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Review



An interdisciplinary understanding of energy citizenship: Integrating psychological, legal, and economic perspectives on a citizen-centred sustainable energy transition

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ABSTRACT

Energy citizenship is an emerging concept in policy and practice. Yet scientific theorising around energy citizenship is scarce, and rarely bundled in interdisciplinary discourse. In this article, we present an interdisciplinary definition of energy citizenship as people's rights to and responsibilities for a just and sustainable energy transition. Energy citizenship contains multiple aspects and allows for various approaches, of which we zoom into psychological, legal, and economic perspectives on the topic. From a psychological perspective, we construct an empirically testable sub-definition of energy citizenship based on previous psychological theorising. A legal perspective shows, exemplarily for the EU context, that energy citizenship qualifies as an EU citizenship because it consists of a bundle of rights and duties of the individual in the context of a committed, just and sustainable energy transition. An economic perspective reveals how energy citizenship already takes shape in current EU directives, and how this implies a new – more collectivist – economic model. Drawing on the three perspectives, we then sketch energy citizenship as an interdisciplinary research field. As a conclusion, we present a trans-disciplinary definition of energy citizenship that is suitable for policy makers, energy communities and citizens, as it explicates a co-responsible process of people and governments.

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1. Introduction

Global environmental crises such as climate change [1], depletion of natural resources [2,3], and biodiversity loss [4,5] stress the need for new approaches to the energy transition. Past approaches have largely focused on people as passive consumers in a top-down transition [6]. They built on a deficit view of the public, assuming that people lack the knowledge, capabilities, and willingness to actively participate in the energy transition [7,8] (but see [9]). Yet such approaches might limit the possibilities for actual change to take place, as they do not acknowledge the manifold roles that people can take in the energy transition, as users, consumers, prosumers, (political) supporters, protesters, and citizens of a specific region, nation, or the EU [10]. In order to reach the EU's ambitious 32 % renewable energy target for 2030 [11], governments urgently need to address these manifold roles and measures through which people living in the EU can actively participate in the energy transition.

To acknowledge people's manifold roles in a novel approach to the energy transition, psychologist Devine-Wright [7] introduced the concept of *energy citizenship*. He defined energy citizenship as 'a view of the public that 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' (p. 71/72). From a practical perspective, EU growth strategies and visions regarding a low-carbon economy have started including citizen participation and engagement [11–14]. Additionally, growing numbers of renewable energy projects in Europe show that many citizens are indeed increasingly interested in participating in the energy transition [15]. However, from a research perspective, energy citizenship is still an underemphasised part of the energy transition that lacks theorising as well as empirical studies in various scientific disciplines [6,16]. In the light of practical trends but scarce scientific investigation, it is crucial to understand, question, and discuss the role of citizens in the energy transition, and to examine how a citizenship approach can unfold its full potential.

There are several conceptual gaps currently surrounding the concept of energy citizenship. Throughout his article, Devine-Wright [7] laid out many possibilities of how energy citizenship could be conceptualised, for example, by highlighting the roles of perceived responsibility, justice, and energy actions. Yet it remains largely unclear whether some of these ideas are part of the core concept of energy citizenship, variants of it or only connected to it [11,17]. Moreover, energy citizenship was defined as a view of the public [7,18]. However, it remains unclear whether 'a view of the public' signifies (1) how the public is perceived, (2) beliefs about how the public should be, or (3) beliefs that the public itself has. Even greater challenges arise if one tries to approximate the concept from various disciplines that involve completely different underlying research traditions and assumptions. While we find a number of studies representing a sociological perspective on energy citizenship [6,10,17], other disciplinary perspectives are scarce. Additionally, current research often views energy citizenship as active participation – and thus immense responsibility – of individuals in the energy transition, thereby neglecting the crucial role of politics and governments for the energy citizenship concept [17,19]. The question remains what exactly constitutes energy citizenship.

We address this question with an interdisciplinary scoping review, based on a cooperation of psychologists, lawyers and economists, inherent to our project [20]. While many other disciplines could have contributed equally useful ideas, a combination of these three disciplines might offer some novel starting points. While psychological research focusses on the behavioural aspects of the energy transition (micro-level), research in economics and law are related to changes in macro-level factors of the energy system. Integrating these complementary perspectives into an interdisciplinary understanding of the energy transition should thus provide a feasible approach, both for

theoretical development as well as for practical application. We adapted our interdisciplinary process to previous frameworks [21,22]. At first, we gathered concepts relevant to the subject of energy citizenship, and opened interdisciplinary debates to build common ground. At the centre were four concepts: *People's rights* (i.e., entitlement with energy services and participation opportunities in the energy transition), *people's responsibilities* (i.e., commitment to promote and participate in the energy transition), the *aim of a just energy transition* (i.e., accounting and seeking to overcome structural barriers, fairly distributing benefits and burdens, and creating a representative and inclusive energy decision-making process [17,23,24]), and the *aim of a sustainable energy transition* (i.e., seeking long-term stability of the environment and economy by integrating environmental, social, and economic concerns throughout the decision-making process [25–28]). In a second step, we used these concepts to construct a preliminary interdisciplinary definition of energy citizenship: Energy citizenship is citizens' right to and responsibility for a fair, just, and sustainable energy transition. This definition would form a parsimonious basis for disciplinary examinations. Third, we decided on our core research question: *How is the concept of energy citizenship featured in psychology, law, and economics?*

In a fourth stage, psychologists, lawyers, and economists wrote disciplinary reviews targeting the core question as well as further scoping questions, rooted in disciplinary traditions. They reflect the structure of this paper. From a *psychological perspective*, we were interested in how energy citizenship could be transformed into an empirically investigable construct with psychological dimensions (Section 2). Our *legal perspective* asked how current EU law is shaping energy citizenship in a context of an overall expanding concept of citizenship (Section 3). From an *economic perspective*, we reflected on the implications of energy citizenship for the economic model within the EU (Section 4). Energy communities, defined as initiatives aiming to collectively promote a sustainable energy transition in a local area [29], presented themselves as prominent examples in which central aspects of energy citizenship are featured. All disciplines therefore elaborated on the connection between energy communities and energy citizenship.

In a fifth step, we discussed commonalities, differences, and learning potential between disciplines, thereby sketching how an interdisciplinary research field of energy citizenship could look like (Section 5.1). Sixth, our team engaged in co-creation processes with diverse stakeholders (e.g., policy makers, energy community members, scientists from other disciplines, citizens) to discuss our preliminary definition. Based on these activities, we concluded that a transdisciplinary definition of energy citizenship needed to be more comprehensive, and should make way for a co-responsibility of both governmental authorities and individuals (Section 5.2). In a last step, we determined our final interdisciplinary definition of energy citizenship that all disciplines were able to work with: *Energy citizenship is people's rights to and responsibilities for a just and sustainable energy transition* (Fig. 1).¹ The ideal outcome of such a transition would be an equitable and regenerative energy system. As we represent only three among many disciplines that are relevant for the study of energy citizenship, this review aims at opening the interdisciplinary discussion around energy citizenship.

2. Energy citizenship from a psychological perspective

Energy citizenship has not yet been systematically studied as a psychological construct. This is possibly due to the innovative and unconventional conceptualisation of energy citizenship. Yet we do find studies in environmental psychology on related concepts such as environmental citizenship. Typically, psychological studies conceptualised environmental citizenship as a *single-faceted* subtype of pro-environmental behaviour in the tradition of Stern et al. [31]. Environmental

¹ In the associated deliverable [30], we provide a detailed reasoning on why we chose this definition.

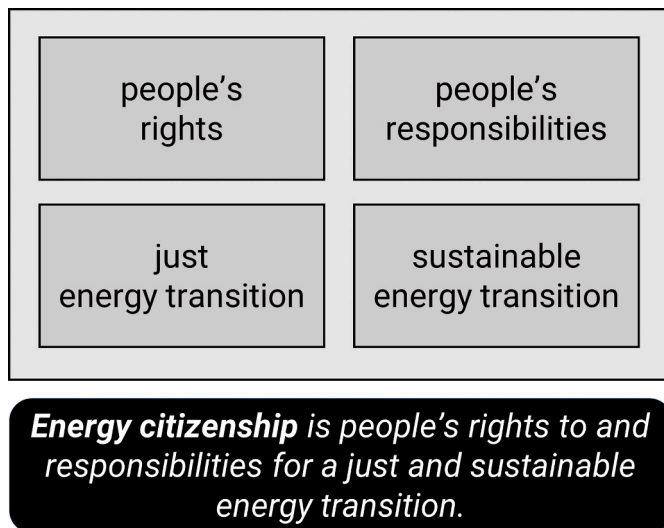


Fig. 1. Interdisciplinary perspective of energy citizenship with four key aspects.

citizenship in this stream solely includes behaviours, for example, 'writing letters to political officials, joining and contributing funds to movement organisations, and reading movement literature' (p. 82) or signing a petition to benefit the environment [31–37]. In contrast, Devine-Wright [7] described energy citizenship as a *multifaceted* construct, including many aspects, among them rights, responsibilities, awareness, positive feelings, and willingness to act. In some ways, it resembles Schultz et al.'s [38] three components definition of environmental attitude that contains beliefs, affects, and behavioural intentions (see also [39,40]). Similarly, Hadjichambis et al.'s [12] concept of environmental citizenship entailed several facets such as awareness, environmental literacy, and motivation for individual consumption and collective action as the implementation of citizens' environmental rights and duties.

At the basis of our psychological review is the assumption that energy citizenship should be conceptualised as a multifaceted concept that goes beyond energy behaviours. Public behaviours such as signing a petition have been studied extensively in previous psychological research [35,41]. Part of the innovative potential of energy citizenship lies in the idea that it is a conglomerate of beliefs and motivations related to the energy transition. Only when conceptualised as a conglomerate can energy citizenship offer new perspectives on already existing psychological theories, methods, and applications. To be a viable multifaceted concept, energy citizenship must have clear facets, and explicitly distinguish its facets from its predictors. Based on all of the facets mentioned by Devine-Wright [7] and Hadjichambis et al. [12], we arrived at the essence of energy citizenship: *Energy citizenship from a psychological perspective is people's belief that they as individuals and as collectives have rights and responsibilities for a just and sustainable energy transition, and their motivation to act upon those rights and responsibilities.* This definition enables researchers to investigate how energy citizenship relates to actual energy behaviours such as involvement in an energy community, and other well-known psychological factors (e.g., values). In the following paragraphs, we describe why a viable psychological concept of energy citizenship should (1) include the aims of a just and sustainable energy transition, (2) centre around the beliefs that people have rights and responsibilities, (3) include a motivation to act, and (4) consider individual and collective aspects of these beliefs and motivations (Fig. 2).

2.1. Energy citizenship has the aim of a just and sustainable energy transition

We argue for an understanding of energy citizenship that binds certain beliefs and aims to an action (motivation). While research in environmental psychology typically focuses on the aim of environmental protection, energy citizenship broadens this perspective to more general sustainability aims (but see, e.g. [42]). For example, former concepts of energy citizenship highlighted social justice as a key element of energy citizenship [7]. The aim of a just and sustainable energy transition accounts for and seeks to overcome structural barriers to participation, thereby ensuring a global energy system that fairly distributes both the benefits and burdens of energy services, and contributes to more representative and inclusive energy decision-making [17,23,24]. It aims for stability of collective environmental, social, and economic interests [25–28]. Energy citizenship should equally reflect this potential for aligned or conflicting collective aims within the individual. Investigating how people's diverse collective aims interact might lead to new research angles and a better understanding of their overall motivation.

We further suggest that energy citizenship should not only include the aim of social justice but should be explicitly justice-based, in that it takes reasoning about justice into consideration [43]. We focus on perceived rights, responsibilities, and motivations (and not behaviour), as these are probably less affected by legal or economic constraints than actual behaviour (see intent- vs. impact-oriented approach [44]). A motivational approach thus allows for a more inclusive definition of energy citizenship.

Energy communities are a suitable example to illustrate how the three aims of energy citizenship (environmental, social, economic sustainability) are targeted. While energy communities across the EU vary substantially [45,46], some common aims stand out. Energy communities usually evolve around people's *environmental sustainability goals* [47–50] (Fig. 3). This entails the promotion of renewable energies, for example, by collectively purchasing solar cells, implementing energy saving programs, and providing renewable energy surplus to the grid. Furthermore, energy communities often aim at more *equitable and democratic energy systems* (e.g., [19,51–54]). Limited access to financial resources (in order to invest in energy communities) or perceived lack of competence to engage in energy issues are potential barriers to participation in the energy transition. Energy communities hold great potential to reduce these barriers, thus making them potential catalysts for promoting energy citizenship [55–57]. For example, they can potentially create the possibility to promote inclusion by allowing more and different types of people to participate in energy transitions.² Many energy communities additionally aim to contribute to *economic sustainability* in that they mean to foster local economic development [59], enhance resource independence [57,60,61], and produce economic benefits for their members [62–64]. Next to ecological, social, and economic aims, energy communities are further characterised by their bottom-up formation by community members [65], open and voluntary participation, and effective control by citizens, local authorities and smaller businesses [11,66]. This example of energy communities shows how energy citizenship aims might be pursued.

2.2. Energy citizenship centres around the beliefs that people have rights and responsibilities

Central to the definition of Devine-Wright [7] and a psychological perspective is that energy citizenship is about people's *perceptions* that they have rights and that they are responsible for a just and sustainable

² We acknowledge that more systematic evidence is needed about the outcomes of energy communities. Energy communities could potentially also lead to negative unintended consequences such as exacerbated inequalities [58].

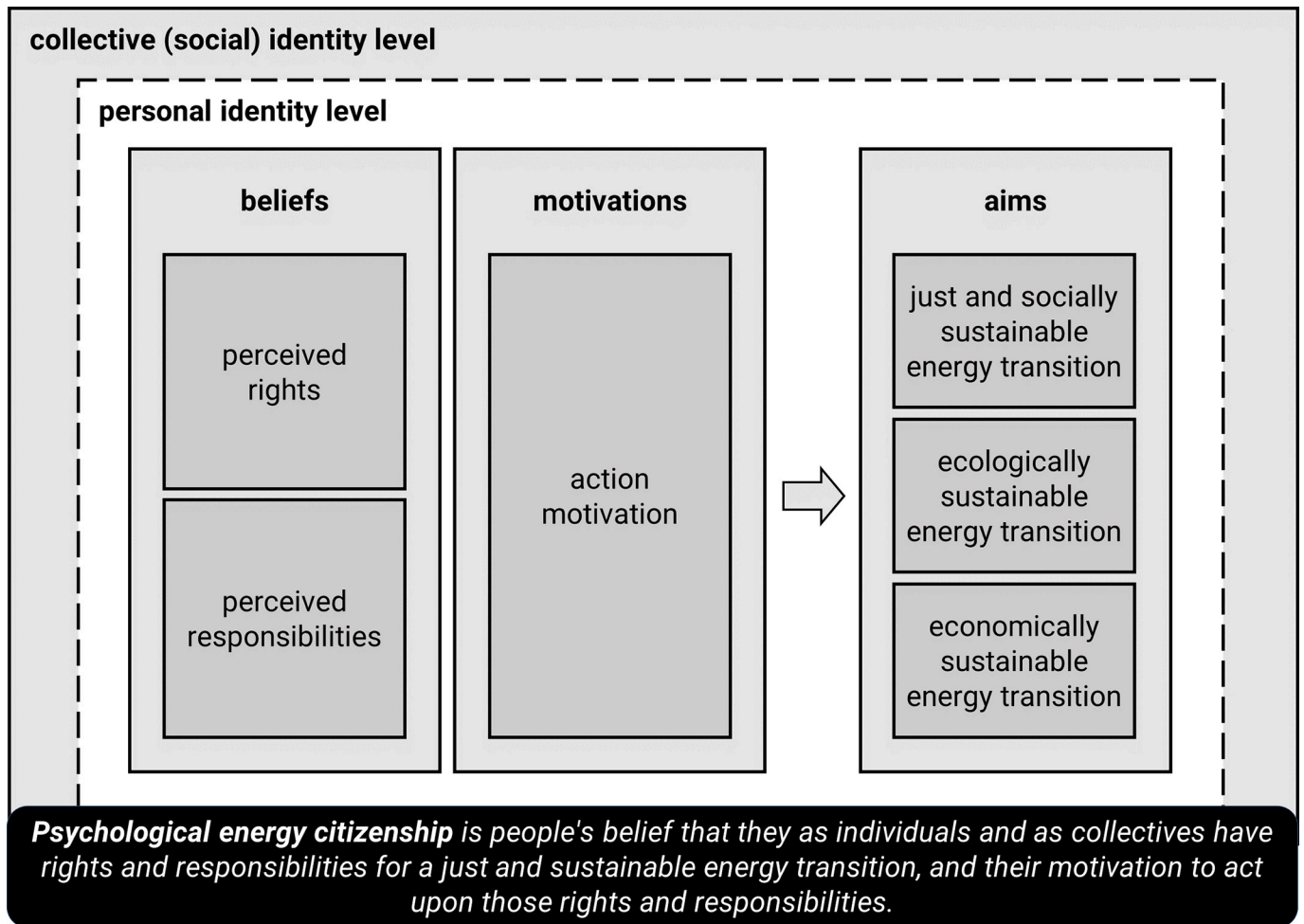


Fig. 2. Psychological perspective of energy citizenship with three pillars (beliefs, motivations, aims) and two levels (personal and social identity).

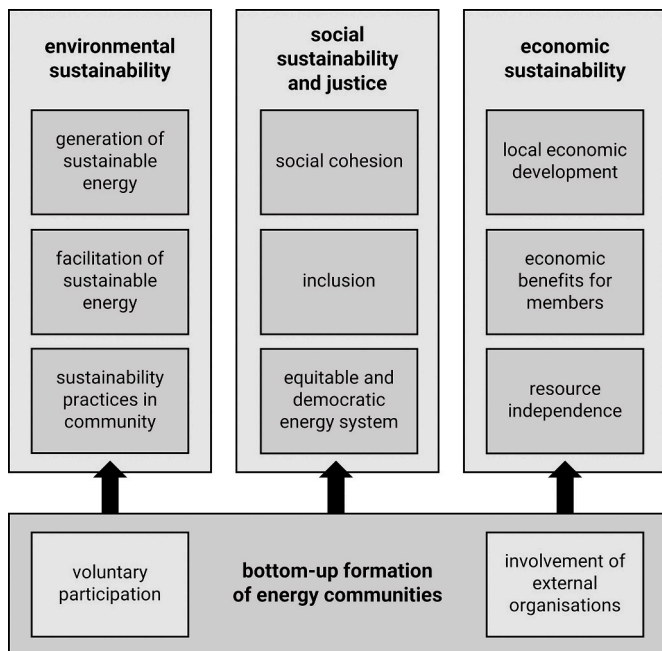


Fig. 3. Overview of common characteristics of energy communities.

energy transition. Despite its relevance for democratic societies, the concept of beliefs regarding specific rights is not yet truly captured by constructs of social and environmental psychological theories. The concept of *beliefs about rights* can point to (at least) three psychological aspects. First, it can refer to the perception of *being formally granted* a right by the government, for example, having the right to vote. Second, it can also link to the belief that one *should have* a specific right if it has not yet been legally implemented, for example, a woman in the 1910s might have thought that they should have the right to vote. Third, perceived rights can also represent the extent that a person feels they *can actually make use* of a right. For example, a person might have the right to go to university, but the financial situation of their parents affects their chances to actually make use of this right. Even if the formal right exists, there might be economic and legal barriers impeding the ability to contribute to the energy transition. This third aspect shares some similarity with the concept of (collective) self-efficacy [67], defined as people's belief that they as individuals or as collectives can perform certain actions to achieve certain aims. (Collective) self-efficacy has been a key predictor of both political behaviour [68] and collective action [41,69–72]. In the energy transition, these three aspects of rights might interact. If people perceive to have a right and the ability to enact this right, this could predict involvement in the energy transition through political participation processes as a form of exercising one's energy citizenship. Yet if a person perceives that they actually have a right but are not able to enact it, this could represent a rights violation and prompt resistance and protest as other ways of exercising one's energy citizenship [73–75]. People's perceived rights in the energy transition as well as their interplay might offer novel psychological

research angles, as they are central aspects of energy citizenship. While perceived rights seem to be an underemphasised topic, *perceived responsibility* is a core construct in multiple theories that aim to explain pro-environmental behaviours (e.g., norm-activation model [76], value-belief-norm theory [31]). It has been found to be predictive of sustainable energy behaviours [77–79]. However, the impact of perceived (collective) responsibilities in an energy transition that aims not only at ecological sustainability but also social justice remains to be studied.

2.3. Energy citizenship includes a motivation to act rather than actual behaviour

While research on organisational citizenship behaviour, explicitly refers to *behaviour* (rather than a motivation to act) [80,81], previous theoretical work on energy citizenship argued that it should be regarded as a *potential for action* rather than a behaviour [7]. We agree with the second stance, as action motivation is more suitable for an energy citizenship concept highlighting social justice and inclusivity. Most people can build motivation but not everyone can engage in specific behaviours, for example, afford to put solar panels on one's roof or make time to volunteer for an energy community initiative. Energy citizens do not just react to extrinsic triggers or incentives. Instead, their actions are based in self-determined goals such as environmental protection and social justice [82,83]. For example, if someone joins an energy community, but derives their motivation merely from personal financial incentives, this might be a sign of pro-environmental energy behaviour but not of energy citizenship. Then again, if someone cannot afford joining an energy community but still feels responsible and willing to promote a just and sustainable energy transition whenever possible, this could be seen as a sign of energy citizenship, as the person is *motivated* to act. While an approach focussing on specific energy behaviours might find that structural factors constrain energy citizenship, a motivational approach to energy citizenship can focus on psychological predictors apart from structural constraints, and might therefore be more appropriate for psychological research [44,84]. Another core advantage to defining energy citizenship as a motivation (and not behaviour) is that it allows researchers to investigate energy citizenship in direct relation to specific behaviours. Thereby, it is generative in providing explanations for various psychological responses beyond personal behaviour that are of pivotal importance for the energy transition, for example, policy acceptance, inclusion, protest, and social identification with specific pro-environmental groups.

While we argue that energy citizenship should be a motivation to act (rather than a behaviour), the question remains which actions are constitutive of this motivation. Stern et al. [31,32] defined environmental citizenship as a form of non-activist public behaviour, and presented examples such as signing a petition. For them, environmental citizenship contrasted to more passive policy acceptance, to riskier environmental activism, and private-sphere environmentalism such as individual energy consumption (see also [33–35,37]). Again, Stern et al.'s [31] empirical operationalisation diverged from Devine-Wright's [7] theoretical conceptualisation. Devine-Wright [7] explicated that while earlier understandings of citizenship mainly concentrated on public and activist behaviours such as energy community membership [85], later definitions highlighted the need to include private consumption and ideas of the ecological footprint [86,87]. We agree that only a more complex understanding of energy citizenship can capture all possible pathways to a just and sustainable energy transition in which individuals play their manifold roles (see also [7,12,88]). Consequently, energy citizenship needs to include the motivation to act – privately (e.g., saving energy, using renewable energies in one's household), and publicly (e.g., voting, petitioning, protesting, volunteering in an energy community).

2.4. Energy citizenship considers individual and collective aspects of motivation

From a psychological perspective, a typology of energy-related behaviours may not only distinguish between private and public/activist behaviours, but also between personal and collective behaviour. According to the social identity approach [89,90], an action can be understood in terms of personal action or collective action. While personal action is rooted in people's individual beliefs and motivations, collective action is defined as individuals' actions as group members and on the ground of collective cognitions, affect, and motivation [69,71,91,92]. At the centre of collective action is people's *social identity*, that is, the part of an individual's self-concept that arises from their group memberships and its emotional valence, thereby creating the human capacity to define the self as *we* [71,93]. Social identity theory posits that people can flexibly shift between various personal and social identities [94].

While previous theorising conceptualised energy citizenship on a local, regional, national, and global level [7], we extend this perspective and suggest that individuals can have collective energy citizenship with respect to a broad range of social identities. In other words, they would perceive responsibilities, rights and action motivation as a local citizen, consumer, a voter of a specific party, an EU citizen, a global citizen, a member of a specific energy community, and many more [95]. A collective perspective is necessary as individual and collective notions of energy citizenship might diverge. For example, a person might believe that they as an individual have only a limited amount of responsibility for an energy transition, but that they as a local community have the shared responsibility to promote an energy transition that is both sustainable and just for members of their community. Also, public energy supply is not typically a task for individuals but rather for collectives (e.g., the municipality). Thus, defining oneself as a group member should be important for determining an individual's actions in the energy transition [71].

What is interesting in the study of collective energy citizenship is that specific social identities will be more central than others, with possible consequences for their relation to actual behaviour. Previous meta-analytical research indicates that identification with a *politicised and pro-environmental group* could be of particular relevance for the motivation to act upon one's rights and responsibilities as energy citizens [69,96,97]. Other identities might be less connected, or only show strong relations if their specific context matches. For example, a strong *EU citizen* identification might be connected to energy citizenship beliefs, affects, and potential actions at the EU level, but less at the local level. Place-bound collective energy citizenship could offer valuable insights into the relationships between individuals, collectives, and governments. A social identity as a *consumer* might even have adverse consequences for energy citizenship. In a framing experiment, cueing a consumer identity (e.g., by labelling a task 'consumer reaction study' as compared to a 'citizen reaction study') led to less perceived responsibility and trust [98]. These findings support Lennon et al.'s [17] notion that the deficit model of individuals portrayed as consumers may undermine energy-related action, and highlight that the potential of the citizen-based approach may lie only in certain social identities. Ultimately, self-identifying as an *energy citizen* could become a relevant social identity for people who (strongly) support a just and sustainable energy transition (see [88]).

As energy communities and energy citizenship have large overlaps in what they aim for – environmental, social, and economic sustainability – energy communities represent one of the key social identities for energy citizenship. By studying energy communities, the interplay between motivations on the collective and individual level becomes visible. There are (at least) two perspectives one can assume when thinking about their relation: energy community involvement as either outcome or predictor of individual energy citizenship. Previous research indeed has shown that individual beliefs and motivations regarding ecological sustainability are associated with joining an energy community (i.e.,

energy community involvement as outcome). For example, people with a stronger pro-environmental motivation, that is rooted in their environmental self-identity and biospheric values, are more likely to join an energy community [29,99–102]. Then again, energy communities can become and shape relevant social identities, affecting members' and non-members' beliefs and motivations to act in accordance with this identity (i.e., energy community involvement as predictor). Research suggests that those involved in energy communities generally develop stronger pro-environmental attitudes [64] and behave more sustainably than people who are not involved [99,103]. Moreover, the more strongly a person identifies with the energy community, the more they will be motivated to act in line with perceived energy community aims [65,99,104,105].

2.5. Summary of psychological perspective

Taken together, we combined previous research on energy and environmental citizenship with psychological and justice-based theorising. We reasoned why energy citizenship – from a psychological perspective – should be conceptualised as people's belief that they as individuals and as collectives have rights and responsibilities for a just and sustainable energy transition, and their motivation to act upon those rights and responsibilities. Energy citizenship can be viewed through the lens of many personal and social versions of the self. Thereby, energy community membership seems to be a key element of a just and sustainable energy transition, as it can both build upon and shape energy citizenship.

3. Energy citizenship from a legal perspective

Beyond conceiving of energy citizenship as a set of beliefs and action motivation held by individuals, we will show that energy citizenship is also an emerging legal concept within the EU.³ We are aware of the fact that citizenship is also a political and philosophical concept, yet in the following we are looking into citizenship from a legal point of view, therefore focusing on legal norms. In our legal analysis, we thus focus on EU law, as the concept is currently developed and promoted in this context [11,13]. In the following sections, we first describe the essence of citizenship and briefly explain how rights and responsibilities, from a legal perspective, can be understood as liberal and republican aspects of citizenship. Second, we explain that EU citizenship can be understood as a multi-layered concept of citizenship including a political, economic and justice layer. We then investigate how current EU law actually incorporates energy-related rights and duties, which allows us to infer an energy layer and the concept of energy citizenship. Finally, we define energy citizenship, from the legal perspective, as a bundle of rights of the individual, framed by a strong legal commitment of the EU towards the goal of a sustainable energy transition. To our knowledge, energy citizenship has not been examined as a legal concept in literature until now. In this article, we illustrate how energy citizenship can be derived from certain legal norms in the EU context. The significance of a legal notion of energy citizenship should not be underestimated since energy citizenship from a legal point of view is about rights of citizens to actively participate in the energy transition.

3.1. The focus of citizenship is expanding beyond traditional aspects

In order to conceptualise energy citizenship, one needs to have a proper understanding of citizenship and its current developments. In this section, we describe 'traditional' citizenship concepts from a legal point of view and argue that citizenship is becoming an increasingly open and flexible concept. A legal view on citizenship helps to focus on

³ The ideas laid down here are further elaborated in our legal article [106] and in our deliverable [30].

rights and duties of individuals which, other than the philosophical and political view on citizenship, highlights the actual possibilities of citizens.

Traditionally, we find various definitions and conceptions of citizenship in the legal context [107,108]. Often the following four main aspects of citizenship are identified [107,109]: first, citizenship is seen as linking the individual to a *nation state*. Second, citizenship has a political dimension encompassing *political rights*, for example, the right to vote. Third, citizenship includes *civil rights* aspects, which overlap with political rights [110]. Civil rights entail, for example, the right to own property or a right to justice [110]. Fourth, scholars point to the *psychological aspect* that citizenship might lead to a feeling of membership and of belonging to a certain community [109].

These main aspects of citizenship are neither set in stone, nor clearly cut as the evolution of the law shows. Recent legal developments point at the softening and opening of the concept of citizenship. EU citizenship is an excellent example of such a development [111,112], because EU law softens the connection between citizenship and the nation state. This is reflected in literature. For example, O'Leary [113] does not rely on the *nation state* in her definition of EU citizenship but uses the term *community* instead and defines it as 'a juridical condition which describes membership of and participation in a defined community [... carrying] with it a number of rights and duties which are, in themselves, the expression of the political and legal link between the [... community] and the individual' (p. 13). Conceptualising citizenship as a link between an individual and a community (and not necessarily a nation state) has further implications for other aspects of citizenship such as the psychological feeling of belonging. If we follow O'Leary's [113] definition, the feeling of belonging could be tied to any political community, for example, the EU, a certain region, a municipality, a neighbourhood, or even another community, such as the digital community [114].

We also observe that the legal concept of citizenship is opening when we look into *political rights*. Whereas before political rights were depending on having a certain citizenship in the sense of nationality, nowadays political rights are sometimes also given to residents. In this light, some authors have developed a different understanding of citizenship: for instance, Kostakopoulou [112] conceptualises citizenship as a network good, for which residence in a certain territory constitutes the main criterion for citizenship. In such a concept, citizenship would benefit all people residing in the territory of a certain community (for a certain period of time). Thus, the pillar of (political) rights as such remains unchanged, but it appears to be more flexible, since citizenship is tied to the place of residence. In New Zealand, for example, voting rights are given to permanent residents (and not only to citizens) [115]. We also find that *civil rights* as a main aspect of traditional citizenship concepts lose importance. This is due to the rise of human rights [116]. Civil rights such as the freedom of belief do not depend on citizenship but on being a human being living in a certain area. For the states committed to the European Convention on Human Rights, civil rights are guaranteed to every human being (irrespective of their citizenship) [117].

Citizenship in the traditional sense, as a legal link between an individual and a nation will continue to exist. Yet more open concepts of citizenship are emerging in law, for instance, EU citizenship. Additionally, there are other current legal developments promoting an open citizenship concept, for example, the increased recognition of double or multiple citizenship.

3.2. Liberal and republican aspects of citizenship

'Traditional' citizenship as well as more open forms of citizenship harbour a liberal and a republican aspect [118]. The liberal and the republican aspect can be detected in law, and are not only a philosophical and/or political idea. According to Honohan [118], the *liberal aspect of citizenship* emphasises legal status and rights. In this view, citizenship means that an individual has rights, which can be enforced against the state or another community. The *republican aspect of*

citizenship highlights what a certain legal order expects to be done and focuses on activity. It thus centres around common responsibilities, for example, the group-based possibilities arising from citizenship ‘through which citizens can enjoy common goods that individuals cannot achieve alone’ (p. 88) [118]. While it may be an oversimplification, this can be illustrated by the following example: in liberal thinking, a clean environment would be guaranteed by a right to a clean environment against the state. In republican thinking, a clean environment would be a common good which has to be achieved through active participation of citizens. As is often the case, not only one but both approaches combined are necessary to achieve a healthy environment. In the case of energy citizenship, the liberal aspect of citizenship harbours individual rights (and eventually duties) of citizens in the energy transition. The republican aspect underpins the collective dimension of energy citizenship and the joint (moral) responsibilities that follow from it.

3.3. EU citizenship as an open and multi-layered citizenship

EU citizenship is an example for an open and flexible concept of citizenship [111,112]. When we focus on liberal and republican aspects, EU citizenship can moreover be seen as a multi-layered concept of citizenship,⁴ where we can see a liberal (or rights) aspect as well as a republican (or responsibilities) aspect for each of these layers. According to EU law, EU citizenship does not replace national citizenship but complements it [119,120]. Although in its core EU citizenship still depends on individuals being nationals of a Member State (depending on traditional citizenship as described in 3.1), EU citizenship reduces the significance of *national* citizenship because it implies a principle of non-discrimination between all EU citizens [121,122]. It is therefore transnational. In our view, however, the innovative character of EU citizenship does not only lie in its transnational nature, but also in its open and multi-layered structure [123].

The layers of EU citizenship derive from EU primary and secondary law, and they all harbour a republican and a liberal aspect. At the core of EU citizenship lies a *political layer* consisting, for example, of the right to vote and stand for elections in the EU parliament and on the municipal level in other member states [119,124], or the right to participate in an EU citizen initiative [125,126]. This would be the liberal aspect of the political layer. These rights are connected to the common goal ‘of creating an ever closer union among the peoples of Europe, in which decisions are taken as openly as possible and as closely as possible to the citizen’ [127], which represents the republican aspect of the political layer. In addition, several other layers exist, characterised by rights (liberal aspect) which are tightly linked to some important community goals (republican aspect). An *economic layer* pertains to the functioning of the internal market and the economic union [128]. A *justice layer* entails the realisation of an area of freedom, security and justice [129] including (among others) fundamental rights [129], the free circulation of judgements [129], equal access to social security [130], and the recognition principle for names and family relations [121]. We also find evidence for an *energy layer* of EU citizenship.

3.4. Energy citizenship as an additional layer of EU citizenship

The energy layer, as the other layers described above, also includes both liberal and republican aspects (for a more detailed analysis see [106]). In literature, the energy transition has already been described as a ‘collective obligation’ [131]. The sources feeding the energy layer of EU citizenship are EU primary law (1), EU secondary law (2), international treaties the EU is signatory of (3), and political documents of the EU (4). Moreover, the decisions of the Court of Justice of the European

Union are considered in all mentioned sources.

(1) Primary law highlights that energy, and a just and sustainable energy transition are topics of common concern, thus feeding into the republican aspect of energy citizenship. EU energy policy is connected to the internal market as well as to the preservation and improvement of the environment [132]. While citizens are not explicitly mentioned, the high significance of energy supply for society and the environment is clearly illustrated. Therein, the special nature of energy as a prerequisite for the functioning of the market as well as its significance for the existence of human beings are shining through [133]. In addition, the Fundamental Rights Charter [134] stipulates that a ‘high level of environmental protection and the improvement of the quality of the environment must be integrated into the policies of the Union and ensured in accordance with the principle of sustainable development’. Furthermore, solidarity between the Member States and the EU is linked to topic of energy as well [135]. Based on the Treaty on the Functioning of the European Union [132,136], the Court of Justice of the European Union recently recognised a principle of energy solidarity between the Member States and the EU [137]. Moreover, the Treaty on the Functioning of the European Union and the Trans-European Networks aim to connect Europe better when it comes to (energy) infrastructure and explicitly refer to citizens [138].

(2) Secondary law mainly feeds into the liberal aspect of energy citizenship because it gives citizens a bundle of rights, mainly deriving from the Renewable Energy Directive II (RED II) [11] and the Internal Electricity Market Directive (IMED) [66]. The two directives promote a transformation of consumers from passive to active customers [139]. This transformation is nourished by different rights of the active consumer: For example, the directives extend the possibilities of self-consumption [140] and they provide final customers with private (contractual) rights over the energy supplier (rights vis-à-vis another private) [141]. From a legal perspective, it is highly interesting that the rights contained in the directives are not only rights pertaining to public law (rights against the state), but mainly to private law (rights against other privates) [142]. The transformation of consumers from passive to active customers is especially emphasised by the right to participate in so-called energy communities. The RED II mentions Renewable Energy Communities [143], and the IMED lays down the rules for Citizens Energy Communities [144]. The two directives define energy communities as legal entities that generate, distribute, supply, consume, aggregate or store energy or provide any other energy services to its members or shareholders. Therein, energy communities are based upon open and voluntary participation, and consist of or are controlled by members or shareholders which are natural persons, small and medium-sized enterprises, or local authorities (including municipalities). The primary purpose of energy communities is to provide environmental, economic, or social community benefits to its members, shareholders, or to the local areas where they operate – rather than to generate financial profits. Whereas it is clear that secondary law contains many *rights* regarding renewable energy, *duties* are less evident. This does not come as a surprise since the duty aspect of citizenship has been classified as thin also in a more general perspective [118]. Yet we identify the expectation of the EU legislator that citizens will make (ample) use of their multiplicity of energy (transition)-related rights. This might in the end result in a considerably strengthened moral commitment and *responsibility* of EU citizens for the urgent and highly important EU goal of a sustainable energy transition.

(3) EU policy papers and communications of the EU commission also feed into the concept of energy citizenship by highlighting republican aspects. In its communication ‘A Clean Planet for All’, the EU Commission seemed to have, at least partly, an active citizen in mind [145]. One of the most recent communications from the European Commission, the new EU strategy on adaptation to climate change, also mentions the key role of empowering ‘individual citizens, who will play a key role in the success of the adaptation strategy’ [146]. Similarly, the Commission’s July 2021 communication ‘Fit for 55: delivering the EU’s 2030 Climate

⁴ While we decided to speak of a multi-layered concept, one could also use the term multi-dimensional as an indicator of various layers/dimensions of citizenship.

Target on the way to climate neutrality’ emphasises the role of citizens in the climate transition [147]. Generally, the Fit for 55 document presents climate change as a common challenge and therefore also points at the republican aspect [147]. Lastly, the European Green Deal states not only the goal ‘to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use’ [148]. It also acknowledges that ‘[c]itizens are and should remain a driving force of the transition’ [148], and explicitly mentions energy communities, thus emphasising collective aims and actions that are part of the republican aspect of citizenship [14,148].

(4) Further political documents of the EU confirm the republican aspect of energy citizenship. For example, the Aarhus Convention that was signed by the EU [149] works towards more participation of individuals and an organised civil society. It can therefore strengthen the position of the individual in the energy transition and support the concept of energy citizenship as part of an energy layer [150–152].

Taken together, all these sources allow us to infer an energy layer of EU citizenship with a liberal and a republican aspect [153]. Energy citizenship is a complex construct, a legal status, consisting of more than just a bundle of rights. Energy citizenship in the EU context can be defined as follows: *Energy citizenship from a legal point of view consists of a bundle of rights of the individual, under public and private law (liberal aspect), framed by a strong legal commitment of the EU towards the goal of a sustainable energy transition (republican aspect) (Fig. 4).*

3.5. Functions of a legal definition of energy citizenship

Against the backdrop of the existential problems resulting from climate change, the EU legislator has realised that individual citizens – taking over responsibility and control of their energy production and consumption – should stand at the core of a successful energy transition. Building on this, we expect that our legal definition of energy citizenship will make the EU regulatory regime for the energy transition more effective, both in the application of EU law and in the everyday life of EU citizens, as it fulfils various functions. Firstly, it creates additional awareness in the population of the important community goal of a sustainable energy transition. Secondly, the definition casts the necessary legal link between the individual citizen and the common goal of a secure decarbonised energy market into a tangible and easily comprehensible form. It thereby clarifies that energy citizens making use of their numerous energy-related rights (e.g., by consuming or self-producing energy, participating in an energy community, or switching the supplier) assume social responsibility. Participation in an energy community, for instance, means that a person *makes use of a right* pertaining to energy citizenship. Participation in and establishment of an energy community is an exceptionally sophisticated way of exercising energy citizenship because it particularly helps a sustainable transition by protecting the environment (e.g., through CO₂ reduction) and reducing energy costs. Thirdly, energy citizenship raises the awareness

that citizens and local communities actually have energy-related rights, thus empowering citizens and local communities to make active use of them. Fourthly and finally, energy citizenship also addresses state powers and authorities. Once recognised as a legal concept, energy citizenship could force courts, administrative authorities and the law-maker to take it into account when taking decisions, and enable citizens to enforce it themselves.

3.6. Summary of legal perspective

In this section, we have shown that EU citizenship can indeed harbour a concept of legal energy citizenship. Moreover, we derived a legal layer of energy citizenship from different norms of EU law. This resulted in the definition of energy citizenship as a bundle of rights of the individual (liberal aspect), framed by a strong legal commitment of the EU towards the goal of a sustainable energy transition (republican aspect). Overall, energy citizenship does not only create more awareness for a clean energy transition, but it includes citizens in this energy transition, which seems to be more necessary than ever.

4. Energy citizenship from an economic perspective

The emerging legal concept of energy citizenship also shapes the economic model in the context of the EU. More precisely, energy citizenship is taking shape in an environment in which two economic concepts create a tension, as they are characterised by different understandings of the role of individuals in economic relations. On the one hand, a neoliberal approach views the individual as a consumer or producer, participating in market competition as homo oeconomicus [154]. On the other hand, we find a collectivist approach, viewing individuals as citizens with new roles and importance in the economic system. Building on critique by Lennon et al. [17], this is the first economic analysis of this specific tension between economic models in the context of the EU. In the following sections, we first describe general aspects of libertarian, neoliberal and collectivist economic approaches. Second, we show that a tension between a neoliberal and collectivist approach exists in current EU directives surrounding energy citizenship and energy communities. Third, as a result of this tension, we then describe the risk that collectivist ideas might be absorbed by neoliberal approaches. Nonetheless, we also acknowledge the chance of an emerging collectivist energy citizenship approach. By characterising what such an approach would look like, we arrive at an economic definition of energy citizenship that recognises people as citizens (not only consumers) and empowers them with rights and responsibilities in a just and sustainable energy transition. In our view, energy citizenship implies a paradigm shift. Finally, we give an overview of heterodox economic theories that could nurture the concept of energy citizenship.

4.1. Citizenship in central economic approaches

Similar to research in psychology and law, economic research on

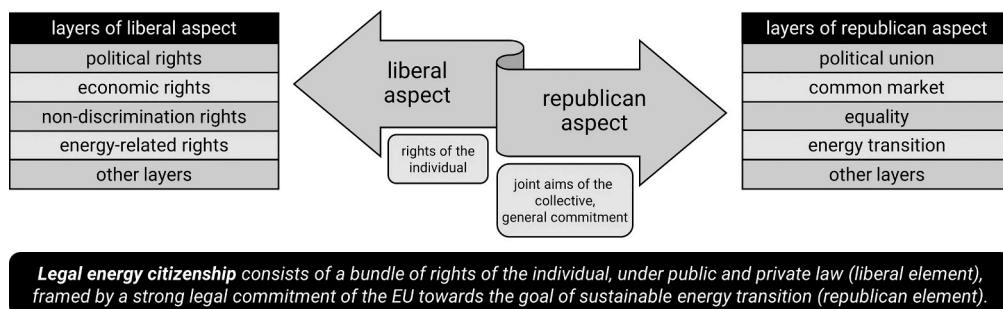


Fig. 4. Legal perspective of energy citizenship in the context of EU citizenship.

energy citizenship is limited. In order to apprehend how a tension between economic models can emerge, we need to first build an understanding of the philosophical ideas and values that lie behind economic systems. Classic economic approaches do not recognise citizenship as an essential element of the economic model. However, in the face of climate change, social inequalities and poverty, there is an urgent need to develop an economic understanding of citizenship – in general and as part of the energy transition. Therefore, we first examine three central economic approaches of political philosophy with regard to citizenship that are typically relevant in political decision-making: libertarianism, neoliberalism, and collectivism.

The *libertarian approach* is shaped by the belief in individual responsibility. The state only intervenes to protect individuals from coercion, interference, and discrimination [155]. Citizenship is not a core feature of the libertarian approach. Typically, the subject in libertarian theorising and research is the individual consumer and producer [156]. The law of supply and demand regulates the behaviour of market actors and a person's life chances are viewed as the result of market outcomes [157,158]. The libertarian approach carries the assumption that private interests take precedence over public interests. In the libertarian logic, individual responsibility creates less need for state action, encourages further private sector provision, and progressively reduces the need for government intervention [156]. Thus, the state has no right to redistribute incomes and wealth in pursuit of social or ecological justice. It can be concluded that the typical energy citizenship aims of equality and sustainability, as well as people's citizen-based rights in the energy transition, are not represented in the libertarian approach. Instead, the homo oeconomicus rationale is applied to the concept of energy consumers.

To some extent, the *neoliberal approach*⁵ is historically linked to libertarianism. Both the libertarian and neoliberal approach can be regarded as orthodox schools of thought viewing people as consumers who participate in the free market and fit into the concept of homo oeconomicus, maximising their utility [159–161]. Similar to the libertarian approach, the neoliberal approach emphasises individual responsibility [156,162–165]. However, this approach also assumes that market outcomes may be unjust due to unequal opportunity to earn one's livelihood. The neoliberal approach recognises market failures and accepts limited state intervention in securing citizens' rights but emphasises the primacy of the individual [156]. Therefore, the state's role is to ensure that everyone has the same opportunity to secure an adequate standard of living, and to enable people and families to look after themselves, rather than being the first port of call in times of need [156,166–168]. In this approach, energy consumers (as actors on the energy market) would still be the central economic subjects, however, they are also guaranteed certain rights. For example, the state could provide equal opportunities for individuals to compete on the energy market.

The *collectivist approach* (also known as the communitarian approach) does not embrace the concept of the autonomous individual [155,169,170]. Rather, it assumes that each individual is part of a community and cannot function without it. This mutual dependence requires collective rather than individualised provision to meet social needs. Individuals are seen through the prism of social needs and do not participate in market competition. While discarding the concept of energy consumers as market actors, energy citizenship, sustainability and equality could be seen as fundamental constitutional features of the collectivist approach.

These three central economic approaches of political philosophy (libertarianism, neoliberalism, collectivism) have fundamentally different implications for the degree to which governments should intervene in the economy and society. With each approach, the roles and

responsibilities of the individual, as well as the constitutional relationships between the individual citizen and the state vary. With regard to energy citizenship, the three approaches hold radically different views of the nature of citizenship, and the meaning of rights, responsibilities, justice, and sustainability. Specifically, they have diverging views on who drives the energy transition and the amount of agency that should be given to citizens, thus carrying the potential to create a tension in actual economic practice.

4.2. The tension between neoliberal and collectivist approaches in current EU directives

Our legal analysis described how two EU directives on energy communities (RED II [11], IMED [66]) already indicate that energy citizenship is emerging as a legal concept. From an economic perspective, EU directives are tools of economic policy that reflect the current economic discourse. In Table 1, we analyse this economic discourse in the respective EU directives, and we gather keywords and sentences that are either in line with a neoliberal or a collectivist approach. The analysis shows that there is a tension between a neoliberal approach focussing on energy consumers and a collectivist approach focussing on energy citizens [11,66].

On the one hand, the neoliberal market-oriented approach is visible in these directives, as they emphasise the main role of individual consumers, customers, and prosumers. Therein, the energy transition is guided by competitiveness, market price signals, and people in their consumer role. On the other hand, a citizenship and community framing fit the collectivist approach. The two directives emphasise energy communities as drivers of a citizen-based energy transition. They clearly define people's rights to production, consumption, sale, and storage of (renewable) energy in EU legislation. Therein, the directives seem to further advance an energy citizenship concept as they emphasise cooperation rather than market competition. Therefore, the two energy community directives empower citizens to take a new role in the energy transition. In sum, the analysis of the directives shows that the hitherto dominant market regulations aimed at creating a neoliberal internal

Table 1

Keywords and sentences representing a neoliberal and collectivist approach on the energy transition based on two central EU directives.

Directive	Neoliberal approach	Collectivist approach
RED II [11]: Directive 2018/2001/EU on the promotion of the use of energy from renewable sources (recast)	Liberal energy market, competitiveness, consumer, market price signals, the reduction of the cost of capital, market-based mechanisms, tendering procedures, competitive markets, rights and obligations of the renewable energy community members as customers	Renewable energy communities entitled to: produce, consume, store and sell renewable energy, share, within the renewable energy community, without being subject to unjustified or discriminatory conditions or procedures, accessible to all consumers, including those in low-income or vulnerable households, access to finance and information, justice
IMED [66]: Directive 2019/944/EU on common rules for the internal market for electricity	A well-functioning electricity market, an essential role of consumer, healthy competition in retail markets, by empowering consumers, promoting fair competition, allow consumers to take full advantage of liberalised internal market for electricity, market prices, a fully liberalised	Citizen energy communities, cooperation of citizens or local actors, decentralised production of electricity from renewable sources, community energy initiatives not prioritising profit-making, fighting energy poverty

⁵ We would like to highlight that the neoliberal approach should not be confused with the liberal legal concept of citizenship.

market were supplemented with the admission of new actors promoting a collectivist approach: energy communities.

4.3. Energy citizenship is immersed in a neoliberal market narrative

The tension between neoliberal and collectivist approaches regarding energy citizenship raises the question: what will follow from it? Many scholars argue that, in real-life practice, the energy transition is currently simply immersed in a neoliberal market narrative [7,171]. They describe how collectivist approaches clash against the way the liberal energy market in Europe is currently designed. Non-profit oriented entities like citizens and energy communities are merely included in the rules and criteria of the market game, like supply, demand, prices, efficiency, liberalisation, individual decision, competitiveness. As a result, the neoliberal market determines the instruments for the energy transition: financial resources, funding systems, participation in the decision-making process, and access to knowledge and information. For example, we find that the electricity market, especially at the wholesale level, is a free market (though in the retail sector it is partially regulated in some countries). Thus, Lennon et al. [17] argue that the EU's new regulation creates 'minimal disruption to current centralised models of energy production and distribution, a continued (re) conceptualisation of energy as a commodity, and the maintenance of corporate ownership and control over individualised patterns of consumption' (p. 2). What is important is that currently, citizens are not properly equipped with the tools to operate within the energy market, where typical business players are functioning. Thus, people's expertise in energy fields compared with incumbent actors is unequal and limits the agency and access to resources [17]. As a consequence, the neoliberal approach of the energy system, together with the state occupying a centralised regulatory role, may remove any real agency from its citizens [172].

4.4. Energy citizenship implies a paradigm shift

We clearly share the abovementioned concerns that a neoliberal approach currently and prospectively dominates collectivist approaches to the energy transition. Nonetheless, we cannot ignore that the collectivist approach is also present in these directives. If applied, the collectivist approach to the energy transition provides the chance to reduce market failure such as energy poverty and other negative externalities, such as social-health and environmental-climate issues, that are related to the functioning of the energy market. It carries the prospect of ultimately leading to energy justice. What is more, it gives way to an economic model of energy citizenship.

Building on the observation that, at the core, the neoliberal and collectivist approaches imply completely different concepts of energy and people's role in the energy transition, we propose that it will be difficult, if not impossible, to make them compatible and resolve the described tension. Table 2 shows that, contrasting to a neoliberal consumer approach, we see the emergence of a new collectivist energy citizenship approach that makes different assumptions about energy, main actors and drivers, values and societal principles, organisation, time, costs, and funding in the energy transition.

For example, Stern and Aronson [18] presented various understandings of the energy concept (p. 16). In line with the neoliberal consumer approach, the *energy as commodity* concept views people as consumers. Therein, they are individual users of energy that can act on the liberal free market, where supply and demand rules for energy are determining energy prices. The concept of energy as a commodity has been, and continues to be, the dominant social representation of energy held by policy makers [17,18]. Next to it, we find the concept of *energy as an ecological resource* which is connected to the collectivist energy citizenship approach. In this concept, citizens feel responsible for energy consumption and negative externalities such as environmental damage, energy resource depletion, and the needs of future generations. It therefore matches an understanding of energy citizenship as people's

Table 2

The neoliberal consumer approach and the collectivist energy citizenship approach to the energy transition.

Main features	Neoliberal consumer approach	Collectivist energy citizenship approach
Definition of energy	Energy as commodity	Energy as a social necessity and ecological resource
Main position of actors	Energy consumer, prosumer	Energy citizen
Values of energy transition	Individual freedom, autonomy	Right to energy, community spirit, collectivism
Principles of societal organisation	Competitiveness, market regulation and instruments, cost-benefit, economic effectiveness	Justice, equity, inclusion, environment, cooperation, responsibility
Drivers of energy transition	Market ruled individual consumer with responsibility for the energy transition	Collective action, co-creation, reflexive process
Organisation of energy production	Centralised, big energy	Decentralised, democratic
Time perspective	Short time decision horizon, profit-oriented	Long time horizon, purpose-oriented
Costs perspective	Private costs reduction	Private and external costs reductions (social and environmental)
Funding system of energy transition	Financial subsidies for big energy	Investment subsidies for citizens endangered by energy poverty

responsibility for a sustainable energy transition. A third view highlights *energy as a social necessity*, which also fits the collectivist energy citizenship approach. Here, energy is understood as an essential right, so citizens should have equal access to energy, and energy justice should be provided. Thus, citizens have full agency and participate at all levels in decision-making [173]. Energy as a social necessity therefore connects to energy citizenship as people's rights to a just energy transition. We argue that the two concepts of energy as an ecological resource and as a social necessity become the foundation of collectivist approaches to the energy transition – and therefore energy citizenship.

Next to the perspective of energy, the two approaches put diverging actors, values and societal principles at the centre of the energy transition. In a neoliberal consumer approach, the energy transition is characterised by freedom, competitiveness, and economic effectiveness. Therein, people are bound to the role of energy consumers and carry the responsibility for the energy transition. In contrast, the collectivist approach views people as energy citizens with (collective) rights and responsibility and the aim of a just and sustainable energy transition. Such a transition is designed by a reflexive co-creation process, based on collective action of citizens and communities. Therefore, societal participation, dialogue, and access to information and knowledge create the basis for a psychological perception and feelings of ownership, control, and responsibility for the energy transition in citizens. Furthermore, whereas a neoliberal consumer approach would promote centralised, big energy in order to provide short-term profit and reduce private costs, we can sketch a collectivist energy citizenship approach that puts an emphasis on a decentralised and democratic energy system. By contrasting neoliberal and collectivist approaches, we arrive at the following definition of energy citizenship: *Economic energy citizenship recognises people as citizens (not only consumers) and empowers them with rights and responsibilities in a just and sustainable energy transition where energy is treated as a social necessity and as an ecological resource on the decentralised and democratic market (Fig. 5).*

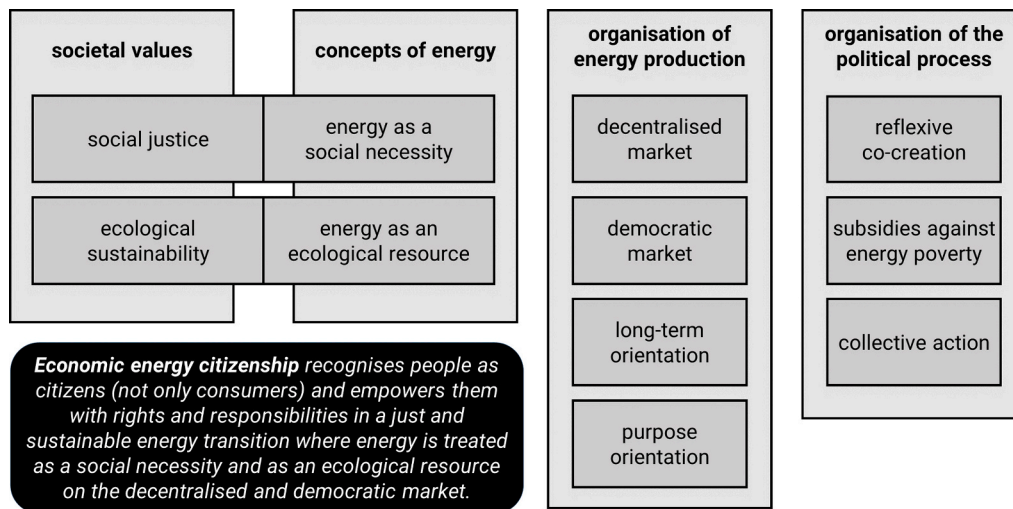


Fig. 5. Economic perspective on energy citizenship defined by specific societal values, concepts of energy, as well as a particular way of organising energy production and the political process.

4.5. Heterodox economic theories as potential breeding grounds for energy citizenship

It becomes clear that new approaches are needed to address the energy transition, especially if energy citizenship is to be placed at its core. Criticism of *orthodox theories* (i.e., libertarianism, neoliberalism) as a response to the environmental and social problems generated by the market inspired the search for alternative, *heterodox theories* and the emergence of new economic trends [174–176]. Heterodox approaches imply radically different theories, assumptions, or methods from those used in orthodox economic approaches [174,175]. Accordingly, they treat the challenge of the energy transition in a reformed way and argue that problems require collective and systemic solutions. While the collectivist approach can also be seen as heterodox thinking, we find a number of recently occurring heterodox theories that share strong similarities with a collectivist energy citizenship approach. In our view, they constitute potential breeding grounds for energy citizenship, and could provide answers for how to economically empower energy citizens as part of the sustainability transition. Table 3 gives a brief overview of these exemplary heterodox economic theories.

More precisely, the common good economy, doughnut economy, collective action, degrowth concept, the economics of sustainable development, and mission economy all place importance on individual's roles that go beyond their consumer role. These heterodox approaches highlight citizenship as an essential aspect of society and the energy transition. Additionally, they are willing to refer to communities such as the household and society. This community terminology seems central to heterodox theories. It is noteworthy that the choice of words fits the terminology of the two energy community directives (RED II [11] and IMED [66]). In the face of environmental planetary limits, heterodox theories view the renewable energy transition as a core driver of the sustainability transition. Similar to a collectivist energy citizenship approach, they emphasise participation, dialogue, empowerment, collective action, agency of citizens and collectives, as well as the responsibility of governments as vital aspects of such a transition. Some of them even consider energy from renewable energy sources as a common good. It becomes clear that emerging heterodox concepts thus nurture an understanding of energy citizenship and promote an economic paradigm shift to a collectivist energy citizenship approach [177].

4.6. Summary of economic perspective

From an economic perspective, the libertarian and neoliberal

approaches represent a limited perspective on the current economic reality of the energy transition. Current EU directives on energy communities confront researchers and policy makers with a tension between a neoliberal approach centring around energy consumers, and a collectivist approach focussing on energy citizens. It seems relevant to acknowledge this tension, so that innovative collectivist ideas will not clash with the way the liberal energy market in Europe is currently designed. Nevertheless, the emergence of energy citizenship in EU energy policies and strategies is a step forward. To pursue this strategy, citizens need to co-create policies, law, and funding. By defining energy citizenship as the part of an economic model that recognises people as citizens and empowers them with rights and responsibilities in a just and sustainable energy transition, we propose that energy citizenship implies a radical economic paradigm shift from the neoliberal, market-based to a collectivist, participatory economic model with energy communities and energy citizens at its heart.

5. Discussion and conclusion

In this scoping review, we presented a novel interdisciplinary definition of energy citizenship that creates common ground for perspectives from three different scientific disciplines (psychology, law, economics): energy citizenship is people's rights to and responsibilities for a just and sustainable energy transition [30]. Thereby, we arrived at the psychological definition of energy citizenship as people's belief that they as individuals (personal lens) and as collectives (social lens) have rights and responsibilities for a just and sustainable energy transition, and their motivation to act upon them. This concept highlights aspects of the energy transition previously overlooked by psychological research. The legal perspective showed that energy citizenship qualifies as one layer of citizenship in the exemplary context of the EU because it consists of a bundle of rights and duties of the individual (liberal aspect) in relation to a committed just and sustainable energy transition (republican aspect). The economic section laid out how energy citizenship already takes shape in current EU directives, and how this implies a new – more collectivist – economic model. In this model, energy citizenship recognises people as citizens (not only consumers) and empowers them with rights and responsibilities in a just and sustainable energy transition. In the following section, we take a look into the emerging interdisciplinary research field of energy citizenship, highlight implications for research and practice, and conclude with a practical definition of energy citizenship.

5.1. Sketching energy citizenship as an interdisciplinary research field

Despite their diverging research traditions and approaches to energy citizenship, we find a number of commonalities between the three perspectives that sketch the start of an interdisciplinary research field. First and foremost, we observe a *trend towards energy citizenship concepts* (e.g., in the EU) that is not yet captured in any of our disciplines. The definition by Devine-Wright [7] offers a starting point for discussion. However, it is not completely transferable to any of our disciplines. From a psychological perspective, the definition is so rich with ideas that it seems too broad for a quantifiable psychological construct. In a legal sense, energy is not part of classic or traditional concepts of citizenship, which makes it necessary to argue why this has changed and how energy can form part of citizenship. From an economic perspective, the definition is not easily transferred yet to the market level as it is incongruent with the mainstream neoliberal economic model. As a result, we explored the concept of energy citizenship based in a new, parsimonious, and viable interdisciplinary definition.

Second, all disciplines suggest that energy citizenship is driven by *environmental and social goals*. This idea is reflected by the notion that

different values can motivate people's perceived responsibility and actions in the energy domain (psychological perspective [189]), in the republican approach according to which people or institutions have the public good in mind or are even legally bound to follow the public good (legal perspective), and in collectivist and heterodox approaches to the energy transition (economic perspective). This value-base is also indicative of specific ideas about human nature and the functions of energy in societies. For example, individuals are not viewed as homo oeconomicus that only act in their own best interest, but as social beings pursuing collective goals, such as preventing climate change and promoting an equal society. Energy is not only viewed as a commodity (consumer concept) but as a social necessity and resource (citizenship concept [18]) that includes, for example, taking measures against energy poverty and for 'vulnerable customers' [190].

Third and connected to this, the trend of combining *ecological and justice aspects of the energy transition* in the concept of energy citizenship is present in all disciplines. A just energy transition not only promotes environmental protection but accounts for and seeks to overcome structural barriers to participation, thereby ensuring a global energy system that fairly distributes both the benefits and burdens of energy

Table 3
Role of individuals and the energy transition in orthodox and heterodox economic theories.

Economic theories	Short description	Role of individuals	Role of energy transition
Neoliberalism, free-market capitalism [178–180]	Consumers in the economy are seen as participants in the free market who fit into the concept of <i>homo oeconomicus</i> by maximising their utility. According to this orthodox economic model, wealth is created thanks to consumer egoism and other market participants. The more consumers consume products and services, the more they contribute to wealth creation in the economy. This approach can be criticised for creating the <i>tragedy of the commons</i> , in which communities over-exploit and destroy common resources.	Individuals as consumers or producers, citizenship is not represented in the market system	The energy transition would only emerge as a by-product of wealth creation.
Economy of the common good [181]	Based on criticism of the neoliberal approach, this economic concept evolved around building trust, cooperation, and sharing with others. The key factors for the new economy are ethical management, transparency, reducing environmental impact, supporting the community, social and ecological creation of products and services, and minimising the payment of profits outside the community.	Citizens, cooperation	The energy transition is necessary as it secures common good values such as human dignity, cooperation and solidarity, ecological sustainability, social justice, as well as democratic co-determination and transparency. Energy from renewable energy sources is seen as a common good.
The doughnut economy [182]	Households, markets, states and common goods are the four main components of this economic approach. Economy is a part of society, which is part of the earth system. The doughnut economy outlines two societal boundaries, social and environmental, which define the safe and just space for humanity. All economic activities should fall within its boundaries.	Individuals are concentrated in households, individuals form societies	The energy transition is regarded as a necessary course because the economy has exceeded safe environmental planetary limits on climate change, air pollution, and land conversion. Simultaneously, social limits in the scope of energy have been exceeded, for example, energy poverty. Energy from renewable energy sources is a common good.
Theory of common-pool resources [183]	According to this approach, self-organised, smaller communities tend to be more successful in protecting resources. It builds on research showing that when citizens can democratically decide about resources, they are more willing to act responsibly and typically do not over-exploit them.	Citizens, communities	While Ostrom [183] did not study the energy transition, numerous research draws on the institutional heritage of her work. In particular, research on the role of communities in sustainability transition is based on her theorising.
The degrowth concept [184,185]	The degrowth concept developed as an opposition to a market-based economy by demanding a reduction of economic growth. It undermines the neoliberal figure of the passive consumer, replacing it with the active consumer – decisive in the field of the free market and aware of the necessity of socio-economic transformation towards a citizen-oriented society.	Citizens	The transition to renewable energy sources, energy efficiency, reduction of energy consumption is a core feature of the degrowth concept.
Economics of sustainable development [186,187]	The economy of sustainable development defines economic conditions that would ensure sufficiently high ecological, economic and socio-cultural standards for all people living now and in all future generations within the limits of nature's tolerance. It therefore implements the principle of intra- and intergenerational justice.	Citizens	The energy transition is viewed as a driver of the sustainability transition.
Mission economy [188]	The mission economy demands to radically rethink the capacities and the role of governments within the economy and society. It aims to recover a sense of public purpose.	Citizens, collectives	The mission economy features the green transition, green strategies, and the Green New Deal.

services, and contributes to more representative and inclusive energy decision-making [17,23]. The goal of such a just energy transition would be to prevent energy poverty and achieve equity in participation, particularly by considering the concerns of marginalised groups [190]. Thus, a just energy transition explicitly acknowledges procedural and distributional justice by raising the questions of who wins, who loses and who bears the costs – socially, environmentally and economically [191,192]. This combination will possibly open up new research angles as well as practical challenges and opportunities.

Fourth, from all three disciplinary angles a broad understanding of energy citizenship can be argued for by showing the *variety of forms that energy citizenship can take*. Energy citizenship therefore goes beyond the mere consumption and production of energy. From a psychological point of view, for example, joining a protest that supports the energy transition could be regarded as an act of energy citizenship. From a legal perspective, energy citizenship can be seen as containing various energy-related rights that everyone has, such as switching providers, being a self-consumer or establishing an energy community. The economic perspective highlights that current EU directives view people not only as consumers and producers but also as citizens.

Fifth, all disciplines note that *individual as well as collective aspects* of energy citizenship must be considered. Therein, energy citizenship links the individual to a group (e.g., EU, energy community). From a psychological perspective, energy citizenship can be associated with individual factors (e.g., perceived responsibility as an individual) as well as group factors (e.g., identification with one's community). Thereby, energy citizenship is connected to numerous individual and collective identities that form decisions around one's commitment for a just and sustainable energy transition. From a legal point of view, people are viewed as individuals that are either part or not part of a collective legal form. From an economic perspective, the energy citizenship concept seems to imply a shift from a radically individualised energy consumer concept to a citizenship concept that mixes ideas of individual and collective roles and responsibilities in a co-creative process. For all disciplines, energy communities seem to be central agents allowing individuals to collectively exercise energy citizenship.

Finally, our *interdisciplinary process* accentuates how the three disciplines might influence each other in the field of energy citizenship. For example, as psychology shifts the focus to individuals and their actions, it might create the unintended impression that a large part of the responsibility for an energy transition lies with individuals. Thus, a psychological perspective would benefit from taking into account legal and economic perspectives on energy citizenship that specifically emphasise responsibility of governmental authorities and justice aspects. Then again, legal considerations are based on what has already been formulated in law. For the creation of legal possibilities of energy citizens in the future, the findings of economics and psychology (and other disciplines) are key: knowledge on currently practised forms of energy communities and citizenship (possibly informed by economics) as well as current societal and political opinions, goals, and insights on why citizens participate in the democratic process surrounding the energy transition (possibly informed by psychology [19]) can potentially validate existing and shape future laws. Moreover, psychological and economic perspectives might display whether a law works as intended (e.g., in specific marginalised groups). In an iterative process, this legal ideal might then influence economic and psychological processes. For example, it determines which types of energy communities are recognised as such, and possibly receive financial support (economic perspective). Additionally, laws carry information about what is socially acceptable in a specific society, thus influencing people's motivation and actions [193]. Interdisciplinary debates are further useful as they highlight conceptual tensions. For example, our interdisciplinary definition includes rights and responsibilities, with the question of who carries what amount of rights and responsibilities remaining open. From a legal perspective, the emphasis might lie more on responsibilities of governmental authorities, while psychological considerations might

focus on individual responsibility – simply due to their object of study. As this tension of rights and responsibilities is a core aspect of how energy citizenship is implemented in practice, interdisciplinary debates are central to building a reasoning around it.

In sum, an interdisciplinary understanding of energy citizenship needs (1) to face current trends that tend to outrun scientific elaborations, (2) to acknowledge a basis in environmental and social goals, (3) to include both ecological and justice aspects of the energy transition, (4) to recognise that energy citizenship can take a variety of forms, (4) to consider individual and collective aspects, and (5) to build on interdisciplinary debates seeking commonalities, mutual influences, as well as tension between disciplines. As we have shown, our interdisciplinary definition provides a basis for disciplinary and interdisciplinary approaches to energy citizenship. The definition as well as our elaborations carry implications for research and practice.

5.2. Implications for research and for a transdisciplinary definition of energy citizenship

Throughout this article, disciplinary research gaps shone through in the specific sections. For example, psychological research on energy citizenship needs a proper understanding of perceived rights, as they are currently underemphasised in psychological theorising. Moreover, we suggest that self-identifying as an energy citizen could be an emerging social identity. A legal perspective elaborated on how energy citizenship could be conceptualised, yet it remains unclear what this newly emerging concept implies legally on the local, national, EU level and in other countries. Confronted with the necessity of a fast energy transition across the globe, future research could also repeat our steps to analyse energy citizenship in EU law for other legal systems. The economic section highlighted that, in reality, a new economic model of energy citizenship is not yet fully acknowledged in traditional – and also newer – economic models. The existing political, economic, and social framework has been created for consumers and is too narrow to serve energy citizens. Future research questions are therefore: what kind of further adjustment in legislation, energy transition management procedures, co-creation of public tools, economic incentives and financial instruments are crucial for the real operationalisation and implementation of energy citizenship? Future research could also analyse whether and how the existing entities on the energy market will make room for citizens.

Linked to these issues is the question of what are the major psychological, legal, and economic boundary conditions for being an energy citizen. Interdisciplinary work might be useful to detect how these interact in specific contexts. One could imagine that in some countries, legal and economic barriers are so high that one can be truly psychologically motivated but nevertheless not act. In other countries, legal barriers might be lower and economic and psychological factors become more important for an individual's decision to promote the energy transition or join an energy community. Regarding rights and responsibilities, the question arises if these should be implemented in parallel or sequentially, for example, by first giving opportunities to act and then delegating responsibility? Overall, our interdisciplinary approach highlights the need for more interdisciplinary research, so that disciplines have the chance to build on each other's insights [194,195]. We are aware that the three depicted disciplines (psychology, law, economics) only cover a certain aspect of reality and lack, for example, knowledge from transition research and political science. This is why we invite other disciplines to take up from here and show how they approach the field of energy citizenship with our interdisciplinary definition.

In terms of practical implications, our article highlights how little research on energy citizenship exists and how minimally citizens are currently involved in the energy transition. At the same time, it clarifies the potential disruptive character of energy citizenship. This article therefore also constitutes an agenda for policy makers and governments by showing the implications of energy citizenship on psychological,

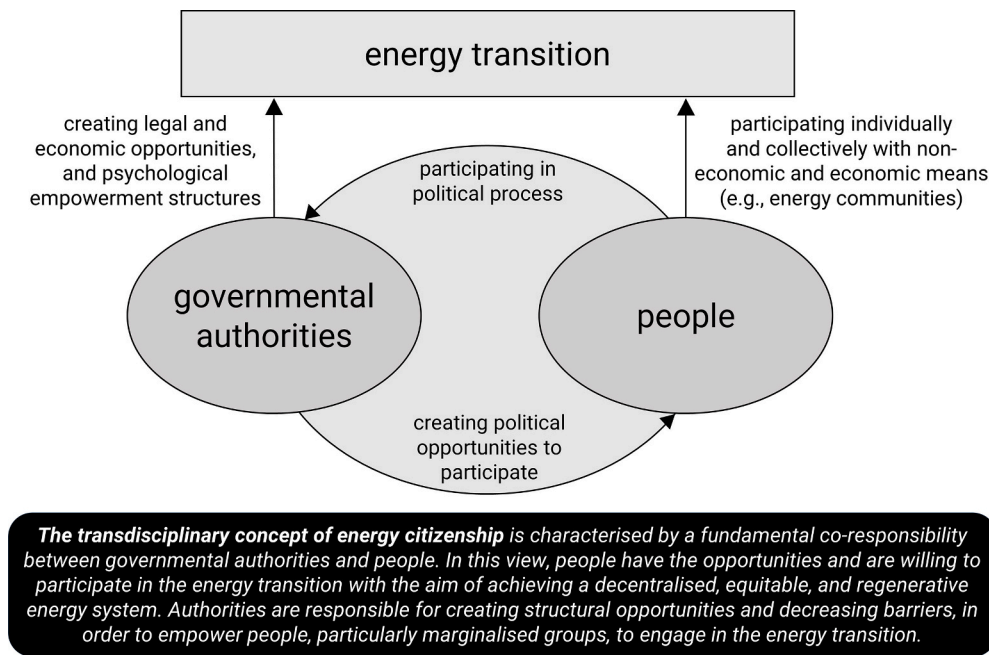


Fig. 6. Transdisciplinary perspective of energy citizenship building on the interdisciplinary definition.

legal, and economic developments, highlighting the issue of accessibility and support of citizens, and raising questions such as ‘How are responsibilities distributed? Which governmental authorities are responsible?’ Nonetheless, we assume that our interdisciplinary definition of energy citizenship might not be suitable for practice as it remains vague enough to spark scientific discourse. More precisely, we see the need for a transdisciplinary definition of energy citizenship that is viable for policy makers, energy communities and citizens. This definition should account for the tension between rights and responsibilities by making co-responsibilities explicit. Furthermore, it should be motivating for people, so that they want to join co-creation processes of the energy transition and follow the practical ideal of energy citizenship. For this purpose, we implemented co-creation workshops with policy makers, energy community members, scientists from other disciplines, and citizens. Our result is a transdisciplinary definition of energy citizenship based on the interdisciplinary definition (Fig. 6): *The concept of energy citizenship is characterised by a fundamental co-responsibility between governmental authorities and people. In this view, people have the opportunities to, and are willing to participate in the energy transition with the aim of achieving a decentralised, equitable, and regenerative energy system. Authorities are responsible for creating structural opportunities and decreasing barriers, in order to empower people, particularly marginalised groups, to engage in the energy transition.*

By approaching the topic of energy citizenship in an interdisciplinary discourse and through psychological, legal, and economic reviews, we showed how energy citizenship shapes a new interdisciplinary research field that carries new assumptions and many research gaps. Upfront is the question of how to foster energy citizenship. Fostering energy citizenship could at the same time be a lever of change. By changing beliefs and motivations, as well as legal and economic settings, energy citizenship carries the potential to provide a basis for even bigger transitions to citizen-based political systems – with communities at its heart [12].

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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.

Data availability

No data was used for the research described in the article.

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References

- [1] IPCC, Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, Intergovernmental Panel on Climate Change, Geneva, Switzerland. https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM_final.pdf, 2021 (accessed November 22, 2021).
- [2] Food and Agriculture Organization of the United Nations, The State of the World's Forests 2022: Forest Pathways for Green Recovery and Building Inclusive, Resilient and Sustainable Economies, FAO, Rome, Italy, 2022, <https://doi.org/10.4060/cb9360en>.
- [3] Convention on Wetlands, Global Wetland Outlook: Special Edition 2021, Secretariat of the Convention on Wetlands, Gland, Switzerland. https://medwet.org/wp-content/uploads/2021/12/RamsarGWO_SpecialEdition2021%E2%80%9393ENGLISH_WEB.pdf, 2021 (accessed July 25, 2022).
- [4] J. Rockström, W. Steffen, K. Noone, Å. Persson, F.S. Chapin, E.F. Lambin, T. M. Lenton, M. Scheffer, C. Folke, H.J. Schellnhuber, B. Nykvist, C.A. de Wit, T. Hughes, S. van der Leeuw, H. Rodhe, S. Sörlin, P.K. Snyder, R. Costanza, U. Svedin, M. Falkenmark, L. Karlberg, R.W. Corell, V.J. Fabry, J. Hansen, B. Walker, D. Liverman, K. Richardson, P. Crutzen, J.A. Foley, A safe operating space for humanity, *Nature* 461 (2009) 472–475, <https://doi.org/10.1038/461472a>.
- [5] W. Steffen, K. Richardson, J. Rockström, S.E. Cornell, I. Fetzer, E.M. Bennett, R. Biggs, S.R. Carpenter, W. de Vries, C.A. de Wit, C. Folke, D. Gerten, J. Heinke, G.M. Mace, L.M. Persson, V. Ramanathan, B. Reyers, S. Sörlin, Planetary boundaries: guiding human development on a changing planet, *Science* 347 (2015) 1259855, <https://doi.org/10.1126/science.1259855>.
- [6] P.M. Bögel, P. Upham, H. Shahrokni, O. Kordas, What is needed for citizen-centered urban energy transitions: insights on attitudes towards decentralized energy storage, *Energy Policy* 149 (2021), 112032, <https://doi.org/10.1016/j.enpol.2020.112032>.
- [7] P. Devine-Wright, Energy citizenship: psychological aspects of evolution in sustainable energy technologies, in: *Energy Citizsh. Psychol. Asp. Evol. Sustain. Energy Technol., Earthscan, London; Sterling, VA, 2007*.
- [8] I. Beauchamp, 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>.
- [9] G. Seyfang, A. Smith, Grassroots innovations for sustainable development: towards a new research and policy agenda, *Environ. Polit.* 16 (2007) 584–603, <https://doi.org/10.1080/09644010701419121>.
- [10] M. Ryghaug, T.M. Skjelsvold, S. Heidenreich, Creating energy citizenship through material participation, *Soc. Stud. Sci.* 48 (2018) 283–303, <https://doi.org/10.1177/0306312718770286>.
- [11] RED II, 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. <http://data.europa.eu/eli/dir/2018/2001/oj/eng>, 2018 (accessed July 26, 2022).
- [12] A.Ch. Hadjichambis, P. Reis, D. Paraskeva-Hadjichambi, J. Činčera, J. Boevde Pauw, N. Gericke, M.-C. Knippels (Eds.), *Conceptualizing Environmental Citizenship for 21st Century Education*, Springer International Publishing, Cham, 2020, <https://doi.org/10.1007/978-3-030-20249-1>.
- [13] European Commission, Building a Low-Carbon, Climate Resilient Future: Secure, Clean and Efficient Energy (H2020-LC-SC3-2018-2019-2020). Social Sciences and Humanities (SSH) aspects of the Clean-Energy Transition. Horizon 2020 Framework Programme. <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-sc3-cc-1-2018-2019-2020>, 2020 (accessed July 11, 2022).
- [14] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank. A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy (COM/2015/080 final). <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015DC0080>, 2015 (accessed July 26, 2022).
- [15] REScoop.eu, REScoop.eu is the European federation of citizen energy cooperatives. <https://www.rescoop.eu/>, 2022 (accessed July 26, 2022).
- [16] T. von Wirth, L. Gislason, R. Seidl, Distributed energy systems on a neighborhood scale: reviewing drivers of and barriers to social acceptance, *Renew. Sustain. Energy Rev.* 82 (2018) 2618–2628, <https://doi.org/10.1016/j.rser.2017.09.086>.
- [17] 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>.
- [18] P.C. Stern, E. Aronson, *Energy Use: The Human Dimension*, National Academies Press, Washington, D.C., 1984, <https://doi.org/10.17226/9259>.
- [19] 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), 102482, <https://doi.org/10.1016/j.erss.2021.102482>.
- [20] ec2project.eu, EC2 Energy Citizsh. Energy Communities Clean-Energy Transit. <https://ec2project.eu/>, 2022 (accessed December 6, 2022).
- [21] A.S. CohenMiller, E. Pate, A model for developing interdisciplinary research theoretical frameworks, *Qual. Rep.* (2019), <https://doi.org/10.46743/2160-3715/2019.3558>.
- [22] S. Menken, M. Keestra, L. Rutting, G. Post, M. de Roo, S. Blad, L. de Greef (Eds.), *An Introduction to Interdisciplinary Research: Theory and Practice*, Amsterdam University Press, Amsterdam, 2016.
- [23] B.K. Sovacool, M. Burke, L. Baker, C.K. Kotikalapudi, H. Wlokas, New frontiers and conceptual frameworks for energy justice, *Energy Policy* 105 (2017) 677–691, <https://doi.org/10.1016/j.enpol.2017.03.005>.
- [24] 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>.
- [25] United Nations, Our Common Future: Report of the World Commission on Environment and Development. <https://www.un.org/development/dpd/publications/sustainable-development/brundtland-report.html>, 1987.
- [26] H.E. Daly, Sustainable development: from concept and theory to operational principles, *Popul. Dev. Rev.* 16 (1990) 25–43, <https://doi.org/10.2307/2808061>.
- [27] T.N. Gladwin, J.J. Kennelly, T.-S. Krause, in: *Shifting Paradigms for Sustainable Development: Implications for Management Theory and Research*, 1995, pp. 874–907, <https://doi.org/10.2307/258959>.
- [28] G. Chichilnisky, in: *What Is Sustainable Development?*, 1997, pp. 467–491, <https://doi.org/10.2307/3147240>.
- [29] F. Goedkoop, D. Sloot, L. Jans, J. Dijkstra, A. Flache, L. Steg, The role of community in understanding involvement in community energy initiatives, *Front. Psychol.* 12 (2022), 775752, <https://doi.org/10.3389/fpsyg.2021.775752>.
- [30] K.R.S. Hamann, M.P. Bertel, B. Ryszawska, B. Lurger, P. Szymanski, M. Rozwadowska, F. Goedkoop, L. Jans, G. Perlaviciute, T. Masson, A. Hofer, J. Held, C. Gutsch, C. Grosche, I. Fritsche, T. Favaro, I. Eisenberger, K. Corcoran, U. Athenstaedt, Energy Citizenship as a Viable Concept: An Interdisciplinary Understanding to Unfold the Potential of Legal, Economic, and Psychological Perspectives on the Citizenship-Based Energy Transition, 2022. https://ec2project.eu/sites/site0261/media/downloads/d2.1_interdisciplinary_understanding_of_energy_citizenship_2022_02_24_finalversion.pdf.
- [31] P.C. Stern, T. Dietz, T. Abel, G.A. Guagnano, L. Kalof, A value-belief-norm theory of support for social movements: the case of environmentalism, *Hum. Ecol. Rev.* 6 (1999) 81–97.
- [32] P.C. Stern, Toward a coherent theory of environmentally significant behavior, *J. Soc. Issues* 56 (2000) 407–424.
- [33] P.G. Bain, M.J. Hornsey, R. Bongiorno, C. Jeffries, Promoting pro-environmental action in climate change deniers, *Nat. Clim. Chang.* 2 (2012) 600–603, <https://doi.org/10.1038/nclimate1532>.
- [34] P.G. Bain, M.J. Hornsey, R. Bongiorno, Y. Kashima, C.R. Crimston, Collective futures: how projections about the future of society are related to actions and attitudes supporting social change, *Personal. Soc. Psychol. Bull.* 39 (2013) 523–539, <https://doi.org/10.1177/0146167213478200>.
- [35] Y. Lee, S. Kim, M. Kim, J. Choi, Antecedents and interrelationships of three types of pro-environmental behavior, *J. Bus. Res.* 67 (2014) 2097–2105, <https://doi.org/10.1016/j.jbusres.2014.04.018>.
- [36] F. Yeboah, M. Kaplowitz, Explaining energy conservation and environmental citizenship behaviors using the value-belief-norm framework, *Hum. Ecol. Rev.* 22 (2016), <https://doi.org/10.22459/HER.22.02.2016.06>.
- [37] J.W. Fernando, N. Burden, A. Ferguson, L.V. O'Brien, M. Judge, Y. Kashima, Functions of utopia: how utopian thinking motivates societal engagement, *Personal. Soc. Psychol. Bull.* 44 (2018) 779–792, <https://doi.org/10.1177/0146167217748604>.
- [38] P.W. Schultz, C. Shriver, J.J. Tabanico, A.M. Khazian, Implicit connections with nature, *J. Environ. Psychol.* 24 (2004) 31–42, [https://doi.org/10.1016/S0272-4944\(03\)00022-7](https://doi.org/10.1016/S0272-4944(03)00022-7).
- [39] M.J. Rosenberg, C.I. Hovland, Cognitive, affective and behavioral components of attitudes, in: M.J. Rosenberg, C. Hovland (Eds.), *Attitude Organ. Change Anal. Consistency Attitude Compon.*, Yale University Press, New Haven, 1960.
- [40] S. Himmelfarb, A.H. Eagly, Orientations to the study of attitudes and their change, in: S. Himmelfarb, A.H. Eagly (Eds.), *Read. Attitude Change*, John Wiley & Sons, New York, 1974, pp. 2–49.
- [41] K.R.S. Hamann, G. Reese, My influence on the world (of Others): goal efficacy beliefs and efficacy affect predict private, public, and activist pro-environmental behavior, *J. Soc. Issues* 76 (2020) 35–53, <https://doi.org/10.1111/josi.12369>.
- [42] D. Hanss, G. Böhm, R. Doran, A. Homburg, Sustainable consumption of groceries: the importance of believing that one can contribute to sustainable development, *Sustain. Dev.* 24 (2016) 357–370, <https://doi.org/10.1002/sd.1615>.
- [43] T.R. Tyler, K.A. Rasinski, E. Griffin, Alternative images of the citizen, *Am. Psychol.* 970–978 (1986).
- [44] S. Bamberg, J. Rees, Environmental attitudes and behavior: measurement, in: *Int. Encycl. Soc. Behav. Sci.*, Elsevier, 2015, pp. 699–705, <https://doi.org/10.1016/B978-0-08-097086-8.91066-3>.
- [45] A. Hannoset, L. Peeters, A. Tuerk, Energy Communities in the EU. Task Force Energy Communities, BRIDGE Project Horizon 2020, 2019.
- [46] F. Tounquet, L. De Vos, I. Abada, I. Kielichowska, C. Klessmann, Energy Communities in the European Union, Publications Office of the European Union, LU, 2020. <https://data.europa.eu/doi/>.
- [47] M. Igalla, J. Edelenbos, I. van Meerkerk, Citizens in action, what do they accomplish? A systematic literature review of citizen initiatives, their main characteristics, outcomes, and factors, *Volunt. Int. J. Volunt. Nonprofit Organ* 30 (2019) 1176–1194, <https://doi.org/10.1007/s11266-019-00129-0>.

- [48] T. Bauwens, Explaining the diversity of motivations behind community renewable energy, *Energy Policy* 93 (2016) 278–290, <https://doi.org/10.1016/j.enpol.2016.03.017>.
- [49] G. Seyfang, J.J. Park, A. Smith, A thousand flowers blooming? An examination of community energy in the UK, *Energy Policy* 61 (2013) 977–989, <https://doi.org/10.1016/j.enpol.2013.06.030>.
- [50] G. Walker, P. Devine-Wright, Community renewable energy: what should it mean? *Energy Policy* 36 (2008) 497–500, <https://doi.org/10.1016/j.enpol.2007.10.019>.
- [51] 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, <https://doi.org/10.1016/j.erss.2018.11.013>.
- [52] L.L. Delina, Climate mobilizations and democracy: the promise of scaling community energy transitions in a deliberative system, *J. Environ. Policy Plan.* 22 (2020) 30–42, <https://doi.org/10.1080/1523908X.2018.1525287>.
- [53] M.J. Burke, J.C. Stephens, Energy democracy: goals and policy instruments for sociotechnical transitions, *Energy Res. Soc. Sci.* 33 (2017) 35–48, <https://doi.org/10.1016/j.erss.2017.09.024>.
- [54] V. Brummer, Community energy – benefits and barriers: a comparative literature review of community energy in the UK, Germany and the USA, the benefits it provides for society and the barriers it faces, *Renew. Sust. Energ. Rev.* 94 (2018) 187–196, <https://doi.org/10.1016/j.rser.2018.06.013>.
- [55] G. Walker, S. Hunter, P. Devine-Wright, B. Evans, H. Fay, Harnessing community energies: explaining and evaluating community-based localism in renewable energy policy in the UK, *Glob. Environ. Polit.* 7 (2007) 64–82, <https://doi.org/10.1162/glep.2007.7.2.64>.
- [56] C.R. Warren, M. McFadyen, Does community ownership affect public attitudes to wind energy? A case study from south-west Scotland, *Land Use Policy* 27 (2010) 204–213, <https://doi.org/10.1016/j.landusepol.2008.12.010>.
- [57] G. Seyfang, A. Haxeltine, Growing grassroots innovations: exploring the role of community-based initiatives in governing sustainable energy transitions, *Environ. Plan. C govPolicy* 30 (2012) 381–400, <https://doi.org/10.1068/c10222>.
- [58] E. Creamer, G. Taylor Aiken, B. van Veelen, G. Walker, P. Devine-Wright, Community renewable energy: what does it do? Walker and Devine-Wright (2008) ten years on, *Energy Res. Soc. Sci.* 57 (2019) 101223, <https://doi.org/10.1016/j.erss.2019.101223>.
- [59] J.C. Rogers, E.A. Simmons, I. Convery, A. Weatherall, Social impacts of community renewable energy projects: findings from a woodfuel case study, *Energy Policy* 42 (2012) 239–247, <https://doi.org/10.1016/j.enpol.2011.11.081>.
- [60] G. Seyfang, S. Hielscher, T. Hargreaves, M. Martiskainen, A. Smith, A grassroots sustainable energy niche? Reflections on community energy in the UK, *Environ. Innov.Soc. Transit.* 13 (2014) 21–44, <https://doi.org/10.1016/j.eist.2014.04.004>.
- [61] Y. Sokona, Y. Mulugetta, H. Gujba, Widening energy access in Africa: towards energy transition, *Energy Policy* 47 (2012) 3–10, <https://doi.org/10.1016/j.enpol.2012.03.040>.
- [62] F.P. Boon, C. Dieperink, Local civil society based renewable energy organisations in the Netherlands: exploring the factors that stimulate their emergence and development, *Energy Policy* 69 (2014) 297–307, <https://doi.org/10.1016/j.enpol.2014.01.046>.
- [63] I. Lizarralde, A.A. Akle, M. Hamwi, *Database of Driving Factors in Social Innovations in the Energy Sector*, 2020.
- [64] T. Kamin, U. Golob, P. Medved, T. Kogovšek, Benefits for community members in terms of increased access to clean, secure and affordable energy. https://www.newcomersh2020.eu/upload/files/NEWCOMERS%20D6_1_benefits%20for%20community%20members_v%2030-12-2020.pdf, 2020 (accessed July 26, 2022).
- [65] L. Jans, Changing environmental behaviour from the bottom up: the formation of pro-environmental social identities, *J. Environ. Psychol.* 73 (2021), 101531, <https://doi.org/10.1016/j.jenvp.2020.101531>.
- [66] IMED, 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. <http://data.europa.eu/eli/dir/2019/944/oj/eng>, 2019 (accessed July 26, 2022).
- [67] A. Bandura, *Self-efficacy: The Exercise of Control*, W.H. Freeman, New York, 1997.
- [68] G.V. Caprara, M. Vecchione, C. Capanna, M. Mebane, Perceived political self-efficacy: theory, assessment, and applications, *Eur. J. Soc. Psychol.* 39 (2009) 1002–1020, <https://doi.org/10.1002/ejsp.604>.
- [69] M. van Zomeren, T. Postmes, R. Spears, Toward an integrative social identity model of collective action: a quantitative research synthesis of three socio-psychological perspectives, *Psychol. Bull.* 134 (2008) 504–535, <https://doi.org/10.1037/0033-2909.134.4.504>.
- [70] K.R.S. Hamann, J.R. Holz, G. Reese, Coaching for a sustainability transition: empowering student-led sustainability initiatives by developing skills, group identification, and efficacy beliefs, *Front. Psychol.* 12 (2021), 623972, <https://doi.org/10.3389/fpsyg.2021.623972>.
- [71] I. Fritsche, M. Barth, P. Jugert, T. Masson, G. Reese, A social identity model of pro-environmental action (SIMPEA), *Psychol. Rev.* 125 (2018) 245–269, <https://doi.org/10.1037/rev0000090>.
- [72] M.J. Hornsey, C.M. Chapman, D.M. Oelrichs, Why it is so hard to teach people they can make a difference: climate change efficacy as a non-analytic form of reasoning, *ThinkReason* (2021) 1–19, <https://doi.org/10.1080/13546783.2021.1893222>.
- [73] A.M. Miron, J.W. Brehm, Reactance theory - 40 years later, *Z. Sozialpsychol.* 37 (2006) 9–18, <https://doi.org/10.1024/0044-3514.37.1.9>.
- [74] D. Mazzoni, M. van Zomeren, E. Cicognani, The motivating role of perceived right violation and efficacy beliefs in identification with the Italian water movement: explaining water activism, *Polit. Psychol.* 36 (2015) 315–330, <https://doi.org/10.1111/pops.12101>.
- [75] M. Kutlaca, M. van Zomeren, K. Epstude, Our right to a steady ground: perceived rights violations motivate collective action against human-caused earthquakes, *Environ. Behav.* 51 (2019) 315–344, <https://doi.org/10.1177/0013916517747658>.
- [76] S.H. Schwartz, Normative influences on altruism, in: *Adv. Exp. Soc. Psychol.*, Elsevier, 1977, pp. 221–279, [https://doi.org/10.1016/S0065-2601\(08\)60358-5](https://doi.org/10.1016/S0065-2601(08)60358-5).
- [77] E. van der Werff, L. Steg, One model to predict them all: predicting energy behaviours with the norm activation model, *Energy Res.Soc. Sci.* 6 (2015) 8–14, <https://doi.org/10.1016/j.erss.2014.11.002>.
- [78] F. Fornara, P. Pattitoni, M. Mura, E. Strazera, Predicting intention to improve household energy efficiency: the role of value-belief-norm theory, normative and informational influence, and specific attitude, *J. Environ. Psychol.* 45 (2016) 1–10, <https://doi.org/10.1016/j.jenvp.2015.11.001>.
- [79] Y. Zhang, Z. Wang, G. Zhou, Antecedents of employee electricity saving behavior in organizations: an empirical study based on norm activation model, *Energy Policy* 62 (2013) 1120–1127, <https://doi.org/10.1016/j.enpol.2013.07.036>.
- [80] D.W. Organ, K. Ryan, A meta-analytic review of attitudinal and dispositional predictors of organizational citizenship behavior, *Pers. Psychol.* 48 (1995) 775–802, <https://doi.org/10.1111/j.1744-6570.1995.tb01781.x>.
- [81] S. Fox, P.E. Spector, A. Goh, K. Bruursema, S.R. Kessler, The deviant citizen: measuring potential positive relations between counterproductive work behaviour and organizational citizenship behaviour: the deviant citizen, *J. Occup. Organ. Psychol.* 85 (2012) 199–220, <https://doi.org/10.1111/j.2044-8325.2011.02032.x>.
- [82] I. Fritsche, T. Masson, Collective climate action: when do people turn into collective environmental agents? *Curr. Opin. Psychol.* 42 (2021) 114–119, <https://doi.org/10.1016/j.copsyc.2021.05.001>.
- [83] J.I.M. de Groot, L. Steg, Relationships between value orientations, self-determined motivational types and pro-environmental behavioural intentions, *J. Environ. Psychol.* 30 (2010) 368–378, <https://doi.org/10.1016/j.jenvp.2010.04.002>.
- [84] L. Steg, G. Perlaviciute, E. van der Werff, Understanding the human dimensions of a sustainable energy transition, *Front. Psychol.* 6 (2015), <https://doi.org/10.3389/fpsyg.2015.00805>.
- [85] A. Reeve, Citizenship, in: *Concise Oxf. Dict. Polit.*, 3rd ed., Oxford University Press, 1996, p. 69, <https://doi.org/10.1093/acref/9780199207800.001.0001>.
- [86] A. Dobson, *Citizenship and the Environment*, Oxford University Press, Oxford, 2003, <https://doi.org/10.1093/0199258449.001.0001>.
- [87] J. Barnett, B. Doherty, K. Burningham, A. Carr, G. Johnstone, C. Rootes, *Environmental Citizenship: Literature Review*, European Environment Agency (EEA), Bristol. <http://www.environment-agency.gov.uk/>, 2005 (accessed July 25, 2022).
- [88] 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>.
- [89] S. Reicher, R. Spears, S.A. Haslam, *The social identity approach in social psychology*, in: *SAGE Handb. Identities*, SAGE Publications Ltd, 1 Oliver's Yard, 55 City Road, London EC1Y 1SP United Kingdom, 2010, pp. 45–62, <https://doi.org/10.4135/9781446200889.n4>.
- [90] H. Tajfel, J.C. Turner, The social identity theory of intergroup behavior, in: S. Worchel, W.G. Austin (Eds.), *Psychology of Intergroup Relations*, 1986, pp. 7–24.
- [91] S. Brunsting, T. Postmes, Social movement participation in the digital age: predicting offline and online collective action, *Small Group Res.* 33 (2002) 525–554, <https://doi.org/10.1177/104649602237169>.
- [92] S.C. Wright, D.M. Taylor, F.M. Moghaddam, Responding to membership in a disadvantaged group: from acceptance to collective protest, *J. Pers. Soc. Psychol.* 994–1003 (1990).
- [93] H. Tajfel, Social categorization, social identity and social comparison, in: H Tajfel Ed Differ. *Soc. Groups Stud. Soc. Psychol. Intergroup Relat.*, Academic Press, London, 1978, pp. 61–76.
- [94] J.C. Turner, M.A. Hogg, P.J. Oakes, S.D. Reicher, M.S. Wetherell, *Rediscovering the Social Group: A Self-Categorization Theory*, Basil Blackwell, Cambridge, MA, US, 1987.
- [95] S. McFarland, J. Hackett, K. Hamer, I. Katzarska-Miller, A. Malsch, G. Reese, S. Reysen, Global human identification and citizenship: a review of psychological studies, *Polit. Psychol.* 40 (2019) 141–171, <https://doi.org/10.1111/pops.12572>.
- [96] M. Agostini, M. van Zomeren, Toward a comprehensive and potentially cross-cultural model of why people engage in collective action: a quantitative research synthesis of four motivations and structural constraints, *Psychol. Bull.* 147 (2021) 667–700, <https://doi.org/10.1037/bul0000256>.
- [97] S. Vesely, T. Masson, P. Chokrai, A.M. Becker, I. Fritsche, C.A. Klöckner, L. Tiberio, G. Carrus, A. Panno, Climate change action as a project of identity: eight meta-analyses, *Glob. Environ. Change.* 70 (2021), 102322, <https://doi.org/10.1016/j.gloenvcha.2021.102322>.
- [98] M.A. Bauer, J.E.B. Wilkie, J.K. Kim, G.V. Bodenhausen, Cuing consumerism: situational materialism undermines personal and social well-being, *Psychol. Sci.* 23 (2012) 517–523, <https://doi.org/10.1177/0956797611429579>.
- [99] D. Sloot, L. Jans, L. Steg, Can community energy initiatives motivate sustainable energy behaviours? The role of initiative involvement and personal pro-environmental motivation, *J. Environ. Psychol.* 57 (2018) 99–106, <https://doi.org/10.1016/j.jenvp.2018.06.007>.
- [100] S.M. Hoffman, A. High-Pippert, From private lives to collective action: recruitment and participation incentives for a community energy program,

- Energy Policy 38 (2010) 7567–7574, <https://doi.org/10.1016/j.enpol.2009.06.054>.
- [101] D. Sloot, L. Jans, L. Steg, In it for the money, the environment, or the community? Motives for being involved in community energy initiatives, *Glob. Environ. Change*. 57 (2019), 101936, <https://doi.org/10.1016/j.gloenvcha.2019.101936>.
- [102] E. van der Werff, L. Steg, The psychology of participation and interest in smart energy systems: comparing the value-belief-norm theory and the value-identity-personal norm model, *energy res Soc. Sci.* 22 (2016) 107–114, <https://doi.org/10.1016/j.erss.2016.08.022>.
- [103] L. Middlemiss, The effects of community-based action for sustainability on participants' lifestyles, *Local Environ.* 16 (2011) 265–280, <https://doi.org/10.1080/13549839.2011.566850>.
- [104] J.M. Jachimowicz, O.P. Hauser, J.D. O'Brien, E. Sherman, A.D. Galinsky, The critical role of second-order normative beliefs in predicting energy conservation, *Nat. Hum. Behav.* 2 (2018) 757–764, <https://doi.org/10.1038/s41562-018-0434-0>.
- [105] T. Bouman, L. Steg, Motivating society-wide pro-environmental change, *One Earth* 1 (2019) 27–30, <https://doi.org/10.1016/j.oneear.2019.08.002>.
- [106] M.P. Bertel, I. Eisenberger, B. Lurger, The Emergence of Energy Citizenship in the EU, *EuCML* (under review).
- [107] A. Shachar, R. Bauböck, I. Bloemraad, M. Vink, Introduction: citizenship—quo vadis? in: A. Shachar, R. Bauböck, I. Bloemraad, M. Vink (Eds.), *Oxf. Handb. Citizsh.*, Oxford University Press, 2017, pp. 2–12, <https://doi.org/10.1093/oxfordhb/9780198805854.013.37>.
- [108] A. Shachar, R. Bauböck, I. Bloemraad, M. Vink (Eds.), *The Oxford Handbook of Citizenship*, 1st ed., Oxford University Press, 2017 <https://doi.org/10.1093/oxfordhb/9780198805854.001.0001>.
- [109] P. Weil, From conditional to secured and sovereign: the new strategic link between the citizen and the nation-state in a globalized world, *Int. J. Const. Law*. 9 (2011) 615–635, <https://doi.org/10.1093/icon/mor053>.
- [110] T.H. Marshall, T. Bottomore, *Citizenship and Social Class*, Pluto Press (2015), <https://doi.org/10.2307/j.ctt18mvsn1>.
- [111] A. Shachar, *Citizenship*, in: M. Rosenfeld, A. Sajó (Eds.), *Oxf. Handb. Comp. Const. Law*, Oxford University Press, 2012, <https://doi.org/10.1093/oxfordhb/9780199578610.013.0050>.
- [112] D. Kostakopoulou, *The future governance of citizenship*, 1st ed., Cambridge University Press, 2008 <https://doi.org/10.1017/CBO9780511619861>.
- [113] S. O'Leary, *The Evolving Concept of Community Citizenship: From the Free Movement of Persons to Union Citizenship*, Kluwer Law International, The Hague, Boston, 1996.
- [114] S. Ranchordas, We Teach and Learn Online. Are We All Digital Citizens Now? Lessons on Digital Citizenship from the Lockdown, *I-CONNECT*. (n.d.). <http://www.icconnectblog.com/2020/05/we-teach-and-learn-online-are-we-all-digital-citizens-now-lessons-on-digital-citizenship-from-the-lockdown/> (accessed July 27, 2022).
- [115] Electoral Commission, Are you eligible to enrol and vote?, *Vote NZ*. (n.d.). <https://vote.nz/enrolling/get-ready-to-enrol/are-you-eligible-to-enrol-and-vote/> (accessed July 26, 2022).
- [116] D. Owen, *Citizenship and human rights*, in: A. Shachar, R. Bauböck, I. Bloemraad, M. Vink (Eds.), *Oxf. Handb. Citizsh.*, Oxford University Press, 2017, pp. 246–267, <https://doi.org/10.1093/oxfordhb/9780198805854.013.11>.
- [117] G. Shafir, A. Brysk, The globalization of rights: from citizenship to human rights, *Citizsh. Stud.* 10 (2006) 275–287, <https://doi.org/10.1080/13621020600772073>.
- [118] I. Honohan, Liberal and republican conceptions of citizenship, in: A. Shachar, R. Bauböck, I. Bloemraad, M. Vink (Eds.), *Oxf. Handb. Citizsh.*, Oxford University Press, 2017, pp. 82–106, <https://doi.org/10.1093/oxfordhb/9780198805854.013.4>.
- [119] Art 20 TFEU, Consolidated version of the Treaty on the Functioning of the European Union. http://data.europa.eu/eli/treaty/tfeu_2012/oj/eng, 2012 (accessed July 26, 2022).
- [120] Art 9 TEU, Consolidated version of the Treaty on European Union. http://data.europa.eu/eli/treaty/teu_2012/oj/eng, 2012 (accessed July 26, 2022).
- [121] B. Lurger, M. Melcher, *Europäisches Privat- Und Wirtschaftsrecht: Handbuch*, Verlag Österreich, Wien, 2020.
- [122] F. Strumia, *Supranational citizenship*, in: A. Shachar, R. Bauböck, I. Bloemraad, M. Vink (Eds.), *Oxf. Handb. Citizsh.*, Oxford University Press, 2017, pp. 668–693, <https://doi.org/10.1093/oxfordhb/9780198805854.013.29>.
- [123] A. Von Bogdandy, M. Kottmann, C. Antpöhler, J. Dickschen, S. Hentrei, M. Smrkolj, in: *Ein Rettungsschirm für europäische Grundrechte. Grundlagen einer unionsrechtlichen Solange-Doktrin gegenüber Mitgliedstaaten*, *ZaöRV*, 2012, pp. 45–78.
- [124] Art 22 TFEU, Consolidated version of the Treaty on the Functioning of the European Union. http://data.europa.eu/eli/treaty/tfeu_2012/oj/eng, 2012 (accessed July 26, 2022).
- [125] Art 11 para 4 TEU, Consolidated version of the Treaty on European Union. http://data.europa.eu/eli/treaty/teu_2012/oj/eng, 2012 (accessed July 26, 2022).
- [126] Art 24 TFEU, Consolidated version of the Treaty on the Functioning of the European Union. http://data.europa.eu/eli/treaty/tfeu_2012/oj/eng, 2012 (accessed July 26, 2022).
- [127] Art 1 TEU, Consolidated version of the Treaty on European Union. http://data.europa.eu/eli/treaty/teu_2012/oj/eng, 2012 (accessed July 26, 2022).
- [128] Art 26 TFEU, Consolidated version of the Treaty on the Functioning of the European Union. http://data.europa.eu/eli/treaty/tfeu_2012/oj/eng, 2012 (accessed July 26, 2022).
- [129] Art 67 TFEU, Consolidated version of the Treaty on the Functioning of the European Union. http://data.europa.eu/eli/treaty/tfeu_2012/oj/eng, 2012 (accessed July 26, 2022).
- [130] Art 34, Charter of Fundamental Rights of the European Union. http://data.europa.eu/eli/treaty/char_2012/oj/eng, 2012 (accessed July 26, 2022).
- [131] A. Monti, B. Martínez Romera, Fifty shades of binding: appraising the enforcement toolkit for the EU's 2030 renewable energy targets, *Rev. Eur. Comp. Int. Environ. Law*. 29 (2020) 221–231, <https://doi.org/10.1111/reel.12330>.
- [132] Art 194 TFEU, Consolidated version of the Treaty on the Functioning of the European Union. http://data.europa.eu/eli/treaty/tfeu_2012/oj/eng, 2012 (accessed July 26, 2022).
- [133] T. Favaro, *Regolare la transizione energetica: Stato, mercato, innovazione*, Wolters Kluwer, Milano, 2020.
- [134] Art 37, Charter of Fundamental Rights of the European Union. http://data.europa.eu/eli/treaty/char_2012/oj/eng, 2012 (accessed July 26, 2022).
- [135] A. Bartenstein, *The Concept of Solidarity: Energy Policy in the European Union*, Nomos Verlagsgesellschaft mBH & Co. KG, 2021, <https://doi.org/10.5771/9783748927952>.
- [136] CJEU 15.7.2021, Consolidated version of the Treaty on the Functioning of the European Union. http://data.europa.eu/eli/treaty/tfeu_2012/oj/eng, 2012 (accessed July 26, 2022).
- [137] CJEU 15.7.2021, Federal Republic of Germany v European Commission, ECLI:EU:C:2021:598. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A62019CJ0848>, 2021 (accessed July 26, 2022).
- [138] Art 170 TFEU, Consolidated version of the Treaty on the Functioning of the European Union. http://data.europa.eu/eli/treaty/tfeu_2012/oj/eng, 2012 (accessed July 26, 2022).
- [139] Art 15 IMED, 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. <http://data.europa.eu/eli/dir/2019/944/oj/eng>, 2019 (accessed July 26, 2022).
- [140] Art 21 RED II, 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. <http://data.europa.eu/eli/dir/2018/2001/oj/eng>, 2018 (accessed July 26, 2022).
- [141] Art 10ff IMED, 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. <http://data.europa.eu/eli/dir/2019/944/oj/eng>, 2019 (accessed July 26, 2022).
- [142] K. Huhta, The scope of state sovereignty under article 194(2) TFEU and the evolution of EU competences in the energy sector, *Int. Comp. Law Q.* 70 (2021) 991–1010, <https://doi.org/10.1017/S0020589321000269>.
- [143] Art 22 RED II, 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. <http://data.europa.eu/eli/dir/2018/2001/oj/eng>, 2018 (accessed July 26, 2022).
- [144] Art 16 IMED, 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. <http://data.europa.eu/eli/dir/2019/944/oj/eng>, 2019 (accessed July 26, 2022).
- [145] Communication from the Commission to the European Parliament, the European Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank. A Clean Planet for all A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy (COM/2018/773 final). <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52018DC0773>, 2018 (accessed July 26, 2022).
- [146] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Forging a climate-resilient Europe - the new EU Strategy on Adaptation to Climate Change (COM/2021/82 final). <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2021:82:FIN>, 2021 (accessed July 26, 2022).
- [147] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. "Fit for 55": delivering the EU's 2030 Climate Target on the way to climate neutrality. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021DC0550>, 2021 (accessed July 27, 2022).
- [148] Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions. The European Green Deal (COM/2019/640 final). <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2019%3A640%3AFIN>, 2019 (accessed July 26, 2022).
- [149] P. Oliver, Access to Information and to Justice in EU Environmental Law: The Aarhus Convention. <https://papers.ssrn.com/abstract=2548232>, 2013 (accessed July 26, 2022).
- [150] Directive (EU) 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information and repealing Council Directive 90/313/EEC. <http://data.europa.eu/eli/dir/2003/4/oj/eng>, 2003 (accessed July 26, 2022).
- [151] Directive 2003/35/EC of the European Parliament and of the Council of 26 May 2003 providing for public participation in respect of the drawing up of certain plans and programmes relating to the environment and amending with regard to public participation and access to justice Council Directives 85/337/EEC and 96/61/EC. <http://data.europa.eu/eli/dir/2003/35/oj/eng>, 2003 (accessed July 26, 2022).
- [152] Regulation (EC) No 1367/2006 of the European Parliament and of the Council of 6 September 2006 on the application of the provisions of the Aarhus Convention

- on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters to Community institutions and bodies. <http://data.europa.eu/eli/reg/2006/1367/oj/eng>, 2006 (accessed July 26, 2022).
- [153] J. Neuner, § 12. Die rechtsfortbildung, in: K. Riesenhuber (Ed.), *Eur. Methodenlehre*, 4th edn, De Gruyter, 2021, pp. 245–262, <https://doi.org/10.1515/9783110332070.245>.
- [154] M. Faber, T. Petersen, J. Schiller, Homo oeconomicus and homo politicus in ecological economics, *Ecol. Econ.* 40 (2002) 323–333, [https://doi.org/10.1016/S0921-8009\(01\)00279-8](https://doi.org/10.1016/S0921-8009(01)00279-8).
- [155] W. Stankiewicz, *Historia Mysli Ekonomicznej*, Polskie Wydaw. Ekonomiczne, Warszawa, 1998.
- [156] S.J. Bailey, *Strategic Public Finance*, Palgrave Macmillan, Houndmills, Basingstoke, Hampshire, New York, 2004.
- [157] D.W. Hursh, J.A. Henderson, Contesting global neoliberalism and creating alternative futures, *Discourse Stud. Cult. Polit. Educ.* 32 (2011) 171–185, <https://doi.org/10.1080/01596306.2011.562665>.
- [158] K. Graham, Robert Nozick, Property, justice and the minimal state, *Philos. Books* 34 (1993) 55–57, <https://doi.org/10.1111/j.1468-0149.1993.tb00759.x>.
- [159] D.K.H. Begg, S. Fischer, R. Dornbusch, *Economics*, 1st ed., McGraw-Hill, London, 1984.
- [160] M. Blaug, *Economic Theory in Retrospect*, 1st ed., Cambridge University Press, 1984 <https://doi.org/10.1017/CBO9780511805639>.
- [161] A. Smith, *The Wealth Of Nations: A Translation Into Modern English.*, *Industrial Systems Research*, 2015.
- [162] M. Pendenza, V. Lamattina, Rethinking self-responsibility: an alternative vision to the neoliberal concept of freedom, *Am. Behav. Sci.* 63 (2019) 100–115, <https://doi.org/10.1177/0002764218816827>.
- [163] T. Biebricher, E.V. Johnson, What's wrong with Neoliberalism? *New Polit. Sci.* 34 (2012) 202–211, <https://doi.org/10.1080/07393148.2012.676398>.
- [164] J.B. Brown, S. Baker, Responsible citizens: individuals, health and policy under neoliberalism, *J. Soc. Policy* 43 (2012) 210–211, <https://doi.org/10.1017/S0047279413000676>.
- [165] J. Roper, S. Ganesh, K. Inkson, Neoliberalism and knowledge interests in boundaryless careers discourse, *Work Employ. Soc.* 24 (2010) 661–679, <https://doi.org/10.1177/0950017010380630>.
- [166] T.H. Hamann, Neoliberalism, governmentality, and ethics, *Foucault Stud.* (2009) 37–59, <https://doi.org/10.22439/fs.v0i0.2471>.
- [167] S. Springer, Neoliberalism and geography: expansions, variegations, formations: neoliberalism and geography, *geogr. Compass.* 4 (2010) 1025–1038, <https://doi.org/10.1111/j.1749-8198.2010.00358.x>.
- [168] M. Hilgers, The historicity of the neoliberal state: THE HISTORICITY OF THE NEOLIBERAL STATE, *Soc. Anthropol.* 20 (2012) 80–94, <https://doi.org/10.1111/j.1469-8676.2011.00192.x>.
- [169] G. Dalley, *Ideologies of Caring: Rethinking Communities and Collectivism*, 2nd ed, Macmillan in association with the Centre for Policy on Aging, Basingstoke, 1996.
- [170] D.G. Newman, Value collectivism, collective rights, and self-threatening theory, *Oxf. J. Leg. Stud.* 33 (2013) 197–210, <https://doi.org/10.1093/ojls/gqs029>.
- [171] J. Schot, L. Kanger, G. Verbong, The roles of users in shaping transitions to new energy systems, *Nat. Energy* 1 (2016) 16054, <https://doi.org/10.1038/nenergy.2016.54>.
- [172] J. Webb, Climate change and society: the chimera of behaviour change technologies, *Sociology* 46 (2012) 109–125, <https://doi.org/10.1177/0038038511419196>.
- [173] P. Devine-Wright, Beyond NIMBYism: towards an integrated framework for understanding public perceptions of wind energy, *Wind Energy.* 8 (2005) 125–139, <https://doi.org/10.1002/we.124>.
- [174] D. Dequech, Neoclassical, mainstream, orthodox, and heterodox economics, *J. Post Keynes. Econ.* 30 (2007) 279–302, <https://doi.org/10.2753/PKE0160-3477300207>.
- [175] T. Lawson, The nature of heterodox economics, *Camb. J. Econ.* 30 (2006) 483–505, <https://doi.org/10.1093/cje/bei093>.
- [176] F.S. Lee, Heterodox economics and its critics, *Rev. Polit. Econ.* 24 (2012) 337–351, <https://doi.org/10.1080/09538259.2012.664360>.
- [177] M. Mazzucato, Financing the green new deal, *Nat. Sustain.* 5 (2022) 93–94, <https://doi.org/10.1038/s41893-021-00828-x>.
- [178] M. Friedman, R.D. Friedman, *Capitalism and Freedom*, University of Chicago Press, Chicago, 1962.
- [179] F.A. von Hayek, *The Road to Serfdom*, 50th Anniversary Ed./With a New Intro. by Milton Friedman, University of Chicago Press, Chicago, 1994.
- [180] L. Von Mises, *Liberalismus*, Academia-Verl, Sankt Augustin, 1927.
- [181] C. Felber, *Die Gemeinwohl-Ökonomie: eine demokratische Alternative wächst*, Aktual, in: u. Erw. Neuausg., [Nachdr.] Deuticke, Wien, 2013.
- [182] K. Raworth, *Doughnut Economics: Seven Ways to Think Like a 21st Century Economist*, Chelsea Green Publishing, White River Junction, Vermont, 2017.
- [183] E. Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action*, 1st ed., Cambridge University Press, 1990 <https://doi.org/10.1017/CBO9780511807763>.
- [184] J. Hicckel, *Less Is More: How Degrowth Will Save the World*, William Heinemann, London, 2020.
- [185] G. Kallis, V. Kostakis, S. Lange, B. Muraca, S. Paulson, M. Schmelzer, Research on degrowth, *Annu. Rev. Environ. Resour.* 43 (2018) 291–316, <https://doi.org/10.1146/annurev-environ-102017-025941>.
- [186] H. Rogall, K. Gapp-Schmeling, S. Klinski, N.V. Michaelis, E.U. von Weizsäcker, H. Rogall, *Grundlagen des nachhaltigen Wirtschaftens*, 3., überarbeitete und stark erweiterte Auflage, Metropolis-Verlag, Marburg, 2021.
- [187] B. Poskrobko, *Paradygmat zrównoważonego rozwoju jako wiodący kanon w badaniu nowych obszarów ekonomii*, *Ekon. Śr.* (2013) 10–24.
- [188] M. Mazzucato, *Mission economy a moonshot guide to changing capitalism*. <https://www.vlebooks.com/vleweb/product/openreader?id=none&isbn=9780241419748>, 2022 (accessed July 26, 2022).
- [189] G. Perlaviciute, R. Görsch, M. Timmerman, L. Steg, L. Vrieling, Values in the backyard: the relationship between people's values and their evaluations of a real, nearby energy project, *Environ. Res. Commun.* 3 (2021), 105004, <https://doi.org/10.1088/2515-7620/ac25d0>.
- [190] Art 28/29 IMED, 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. <http://data.europa.eu/eli/dir/2019/944/oj/eng>, 2019 (accessed July 26, 2022).
- [191] P. Newell, D. Mulvaney, The political economy of the 'just transition': the political economy of the 'just transition', *Geogr. J.* 179 (2013) 132–140, <https://doi.org/10.1111/geoj.12008>.
- [192] P. Newell, J. Phillips, D. Mulvaney, *Pursuing Clean Energy Equitably*, Human Development Report Office (HDRO), United Nations Development Programme (UNDP). <https://ideas.repec.org/p/hdr/papers/hdrp-2011-03.html>, 2011 (accessed July 26, 2022).
- [193] L. Eisner, F. Turner-Zwinkels, D. Spini, The Impact of Laws on Norms Perceptions, *Pers. Soc. Psychol. Bull.* (n.d.) 13.
- [194] M.C. Wullenkord, K.R.S. Hamann, We need to change: integrating psychological perspectives into the multilevel perspective on socio-ecological transformations, *Front. Psychol.* 12 (2021), 655352, <https://doi.org/10.3389/fpsyg.2021.655352>.
- [195] L. Steg, G. Perlaviciute, B.K. Sovacool, M. Bonaiuto, A. Diekmann, M. Filippini, F. Hindriks, C.J. Bergstad, E. Matthies, S. Matti, M. Mulder, A. Nilsson, S. Pahl, M. Roggenkamp, G. Schuitema, P.C. Stern, M. Tavoni, J. Thøgersen, E. Woerdman, A research agenda to better understand the human dimensions of energy transitions, *Front. Psychol.* 12 (2021), 672776, <https://doi.org/10.3389/fpsyg.2021.672776>.