



Perspective

Energy citizenship: A critical perspective

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ABSTRACT

The centrality of energy for daily life entails that citizens' relations to energy need particular attention, to the extent that it might merit a specific concept of energy citizenship. However, the academic literature on energy citizenship has remained small even if it is growing, the concept itself underspecified, and focused on a narrow set of topics that leave many core social science insights on both citizenship and energy governance unaddressed. In this perspective, we analyze the concept of energy citizenship as it is used in the current energy research literature and develop reflections on how and why current approaches do not seem to trigger further specification of the concept. We carry this discussion forward by refining the concept and proposing a new agenda for future energy citizenship research areas. We conclude with three primary outcomes that require more attention when juxtaposing energy and citizenship: the question of who counts as a 'citizen' in energy citizenship initiatives, interrelations between democratic cultures and citizenship, and diverse citizenships enacted among various kinds of energy infrastructure.

1. Introduction

Energy is at once a commodity where the market rules apply and a vital system that keeps daily life functioning. This complex nature brings it into the sphere of human rights and the responsibilities of public bodies [1,2]. Momentous changes are underway in global energy supplies, leading to uncertainties, disruptions in energy markets, and wide public and political debates. These issues range from rapid energy price changes and the resulting government interventions to social movements concerning renewable energy projects all over the world. Further changes are impending in the coming years as the war in Ukraine has caused plans to end the EU's dependence on Russian fossil fuels long before 2030 [3].

The concept of *energy citizenship* offers a valuable conceptual tool for reflecting on a range of critical dimensions of these processes and has served as a site for theorizing the relations between individuals and the collectives of which they are part. However, the academic literature on energy citizenship has remained small even if it is growing, the concept itself underspecified, and focused on a narrow set of topics that leave many core social science insights on citizenship and energy governance unaddressed.

This is exactly where we identify important avenues for further development and original contributions and reasons for the topic to

remain controversial rather than consensual. First, we notice that there is no natural connection between 'being an energy citizen' and 'endorsing low-carbon transitions' or other arguable goods. Quite the contrary, important work is to be done in more adverse forms of engagement that could be considered part of energy citizenship. Second, in a similar vein, the focus on small-scale and community-based practices is too much of a limitation, which has hitherto been insufficiently dealt with. We argue that energy citizenship, like general citizenship and energy democracy, is not tied to any specific level of organization, but rather an amalgam of connections at any level of sociotechnical organization.

In this perspective, we analyze the concept of energy citizenship used in the current energy research literature and develop reflections on how and why this unsophisticated concept is used comparably eagerly. We carry this discussion forward by tightening the concept and proposing a new theoretical agenda for future energy citizenship research areas. Section 2 will sketch the conceptual questions to which a concept of energy citizenship will have to respond. Chiefly, these are the questions of what citizenship might mean for energy systems and what energy systems might mean for citizenship. We end in Section 3 with a set of important but overlooked questions that would merit further attention in the theories of energy citizenship.

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2. Critical questions for energy and citizenship

2.1. Research procedure

The existing literature on energy citizenship is still relatively small, but it is evidently growing. Currently, both analyses and reviews are emerging in this area. Wahlund & Palm [4] have provided the most comprehensive review to date with a systematic comparison of energy citizen and energy democracy literatures. We agree with this earlier review on the small number of studies (our research discovered 25 works from the same scientific databases by 2022, compared to the 21 identified by Wahlund & Palm [4] by 2020). We can also confirm that most if not all of the studies on energy citizenship have focused on European and other Western countries.

However, in interpreting these results, our paths diverge in marked and important ways. While Wahlund and Palm [4] resolutely distinguish between energy citizenship and energy democracy, we argue that this distinction is unduly constraining for energy research scholarship. In so doing, they argue that energy citizenship research is highly focused on behavior change and small-scale decentralized sites (e.g., smart homes, energy communities, and small-scale renewables). Our research only partly supports these conclusions. The existing energy citizenship research we found does not typically tend to overlook normal democratic processes. Furthermore, it addresses all kinds of energy systems on multiple scales, whose differences require more attention. As we argue below, behavior change and local systems constitute only a small and incomplete subset of energy citizenship research. Thus, this research can be seen as an expansion and a reinterpretation of complementary materials to the earlier review.

The resulting set of research on energy citizenship was small enough to include all the published works to date relevant to our further elaboration of the concept. We have also summarized the main dimensions of these works in [Appendix A](#) in a table.

2.2. The academic pedigree of energy citizenship

The social science concept of energy citizenship is often associated with Devine-Wright's research. An early mention of the concept dates to Devine-Wright [5] in 2004, who traces it back to earlier literature as far back as the 1970s. In 2007, Devine-Wright [6, pp., 67-8] defined energy citizenship "in which the public are conceived as active rather than passive stakeholders in energy system evolution and where the potential for action is framed by notions of equitable rights and responsibilities across society for dealing with the consequences of energy consumption, notably climate change."

By the time of that publication, the concept had come to serve as a container notion or even research agenda for approaches and assumptions in connection with research on energy users. As follows from Devine-Wright [6], energy citizenship is a novel representation of the public, explicitly disavowing any conceptions of the public as having a 'knowledge deficit' and in need of information and education. Energy citizenship can relate to all aspects of the energy system and changes therein, encompassing the generation, transport and distribution, storage, and consumption of fuel, heat, and electrical power. Energy citizenship is certainly not limited to local electricity distribution, households, and small-scale renewable energy production, though those topics are overrepresented in some studies.

Furthermore, this field of scholarship has aspired to identify the differences between energy citizenship and conventional citizenship. In a conventional sense, the concept of citizenship captures an individual's membership in a constituency, whether a nation-state, a city, the European Union, or any other body of collective governance. Such membership relations may serve different functions; primary concerns may include the equitable distribution of social goods, the building of collective identities, and partaking in decision-making processes, to mention just a few [7,8]. Energy citizenship does not necessarily refer to

such a conventional membership in a political constituency. Instead, the list above suggests that the concept is used more metaphorically to refer to political identity and subjectivity broadly.

The difference between meanings of citizenship brings us to constructivist research interests. Chilvers and Kearnes [9,10] have shown that there are two different – and potentially incompatible – interests in public participation in science and technology. One is a *normative interest* in democracy and participation, posing questions about 'good' participation, inclusiveness, representation, and related topics. They argue that such interests often hide a 'residual realist' understanding of the public, i.e., assuming the public is already known and exists independently of the attempts to engage the public. The other is a *constructivist interest*, building on a situated description of how the concept of the public is used and produced. These perspectives have also been brought to energy research [11,12].

Yet, while Chilvers and Kearnes [9] seek to move beyond the realist perspective and replace it with a constructivist approach, the energy citizenship literature is not developed along with this distinction and does not pursue the scholarly reflexivity it would bring about. As we show, the existing discussion on energy citizenship has somewhat blurred this distinction. However, some works emphasize realistic or constructivist approaches, and there is a continuum between the two ends.

2.3. Desired directions for energy citizenship

Several studies have used energy citizenship as a normative concept, i.e., to make value judgments about desirable citizen participation. Across these analyzed studies, we contend that four common messages emerge, each of which we now discuss.

Firstly, despite its supposed novelty and the contemporary relevance of energy citizenship, the concept is often taken more or less directly from Devine-Wright's [6] chapter first published in 2007. According to our analysis, this direct usage spans several years [13–18]. We find that in most of this literature, the energy citizenship concept serves as a placeholder to legitimize and contextualize particular research questions. Indeed, there is a distinct feeling that this research area does not have confidence in advancing the concept. As one study even admits, "(w)e don't claim to substantially advance the theoretical discussion on energy citizenship" [19, p. 77].

Secondly, while many works refer directly to the classic definition of energy citizenship by Devine-Wright [6], many others use the concept without designating it at all [20–25]. Even if the concept has no singular definition, one could ask what analytical work the concept could be doing and if it can be used without designating it a priori. One potential answer in some of the works is that the concept of energy citizenship is made into an empirical category: it becomes a name that scholars give to results found in their empirical materials [22,26].

Thirdly, a small set of these studies use energy citizenship interchangeably with other concepts: most notably, according to this analysis, to refer to energy prosumerism, social movements, energy communities [13], citizen engagement [23], and social acceptance [24]. This broader usage situates energy citizenship as part of burgeoning energy justice literature. Still, it once again raises the question of what specific work the concept is doing. This unclarity can be especially problematic because not all concepts draw in the same direction for analytical purposes. For example, as we show in the following section, it is not always the case that citizenship and social acceptance develop in tandem, given that citizens may resist the technologies enrolled and hence decrease their acceptance.

This interchanging of concepts also raises broader questions on assumptions about citizenship, which we addressed in the context of conventional citizenship above. In political theory and sociology, citizenship typically refers to a relationship between the citizens and the state. Even though they seem to relate to radically different polities at face value, as Devine-Wright [6] notes, it merits attention to how deeply

the energy system is tied to the apparatus of the state. Heiskanen et al. [27], drawing from Szulecki [28], engage with the relation between energy citizenship and conventional citizenship, explicitly concerning how both relate to the state. This relation to the state is shaped, for example, through national grids that make energy available all the time and ubiquitously [29].

For comparison, in another example, energy citizenship is associated in the field of energy poverty with behavior change and awareness. In practice, energy citizenship designates how vulnerable customers become more aware and change their behavior to reduce their energy consumption [22]. Such a norm is compatible with some ideas about citizenship but lacks a reference to a larger constituency that is still definitive of most current meanings of citizenship. In this case, citizenship becomes a mere stand-in for individual behavior, which some might interpret as a 'neoliberal' emphasis in what follows [30].

Indeed, Wahlund and Palm [4,p.1] likewise associate energy citizenship with an emphasis on "behavior change and ways for individuals to participate in energy systems, thereby often focusing on individuals as agents of change." They preserve energy democracy to refer to governance and institutionalization. Ironically, however, many works use energy citizenship more or less as a synonym for public engagement [23], participation [31], or even directly for energy democracy [32].

At this point, we wish to take a different approach than Wahlund and Palm [4]. Energy citizenship and energy democracy are not complementary concepts that each organize different levels or objects of analysis. Instead, their contents overlap and highlight different aspects of what are often the same practices and social phenomena. Energy citizenship emerges and is conceptualized in many ways. Some of those straightforwardly subside under energy democracy, while others do not. Most notably, we find that energy citizenship need not be a local or community-based affair, nor is it always a matter of early adopters or activists. In fact, it also circulates at the highest levels of organization such as the European Commission.

Following this, the fourth type of using the energy citizenship concept exposes the concept and treats it as an ideology. There are two types of instances in our analysis of this usage. The first and less comprehensive commenting states that energy citizenship is an academic theory and could be a concept that excludes those that cannot participate in 'desirable' energy activities. Energy democracy, yet again, offers a more collective focus on participation, communities, and social movements [33].

Others take the critique a step further and assess energy citizenship not merely as a 'buzzword' [28] but as a 'neoliberal' concept [30]. The authors argue that energy citizenship is a free-market concept that emphasizes consumer choice and, in so doing, conceals unequal agency and access to resources in energy matters. Thus, it works wholly opposite to what the concept intends to do in many other guises: linking energy usage to collective action and broader constituencies.

2.4. Constructions of energy citizenship

In contrast to the conceptual discussion on the desirable aspects and designations of energy citizenship, we now move to examine some empirical manifestations and social construction of the energy citizenship concept. The studies here present various materials, from political debates in the media to policy instruments. We aim to show that empirical uses and constructions of the concept vary just as widely as conceptual uses. They similarly point to significant ramifications that merit further (conceptual) development.

Mullally et al. [19] study how energy citizenship is diverse and context-specific, depending on the designated concept. They pay particular attention to the concept of energy citizenship as what they call a scholarly fabrication, which in itself may expose the social structures of actors doing the designation. These actors may be academics as well as policymakers. Nevertheless, the authors recognize three uses of energy citizenship: one sees citizens as voters and members of interest

groups, another focuses on collective associations, and a third on deliberative citizens.

The categories are fuzzy and overlapping, and other ways exist to categorize energy citizens (e.g., deliberative citizens, activist citizens, consumer citizens, and resourceful citizens, see [12]). Still, different situations may come with different emphases. For example, organizing local voting in energy matters pays more tribute to the first idea than the other two. The argument here begins to approach a fundamental point: who counts as a 'citizen' varies considerably depending on how energy citizenship is framed. We discuss this strong argument for future scholarship in the final section.

Similarly, Lee [34] acknowledges different current theories of citizenship (e.g., on technological citizenship, [35]). This study of reducing energy use argues that several dimensions of citizenship highlight different aspects of energy demand reduction, complementing energy citizenship: environmental, ecological, and sustainability citizenship. Lee [34] then examines how residents saving energy were engaged in seeing their rights and responsibilities in different dimensions of citizenship, such as not seeing responsibility in terms of environmental citizenship but in terms of social justice, i.e., sustainability citizenship. These dimensions of citizenship may change over time, as in this case, where residents were initially concerned with saving on their bills but, over time, become concerned about their rights as energy citizenship implies.

But energy citizenship does not necessarily make the energy transition happen more rapidly, as it also includes opposing stances among the public. In their content analysis of the public debate in Italy, Sarrica et al. [16] observe that the use of the notion of energy citizenship is connected to both relations of acceptance and rejection. They thereby also problematize that some dynamics are often conceptually tied together – such as increasing participation and decentralization – that is, at a closer look, not necessarily harmonious. For example, while they show that references to energy citizenship typically highlight participation in national issues such as elections, decentralization implies localism, where participation operates at a level different from the national. Indeed, most energy solutions serve multiple goals in public and political debate, which means that taking them as singular issues is to mistake this complexity.

The energy citizenship concept needs more qualifications as a lens through which to look at the current energy transitions. Many of these issues can be built on a recent review of energy citizenship alongside (and in this case, differentiated from) energy vulnerability, identity politics, and just transitions by Heiskanen et al. [27]. These subdivisions suggest that justness in energy issues and energy citizenship are distinct issues, even if they are interrelated. Carvalho et al. [36] offer similar evidence when they recognize four 'imaginaries' of energy transitions: one energy citizenship; the others distinctly modernization and technoeconomic development; the green economy; and also just transition.

The review by Heiskanen et al. [27] confirms that the idea of energy citizenship often boils down to participation and even grassroots innovation. It also points out that these capacities are unevenly distributed between countries and, in some, still not accessible to the population at large. In addition, the ideal of democratic participation is paradoxically reserved for those with financial and cultural resources to participate, often financially affluent end-users [33]. A typical example is the purchase, installation, and commission of solar panels or electric vehicles, which require ample financial resources [37]. This resource dependence renders prosumerism, in fact, a somewhat elitist phenomenon. Meanwhile, the age, socio-economic positions, gender, and ethnicity of these 'energy citizens' receive little to no attention, presuming that the citizen is figured as every person.

These differences suggest that each emerging form of citizenship has a dynamic of its own that requires nuanced empirical explanation. Ryan et al. [23] develop a model for explaining why citizenship emerges, which they comparably single-sidedly associate with engagement. They argue that energy citizenship emerges when external pressure (such as a

major accident), community needs, or a novel framing of energy issues appear.

However, given all the complexities in empirical and conceptual accounts of energy citizenship that we point out throughout this paper, we argue that there is ample opportunity to develop these models in more nuanced directions. While Ryan et al. [23] directly link citizen engagement and energy citizenship positively - in addition to many others (e.g., [18]) - we argue that an explanatory model such as this should focus 'symmetrically' on engagement as well as opposition. Almost without exception, empirical cases show that both support and opposition usually appear: including protesting and petitioning against developers and public authorities [11]. These relations between support and opposition are not static and fixed once and for all but alternate during energy projects [38]. Any meaningful account of energy citizenship must thematize varieties of citizenship across space and time. Only then will it do justice to social learning processes where policy, framings, and the publics co-evolve.

3. Conclusion: an agenda for energy citizenship

This perspective has shown various paradoxical and contradictory uses of energy citizenship. We analyzed small literature but found rich and nuanced uses of energy citizenship itself. We outlined how for some, the concept needs no definition; for some, it is a name given to results; yet for others, a synonym for equity and fairness more generally; or a concept to be criticized for lacking in a public perspective.

This discussion points to research interests in energy citizenship that need to be accomplished in the future. There is a set of general lessons that apply to most research areas in energy social science research, including participation more generally. We hold that the concept of energy citizenship needs to be handled symmetrically: citizenship is not only about supporting and endorsing energy transitions, but there are also adverse forms that can arguably be termed energy citizenship. In other words, we uncovered an implicit normativity in the energy citizenship literature, which more typically recognizes citizens only insofar as they support the desired directions of energy transitions. With this discussion in view, the concept of energy citizenship is policy-relevant, and policymaking needs to include reflection on how citizens are positioned and how their membership is substantiated in concrete energy citizenship initiatives. This discourse needs to acknowledge citizens not only as subjects of state power but also as agents in energy transitions.

Beyond these directions for future research, our synthesis of existing energy citizenship literature points to unique research problems that result from the juxtaposition of energy with citizenship. We highlight three main findings and discuss their implications for the theory of energy citizenship.

First, who counts as a 'citizen' is a critical discussion that should be opened more often, which the existing literature does not address systematically. The literature synthesized here does not always thematize this point, but implicitly and on different occasions, takes citizens to be all the residents of a country, members of prosumer initiatives, residents in a neighborhood, or simply informants self-selected to the studies conducted.

There are more detailed questions on the boundaries of citizenship. This is especially true when these boundaries are fought over and open for negotiation, such as in the citizenship of protesters, the under- and misrepresentation of certain groups, and perceptions of voting as a duty or obligation. The energy research topic of the opposition to transitions brings these boundaries of citizenship into a direct focus. Namely, when should opposing the energy transition still be counted as part of energy citizenship and when outside of it? While conclusive answers to such

complex questions are meaningless, we emphasize that future research needs to account for the conceptual choices made and how these are consequential for the shape and outcomes of research.

Second, similarly to other works [4,33], we note the interrelations between energy citizenship and energy democracy concepts. However, we argue that these interrelations need more nuanced discussion in future studies than has so far been the case. Rather than each other's alternatives, energy democracy and energy citizenship are distinct but often reconcilable perspectives on the same problematics of democracy about energy. The reconcilability we find points to a further problem emerging when energy democracy and energy citizenship are used as rather distinct concepts. Since the concepts we social analysts use are performative and productive, such usage risks reproducing the rift between high-level policymaking and on-the-ground practices. While we agree with the earlier reviews that the connection between these levels merits further development in both conceptual and practical senses, we sense that reserving democracy for institutions and citizenship for individuals [4] will ultimately defy its own program. We argue that citizenship is just as much a matter of institutions as democracy is just as much a matter of individuals.

In claiming this, we do not argue that energy citizenship and energy democracy always have to develop in tandem and support each other. Most of the studies synthesized here do assume a citizenry that values democracy. Still, there may be forms of citizenship that do not see themselves as supportive of or compliant with existing democratic structures but as critical, adverse, or even hostile to them. Hence, more explanation is needed on what exactly is meant by open democratic rights in the case of energy supplies. This is especially important in states that depend on energy revenues and where the power to stop critical flows of energy or energy extraction - and hence democratic contestation - might not be straightforward [39].

Third, we want to end by highlighting a related point on the differences between kinds of energy supplies in citizenship terms, which needs more attention. Not all energy citizenship is focused on small-scale renewables, energy communities, or householders interacting with the energy system via smart technologies. Neither have the studies here been exclusively on renewable energy and electricity grids - with transport, industry, buildings, and other energy demands also represented. Nevertheless, the studies have not addressed the differences between varieties of infrastructures and sectors, even though our review indicates the various sectors examined in these same studies. The various sectors of energy provision not only have different technical characteristics as economic sectors but different relations to governance and hence citizenship. Comparative studies of the differences between energy citizenship - including the role of democracy and the boundary conditions of who counts as a citizen - in several kinds of infrastructure offer several avenues for future research.

Declaration of competing interest

The authors have no conflict of interest to declare.

Data availability

Data will be made available on request.

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Appendix A. Literature included in the review

Reference	Energy issue in focus	Geographical scope	Position on citizenship
Beauchampet & Walsh, 2021 [26]	Whole energy system	Netherlands	Self-activated management
Campos & Marín-González, 2020 [13]	Whole energy system	Europe	Collective actions (prosumerism, social movements)
Cantoni, Lis, & Stasik, 2018 [14]	Shale gas	Poland	Active stakeholders
Carvalho, Riquito, & Ferreira, 2022 [36]	Whole energy system, including mobility, transport, industry, buildings, agriculture, forests, other land uses, waste, and wastewater	Portugal	An imaginary of active agents of socioecological transitions
Coy, Malekpour, Saeri, & Dargaville, 2021 [20]	Whole energy system	Global/unspecified	Mechanism of inclusion
Della Valle, & Czako, 2022 [18]	Energy poverty	European policy	Engaged and participating in the energy transition, not mere consumers
Devine-Wright, 2007 [6]	Whole energy system, including microgeneration and district heating/CHP	UK	Public as active participants in energy systems, with set rights and responsibilities
Goulden, Bedwell, Rennick-Eggleston, Rodden, & Spence, 2014 [15]	Smart grids and demand-side management	UK	Public's role, with equitable rights and responsibilities
Huh, Yoon, & Chung, 2019 [21]	Whole energy system	OECD countries	A driver for energy transition
Lee, 2018 [34]	Household energy use	Soul (South Korea)	Emphasizes equitable rights and responsibilities
Lennon, Dunphy, Gaffney, Revez, Mullally, & O'Connor, 2019 [30]	Whole energy system	European research and policy	Citizen action and not merely a market-based relationship
Longo, Olivieri, Roversi, Turci, & Turillazzi, 2020 [22]	Energy poverty and protection of vulnerable consumers	EU funding programmes	The adoption of behavioral changes
Mihailova, Schubert, Burger, & Fritz, 2022 [12]	Positive Energy Districts	EU policy	Engaged citizens in energy communities
Mullally, Dunphy, & O'Connor, 2018 [19]	National energy policy consultation	Ireland	Conjoins rights and responsibilities, but also a scholarly construction
Ringholm, 2022 [11]	Whole energy system	Global/unspecified	Constructed archetypes
Roversi, Boeri, Pagliula, & Turci, 2022 [32]	Energy communities and climate cities	Italy and European frameworks	Engaged citizens and energy communities
Ryan, Hebdon, & Dafoe, 2014 [23]	Energy research, climate science, policymaking, and public administration	Global/unspecified	A potential to be activated (external pressure, community need, or new framing)
Ryghaug, Skjolsvold, & Heidenreich, 2018 [37]	Smart grids, electric vehicles, and solar panels	Norway	Mundane and material manifestations of citizenship
Sarrica, Biddau, Brondi, Cottone, & Mazzara, 2018 [24]	Public discourse on energy sustainability	Italy	Active, socially aware, and committed
Sarrica, Brondi, & Cottone, 2014 [16]	Public discourse on energy sustainability	Italy	Aware and responsible, potentially collective actions
Thomas, Demski, & Pidgeon, 2020 [25]	Energy systems flexibility	UK	Citizens that meaningfully influence their energy services
Van Veelen & Van der Horst, 2018 [33]	Social science energy research and political theory	Global/unspecified	Public as active participants in energy systems, with set rights and responsibilities
Van Wees et al., 2022 [31]	Positive Energy Districts	European cities	New social roles and responsibilities for citizens in an energy system
Wahlund & Palm, 2022 [4]	Whole energy system	Global/unspecified	Participation and behavioral changes
Wuebben, Romero-Luis, & Gertrudix, 2020 [17]	Citizen science and energy communities	Global/unspecified	Public as active participants in energy systems, with set rights and responsibilities

References

- [1] S. Collier, A. Lakoff, Vital systems security: reflexive biopolitics and the government of emergency, *Theory Cult. Soc.* 32 (2015) 19–51, <https://doi.org/10.1177/0263276413510050>.
- [2] J. Urry, The problem of energy, *Theory Cult. Soc.* 31 (2014), <https://doi.org/10.1177/0263276414536747>.
- [3] European Commission, REPowerEU: A plan to rapidly reduce dependence on Russian fossil fuels and fast forward the green transition. https://ec.europa.eu/commission/presscorner/detail/en/IP_22_3131, 2022. (Accessed 4 October 2022).
- [4] M. Wahlund, J. Palm, The role of energy democracy and energy citizenship for participatory energy transitions: a comprehensive review, *Energy Res. Soc. Sci.* 87 (2022), <https://doi.org/10.1016/j.erss.2021.102482>.
- [5] P. Devine-Wright, Towards zero-carbon: citizenship, responsibility and the public acceptability of sustainable energy technologies, in: C. Buckle (Ed.), *Proceedings of Conference C81 of the Solar Energy Society, London, 2004*.
- [6] P. Devine-Wright, in: J. Murphy (Ed.), *Energy Citizenship: Psychological Aspects of Evolution in Sustainable Energy Technologies, Governing Technology for Sustainability*, Earthscan, London, 2007, pp. 63–86, <https://doi.org/10.4324/9781849771511>.
- [7] T.H. Marshall, *Citizenship and Social Class and Other Essays*, Cambridge University Press, Cambridge, 1950.
- [8] B.S. Turner, Outline of a theory of citizenship, *Sociology* 24 (1990) 189–217, <https://doi.org/10.1177/0038038590024002002>.
- [9] J. Chilvers, M. Kearnes, Remaking participation in science and democracy, *Sci. Technol. Hum. Values* 45 (2020) 347–380, <https://doi.org/10.1177/0162243919850885>.
- [10] J. Chilvers, M. Kearnes (Eds.), *Remaking Participation: Science, Environment and Emergent Publics*, Routledge, London, 2016.
- [11] T. Ringholm, Energy citizens – conveyors of changing democratic institutions? *Cities* 126 (2022), 103678 <https://doi.org/10.1016/j.cities.2022.103678>.
- [12] D. Mihailova, I. Schubert, P. Burger, M.M.C. Fritz, Exploring modes of sustainable value co-creation in renewable energy communities, *J. Clean. Prod.* 330 (2022), <https://doi.org/10.1016/j.jclepro.2021.129917>.
- [13] I. Campos, E. Marín-González, People in transitions: energy citizenship, prosumerism and social movements in Europe, *Energy Res. Soc. Sci.* 69 (2020), 101718, <https://doi.org/10.1016/j.erss.2020.101718>.
- [14] R. Cantoni, A. Lis, A. Stasik, Creating and debating energy citizenship. The case of shale gas in Poland, in: A. Szolucha (Ed.), *Energy, Resource Extraction and Society*, Routledge, London, 2018.
- [15] 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 resSoc Sci.* 2 (2014) 21–29, <https://doi.org/10.1016/j.erss.2014.04.008>.
- [16] M. Sarrica, S. Brondi, P. Cottone, Italian views on sustainable energy: trends in the representations of energy, energy system, and user, 2009–2011, *Nat. Cult.* 9 (2014) 122–145, <https://doi.org/10.3167/nc.2014.090202>.
- [17] D. Wuebben, J. Romero-Luis, M. Gertrudix, Citizen science and citizen energy communities: a systematic review and potential alliances for SDGs, *Sustainability* 12 (2020) 10096, <https://doi.org/10.3390/su122310096>.

- [18] N. DellaValle, V. Czako, Empowering energy citizenship among the energy poor, *Energy Res. Soc. Sci.* 89 (2022), 102654, <https://doi.org/10.1016/j.erss.2022.102654>.
- [19] G. Mullally, N. Dunphy, P. O'Connor, Participative environmental policy integration in the Irish energy sector, *environ sciPolicy* 83 (2018) 71–78, <https://doi.org/10.1016/j.envsci.2018.02.007>.
- [20] 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, <https://doi.org/10.1016/j.erss.2020.101871>.
- [21] T. Huh, K.-Y.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 (2019) 1441, <https://doi.org/10.3390/ijerph16081441>.
- [22] D. Longo, G. Olivieri, R. Roversi, G. Turci, B. Turillazzi, Energy poverty and protection of vulnerable consumers. Overview of the EU funding programs FP7 and H2020 and future trends in horizon Europe, *Energies (Basel)* 13 (2020) 1030, <https://doi.org/10.3390/en13051030>.
- [23] S.E. Ryan, C. Hebdon, J. Dafeo, Energy research and the contributions of the social sciences: a contemporary examination, *energy resSoc Sci.* 3 (2014) 186–197, <https://doi.org/10.1016/j.erss.2014.07.012>.
- [24] 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, <https://doi.org/10.1016/j.enpol.2017.12.021>.
- [25] 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, <https://doi.org/10.1016/j.erss.2020.101494>.
- [26] I. Beauchampet, B. Walsh, Energy citizenship in the Netherlands: the complexities of public engagement in a large-scale energy transition, *Energy Res. Soc. Sci.* 76 (2021), 102056, <https://doi.org/10.1016/j.erss.2021.102056>.
- [27] E. Heiskanen, K. Matschoss, S. Laakso, J. Rinkinen, E.-L. Apajalahti, Energiaturroksen jännitteet kansalaisten arjessa, *Alue Ja Ympäristö.* 50 (2021) 124–138, <https://doi.org/10.30663/ay.102992>.
- [28] K. Szulecki, Conceptualizing energy democracy, *Environ. Polit.* 27 (2018) 21–41, <https://doi.org/10.1080/09644016.2017.1387294>.
- [29] S. Abram, B.R. Winthereik, T. Yarrow (Eds.), *Electrifying Anthropology: Exploring Electrical Practices and Infrastructures 2020*, Routledge, London, 2019, <https://doi.org/10.4324/9781003085225>. New York: Bloomsbury Academic.
- [30] B. Lennon, N. Dunphy, C. Gaffney, A. Revez, G. Mullally, P. O'Connor, Citizen or consumer? Reconsidering energy citizenship, *J. Environ. Policy Plan.* 22 (2020) 184–197, <https://doi.org/10.1080/1523908X.2019.1680277>.
- [31] M. van Wees, B.P. Revilla, H. Fitzgerald, D. Ahlers, N. Romero, B. Alpagut, J. Kort, C. Tjahja, G. Kaiser, V. Blessing, L. Patricio, S. Smit, Energy citizenship in positive energy districts—towards a transdisciplinary approach to impact assessment, *Buildings* 12 (2022) 186, <https://doi.org/10.3390/buildings12020186>.
- [32] R. Roversi, A. Boeri, S. Pagliula, G. Turci, Energy community in action—energy citizenship contract as tool for climate neutrality, *smartCities* 5 (2022) 294–317, <https://doi.org/10.3390/smartcities5010018>.
- [33] B. van Veelen, D. van der Horst, What is energy democracy? Connecting social science energy research and political theory, *energy resSoc Sci.* 46 (2018) 19–28, <https://doi.org/10.1016/j.erss.2018.06.010>.
- [34] T. Lee, Which citizenship do you mean? The case of the Seokkwan Doosan apartment complex in Seoul, *Energy and Environment* 30 (2019) 81–90, <https://doi.org/10.1177/0958305X18787269>.
- [35] G. Valkenburg, Sustainable technological citizenship, *Eur. J. Soc. Theory* 15 (2012), <https://doi.org/10.1177/1368431011423605>.
- [36] A. Carvalho, M. Riquito, V. Ferreira, Sociotechnical imaginaries of energy transition: the case of the Portuguese roadmap for carbon neutrality 2050, *Energy Rep.* 8 (2022) 2413–2423, <https://doi.org/10.1016/j.egy.2022.01.138>.
- [37] M. Ryghaug, T.M. Skjølvold, S. Heidenreich, Creating energy citizenship through material participation, *Soc. Stud. Sci.* 48 (2018) 283–303, <https://doi.org/10.1177/0306312718770286>.
- [38] E. Jolivet, E. Heiskanen, Blowing against the wind—an exploratory application of actor network theory to the analysis of local controversies and participation processes in wind energy, *Energy Policy* 38 (2010) 6746–6754, <https://doi.org/10.1016/j.enpol.2010.06.044>.
- [39] T. Mitchell, *Carbon Democracy: Political Power in the Age of Oil*, Verso, London, 2011.