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Can renewable energy communities enable a just energy transition? Exploring alignment between stakeholder motivations and needs and EU policy in Latvia, Norway, Portugal and Spain

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ABSTRACT

As a response to societal polarisation and mobilisation against the clean energy transition and renewable energy projects, policy makers at EU level have put focus on renewable energy communities as an instrument to drive transition, due their ability to promote citizens' participation and control over decision-making in renewable energy at local level. Literature on public acceptance and legitimacy of renewable energy projects highlights issues related to who are recognised and included as stakeholders, (un)fair distribution of the costs and benefits related to projects and the decision-making procedures involved. Renewable energy communities bring potential positive aspects that drive public acceptance, including social ownership, community development and distribution of benefits to grassroot actors. We contribute to the literature on how energy justice is perceived and can be enacted through renewable energy communities. In this article we explore what challenges for energy justice can be identified for renewable energy communities from the perspective of potential and existing shareholders in Latvia, Norway, Portugal and Spain. We also briefly discuss how identified challenges are addressed in the recast Renewable Energy Directive (REDII).

1. Introduction

EU climate and energy policy increasingly focuses on how to involve citizens and ensure democratisation of energy supply in the energy transition to a low-carbon society. One key example in the Clean Energy Package (CEP) is the recast EU Renewable Energy Directive (2018/2001/EU) (RED II) [1], which contains specific provisions to enable citizens, local authorities and small and medium enterprises (SME) to take an active role in renewable energy communities (REC). According to the CEP, the democratisation of energy will alleviate energy poverty and protect vulnerable citizens [2]. Energy community solutions are appealing for the energy transition as these initiatives combine increasing the generation of renewables in the energy mix [3], flexibility of the energy system through balancing electricity supply and demand at the local level (e.g. storage) [4,5] and often local ownership [6]. Further, in the light of increasing mobilisation against energy projects as well as climate measures in general, researchers have highlighted energy community as one solution to integrate citizens' needs and opinions [7–9],as it provides potential for a more inclusive and bottom-up transformation of national energy systems [10–12].

According to Coy et al. [13] the main literature on energy community employs methods that have limitations in capturing the 'voice' of the actors as well as more complex mechanisms for understanding what drives decisions. Further, most studies focus on single case-study contexts [14,15], making generalisations difficult and there is a geographical over-representation of case-studies from Germany, the Netherlands,

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UK and the US [15,16]. While a growing body of research explores the transposition and implementation of the Clean Energy Package and its provisions for RECs and CECs [10,17–20], fewer studies have explored the motives and perspectives of involved actors in relation to justice perspectives [21–24]. To address these knowledge gaps this article has a qualitative focus on dimensions that enable and inhibit RECs potential to enable a more just and inclusive energy transition in four under-investigated European countries, i.e. Latvia, Norway, Portugal and Spain. We ask the following research questions: What challenges for energy justice (recognition, distribution, procedures) can be identified for RECs from the perspective of potential and existing shareholders? Are these challenges reflected in the intentions of the European Green Deal and the Clean Energy Package (in particular RED II)?

We draw our findings from interviews with civil society organisations, citizen-initiated RECs, SMEs and local government institutions in Latvia, Norway, Portugal and Spain. These actors are defined as potential members or shareholders of RECs in RED II. This article provides knowledge about challenges experienced locally, which give insights into how the EU may improve its regulatory framework on RECs; hence, complimenting the feedback loop from local to the supranational level. The next sections give an overview of the literature on energy community (Section 2); the conceptualisation of energy community and energy justice (Section 3); and the methodological approach (Section 4). These sections are followed by a presentation of the interview findings concerning motivations and potential for low-carbon energy transition and added societal values of RECs as well as informants' perspectives and experiences concerning challenges for RECs that also limit justice dimensions (Section 5). In Section 6, we discuss the findings in relation to justice dimensions of recognition and distribution and how identified challenges are adequately addressed in RED II to enable fair procedures, In Section 7 we conclude that while the RED II is pushing further development of RECs, much is left to the national level to implement. Potential and existing shareholders motivations are in line with social and environmental sustainability, but the findings emphasise in particular the need for regulatory clarity, relevant support schemes and information to overcome thresholds that limit diversity of REC shareholders and redistribution.

2. The energy community literature

The body of scholarly literature addressing energy communities has been growing in the last decade. Several studies have looked into decentralised energy systems and integration into the centralised grid supply [4,5] or market acceptability [25,26] Support schemes, access to finances and regulations are identified as key to reach objectives for GHG emission reductions, energy efficiency, self-sufficiency and cost savings at local level [19,27–33] The literature has also highlighted how certain local preconditions in terms of competences, assets and capabilities are necessary to mobilise individuals to be engaged in development of energy community [34,35] Many energy communities depend heavily on voluntary work, as resources such as funding and expertise are lacking. Lack of time is also emphasised as an impediment for citizens to engage with energy communities, especially women [35–37]. Moreover, dimensions such as collective decision-making, management of large member/shareholder bases, complex planning and approval procedures, lower economies of scale, a weak capital base and limited possibilities for risk diversification constitute known barriers for energy communities [9,30].

Socio-cultural and normative aspects are in the literature found to be important motivations for engagement in energy communities ([33,38,39]. Most studies find that the main motivations were environmental and climate commitments [37,40–43] local benefits, and community-building [34,35,44]. However, some studies also point to financial motivations and economic incentives as important [25,35].

As mentioned in the introduction the existing literature on energy community has several limitations in understanding relevant actors' decisions, justice dimensions and geographic coverage. Considering the importance of engaging grassroot actors, this has implications for energy justice as the studies (often survey-based) are grounded in researchers and policymakers pre-conceived terms of drivers and barriers. As an example, dimensions concerning gender are seldom addressed, though available literature points to fewer women participating in energy communities and gender roles that limit the understanding of women's role in them [23,36,46,48]. Furthermore, the ways energy justice is enacted within energy community initiatives regarding inclusivity, transparency in decision-making, fair distribution of financial benefits, burdens and risks, legitimacy in the local community and empowerment is less explored (21–24, 247).

3. Renewable energy communities and energy justice

The energy justice concept facilitates understanding of the fairness of the energy transition in terms of recognitional, procedural and distributional justice (commonly called the ‘three tenets of energy justice’) [49]. Recognitional justice focuses on issues and people systematically overlooked or marginalised in energy transition processes (e.g. nature, vulnerable consumers, tenants, youths, migrants, indigenous populations etc.) [50]. In this regard energy initiatives engaging local actors are regarded as an instrument to implement a more inclusive and just energy transition [11,51,52], and aid public acceptance due to their ability to promote citizens' participation and control over decision-making in renewable energy [8,33,53]. Its social innovation potential lies in overcoming energy-related injustices through the ability for an inclusive integration of grassroot actors who otherwise would not have the financial and human capital to act individually [12,23].

Distributional justice analyses how costs and risks of the energy transition are distributed within societies [54]. Renewable energy projects led and financed by citizens represent an innovative medium to bridge the investment gap [3] as well as channelling a redistribution of resources to local communities and grassroot actors [12,23,46]. In the present context of high and increasingly volatile prices in Europe, with detrimental effects on businesses, public services and citizens, energy community is becoming even more relevant. Still so, negative distributional effects of upscaling RECs in a particular context are also poorly understood (see [55].

Distributional justice is closely linked to procedural justice, which focus on analysis of governance and decision-making processes in energy transition research and how power is distributed and manifested in decision-making arenas [49]. Lack of public acceptance for (large-scale) energy facilities have been linked to poorly developed mechanisms for public participation and engagement [8,14,56], as well as mismatch with local development strategies (e.g. local business sectors) that are distant from the logics of energy transition promoted on national government level. The European Green Deal emphasises public participation to a larger extent than in previous EU energy policies and the Clean Energy Package 2021 aims to stimulate the growth and acceleration of energy community initiatives. This is a sign that the EU institutions have realized that energy community possesses a potential for achieving a more just and democratic energy transition. For many years, the EU has been criticized for being highly regulatory and not sufficiently assertive to public pressures [56].

One key example incorporating citizens and justice dimensions in the Clean Energy Package is the aforementioned REDII (2018/2001/EU) [1], which has specific provisions for RECs. The way RECs are defined in REDII (as a legal entity which, in agreement with applicable national laws) lays the ground for a more bottom-up energy transition with a diversity of actors: i) The shareholders or members of a REC are to be natural persons, SMEs or local authorities, including municipalities (RED II, Article 2 [16](b) and (c)), ii) RECs need to be based on open and voluntary participation, iii) RECs should be autonomous and effectively controlled by shareholders or members located in the proximity of the RES project owned and developed by the REC, iv) The primary purpose

of RECs should be to provide environmental, economic or social community benefits for its shareholders or members, or for the local area where they operate, rather than financial profits (RED II, Article 2 [16]). The enhancement of RECs initiatives is complex. The RED II obliges Member States to assess and remove barriers and to create an enabling framework to give new momentum to the local development of democratic renewable energy projects. As discussed later the progress of implementing RED II legal and enabling framework is uneven among Member States and the European Economic Area countries [57] and in many aspects up to Member States to define how to act on.

4. Methods

To address the knowledge gaps concerning capturing complex mechanisms for understanding what drives decisions and perceived challenges among potential and existing REC shareholders across regions and countries [13,14,16] this study employs qualitative methods and data from the COME RES project.[1] A qualitative approach allows special attention to details and closeness to the informants [58] that enable understanding the experiences of potential REC shareholders/members face in establishing and running RECs and possible role RECs can play in enabling a just energy transition. To ensure credibility, consistency and transferability we base our data on actor's own descriptions to as best as possible communicate interpretations of reality. Further, we include four country case-studies for more breadth. Despite qualitative methods obvious strength in exploring our chosen research question our study also have limitations. A qualitative approach does not capture the full diversity of perceptions and experiences that exist and statistic generalisation of the results. The focus on actors' experiences and perceptions also does not guarantee specific outcomes, but only show potential outcomes. However, our findings are still transferable to similar contexts and relevant for policymakers and researcher to address issues that challenge RECs opportunities for an inclusive and just energy transition. Further, the findings should be interpreted as means to further research in a broader range of contexts and topics.

4.1. Case-selection

This article focuses on four countries where energy community is less studied and where there are only a few RECs and energy community initiatives in the country as a whole or in particular regions. Experience with energy community initiatives vary greatly within Europe, but the concept of REC as outlined in REDII is novel. Though the transposition of RED II into Member States national law was set for 30 June 2021the process to re-align national and regional policy frameworks and support schemes with RED II is still ongoing in the chosen case countries [57]. The four cases selected allow for diversity of empirical understanding across North, East and South of Europe. In Spain, the informants were mostly recruited from the Balearic and Canary Islands (SP). Norway is not an EU member, but part of the European Economic Area (EEA) and provide an opportunity to explore potential shareholders perspectives from outside the EU system. For more detailed information see the Table 1 below.

4.2. Data material

The data for this article was gathered in the form of interviews with potential and existing REC shareholders as defined in REDII (Article 2 [16](b) and (c)): citizens, small and medium enterprises and local authorities. The interviews took place over the period November 2021 – February 2022. The justification for selecting potential shareholders is that REC is a new concept in the chosen countries. We therefore recruited informants representing a diversity of civil society organisations representing the citizen perspective. This included established RECs or citizen-led energy communities, civil society organisations that are engaged with or interested in local energy production and relevant research institutions. Further, we recruited local authorities' representatives such as county municipalities, municipalities, municipal agencies and municipal property enterprises, city administrations, local energy agencies. Finally, we recruited informants from SMEs from a diversity of sectors, including energy and tech companies that directly work with solutions for RECs or businesses such as tourist operators, food retailers, and property developers. As the concept of REC was a new phenomenon recruitment of informants was challenging, especially in Latvia and flexibility in potential actors to interview was necessary. In general, we approached informants who were in leadership positions or who were responsible for relevant domains (e.g. energy production) in their institutions, workplaces or RECs (with the exception of the civil society group in Latvia). This provided informants with good insight into motivations and experiences for RECs, but also meant that we could not ensure balance in terms of gender or marginalised groups. The gender balance of informants was skewed towards men in all cases except Portugal. In total we interviewed 26 men and 17 women. The informants were engaged in, and/or interested in, a multitude of technologies: RES production from PV and wind, storage (batteries, hydrogen), Electric Vehicles (EV) charging and heating/cooling. Table 1 gives an overview of the research participants.

Table 1
Overview of interviews.

Case country/region	Informant category	Type of organisation/institution	Number of interviews
Spain and Balearic and Canary Islands	Civil society	RECs [3], regional research centre, research platform	5
	Local authorities	County municipality, municipality, association of municipalities, local energy agency, regional public energy company	5
	SMEs	Renewable energy company, energy consultancy company, wine company	3
Latvia	Civil society	Students in spatial development planning	5
	Local authorities	Municipality [2], city administration [2], Climate Change Department (CCD) of the Ministry of Environmental Protection and Regional Development	5
	SMEs	Local energy producer, federation of renewables	2
Portugal	Civil society	REC, Consumer protection association, parent association	3
	Local authorities	Municipality, parish, local energy agency	3
	SMEs	Network of technology suppliers, tech company, private university, property owner	4
Norway	Civil society	National non-profit organisation, Housing company association, housing cooperatives [2],	4
	Local authorities	County municipality, municipality, municipal enterprise, municipal agency for climate and environment	4
	SMEs	Food industry company, property developer, architect company, renewable energy company	4

[1] COME RES (https://come-res.eu/) is a Horizon2020 project that aims to facilitate the diffusion of renewable energy communities (RECs) in nine EU countries and to support the implementation of an enabling framework as outlined in RED II.

The interviews consisted of a mix of focus group and individual semi-structured interviews. Focus-group interviews was mostly used as this give the possibility that informants follow up each other's answers and motivates informants to share knowledge and experiences. However, due to the Covid pandemic some informants could only participate at a later stage in online individual interviews. We asked the informants questions about 6 main topics: 1) Role or involvement in the establishment or interest in RECs, 2) Motivations for engaging in RECs, 3) How being a REC fit into their existing strategies and work, 4) Who they cooperate with and see as relevant and needed network for establishing of running RECs, 5) What they experience as key impediments for the establishment and running of RECs and 6) their reflections on RECs and justice dimensions such as diversity and redistribution of power and resources in the energy system. In line with a qualitative approach, we strived towards making the interviews as a conversation allowing for flexibility in how questions were asked and where informants can bring up topics they feel are important. Semi-structured interviews still follow a predetermined thematic framework, and the same topics were asked in all interviews.

After the interviews, notes and transcriptions were analysed and coded based on justice dimensions on the motivations and roles of RECs in terms of inclusiveness, redistribution effects and major impediments to running of establishing RECs. Based on this, a summary report was made for each case country and shared and discussed within the research group. The empirical findings pointed to emphasis on 1) informants' motivations as aligned with just transition goals, but also key challenges concerning 2) financial aspects 3) lack of general awareness and skills 4) lack of policy attention and framework conditions. These findings have also structured the analysis of this article. All interviews followed respective national and institutional ethical guidelines and all informants gave their informed consent and are anonymised.

5. Findings and results

This section presents the interview findings concerning potential and existing shareholders motivations for low-carbon energy transition, as well as their views on challenges for establishing RECs that limit their opportunities for delivering on energy justice.

5.1. REC shareholders motivations for low-emission society

The motivations for engaging in RECs highlighted most by all informants across all case countries and informant categories was protecting the environment on the local level and climate on a global level. A recurring theme was justice to the next generations and impact of climate change. All informants pointed to how RECs could be designed to support local energy demand, replace fossil fuels and provide smarter grid in their regional or local contexts. This was associated with lack of power in the current transition, electrification of sectors like transport and reduced need for grid upgrades. As an example, in Portugal, RECs are viewed as important vehicle to increase the share of renewables in the energy mix (54 % of electricity generation) and support high ambitions for electrification of the whole energy demand. One illustration given by the informants from Spain was the high energy dependence (from mainland) in the Balearic and Canary Islands and significant energy demand fluctuations due to mass tourism in the summer season. In this context, RECs have potential to provide an increase of renewable energy generation, such as PV, that is suitable for handling the summer peaks in energy demand. Also in Norway, which is almost self-sufficient in renewable electricity generation (about 98 % renewables), all informants emphasised benefits in terms of future energy needs in relation to large-scale electrification (transport sector) and future needs for energy flexibility due to increased peaks and more volatility by phasing in new renewables. As an exception to the other case country informants, in Latvia, the benefits were seen more in terms of improved local environment and reduced costs and not reducing global emissions in the climate change context.

Taking a responsibility for a low-carbon energy transition as well as protecting the environment by producing green and local energy (reducing grid costs) was highlighted by all informants, but the underlying reasons differed somewhat across the informant categories. tThe civil society informants emphasised ‘doing their part’ and preserving the environment for the next generations. For SMEs this narrative was also associated with branding themselves green and forward-leaning, which is beneficial for their standing with consumers and collaborators. Local authorities' interest in RECs was linked to political commitments such as emission targets and the Sustainable Development Goals. All municipal and local authorities interviewed referred to municipal energy and climate action plans and how RECs can contribute to reach the associated targets (e.g. [59]).

5.2. REC shareholders' motivations and local socio-economic benefits

Economic aspects were also seen as a significant motivation by all categories of informants in all case countries. The interviews were conducted as energy prices in Europe started to increase at unprecedented levels due to the energy transition itself and later the Russian aggression on Ukraine. This coincided timewise with the business sector recuperating after the Covid-19 pandemic. In Latvia, Portugal and Spain, the informants stressed RECs opportunities for reducing energy costs and dependency on large energy supply entities, thus enabling more job opportunities and boosting local economies. This view was most pronounced with the SME informants, but a recurring theme also for local authorities and researchers. As an example, the energy prices in the Balearic and Canary Islands were seen as generally higher than EU average, and thus decreasing SME enterprises competitiveness.

Interestingly, the Norwegian SME informants did not emphasise economic benefits to local communities to the same extent, but they were all more in the category of medium enterprises. But local authorities across the case countries were motivated by the opportunity of RECs or local energy production to make communities more attractive by strengthening local businesses and employment. In an example from an isolated rural community in Norway struggling with depopulation, the municipality were planning decentralised energy production as means to enable new business activities in offshore fish farming that will provide tax revenues and employment opportunities.

Several informants also mentioned how municipalities or local authorities engaging in energy production on their own buildings could reduce their cost at the benefits of the population they provide services for. For strained municipal budgets the increasing energy prices had direct consequences in all case countries.[2]

None of the informants mentioned value sharing within the RECs. Picking the most optimal method of distributing financial value often involve partly contradictory dimensions concerning fairness, stability, understandability, computational feasibility and enabling the right incentives for members to act in a way that benefits the REC [2,47]. The reason for not being problematised might be explained by the novelty of REC in the case countries and actors relevant for RECs often have limited technical expertise.

Some pointed to how sharing costs in the REC model could provide better funding opportunities. Further, economic opportunities by reducing energy costs through self-consumption or providing energy flexibility was highlighted as an important way to increase willingness to participate in RECs.

[2] In Norway some municipalities have a high degree of ownership in power companies and for them, the increased prices have resulted in budget surplus. This has also increased ‘inequality’ between different municiaplities.

5.3. REC shareholders motivations for supporting low-income households

In regions where the renewable energy supply is less (e.g. Balearic and Canary Islands) or unstable (e.g. isolated rural or island communities) RECs can enable renewable energy access for all community members at a fair price. As described later, this depends on RECs rights to share self-produced energy in the community. Further RECs possibilities to alleviate energy poverty is one of the assumptions in the CEP [2,45]. In all case countries, RECs owned by local authorities were considered good ways of distributing energy to low-income and vulnerable households for instance through social housing schemes.

RECs in the form of housing cooperatives or housing companies were also considered as means to increase renewables and inclusion of low-income and vulnerable households in the energy transition. In Norway, it was pointed out that RECs would be most relevant for old and poorly insulated buildings in low-income areas as newer buildings frequently have already undergone significant investment in energy efficiency:

> Many Norwegian housing cooperatives have large buildings and areas that make them particularly suitable for establishing local energy solutions. And they have a lot of customers, namely their own residents. It also has a social aspect to it, being a resident of a housing cooperative that gets an upgrade increase in value many times because of this. And in the EU framework a social, equitable distribution of what should be a massive investment in green upgrades is also of great importance because we see that those households with the weakest economy often live in old block buildings. And that is our main motivation (Interview housing company association, Norway).

In Norway and Latvia, the informants showed a high interest in energy community in condominiums, which was later also found in a survey of stakeholders [60]. Housing cooperatives already have a model where investments are shared between all members/households. In Norway, the housing cooperative model is common in most larger cities and is seen as one of the most promising for REC development and new regulations to accommodate this is expected within 2023 [57]. Though several informants argued for how RECs could alleviate energy poverty or economic inequality the informants had less explicit focus on diversity within the RECs or how RECs could positively reduce other types of inequalities in society among concerning dimensions such ethnicity, age, gender etc.

5.4. Justice challenges: high financial thresholds for RECs

As shown, RECs may enable a redistribution within the power sector that favours local actors, low-income and vulnerable households, but as presented below there are significant impediments for this potential to be realized. Though many informants described reduced costs as an important motivation (reinforcing environmental motivations), overcoming the threshold of high investment costs, economic risks and lack of credit was perceived as challenging across all case countries and informant categories. The current energy situation in Europe (unprecedented high energy costs) was seen as potential driver for RECs along with lower price of PV, but the uncertainty regarding future energy prices and long-term economic sustainability was a concern and economic sustainability was seen as challenging (see also 61). In general, the lack of economic incentives in the form of support and funding schemes was noted as very difficult in all case countries except Spain. This can be related to a national support scheme for energy communities that has been set in place in Spain, endowed with 100 million euros from the Recovery, Transformation and Resilience Plan. Through this plan, the Spanish Ministry for Ecological Transition and Demographic Challenge (MITECO) has approved 29 REC projects, where 3 % seek to address energy poverty through the inclusion of vulnerable consumers and (55 %) have gender equality plans as part of their governance.[3] Standal and Ytreberg et al. [60] finds that access to specific funding for REC in the operational programmes under the European Structural and Investment Fund (ESIF) is seen as relevant for promoting RECs by many stakeholders.

However, in general, support schemes such as feed-in tariffs are being phased out across Europe, while the requirements of auctions and tenders tend to favour large players and is seen as less relevant among many stakeholders [28,30,60]. As of recently, the EU state Climate, Energy and Environmental Aid Guidelines (CEEAG) allow Member States to exempt REC projects and SME-owned projects below 6 Megawatts (MW) of installed capacity from the competitive bidding requirement. Renewable energy communities and small and micro enterprises may also develop wind projects up to 18 MW without competitive bidding.[4] Germany has made use of these exemptions.

EU Member States should have implemented enabling frameworks for RECs [57], but the informants highlighted that the pace was too slow. As an illustration, in Latvia the Amendments to the Law on Energy, implementing the legal framework for REC, was not yet adopted at the time of the interviews. These Amendments provide that the Ministry of Economics shall develop the support schemes available to RECs, and these support schemes shall be the subject to business support conditions. Though the Amendments have been adopted recently there is still no consistent support scheme for REC as per February 2023. Further, feed-in premium and competitive bidding/auctions are not applied for RES electricity producers in Latvia for the time being.

Norway is not part of the EU and thus are not required to implement enabling frameworks. Norway also lacks support schemes that take into account the specificities of RECs. There is a national scheme (Enova) for individual household prosumers that guarantees refund of around 25 % of the investment for rooftop PV, which, in addition to implementation of prosumer regulations, has made it significantly easier for individual households to invest in solar PV. However, the mandate of Enova puts limitations on what they can support. RECs can only apply for support alongside commercial projects aimed for technological innovation. To be successful requires the same expertise and financial resources as corporate actors.

As a result of lack of targeted support schemes for RECs, several informants emphasised the need for financial support from an external partnership (e.g. grid company, research project grants, financing institution etc.) to realise an energy community project. Building strong cooperation with other actors provides opportunities for funding (e.g. Research and Development funds) and competence, but also decrease control and ownership of REC actors.

5.5. Champions needed: lack of awareness and skills

Another main challenge to RECs opportunities to deliver on energy justice highlighted by the informants was the lack of awareness of RECs, as well as knowledge and leadership competence needed to promote the REC model. Across all case countries, all informants were concerned about the low awareness and interest among designated REC actors in taking an active part in RECs. The informants were also worried about disinterest in the energy system in general among citizens and SMEs.

Several informants perceived this challenge to be interrelated to an individualistic culture and a socio-cultural barrier concerning sharing

[3] https://www.lamoncloa.gob.es/serviciosdeprensa/notasprensa/transicion-ecologica/Paginas/2022/151222-apoyo-proyectos-comunidades-energeticas.aspx

[4] https://ec.europa.eu/commission/presscorner/detail/en/qanda_22_566

economy principles. In all the case countries the informants described that there was a strong focus on private ownership in line with capitalist ideologies that deters citizens and local communities from joint investments and common ownership of assets (beyond household level) (see [62]). As described from a focus group interview:

> People tend to stick to what they know best and what they perceive as reliable: that is, the traditional grid consumption system, whereby citizens are passive agents. Moreover, community-based initiatives such as cooperatives or public-private partnerships are poorly rooted in the tradition of the region (Focus group interview with RECs in the Balearic and Canary Islands)

The mistrust was also explained by lack of experience with energy cooperative models in the case countries. Energy cooperatives is a common legal form for energy community initiatives in Western Europe [60] However, in Eastern and Southern Europe, as well as Norway, this model is rarer. In Latvia, the mistrust of the cooperative model was also ascribed to their socialist heritage (see also 38).

All informants in all case countries expressed that the needed knowledge and resources for engaging in RECs were challenging. Many informants stressed the need for 'champions' and successful model examples in order to promote RECs and several referred to the lack of this as reason for them to have not engaged in RECs so far. As illustrated by a quote from a focus group interview:

> The absence of concrete cases of REC implementation in the local/national context hampers the concretisation of the concept by individual citizens, leading to a sense of mistrust. (Interview civil society, Portugal).

A local champion was generally characterised as someone able to push for change and engage other citizens and promote their collaboration. Key characteristics are: Persuasive power, personal motivation and leadership skills, often in combination with technical interest and knowledge. In other words, implementation is seen as dependent on individual motivation and skills, and the need for these preconditions to be in place to promote development RECs beyond a small niche.

As another illustration, one of the municipalities interviewed in Norway had prioritised employing a person dedicated to work on local energy systems and seek cooperation with external actors (e.g. grid companies, research institutions and business sector) as this was the municipalities main strategic area. Being a location desirable for testing out new energy technologies in extreme climatic conditions had resulted in attracting considerable resources through funds for pilot projects that would secure local energy production. However, in all case-countries, most informants pointed to challenges of lack of qualified staff with the necessary technical and specific knowledge of RECs at local government level. This was related to civils society actors and SMEs challenges in communicating with local authorities for establishing RECs, but also within local authorities taking an active role was seen as difficult within strained financial and human resources (see also 63).

5.6. Justice challenges: distributing relevant information to relevant stakeholders

Across all case countries and informant categories emphasised needed measures to enable access to information for potential stakeholders to promote RECs. Especially, the lack of trustworthy objective information to the public was noted. There was also a concern of getting information to a diversity of potential shareholders. As illustrated in the explanation from an informant working with economic support for prosumer energy systems in her municipality:

> One of the most important things we do for people to take advantage of the grant schemes is to promote them. And then we are trying to reach out to all parts of the city, now we have had a particular focus on several of the eastern districts, because we have seen that the subsidy scheme for solar cells [by Enova] ended up on the west side of the city. We try to balance out as much of that difference as possible. And we try to use examples that perhaps more people in the east side can relate to. Not white men at 50 plus… (Interview city municipality, Norway).

In this particular municipality, the eastern area has lower average income levels and higher immigrant population than the west. Previously, the Enova support for prosumers have been channelled mainly towards middle-class homeowner, most often men [63,64].

The need for information must be understood in conjunction with the challenges of getting people involved mentioned above. Most informants pointed to the need for national or local authorities to provide relevant and objective information to promote RECs that are diverse and significant enough in numbers to play an important role in the energy transition.

5.7. Underprioritised and poorly understood? Need for policy focus and changes

A final major challenge pointed out by informants across case countries and categories was lack of political commitment towards RECs, as well as delayed implementation of the provisions for RECs outlined in RED II. Further, in all case countries, informants argued that energy policy have mainly been focused on central power supply, often with a few large actors dominating, and this system is still prevalent despite the EU policy agenda being favourable towards a gradual increasing decentralisation of energy. In Norway there has also been a lack of momentum to make radical changes to the power system and regulated grid monopoly as RES targets for the electricity sector are already met and electricity prices have until late 2021 been low. In both Latvia and Norway there was a firm impression that the benefits of RECs and the role they could play was not well understood among policymakers at national and local levels, whereas this was perceived as higher on the agenda in Portugal and Spain.

The lack of legal frameworks concerning RECs was highlighted in Latvia, Portugal and Spain. Especially the 'fuzziness' of the REC concept and how it should harmonise with existing concepts limited the opportunities to attract shareholders and investors. As explained in detail later, it is up to Member States to define aspects of the provisions of the RED II, for example in terms of proximity and community benefits.

> The lack of clarity in the current provisions for RECs in Portugal is one of the main barriers to the implementation of energy community initiatives. Individual consumers have been contacting consumer associations and other relevant entities to fully understand the requirements and procedures to be licensed as a REC. (Interview civil society, Portugal)

In Norway the informants were not equally worried about the legal frameworks and specific provision in RED II, but as in the other case countries more concerned with regulations that limit financial and technical optimalisation. All informants, expressed challenges concerning regulations on land use, licencing, and rights to sell surplus produced electricity to the grid or share self-produced electricity between REC members. As an illustration, this is a particularly sensitive issue in peripheral territories such as the Balearic and Canary Islands, where the electricity mix has a low presence of renewables and a low degree of interconnection. Further, the existence of 'territorial tensions' due to the scarcity of developable spaces was highlighted by informants in Spain.

Possible negative effects of regulations concerning how costs of the grid supply should be distributed when there is an increase in decentralised generation was less highlighted by our informants. Only among the Norwegian informants was this issue raised as PV was perceived as the most suitable REC technology for electricity production, but the productive potential is limited during the increased energy demand in

the winter. Within the Norwegian energy system, the costs and reduced income of grid companies due to decentralised systems is transferred to other consumers in the grid. This has resulted in what informants interpreted as 'unwillingness' to change existing grid monopoly regulations, which do not allow prosumers to share self-produced electricity beyond their meter point. This has been high on the agenda among the national policymakers and energy stakeholders and new regulations that provide RECs with some increased rights are signalled [57].

6. Discussion

In the following, interview and literature findings will be discussed in relation to implications for recognitional and distributional justice. Further, we will discuss to what extent RED II provisions can provide a foundation for procedural justice in terms of adequately address identified challenges from the viewpoint of stakeholders needs.

6.1. Do RECs increase recognitional justice?

The focus on potential and existing REC shareholders' perspectives and experiences in this article reveals positive and challenging aspects for recognitional justice. RED II's explicit focus on local energy actors within civil society, local authorities and SMEs may lead to a reconfiguration of the energy systems and broaden the scope of who are seen as rightful stakeholders in the energy transition. If scaled up, energy production from these actors has to be 'reckoned with' in energy systems traditionally dominated by large and often few players. However, as shown the high thresholds facing REC initiators will negatively impact who are included and who are excluded. Firstly, the economic risks are significant, and the characterisation of joint investment might not make it more attractive to investors. Other studies also point to financial entry barriers for vulnerable consumers and that minimum investment open to the low-income members might give lower return on investment [2]. In addition, they compete with centralised (often oligopolistic) energy markets where certain technologies have a high penetration [65,66].

Many of the informants pointed to the necessity of bringing on board third-party partners to make the investment costs and enable an ecosystem of sharing knowledge and resources. The consequences might be exclusion of grassroot actors and energy projects that are not aimed at technological innovation or that RECs are co-opted by more powerful actors [61]. It could also divert the focus on social, environmental and economic benefits to the shareholders of local communities the RECs operate in, which is a articulated aim in RED II.

Furthermore, as shown present initiators of RECs need to encompass not only financial and social capital, but also managing executive roles in energy community require not only technical skills, but competence in business, administration as well as time, that in practice mean that some members find it hard to take an active participatory role. Further, initiators of RECs need a cultural and symbolic capital that inspires for change to engage other actors to get involved. Such abilities and resources are not equally distributed in society and literature has pointed to grassroot actors engaging in energy production as a 'niche group' who have particular capital in terms of material resources (their own detached or semi-detached home and ability for up-front investment) and technical education or skills [22–24,36,45,63–66]. Further, studies show that traditional gender roles are easily reproduced when citizens engage in energy production [36,45,46,64]. Women lack (or perceive that they lack) competence, self-esteem and networks. Even within households differentiated status and competences play out in relation to implementation of new energy technologies [64,67]. Gender is only one axis of marginalisation that needs to be overcome to ensure RECs fulfil the expectations on inclusiveness. Our material also show that the potential and existing REC shareholders are not explicitly focused on diversity (e.g. gender, ethnicity, elderly) beyond low-income households.

Lack of information and related issues of trust and awareness of the REC model shown above pose challenges to energy justice. The preconditions needed for engaging citizens and other grassroot actors seem to be reliant on champions, members of the community with particular enthusiasm and skillsets. These qualities may be harder to find among grassroot actors, such as small municipalities, or in low-income areas. As expressed by the informants it will also be challenging to provide relevant information to such a diverse group that RECs are intended for.

Most informants called for more attention towards the benefits of RECs in the political agenda. That would facilitate a broader public debate compelling policymakers to take more perspectives into account when designing policies for the energy transition and the role RECs can play. At present, diversity is only implicitly dealt with [57] and RECs may have problems bridging the gap towards social acceptance of the energy transition.

6.2. Do RECs enable a fair distribution in the transition?

The motivations raised by the informants point to strong consistency with environmental and social sustainability and thus potential redistribution. All case countries and informant categories were motivated to enable increased renewable energy, energy flexibility and reduce grid upgrades. As pointed out, in addition to providing means for a low-carbon transition, RECs may provide a wider value sharing and redistribution, through accessible and stable energy prices for local businesses, households and municipalities who have pressed resource budgets, as well as low-income households (e.g. lifting entry fees for specific members to be inclusive). Further, they can strengthen system resilience by reducing the need for investments in electricity grid extensions who is a benefit to also those who are not members. As mentioned, municipal ownership of RECs has potential for positive redistribution as reduced energy costs provide increased budgets for other social services they provide to the population. This would also decrease their energy dependency. Furthermore, as argued by Carrosio and Vidovich, if RECs reach vulnerable households it can function as a pre-redistributive policy where RECs enable welfare that is de-coupled from the growth paradigm. This is increasingly relevant in today's multiple climate, political and economic crises, such as the recent high energy prices in Europe [68].

A potential negative distributive effect of RECs would be if grid costs are transferred to consumers not engaged in their own energy production. This is interlinked with types of technologies and their match to climatic conditions and demand needs, as exemplified in Norway. A related problem is that in all the case countries sharing of self-produced electricity is challenging or even prohibited, thus also limiting RECs opportunities to e.g. send surplus electricity to low-income households.

Another potential negative distributional effect, as highlighted by our informants, given the need for considerable financial resources, skills, time and social capital to establish and run RECs, there is a risk that such an energy transition development may increase inequality. As already mentioned, previous literature has shown that women may have equal motivation for engaging in citizen energy production but feel that they lack in technological skills. In other words, some groups may solve their energy needs and costs by means of RECs, while others will experience increased costs. This applies to citizens, SME companies and local authorities. The question then will be what is the most cost-efficient way to operate the electricity system? As per now, this debate is dominated by the traditional actors in the electricity system while other narratives that emphasise citizen engagement and grassroot actors and benefits are largely excluded [46]. However, the negative effects can be addressed if framework conditions and regulations are designed with them in mind.

6.3. Are fair procedures adequately addressed in RED II?

Given that the concept of RECs is novel, the procedures that ensure fair decision-making and governance within RECs is not well known. It is

therefore important to look at EU and national level procedures. The intention of RECs (in REDII) is to enable more diversity of actors in the energy transition and thus enable procedures to this end:

> The participation of local citizens and local authorities in renewable energy projects through renewable energy communities has resulted in substantial added value in terms of local acceptance of renewable energy and access to additional private capital which results in local investment, more choice for consumers and greater participation by citizens in the energy transition. Such local involvement is all the more crucial in a context of increasing renewable energy capacity. Measures to allow renewable energy communities to compete on an equal footing with other producers also aim to increase the participation of local citizens in renewable energy projects and therefore increase acceptance of renewable energy. (REDII [1], recital 70)

The provisions of REDII in the enabling framework provide several measures to ensure citizens, local authorities, SME participation: rights to produce, consume, store and sell renewable energy, removal of unjustified or discriminatory conditions, assessment of barriers and potential, facilitation from grid operators, fair, proportionate and transparent procedures, accessibility of all consumers, including low-income and vulnerable households, tools to facilitate finance and information, take RECs specificities into account when designing support schemes. The enabling framework provisions are part of the updates of the Member States' integrated national energy and climate plans, and progress reports pursuant to Regulation (EU) 2018/1999.

Further, the overarching policy intentions of the EU Green Deal paramount that the energy transition must be just and inclusive. This incorporates the idea of broad participation where 'no one is left behind' and that inclusion of all stakeholders enable better decisions-making:

> Since [the energy transition] will bring substantial change, active public participation is needed to bring together citizens in all their diversity, with national, regional, local authorities, civil society and industry working closely with the EU's institutions and consultive bodies [69]

An overview of applying justice recognitional and distributional justice to the interview results and how this is addressed in RED II shows that RED II do consider several of the challenges raised:

	Shareholder motivations	Shareholder challenges	REDD II provisions For Member states
Recognitional justice	• Engaging low-income households • Bringing information to a diverse group (local authorities)	• Lack of adequate support schemes • Lack of objective information • Lack of awareness • Lack of skills and champions • Lack of policy commitment	• Take into account the specificities of RECs when designing support schemes • Tools to facilitate access to finance and information are available
Distributional justice	• Taking responsibility for energy transition • Reducing grid upgrades • Energy at fair price for households, businesses and municipalities • Reduced energy costs and material wellbeing for low-income households	• Lack of adequate support schemes • Cumbersome regulations (e.g. sharing electricity) • Lack of legal framework • Lack of objective information • Lack of awareness • Lack of skills and champions • Lack of policy commitment	• Take into account the specificities of RECs when designing support schemes • Tools to facilitate access to finance and information are available • participation in REC is accessible to all consumers, including those in low-income or vulnerable households

What is not addressed in the REDII is how Member States concretely should incorporate important dimensions that deliver on inclusiveness, local ownership and benefits, public acceptance and more. Aspects concerning legal definitions of RECs, rules of proximity, and autonomy have to be operationalised by Member States. As an example, the CEP highlights how energy communities may through democratisation alleviate energy poverty [2,24,45]. Specifically, RED II states that Member States must ensure that RECs are accessible to all consumers, including those in low-income or vulnerable households and the tools to facilitate access to finance and information are available for low-income and vulnerable households (REDII, Article 22 (2 f and g)).

However, Member States have to define what constitutes low-income and vulnerable households. Ideally, national legislation will enable conditions that requests RECs to engage in social sustainability, but as the process of implementing the enabling frameworks is not complete the outcome is unsure. The enabling frameworks in place tend to be designed in a manner that favour households that have the capacity to make up-front investment to become part of a RECs. As a result, it becomes difficult for many vulnerable households despite that many RECs offer low entry hurdles (sometimes as low as 100 Euros a share) [2,10]. While the EU's competences on social welfare policy are limited [70], it would nevertheless be prudent to issue guidance or recommendations to Member States suggesting that the participation in RECs for vulnerable households (recipients of social benefit payments) becomes decoupled from the need to liquidate assets before investing in RECs [71]. As our analysis shows, how aspects such diversity, distribution of local benefits (e.g. provisions of proximity and primary purpose) will be operationalised at national and local levels remains to be seen. As Krug et al. [57] argue, there is an implementation gap at national level. E.g. gender perspectives, is in general, seen as irrelevant in most climate and energy policy measures in developed countries that define themselves as 'gender equal' [72,73]. Furthermore, implementation of provisions do not necessarily translate into reliable and accessible information to diverse groups.

7. Conclusion

This article has focused on crosscutting justice challenges identified from interviews with potential and existing REC shareholders in Latvia, Norway, Portugal and Spain. While current EU policy is pushing forward to create more favourable conditions for RECs to enter into the competitive, strongly regulated energy markets, the question of how energy justice can be enacted is still unclear. Our findings support the view that RECs have significant potential to contribute to environmental, economic and social sustainability (as described in the informants' motivations), but still the many expectations on RECs to be democratic, transformative and equity-enhancing actors for a just transition are not given. Firstly, as our findings across the case countries show there are significant barriers for establishing and maintaining RECs that have implications for ensuring diversity and fair distribution of benefits and burdens. The interviewed stakeholders emphasise the need for regulatory clarity, financial support schemes, and information to overcome thresholds that limit diversity of REC shareholders and redistribution. Also, beyond a focus on energy poverty and low-income households, the informants' understanding and focus on diversity is

limited and thus further challenges the opportunities of inclusiveness.

RECs alone are limited in their ability to address imbalances in distribution. Providing dimensions such as; adequate information to bring awareness and involvement, relevant support schemes and financial tools, conducive regulations are issues that have to be solved through national policies if RECs are to be scaled up and deliver on the expectations of the CEP. From EU policy level, RECs are welcomed, and ideally, national enabling frameworks will provide RECs with tools and regulations to overcome a number of obstacles and to help them contribute to a fairer distribution of social, environmental and economic costs and benefits linked to the energy transition. However, in the end, it is up to the national states and the individual RECs to find adequate ways so that the aspiration of local benefits combined with the philosophy of democratic governance can help reconciling, at least in part, financial, social and other inequalities.

Declaration of competing interest

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Data availability

The data that has been used is confidential.

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