



Review

Fostering justice through engagement: A literature review of public engagement in energy transitions

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ABSTRACT

Social science and humanities scholars have highlighted that energy transitions have unequal and unjust consequences on societies. This has strengthened the importance of energy justice in both policy and research on energy transitions. Public engagement in energy transition is an important cornerstone to mitigate such outcomes; however, it does not univocally equal nor lead to energy justice. Public engagement can also be used to maintain the status quo and the unequal distribution of burdens of benefits in energy transitions. In this review, we explore how justice considerations are addressed in the literature on public engagement in energy transitions. Our point of departure is that all three tenants of energy justice – procedural, distributional, and recognition justice – need to be considered when designing, implementing, and evaluating processes of public engagement. By dividing the literature into four categories of engagement – public consultation and deliberation, co-creation, community-led energy, and ecologies and collectives of engagement – we discuss how each strand of literature addresses the different dimensions of justice. We find that most of the reviewed literature does not explicitly address justice. Critical discussions in the literature can be linked to procedural justice issues, but only marginally to recognition and distributional justice. We argue that more explicit engagement with different tenants of justice is necessary in order to foster just energy transitions.

1. Introduction

As the intensity and scope of climate and energy transitions have increased [1], scholars across the social sciences and humanities (SSH) have highlighted that the consequences of such transitions reach far beyond decarbonizing discrete energy systems or sectors. They entail producing new conditions and directions for future societies [2,3]. Concerns for such consequences have resulted in high scholarly and normative ambitions of understanding and promoting concepts related to just transitions [4] and energy justice [5,6]. These concepts underline the importance of avoiding social, economic, and spatially unjust consequences of transforming energy systems (e.g., [7–9]).

This scholarly focus mirrors recent policy developments in the EU and, beyond that, point to the importance of justice in research and innovation policies that seek to transform energy systems. For instance, the European Green Deal states that it:

“aims to protect, conserve and enhance the EU's natural capital, and protect the health and well-being of citizens from environment-

related risks and impacts. At the same time, this transition must be just and inclusive. (...) Since it will bring substantial change, active public participation and confidence in the transition is paramount if policies are to work and be accepted” [10, p. 2].

Such statements are echoed in research and innovation funding at the European level, which has recently focussed strongly on aspects like energy citizenship and just transitions. High-profile science policy advice on the energy transition in Europe likewise points to embedding energy transitions into society to ensure just transitions as a crucial challenge. It calls for studies of public acceptance, public engagement, deliberation and ecologies of participation [11, p. 69–74]. In sum, there is a strong push by researchers, policymakers as well as climate activists and independent advisors to make energy transition processes just and inclusive.

The energy justice literature is concerned with collective decision-making as one key to energy justice [5]. In light of this, it is not surprising that researchers and practitioners extensively probe and seek to modify such decision-making processes, e.g., by studying and advancing

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public engagement and participation. As Szulecki [12] notes, there are substantial overlaps between literature that advances energy justice principles and energy democracy. This overlap does not mean that energy democracy and energy justice are synonyms. The same goes for concepts of public engagement, participation, and citizenship which sometimes overlap with justice aspects [13]. However, it has been noted that literature focused on energy justice has been more concerned with ethical principles and legal instruments than with understanding “direct emancipatory action”, in other words, how engagement can be done in practice [14]. Building on these identified needs in the literature, our ambition in this article is to explore the conceptual relationship between public engagement and participation on the one hand and justice on the other. Our starting point is an observation that engagement and participation are increasingly mobilized in the literature, however, most often implicitly as vehicles for enabling just energy transitions and outcomes. To explore this more systematically, we ask the questions: *How does the literature on public engagement and inclusion in energy transitions address different justice aspects of energy transitions?*

We approach this question in the following way. Based on a review of recent literature on engagement and participation in energy transitions, we analyze if and how justice, operationalized through the three tenets of energy justice: procedural, recognition, and distributional justice [6], is addressed as an aspect of engagement and participation. In doing so, we move from the general idea that engagement and participation are good and discuss if and how justice consideration could strengthen engagement in energy transitions. We find that current approaches and methods for engagement and participation may both alleviate and reinforce existing social, economic, and spatial disparities and injustices. Thus, we argue that justice needs to be more explicitly addressed and operationalized in the literature on public engagement and participation in energy transitions. Strengthening this link can secure public support for and legitimacy of measures and strategies and ensure that engagement and participation processes result in better outcomes for those affected.

2. Public engagement through the lens of energy justice

The social scientific energy scholarship is saturated with empirical examples of the development of new renewable and low-carbon energy sources and technologies which produce an unequal distribution of burdens and benefits, on different scales and in different spaces (e.g., [15–20]). However, energy transitions also have the potential to redistribute and build more just and inclusive energy systems [6,21]. Public participation and engagement in energy transitions are broadly accepted as cornerstones of democratic decision-making and avenues for more just energy transitions.

Public participation and engagement, in general, refer to the involvement of publics or groups in agenda-setting, decision-making, and policy-forming activities [22, p. 253]. There is a large variety of mechanisms (processes, techniques, and instruments) for facilitating such involvement, e.g., citizen juries, public meetings, and focus groups (for an overview, see [22], p. 257). Rowe and Frewer [22] group these engagement mechanisms into three key typologies: public communication, consultation, and participation. Each of these caters to a different level of information flow and level of influence on the engagement processes. Recently, there is also been a growing emphasis on public engagement where publics are equal members of development and innovation processes such as co-creation, co-design, and co-production [23], or self-initiators of engagement through community and citizen-led initiatives [24]. For simple readability, we use the term ‘public engagement’ in the remainder of the paper as the most encompassing term that captures this diversity of engagement mechanisms [22]. Still, we will acknowledge important distinctions in the literature analysis.

There are many long-standing debates about public engagement in SSH scholarship. Delgado et al. [25, p. 830–836] summarise five key concerns in such discussions, namely questions regarding 1) *why* public

engagement should be done, 2) *who* should be involved, 3) *how* publics should be engaged, 4) *when* publics should be involved, and 5) *where* public engagement should be grounded. These debates raise questions regarding the motivation, actors, methods, timing, and spaces/geographies of public engagement. Such debates have also been central in sustainable transition scholarship, but in this paper, we are specifically interested in how they account for justice concerns.

‘Energy justice’ can be defined as “a global energy system that fairly disseminates both the benefits and costs of energy services and one that has representative and impartial energy decision-making” [5, p. 436]. For analytical purposes, Jenkins et al. [6, p. 275] conceptualize energy justice along three key tenants, each connected to an (evaluative and normative) research agenda:

1. *Distributional justice* deals with the distribution of burdens and benefits among different social groups and individuals. It focuses on the outcomes of projects and processes: who is affected by the outcomes, and how?
2. *Recognition justice* focuses on if and how different social groups, especially marginalized and underrepresented groups, and their needs, knowledges, discourses, and stories are recognized. It pays attention to social inequities and diversity and raises questions such as: who is represented and ignored or misrepresented?
3. *Procedural justice* addresses how social groups and individuals are included in decision-making processes: are processes fair?

In this distinction, procedural justice directly relates to public engagement. It questions how people are involved in decision-making with a specific focus on normative considerations such as equity, fairness, and anti-discrimination. Jenkins et al. [6, p. 178–9] highlight three mechanisms that can improve procedural justice: mobilization of local knowledge, disclosure and transparency of information, and representation in institutions. These mechanisms go beyond the mere inclusion of publics and argue that the conditions for engagement are essential for just outcomes. In continuation, we argue that questions related to distributional and recognition justice are equally important considerations in public engagement processes. Questioning how burdens and benefits are *distributed* may help identify which groups need to be *recognized* and included in public engagement. Similarly, assessing which groups are represented in public engagement procedures and mechanisms can inform how just and fair these procedures are.

In addition to the three justice dimensions presented above, scholars have introduced additional dimensions. For example, cosmopolitan justice focusing on that justice principles must apply to every human being on earth [26] and restorative justice focusing on restoring victims of damaging energy-relating activities to their original position [27]. Furthermore, it has recently been critiqued that energy justice concepts have a Western and anthropocentric bias and the value of considering non-Western justice theories, such as indigenous perspectives or perspectives from Taoism, Hinduism and Buddhism have been emphasized [28]. While we acknowledge the importance of the insights these justice dimensions and perspectives contribute to energy transition debates, we argue that it, in the context of this review paper, is beneficial to only use the three dimensions mentioned above as an analytical framework. Distributive, procedural and recognition justice are the most prominent dimensions in the energy justice literature and, we assume, also most represented in the reviewed public engagement literature.

The remainder of our analysis, therefore, focuses on these three justice dimensions to better understand how to devise public engagement in a way that is fair (procedural justice), that does not leave out certain groups (recognition justice), and that does not benefit only a few and burden others (distributional justice).

3. Method

3.1. Selection strategy and implementation

This paper studies how academic peer-reviewed articles about public engagement in energy transitions deal with justice issues. Our review approach was comprehensive in two ways. First, we chose to focus on ‘energy transitions’ as an open category instead of narrowing down the search to a particular area such as renewables, transport, or smart infrastructures. Second, since there were few papers explicitly discussing justice in relation to engagement in energy transitions (or they did not include such keywords), we chose to screen all abstracts of papers mentioning both energy transitions and public engagement/participation/inclusion to determine whether they were relevant for further reading qualitatively. Third, we focused our search on literature categorized as falling within the SSH. The reason for not further delimiting the field is that the review’s objective is exploratory.

We conducted the literature search through Scopus in June 2021. The search words used were: ‘(public engagement’ OR ‘public participation’ OR ‘inclusion’) AND ‘energy transition’. We further limited the results to English language articles within the categories ‘social science’ and ‘humanities’, published in the period 2017–2021. Some of the articles in the literature list are published in 2022, but the online first version fell within our scope of search. The systematic search resulted in 519 publications. Of these, 268 articles were excluded after the initial screening of abstracts because they did not thematize public engagement. Although many of the remaining 251 abstracts mentioned methods such as living labs, participatory budgeting or workshops, we decided only to do a closer reading of the articles that either critically discussed the engagement mechanisms in question or (indirectly or directly) addressed justice aspects. This screening resulted in a final sample of 93 articles. Most of these were published in *Energy Research & Social Science* (37), a few in *Sustainability* (6) and *Environmental Science & Policy*, and the rest in 36 additional journals.

3.2. Analytical procedure

We analyzed the 93 articles through qualitative content analysis. The articles varied greatly in terms of format — from methodological discussions to conceptual papers, reviews, and empirical studies. Since our interest was explorative, we decided not to make a distinction between the types of papers included. Rather, we organized the literature around four primary public engagement forms: 1) Public deliberation and consultation (39 articles), 2) co-creation (16 articles), 3) community energy (22 articles), and 4) ecologies and collectives of participation (7 articles). We chose to structure the results according to these categories (as opposed to, for example, Rowe and Frewer’s [22] typology) for two main reasons. On one side, it was a pragmatic choice because the distinction best covers the vast diversity of engagement mechanisms in the papers analyzed. On the other side, it was also strategically important because each of the four categories sets a different premise for ensuring justice. While reading the literature, we saw that when papers discuss specific engagement events such as workshops or nation-wide surveys, ensuring justice involved different considerations than community-led initiatives.

However, we recognize that there is considerable overlap between these categories. For instance, it was not always clear whether an engagement mechanism, such as a workshop aimed to co-create solutions or to function as means for consultation. In the cases where co-creation was not made explicit, we included the papers in the first category. Similarly, articles grouped as part of ecologies and collectives of engagement describe engagement mechanisms from all three other categories. Still, the point of departure of these papers is focused on the collective effects of such methods as opposed to individual processes. Some articles (9 in total) also did not fit neatly into these categories because they were mainly focused on visions or construction of publics

and did not specifically address a mechanism of engagement. We categorized these papers as miscellaneous. Thus, even though the four identified categories overlap both analytically and in practice, and are not clean-cut in the articles themselves, our focus is on their distinctive features to highlight the strengths and weaknesses for fostering justice through the different conceptualizations of engagement.

From here, we use distributional, recognition and procedural justice [6] as an analytical lens to review the four groups of literature. While reading the papers, we focused on their main arguments and points of discussion regarding engagement and assessed how each article addressed justice. In most cases, the papers did not address justice explicitly. Therefore, we use the analysis to tease out some of the implicit problematizations of engagement that could be relevant for ensuring justice.

3.3. Limitations of the study

While this review tries to be comprehensive concerning the field and format of included articles, the delimitation in time (5 years) and the focus on ‘energy transitions’ do not capture all important advances in the public engagement literature. We acknowledge that this means that a large body of literature on participation is not covered, probably because it did not mention energy transitions explicitly. Most notably, literature that might have focused more generally on sustainability or climate change is outside the scope here. The results will, therefore, not be a general representation of the status of the field. Still, the selection is comprehensive enough to indicate critical gaps in current research discussions on public engagement in energy transitions.

4. Analysis: justice considerations in public engagement in energy transitions literature

In the following analysis, we explore how different strands of public engagement literature address issues relevant to the three tenants of energy justice — procedural, recognition, and distributional justice, mentioned above. Albeit overlapping, these tenants highlight different aspects of fostering just engagement. We start with the literature discussing more traditional methods of engagement.

4.1. Public consultation and deliberation

The first group of papers discuss engagement methods limited to particular events or activities focused on consulting publics about specific energy issues and facilitating more thorough public deliberation activities. Such methods are often a formalized part of a decision-making process (e.g., surrounding a new energy policy) or organized as a responsible approach to innovation and technological change (e.g., in the siting of wind-farm developments). The literature mainly points to various limitations and strengths of these methods and how they can improve or hamper active participation. Good and fair methods are primarily connected to how participants are included in decision-making processes and their effects on the eventual decisions. This is mainly defined as the level, scope, or degree of engagement [29–31]. Chaiyapa et al. [32], for instance, discuss how representation, process and influence in engagement activities influence their legitimacy and, in turn, the democratization of policy making. Although justice is not explicitly referenced, it is understood as central to engagement. In most of the literature, however, the justice considerations are even more implicit.

The level of engagement is important because it sets the premise for how much influence participants have to co-determining outcomes [29]. Conversely, Shin and Lee [33] show that participants are less engaged when they feel they cannot influence the outcomes. This is, however, not the case for all literature. Many papers do not problematize the lack of influence of publics, especially in instances where the goal of engagement is to generate public acceptance of new energy solutions or to

motivate people to support energy transitions actively (see, e.g., [34–37]). Yet, several papers criticize engagement which remains at the level of consulting the public and not actively including publics, albeit showing that, in practice, engagement often remains at the level of consultation [31,38–41]. In such cases, the engagement processes do not give the public any authority on the outcome [42,43], local communities' needs are not understood and accounted for [44], and people may feel excluded [45]. The papers thus highlight how procedural fairness is challenged when public engagement activities limit the involvement of publics and the exchange of information. In turn, distributional justice can be called into question when publics do not get to influence outcomes.

Some papers offer suggestions for how to include specific publics. For example, Hettinga et al. [46] argue that gaming can be used to include the overlooked voices of children in urban energy transitions. This hints to the need to not only have methods that are inclusive to diverse publics, but also design specific mechanisms to target particular publics that are usually overlooked. Combining a variety of methods may then also be a means to ensure recognition justice. Gustafson and Hertting [47] point out that participants have different motives for engagement; therefore, multiple strategies need to be used to mobilize diverse participants. Batidzirai et al. [48] argue for the need to combine top-down and bottom-up engagement for community needs to be recognized by public and private energy actors. One example explicitly discussing justice is Boyle et al. [49] participatory network mapping approach to engagement. Its strength was that it could involve many stakeholders in deliberative decision-making processes. However, it also found that certain people and communities were excluded, stressing that ideal participation is still sought after.

Conversely, there is a call for engagement where publics can impact the direction, outcome, and processes of transitions. One challenge highlighted are existing power relations, as was the case in a study of renewable energy technology projects in Mexico where the public was not given space to influence decisions resulting in sustained resistance [50]. Pandey and Sharma [51] also argue that resisting to accept predefined engagement activities, thus nonparticipation, also is a way for vulnerable groups to claim recognition justice for their own needs and knowledge.

Another challenge identified in the literature is a lack of transparency that limits the opportunity to impact outcomes and thus include publics in decision-making [52,53]. A few papers also caution against public engagement with predefined outcomes and solutions. For instance, Alvia-Palavicino and Opazo-Bunster [54] warn that scenario-building and back casting exercises should be careful not to close down plural expressions of visions to avoid conflicting frames, values, and interests. Or in another example, the authors demonstrate how the staging of engagement according to technocratic framings and neoliberal energy models can result in limited participation, as was the case with Chile's new energy policy [38,54]. From a justice perspective, public acceptance of predefined solutions raises concerns related to procedural and distributional issues, such as questions about the real influence of publics and to what extent they may contribute to redefining what should be accepted and how. Openness about options for outcomes of public engagement processes is thus a key feature for publics to be included in a meaningful way.

A few papers pay attention to who is represented in public consultation and deliberation activities, a fundamental tenet of recognition justice. Some publications identify the lack of participation of particular stakeholders or groups. Fraune and Knodt [53] criticize the legitimacy of the German energy transition because people from rural areas were excluded, and citizens and policymakers were not appropriately connected during policy development. Other papers stress the need to represent plural views or include diverse stakeholders (e.g., [30]). Often, however, the representation of stakeholders is not critically discussed but remains a vague category - 'the public'. Ansell et al. [55] show that this vagueness is not limited to the scholarly literature but that

the legislative apparatus around the governance of greenhouse gas emissions is unclear about the 'who and how' of participation processes. Recognition justice usually remains a general normative claim in the literature, and how different groups and individuals should be identified and recognized in public engagement is rarely addressed.

The literature offers some specific engagement mechanisms that aim at ensuring procedural justice through openness and inclusion. Among them: public value theory as means to help organizers understand the opposition and find new ways to foster deliberative democratic processes [56], gaming to facilitate learning and consequently actionable participation [57], use of imaginaries in deliberative events to bring different groups together [58], and multi-day deliberative participation events to facilitate higher orders of learning and participation [59]. These findings contribute to a diverse toolbox for facilitating public engagement in more procedurally just ways.

They also highlight the need to assess and implement diverse engagement methods. Mejia-Montero et al. [50] highlight how consultations are not continual and limited to particular project stages. However, Spath and Scolobig [31] argue that certain mechanisms are more crucial at the start of the project, e.g., stakeholder empowerment in the early stages of the process to equalize power differences between participants. Delina's [60,61] argument is of crucial importance when viewing public engagement as a continuous process. When the conditions for engagement change, avenues for exclusion, disempowerment, and oppression also change, and the engagement processes need to be reassessed [60,61]. Thus, this literature points to how public engagement is a continuous process, not one-off time-constrained events. Therefore, it requires flexibility to redefine the mechanisms, issues, and actors involved. Hence, also justice considerations in public engagement have to be continually reassessed.

To summarise, the literature on public consultation and deliberation does not explicitly refer to engagement as justice, but it does refer to engagement as important for democracies. Since it mainly focuses on procedural aspects of engagement, it may be best transferable to discussions on *procedural justice*. This will, however, require a more explicit normative position on what just procedures are. Taking a justice perspective on the procedures (methods) described in the reviewed literature suggests that many methods insufficiently ensure that participants have power and influence on the outcomes of engagement. Engagement that is framed as public acceptance and engagement mechanisms that only remain on the level of information sharing and consultation cannot be considered procedurally just. There are examples of methods that are considered successful because they do create avenues where actors can participate in engagement activities in a meaningful way. *Recognition justice* is rarely addressed in the literature, and inclusion is often discussed in a general manner where 'publics' remains a vague category that is not problematized further. Discussions on the level of influence publics have on outcomes of engagement is abundant and highly relevant to recognition justice (where the focus is not only on including but on letting diverse voices be heard). Finally, *distributional justice* is not explicitly discussed in the literature, but it appears that the literature assumes that good procedures would lead to fairer outcomes.

4.2. Co-creation

The second strand of literature describes public engagement methods that emphasize co-creation. Such methods are partly a response to more traditional public consultation and deliberative engagement methods, which, as also the literature in the previous section points out, often limit the influence of publics. Co-creation, and related approaches such as co-production, co-design, living labs, experiments, and participatory research, ideally give participating actors equal control in the process and more power to determine the outcomes of the engagement processes. This form of public engagement aims to arrive at non-predefined outcomes or solutions through collaboration. It thus builds upon *procedural justice* concerns because it has the potential to facilitate fair

participation processes and *distributional justice* because involved groups have the potential to influence outcomes.

Several of the reviewed papers highlight the strengths of this form of engagement. Most notably, findings from a recent study on the use of creative methods as means for co-designing sustainable mobility solutions [62], foreground several benefits from the process in line with all three justice dimensions: giving marginalized groups a voice and widening the range and diversity of participants involved (recognition); catering for more equitable decision-making on infrastructures and opening up for possible new and unexplored alternative solutions (procedural), and allowing for more equitable identification of problems (distributive). Other articles stress co-creation methods as avenues to include overlooked actors and thus improve both procedural and recognition justice. In two reviews of the literature on the wind sector, Elkjær et al. [63] and Solman et al. [64] highlight how co-creation moves beyond traditional participation methods, both in terms of whose voices are valued and what publics are included. Regarding the latter, they identify a shift from a predetermined framing of publics to emergent publics. This means that determining what publics to include in the co-creation is a continuous process and never set in stone [64]. An analysis of actors who participate in co-creation also finds that the co-creation approach includes both incumbent and alternative actors, that it can gather developers, authorities, and local communities. Lastly, both human and non-human actors are regarded as important.

Others argue that co-creation methods can improve equality. For example, through transdisciplinary or participatory knowledge production as an avenue to ensure that different types of knowledges and reasonings are valued equally [65–67], or through narrative and storytelling approaches to ensure openness and inclusiveness [68,69]. Hence, some literature supports the claim that co-creation methods can improve justice considerations through public engagement.

However, the literature also argues that co-creation ideals often fall short and that the methods are difficult to implement. In practice, co-creation methods often remain on the level of information sharing and consultation and do not provide publics with meaningful influence on engagement outcomes [39,66]. One of the challenges is that co-creation opens up conflicts or controversies which may create deadlocks once diverse groups gather [70]. Another example shows how city experiments set limits to inclusion because of the geographically specific areas of implementation [71]. Even when successful, Fitzgibbons and Mitchell [72] find it challenging to sustain cooperation with marginalized communities over long periods. One literature review of co-production in climate and energy also points to the challenges of using the category of ‘communities’ as a more inclusive way to account for different publics, because particular groups such as women, children and young people may be overlooked [39]. This points to ensuring recognition justice by keeping the definition of publics flexible to change and ensuring that marginalized groups are not overlooked.

In sum, co-creation is difficult to implement and has several limitations but is generally recognized as a more inclusive form of engagement than top-down organized and stand-alone engagement events. An overall argument from much of the literature is that co-creation mechanisms cater to more public influence. However, the literature also stresses that such mechanisms are challenging to implement in practice. From a procedural justice perspective, scholars could be more explicit about the consequences of a lack of effort invested in specific co-creation activities. A point in the literature that is also relevant for a distributional view on the inclusion of participants is the tension between the need for an engagement design that allows for emergent publics and the necessity for predefined methods to recognize marginalized groups. This two-way understanding of recognition is critical to include in a recognition justice framework. As with the public deliberation and consultation literature, the positive distributional outcome of co-creation is assumed. It is an approach to engagement where diverse publics are participating, which may ensure that outcomes are fairly distributed.

4.3. Community-led energy

The third form of engagement we have delineated in the literature deals with community-led energy initiatives. These are bottom-up initiatives or approaches to decision-making where local communities design and develop their approach to energy transitions.

This group of papers predominantly frames community energy as a form of engagement in energy transitions that challenge dominant energy regimes [73]. It thus redistributes power in energy transitions [74]. For example, Campos and Marin-Gonzalez [75] explore prosumer initiatives across Europe, arguing that they are a new form of collective participation that challenges dominant practices and power structures by decentring renewable energy, while relying on socially inclusive, transparent, and participatory energy models. When new community-led energy initiatives are viewed as a self-organized way to engage with energy transitions, they represent a new avenue to redistribute the burdens and benefits of transitions and thus improve distributional justice.

Community energy is also understood as a form of organization that can cater to procedural justice in places where there is little space for it otherwise e.g., in non-democracies. As an example, Delina's [60] study of the Pa Deng collective in Thailand illustrates how spaces for communal deliberation on new energy sociotechnical orders were made and re-made, arguing how participation is not only a matter of formal processes but a set of relations that can become durable over time. In a review of literature on energy transitions in the global South, Cantarero [76] supports such alternative forms of participation as means to empower citizens when institutional barriers limit participation in central planning. Still, the author argues that restructuring of democratic decision-making infrastructure is necessary for just forms of participation and inclusion of marginalized groups to part-take in transitions. Thus, community energy is not sufficient to ensure procedural justice in energy transitions on a larger scale.

Community energy can account for usually overlooked groups and communities to be recognized in energy transitions. However, there are some pitfalls. When engagement relies on community dynamics, certain groups, such as women and their needs and knowledge, can again be excluded from decision-making processes [77,78]. To counter inequalities that persist within communities, such as patriarchal structures, the scholars argue that women need to be empowered and be given more agency to facilitate inclusive participation [77,78]. This may create new challenges. When community energy initiatives are community-led, it is more difficult to steer inclusion in just directions. Consequently, one should be careful to assume community engagement as a pathway towards more just outcomes. Van Veelen [79] finds that even when inclusive participation and exchange is desired in community energy projects, some groups still considered such criteria as secondary and struggled with internal exclusionary mechanisms.

Within this strand of literature, most papers discuss ways that participation can be fostered in community energy. For instance, the articles discuss how to foster participation in community energy by studying motives for participation [80–82], and the role of local governments in creating good conditions for initiatives [83], and they call for the empowerment of citizens to participate in local energy initiatives [84,85]. However, the literature rarely considers how to foster good community dynamics within the community energy initiatives. In one of the few papers explicitly addressing procedural justice in the context of nuclear waste siting, Bell [86] discusses the challenges of fostering meaningful engagement where the public has input and impact on the development process, even when it is part of the policy. She finds that local power dynamics challenge inclusive participation, which requires some oversight instead of leaving all decision-making to communities.

To summarise, community energy is a form of public engagement that creates opportunities for self-inclusion and a shift of power relations in energy transitions which may redistribute burdens and benefits on a broader scale, in line with the distributional justice dimension. The

literature raises questions regarding the level/position through which one analyses *distributional justice*. Distributional justice may be fostered on a macro scale but not within the localities in question, as there is less focus on internal engagement mechanisms in communities. When it does, it has pointed to procedural difficulties such as unequal power relations in communities. Hence, the literature suggests that community energy initiatives are well suited to improve *recognition justice* on a macro scale. That is, better represent community groups in a space dominated by various businesses, national agendas, and infrastructures which favour particular groups and interests. It is, however, less clear how such initiatives can also foster recognition justice locally and internally. The literature highlights how *procedural justice* can be assessed from different analytical perspectives. As the previous literature does, one is to focus on concrete engagement mechanisms when developing new energy solutions. Here, we also see that procedural justice can be understood at a broader/macro scale, e.g., how different communities/publics engage in national/global energy transitions. This requires institutional elements necessary to ensure participation, e.g., local government support. Thus, contrary to the previous forms of engagement, this literature says more about the re-distributional impact of community energy than about the fairness and inclusiveness of the community organization processes. It mainly states that removing institutional barriers and empowering communities and groups can contribute to improving energy democracy, but less about the micro-politics of such engagement.

4.4. Ecologies and collectives of engagement

The fourth set of papers stresses that our understanding of public engagement needs to move beyond individual engagement events, encompassing a wider set of ongoing and interrelated forms of participation. It thereby challenges mainstream approaches which build on fixed, pre-given meanings of what it means to participate. The notions of ‘ecologies and collectives of participation’ has been coined as a means to stress the dynamics of diverse, interrelating collectives and spaces of participation and their interactions with wider systems and political cultures [87,88]. This approach opens up the diversity of mechanisms through which publics engage in energy transitions and goes beyond typical public engagement approaches such as public opinion surveys, deliberative process, behaviour change initiatives, digital democracy, citizen science, protests, activism, community energy, and everyday social practices which consume energy [87]. Public participation is seen as “heterogeneous collective practices through which publics engage in addressing collective public issues (...), whether deliberately or tacitly, which actively produce meanings, knowings, doings and/or forms of social organization” [87, p. 202]. *Collectives of participation* in the process of the distributed energy transition, for instance, include i) policy production and regulation collectives, ii) research, development, and innovation collectives, and iii) technology design collectives that all work to orchestrate participation at a distance in space and time. These collectives both enroll households and mediate participation through different strategies and techniques, producing conditions for various modes of participation.

According to these perspectives, public engagement is not only a matter of actors’ involvement at specific moments, but publics are understood as continuous co-producers of energy systems, for instance through their use of energy technologies that may cater to a specific form of material participation [88]. Material participation is a perspective on engagement that highlights the role of objects such as technologies and things for peoples’ participation in various (political) issues such as energy [89]. This view on participation, closely connected to concepts of energy democracy and energy citizenship, sees public engagement as constitutive of energy policy and energy transitions [90]. Although the other three types of engagement described in the previous sections may be seen as constitutive of energy democracy and citizenship, the ecologies and collectives of engagement give a more

encompassing perspective on how such citizen involvement should be facilitated. Furthermore, it sets a different premise for how justice can be nurtured.

By viewing participation as a co-produced, emerging, and distributed phenomenon, it is more complicated to determine how different dimensions of justice can be ensured. Authors describe the processes as an ensemble of carefully orchestrated activities, distributed across an ecology of participatory collectives. Households may, for instance, take part in nurturing quite radical participatory practices, and citizens may have autonomy both over the engagement processes and who gets to be engaged. However, similar to community energy initiatives, this leaves the question of how just procedures and recognition of diverse groups can be ensured. Broadening the view on where engagement may take place can ensure more recognition justice if overlooked voices and groups are included, but the question of ensuring accountability of such just processes is quite challenging when engagement is viewed as a dispersed and multi-sited activity initiated and facilitated by diverse sets of actors.

Scholars within this strand of research emphasize systemic inequalities of engagement and inclusion in sociotechnical change processes by pointing to forms of public engagement that are dominant, endangered, or non-present. Thus, this line of reasoning may contribute to making more obvious the dominant forms of participation, and the way regime actors typically facilitate certain types of engagement. In contrast, other types of engagement are marginalized. This may give a new basis “from which to evaluate or intervene in the justices of sociotechnical systems, which also allegedly “opens up possibilities for future work to understand energy justice in more systemic and relational terms” ([87]: 208). For example, decentring engagement as a purely human-oriented practice, arguing that objects also may give rise to, mediate, or cater to public involvement and emphasize the multiple forms of potential public involvement [88].

To summarise, the literature that considers engagement as an ecology or collective endeavour can be used to argue that *procedural justice* is not only a matter of individual engagement mechanisms but needs to be viewed in relation to a wider set of engagement mechanisms/efforts/activities. This is useful as most of the literature highlights the limitations of singular approaches to meaningfully engaging citizens. Further, the literature can help identify the types of engagement that are marginal and critically scrutinize the procedural justice aspects of engagement. It is difficult to see how this type of relational and distributed take on engagement relates to *recognition justice*, although it is noted that not all collectives are treated equally. Similarly, the literature is limited in its debate on how such engagement may lead to *distributional justice*. We can assume that diversity and variety of public engagement give more groups the opportunity to influence outcomes, thus possibly better ensuring just distribution of energy transitions benefits and burdens.

5. Discussion and conclusion: towards just engagement

Through this review, we have highlighted how papers across four different categories of public engagement relate to the three tenets of energy justice. On its most basic level, this review exercise has illustrated an overall lack of explicit justice concern in the literature, but it illustrates many indirect debates about all three justice dimensions. We find that each identified engagement form encompasses distinct opportunities and limitations to fostering just transitions. We summarise these in Table 1.

This overview highlights distinctions in how justice is addressed and how it can be operationalized across the various categories of engagement. They represent different points of departure, and in the following we discuss how they relate to each other according to the three justice dimensions. We use Delgado et al. [25] delineation of key tensions in public engagement – the *why*, *who*, *how*, *when*, and *where* – for a more pragmatic discussion of how just engagement could be achieved.

Table 1
Overview of justice considerations across four public engagement forms.

Public engagement forms	Procedural justice	Recognition justice	Distributional justice
Public deliberation and consultation	Many methods are insufficient in ensuring that participants have power and influence on engagement outcomes. Much focus is on social acceptance and critique of engagement mechanisms which remain on the level of information sharing and consultation. Some methods successfully create avenues where actors can participate in engagement activities in meaningful ways. A clearer link to and critical discussion of justice implications is needed to strengthen their rigour as mechanisms that can ensure procedural justice.	Much focus is on inclusion, but recognitional justice is rarely addressed. 'Publics' often remain a vague category that is not problematized by focusing on inherent marginalization and inequities. Some methods focus on recognizing particular voices and groups without reference to why such groups need special attention. Much discussion on the level of influence publics (and diverse voices) have on engagement outcomes.	Distributional justice is rarely discussed. Assumptions that good procedures lead to fairer outcomes are common.
Co-creation	Co-creation mechanisms cater to more public influence but are difficult to implement in practice. Thus, they often do not consider the procedural justice aspects considerably, which implies that some people may be left out or not adequately included.	Co-creation has the potential to engage diverse and emergent publics, and to give these publics power to influence engagement outcomes. There is a tension between the need for an engagement design that allows for emergent publics and the necessity for predefined methods to recognize marginalized groups. Community energy initiatives are well suited to improve recognitional justice on a macro scale. It is unclear how such initiatives can foster recognition justice locally/ internally.	The positive distributional outcome of co-creation is assumed but rarely explicitly investigated. Thus, one cannot be sure that this form of public engagement will result in the more just distribution of rights and burdens.
Community energy	Community energy is mainly understood as a bottom-up and citizen-led form of engagement. Discuss mainly communities' engagement in broader (often national) energy transition contexts. Focuses less on	Community energy initiatives are well suited to improve recognitional justice on a macro scale. It is unclear how such initiatives can foster recognition justice locally/ internally.	Community energy can redistribute burdens and benefits by shifting power relations in energy transitions. Distributional justice may be fostered on a macro scale, but not within the

Table 1 (continued)

Public engagement forms	Procedural justice	Recognition justice	Distributional justice
	the engagement mechanisms used by communities. When it does, procedural difficulties such as unequal power relations are revealed.		localities in question.
Ecologies and collectives of participation	Procedural justice is not only a matter of individual engagement mechanisms but needs to be viewed in relation to a broader set of engagement mechanisms/ efforts/activities. It is unclear how such engagement can be steered.	A plural view on public engagement allows diverse and emergent publics to be included. The plurality does not necessarily equal recognition, and certain groups may be overlooked.	Distributional justice is rarely addressed. The implicit assumption that diversity and variety of public engagement facilitate just distribution of benefits and burdens.

5.1. Recognition justice

Recognizing and including diverse actors is a tenant for just engagement. However, across all four categories of public engagement, the recognition and inclusion of different publics is not easily feasible in practice and remains a tension point in the literature. From a justice perspective, asking *who* is included in public engagement is essential. Including everyone in public engagement activities is impossible, and some kind of (self-)selection of (representatives of) publics must occur. However, we find it problematic when much of the reviewed literature does not problematize 'the public' as a category. When the category remains vague, it may hide the exclusionary mechanisms of social groups and individuals. In these cases, public engagement is uncritically coined as a form of inclusion.

Literature that does pay attention to the inclusion of diverse publics points to how certain social groups are overlooked or excluded because they are not recognized (e.g., people from rural areas, elderly, women, or low-income groups), or because the methods for engagement do not cater for the inclusion of certain groups. In the case of community-led energy and ecologies and collectives of engagement literature, we also see that publics are treated as an emergent. The strength of this conceptualization of publics is that it avoids stereotyping publics into pre-set categories. Even though these perspectives champion plurality, it does not necessarily equal recognition. For example, when the collectives are conceptualized as publics around particular issues, it does not necessarily debate the fairness of such recognition. Moreover, dilemmas also arise as to how recognition can be ensured when there is a lack of steering mechanisms or an accountable facilitator. A recognition justice perspective requires some steering and management beyond merely an orchestration of engagement. We, therefore, argue that the reviewed literature indicates a need for more consideration of the *who* of public engagement to avoid reproducing existing social inequities and a low level of recognition justice.

Another tension relates to the temporal dimension: the *when* of public engagement. On the one hand, the literature emphasizes the importance of involving publics early and before important decisions are made in order to ensure actual influence on processes and outcomes. On the other hand, as noted, some literature views publics as emergent and

continually shaped around issues of concern. Both a focus on early engagement, which potentially closes engagement opportunities for emerging publics later and a focus on the flexible engagement of emergent publics risks overlooking publics that are excluded from dominant social, political and economic domains. This means that the *who* of public engagement needs to be continuously (re)considered.

The spatial dimension – the *where* of public engagement – also creates tension about recognition justice. If, for example, the entire life cycle of energy technology development and appropriation processes is considered, relevant publics may be spread worldwide. Thus, recognition justice overlaps with the discussion of global justice, and energy transition processes have to account for their role in reproducing global inequities. While this is realistic and important on a larger scale, from the literature, we see that this may be difficult to accommodate and include voices from all relevant social groups, especially within smaller public engagement initiatives or community energy.

The question of the *why* of public engagement in this context relates to the normative aim of shaping just energy transitions with a fair distribution of burdens and benefits. Considering distributional issues from the start and throughout the entire decision-making process is necessary to ensure recognition justice. The early assessment of costs and benefits enables the inclusion of publics who are directly affected by the outcomes of energy transition processes, especially when it comes to those taking the burdens. As it is not always possible to know in advance what the consequences of energy transitions will be, a continuous assessment of distributional justice aspects of initiatives can help identify emergent publics that need to be included.

Finally, tensions with regard to recognition justice also relate to the *how* of public engagement, such as the inclusiveness of the specific engagement methods, mechanisms, and processes. An important tenet of recognition justice is that the knowledges, needs, and points of view of publics need to be included. Most scholars criticize forms of public engagement where there is no dialogue with participants, and discussion about how best to cater to different voices to be recognized is at the core of public engagement literature. For example, co-creation methods have been put forth as more suited because they give participants more decision power, and engagement is more open-ended, thus not closing down the view on which voices can be heard. However, as the review shows, they are challenging to implement and sustain over time. Also, they may open up to conflicting views, which may hamper and slow energy transitions. Such discussions overlap with matters of procedural justice.

5.2. Procedural justice

Intuitively, procedural justice, with its focus on fair engagement processes mainly addresses the *how* of public engagement. However, our review indicates that the other four key concerns (*why*, *who*, *when*, and *where*) of debates around public engagement [25] also provide important insights into how public engagement can foster procedurally just energy transitions. Considerations of procedural justice focus on the design of particular engagement methods and mechanisms and how procedures cater to the inclusion of publics (recognition justice) and a fair distribution of outcomes (distributional justice).

The reviewed literature across all four engagement forms identifies various aspects contributing to procedurally just engagement. First, the literature reveals challenges concerning the framing of public engagement and *why* public engagement should be carried out. In general terms, the literature refers to public engagement as an important element of energy democracies. Public consultation and deliberation literature, in particular, also shows that engagement is often framed as public acceptance of predefined technological solutions without giving publics agencies to co-design and co-decide outcomes. In response to that, many papers argue that participants need to have a stake in defining the engagement's outcome. An open and inclusive framing of the purpose and outcome of engagement which allows for the inclusion

of different points of view, is central to co-creation methods. An point of discussion is the tension between the need for inclusive democratic processes and the need for fast energy transitions, namely, open inclusive framings of engagement could slow down energy transitions. Still, inclusive framings are necessary for responsible accelerations of transitions [3].

Moreover, the literature discusses many methods – the *how* of public engagement – and how they facilitate recognition and inclusion of different actors and their voices – the *who* of engagement. From the review, it is clear that there are no one-size-fits-all mechanisms. While some methods may be good to target one social group specifically (e.g., children through gaming, see [21], the newest strand of literature argues for a mix of methods that are both temporally and spatially dispersed [87,88]. The practical challenge, then, is to find a way to balance between the targeted inclusion of specific groups and a broader view of mix-methods that ensure the inclusion of collectives. Moreover, the community energy literature shows that self-inclusion is an avenue to challenge existing power relations. Even if public engagement in energy transitions were in line with justice considerations, it would not remove the need for community energy and decentralized forms of engagement. Since community energy is mainly understood as bottom-up citizen-led initiatives, a normative question is whether community energy also needs to be steered in order to ensure recognition and procedural justice principles. In this case, institutional policies could play an important role in ensuring justice principles, as opposed to practical engagement tools. This relationship between institutional mechanisms for just participation and good practices on the local level is a relevant avenue for further research.

When it comes to temporality, *when* including publics, the literature shows a lack of good procedures for continuous engagement. As mentioned above, engagement needs to be ongoing and include publics at the early stages. If publics are included too late, they cannot influence the framing of the engagement. However, it is hard to ensure continuity in energy transitions where new development is often directly connected to projects which are limited in time.

Finally, the literature addresses the spatial aspect of *where* to conduct engagement. Some papers give concrete advice. For instance, if engagement is conducted on the sidewalks, you may miss out on the driver's perspective, or conversely. When we view energy transitions as global processes, it is harder to pinpoint where engagement should occur (and thus also what publics – *who* – to recognize). Literature on ecologies and collectives highlights a decentred view on participation from an analytical standpoint, but in practice, it may be hard to facilitate such forms of engagement. Indeed, some methods for engagement can be more inclusive to publics located in different places e.g., online methods for globally dispersed publics. Still, they may not be well suited for publics to have a meaningful influence on outcomes and hence, on distributional justice.

5.3. Distributional justice

The literature review illustrates that distributional justice aspects are hardly discussed in any engagement forms, except for being a clear goal in community energy and a more implicit goal in co-creation literature. Hence, we found what we can describe as a (re)distributional deficit in the literature on public engagement in energy transitions. A few potential contributions from such perspectives are worth mentioning. On one side, distributional justice perspectives can strengthen procedural and recognition justice. As mentioned above, considering the distribution of benefits and burdens before and during public engagement can help identify *who* to include and which spaces – *where* – to target. On the other side, procedural and recognition justice considerations in public engagement can help ensure more just distribution in energy transitions. The emphasis on recognizing publics in a way that gives them meaningful influence on outcomes of public engagement can contribute to more just distribution. But, there is a pitfall in assuming that inclusion of

the 'right' public and implementing the 'right' procedures lead to just outcomes. Distributional justice considerations must be facilitated through engagement which continually engages in efforts towards steering outcomes in equitable directions. Hence, the literature on public engagement would benefit from a more explicit focus on investigating the distributional outcomes of engagement activities.

6. Conclusion

In this paper, we have reviewed how recent literature on public engagement in energy transitions addresses questions of justice. Our point of departure is that public engagement in energy transitions does not univocally mean that justice is ensured. In order to avoid the reproduction of inequalities and avoid unjust consequences of energy transitions, decision-making and public engagement is key [5,14], but it also needs to be critically assessed from a justice perspective. This normative claim goes beyond the argument that we need democratic procedures and stresses that to ensure justice, such procedures should pay regard to procedural, recognitional and distributional considerations.

Our critical review of public engagement in energy transitions shows that justice is usually implied but not critically addressed in the literature. This is a shortcoming. If a justice perspective is not considered in scholarly discussions of public engagement, we risk getting the same (unjust) outcomes even when efforts are made to engage publics. There is, thus, room for more critical discussions of all three justice dimensions and how they can be operationalized in public engagement. The energy justice framework has the potential for being a good sensitizing tool when considering who, why, when, where and how public engagement should be done. Moreover, assessing procedural, recognition, and distributional justice consideration together is mutually strengthening. For instance, to ensure recognition and inclusion of relevant group, distributional effects need to be assessed. Or to ensure good procedures for public engagement, recognizing and giving a voice to a plurality of publics is necessary.

Including a justice perspective on public engagement will not solve tensions or debates regarding the best way to conduct engagement, nor will it give a clear-cut answer that leads to win-win solutions. Our categorization of different engagement has revealed additional considerations and challenges that need to be made when theorizing or organizing public engagement efforts. However, steering away from such discussions does undermine the agenda of contributing to just energy transitions. There are many kinds of literature not included in this review that have some answers to these dilemmas, primarily as we have mainly focused on recent energy transitions scholarship. Still, we think there is ample reason to urge public engagement and energy justice literature to speak more explicitly to each other.

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Data availability

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

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