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Review

The role of energy democracy and energy citizenship for participatory energy transitions: A comprehensive review

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ABSTRACT

Increasingly, scholarly debates and policy developments on citizen participation in energy transitions have included calls for 'energy democracy' and active forms of 'energy citizenship'. The concepts are tightly connected to the debate on energy transition, and the need for a decentralised energy system, based on renewable energy and increased local energy ownership. The two concepts exist in parallel and are sometimes used as synonyms and sometimes with clear distinctions made between them. This spurred an interest to systematically investigate them further. The aim of this paper is to identify similarities and differences between the two concepts and synthesise their contributions to debates on citizen participation in energy transitions. We review the literature thematically, finding that the concepts often refer to participation in domestic energy technologies, energy communities, energy transition movements, and energy policy. Energy citizenship tends to emphasise behaviour change and ways for individuals to participate in energy systems, thereby often focusing on individuals as agents of change. In contrast, energy democracy tends to focus on institutionalisation of new forms of participative governance and often placing collectives as central agents of change. The review also highlights some weaknesses of the literature: a bias towards decentralised energy systems, a lack of attention to representational democracy, and an underrepresentation of studies from outside Europe and North America.

1. Introduction

The target for the EU's energy and climate strategy is to achieve climate neutrality by 2050. This is the EU's commitment to the global climate action under the Paris Agreement and also the long-term strategy, which is the core of the European Green Deal [1]. As a way to facilitate such a transition, the European Commission launched the Clean Energy Package (CEP) where the citizens are empowered to push the energy transition in the member states [2]. The EU has over the years developed and confirmed its vision that citizens should have a central role in the energy transitions [2,3]. There is a wish for a more decentralised and democratic system which would benefit renewable energy production and a move away from passive consumers towards a more dynamic relationship where active energy citizens are engaged and take responsibility for energy production and consumption [4,5]. Energy democracy and energy citizenship are keywords in this future strategy. Both are political, social and cultural concepts tightly connected with an increased awareness of a need for a rapid but also fair and inclusive energy transition [6]. The concepts have been present in research since

2011 but with increased appearance the last years.

The concepts are closely linked to the research and the debate on energy transitions. Whilst the field of energy transitions has made considerable advancements in understanding system dynamics, an emerging critique that centers on the limited attention to the role of power and politics in transitions processes have, however, brought the question of participation to the agenda [7]. One particular critique is the way this generally technically focused fields has overlooked the role of the public and democratic engagement in transition processes [8]. In relation to this debate, energy democracy and energy citizenship are contributing to the new conceptualization of what citizenship and democracy mean in the context of energy transitions. While energy democracy and energy citizenship are central to this debate, the two concepts exist in parallel and are sometimes even used as synonyms. Both concepts indicate active citizen participation, such as adopting renewable technologies, joining energy communities, supporting local initiatives, and participating in policy decision-making, but the relationship between them is rarely outlined and explained. There are at the same time distinctions made in the literature between these concepts.

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This spurred our interest to systematically investigate the similarities and differences between the concepts. Until now such a systematic comparison has been lacked. As participative approaches to energy system development are becoming more common, the lack of clarity as to energy democracy versus energy citizenship risks diluting their meanings.

Recent conceptual reviews by van Veelen and van der Horst [9], Burke and Stephens [10], and Szulecki [11] show that there is a need to strengthen the conceptual foundations of energy democracy. Similarly, Lennon et al. [12] have noted that the role of citizens in energy citizenship is under-theorised. The aim of this work is accordingly to conduct a combined systematic review of earlier research to identify the kind of knowledge produced and the similarities and differences between the two strands of research. We specifically focus on how the concepts differ regarding where, how, and why citizens are supposed to have a role in the energy transition.

This literature review is organised as follows. In section 2, the methodological design and data collection methods are presented. In section 3, differences and similarities between the energy citizenship and energy democracy literatures are parsed in two steps: first, the definitions of energy democracy and energy citizenship are compared and, second, the broader trends within each research stream are presented and compared. In section 4, we outline the main contributions of the literatures, identifying similarities and differences between them relative to four central themes: ‘Domestic energy technologies’, ‘Community energy’, ‘Energy transition movements’, and ‘Energy policy’. In section 5, the most important contributions of each literature stream, together with their limitations and identified research gaps, are discussed. Lastly, section 6 presents conclusions and an outlook for future research.

2. Methodology

This article presents a semi-systematic literature review of energy citizenship and energy democracy, the idea being to analyse how the two concepts have been conceptualised and studied within research over the years [13,14]. This means that we did not, as in a systematic review, aim to synthesise and assess all empirical evidence in the field. Rather, the semi-systematic approach was chosen as it enables us to identify themes and theoretical components that are reoccurring in the literature. According to Snyder [13], this method is especially useful if the aim is to detect meta-narratives in the literature, which is part of the aim of this article. Our aim is to analyse how energy democracy and energy citizenship have been researched, concentrating on what has been in focus – where, how and why – in earlier studies. We are interested in when the energy citizenship and energy democracy strands overlap and

diverge, especially regarding citizen participation and what research gaps can be identified. Citizen participation is a lens through which we analyse previous research rather than the empirical focus of the paper.

The review considers academic articles published in peer-reviewed journals. To ensure research quality, we retrieved articles on 9 and 10 December 2020 from two established research databases: Scopus and Web of Science. We used the search terms ‘energy citizenship’, ‘energy citizen’, ‘energy citizen*’, ‘energy democracy’, and ‘energy democr*’. We used * to avoid missing multiple variations of the word. We limited the search to articles and review articles and excluded all non-English articles and reviews. We did not use a time span, but included all years. We were left with 326 journal articles on energy democracy and 115 on energy citizenship. Duplicates were removed, leaving 88 articles on energy democracy and 33 on energy citizenship. Eight articles about energy democracy and two about energy citizenship were excluded due to paywalls. When initially screening the articles, we removed two articles that did not mention the concept of energy democracy and four that did not mention energy citizenship. Lastly, when conducting the full-text article analysis, another 17 articles about energy democracy and six about energy citizenship were removed since they only mentioned the terms in the keywords or abstract, but never returned to the concepts in the text. That left 61 articles focusing on energy democracy and 21 on energy citizenship, all of which were included in the review.

The 83 articles were coded in NVivo software. According to Sovacool et al. [15], a well-conducted literature review uses themes, theories, or disciplines to organise the analysis; we accordingly used themes to organise the data. An explorative approach was chosen in which themes emerged from the data inductively [15,16].

The analysis was conducted in several steps. First, the selected articles were read and coded according to the following categories: conceptual definition, empirical focus, method, theory, actors, geography, publication details, main conclusions, and suggestions for future research. In the next step, we went through our coding to find emerging themes in each stream of literature. The themes identified were the same in both literatures and related to energy technologies (e.g., smart systems or small-scale renewables), different spheres of participation (e.g., home or community), or different types of participation (e.g., consumer choice or policy advocacy). In a third step, the articles were revisited with the themes in mind. In this step, more specific questions were asked of the material to find out how the concepts differ regarding where, how, and why citizens are supposed to have a role in energy system governance. In sections 3 and 4, we present the results of this coding.

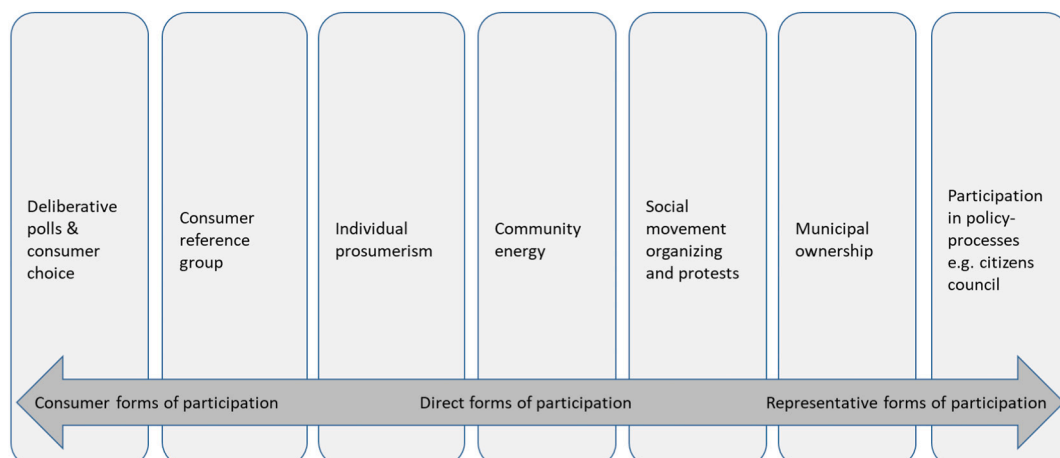


Fig. 1. Common types of citizen participation discussed in ED and EC literature.

3. Conceptual review and quantitative trends

Questions of citizen engagement, inclusion, and democracy in energy governance can be traced to the expanded deployment of distributed and small-scale renewable sources but also reflects the growing politicisation of energy governance and climate policy [17]. According to Szulecki and Overland [17], the concept of energy democracy became more widespread in the 2010s as a combination of both this technical and political reality. Initially coined by activists, energy democracy often referred to the political nature of energy transitions and concerned who controlled the means of energy production and consumption [18]. The concept of energy citizenship also appeared at approximately the same time and was a constituting element of energy democracy [19] referring to the idea that citizens will have a key role in the energy transition [20]. Indeed, both strands of literature have included questions of 'humanising' the transition by exploring new ways of thinking about public engagement and participation that go beyond traditional forms of governance. At the same time, both concepts have also become increasingly popular references for analyst and policymakers and is now used by, for instance, European Union officials [12,17].

Political discussions on energy have typically prioritized technical and economic issues [21,22] while issues concerning inclusive and democratic governance have historically not been included. The introduction of energy democracy and energy citizenship marked a clear shift. While the discussion of citizen participation sits at the heart of both strands of literature, there are, however, different visions of what form participatory energy governance could and should take. Below, is an overview of the most common types of citizen participation discussed in the two strands (Fig. 1). These range from the more radical demands of energy democracy movements for local cooperative ownership to consumer forms of participation more commonly advocated by energy companies and policymakers [23].

This broad range of participative forms of governance, all referred to as examples of energy democracy and energy citizenship, makes the precise contours of what participation means in practice largely open to interpretation. As for example Lennon et al. [12] warn, the lack of a consistent definition and theorising of energy citizenship has already allowed more normative neoliberal constructs of what it means to be a 'good citizen' to shape the transition debates in the EU. In this and other policy contexts (e.g., [23]), the less politicised word 'energy consumer' have also tended to be used interchangeably with 'energy citizen', thereby contributing to blurring the boundaries between consumer forms of participation, direct forms of participation and representative forms of participation. In addition, the use of energy democracy and energy citizenship, have sometimes been problematic in how they have been applied and even risked co-optation. In contrast to classical definitions of citizenship and democracy where allegiance to certain positions is usually not part of what constitutes citizenship/democracy, definitions of energy democracy and energy citizenship tend to be normatively embedded in pro-environmental positions. However, the concepts have also been used by groups and industries opposed to energy transition initiatives. As Wood [24] has shown, the concept of energy citizenship has been used by fossil fuel industry lobbying campaigns where they promote citizens as spokespersons for the continuation of oil and gas and amplify them as 'voices of the people' in debates over energy futures. Another example is the creation of the fake grassroots movement 'Responsible Energy Citizen Coalition' that was created to influence the EU policies regarding shale gas [25]. This highlights the need for a clearer differentiation between what the concepts mean in practice. In the following section, we explore the differences between the conceptual definitions to start to address this need.

3.1. A conceptual comparison of energy democracy and energy citizenship

Energy democracy and energy citizenship are both solution-oriented concepts, responding to calls for rapid decarbonisation, accountability,

Table 1

Similarities and differences between definitions of energy democracy and energy citizenship in earlier research.

	Energy democracy	Energy citizenship
Similarities between definitions	<p>'... attempts to achieve more democratic energy decision-making and greater community ownership of a decentralised energy system' [27] (p. 2).</p> <p>"Broadly, energy democracy refers to an emergent social movement that re-imagines energy consumers as 'prosumers' or innovators, designers, and analysts who are involved in decisions at every stage of this sector, from production through use" [28] (p. 53).</p> <p>'... a novel concept and emergent social movement that connects energy infrastructural change with the possibilities for deep political, economic and social change' [10] (p. 35).</p>	<p>'The concept of energy citizenship has a strong focus on communities and includes practical participation in energy decisions' [26] (p. 288).</p> <p>'... emphasises awareness of responsibility for climate change, equity and justice in relation to siting controversies as well as fuel poverty and, finally, the potential for (collective) energy actions, including acts of consumption and the setting up of community renewable energy projects such as energy co-operatives' [21] (p. 72).</p> <p>'... ways in which citizens are becoming actively involved in the energy transition, and engaging politically, either as consumers and users, by participating in protest and support movements and ... as prosumers' [20] (p. 2).</p> <p>'Energy citizenship conjoins rights and responsibilities, underpinned by sustainability principles of participation, local action, equity, justice and the remediation of poverty' [23] (p. 71).</p> <p>'In contrast with the consumer, for whom energy is simply a good to be expended in pursuit of personal goals, the energy citizen engages with energy as a meaningful part of their practices' [30] (p. 24).</p> <p>"... what concepts like 'energy citizenship' might involve in practice remains largely open to interpretation. ... Official narratives and policy cycles tend to place particular emphasis on individual behaviour change, with citizens urged to 'play our part' by using energy more efficiently and making more informed choices as consumers" [12] (p. 185).</p>
Differences between definitions	<p>'Energy democracy refers to political calls for and the institutionalisation of more participatory forms of energy provision and governance' [29] (p. 1).</p> <p>'... an ideal political goal, in which the citizens are the recipients, stakeholders (as consumers/producers) and accountholders of the entire energy sector policy' [11] (p. 15).</p> <p>'... a response to the current energy regime experienced in many Western countries' [9] (p. 20).</p>	

and democratisation in the energy sector. While energy democracy emerged as a more politically oriented concept with its roots in social movements [17], energy citizenship is a narrower and more academic concept that involves individual acts of participative consumption and production of energy [21]. Key questions both strands of the literature address are 'How can energy be participatory governed?' and 'What kinds of citizens are (energy) citizens invited to be in the future energy system?'. Delimiting where discussions of one concept ended and the others began was often unclear, clearly resembling the broader political debate on democracy and citizenship.

By comparing the most common definitions of energy democracy and energy citizenship, we found several elements that help situate the two literatures' contributions. In Table 1, similarities and differences are

highlighted. The quotations were selected as representative examples of how both concepts were defined and discussed in earlier research. Among the similarities were an emphasis on citizen participation in energy decision-making [26,27], community or individual ownership of energy production in the form of prosumerism [21,28], and participation in social movements or protests [10,20]. In addition, most authors in both the energy democracy and energy citizenship streams described the shift towards more active forms of energy citizenship and democratic energy systems as most likely within decentralised energy systems.

Some of the elements unique to definitions of energy democracy were an emphasis on the institutionalisation of more participatory forms of energy provision and governance, such as community and civic ownership of power generation and grids [29]. Broadly, the goal of energy democracy was described as to redistribute economic and decision-making power by making citizens into recipients, stakeholders, and account holders of the entire energy sector [11]. The energy democracy literature framed energy democracy primarily as a response to the current energy regime in many Western countries [9].

In contrast, those elements unique to energy citizenship were the rights and responsibilities of individuals to participate in the transition to sustainable energy systems [23]. Participation was often described as a sort of personal journey from passive consumption to more meaningful interaction with energy in everyday life, through which energy consciousness and energy literacy were assumed to develop [30]. Other authors argued that what energy citizenship involves in practice remains largely open to interpretation and is often shaped in accordance with the interests of different actors using the concept [12,23]. In line with the techno-economic narrative of consumer demand, official narratives have tended to put particular emphasis on individual behaviour change [31].

Although some of the differences found in the definitions derive from the conceptual focus of each strand of literature (i.e., system governance vs. citizens' role in governing), the most striking difference between the two concepts was between behavioural and institutionalised visions and strategies for energy transitions. Definitions of energy democracy often presented direct forms of citizen participation such as collective prosumerism, community ownership, and cooperatives as key steps to democratising energy systems. Importantly, this was always discussed in the context of policies, laws, infrastructure or other forms of structural support or barrier, to institutionalisation of new forms of participatory governance. In contrast, energy citizenship more commonly referred to individual or collective forms of prosumerism and sustainable consumption practices as tools for individuals to contribute to the energy transition by means of self-governance. This confirms van Veelen and van der Horst [9] argument that energy citizenship is usually described as an active form of participation rather than as a citizenship entailing legal obligations and entitlements.

3.2. Quantitative trends

The concepts of energy democracy and energy citizenship have gained increased attention in the academic literature, especially during the last five years (see Appendix A for classification and summary of quantitative trends within the literature included in the review). The majority of the literature is biased towards a European and North American context. In Europe research has often focused on direct and consumer forms of participation, including energy cooperativism, remunicipalisation campaigns [32,33], community energy [34], prosumerism [20] and smart home devices [30]. Importantly, many studies often relate experiences in this type of participation to broader policy discussion of bottom-up elements and prosumerism in energy transitions, such as the CEP (e.g., [11]). In contrast, studies on energy democracy in the North American context have focused more on direct forms of participation in combination with representative forms of participation. This includes policy debates and regulation in regards to the level of influence of citizens/consumers in the energy transition

[35–37] as well as struggles to form political coalitions for policy change [38,39] and exchanges with broader social and environmental justice struggles specific to the North American experience [31,40,41]. In contrast to Europe, no studies have focused exclusively on energy citizenship in the North American context. While there may be a number of reasons explaining the relative lack of studies on energy citizenship in North American literature, the extensive focus on prosumerism, community energy and smart home devices in the CEP has probably contributed to a higher interest in the concept of energy citizenship in Europe. In this sense, the types and forms of participation central to the debate of the two concepts is, not always, but often, specific to ongoing debates and actors in these sites.

4. Themes identified in earlier research

Central to both literatures is the question of citizen participation. In the following analysis, we use themes to identify the kind of knowledge produced about different types of participation and in relation to citizens' role in future energy transitions. The four main themes emerged in the coding and were present in both the energy democracy and energy citizenship literatures.

4.1. Domestic energy technologies

Energy democracy and energy citizenship are often linked to the decentralisation of energy systems. One example of this is the work of Ryghaug et al. [26], who pointed out that the gradual shift from centralised and fossil-fuel-based production sites to more decentralised and distributed systems based on renewables will likely make electricity production a mundane matter for an increasing number of people. Regarding new domestic technologies, the expected decentralisation will typically include new modes of renewable energy production, microgrids, local storage solutions, automation, and smart home devices. Energy citizenship may refer to individual practices, such as energy efficiency measures or installing solar power for household use [26]. A common theme in the energy citizenship literature has therefore concerned questions of participation in the design and use of these types of domestic energy technologies. Although less prevalent in the energy democracy literature, some studies have also explored questions concerning the democratic participation in the design and use of energy technologies.

A 'material perspective' on participation is particularly prevalent in the energy citizenship literature. According to Ryghaug et al. [26], material participation can be defined as an 'object-oriented' or 'device-centred' perspective emphasising the role of technologies and material objects for (mundane) participation in political matters of concern. Material participation through renewable technologies in the home is a way in which individuals, rather than businesses or government agencies, can actively take responsibility for their role in mitigating carbon emissions by adopting and interacting with smaller-scale renewable energy technologies, such as electric vehicles, smart meters, and rooftop PVs [21]. The motivation for participating can be understood as awareness of the need for active and socially reformative action [42]. According to Ryghaug et al. [26] this kind of 'mundane energy citizenship' begins with physical, embodied experience, which in turn opens 'opportunities for connecting to new issues, new concerns, and through this, new ways of enacting energy citizenship'. Similarly, Wuebben et al. [43] argued that solar panels on roofs or electric vehicles in driveways by themselves do not define energy citizenship; rather, it is experiences of these technologies that can co-produce energy citizenship and expand opportunities to participate. Narrower accounts of energy citizenship have also proposed that it can involve consumption-oriented actions such as proactively shifting electricity consumption to periods of peak renewable energy generation or adopting energy efficiency measures [30,44,45].

From a policy perspective, the motivation for citizen participation in

flexible systems is of interest, especially given the increasing roles of wind and solar power. Since their generation fluctuates between different times of day and year, this increases electricity production and price volatility, which in turn increases the need for customer demand management [46]. Although the literature raises important questions concerning citizens' ability to meaningfully influence how their energy needs are met through mundane, everyday practices, there are also criticism that individualised notions of 'energy citizenship' might exclude both more effective collective forms of participation and large swaths of society. For example, by exploring European-level official narratives, Lennon et al. [12] warned against recent policy developments that tended to place particular emphasis on individual behaviour change. With citizens urged to 'play our part' by using energy efficiently and making more informed choices, they see citizen participation in energy transitions becoming increasingly conceived as a matter of purchasing and investment decisions rather than political participation.

Such concerns mirror recent work at the intersection of the energy justice and energy citizenship literatures, in particular that focusing on recognition justice, such as the work of Thomas et al. [47]. In their study of the public perception of system flexibility in the UK, they showed that although most participants perceived decentralised procedures for managing flexibility to enable greater citizen participation, they also felt that they imposed a one-size-fits-all approach to flexibility. Many participants argued that the focus on citizen engagement in flexibility provision did not consider the needs of those who lacked economic or social resources to invest in flexibility technologies or adapt their practices, such as elderly, chronically ill, and people engaged in unpredictable shift work.

As these critiques show, desires for greater citizen participation in energy system processes may sit uneasily with concerns about more democratic forms of participation when structural barriers to participation are not properly addressed. In this sense, van Veelen and van der Horst [9] noted that citizen participation is closely connected to questions of energy democracy, such as inclusivity (e.g., who can participate) and potential effects over time (e.g., who can benefit). Addressing the first of these concerns, Burke and Stephens [10] remarked that microgrids and democratised grid management are of central concern to many energy democracy advocates. Expanding microgrids and democratised grid management would not just allow individuals and collectives to

enter the market but also ensure equal access to the grid and new ways to coordinate electricity under distributed ownership [10]. Further addressing the question of inclusivity, MacEwen and Evensen [48] argued that women's empowerment and the inclusion of other marginalised groups in deploying small-scale renewables could serve as useful means of benchmarking the success of energy democracy. By drawing attention to how the gendered nature of the energy sector translates to the local level, they touched on an area that have still received relatively little attention in the energy democracy literature.

Addressing questions about who can benefit from domestic energy technologies, Lennon et al. [34] discussed citizens' ability to meaningfully participate in energy issues in their everyday lives. Their study of five European countries found that most participants did not consider themselves to have real agency in decision-making regarding their energy use other than as consumers. Most also expressed a desire to move beyond the consumer empowerment narrative that was considered illusory. Drawing on wider energy democracy narratives, the authors presented several participatory business models that meet the requirements that participants said were important for having influence on their everyday energy use. These include energy purchasing co-operatives and different models of locally or collectively owned micro-production and distribution. Most importantly, these participatory business models represent wealth-creation opportunities and ways of generating new employment also for low-income groups as opposed to just the wealthier, better-connected individuals who have traditionally benefitted more from commercial forms of community energy [34].

What can be distilled from these more technology-focused publications is that energy citizenship and energy democracy are practically associated with increasing numbers of individual prosumers and domestic engagement with energy efficiency and demand response systems. However, while the literature on energy citizenship mostly emphasises individual notions of material participation, the energy democracy literature has focused more on collective or institutional forms of participation in decentralised systems. The emphasis on individual material practices is much more obvious in the energy citizenship literature, while the energy democracy literature has focused more on procedural aspects of participation in policy. Fig. 2 summarise similarities and differences between energy democracy and energy citizenship in relation to domestic energy technologies.

	Similarities	Unique ED	Unique EC
Main focus	Material forms of participation	Procedural and distributional focus on implementation of domestic energy technology infrastructure	Device-centred participation in the home
	Local ownership	Local and collective owned energy technologies	Individual material practices
Overarching questions	Who can adopt and actively engage with domestic energy technologies?	How can decentralised energy technologies empower individuals and communities?	How can energy users become more actively engaged with energy issues via domestic energy technologies?
Main takeaway regarding participation	Important to broaden inclusion of women, low-income, and other marginalised groups deployment and decision-making	Business and grid structures must enable broader participation	Energy users should be seen as citizens rather than consumers

Fig. 2. Similarities and differences between energy democracy (ED) and energy citizenship (EC) concerning domestic energy technologies.

4.2. Energy communities

In recent years, many European countries have implemented policies to make it easier for citizens to set up energy communities [49]. European legislation following on the CEP, the Internal Energy Market Directive (IEMD) [50], and the Renewable Energy Directive (RED II) [51] has fostered advances by recognising ‘citizen energy communities’ and ‘renewable energy communities’ at the EU level in an attempt to provide an enabling framework and a level playing field with other energy provision models [43,52]. Participation in energy communities can take different forms but often includes participating in cooperatives, setting up local collective self-consumption schemes, acting as market aggregators and selling surplus energy from various energy communities, adopting diverse organisational and decision-making structures, and providing citizen-led responses to local energy needs [49]. A common theme in both the energy democracy and energy citizenship literatures has therefore concerned questions of energy community participation and governance.

The concept of energy citizenship is generally used to explain how community energy practices might help individuals to learn about energy and sustainability and to build capacity for engaging in broader energy policy. For example, Wuebben et al. [43] used the energy citizenship concept to describe how participation in energy communities might empower individuals to demand cleaner energy choices and to use their political power to shape new energy policies. Vihalemm and Keller [53] described energy citizens as co-providers of electricity who try to change regulative frameworks by employing democratic mechanisms and organisational participation. This often takes the form of developing energy communities or establishing energy cooperatives, but as Lee [54] showed, it can also occur by participating in collective energy decision-making in, for example, housing association boards. In this sense, collective energy practices such as energy communities are seen as a way to help build capacity for energy citizenship [43].

Many energy citizenship studies have focused on opportunities and barriers to participating in and establishing community energy projects. According to Inês et al. [49], collective prosumers still face regulatory challenges in the EU despite great advances in some national contexts in recent years. These include not being able to legally set up renewable energy communities, a lack of incentives to set up joint renewable self-consumer projects, and, in some cases, the reduction or removal of existing incentives. In addition, Inês et al. [49] warned that matters that

risks the exclusion of more vulnerable communities and lower-income families, such as the high costs as well as organisational and knowledge needs to set up local projects, have been insufficiently addressed in European legislation. Furthermore, in their case study of the electricity market liberalization in Estonia, Vihalemm and Keller [53] noted that in many Eastern European countries, ‘structural and cultural conditions do not favour quick advancement towards energy citizenship that aims at decentralised energy projects’ (p. 38). Rather than focus solely on regulatory frameworks to enable community energy, they argued that it is necessary to consider cultural barriers such as distrust of collective agency or lack of relevant skills if we are to understand where this form of energy citizenship is likely to develop.

While much of the literature discussing energy community and energy citizenship has tended to assume that community energy projects are inherently inclusive, the energy democracy literature has instead focused on understanding what makes projects democratic. For example, in their study of decision-making processes within two community energy projects in England and Scotland, van Veelen and Eadson [55] emphasised the importance of ‘becoming democratic’ as a reflexive process rather than an outcome. By highlighting the complex interaction between historic norms and relations within local and technological realities, they showed how the boundaries of what is considered the ‘democratic public’ are shaped. In this case, the difference between defining the democratic public as the shareholders of a project or as the local community had clear implications for who could participate in the project. In another study of community energy cooperatives in Scotland, Van Veelen [56] showed that while respondents deemed inclusivity to be important, the ideals of inclusive decision-making and robust accountability procedures could be at odds with the practicalities of implementing them. For example, time constraints can limit members’ ability to actively participate. The study also showed that the inclusion of previously underrepresented groups in decision-making does not automatically guarantee the transfer of power, as internal forms of exclusion may remain.

The concept of energy democracy has mostly been used to describe different experiences or normative ideals of democratic governance in energy communities – that is, procedural and representational aspects of decision-making. In this context, Allen et al. [57] research on women’s leadership in community energy projects in the USA is important. They explored the unique approaches of two women-led community energy projects in advocating for gender diversity in energy systems and

	Similarities	Unique ED	Unique EC
Main focus	Collective forms of participation in energy community (i.e., prosumerism, locally owned energy, and participatory business models)	Organisational principles for democratic energy communities	Legal and individual barriers to/enablers of participating in energy communities
Overarching questions	How can legal frameworks better support energy communities?	What makes energy communities democratic?	How can citizens’ participation in energy communities increase?
Main takeaway regarding participation	Warns against the exclusion of vulnerable groups due to economic and knowledge barriers to setting up energy communities	Emphasises the importance of inclusive decision-making processes and representation in energy communities	Legal and cultural conditions can hinder the development of energy communities in some countries

Fig. 3. Similarities and differences between energy democracy (ED) and energy citizenship (EC) concerning energy communities.

women's leadership with respect to energy democracy. By highlighting the importance of gender diversity, not just among members of community energy projects but also in project leadership, Allen et al. [57] countered the gender blindness that is otherwise common in much of the energy literature, emphasising practical considerations of inclusivity and representation in community energy projects. Fig. 3 summarise similarities and differences between energy democracy and energy citizenship in relation to energy communities.

4.3. Energy transition movements

A theme that is particularly evident in the energy democracy literature is the analysis of energy transition movements. Studies of this theme typically use energy democracy as a framework for understanding the political demands and rationale behind social movements and civil society initiatives advancing democratic visions of energy transition. In their study of grassroots movements in the USA and Canada, Burke and Stephens [10] identified three main goals of the energy democracy movement: resisting the dominant fossil fuel agenda; reclaiming social and public control over the energy sector; and restructuring the energy sector to better support democratic processes, inclusion, and environmental sustainability. Often explicit or implicit in these movements is an inclination towards participatory democratic governance, which has two main characteristics: greater citizen involvement in policy decision-making and popular control over energy infrastructure. Although these appear to be the most commonly articulated goals of energy democracy advocates [see also 18], Hess [58] highlighted that it is important to recognise that movements are often splintered and divided across multiple coalitions, each with its own goals, strategies, and organisational partners. One major division involves whether movements are positioned as oppositional or alternative. That is, do they concentrate on the 'sun-setting' fossil fuel industries and sociotechnical systems, or do they concentrate more on developing support for the 'sun-rising' renewable or energy-efficiency industries and sociotechnical systems?

Other authors, such as Paul [32], have explored broad instances of energy politics, in this case, the German Energiewende, as processes and spaces where energy democracy unfolds. He argued that energy democracy itself can be understood as an expression of a new spatial politics of energy transition, evident in the protests, civil disobedience, and alternative energy practices of civil society. Similarly, Angel [59] examined the experiences of the Berliner Energietisch campaign, which

in 2013 forced and lost a referendum aiming to re-municipalise and democratise Berlin's energy system. By focusing the political struggles on alternative ownership and decision-making models in the energy sector, such geographical studies provide a dynamic and plural understanding of energy transitions. For example, while the Energietisch forced concessions but lost the referendum to increase the local state's role in Berlin's energy governance, a similar campaign for energy re-municipalisation was successful in Hamburg. In this sense, future comparative geographical studies could also provide further insight into the opportunities for and barriers to democratic energy transitions in different places and governance contexts.

Regarding more institutional forms of participation, Burke and Stephens [10] identified several policy instruments associated with the overarching goals (i.e., resistance, reclamation, and restructuring) of the movement. The most prominent ones are: legal instruments for demand reduction and distributed generation; public bond instruments for renewable energy; cap-and-dividend schemes for fossil fuels; and a set of economic and new energy system institutional reforms including community energy, renewable energy cooperatives, re-municipalisation, green public service banks, microgrids and democratised grid management, and sustainable energy utilities. However, and notwithstanding the many policies closely associated with their agenda, Williams and Sovacool [27] argued that the energy democracy movement tends to overlook more conventional forms of political action. Rather than participating in representational democracy forums, for example, by debating and participating in policy decisions, the movement has favoured more material forms of participation, such as community ownership. To consider the untapped potential of more institutional participation, Williams and Sovacool [27] explored whether influencing thinking and decision-making in national political sites can be an effective means of pursuing energy democracy aims. Their study explored energy democracy as a framing strategy in the UK parliamentary debate on shale gas and showed that certain elements of energy democracy, such as local community participation in and control over decision-making, have had some success in shifting the government and industry towards energy democracy aims. Nevertheless, it also demonstrated how many other political issues, including industrial strategy and economic development, could triumph over the importance of energy democracy as a whole, making it a less effective framework in national politics.

To strengthen the energy democracy agenda, some researchers have

	Similarities	Unique ED	Unique EC
Main focus	The role of social movements and civil society initiatives in advancing energy transitions	Uses energy democracy as a framework for understanding the demands and rationale of social movements	Uses citizenship to discuss rights (e.g., affordable energy) and responsibilities (e.g., responding to inequities) expressed through social movements
Overarching questions	No overlap	How are social movements and civil society initiatives advancing the energy democracy agenda?	How is energy citizenship expressed through social movements?
Main takeaway regarding participation	Demands raised by social movements are often about recognising the needs of specific groups of citizens or specific localities in terms of energy access and design	Political action tends to focus on 'sun-setting' or 'sun-rising' alternative energy practices through protests, civil disobedience, policy advocacy, or acts of setting up collective energy alternatives	Energy citizenship is sometimes used to describe participation in energy democracy movements

Fig. 4. Similarities and differences between energy democracy (ED) and energy citizenship (EC) concerning energy transition movements.

called for more critical engagement with the concept itself. For example, Lennon [31] argued that it is necessary to challenge dominant understandings of energy to formulate a truly democratic agenda. Rather than simply seeing energy as an objective natural resource, he argued that it is necessary to understand the colonial context that has historically shaped its structure and still influences different groups' access to energy. As such, Lennon [31] called for intersectional research challenging dominant conceptions of energy and for the broader inclusion of marginalised groups in energy democracy movements. For this purpose, he argued that antiracist movements, such as Black Lives Matters, could play an important role in 'decolonising energy' by enabling marginalised groups to participate in and shape the energy sector.

While social movements have been central to discussions of energy democracy, they have been less central, at least in academic debate, to the concept of energy citizenship. Nevertheless, some exceptional studies have initiated discussion of how social movements can facilitate new forms of energy citizenship. Campos and Marín-González [20] placed energy citizenship in this context by exploring whether prosumerism could be understood as a social movement. Specifically referring to the legal forms of cooperatives or energy communities, they argued that, like members of other social movements, prosumers have collective identities, are often involved in networks (acting locally, yet aiming for a global outreach), and seek to achieve goals that benefit the collective, motivated by altruistic aspirations. In this sense, active energy citizens could be seen as part of a larger movement of 'change agents' promoting decentralised and democratic energy models.

Further, Sanz-Hernandez [60] showed that 'energy citizens' engaged in social movements addressing energy poverty and energy justice in Spain helped in giving a voice to those affected. By writing articles and opinion pieces, following up public policies, participating in forums, etc. she argues that they proposed a revision of the notion of citizenship. On a conceptual level, this notion of citizenship included the right to affordable energy and, at the institutional and formal levels, it called for additional participation mechanisms and the right of citizens to participate in decision-making processes. Thus, Sanz-Hernandez [60] showed that social movements could help facilitate a form of energy citizenship that concerns the meaning and recognition of rights and responsibilities in local conflicts. She also showed that this form of energy citizenship does not need to respond to specific events, but can also arise in response to longer periods of energy injustice. Fig. 4 summarises similarities and differences between energy democracy and energy citizenship in relation to energy transition movements.

4.4. Energy policy

One of the underlying assumptions of energy democracy is that inclusive decision-making processes could strengthen the legitimacy of energy policy, especially regarding renewable energy transitions. Furthermore, advocates highlight the normative value and strategic importance of including citizens and civil society organisations in energy policy design and decision-making as an alternative to more technical and technocratic routes to a low-carbon society [55]. Arguably, this could entail a range of benefits for energy transitions, such as increasing the social acceptability of new infrastructure, distributing financial benefits to nearby affected populations, involving previously marginalised actors who have new ideas, and facilitating effective policy implementation [61]. However, exactly how such participation should take place is largely disputed in both policy and research.

According to most literature on energy democracy, citizens can play a greater role in shaping energy policy outcomes through three primary mechanisms. The first is participation in energy sector planning and decision-making, including through policy co-design initiatives [62], public consultation [23,40], and participative energy landscape design [63]. The second mechanism is increased asset ownership and local control by communities [64] or the re-municipalisation of utilities [65]. According to Welton [35], consumer choice is a third mechanism to

channel citizen preferences. Like the 'local control' concept, consumer choice focuses on decentralisation as a form of democratisation but rather than emphasising ownership or legal control, consumer choice emphasises the creation of decentralised markets in which consumers can participate on the same terms as energy companies. While some level of consumer choice would entail increased participation in energy purchasing decisions, including more control over levels of energy demand and the opportunity to generate sell and store self-produced electricity, Welton [35] warned against overemphasising this or any other single definition of energy democracy in policy. Overemphasising consumer choice could weaken regulatory mechanisms giving citizens access to centralised decision processes. Likewise, the one-sided pursuit of local control to replace more centralised energy decision-making risks diminishing the impetus to engage in bureaucratic processes and reforms at other levels of governance where citizens are more likely to accomplish the aim of democratising energy systems.

All three mechanisms share the inclusion of non-traditional actors, such as local communities, civil society organisations, and historically marginalised populations, in political processes relating to energy. This is important because, as MacArthur et al. [61] have noted, when the pressure increases to develop new renewable energy infrastructure, tensions are likely to intensify over the location and ownership of this infrastructure. The decentralised character of renewable assets such as wind and solar power generation means that many more local areas will be confronted with the physical, social, and economic impacts of energy transitions. Much of the energy democracy literature has therefore concerned questions of how to enable this shift to increased participation, with diverse gendered, racial, and class interests at the table. In line with Lennon's [31] call to 'decolonise' energy, studies have increasingly started to explore how the principles of energy democracy could be used in formulating public policy to correct historical injustices. For example, Scott [41] explored how investments in renewable energy infrastructure in Canadian indigenous communities, which have insufficient energy security, could be a way of advancing a politics of reconciliation. Similarly, Johnson [40], who explored the process behind the Dakota Access Pipeline in the USA, proposed that principles of energy democracy could be a way of addressing the disproportionate burden currently shouldered by marginalised, often indigenous communities, in developing American energy infrastructure. Other examples include Davies et al. [64] study of a national community energy programme in South Africa – a country whose energy landscape is structurally shaped by histories of colonisation, apartheid, and vested governmental and private interests – that attempts to combine inclusive socio-economic development with the advance of renewable technologies.

While these regulatory and political aspects of promoting citizen participation have been frequently discussed in the energy democracy literature, the energy citizenship literature has focused more on how different forms of energy citizenship can be enacted through energy policy. For example, in the case of Italy, Sarrica et al. [66] showed that the perception of energy citizenship differs depending on the level of energy governance. By exploring parliamentary and newspaper discourses, they discovered that at the national and regional levels, energy citizenship often had negative connotations and was in some cases even perceived as an obstacle to top-down energy decisions. In contrast, actors at the local level often held a positive view of energy citizenship. Procedural participation and the development of citizen-led initiatives at the local level were rather recognised as a resource. Naturally, such divergent views of energy citizenship can create tensions and incoherence between different scales in terms of what form public engagement should take.

These tensions are not exclusive to actors at different levels of governance. In policy processes, different ways of understanding energy citizenship can sometimes overlap and even enacted in complementary ways to realise certain political goals. This was demonstrated by Mulally et al. [23], who identified six distinct narratives articulating divergent views of energy citizenship among actors in their study of an

	Similarities	Unique ED	Unique EC
Main focus	Formal processes and mechanisms for citizens to influence energy policy	Policy mechanisms for distributing financial benefits to nearby populations, reconciling historic injustices, and involving previously marginalised groups in energy decisions	Tensions and incoherencies between different views of energy citizenship in policy
Overarching questions	How can inclusive decision-making processes strengthen the legitimacy of energy policy?	How can the principles of energy democracy aid in developing policy mechanisms for more inclusive energy policies?	How do different views of energy citizenship influence policy?
Main takeaway regarding participation	The preferred form of public engagement in public administration has been consumer-type participation	Too much focus on either consumer choice or local control risks diminishing the space for policy participation	Different perceptions of energy citizenship create tensions concerning what form public participation should take in policy

Fig. 5. Similarities and differences between energy democracy (ED) and energy citizenship (EC) concerning energy policy.

energy policy consultation process. These ranged from a top-down paternalistic frame to a bottom-up deliberative frame. In the paternalistic frame, mostly found among energy firms, public agencies, and trade unions, no citizen participation beyond legally mandated processes was deemed necessary. Rather, policymaking was considered best handled by experts and implemented in a top-down manner through information and education. At the other end of the spectrum was the deliberative frame, found among some environmental NGOs and political parties. These groups advocated citizen involvement in all stages of the policy cycle. Energy policy should originate at the community scale and feed into local authority, regional, and national plans through an inclusive bottom-up approach. Another frame, common among public agencies, energy firms, businesses, and academia, was the consumerist frame that sees energy citizenship as primarily enacted via market mechanisms and through consumer choice. These divergent views of energy citizenship clearly feed into the previously outlined debate in the energy democracy literature on different mechanisms for citizen participation in energy policy.

Considering the intertwined character of the two concepts, it is often hard to distinguish the specific contribution of each literature in regard to policy. Both literatures identify a similar typology in relation to participation, ranging from consumer-type participation to formal deliberative or bottom-up decision-making and ownership-type participation. There also appears to be a rather broad consensus among researchers in each strand of literature that the preferred form of public engagement in public administration is consumer-type participation. As Lennon et al. [12] critically noted, this form of participation involves minimal disruption to current centralised models of energy production and consumption and ensures the maintenance of corporate ownership and control over consumption in the shift to renewables. Scholars from both strands of literature has therefore tried to answer how to make decision-making processes more inclusive to strengthen the legitimacy of energy policy. While energy democracy scholars ask how energy could be governed more democratically, the energy citizenship literature attempts to identify what roles citizens could be asked to play in participative forms of energy governance. It is regarding these questions that the specific contributions of each field can be discerned, but also where the analysis needs to be deepened to strengthen the relevance of the two concepts in future discussions on public participation in policy. Fig. 5 summarise similarities and differences between energy democracy and energy citizenship in relation to energy policy.

5. Discussion

Given the increased importance of a just energy transition, including decentralisation, increased volumes of renewables and local ownership, the two concepts energy democracy and energy citizenship are more relevant than ever. Below, we will compare energy democracy and energy citizenship, focusing on: Where is participation taking place? How do people participate in energy systems? Who is demanding more influence on energy governance and why, and what motivates citizen participation from a policy point of view?

5.1. Where citizens are participating – decentralised versus centralised systems

As mentioned in the introduction, the research on energy democracy and energy citizenship spurred out of a critic of the centralised fossil-fuelled energy system. As a result, the research has mostly focused on participation in decentralised energy systems, including smart home energy solutions, renewable energy, and energy communities. We can now take a 10-year perspective of this still emerging research field and some critical reflections could and should be done. As described in section 3.2, the reviewed literature mainly covers Europe and North America, i.e., countries dominated by centralised energy production and energy system ownership [67,68] and where most households do not live in smart homes [69]. The literature tends to capture how relatively few early adopters participate in emerging systems, rather than participatory practices in existing dominant systems. A gap in the existing research in both strands, thus, relates to the lack of studies of the centralised energy system that most citizens experience in their everyday lives. Admittedly, the most central contribution of both strands of research is and should continue to be to bring in ways of thinking about public engagement and participation that goes beyond traditional, non-existent or low-engagement, forms of participation, such as public consultations, that have been common to more centralised energy governance. However, the lack of studies on centralised system governance is a missed opportunity to vitalise democratic mechanisms within these types of energy systems. As Sarrica et al. [66] and Mullally et al. [23] pointed out, actors in centralised systems have not always viewed participation in policy decision-making or community ownership as relevant, necessary, or pragmatic. To let energy democracy and energy citizenship revitalise debates on the governance of existing more centralised systems that most likely will be in place for long still, such as

district heating or the transmission grids, seems like a well-needed development for both the concepts and the energy systems in place.

Another critical reflection in relation to the existing research is the bias towards North American and European contexts. This bias has been somewhat taken for granted, especially in the energy democracy literature, which often frames the turn towards distributed ownership and decentralisation as a citizen response to the current energy regime in Western countries (e.g., [9]). However, as multiple studies in for example Kenya [48], India [70] and Thailand [71,72] have shown, citizen initiatives for decentralised participative energy practices are neither exclusive to Western contexts nor new. Despite this, a deeper self-critical reflection of the overall 'Western bias' and politico-historical context of the two concepts is lacking. Such reflections could potentially help highlight blind spots in existing literature but also help expand and explore the concepts in other contexts.

Moreover, since much research on energy democracy and energy citizenship concerns local-level participation, it would benefit from more careful consideration of scale and scalar politics. Much of the literature suffers from what the geographical literature has called 'the local trap', in which it is assumed that organisations, policies, and actions at the local scale are inherently more likely to have desired social and ecological effects than are activities at other scales [73]. The energy democracy and energy citizenship literatures commonly assume that devolution of power to local actors and organisations is central to environmental sustainability and to an active citizenry and democracy. While there are exceptions, such as Mullally et al. [23], Davies et al. [64] Na'puti et al. [62] who have examined participation in national-level politics, deeper engagement with other scales of participation and critical accounts of local forms of participation would add new perspectives to these two streams of literature.

5.2. How citizens participate – direct and representative participation

Energy citizenship is often considered in terms of individual practices and behaviour (e.g., [26]), while energy democracy, with its focus on participatory processes, has dealt more with procedural aspects of participation and issues of inclusion and outcomes (e.g., [9]). What they share is a focus on decentralised and direct forms of citizen participation and, according to our thematic analysis of the literature, there are four main ways in which such participation takes place. One of them is by adopting and interacting with smaller-scale domestic renewable energy technologies. A second is by participating in energy communities. A third is by engaging in social movements and the fourth one is by engaging in participative energy policy processes.

Energy citizenship's focus on material participation has also contributed to an alternative, more mundane view of participation. By adopting and interacting with small-scale renewables and smart systems in their homes, people's energy literacy will expand and help them connect to larger issues. Nonetheless, reading this literature raises questions about what *non-participation* in mundane forms of energy citizenship would be like. For example, how could a citizen living in a smart home avoid material participation? Such questions are neither discussed nor problematised. Rather, some of the literature gives the impression that no reflective participation is needed for one to qualify as an energy citizen, which might dilute the concept.

While all reviewed studies agreed that enlarged citizen participation could benefit energy transitions in a range of ways, some results also pointed to political barriers to some forms of participation. As Welton [35] and Lennon et al. [12] highlighted, since policy-makers have preferred consumer choice-type of participation, this may limit advancements in mechanisms regulating citizens' access to formal policy decision-making processes. This could help perpetuate current centralised models of energy production and corporate ownership and control, contrary to the decentralised vision inherent to the two concepts. Despite this, mechanisms regulating citizen participation in formal policy processes have not been extensively researched in the energy

citizenship literature.

The lack of problematisation of how a citizen can participate is not exclusive to the energy citizenship literature. This literature review confirms Williams and Sovacool [27] claim that, due to the focus of energy democracy and energy citizenship on more direct forms of participation, these strands of research have largely overlooked conventional representative forms of political action. Citizens can, for example, choose to be active as voters or in political parties and in this way express their wishes and demands regarding the energy system. In Europe, municipal ownership of energy companies is also common, and these entities can be seen as vehicles of citizen participation [74–76]. Representative aspects of re-municipalisation and citizen participation have, however, been somewhat neglected in earlier research. Echoing Burke and Stephens [19] call for improved models of democratic governance in the energy sector, we also propose that representative democracy can play a bigger role.

Paying attention to representative forms of participation in energy transitions is important because they are highly political. If governed largely to preserve existing power relations, new energy systems may replicate existing dynamics of power. This is often discussed in transition research, where, for example path dependency and lock-in effects are central concepts (e.g., [77]). Few studies recognised or discussed how these systemic dynamics influence citizen participation, despite many studies in both strands of literature being embedded in science and technology studies-related perspectives.

5.3. Why do or should citizens participate? The limited view of participation

Searching the literature revealed three main arguments as to why it is desirable to have increased citizen participation in energy system governance. The first relates to energy invisibility and how citizens in general have become socially and psychologically detached from centralised energy systems. Decentralised renewable energy technologies could help raise energy consciousness and literacy. Second, citizen participation in collective ownership is conceived as a way to promote affordable services and to ensure collective benefits flowing back to either members or the state. Citizen involvement through ownership is seen as advancing the transition towards renewable energy faster than will be done by large privately owned energy corporations (see, e.g., the CEP). Third, from a policy point of view, citizen participation addresses the challenge of achieving public acceptance of new technologies and energy policy legitimacy. From an energy democracy perspective, the energy transition is linked to a broader project of expanding political democracy, in which energy sector reform serves to re-inspire a politically engaged citizenry participating as citizens rather than consumers.

Both energy democracy and energy citizenship researchers have recognised the importance of broadening the range of actors participating in energy politics and adopting renewable energy technologies. There is research consensus that methods need to be developed to involve marginalised groups, individuals, and communities, including communities of colour, indigenous communities, women, low-income communities, and others, who bring a fresh set of priorities and values to the debate on energy futures.

With few exceptions, scholarship on energy democracy and citizenship has neither explored the tensions involved in increasing citizen participation. Although critical accounts are found in the literature, most start from the premise that citizen participation is generally desirable to achieve good energy governance. However, given the psychological and social 'detachment' from energy [21] that most people experience in their daily lives, surprisingly few studies have explored the relationship between energy literacy and people's willingness to engage with energy issues. Many people may not possess the necessary knowledge to understand what opportunities for participation exist nor the reasons why they should engage with energy issues. A potential avenue for future research would thus be to expand the exchange between the

literatures on energy democracy, energy citizenship, and energy literacy.

Another important challenge facing future research is to specify how participatory forms of governance can be made compatible with simultaneous calls for a rapid transition. While the inclusion of non-traditional actors, such as local communities and civil society organisations, in political processes is central to developing more democratic energy systems, researchers have recently started to engage more with questions of the effective outcomes of democratic energy systems [6,78,79]. Maintaining responsibility for the effectiveness of the energy transition is needed to sustain political and citizen support. While increasing the number of actors and areas of decision-making is desirable from a representational point of view, and could potentially allow for productive pluralism, it could also lead to antagonism and irreconcilable perspectives that could limit the prospects for the rapid transition envisioned by energy democracy advocates and movements. Further, as Szulecki and Overland [17] noted, it cannot be assumed that more energy democracy necessarily equates to better and faster decarbonisation, broader energy access, or greater societal wellbeing. However, the same argument could also be turned on its head, which events such as the ‘Yellow Vests’ in France and the Swedish ‘Bensinupproret’ (the petrol uprising) clearly demonstrates. These and similar protests around the world are important warnings of what happens when people experience themselves being unjustly affected by and have not been included in decision-making that substantially impacts their daily life. In the light of this, we welcome the direction pointed out by Skjølsvold and Coenen [6] of problematizing the ‘fast policy’ [80] of energy transitions and

adopting a more reflexive approach to accelerating transitions. Here, research on energy democracy and energy citizenship could play an important role in furthering the understanding of the form that participation should take to ensure both a rapid and democratic energy transition.

6. Conclusions

The EU has over the years developed and confirmed its vision that citizens should have a central role in energy transitions. In the ongoing implementation of the CEP and other policies for decentralisation and public engagement, it will be central to understand the changing role of the public as well as the forms that democratic engagement might take. This literature review has shown that there are similarities and differences between the meaning of energy citizenship and energy democracy. The two strands of research have both contributed to a discussion on how to achieve a rapid and inclusive energy transition through means of decentralisation and increased local ownership/decision-making. Both strands discuss the roles of social movements, the importance of material forms of participation, inclusive decision-making processes and formal participatory processes to influence policy. In relation to these broader debates and themes, the need of two concepts seems less valuable. Both concepts contribute to the same discussions and share similar reasoning of structural and individual barriers and opportunities for citizen participation in energy.

Nevertheless, there are also important nuances within these broader debates that clearly differentiate the two concepts. The main difference

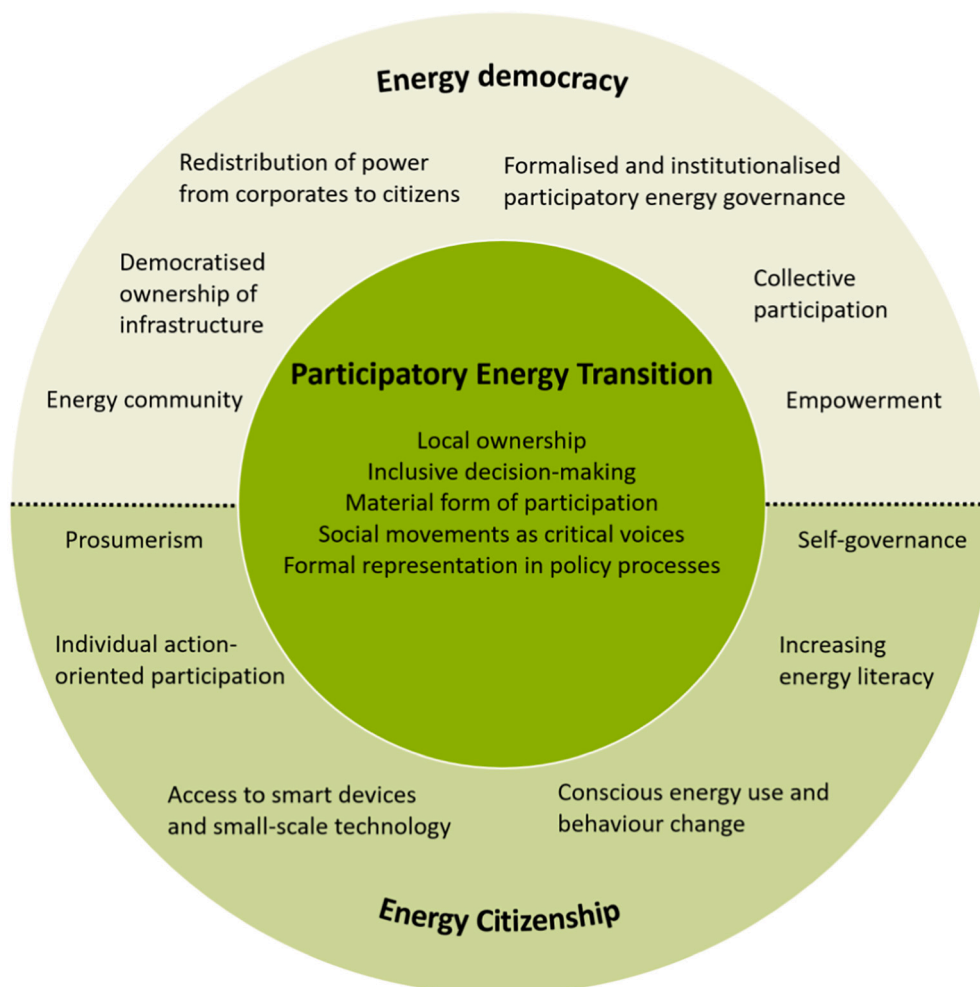


Fig. 6. Conceptual framework for analysing of participatory energy transition.

is related to questions of structural change versus individual agency in the energy transition. In energy democracy, the perceived undemocratic nature of the dominant energy regime and collective forms of organising are important triggers for the participation of individuals. The energy democracy literature often tends to focus on ways to support and institutionalise decentralised ownership and direct democratic forms of governance. In the energy citizenship literature, there is more focus on the individual responsibility and the individual's personal journey to become active and engaged. Here, energy users are often discussed in terms of rights and responsibilities. In contrast, from the perspective of energy democracy, individuals would rather see the benefits of engaging in the energy systems as a matter of deepening democracy and volunteer to do so. Energy democracy often focuses on political questions of systemic change by emphasising the need for redistribution of economic and decision-making power in the transition to renewable energy. In contrast, energy citizenship adds important nuance to the discussion of citizen participation by emphasising that the debate about increased participation is also a question of changing the perceptions of the public. Energy citizenship critically engages with new ways of thinking about the role of the public in relation to energy. It highlights some of the central tensions involved in increased citizen participation, where participation at the one hand can deepen democracy, while on the other hand, risk shifting responsibility from corporal and governmental responsibility to individuals. These are the main patterns emerging in our material, even if there are also overlaps and studies crossing these borders. However, when leaving the individual studies aside these are the main characteristics of each strand of literature. Fig. 6 summarise these findings.

Empirically, Fig. 6 conceptualises the range of perspectives and elements that are central when analysing participatory energy transitions. Theoretically, it can provide a framework for understanding the tensions and conflicting perspectives that exist between the two strands of literature as well as where they align. This framework can be helpful to bring the two concepts into a more honest conversation, where neither their similarities risk to dilute the meaning of each concept nor differences are overly accentuated. Rather, it is important to see how the two concepts are often interrelated, though they provide different entrance points to understanding public engagement as a central political arena

Appendix A

Table A.1

Energy democracy classification of literature.

Author	Title	Outlet	Author location	Geographical focus	Actor focus	Methodology
M.M. Vanegas Cantarero (2020)	Of renewable energy, energy democracy, and sustainable development: A roadmap to accelerate the energy transition in developing countries	Energy Research & Social Science	Germany	Multiple	Community energy/prosumers	Mixed
K. Szulecki, I. Overland (2020)	Energy democracy as a process, an outcome and a goal: A conceptual review	Energy Research & Social Science	Norway	N/A	N/A	Mixed
B. Lennon, N.P. Dunphy, E. Sanvicente (2019)	Community acceptability and the energy transition: a citizens' perspective	Energy Sustainability and Society	Ireland	Europe	Community energy/prosumers	Mixed
M. Antal, K. Karhunmaa (2018)	The German energy transition in the British, Finnish and Hungarian news media	Nature Energy	Hungary	Europe	N/A	Mixed
O. Akizu et al. (2017)	Tracing the emerging energy transitions in the Global North and the Global South	International Journal of Hydrogen Energy	Spain	Multiple	NGO/Social movement	Mixed
M. MacEwen, D. Evensen (2021)	Mind the gap: Accounting for equitable participation and energy democracy in Kenya	Energy Research & Social Science	UK	Kenya	Community energy/prosumers	Qualitative
L. Williams, B.K. Sovacool (2020)	Energy democracy, dissent and discourse in the party politics of shale gas in the United Kingdom	Environmental Politics	UK	UK	Policy stakeholders	Qualitative
B. Vitéz, S. Lavrijssen (2020)	The energy transition: Democracy, justice and good regulation of the heat market	Energies	Netherlands	Europe	N/A	Qualitative
	Assembling community energy democracies	Voluntary Sector Review	UK	UK		Qualitative

(continued on next page)

for energy transitions.

In conclusion, separate theoretical developments between the two strands of literature have brought important differences. These can broadly be defined, in the case of energy democracy, as focused on structural changes such as formal participation in energy-related decision-making and the democratisation of energy infrastructure. In the case of energy citizenship, theoretical developments have been more focused on the role of the public and individuals abilities and willingness to participate, especially regarding more individualised forms of prosumerism and access to smart and small-scale technology.

Lastly, several reflections arose during the literature review that could help inform further research. First, there is a missed opportunity when the literature solely considers decentralised systems and ignores the centralised system that is the de facto dominant system. Other less researched areas concern non-participation and how representative democracy relates to both energy democracy and energy citizenship. Further research is also needed into whether, when, and how more citizen participation is compatible with a rapid energy transition. Finally, as the literature is clearly dominated by studies in European and North American contexts, there is little understanding of how these concepts translate into other contexts. Given the underrepresentation of African, Asian, and Latin American contexts, these are important areas for future research.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Table A.1 (continued)

Author	Title	Outlet	Author location	Geographical focus	Actor focus	Methodology
B. van Veelen, W. Eadson (2020)					Community energy/prosumers	
A.H. Sorman, E. Turhan, M. Rosas-Casals (2020)	Democratising Energy, Energizing Democracy: Central Dimensions Surfacing in the Debate	Frontiers in Energy Research	Spain	N/A	N/A	Qualitative
K.A. Scott (2020)	Reconciliation and Energy Democracy	Canadian Journal of Program Evaluation	Canada	Canada	Indigenous community	Qualitative
J. Nicholls (2020)	Technological intrusion and communicative renewal: The case of two rural solar farm developments in the UK	Energy Policy	UK	UK	Community energy/prosumers	Qualitative
J.L. MacArthur et al. (2020)	Canada's Green New Deal: Forging the socio-political foundations of climate resilient infrastructure?	Energy Research & Social Science	New Zealand	Canada	NGO/Social movement	Qualitative
M.A. Heldeweg, S. Saintier (2020)	Renewable energy communities as 'socio-legal institutions': A normative frame for energy decentralisation?	Renewable & Sustainable Energy Reviews	Netherlands	Europe	Community energy/prosumers	Qualitative
A. El Mekaoui et al. (2020)	Sustainability, Sociocultural Challenges, and New Power of Capitalism for Renewable Energy Megaprojects in an Indigenous Mayan Community of Mexico	Sustainability	Mexico	Mexico	Indigenous community	Qualitative
S.Y. Choi (2020)	Resilient peripheralisation through authoritarian communication against energy democracy in South Korea	Environmental Politics	USA	South Korea	NGO/Social movement	Qualitative
I. Campos, E. Marin-Gonzalez (2020)	People in transitions: Energy citizenship, prosumerism and social movements in Europe	Energy Research & Social Science	Portugal	Europe	Community energy/prosumers	Qualitative
S. Becker, J. Angel, M. Naumann (2020)	Energy democracy as the right to the city: Urban energy struggles in Berlin and London	Environment and Planning A-Economy and Space	Germany	Europe	Local energy system stakeholders	Qualitative
R.P. Thombs (2019)	When democracy meets energy transitions: A typology of social power and energy system scale	Energy Research & Social Science	USA	N/A	N/A	Qualitative
J.C. Stephens (2019)	Energy Democracy: Redistributing Power to the People Through Renewable Transformation	Environment	USA	Multiple	NGO/Social movement	Qualitative
U. Pesch (2019)	Elusive publics in energy projects: The politics of localness and energy democracy	Energy Research & Social Science	Netherlands	N/A	Local energy system stakeholders	Qualitative
S. Mookerjee (2019)	Renewable energy transition under multiple colonialisms: passive revolution, fascism redux and utopian praxes	Cultural Studies	Canada	India	Community energy/prosumers	Qualitative
G. Juwet (2019)	Exploring the ambiguous socio-spatial potential of collective heating in Flanders. Planning and design as lever for a sustainable energy transition	European Planning Studies	Belgium	Belgium	Local energy system stakeholders	Qualitative
T.N. Johnson (2019)	The Dakota Access Pipeline and the Breakdown of Participatory Processes in Environmental Decision-Making	Environmental Communication- a Journal of Nature and Culture	USA	USA	Policy stakeholders	Qualitative
R.J. Hewitt et al. (2019)	Social Innovation in Community Energy in Europe: A Review of the Evidence	Frontiers in Energy Research	UK	Europe	Community energy/prosumers	Qualitative
D.J. Hess (2019)	Coalitions, framing, and the politics of energy transitions: Local democracy and community choice in California	Energy Research & Social Science	USA	USA	Policy stakeholders	Qualitative
M.A. Heldeweg, I. Lammers (2019)	An empirico-legal analytical and design model for local microgrids: applying the ILTIAD' model, combining the IAD-framework with institutional legal theory	International Journal of the Commons	Netherlands	Netherlands	Community energy/prosumers	Qualitative
S.R. Cayuela, E. Turhan (2019)	Wasting Democracy, Fuelling Dissent: Refuse-Derived Fuels in Can Sant Joan (Catalonia)	Frontiers in Energy Research	Sweden	Spain	NGO/Social movement	Qualitative
C. Aunphattanasilp (2019)	Civil society coalitions, power relations, and socio-political ideas: Discourse creation and redesigning energy policies and actor networks in Thailand	Energy Research & Social Science	Japan	Thailand	NGO/Social movement	Qualitative
J. Angel (2019)	Towards an Energy Politics In-Against-and-Beyond the State: Berlin's Struggle for Energy Democracy	Antipode	UK	Germany	NGO/Social movement	Qualitative
E. Allen, H. Lyons, J.C. Stephens (2019)	Women's leadership in renewable transformation, energy justice and energy democracy: Redistributing power	Energy Research & Social Science	USA	USA	NGO/Social movement	Qualitative
S. Welton (2018)	Grasping for energy democracy	Michigan Law Review	USA	USA	Citizens/consumers	Qualitative
			UK	N/A	N/A	Qualitative

(continued on next page)

Table A.1 (continued)

Author	Title	Outlet	Author location	Geographical focus	Actor focus	Methodology
B. van Veelen, D. van der Horst (2018)	What is energy democracy? Connecting social science energy research and political theory	Energy Research & Social Science				
B. van Veelen (2018)	Negotiating energy democracy in practice: governance processes in community energy projects	Environmental Politics	UK	UK	Community energy/prosumers	Qualitative
P. Picchi (2018)	Why energy democracy can enhance landscape democracy in the energy transition: some reflections on the Italian case	Ri Vista-Ricerche Per La Progettazione Del Paesaggio	Netherlands	Italy	Community energy/prosumers	Qualitative
F.C. Paul (2018)	Deep entanglements: History, space and (energy) struggle in the German Energiewende	Geoforum	UK	Germany	NGO/Social movement	Qualitative
T.R. Na'puti et al. (2018)	Engaging publics through climate math Lessons from Boulder's 2016 Climate Action Plan	Journal of Argumentation in Context	USA	USA	Policy stakeholders	Qualitative
G. Mullally, N. Dunphy, P. O'Connor (2018)	Participative environmental policy integration in the Irish energy sector	Environmental Science & Policy	Ireland	Ireland	Policy stakeholders	Qualitative
D.J. Hess (2018)	Energy democracy and social movements: A multi-coalition perspective on the politics of sustainability transitions	Energy Research & Social Science	USA	USA	N/A	Qualitative
D.J. Hess (2018)	Social Movements and Energy Democracy: Types and Processes of Mobilization	Frontiers in Energy Research	USA	N/A	NGO/Social movement	Qualitative
L.L. Delina (2018)	Can Energy Democracy Thrive in a Non-democracy?	Frontiers in Environmental Science	USA	Thailand	Community energy/prosumers	Qualitative
L.L. Delina (2018)	Energy democracy in a continuum: Remaking public engagement on energy transitions in Thailand	Energy Research & Social Science	USA	Thailand	Community energy/prosumers	Qualitative
M. Davies, M. Swilling, H.L. Wlokas (2018)	Towards new configurations of urban energy governance in South Africa's Renewable Energy Procurement Programme	Energy Research & Social Science	South Africa	South Africa	Local energy system stakeholders	Qualitative
B. Cozen et al. (2018)	Energy Communication: Theory and Praxis Towards a Sustainable Energy Future	Environmental Communication-a Journal of Nature and Culture	USA	N/A	N/A	Qualitative
M.J. Burke, J.C. Stephens (2018)	Political power and renewable energy futures: A critical review	Energy Research & Social Science	Canada	N/A	N/A	Qualitative
C. Alarcón Ferrari, C. Chartier (2018)	Degrowth, energy democracy, technology and social-ecological relations: Discussing a localised energy system in Vaxjö Sweden	Journal of Cleaner Production	Chile	Sweden	Local energy system stakeholders	Qualitative
K. Szulecki (2018)	Conceptualizing energy democracy	Environmental Politics	Norway	N/A	Community energy/prosumers	Qualitative
M. Lennon (2017)	Decolonizing energy: Black Lives Matter and technoscientific expertise amid solar transitions	Energy Research & Social Science	USA	USA	NGO/Social movement	Qualitative
M.A. Heldeweg (2017)	Normative Alignment, Institutional Resilience and Shifts in Legal Governance of the Energy Transition	Sustainability	Netherlands	Netherlands	Community energy/prosumers	Qualitative
M.J. Burke, J.C. Stephens (2017)	Energy democracy: Goals and policy instruments for sociotechnical transitions	Energy Research & Social Science	Canada	N/A	NGO/Social movement	Qualitative
S. Becker, M. Naumann (2017)	Energy democracy: Mapping the debate on energy alternatives	Geography Compass	Germany	Multiple	NGO/Social movement	Qualitative
S.H. Baker (2016)	Mexican energy reform, climate change, and energy justice in indigenous communities	Natural Resources Journal	USA	Mexico	Indigenous community	Qualitative
A. Antal (2015)	The impact of U.S.A. and E.U. on environmental and energy democracy in Hungary	Online Journal Modelling the New Europe	Hungary	Hungary	N/A	Qualitative
B.K. Sovacool (2011)	Seven suppositions about energy security in the United States	Journal of Cleaner Production	Singapore	USA	Citizens/consumers	Qualitative
E. Villamor et al. (2020)	European Cities in the Energy Transition: A Preliminary Analysis of 27 Cities	Energies	Spain	Europe	Local energy system stakeholders	Quantitative
I. Ruostetsaari (2020)	From consumers to energy citizens: Finns' readiness for demand response and prosumerism in energy policy making	International Journal of Energy Sector Management	Finland	Finland	Citizens/consumers	Quantitative
G. Fridgen et al. (2020)	The insurance effect of renewable distributed energy resources against uncertain electricity price developments	Energy Economics	Luxembourg	N/A	Citizens/consumers	Quantitative
S. Dorahaki et al. (2020)	The role of energy storage and demand response as energy democracy policies in the energy productivity of hybrid hub system considering social inconvenience cost	Journal of Energy Storage	Iran	N/A	N/A	Quantitative
			Malaysia	N/A	N/A	Quantitative

(continued on next page)

Table A.1 (continued)

Author	Title	Outlet	Author location	Geographical focus	Actor focus	Methodology
M.M.S. Dezfouli et al. (2019)	A New Energy Hub Scheduling Model Considering Energy Efficiency and Demand Response Programs as Energy Democracy Policy	ICETAS 2019–2019 6th IEEE International Conference on Engineering, Technologies and Applied Sciences				
W. Ajaz (2019)	Resilience, environmental concern, or energy democracy? A panel data analysis of microgrid adoption in the United States	Energy Research & Social Science	USA	USA	Citizens/consumers	Quantitative
W.K. Carroll (2017)	Canada's carbon-capital elite: A tangled web of corporate power	Canadian Journal of Sociology	Canada	Canada	Corporation	Quantitative

Table A.2

Energy citizenship classification of literature.

Author	Title	Outlet	Author location	Geographical focus	Actor focus	Methodology
G. Thomas, C. Demski, N. Pidgeon (2020)	Energy justice discourses in citizen deliberations on systems flexibility in the United Kingdom: Vulnerability, compensation and empowerment	Energy Research & Social Science	UK	UK	Citizen/consumer	Qualitative
I. Ruostetsaari (2020)	From consumers to energy citizens: Finns' readiness for demand response and prosumerism in energy policy making	International Journal of Energy Sector Management	Finland	Finland	Citizen/consumer	Quantitative
B. Lennon et al. (2020)	Citizen or consumer? Reconsidering energy citizenship	Journal of Environmental Policy & Planning	Ireland	Europe	Citizen/consumer	Qualitative
T. Vihalemm, M. Keller (2016)	Consumers, citizens or citizen-consumers? Domestic users in the process of Estonian electricity market liberalization	Energy Research & Social Science	Estonia	Estonia	Citizen/consumer	Qualitative
D. van der Horst et al. (2016)	Improving energy literacy through student-led fieldwork - at home	Journal of Geography in Higher Education	UK	Multiple	Citizen/consumer	Qualitative
P. Devine-Wright (2007)	Energy Citizenship: Psychological Aspects of Evolution in Sustainable Energy Technologies	in (ed.) J. Murphy's Governing Technology for Sustainability. London: Earthscan Sustainability	UK	UK	Citizen/consumer	Qualitative
D. Wuebben, J. Romero-Luis, M. Gertrudix (2020)	Citizen science and citizen energy communities: A systematic review and potential alliances for SDGs	Energy Policy	Spain	Europe	Community energy/prosumers	Qualitative
C. Ines et al. (2020)	Regulatory challenges and opportunities for collective renewable energy prosumers in the EU	Energy Research & Social Science	Portugal	Europe	Community energy/prosumers	Qualitative
I. Campos, E. Marin-Gonzalez (2020)	People in transitions: Energy citizenship, prosumerism and social movements in Europe	Social Studies of Science	Portugal	Europe	Community energy/prosumers	Qualitative
M. Ryghaug, T.M. Skjølsvold, S. Heidenreich (2018)	Creating energy citizenship through material participation	Social Studies of Science	Norway	Norway	Domestic RE technology users	Mixed
J. Chaney, E.H. Owens, A.D. Peacock (2016)	An evidence based approach to determining residential occupancy and its role in demand response management	Energy and Buildings	UK	UK	Domestic RE technology users	Quantitative
P. Mesaric, S. Krajcar (2015)	Home demand side management integrated with electric vehicles and renewable energy sources	Energy and Buildings	Croatia	Croatia	Domestic RE technology users	Quantitative
M. Goulden et al. (2014)	Smart grids, smart users? the role of the user in demand side management	Energy Research & Social Science	UK	UK	Domestic RE technology users	Qualitative
T. Huh, K.-Y. Yoon, I. R. Chung (2019)	Drivers and Ideal Types towards Energy Transition: Anticipating the Futures Scenarios of OECD Countries	International Journal of Environmental Research and Public Health	South Korea	Multiple	N/A	Qualitative
B. van Veelen, D. van der Horst (2018)	What is energy democracy? Connecting social science energy research and political theory	Energy Research & Social Science	UK	N/A	N/A	Qualitative
S.E. Ryan, C. Hebdon, J. Dafoe (2014)	Energy research and the contributions of the social sciences: A contemporary examination	Energy Research & Social Science	USA	N/A	N/A	Qualitative
T. Lee (2019)	Which citizenship do you mean? The case of the Seokkwan Doosan apartment complex in Seoul	Energy & Environment	South Korea	South Korea	NGO/Social movement	Qualitative
A. Sanz-Hernandez (2019)	Media and Stakeholders: Contribution to the Public Debate on Poverty and Energy Justice in Spain	Revista Espanola De Investigaciones Sociologicas	Spain	Spain	Policy stakeholders	Qualitative
M. Sarrica et al. (2018)	A multi-scale examination of public discourse on energy sustainability in Italy: Empirical evidence and policy implications	Energy Policy	Italy	Italy	Policy stakeholders	Qualitative
G. Mullally, N. Dunphy, P. O'Connor (2018)	Participative environmental policy integration in the Irish energy sector	Environmental Science & Policy	Ireland	Ireland	Policy stakeholders	Qualitative
M. Sarrica, S. Brondi, P. Cottone (2014)	Italian Views on Sustainable Energy Trends in the Representations of Energy, Energy System, and User, 2009–2011	Nature + Culture	Italy	Italy	Policy stakeholders	Qualitative

A.1. Summary of quantitative trends in the literature

Energy democracy and energy citizenship have attracted increased attention in the academic literature, mainly in the last five years. Of the 61 articles identified as addressing energy democracy, most were published during the 2017–2020 period, with the first publication by Sovacool appearing in 2011 [37] (Fig. A.1). Almost a third of these articles were published in a single journal, *Energy Research & Social Science*, while other important outlets were *Environmental Politics* and *Frontiers in Energy Research* (Table 2). Apart from these, articles on energy democracy were published in 31 journals covering the fields of human geography, landscape architecture and planning, natural resource management, law, cultural studies, and energy engineering. Notably, in 47 out of 61 articles, the studies were based on qualitative methods, while only seven used quantitative methods and five used a mixed-method approach.

Regarding energy citizenship, which is still an emergent field of research, most of the 21 identified articles were published during the 2014–2020 period, with the first publication by Devine-Wright appearing in 2007 [81] (Fig. A.2). Articles using the concept have been published in a broad range of journals, dominated by *Energy Research & Social Science*, *Energy and Buildings*, and *Energy Policy*, using theories from human geography, environmental policy and planning, energy sector management, and sustainability (Table 3). Most of these studies (17 out of 21) used qualitative methods, with only one using mixed-method approaches and three a quantitative approach.

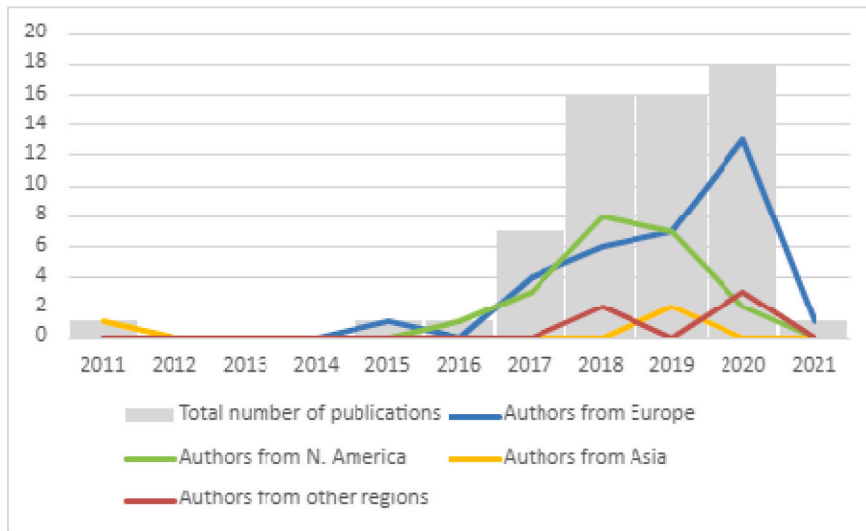


Fig. A.1. Numbers of publications and authors by region publishing academic articles on the topic of energy democracy included in this review. Regional location is based on the location of the institution where the first author is based.

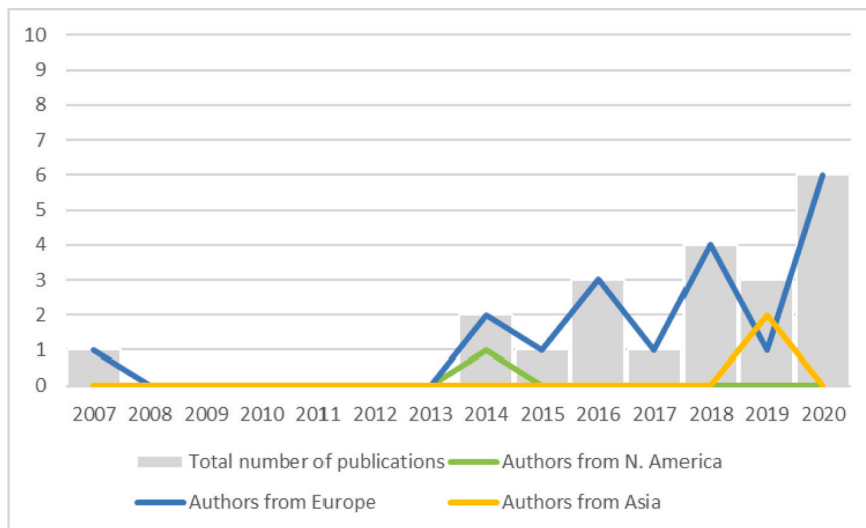


Fig. A.2. Numbers of publications and authors by region publishing academic articles on the topic of energy citizenship included in this review. Regional location is based on the location of the institution where the first author is based.

Table A.3

Number of articles published per journal on the topic of energy democracy included in the review.

Journal	Number of articles
Energy Research & Social Science	18
Environmental Politics	4
Frontiers in Energy Research	4
Other journals	31
Total	61

Table A.4

Number of articles published per journal on the topic of energy citizenship included in the review.

Journal	Number of articles
Energy Research & Social Science	6
Energy and Buildings	2
Energy Policy	2
Other journals	11
Total	21

Among the articles on energy democracy, significantly more authors were from European and North American universities than from universities elsewhere (Fig. A.1). Although energy democracy has been studied in a broad range of geographical contexts, including Asia and Latin America, the empirical studies were clearly biased towards a European and North American context (Fig. A.3). In contrast, European scholars, studying the European context, almost exclusively dominated the energy citizenship literature (Figs. A,2 and A.4). Developments within the North American and European literature also clearly diverge regarding the types of actors in focus in the studies (Fig. A.3 and A.4).

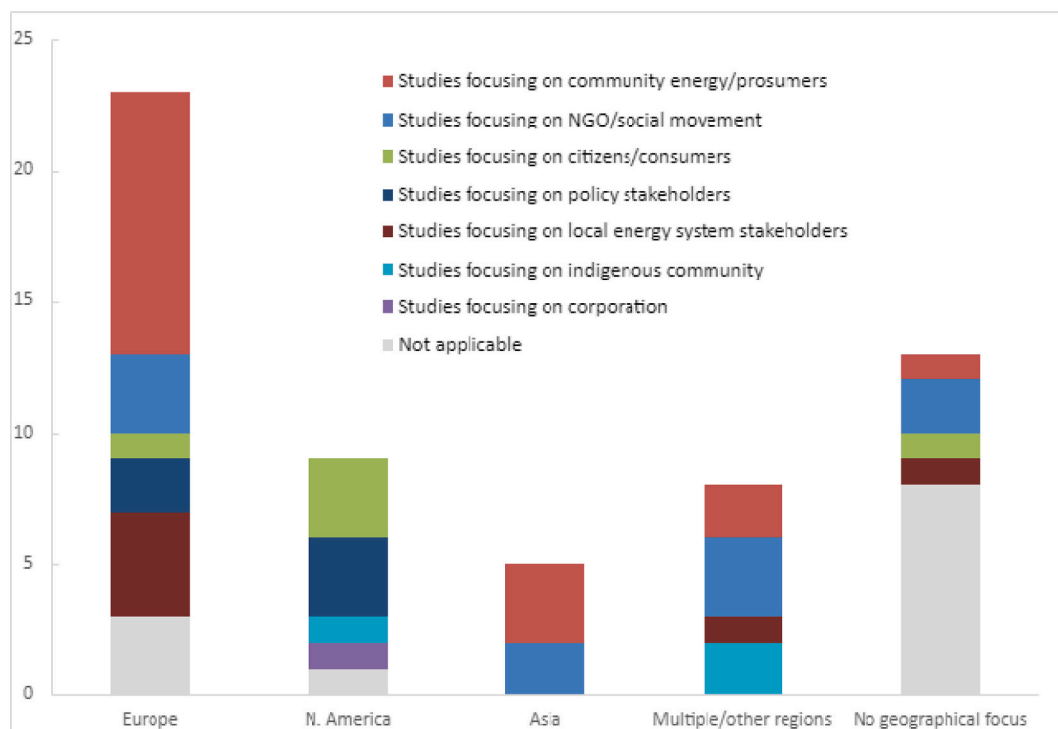


Fig. A.3. The geographical location of data collection and the types of actors in focus in the reviewed studies treating energy democracy.

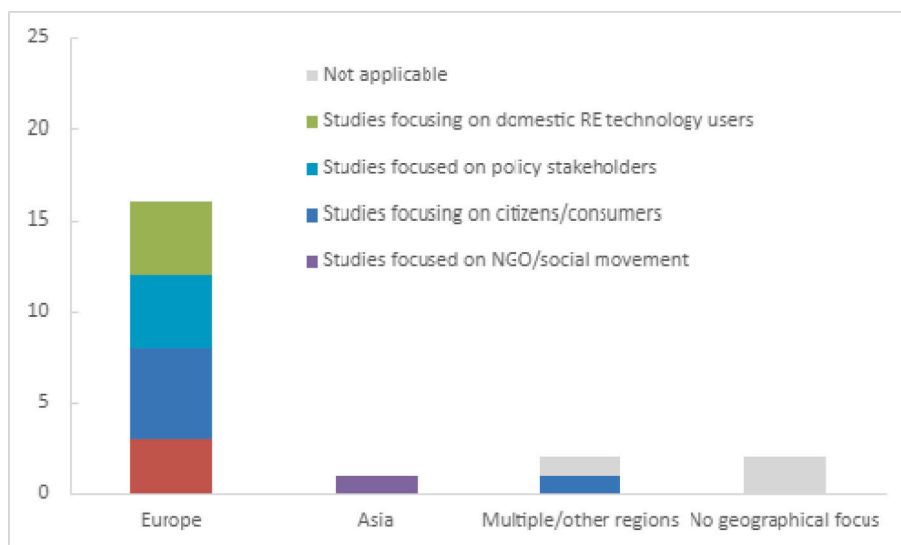


Fig. A.4. The geographical location of data collection and the types of actors in focus in the reviewed studies treating energy citizenship.

References

- [1] European Commission, The European Green Deal. https://eur-lex.europa.eu/re-source.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0002.02/DOC_1&format=PDF, 2019.
- [2] European Commission, Clean Energy for all Europeans, Publications office of the European Union, Luxembourg, 2019.
- [3] European Commission, A Framework Strategy for a Resilient Energy Union With a Forward-looking Climate Change Policy. COM (2015) 80 Final, 25.2.2015, Brussel, 2015.
- [4] D. Coy, S. Malekpour, A.K. Saeri, R. Dargaville, Rethinking community empowerment in the energy transformation: a critical review of the definitions, drivers and outcomes, *Energy Res. Soc. Sci.* 72 (2021), 101871.
- [5] A.-R. Kojonsaari, J. Palm, Distributed energy systems and energy communities under negotiation, *Technol. Econ. Smart Grids Sustain. Energy* 6 (1) (2021) 17.
- [6] T.M. Skjolsvold, L. Coenen, Are rapid and inclusive energy and climate transitions oxymorons? Towards principles of responsible acceleration, *Energy Res. Soc. Sci.* 79 (2021), 102164.
- [7] J. Chilvers, N. Longhurst, Participation in transition (s): reconceiving public engagements in energy transitions as co-produced, emergent and diverse, *J. Environ. Policy Plan.* 18 (5) (2016) 585–607.
- [8] M. Lawhon, J.T. Murphy, Socio-technical regimes and sustainability transitions: insights from political ecology, *Prog. Hum. Geogr.* 36 (3) (2012) 354–378.
- [9] B. van Veelen, D. van der Horst, What is energy democracy? Connecting social science energy research and political theory, *Energy Res. Soc. Sci.* 46 (2018) 19–28.
- [10] M.J. Burke, J.C. Stephens, Energy democracy: goals and policy instruments for sociotechnical transitions, *Energy Res. Soc. Sci.* 33 (2017) 35–48.
- [11] K. Szulecki, Conceptualizing energy democracy, *Environ. Polit.* 27 (1) (2018) 21–41.
- [12] B. Lennon, N. Dunphy, C. Gaffney, A. Revez, G. Mullally, P. O'Connor, Citizen or consumer? Reconsidering energy citizenship, *J. Environ. Policy Plan.* 22 (2) (2020) 184–197.
- [13] H. Snyder, Literature review as a research methodology: an overview and guidelines, *J. Bus. Res.* 104 (2019) 333–339.
- [14] R. Baumeister, M. Leary, Writing narrative literature reviews, *Rev. Gen. Psychol.* 1 (3) (1997) 311–320.
- [15] B.K. Sovacool, J. Axsen, S. Sorrell, Promoting novelty, rigor, and style in energy social science: towards codes of practice for appropriate methods and research design, *Energy Res. Soc. Sci.* 45 (2018) 12–42.
- [16] S. Elo, H. Kyngäs, The qualitative content analysis process, *J. Adv. Nurs.* 62 (1) (2008) 107–115.
- [17] K. Szulecki, I. Overland, Energy democracy as a process, an outcome and a goal: a conceptual review, *Energy Res. Soc. Sci.* 69 (2020).
- [18] J.C. Stephens, Energy democracy: redistributing power to the people through renewable transformation, *Environ. Sci. Policy Sustain. Dev.* 61 (2) (2019) 4–13.
- [19] M.J. Burke, J.C. Stephens, Political power and renewable energy futures: a critical review, *Energy Res. Soc. Sci.* 35 (2018) 78–93.
- [20] I. Campos, E. Marín-González, People in transitions: energy citizenship, prosumerism and social movements in Europe, *Energy Res. Soc. Sci.* 69 (2020).
- [21] P. Devine-Wright, Energy citizenship: psychological aspects of evolution in sustainable energy technologies, in: J. Murphy (Ed.), *Governing Technology for Sustainability*, Earthscan, London, 2007, pp. 41–62.
- [22] J. Palm, Exploring limited capacity in the grid: actors, problems, and solutions, *Front. Energy Res.* 9 (2021) 199.
- [23] G. Mullally, N. Dunphy, P. O'Connor, Participative environmental policy integration in the Irish energy sector, *Environ. Sci. Pol.* 83 (2018) 71–78.
- [24] T. Wood, Energy's citizens: the making of a Canadian petro-public, *Can. J. Commun.* 43 (1) (2018) 75–92.
- [25] B. Lits, Exploring astroturf lobbying in the EU: the case of responsible energy citizen coalition, *European, Foreign Policy Anal.* 7 (1) (2020) 226–239.
- [26] M. Ryghaug, T.M. Skjolsvold, S. Heidenreich, Creating energy citizenship through material participation, *Soc. Stud. Sci.* 48 (2) (2018) 283–303.
- [27] L. Williams, B.K. Sovacool, Energy democracy, dissent and discourse in the party politics of shale gas in the United Kingdom, *Environ. Polit.* 29 (7) (2020) 1239–1263.
- [28] L.L. Delina, Energy democracy in a continuum: remaking public engagement on energy transitions in Thailand, *Energy Res. Soc. Sci.* 42 (2018) 53–60.
- [29] S. Becker, M. Naumann, Energy democracy: mapping the debate on energy alternatives, *Geogr. Compass* 11 (8) (2017), e12321.
- [30] M. Goulden, B. Bedwell, S. Rennick-Egglestone, T. Rodden, A. Spence, Smart grids, smart users? the role of the user in demand side management, *Energy Res. Soc. Sci.* 2 (2014) 21–29.
- [31] M. Lennon, Decolonizing energy: Black Lives Matter and technoscientific expertise amid solar transitions, *Energy Res. Soc. Sci.* 30 (2017) 18–27.
- [32] F.C. Paul, Deep entanglements: history, space and (energy) struggle in the German Energiewende, *Geoforum* 91 (2018) 1–9.
- [33] S. Becker, J. Angel, M. Naumann, Energy democracy as the right to the city: urban energy struggles in Berlin and London, *Environ. Plan. A Econ. Space* 52 (6) (2020) 1093–1111.
- [34] B. Lennon, N.P. Dunphy, E. Sanvicente, Community acceptability and the energy transition: a citizens' perspective, *Energy Sustain. Soc.* 9 (1) (2019).
- [35] S. Welton, Grasping for energy democracy, *Michigan Law Rev.* 116 (4) (2018) 581–644.
- [36] W. Ajaz, Resilience, environmental concern, or energy democracy? A panel data analysis of microgrid adoption in the United States, *Energy Res. Soc. Sci.* 49 (2019) 26–35.
- [37] B.K. Sovacool, Seven suppositions about energy security in the United States, *J. Clean. Prod.* 19 (11) (2011) 1147–1157.
- [38] D.J. Hess, Social movements and energy democracy: types and processes of mobilization, *Front. Energy Res.* 6 (2018).
- [39] D.J. Hess, Coalitions, framing, and the politics of energy transitions: local democracy and community choice in California, *Energy Res. Soc. Sci.* 50 (2019) 38–50.
- [40] T.N. Johnson, The Dakota access pipeline and the breakdown of participatory processes in environmental decision-making, *Environ. Commun. J. Natur. Cult.* 13 (3) (2019) 335–352.
- [41] K.A. Scott, Reconciliation and energy democracy, *Can. J. Program Eval.* 34 (3) (2020) 480–491.
- [42] T. Huh, K.-Y. Yoon, I.R. Chung, Drivers and ideal types towards energy transition: anticipating the futures scenarios of OECD countries, *Int. J. Environ. Res. Public Health* 16 (8) (2019) 1441.
- [43] D. Wuebben, J. Romero-Luis, M. Gertrudix, Citizen science and citizen energy communities: a systematic review and potential alliances for SDGs, *Sustainability* 12 (23) (2020) 1–24.

- [44] J. Chaney, E.H. Owens, A.D. Peacock, An evidence based approach to determining residential occupancy and its role in demand response management, *Energy Buildings* 125 (2016) 254–266.
- [45] P. Mesaric, S. Krajcar, Home demand side management integrated with electric vehicles and renewable energy sources, *Energy Buildings* 108 (2015) 1–9.
- [46] I. Ruostetsaari, From consumers to energy citizens: Finns' readiness for demand response and prosumerism in energy policy making, *Int. J. Energy Sector Manag.* 14 (6) (2020) 1157–1175.
- [47] G. Thomas, C. Demski, N. Pidgeon, Energy justice discourses in citizen deliberations on systems flexibility in the United Kingdom: vulnerability, compensation and empowerment, *Energy Res. Soc. Sci.* 66 (2020), 101494.
- [48] M. MacEwen, D. Evensen, Mind the gap: accounting for equitable participation and energy democracy in Kenya, *Energy Res. Soc. Sci.* 71 (2021), 101843.
- [49] C. Inés, P.L. Guilherme, M.G. Esther, G. Swantje, H. Stephen, H. Lars, Regulatory challenges and opportunities for collective renewable energy prosumers in the EU, *Energy Policy* 138 (2020), 111212.
- [50] Directive (EU) 2019/944, European Parliament and Council of the European Union Directive (EU) 2019/944 of the European Parliament and of the council of 5 June 2019 on Common Rules for the Internal Market for Electricity and Amending Directive 2012/27/EU (Recast), 2019.
- [51] Directive (EU) 2018/2001, European Parliament and Council Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the Promotion of the Use of Energy from Renewable Sources, 2018.
- [52] J. Palm, The transposition of energy communities into Swedish regulations: overview and critique of emerging regulations, *Energies* 14 (16) (2021) 4982.
- [53] T. Vihalemm, M. Keller, Consumers, citizens or citizen-consumers? Domestic users in the process of Estonian electricity market liberalization, *Energy Res. Soc. Sci.* 13 (2016) 38–48.
- [54] T. Lee, Which citizenship do you mean? The case of the Seokkwan Doosan apartment complex in Seoul, *Energy Environ.* 30 (1) (2019) 81–90.
- [55] B. van Veelen, W. Eadson, Assembling community energy democracies, *Voluntary Sector Rev.* 11 (2) (2020) 231–249.
- [56] B. Van Veelen, Negotiating energy democracy in practice: governance processes in community energy projects, *Environ. Polit.* 27 (4) (2018) 644–665.
- [57] E. Allen, H. Lyons, J.C. Stephens, Women's leadership in renewable transformation, energy justice and energy democracy: redistributing power, *Energy Res. Soc. Sci.* 57 (2019), 101233.
- [58] D.J. Hess, Energy democracy and social movements: a multi-coalition perspective on the politics of sustainability transitions, *Energy Res. Soc. Sci.* 40 (2018) 177–189.
- [59] J. Angel, Towards an energy politics in-against-and-beyond the state: Berlin's struggle for energy democracy, *Antipode* 49 (3) (2017) 557–576.
- [60] A. Sanz-Hernandez, Media and stakeholders: contribution to the public debate on poverty and energy justice in Spain, *Revista Espanola De Investigaciones Sociologicas* 168 (2019) 73–92.
- [61] J.L. MacArthur, C.E. Hoicka, H. Castleden, R. Das, J. Lieu, Canada's Green New Deal: forging the socio-political foundations of climate resilient infrastructure? *Energy Res. Soc. Sci.* 65 (2020), 101442.
- [62] T.R. Na'puti, P.C. Pezzullo, L. Sprain, L. Reinig, Engaging publics through climate math lessons from Boulder's 2016 Climate Action Plan, *J. Argumen. Context* 7 (3) (2018) 316–346.
- [63] P. Picchi, Why energy democracy can enhance landscape democracy in the energy transition: some reflections on the Italian case, *Ri Vista-Ricerca Per La Progettazione Del Paesaggio* 2 (2018) 14–31.
- [64] M. Davies, M. Swilling, H.L. Wlokas, Towards new configurations of urban energy governance in South Africa's Renewable Energy Procurement Programme, *Energy Res. Soc. Sci.* 36 (2018) 61–69.
- [65] C. Alarcón Ferrari, C. Chartier, Degrowth, energy democracy, technology and social-ecological relations: discussing a localised energy system in Vaxjö Sweden, *J. Clean. Prod.* 197 (2018) 1754–1765.
- [66] M. Sarrica, F. Biddau, S. Brondi, P. Cottone, B.M. Mazzara, A multi-scale examination of public discourse on energy sustainability in Italy: empirical evidence and policy implications, *Energy Policy* 114 (2018) 444–454.
- [67] IEA, Heating, Paris, 2020.
- [68] IEA, Electricity Market Report - December 2020, Paris, 2020.
- [69] B.K. Sovacool, D.D. Furszyfer Del Rio, Smart home technologies in Europe: a critical review of concepts, benefits, risks and policies, *Renew. Sust. Energ. Rev.* 120 (2020), 109663.
- [70] S. Mookerjee, Renewable energy transition under multiple colonialisms: passive revolution, fascism redux and utopian praxes, *Cult. Stud.* 33 (3) (2019) 570–593.
- [71] C. Aunphattanasilp, Civil society coalitions, power relations, and socio-political ideas: discourse creation and redesigning energy policies and actor networks in Thailand, *Energy Res. Soc. Sci.* 58 (2019).
- [72] L.L. Delina, Can energy democracy thrive in a non-democracy? *Front. Environ. Sci.* 6 (2018).
- [73] J.C. Brown, M. Purcell, There's nothing inherent about scale: political ecology, the local trap, and the politics of development in the Brazilian Amazon, *Geoforum* 36 (5) (2005) 607–624.
- [74] H. Wollmann, H. Baldersheim, G. Citroni, G. Marcou, J. McEldowney, From Public Service to Commodity: The Demunicipalization (or Remunicipalization?) of Energy Provision in Germany, Italy, France, the UK and Norway, *The Provision of Public Services in Europe: Between State, Local Government and Market*, 2010, pp. 168–190.
- [75] J. Palm, Development of sustainable energy systems in Swedish municipalities: a matter of path dependency and power relations, *Local Environ.* 11 (4) (2006) 445–457.
- [76] D. Magnusson, J. Palm, Come together—the development of Swedish energy communities, *Sustainability* 11 (4) (2019).
- [77] N. Frantzeskaki, D. Loorbach, Towards governing infrasystem transitions: reinforcing lock-in or facilitating change? *Technol. Forecast. Soc. Chang.* 77 (8) (2010) 1292–1301.
- [78] J. Blasch, N.M. van der Grijp, D. Petrovics, J. Palm, N. Bocken, S.J. Darby, J. Barnes, P. Hansen, T. Kamin, U. Golob, M. Andor, S. Sommer, A. Nicita, M. Musolino, M. Mlinarič, New clean energy communities in polycentric settings: four avenues for future research, *Energy Res. Soc. Sci.* 82 (2021), 102276.
- [79] D. Lazoroska, J. Palm, A. Bergek, Perceptions of participation and the role of gender for the engagement in solar energy communities in Sweden, *Energy Sustain. Soc.* 11 (1) (2021) 35.
- [80] J. Peck, N. Theodore, *Fast Policy: Experimental Statecraft at the Thresholds of Neoliberalism*, University of Minnesota Press, Minneapolis, 2015.
- [81] P. Devine-Wright, *Energy Citizenship: Psychological Aspects of Evolution in Sustainable Energy Technologies*, *Governing Technology for Sustainability*, 2007, pp. 63–86.