targets of renewable energy production from 40% to 45% with a total of 600GW of installed capacity by 2030. In the so-called European Solar Initiative the European Commission asks Member States to ease permitting procedures and to eliminate administrative obstacles, whilst making mandatory the installation of PV rooftops on buildings and the setup of at least one renewable energy community in all municipalities above 10.000 inhabitants[2]. Next to energy communities the strategy mentions ”other” collective solar energy projects as another avenue to reduce the consumption of fossil fuels and address energy poverty and vulnerability. In this context Member States should support partnerships between local authorities, energy communities and social housing managers to facilitate individual and collective self-consumption schemes. Pre-financing shares in energy communities, virtual net-metering schemes (while accounting separately for calculating network charges) or renting out solar PV, energy storage and heat pumps at a fee lower than retail electricity prices, can all be used for this purpose[3]. The energy crisis consequent to the conflict shows the tight links that energy has directly or indirectly on social aspects. The rise in prices widens inequalities increasing the number of energy poor households and affecting the costs of production for the businesses. Now more than ever energy communities and collective energy actions can play a pivotal role in making sure the energy transition progresses at speed, leaving no one behind. Therefore, it is key that community owned initiatives have a clear legal framework and strong support to multiply across Europe.

Aim of this policy brief is to provide insights on how the EU Member States' frameworks have led to a more dynamic development of energy communities and collective actions and which barriers they still face. Focus is on the DECIDE pilot countries (Austria, Belgium,

[1] https://ec.europa.eu/commission/presscorner/detail/en/IP_22_3131
[2] https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=COM:2022:221:FIN
[3] ibid

Estonia, Germany and Greece), but also information from other EU countries that were retrieved via interviews or via communication with DECIDE replicants are considered.

Recap of definitions[4]

The Clean Energy Package contains two definitions of energy communities: The **concept of Citizen Energy Communities (CEC)**, which is contained in the recast of the Electricity Market Directive (EMD) and **Renewable Energy Communities (REC),** a concept which is contained in the new Renewable Energy Directive (REDII)

According to the recast of the EMD (Art 16), "**Citizen Energy Communitie**s" constitute a new type of entity due to their membership structure, governance requirements and purpose" where the purpose is framed around the provision of services/benefits for members of the community including environmental, economic or social community benefits to its members or shareholders. Citizen Energy Communities have a strong emphasis on non-discriminatory access to the electricity markets, either directly or through aggregation and have no geographical boundaries. The definition of CECs identifies different types of activities that CECs could engage in that are not limited to renewable energy however to electricity. While the provision of services/benefits for members of the community is also a core element of **Renewable Energy Communities** defined in the REDII (Art 22), they have more stringent governance requirements and are open to all kinds of renewable energy sources. RECs are in accordance with the applicable national law based on open and voluntary participation, autonomous, effectively controlled by shareholders or members that are located in the proximity of the renewable energy projects that are owned and developed by that legal entity. There is also a stronger obligation for Member States to incentivize and support the development of RECs, not just to provide a level playing field in the energy market (as is the case for CECs). Renewable self-consumption should be seen as a potential activity of a renewable energy community among other potential activities it could undertake.

The REDII also defines individual "renewables self-consumers" as well as **"jointly acting renewables self-consumers"** (Art 21 RED). The frequently used term collective self-consumption (CSC) corresponds in this report to "jointly acting renewables self-consumers". Member States shall ensure that renewables self-consumers are located in the same building, including multi-apartment blocks or, where permitted by a Member State, within other premises (REDII Art 2.14) and are permitted to arrange sharing of renewable energy that is produced on their site or sites between themselves, without prejudice to the network charges and other relevant charges, fees, levies and taxes applicable to each renewables self-consumer. The renewables self-consumer's installation may be owned by a third party or managed by a third party for installation, operation, including metering and maintenance, provided that the third party remains subject to the renewables self-consumer's instructions. The third party itself shall not be considered to be a renewables self-consumer. The Electricity Market Directive (Art. 15)

[4] See Frieden et al., 2021

defines **active customers** as a final customer or a group of jointly acting final customers, who consume or store electricity generated within its premises located within confined boundaries or within other premises, who sell self-generated electricity or participate in flexibility or energy efficiency schemes, provided that those activities do not constitute their its primary commercial or professional activity.

Most EU countries have already prepared draft or final regulatory frameworks for RECs and collective self-consumption (CSC), a few also for CECs. The degree of details in the respective legislative documents, however, strongly differs among Member States. Note that implemented frameworks (having green hooks in Figure Table 1) can range between having elaborated frameworks or just basic definitions.

Country	Renewable energy communities	Citizen energy communities
Austria	✓	✓
Belgium: Wallonia	✓	✓
Belgium: Brussels	✓	✓
Belgium: Flanders	✓	✓
Bulgaria	-	-
Croatia	draft	draft
Cyprus	draft	draft
Czech Republic	-	-
Denmark	✓	✓
Estonia	✓	✓
Finland	-	-
France	✓	✓
Germany	-	-
Greece	✓	✓
Hungary	draft	-
Ireland	✓	-
Italy	✓	✓
Latvia	-	-
Lithuania	✓	-
Luxemburg	✓	-
Malta	-	-
Netherlands	draft	draft
Poland	draft	draft
Portugal	✓	-
Romania	draft	draft
Slovakia	-	-
Slovenia	✓	✓
Spain	✓	-
Sweden	draft	draft

Table 1: Status quo of full and draft energy community transpositions, May 2022

Regarding jointly acting renewables self-consumers, most Member States limit them to multi-apartments. Portugal and France are providing for a 500 m radius (Spain), 2 km (Portugal) or 10 km (France) distance for collective self-consumption. The concept of active consumers that would allow collective electricity self-consumption, but also a jointly participation in flexibility or energy efficiency schemes with actors possibly being located at different premises is hardly yet operationalized by Member States.

2. FRAMEWORKS IN DECIDE PILOT COUNTRIES

This chapter provides a description of the regulatory frameworks in the DECIDE countries as well as observed barriers to energy community rollout.

Austria

In July 2021, a legislative package on the expansion of renewable energy was adopted (Renewables Expansion Law/Erneuerbaren-Ausbau-Gesetz, EAG). The legislative package establishes a framework for RECs, while also provisions on CECs are introduced.

In the context of RECs „local energy communities“ and “regional energy communities“ are defined. Local energy communities are related to the low voltage (LV) level of the electricity grid and regional energy communities to the medium voltage (MV) level of the grid. The organisational form is open, it can be for example an association or cooperative. The right of consumers to choose a supplier (for the residual demand of electricity) cannot be withdrawn by energy communities.

Austria has introduced reduced grid fees for electricity exchange within energy communities. In order to set the level of reduction the following principle is followed: fees for using electricity grid with voltage levels that are superordinate to the electricity grid voltage level in which the REC is located are deducted for electricity exchanged within the RECs. In addition, the volumetric tariff elements for surcharges are deducted from the electricity grid tariff. That sums up to a grid fee reduction of 57% for the LV level, for MV energy communities it is 28%[5] .

In summer 2021, Austria has established a Coordination Office for Energy Communities. Together with the public advisory institutions in the federal states, it will ensure that energy communities in Austria can be set up and operated easily and become an relevant part of the energy market in Austria[6].

The Austrian government has started to provide up to four million Euro to support the establishment of energy communities. Currently (May 2022) 14 RECs are operational and 34 are in an implementation phase[7].

[5] https://energiegemeinschaften.gv.at/niedrigere-netzkosten-fuer-eegs/
[6] https://energiegemeinschaften.gv.at/
[7] https://orf.at/stories/3265040/

Issues energy communities face in Austria are lengthy procedures for grid connections and data access. Often emerging energy communities do not know the grid typology and which transformer they are related to and need to request this information. The grid related boundaries in Austria may lead alsoo to issues when including local district heating. In Austria there is a large range of local biomass based heating operators, many of them suitable for expanding in electricity via PV, cogeneration, and sector coupling, as well efficiency measures. To get larger reductions of grid fees they would need to operate behind a LV transformer, while the customers of local heating networks may not all be located within this boundary.

Belgium

The implementation status of EU Directives related to Energy Communities varies between the three regions in Belgium: Brussels Capital Region, Flanders and Wallonia, since they have different legal transpositions.

Brussels Capital Region

The Brussels Capital Region transposed the EU framework on energy communities and energy sharing with the ordinance of 17 March 2022[8], published on 20 April 2022.

The Brussels Capital Region makes a distinction between energy sharing and energy communities. Energy sharing includes peer-to-peer trading and collective self-consumption within a building operationalizing the concept of active consumers. Regarding energy communities, the Brussels Capital Region directly transposes the EU definitions of Renewable Energy Communities (REC) and Citizen Energy Communities (CEC). The effective control of RECs is limited to members connected to the distribution system or regional transmission system (the region of Brussels)[9].

The decree additionally introduces a third type of Energy Community: "Local Energy Communities."[10] For these types of communities, production, consumption, storage, and sharing should take place within the energy community, and is limited to renewable energy. The local energy community is created outside of transposition needs, in order to create a category of community adapted to the regional context of Brussels: in particular with regard to the opportunity to mobilize existing installations or to resort to the

[8] https://www.ejustice.just.fgov.be/doc, 17 MARS 2022. - Ordonnance modifiant l'ordonnance du 19 juillet 2001 relative à l'organisation du marché de l'électricité en Région de Bruxelles-Capitale, l'ordonnance du 1er avril 2004 relative à l'organisation du marché du gaz en Région de Bruxelles-Capitale, concernant des redevances de voiries en matière de gaz et d'électricité et portant modification de l'ordonnance du 19 juillet 2001 relative à l'organisation du marché de l'électricité en Région de Bruxelles-Capitale et l'ordonnance du 12 décembre 1991 créant des fonds budgétaires en vue de la transposition de la directive 2018/2001 et de la directive 2019/944.

[9] https://www.rescoop.eu/policy/brussels-rec-cec-definitions

[10] Article 71 of the Ordinance.

participation of a third-party having ownership in a context where many roofs are shared[11]. The Brussels DSO Sibelga has the role to facilitate energy sharing and energy communities[12]. Additionally, the regulator Brugel has is mandated to regulate tariffs and supply licences. In the two years leading up to the adoption of the ordinance, Brugel and the Brussels Government have introduced exceptions for Energy Community Pilots[13].

Wallonia

In October 2018, The Wallonian government adopted a framework for collective self-consumers, followed by adoption of a decree defining Renewable Energy Communities in May 2019. According to this Decree, Renewable Energy Communities (RECs) are communities that produce, consume, store and sell renewable electricity for the benefit of participants at the local level using the public network or a private grid, thereby directly transposing the EU definitition. Similarly to the EU definitions of renewable self-consumers, RECs should further balance both, consumption and production flows in the community grid.

Article 2 of the Decree addresses proximity via a "local perimeter", defined as a grid segment whose connection points are located downstream of one or more stations of public electricity transformation of medium and/or low voltage. According to the decree, the government determines the local perimeter after consulting the Wallonian Energy Commission (CWaPE) and the network operators. Further, any natural person, local authority or small or medium sized company located in a local perimeter can become a member of the community. Participation should be free and open. So far, the law defines the technical requirements for energy communities, while governance aspects are not yet addressed.

In addition, both, citizens energy communities and active consumers were transposed into Walloon law by a decree adopted by the Walloon Parliament on May 4, 2022[14]. Wallonia defined active consumers as actors sharing renewable energy produced collectively within the same building. Both for Citizen Energy Communities and active consumers, shared electricity is not considered as electricity supply activity (and therefore no supply license is required).

Flanders

In April 2021, the Flemish government adopted a decree transposing EU Directives related to Energy Communities. Subsequently, it presented a draft implementation order on 9 July 2021, which further implements the transposition decree.

Aside from the inclusion of the concept of energy communities and collective self-

[11] https://www.ejustice.just.fgov.be/doc, 17 MARS 2022

[12] https://www.sibelga.be/fr/a-propos-sibelga/responsabilite-societale/nos-6-engagements/facilitateur-de-la-transition-energetique

[13] https://projets-innovants.brugel.brussels/

[14] https://energie.wallonie.be/de/communautes-d-energie-et-partage-d-energie.html?IDC=10295

consumption, the adoption is accompanied with several changes with regard to the operation of the distribution grid, including closed electricity distribution networks (as opposed to private networks). The Flemish legislator has opted for combining several concepts in a smaller number of definitions, such as the concepts of active consumer (combining the "active consumer" and the "self-consumer of renewable energy"), citizen energy community and renewable energy community and the newly included activities such as energy sharing and peer-to-peer (P2P) trading. The transposition decree of 2 April 2021 links the role of "active consumer" (located in a building) with the newly defined activity "energy sharing". This entails that the active consumers do not need to be in same buildings and may be at different locations.

Situation on the ground

Changes in the tariff are to be decided by the regulator. The regulator can only allow reductions if there are savings that are linked to a reduction in currently included cost items. Energy communities however may not lead to cost reductions with regards to the operation of the grid. Members of the energy community who inject energy, are further not allowed to sell energy to the other members, unless they apply for a supplier licence which entails additional responsibilities. The implementation is not well-explained and hence complex for most people as well as for administrative staff in cities and municipalities. The lack of a business case further does not encourage market actors to develop dedicated products and services. Hence, there is no actual market development and the phenomenon currently remains marginal.

Estonia

In May 2022, the Estonian government adopted an Electricity Market Act, which promotes the creation of energy communities, obliges network operators to purchase flexibility services from the market and regulates the ownership relations of distribution network operators and electric car sharing infrastructure[15]. A detailed specification of energy communities is missing such as a clear proximity definition. The role of public and local authorities is not defined in the law although those institutions are expected to promote and drive the transition. The new legislation however promotes cooperation between energy distributors and energy communities.

Issues that were identified in a stakeholder workshop on 6.5.2022, to which our DECIDE partner TREA contributed, include:

- public procurement requirements and related restrictions for local governments, have proved to be an obstacle in case of cooperation between local governments and energy communities. This is caused by the restrictions set out in the Estonian Public

[15] https://energiatalgud.ee/node/8904?category=750

Procurement Act and the obligation of local governments to use it, including for the purchase of electricity. The law does not allow to prefer locally produced electricity.

- In some areas there is a poor connection capacity to the grid. Due to the lack of connection power to the DSO grid the processing time can be particularly long.

The workshop identified a range of motivations for implementing energy communities in Estonia including:

- the important value and opportunities of community energy due to the introduction of (roof) areas for which a common agreement is required in particular public areas such as schools, kindergartens, houses of culture, community centres, etc.
- Community energy has the potential to be developed on public owned areas that face different constraints. If there is state-owned land, the state can, under certain conditions, decide to make it available to energy communities. It can provide land for a small fee or free of charge to promote energy communities.
- Integrating community energy with social issues (energy poverty, social aid etc.). For example, the state pays a contribution to the cooperative PV park for disadvantaged people at the expense of social aid payments. The production of the PV park during the summer is accumulating in the person's account for the winter period and persons have to pay less to the energy provider - energy costs are lower and social aid paid by the state/ local government will be lower accordingly.

Germany

Germany has not fully transposed the EU provisions for energy communities into national law. However, there is a long history of citizen-financed projects that are regarded as energy communities in a wider sense. Cooperatives have a long tradition in Germany. There are close to 1,000 cooperatives for the operation of renewable energy plants. These often aim to use the electricity generated by their plants themselves. Implementing the EU directives on energy communities could give these cooperatives an opportunity to implement self-consumption.

According to the Cooperatives Act (GenG), they are defined as an association of persons "whose purpose is to promote the acquisition or the economy of their members or their social or cultural interests through joint business operations". Most energy cooperatives were founded in the last 10 years and have proven their worth in the first area of the German Energiewende “Energy Transition 1.0” as a form of enterprise that brings citizens, energy suppliers and municipalities closer together to jointly finance and implement renewable energy projects. The cooperative form of organisation with its characteristic principles such as self-help, self-responsibility, "one person, one vote" is also suitable for advancing the Energiewende 2.0, possibly in the form of Renewable or Citizen Energy Communities.

Energy supply in Germany is quite diverse and rather complex. Among other things, the role of the approximately 1,000, mostly municipal, public utilities and regional suppliers must be taken into account [16]. There are quite a number of issues to consider when implementing the EU directives on Renewable and Citizen Energy Communities. This is one reason why they have not been (fully) transposed to national law so far. For example, there should be a prosperous cooperation between the new players in the energy system and the municipal utilities that have been operating sustainably in their region for a long time. Further fragmentation of the energy markets or even competitive situations on the market could also hinder the urgently needed energy transition.

The EU directives want to strengthen individual citizens and cooperative actions in the energy market. Sometimes it is also feared that large companies and investors will establish (many) pro forma cooperatives in order to meet the requirements for energy communities and control the market at the same time. This would not be in the spirit of the EU directives, especially if such organisations were to enjoy more rights and higher standing than, for example, municipal utilities, which are not usually considered energy communities under the EU directives. In any case, the legal and regulatory framework should also recognise energy communities that are not centred around self-supply but involved in other energy actions such as improving energy efficiency, managing energy exchanges via block-chains or optimising the use of charging infrastructure.

In Germany, the Erneuerbare Energien Gesetz (EEG, Renewable Energy Sources Act) is decisive for the construction and operation of plants based on renewable energies. As part of the so-called Easter Package, the Federal Government presented an amendment proposal for the EEG in April 2022, which is to come into force in 2023.

§ 21 EEG offers the option of a tenant electricity supply, which according to the EEG shall also be possible if the parties involved are not in the same building but in the same district. However, it has not yet been defined with legal certainty what is meant by a district. In any case, it shall not be allowed to use the public grid in such a concept. In this respect, the possibilities are limited to communities with a single grid connection point. However, such a community can operate a storage outside its building or district and – in case it uses it only for storing and reusing their own electricity – is released from double grid fees.

The currently valid EEG of 2021 had already introduced the concept of a „Bürgerenergiegesellschaft“ (BEG, literally translated „citizen energy enterprise“). In the EEG amendment for 2023, this definition is expanded and now also allows the participation of small and medium enterprises (SMEs) and municipalities. In this way, central elements of the Renewable Energy Communities and Citizen Energy Communities described in the EU directives are implemented and combined under a single term. Projects carried out by a BEG can be realised (with restrictions) without having to

[16] https://www.marktstammdatenregister.de/MaStR/Akteur/Marktakteur/IndexOeffentlich

participate in a tendering process beforehand. In addition, there shall be subsidies for BEGs in the planning and approval phase for onshore wind turbines.

BEGs are limited to renewable energies, but there is no "proximity requirement". However, the supply of electricity is reserved for companies that are Energieversorgungsunternehmen (EVU, literally translated “energy supply companies”) [17]. In this respect, the planned EEG 2023 amendment still largely lacks the possibilities of energy sharing inside a BEG in the sense of the EU directives.

According to the planned 2023 amendment of the EEG, existing or new cooperatives that are also energy supply companies (EVUs) within the meaning of the German Energy Industry Act will be counted as BEGs (citizens' energy companies). They can themselves or through participation in "subsidiary companies" receive relief in tenders for the construction of PV or wind energy plants and can in principle offer their owners or members special tariffs in the sense of energy sharing. As an example the 100 year old cooperative Elektrizitätswerke Hindelang e.G. (EWH) as a member of the DECIDE consortium is investigating its new options with respect to the building and operating of PV, water and wind plants, the supply of its customers and the self-supply of its members.

Heat supply is far less regulated than the electricity supply sector. For the construction and operation of heat generation plants and heat grids, various cooperatives and similar companies have been created in Germany, which include connected households and businesses as members, shareholders or investors. However, at present and even after the amendment of the Renewable Energy Sources Act (EEG 2023), it is not possible, for example, to generate heat with a large heat pump powered by self-generated electricity, to buffer it in a large common heat storage facility and to distribute it via a small heat network.

Greece

In 2018, a law on energy communities (law N4513/2018) was introduced, which expanded the scope of virtual net metering to energy communities. The law defines energy communities as urban partnerships with the aim of social and solidarity economy, and innovation in the energy sector. This law is different from other transposition approaches in Europe in the sense that it preceded the final version of the relevant EU directives. Nevertheless, it addresses a major part of the EU framework providing novel interpretations on specific issues such as insularity and energy poverty. An energy community is to be organised as a cooperative that can produce, distribute, and supply

[17] Energieversorgungsunternehmen (EVU, energy supply companies) are "natural or legal persons who supply energy to others, operate an energy supply network or have power of disposal over an energy supply network as the owner; the operation of a customer installation or a customer installation for the operational supply of electricity does not make the operator an energy supply company.” Energy supply companies are part of the basic supply and are obliged to supply according to the Energy Industry Act (EnWG).

renewable energy from installations of up to 3 MW. (Frieden et al., 2020). Additional activities may include natural gas heating/cooling, demand-side management, aggregation of producers/consumers, and network development. Regarding proximity of effective control, the law states that 51% of the energy community members must have local ties with the district in which the energy community has its headquarters. In case of individuals these local ties shall be demonstrated by a) ownership rights or b) by the right to use (usufruct) immovable property within the district of the energy community, or c) by being officially registered as residents in the concerned municipality. For legal entities, the local relation to the energy community requires the headquarters to be within the district in which the energy community has its headquarters (Douvitsa 2018). The Greek law provides for a cap on the share of each member in the cooperative capital of 20%, with the exception of municipalities. Municipalities may generally participate in the cooperative capital with 40%. In island regions with a population below 3,100 inhabitants, municipalities may even participate with up to 50% in the cooperative capital. At least five energy communities, which have their headquarters in the same region, may set up joint energy cooperatives for the purpose of coordination and the promotion of their activities (Frieden et al., 2020)

The law distinguishes two types of energy communities: non-profit and for-profit cooperatives. In non-profit cooperatives, financial surpluses are not distributed to members but remain in the energy community in the form of reserves and are distributed for its purposes by the decision of the general assembly. The surplus of for-profit cooperatives is permitted to be distributed between members under certain conditions and after deduction of the regular reserve. Each type varies in composition and the minimum number of members. The legislation states that collective self-consumption via virtual net metering may be performed by community members only when they have the same electricity supplier[18] .

Virtual net metering is calculated on annual basis, while the supplier can charge the consumer each month or every 4 months based on the DSO validated meter readings, depending on their billing practice. This can potentially create discrepancies in the bookkeeping and account irregularities. In most Member States each member can be with a different supplier.

[18] Frieden et al, 2021

3. ISSUES WHEN OPERATIONALIZING ENERGY COMMUNITIES AND COLLECTIVE ACTIONS

Even if most EU Member States have basic legislative frameworks for energy communities in place, operationalizing the concept still faces a range of barriers as observed so far and highlighted in DECIDE stakeholder and expert workshops. This chapter is based on insights from the DECIDE pilots, DECIDE replicants, DECIDE workshops including other initiatives and a set of interviews in countries in which DECIDE has no pilots.

Data access

Data access is being discussed in several Member States and is often a problem if energy community accounting depends on this data. In most countries, DSOs are in charge of measurement. In Germany, independent measurement operators ("Messtellenbetreiber") are allowed. DSOs often provide data only once a day or even less frequently, which will not enable peer-to-peer electricity trading or flexibility provisions to markets. In Belgium and Austria, smart meters will have an interface with which the energy community can read out real-time data but energy communities will have to pay for the interfaces and communication infrastructure.

Allocation of energy

Some countries (e.g. Finland) have proposed fixed sharing coefficients, meaning the allocation of energy is fixed for participants independent of their actual energy needs. Most countries have proposed variable ex-ante or dynamic ex-post coefficients, or a choice between static and variable/dynamic coefficients. However, in some countries, the modus of dynamic sharing is determined by DSOs such as in Austria, where the energy communities have no free choice of the sharing mechanism. Dynamic distribution in Austria means that a community-wide quotient between community generation and community demand is equally applied to every member's individual consumption quarter-hourly. This means that members with higher consumption in a quarter-hourly interval receive more energy in absolute terms.

In Spain, the sharing mechanism is set beforehand. The use of variable coefficients was enabled in a regulation in 2021[19]. To use variable coefficients, communities must inform their retailers of the allocation coefficients for each hour for the upcoming year. The value of these coefficients may be determined based on the power to be billed by each of the participating consumers, the economic contribution of each of the consumers for the generation installation, or any other criterion, provided that there is an agreement signed

[19] Order TED/1247/2021

by all participants.[20] In case these coefficient depends on the participant's energy consumption, setting this coefficient however may cause challenges for energy communities as they need to properly predict generation and load profiles. The timeframe in which coefficients can be changed is different among countries, for example in Austria the coefficient can be changed once a year and in Greece every 3 months in conjunction with the electricity bill, which is calculated in this period. In Spain, the coefficient can be changed every 4 months. The period in which changes are possible often reflects DSO practices. The shorter this period is, the better new loads or new generation can be considered. In several countries, we observed that DSOs face challenges taking up their responsibility to allocate energy to energy communities based on predefined and possibly dynamic sharing rules as they need to change their IT systems. According to DSOs this takes time and can be costly.

Grid access

Issues with grid access of energy communities were observed in several EU countries. In Greece there is a need to get a connection term agreement with the DSO. Yet, the DSO can refuse such an agreement if the grid is not capable of absorbing the planned amount of renewables, which is a barrier in particular for big projects and the reason that only a few energy communities are operational. Also in Austria with many small DSOs, larger plants may face restrictions in being connected to the LV grid.

Using grid typologies as spatial limitations

Renewable Energy Communities require the proximity of decision-makers to the renewable energy projects. Proximity of the renewable energy projects can be determined using several approaches, such as grid typologies, administrative boundaries or activity-related methods. In case the spatial boundary is the LV transformer this may be very limiting as has been seen in Austria and other countries (e.g. Slovenia or Croatia, see Frieden et al. 2021)). Providing public support for small communities behind the LV transformer may hinder the development of more diverse communities (mix of households and commercial entities) and may lead to an overinvestment in suboptimal used decentralized technologies. In addition, the area behind an LV can be very different in size depending on the location. In several countries, there is a lack of information and transparency about the local distribution system that an energy community is related to. It can be a complex mechanism to get the required information (e.g. in Portugal the DSO cannot share directly to interested consumers willing to set up a REC or a collective self-consumption whether or not the sharing of electricity will happen through the public grid – this creates high uncertainty).

[20] Order TED/1247/2021

The role of municipalities and local authorities

Municipalities have a possible strong role as enablers of energy communities. The municipality can participate directly in the activities of the energy community as a member or, for example, a representative in the council of the cooperative (Ivask, 2021a). Municipalities however may also be stuck in existing structures and practices that can hinder the deployment of energy communities. The role of public, local authorities is often not defined in law although those institutions are expected to promote and drive the transition with funding and know-how.

Immature or missing flexibility markets

Flexibility markets for LV appliances are often not well accessible even if in principle possible in some EU Member States. This affects collective actions that aim to valorize small-scale flexibilities. Regarding the establishment of local flexibility markets (foreseen in the EMD) many DSOs have no interest, preferring grid expansion (what they know how to do and have been doing for the last 100 years), instead of paying for services from energy communities.

Fast-paced changes and inconsistencies in current legislation

In some countries such as Portugal, we observe unclear requirements (technical and legislative) and fast policy changes e.g. regarding the reduction of grid fees and surcharges for collective self-consumption. In other countries, existing policies, such as full retail net metering for households are more beneficial than joining an energy community. Even though full retail net metering is being phased out in the EU by end of 2023 it may slow down the deployment of energy communities.

Ownership of installations

According to EU provisions, production units are owned by an energy community. “Ownership” may, however, be interpreted differently across different member states and may lead to different rules regarding the legal relationship of the communities to “their” installations (Frieden et. al, 2021). For instance, in Austria third parties can act as contractors and own the installation, while decisions on the operation of the installation are still with the community (Austrian Coordination office for Energy Communities, 2021). Also, in Portugal different options for “external” ownership, including contracting, are discussed: here, the energy community may be responsible for the operation while the involvement of external investors would be possible. In Greece, in contrast, the installations must be owned by the community. The region of Brussels has created a separate definition of “Local Energy Communities” in which third-party parties can have ownership.

Lack of interest in decentralized solutions in some EU member states

In some of the new Member States the public is not used to any type of prosumer approach, as the former energy system was centralized and there is trust in existing supply

structures. Such Member States are more used to the concept of a third party providing energy services. Awareness-raising measures and strong work with municipalities and suppliers is needed in these countries.

4. CONCLUSIONS

The regulatory frameworks in EU Member States are strongly focused on operationalizing Renewable Energy Communities. Less attention is paid to Citizen Energy Communities. Even though the EU definition allows for a broader scope, jointly acting renewables self-consumers are often restricted to the multi-apartment level. Spain, Portugal and France, however, have a larger geographical scope than the building level. Active consumers finally are hardly defined by Member States, and if so, mostly limited to the building level, although they could jointly operate within wider boundaries or other premises.

The way Member States are transposing Renewable Energy Communities is often focused on promoting renewables electricity self-consumption. This may be driven by DSOs who could fear higher shares of fluctuating renewables being injected into the grid. Renewable Energy Communities however are open to all types of energy carriers and should facilitate sector coupling and integrated systems, potentially leading to viable business cases that so far hardly exist. Some of the barriers observed in the DECIDE project are related to difficulties DSOs have with energy communities as new players, with many of them in need to adapt their routines or data management systems.

While most of the member states focus on providing a framework for energy communities, we observe a range of initiatives (most of the initiatives covered in DECIDE) that don't fall under the definitions of energy communities but rather under other collective energy actions and in the case of DECIDE operated by third parties. Interactions with stakeholders also confirmed the interest of actors to carry out collective actions that are not geographically restricted and without necessarily founding an energy community, which would require broader frameworks as currently in place. Some of the collective actions in DECIDE that are no energy communities aim to valorize small-scale flexibilities of communities on reserve markets. While the Clean Energy Package provides for a reform of electricity markets facilitating the activities of aggregators, enabling better market access of small-scale flexibilities and even promote the creation of local flexibility markets, most Member States are slow in transposing these provisions. Overall energy communities are only one piece of a comprehensive EU package, the partial or selective transposition of elements of this package hinders energy communities and other collective actions to achieve their full potential.

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