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Original research article

Energy justice and energy democracy: Separated twins, rival concepts or just buzzwords?

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ABSTRACT

Many new concepts have emerged to better capture socio-technical change in energy systems from a normative perspective. Two of the most visible, popularized, and politically charged are *Energy Justice* and *Energy Democracy*, but it is the tension between them that has drawn recent controversy. Instead of arguing for the superiority of one over the other, this paper's aim is to demonstrate their differential contribution and areas of productive overlap using both quantitative and qualitative measures. It presents the results of the systematic review of 495 articles on Energy Democracy and Energy Justice in the Web of Science database, with attention to the geographical focus, scale, technology, and social groups dominant in both literatures. We find that both the concepts and literatures employing them are very closely related, almost like twins. The key difference is the failure of the Energy Democracy literature to engage with questions of energy poverty and distributional (in) justice. For Energy Justice, we find that despite lip service paid to, for example, the Global South, normative research in energy transitions sphere remains highly Western-centric. We highlight, too, that both terms are most often used as buzzwords and that this undermines knowledge building and the radical potential for change which is inherent in the two concepts and their applications.

1. Introduction

As energy transitions around the world accelerate, fueled by both the pressure to decarbonize energy systems resulting from the looming climate crisis as well as (geo)political shifts impacting fossil fuel trade, the focus of scholarly analyses is visibly expanding. Over the past two decades in particular, the energy social sciences have seen a growing interest in the normative, social, and political aspects of ongoing and imminent energy transitions. On the level of policy, this has coincided with the recent proliferation of the idea of “just transitions”, where not only the ultimate benefits of the transition for entire societies are emphasised, but also the uneven distribution of energy-related burdens or their future risks, especially as carried by particular categories of citizens, groups, classes and vulnerable populations including those disadvantages by their geographies.

This social and normative turn in energy policy, practice and academic study has meant the departure from a technocratic perspective in

which societies were cast in the role of passive recipients of energy services whose “welfare” was to be achieved and safeguarded, but rarely defined. Instead, there is an outlook in which societies are also the subject of decision-making in the energy sector as recognition of its impact upon work, everyday life, and future generations; a socio-technical understanding in which energy and the people it serves are not separate, but fundamentally intertwined. As decarbonization and energy transition is often equated with increased deployment of distributed renewables, there was also a visible change in scales and units of analysis, with more attention on local populations, community energy, individual consumers, and other more granular units.

While many new concepts have emerged in interdisciplinary energy studies to better capture the changes in technology, governance, and the politics of transitions from a socio-technical and normative perspective, two of the most visible, popularized, and most politically charged, we argue, are *Energy Justice* and *Energy Democracy*. Although they bear a strong family resemblance in their concern for “fair” outcomes, the two

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concepts grow out of slightly different traditions, and differ in emphasis they put on key features of transition. This has already led to some visible controversy and the academic sphere. For instance, in a recent and not uncontroversial intervention, Droubi, Heffron and McCauley argue that this duality has created a ‘language war’ and that Energy Democracy ‘fails to deliver real justice’ and is ‘academically unnecessary’ [1].

Instead of arguing for the superiority of one viewpoint over the other, and in so doing ignoring or failing to unpack their different aims and legacies, we believe that it is more productive to explore these differences, understand where they might be coming from, and look for ways to bridge them. In our view, as proponents of both Energy Justice and Energy Democracy research, the differences between these two concepts should not be dismissed as conflictive and counterproductive. We would rather assume that they cover somewhat different empirical terrain and therefore that calls to abandon one of the concepts and focus solely on the other would leave the formers core area unaddressed. Indeed, we would argue that they can be very complementary in this regard.

To be able to grasp the diversity and potential complementarity between these two concepts, this paper presents the results of the systematic review of the two literatures in the full Web of Science database up until the first quarter of 2021, the submission date for Droubi et al.’s paper. The aim is to demonstrate their differential contribution and areas of productive overlap, using both quantitative and qualitative measures. Using the results of our systematic review, we assess some of the theses put forth by critics of both conceptual literatures. To check whether, how and to what extent the two communities and literatures speak to each other we also conduct a network analysis based on the systematic review.

We find that the two concepts and literatures employing them are very closely related. Notwithstanding differences in the origins of each term, they are, in some ways, like twins separated at birth. An important finding, which has been signalled by Droubi et al. in their review of some ED theoretical texts, is the failure of the Energy Democracy literature to engage with questions of energy poverty and distributional (in)justice. However, there are also several areas where Energy Justice scholarship does not deliver on the promises it offers. We find that despite lip service paid to, for example, the Global South and to the various vulnerable groups present in this context, normative research in the energy transitions sphere remains highly Western-centric. The most worrying finding of our review is that rather than existing as allies or rivals, the two concepts are too often used as mere buzzwords that, in a ritual or decorative function that is disconnected from empirical enquiry. This undermines both knowledge building and the radical potential for change which is inherent in the two concepts and their applications.

2. Position statement

We begin by describing critical views on both Energy Justice and Energy Democracy (henceforth also EJ and ED) and use these to develop key dimensions and hypotheses that our systematic view allows us to assess. Both EJ and ED are concepts whose pedigree can be traced back to social movements, and their analytical and academic function is conditioned by the normative baggage they carry. Inasmuch as they describe empirical reality, they are inherently aimed at changing it – they are both *transformative* concepts. In some ways, this makes their goals difficult to pinpoint, and leads to definitional problems and varied applications. For instance, Chilvers and Pallett argue that analyses should follow the meanings attached to ED by users [2], and Feldpausch-Parker and Endres note that ‘democracy’ is not stable and fixed but instead ‘inherently difficult to capture’ [3] (and the same could be said of ‘justice’). Meanwhile, others offer definitions that seek to delimit ED and EJ as social facts, and thus ‘arrest’ their meaning, either to advance a specific approach or to allow for more meaningful debate and more fruitful research [4–7].

The critique offered by Droubi, Heffron and McCauley goes beyond definitional quarrels, as they openly challenge Energy Democracy research, claiming that it is unnecessary from an academic point of view (where, in their opinion it contributes to conceptual chaos) and that it does not live up to the normative standards expected from such a transformative concept; standards apparently set by Energy Justice scholarship, which is the authors’ domain [1]. These are certainly heavy accusations, and we should treat them seriously. Critique launched against ED as well as EJ, from various angles, both theoretical and empirical, is not uncommon [8–12]. Authors have critiqued the conceptual complexity of EJ, for example, suggesting that its definition makes it hard to apply to concrete policy cases [13], whereas ED has been challenged for assuming rather than demonstrating that the forms of governance it promotes are more democratic, for instance [9,14].

Many arguments raised by Droubi et al. are, conveniently, factual claims which can be assessed empirically. That is to say, if ED research does not deliver on its promises, or if EJ scholarship does not address the issues that it claims to do, much of this can be evidenced through a systematic review of these two literatures. This is precisely what this paper seeks to do.

Our systematic review assesses the following dimensions and hypotheses derived from an initial exploratory reading of the literature and the authors’ prior knowledge of the field:

1. **Geographical focus:** Some critics suggest that ED is a ‘first world problem’ while EJ is a global, whole systems concern. This notion builds on the assumption that a functional (liberal) democracy is a prerequisite for thinking about the democratization of the energy sector, which is plausible. If so and if this is true, then the ED literature would by and large focus on the highly industrialized and developed countries of the Global North, and much less on those in the Global South.¹ EJ’s geographical scope, on the other hand, should be more evenly distributed, with a strong emphasis on the South. To verify this, we need to look at the geographical coverage of studies emergent from the two literatures.
2. **Scale:** ED focuses on communities and local (co)ownership while EJ can be applied universally. On a theoretical level, this claim can be defended. Work on ED beyond local or, in rare instances, domestic politics is still pending. Meanwhile, EJ principles can be applied to entire value chains and all elements of energy lifecycles, as well as the global energy system. But does that claim hold? What levels or scales does EJ and ED research focus on? To assess it, we need to compare the scalar focus of extant empirical research.
3. **Technology:** Energy policy traditionalists perceive both the ED and EJ approaches to be overly preoccupied with the ‘soft path’ of the energy transition [15] and critique them as focusing almost exclusively on renewable energy sources. Both ED and EJ supposedly miss other technologies and stages of the value chain. The systematic review therefore asks, which technologies are at the center of research in ED and EJ if we compare the whole corpora of these literatures?
4. **Social groups as objects of analysis:** The most important accusation that Droubi et al. raise is that ED does not bring about justice, meaning that it does not adequately address injustices manifest in energy systems and the practices of governance built around them, instead assuming they will somehow automatically be dealt with when energy governance is democratized. On the other hand, we

¹ We would note, too, that the term “democracy” can be interpreted very differently according to the country in question. In some countries, the prioritization of democracy could be seen as oppressive or imposing certain ideals or principles. Likewise, notions of justice will differ, including in authoritarian contexts or in countries where the notion of “justice” does not readily translate into the mother tongue or does not reflect such a strong nature/culture divide as it often does in Western settings.

could argue that although explicitly “political” in its aims, the EJ literature does not address policymaking per se, and that where it does or claims to do so, it offers very superficial contributions e.g., broad statements that energy policy-making must consider justice issues. Therefore, this systematic review maps the social groups on which the two literatures focus.

5. **Conceptual dialogue:** Droubi et al. accuse the ED scholarship of not ‘critically’ engaging with EJ and of a lack of interdisciplinarity. Meanwhile, both literatures are at times accused of being over-theorized and saturated by normative proposals, with comparatively insufficient focus on their empirical application – a critique the authors of this review have encountered on numerous occasions while presenting their work at energy studies and social science conferences. To find out whether these accusations hold true, this review assesses what kind of publications dominate the two literatures, what definitions are most prominent, how they differ and finally, measures the extent to which ED and EJ engage in dialogue with one another.

In the following section, we introduce the methodology of our systematic, structured review. Section 4 presents the results, first laying out the ‘demographics’ of the two literatures, and then following points 1–4 presented above, discussing the geographical focus, scale, technology and social groups dominant in EJ and ED scholarship. Next, we analyze the degree and character of conceptual dialogue. We then discuss our findings before concluding with a series of reflections for both concepts and their future interactions.

3. Methods

The systematic review process consisted of five major steps: the formation of the data corpus out of the source materials, the formulation of the coding scheme used to map the corpus, the pilot coding and subsequent refinement of the coding scheme, the coding, the data processing, and, finally, the analysis and interpretation of the results (Fig. 1).

The data corpus features English language articles, books and book chapters sourced from the Web of Science database. We should note here that there is a growing interest in ED and EJ in non-English language scholarship, particularly in Spanish, but also German, Portuguese or French. While including these voices could alter our findings somewhat, particularly as it relates to geographical focus, for the sake of methodological clarity in our systematic review we decided to include only publications in English. The database was searched for documents featuring either of the following two strings in either their title or keywords: “energy” AND “justice” and “energy” AND “democracy”. The search covered the full history of the database up until the first quarter of 2021 – the time when Droubi et al. submitted their paper – and yielded

645 source documents: 481 matched the EJ string while 163 were associated with ED. Whilst we acknowledge the limitations of searching for only English language papers, we also acknowledge that this is the primary language of scientific publication, and therefore that non-English papers are a significantly smaller sample that were not always accessible to the team. The choice to sample papers only using EJ and ED in their titles or keywords also restricts the focus of our sample to those papers with these concepts as a dominant focus.

Next, the coding scheme was constructed and tested, following the principles laid out in [16]. A deductive approach was used to build the scheme, with the final result reflecting the points of interest introduced in the position statement. The scheme was also presented and discussed at a workshop dedicated to trends and debates in the fields of EJ and ED. [Anonymized for review].

The coding scheme aimed at extracting two types of information from the source documents: (1) their focus, e.g., country or region of concern, discussed social groups or energy technologies, and (2) their conceptual background, e.g. the version of EJ or ED conceptualizations that they worked with. The testing took the form of pilot coding. A pilot sample of 56 articles, i.e., 9 % of the corpus, was coded by 4 independent coders in several batches. After each batch, the agreement among the coders was evaluated, coding experience discussed and, eventually, coding rules adjusted [17]. The overall agreement the coders reached across the whole pilot reached 91 %.

After the successful pilot, the coders “cleaned” the corpus by removing source documents that were not considered relevant source materials. This included book reviews or commented court decisions, and documents that were not relevant to the study of EJ or ED or were not accessible. [13,14]. During this process, the corpus was also divided into two sets: First, the “field” set included all relevant sources, effectively mirroring the cleaned corpus. Second, the “core” set included only documents whose title or keywords contained the strings “energy justice” or “energy democracy,” i.e., documents whose authors explicitly addressed these concepts.

The manual cleaning reduced the size of the corpus (or the “field” set) to 495 source documents, out of which 400 were associated with EJ and 105 with ED, including 11 documents that related to both concepts. The “core” set contained 238 EJ documents and 62 ED documents, including 10 documents associated with both. The demographics of both sets were analyzed separately (Section 4.1) but the results were largely identical. Thus, only the “field” sets results are reported. The few differences between the sets are then discussed in the respective subsections.

The analysis consisted of collecting a complex set of information about each source document. While some data was already present in the WoS export file (e.g., the demographics, Section 4.1), the majority had to be extracted manually through the application of the coding scheme. During the coding process, the coders closely read the source

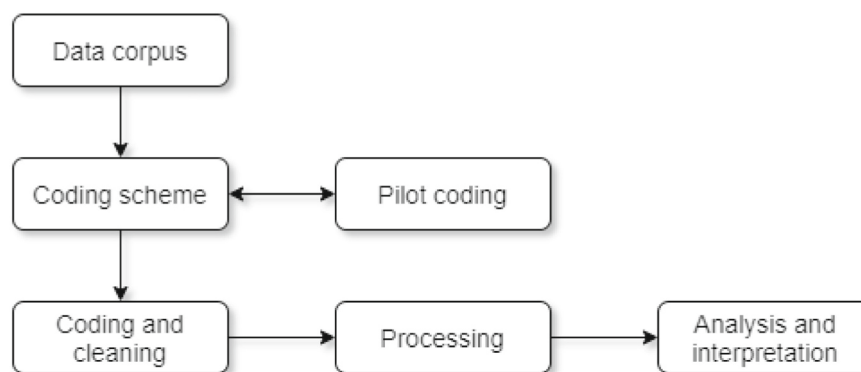


Fig. 1. The research process.

documents and marked down the values of the pre-selected categories, such as geographical focus, scale, technology and social groups dominant (Section 4.2).

Alongside the demographics and the content, the documents' conceptual background was investigated (Section 4.3). Information about what kind of definition is used to guide the empirical research or, more broadly, to convey the authors' understanding of either of the two concepts, was extracted. The associated coding options are presented in Table 1.

Second, if a document's definition type was coded as "reference" all the stated conceptual sources were noted down in the coding table. This resulted in a directed bimodal network in which the investigated documents are connected to (or point to) the conceptual sources they refer to. The network's properties were consequently analyzed, and relevant measures were visualized (see Table 2). A sample visualization is presented in Fig. 2.

During the final stages of analysis, the frequency tables, clusters, and visualizations were contextualized and interpreted. Research tool-wise, the data was processed and cleaned using the Open Refine software [21] and Excel, frequency and occurrence tables were built using R [22] and Excel [23]. The tables then became a basis either for direct interpretation of the results or for building citation a network analyses using R, Excel, and Visone [24] software.

4. A quantitative assessment of the EJ and ED literatures: results

4.1. Demographics

4.1.1. Year of publication

Both EJ and ED fields are remarkably similar in their development over time. While the EJ literature is about four times larger in terms of the sheer volume of publications, their structure across the years of publication virtually copies that of ED. There were traces of both fields before 2015 but it is after this year that their publication volumes took off significantly (Fig. 3).

4.1.2. Publication outlet

Both fields have been primarily developed in the journal *Energy Research & Social Science*, with over 20 % of their respective documents published there. Apart from this journal, the ED field has been relatively evenly distributed across additional 56 publication outlets, the most notable of which in terms of publication volume is *Environmental Politics* (7 %). Beyond *Energy Research & Social Science*, EJ has been discussed also in *Energy Policy* (14 %) and *Applied Energy* (8 %) (Fig. 4). Overall, the field spans across 127 outlets.

Table 1
Extracting the conceptual background.

Definition type (coding)	Description
Reference	The document either explicitly uses a definition introduced in another text or accompanies an early reference to the respective concept by up to four citations ^a
Mixed	The document discusses five and more conceptual sources without being specific about which ones are guiding the featured research ^b
Own	The document introduces its own definition
N/A	No definition is provided

^a Many documents lack any conceptual discussion. Instead, they simply introduce Energy Justice or Energy Democracy in one or two sentences and add a few citations - typically between one and four.

^b If more than four citations are present, it is typically in the form of a lengthy conceptual discussion which features many more definitions and approaches but does not label any of them as the guidance for the featured research.

Table 2
Network visualization principles.

Visualization	Network or conceptual parameter
Node size	Node degree centrality (the number of connections)
Node color	Louvain clustering (grouping nodes together to maximize network modularity and reveal communities [20])
Edge direction	Referencing (citing documents point to cited conceptual sources)
Edge thickness	Co-referencing (multiple documents citing both references establish thicker connection between them - unimodal networks only)
Edge color	Field (orange: Energy Justice, blue: Energy Democracy, pink: both)

4.2. Content

4.2.1. Geographical focus

Out of the 495 source documents, 360 (or 73 %) consisted of some form of a geographically specific case study, or at least included one. Both fields are relatively similar in this regard: 73 % of the EJ documents include country reference while the same number for ED reaches 69 %. Both fields also show highly concentrated geographical coverage (Appendix 1). Only four countries - the U.S., the U.K., Germany, and Canada - represent 44 % of all country references in the whole corpus.

For EJ, the focus has been mainly on the U.S. and the U.K. (17 % and 15 % of the source documents respectively), followed by Germany (6 %), Australia, Canada, and France (all 5 %). No other country occurred in more than 3 % of the documents (Fig. 5).

The ED literature looks predominantly at three countries: the U.S., Germany (both show 11 %) and the U.K. (9 %). Canada, the Netherlands, and Spain are subject of inquiry in 4 % of the documents (Fig. 6).

4.2.2. Scale

Our review did not find any significant differences between these two literatures in terms of scale on which most of the research is focused. Contrary to our hypothesis formulated in Section 2, it was the EJ literature that focused proportionally more on the local level (Fig. 7), but these differences were insignificant and in terms of scale the two concepts, they are applied in a similar way.

Similarly, the focus on local and community energy as a form of bottom-up initiative is a feature of both the Energy Justice and Energy Democracy literatures to almost the same extent. What clearly differentiates the two is the focus on social movements. Here, Energy Democracy, which is itself considered a 'movement' by some scholars and proponents [5,25,26], puts a visibly stronger emphasis on this form of bottom-up initiative, which is marginal in Energy Justice writing. This can be explained by the strong activist pedigree of the ED concept, as well as the very meaning of 'democracy' in this context, very often cast in participatory and direct terms.

Similarly, the focus on local and community energy as a form of bottom-up initiative is a feature of both the EJ and ED literatures to almost the same extent (Fig. 8). What clearly differentiates the two is the focus on social movements. Here, ED, which is itself considered a 'movement' by some scholars and proponents [5,25,26], puts a visibly stronger emphasis on this form of bottom-up initiative, which is marginal in EJ writing. This can be explained by the strong activist pedigree of the ED concept [5,27,28] as well as the very meaning of 'democracy' in this context which is very often cast in participatory and direct terms [29].

4.2.3. Technology

Across the sample period, both fields are relatively similar in their coverage of energy technologies. Approached either generally as RES or specifically as solar and wind, modern renewable energy defines most of the empirical focus of both fields, followed by coal and nuclear energy (Fig. 9).

Nearly 48 % of ED documents deal primarily with renewables, solar

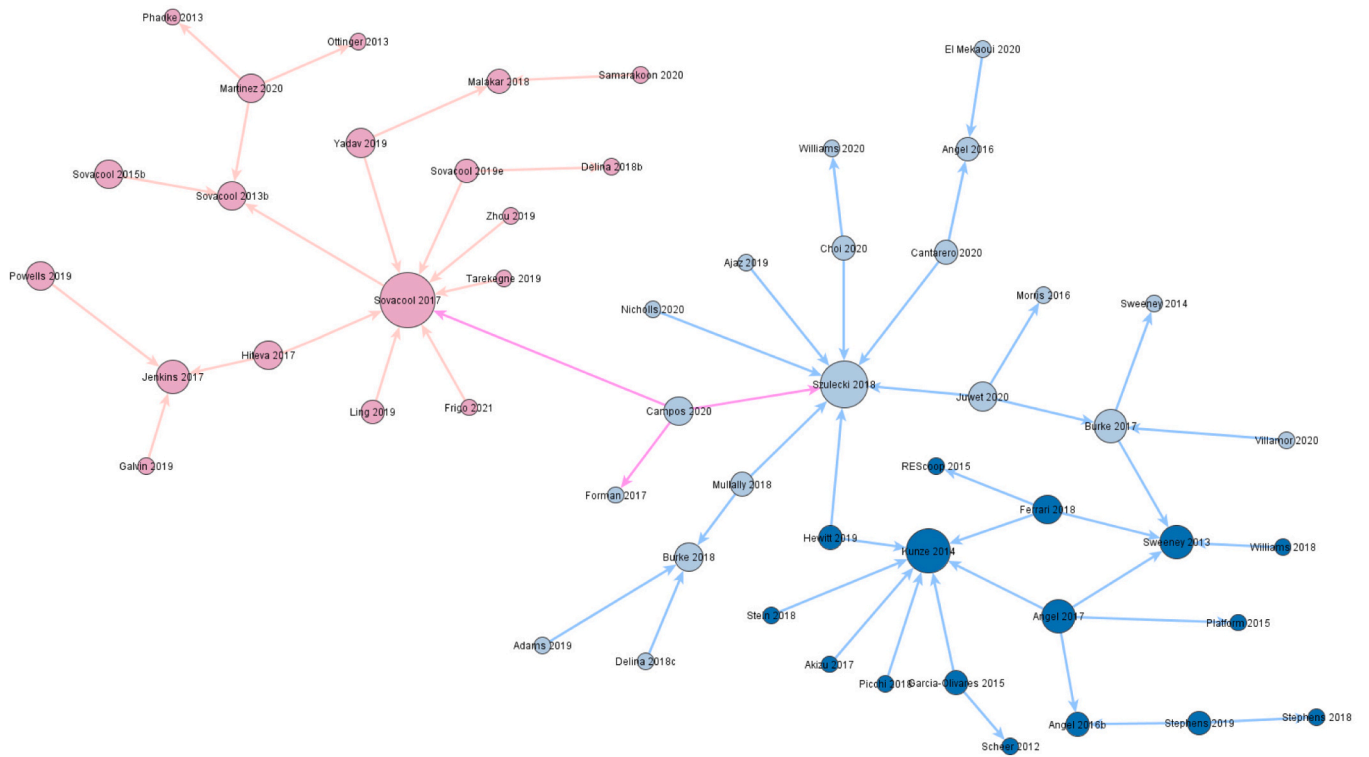


Fig. 2. Sample visualization of a bimodal reference network.

Publication year

Energy Justice Energy Democracy

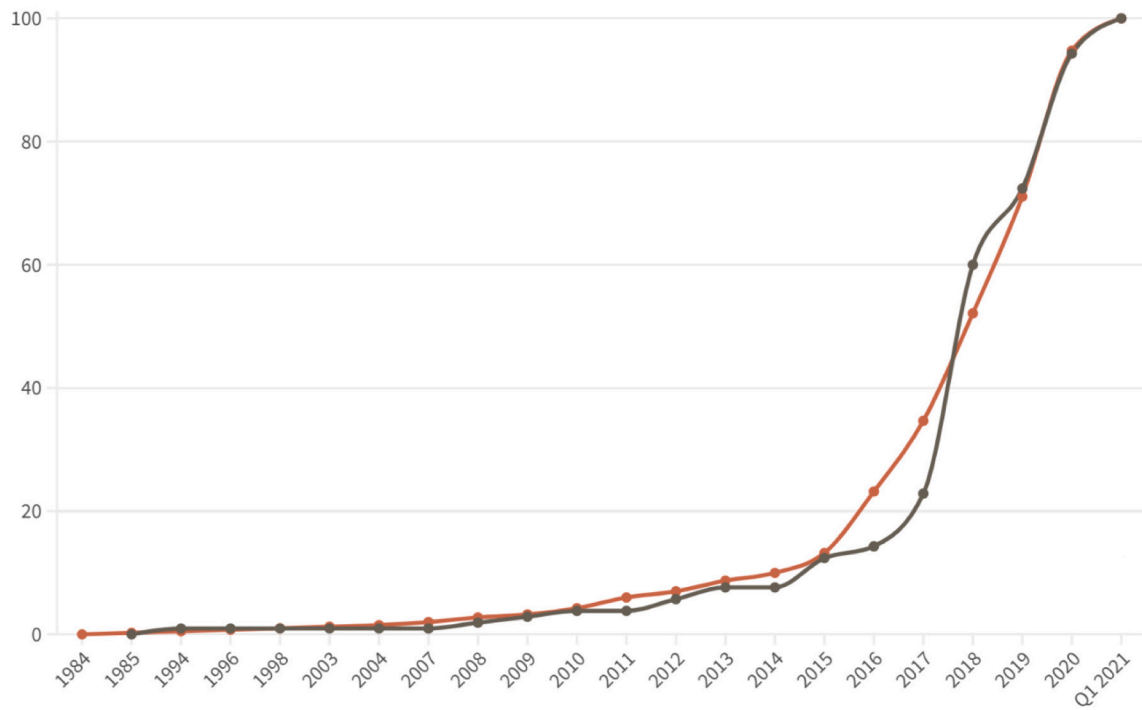


Fig. 3. Publications over time (cumulative percentage).

Outlet journals

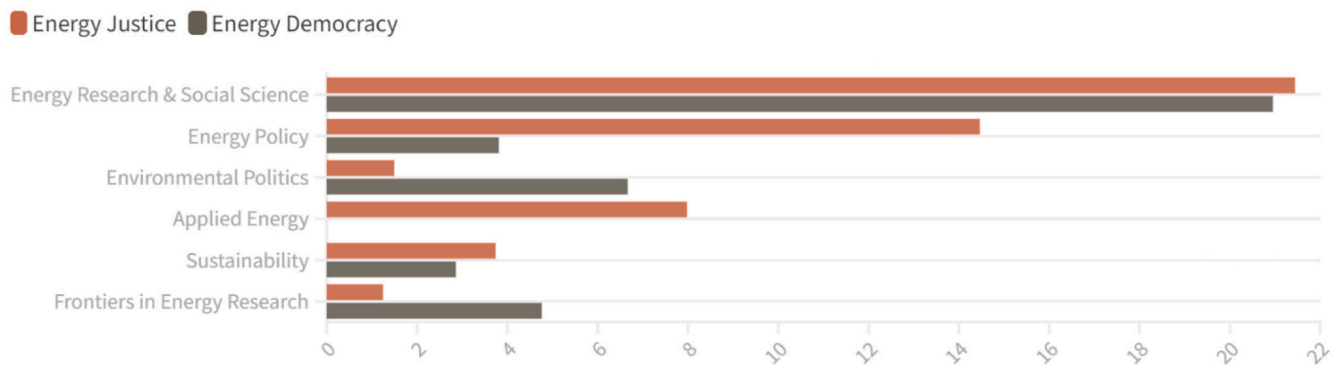


Fig. 4. Main outlets in which EJ and ED research is published.

Country focus



Source map: World Bank Official Boundaries

Fig. 5. Geographical focus of Energy Justice research, by country (occurrence per 100 documents).

or onshore wind, and additional 36 % somewhat reflect them. While these numbers are significantly lower in the case of the EJ field (33 % and 13 %, respectively), it is still the most frequently occurring energy technology.

In both fields, RES are followed by coal and nuclear energy. Coal is mainly developed within the EJ field, as there are only 3 ED documents with coal as their primary focus [19,30,31]. EJ scholars typically approach it in local studies, which are mainly concerned with the socio-economic consequences of phasing out coal or the environmental impacts of expanding coal production or use. Less common are studies that look at the cross-regional impacts of declining coal use. Nuclear energy is typically approached by EJ scholars from an environmental justice perspective or as an example of large (energy) infrastructure whose

siting tends to be technocratic and prone to create social and environmental injustices. ED scholars discuss nuclear energy mainly in the context of participatory decision-making at the national level, and mostly deal with cases where public participation was initiated in a top-down manner. Surprisingly, the issue of nuclear waste is almost absent, as it was the primary empirical focus for only 3 documents out of the entire corpus [32–34].

Offshore wind (despite the issues of local acceptance and participation playing a role in the siting process [35]) and technologies of the bottom of the “energy ladder” [36]: bioenergy and LPG, formed some of the least occurring technologies across the sample. Confirming the limited attention both fields pay to the issue of economic development, only 5 out of 20 documents which deal bioenergy and LPG include a

Country focus

0.95  20



Source map: World Bank Official Boundaries

Fig. 6. Geographical focus of Energy Democracy research, by country (occurrence per 100 documents).

Scale

Other Local

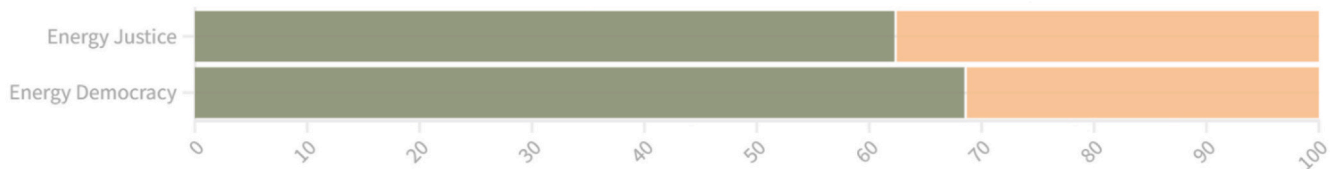


Fig. 7. EJ and ED compared according to scale (local scale or 'other').

Bottom-up initiative

Local energy community Movement Protest NA



Fig. 8. Type of bottom-up initiative analyzed by empirical EJ and ED research.

country focus look at developing countries [37–41].

4.2.4. Social groups as objects of analysis

While both literatures reference 'local communities' as objects of their analysis to the same extent, a major difference lies in the attention

paid to low-income households and groups. EJ has a distinct focus on socio-economic inequalities, dealing with low-income households or exploring issues such as energy poverty or the impact of decarbonization policies on vulnerable communities, whereas in ED this category is virtually absent. In this sense, Droubi et al. are certainly right that ED

Technology

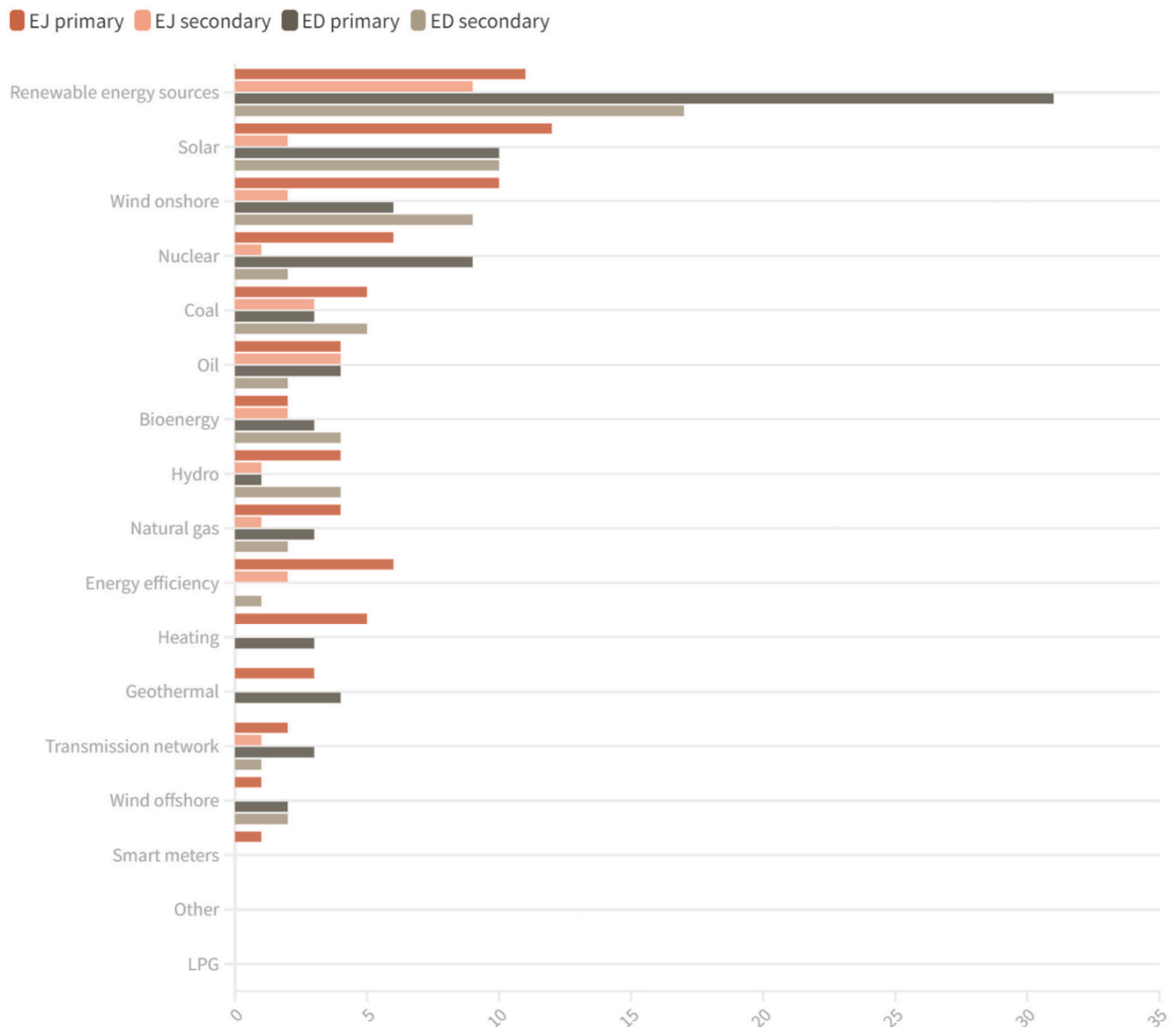


Fig. 9. Energy technologies covered in EJ and ED research.

fails to address the distributive dimension of energy justice. Instead, ED pays somewhat more attention to women, particularly their empowerment through the transition to renewable energy and the associated

decentralization of energy supply. EJ research, on the other hand, is devoted to unspecified social groups (Fig. 10).

Social group

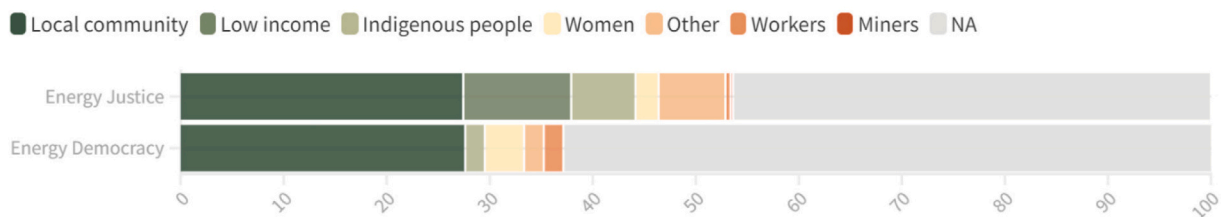


Fig. 10. Social groups referenced in EJ and ED research.

4.3. Conceptual dialogue: definitions, overlaps and contradictions

4.3.1. Definition type

Within the “core” set, i.e., among documents which refer to either EJ, ED or both in their titles or keywords, 60 % of the EJ and 43 % of the ED documents are explicitly guided either by one definition or understand the concepts through a straightforward framework built of up to four definitions (coded as “Reference”). An additional 18 % and 13 % respectively engage with the concepts via more complex theoretical discussions, which cover multiple approaches and definitions but are not explicit in which one(s) are guiding their empirics. A relatively small number of EJ authors attempt to come up with their own definition (less than 4 %) while such an endeavor is fairly common among the ED authors (15 %) (though here we note the smaller size of the “core” sets – 53 ED papers in comparison to 238 for EJ) (Fig. 11).

Despite referring to EJ in title or keywords, as many as 18 % of the core documents do not include any definition of the concept whatsoever. This number climbs even higher in the case of the ED core set to 28 %. Similarly, of the documents that explicitly mention EJ or ED in their titles, 7 % and 13 % respectively do not provide any definition (see the “Title” sets in Fig. 11). It could also be seen to demonstrate that these terms reflect a particular fashion in the literature for these topic areas and therefore are routinely treated as self-explanatory. In the case of ED in particular, a closer look at the source material reveals that some authors simply settle for the commonsense view that means more people having more control over energy supply, without engaging with the ED literature. Similarly, EJ is tacitly approached as an injustice that occurs alongside some development of energy systems, again without any attempt to clarify what the concept means.

Alternatively, the concepts are used to position one’s research in the social sciences. Authors include them in titles or keywords to indicate that the research may also be relevant to the study of EJ or ED, without actually addressing them. In instances where the concepts are included in titles but not substantively discussed, this practice may seem excessive and misleading. It may give the impression that the concepts are being used as mere buzzwords to attract a wider audience.

4.3.2. Definition

Across the whole corpus, there are 175 EJ and 35 ED documents guided by a single definition or a straightforward conceptual framework (coded as “Reference”). This includes 7 documents that belong to both fields.

Altogether, 124 unique definitions or conceptualizations were identified. Some of them were explicit attempts to define the concepts in question, while others were originally developed within other strands of research, such as Environmental Justice or Energy Poverty, and then applied to the study of Energy Justice or Democracy. Some of them, in

fact as many as 17, were applied within both fields simultaneously.

In terms of frequencies, the most common definitions are by Jenkins et al. 2016 [42] and Szulecki 2018 [4]. Among the “Reference” documents, they provided guidance for 29 % and 26 % of them respectively. In the EJ subset, Jenkins et al. 2016 is followed by Sovacool and Dworkin 2015 (17 % [43]), McCauley et al. 2013 (16 %, [44]), and Sovacool and Dworkin 2014 (10 %, [45]), followed by other definitions [46–56]. Alongside Szulecki 2018, the Energy Democracy field is mostly guided by Kunze and Becker 2014 (23 %, [57]), Sweeney 2013 (14 %, [58]), and Van Veelen 2018 [14] and Jenkins et al. 2016 [42] (both 9 %). The latter is worth noting, as it means that a considerable share of ED literature refers to the most important conceptualizations of Energy Justice, alongside Energy Democracy. This is followed by a number of other, less popular conceptualizations [6,25,28,43,46,48,59–67], many of which are in fact primarily referring to Energy Justice (see Fig. 12.). The weight of these references varies. Some ED scholars explicitly treat EJ as a foundation for ED, others seek to differentiate the work on energy democracy from that on energy justice, others use elements of EJ in their ED frameworks. What is most important is that there is certainly a high degree of awareness and conceptual dialogue which can be seen as ‘critical’, depending of course on how one defines such engagement.

Please note that for presentational reasons, in this and the following Figures and Tables, references only list the first author without naming the second author or adding ‘et al.’ for three or more authors. The key to the publications analyzed in our review can be found in the Appendix 2).

4.3.3. Reference network and clusters

The reference network analysis yielded three maps: a directed bimodal network where citing documents point to their references (Fig. 13), an undirected unimodal network in which references are connected if they are cited by the same document (Fig. 14), and an undirected unimodal network in which references are connected if both are cited by at least two documents (Fig. 15). The original bimodal network was clustered via the Louvain algorithm [20], which effectively returns node groups that have more connections within groups than outside of them. The clustering yielded 9 EJ clusters and 2 ED clusters (Table 3).

The EJ clusters are internally heterogeneous, and a closer inspection did not reveal any major differences in the substantive foci of the documents across the clusters. Documents focusing on specific countries, technologies, or social groups are relatively evenly distributed across multiple clusters and the same applies to relatively frequently occurring broader themes they cover, such as Energy Poverty. This may suggest either that the EJ definitions are overlapping and many of them can be used in all sorts of empirical analyses, or that the documents’ authors select the guiding definitions based on something other than thematic or empirical foci of their articles. They may, we speculate, be more familiar

Definition type

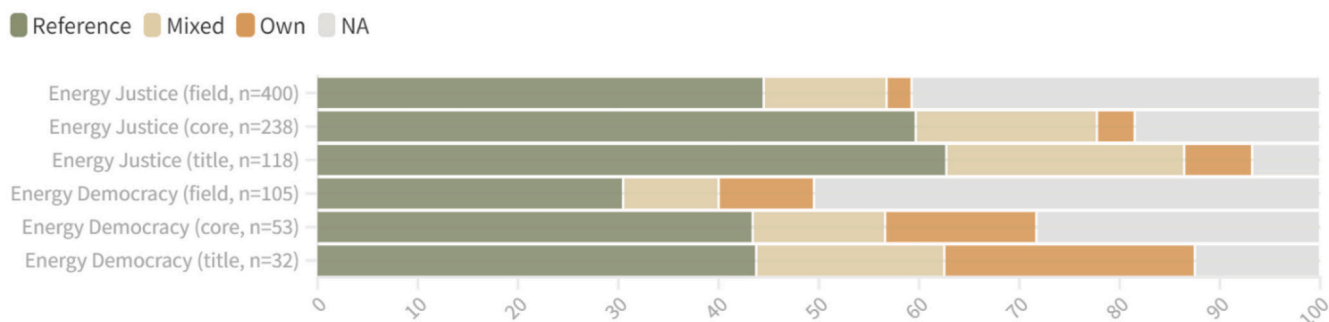


Fig. 11. Type of definition according to article category.

Definition

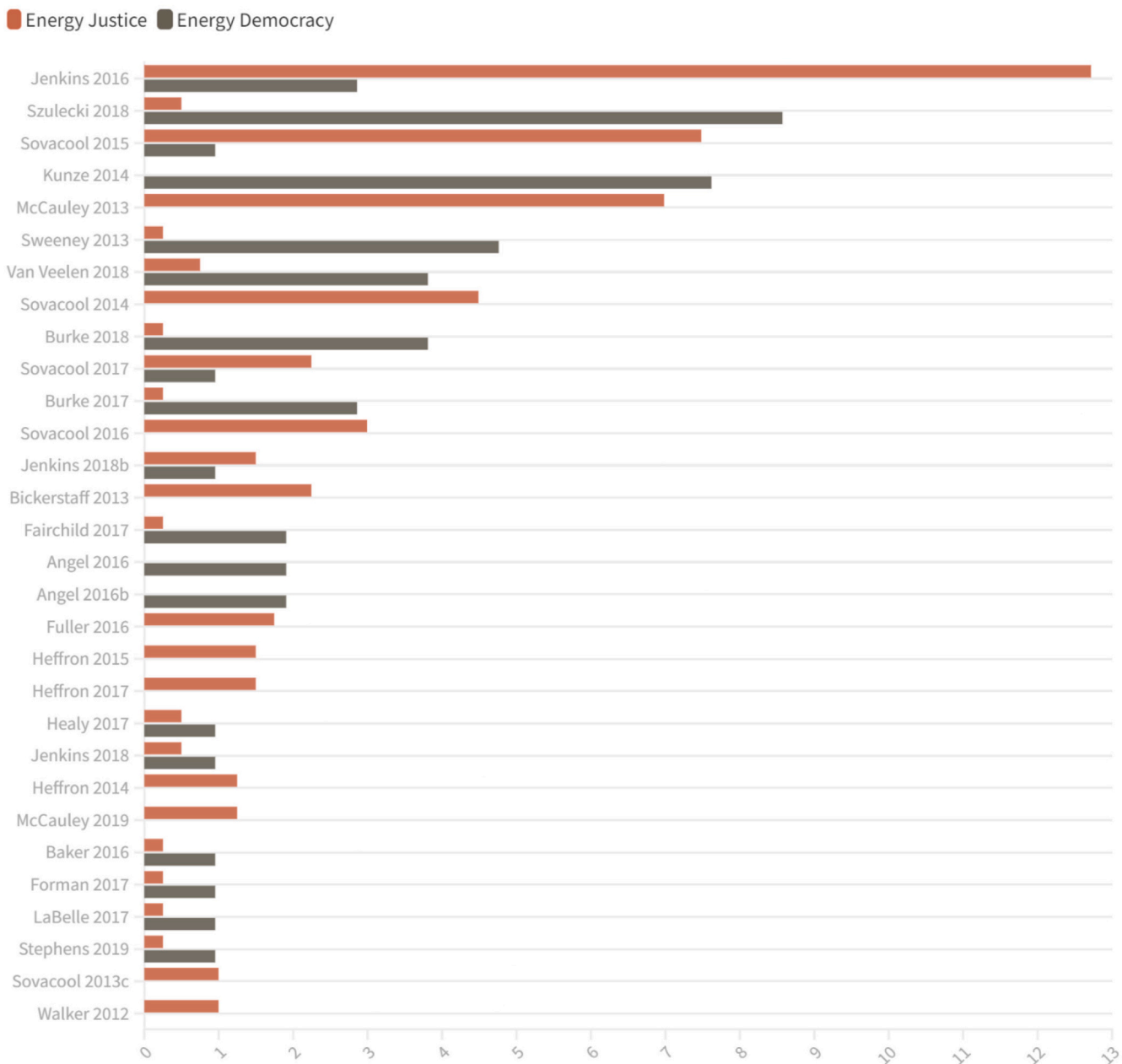


Fig. 12. Comparison of most popular definitions' occurrence for EJ and ED (occurrence per 100 documents within the "Reference" subset).

with a certain strand of the conceptual literature, consider one definition more useful than the others, or simply use a definition which is most accessible, known or cited elsewhere.

The ED clusters, albeit similarly heterogeneous, show one clear pattern: the pre-2019 documents typically draw on Kunze and Becker 2014 [57] or Sweeney 2013 [58] (the ED2 cluster), two early conceptualizations originating from social movement practice. In contrast, the ones published after 2019 are typically guided by Szulecki 2018 [4] and, to a lesser extent, by Burke and Stephens 2017 and 2018 [28,59] (ED1). Notably, the ED1 cluster contains no document published in 2020 and later.

The bimodal network (Fig. 13) features four major focal points in the Energy Justice field (Jenkins et al. 2016, McCauley et al. 2013, Sovacool

and Dworkin 2015 and 2014, [42–45]) and two in ED: Szulecki 2018 and Kunze and Becker 2014 [4,57].

At first sight, the two fields appear largely disconnected but upon closer examination, there are two points of connection between them. One is represented by the 11 documents which are featured in both fields (marked by pink edges in the network graph) and which largely revolve around the topic of inclusion. The other by definitions which are broad enough to accommodate substantive themes from both fields, e.g. Jenkins et al. 2016 or Van Veelen 2018 [14,42].

The unimodal projection of the network (Fig. 14) reveals a strong co-occurrence of the definitions by McCauley, Heffron, Stephan, and Jenkins (2013) [44] and Jenkins, McCauley, Heffron, Stephan and Rehner (2016) [42]. This is perhaps not surprising, given that they are authored

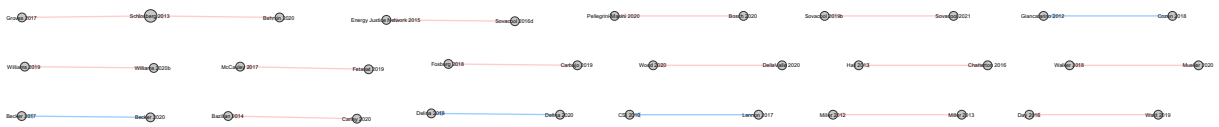
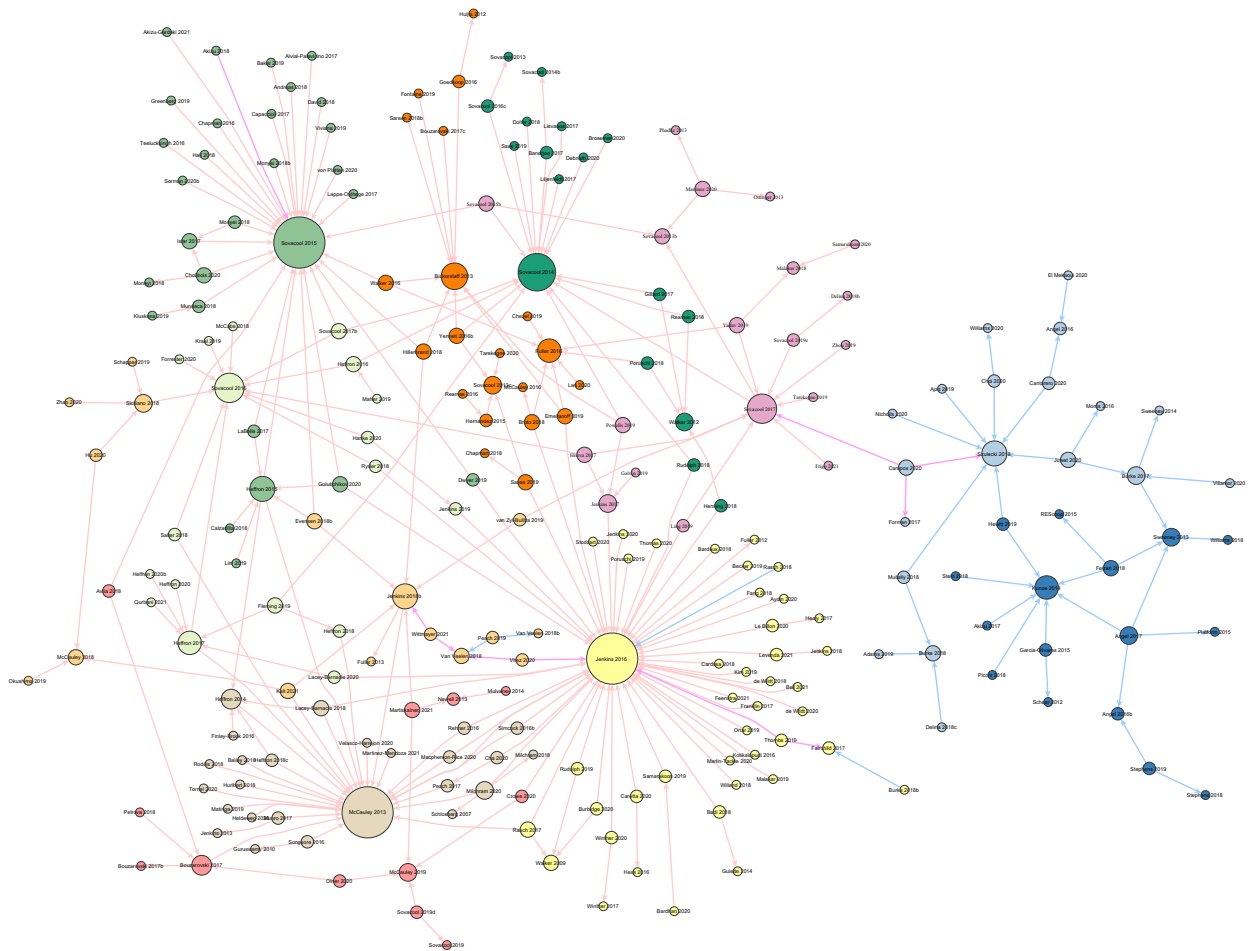


Fig. 13. The document-definition bimodal network.

by the same group of researchers, and both develop the same tripartite conceptualization of Energy Justice, that which comprises distributional justice, justice as recognition and procedural justice. They also represent the third largest and the largest cluster respectively, which makes them more likely to show multiple mutual connections than, for example, relatively smaller ED clusters.

When reduced to the backbone, that is, an unimodal network showing only nodes with two and more mutual connections (Fig. 15), the visualization confirms the strong connection between the two definitions and, on the other hand, reveals relative absence of connection between the EJ5 (Sovacool 2013b [68]) and EJ8 (Jenkins 2018b [48]) clusters and the rest of the network. This can be explained by the nature

and aim of these conceptualizations. Sovacool 2013b offers a more general approach to ‘energy ethics’, where EJ is but one component. The result is a list of eight principles that should drive decisions in the energy sector: availability, affordability, due process, good governance, prudence, intergenerational equity, intragenerational equity, and responsibility. Meanwhile, Jenkins et al. 2018 is an attempt to integrate the dominant tripartite Energy Justice framework with transitions studies in innovation/STS, by pointing out EJ dimensions applicable at the niche, regime, and landscape level according to the multi-level perspective on socio-technical transitions.

A relatively limited co-occurrence was also found between two pairs of the four most frequently occurring definitions: McCauley et al. 2013,

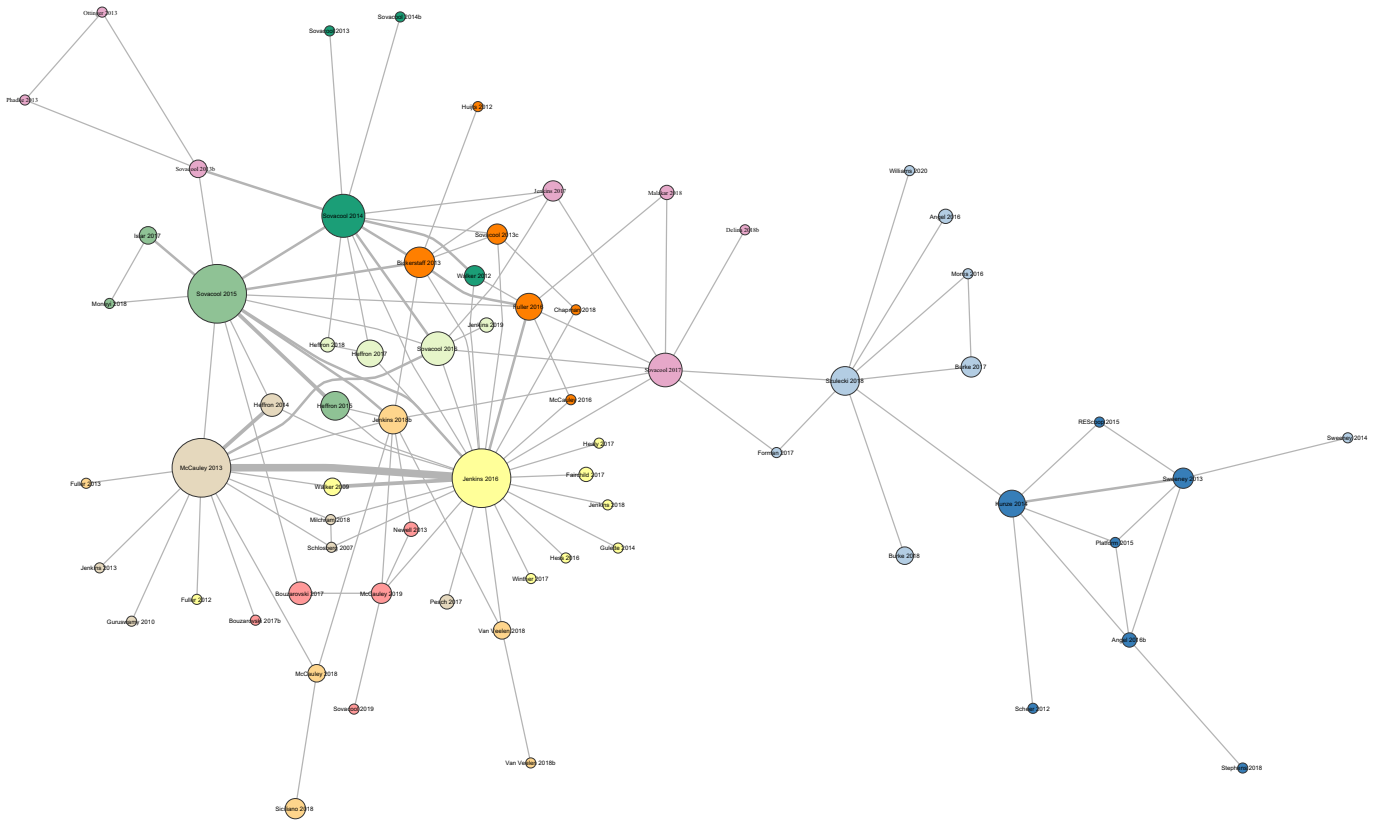


Fig. 14. The definition-definition unimodal network.

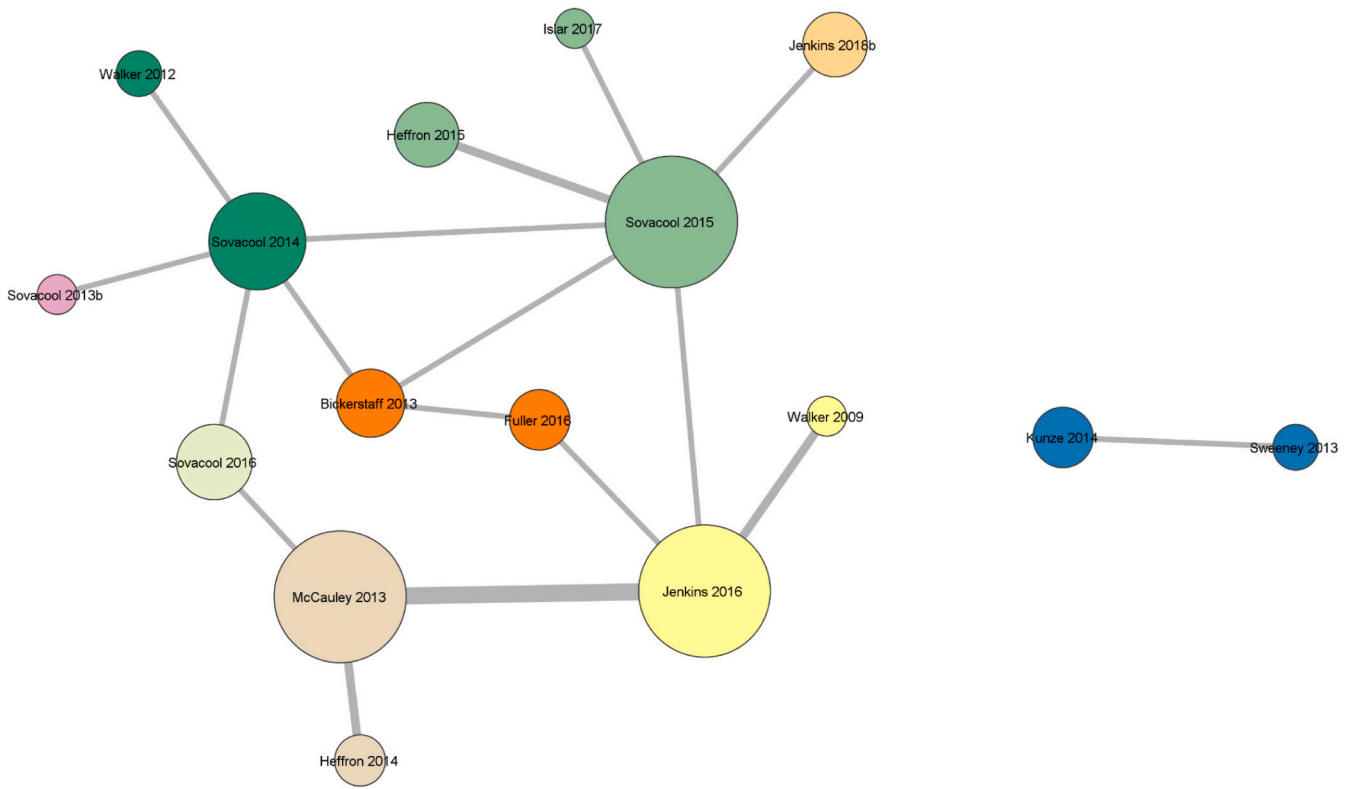


Fig. 15. The definition-definition unimodal network: the backbone.

Table 3
Reference clusters.

Cluster	Nodes	Leading definition	Cited ^a
ED1	18	Szulecki 2018 (Conceptualizing energy democracy)	8
ED2	16	Kunze 2014 (Energy Democracy in Europe: A Survey and Outlook)	7
EJ1	42	Jenkins 2016 (Energy justice: A conceptual review)	51
EJ2	29	Sovacool 2015 (Energy justice: Conceptual insights and practical applications)	30
EJ3	25	McCauley 2013 (Advancing energy justice...)	27
EJ4	21	Bickerstaff 2013 (Energy Justice in a Changing Climate...)	9
		Fuller 2016 (Framing energy justice: perspectives from activism and advocacy)	7
EJ5	19	Sovacool 2017 (New frontiers and conceptual frameworks for energy justice)	9
EJ6	18	Sovacool 2016 (Energy decisions reframed as justice and ethical concerns)	11
EJ7	16	Sovacool 2014 (Global Energy Justice: Problems, Principles, and Practices)	18
EJ8	16	Jenkins 2018b (Humanizing sociotechnical transitions through energy justice)	6
EJ9	12	McCauley 2019 (Energy justice in the transition to low carbon energy systems)	4

^a Times cited within the Reference set.

and Sovacool and Dworkin 2015 on the one hand and Sovacool and Dworkin 2014 and Jenkins et al. 2016 on the other. Finally, this projection hints at relatively weak co-occurrence across the ED field as only the early definitions by Kunze and Becker 2014 and Sweeney 2013 were cited by two and more documents simultaneously.

5. Discussion: what have we learned?

This systematic review allows us to better understand both the coverage of two leading normative concepts in energy studies – Energy Justice and Energy Democracy – as well as their mutual relationship. In this section, we will first revisit the initial questions and hypotheses, discussing the evidence gathered, and then move to more general findings, some of which are a cause for considerable concern.

5.1. Geographical focus

Is ED indeed a ‘first world problem’ while EJ is global? We hypothesized that if this were true, the ED literature would focus on the highly industrialized and developed countries of the Global North, while EJ’s geographical scope should be more evenly distributed, and display a strong (or at least relatively stronger) emphasis on the South. This is not the case. Both EJ and ED literatures are dominated by empirical case studies in the Global North, with only a handful of countries – where many of the researchers active in these fields reside – getting most attention. These leading countries include the US, Germany, and the UK. ED appears to have a more ‘German-centric’ focus than EJ, which in turn is more ‘British-centric’ – a fact which is not difficult to explain given the origin of the two concepts in the literature. We could even go as far as saying that for some of the studies that look at normative aspects of energy transitions in general, the scholar’s connection to either the UK or Germany may determine whether they choose to frame their analysis in terms of ED or EJ. Meanwhile, if non-Northern cases are analyzed, they are most often from Australia or the BICS countries (Brazil, India, China and South Africa, as Russia is not an object of analysis for either EJ or ED scholarship), with only a small fraction of research dedicated to other the Global South. Indeed, the Middle East and North Africa, the Sahel, Latin America south of Brazil, and Central Asia remain as white patches on the EJ/ED research map. In this dimension, EJ and ED are indeed twins, with hardly any visible, geographical differences.

5.2. Scale

Does ED focus on communities and local (co)ownership while EJ is applied universally, across scales and levels of governance? Hardly so. If anything, EJ research puts a bit more emphasis on the local level, while ED is more focused on social movements – not surprising, perhaps, because it is sometimes seen as one [5,25,60]. In this dimension, too, the normatively underpinned research on energy transitions, conducted under both the ED and EJ banners, is virtually indistinguishable, which suggests that for some scholars and in certain contexts, the concepts may be synonymous and interchangeable, especially if references to EJ and ED appear only in the paper’s title, keywords or introduction.

5.3. Technology

Which technologies are at the center of EJ and ED research? Is either of them more preoccupied with a renewables-dominated, ‘soft’ energy path while the other shows more universal concern? Not quite. Although ED research puts a visibly stronger emphasis on renewable energy sources, this can be explained by the shared theoretical assumption of all ED definitions, which is that the deployment of distributed RES generation unlocks the possibility of energy system democratization, or that the ED movement should strive to promote renewables to reclaim and restructure the current political economy of energy [3,4]. Either way, ED is inherently more technology driven than EJ. But apart from this distinction, the two concepts are largely applied to case studies of the same technologies in the energy sector. There is more EJ scholarship referring to energy efficiency and smart meters, while offshore wind is receiving slightly more attention from the ED perspective. As already noted, neither literature pays visible attention to the problem of nuclear waste (except from in a very few circumstances, e.g., [33]) which shows that this long-term problem involving intergenerational ethical issues is still not sufficiently recognized in social science energy research.

5.4. Social groups as objects of analysis

A major accusation that Droubi et al. made towards ED research was that it fails to address ‘justice’ or put differently, that it does not adequately address the injustices manifest in energy systems. Our systematic review generated important evidence corroborating their claim. Indeed, in comparison to EJ, ED literature is apparently blind to the problem of low-income groups and their fate in energy transitions. However, whether that means that ED assumes that ‘justice’ is dealt with through a democracy framework, is a more complex question. We can argue that through its openly political and governance-centered outlook, ED focuses on (and possibly expands) the justice as recognition and procedural justice dimensions in the conventional and most popular tripartite conceptualization of EJ. ED, however, does not directly address the distributional justice dimension, which many ED scholars would, as Droubi et al. also suggest, see as the result of effective participation and accountability, as well as pressure on the responsible institutions and decisionmakers.

5.5. Conceptual dialogue

Similarly to the above, Droubi et al. accuse the ED scholarship of not engaging ‘critically’ with EJ and of a lack of interdisciplinarity. As this is difficult to measure and easily falls into subjective judgements about what real ‘critical’ engagement is, we have instead checked whether ED and EJ scholars are aware of each other’s work, and refer to one another. Our findings are not conclusive, but if anything, they suggest that the ED literature that is more aware of its big sister EJ. ED conceptualizations more often refer to existing EJ frameworks, building on them and expanding them in a different direction. If they are not addressing justice to the same extent as EJ scholarship, it appears to be because of a conscious choice and not an omission. Our analysis of outlets also does

not seem to indicate that there is a difference in levels of interdisciplinarity, although ED could be seen as a concept more firmly rooted in political science, whereas EJ has less of a clear disciplinary stem.

Going beyond our systematic review, we should note that in recent years, both concepts have developed further and reached a new level of (self)awareness. Two important volumes that appeared already after our systematic review period, namely Feldpausch-Parker et al. [69] and Nadesan et al. [70], offer a deeper and broader discussion of ED than the seminar theoretical texts alone ever could. Some of the contributions in these volumes explicitly deal with the relationship between ED and EJ, or ‘democracy’ and ‘justice’. Feldpausch-Parker, Endres and Peterson, who in 2019 proposed the justice-participation-power framework for Energy Democracy [71], explicitly incorporating justice concerns in ED research and practice, have refined their approach adding technology as a new dimension [3]. Critical engagement with the problem of justice and acknowledgement that democracy alone does not guarantee it can also be found in the contributions by Peterson [72] and Scherhauser [73]. Further, Plumridge Bedi proposes the concept of ‘just energy democracy’ in a non-Western context (India) [74] while Walker and colleagues [75], Selk and Kammerzell, and Berthod et al. [76] all offer a strongly critical evaluation of ED as it translates to political practices – signalling a second or perhaps already third wave of ED scholarship which learns from its own mistakes. Meanwhile, EJ scholars are also taking stock of their evolving field and refining their frameworks, like Sovacool et al. [77] who seek to ‘pluralize’ EJ with more radical and transformational inputs from e.g. feminist and postcolonial literature.

6. Conclusions

Our review, inspired by the discussion opened by Droubi et al., leads to three main conclusions. *Firstly*, Energy Justice (EJ) and Energy Democracy (ED) display a close family resemblance in that not only their normative pedigree but also their empirical coverage is very similar. Where they differ, as indicated above, is particularly in ED’s reluctance to engage with distributional justice issues, and instead, focus on emphasizing the politics of energy transitions and issues of (good) governance in energy policy.

Dismissing ED as ‘academically unnecessary’ would be hard to ordain, especially since it has by now become a popular policy concept, functioning in European Union policymaking for example, where it refers to community energy, the creation of cooperatives, and other forms of citizen engagement in energy production, ownership and decision making (including, for instance, provisions made for the explicit role of citizens and communities in the Renewable Energy Directive [78]). These domains are uses and issues where EJ does not seem to reach at present.

As a political ideal, ED appeals to different principles and mobilizes different audiences than EJ does, which also means that it unlocks other opportunities for transformation. A simple mental exercise helps to make this point – if we removed the ‘energy’ part, would anyone be seriously willing to dismiss democracy, arguing that seeking justice is enough to guide our political life? And on the other hand, with decades-long experiences of democratic politics, at least in parts of the Global North, we should be well aware that justice and equity are not brought about by democracy alone and securing them requires a continuous struggle [79]. As democracy matures, and scholarly work on democracy develops, it is natural to investigate democracy in specific contexts and to consider its relationship to the pursuit of justice.

In practice, the radical potential for change is unlikely to be determined by whether the actors involved in transformation use either the term energy democracy or energy justice, particularly as the practices and policies explained within these frameworks are often consistent no matter which term is used. Indeed, these terms might only be used infrequently, if at all. In that regard, we argue that establishing and reinforcing the synergies, linkages, and overlaps between is more

important than continuing a competitive and critical tradition that seeks to reinforce only tensions and differences.²

If the two concepts ought to be bridged rather than proven superior, how can that be achieved? As we noted, eleven papers in our review corpus were featured in both fields and largely revolved around the topic of *inclusion*. Inclusion and inclusiveness can be understood in more socio-economic terms, where it means equity and reducing inequalities and unfair burden distribution; or it can be approached from a political perspective, where it is a question of expanding franchise and participation and of broadening the pool of stakeholders through meaningful participation. If one agrees with that, then talking about inclusive energy transitions and maintaining the ideal of social inclusion as a standard should, it seems, allow scholars to build both ED and EJ elements into that framework.

While welding and expanding normative research on energy transitions is possible, our *second* conclusion is that both EJ and ED researchers need to practice what they preach and take the study of vulnerable groups and less privileged countries as a priority. Of course, research funding limitations, insufficient resources, and the length of projects are understandable barriers, as is access to research subjects in the field. It is without doubt easier to gather data in highly developed societies and transparent democratic political systems. But the imbalance between the normative ideals of democracy and justice and the geographic scope, scale and focus of the two literatures is striking. The already noted emphasis on inclusion should also be a guiding principle here, where the need to promote more inclusive energy transition research can be used as an argument to expand research in areas where it is now lacking.

A *third conclusion* of our review and a major problem which we identify, is the detachment of theory and empirical research. Both literatures, as we noted, are top-heavy in terms of an oversupply of theoretical and normative proposals but display an insufficient focus on empirical application. Much if not most of the empirical research on EJ and ED does not really translate these concepts into research practice. Even if, in numerical terms, empirical papers outnumber theoretical papers by a factor of 4 to 5, it appears that theoretical proposals on EJ and ED are not sufficiently informing empirical research. Too many papers make reference to concepts, sometimes even cite definitions, but fail to make a connection between the theoretical framework and the empirical work and findings. The deeper roots of this can be traced to the internal characteristics of the theoretical debates among EJ and ED scholars. Indeed, ED scholarship, as has already been noted [5], is fragmented, and fails to work out an approach to ED that allows for learning across cases. On the other hand, while EJ appears to have worked out a dominant definition, the way it can be operationalized and the analytical purpose it can serve is not clear.

Our review has demonstrated that very often concepts are either vaguely alluded to or not applied beyond broad conceptualizations to inform or analyze empirical contexts. As many as 19 % of papers do not define the concepts, they refer to in their titles at all. For others, it was also not uncommon to merely cite one or several conceptual papers, but not to apply them and, as we note above, not to draw connections between the theoretical concept and the empirical analysis. This suggests that the biggest problem in normative energy studies is not that the concepts are too similar, or that they are not clearly defined or cannibalize each other in conceptual rivalry. It might rather be that they are often used as buzzwords that are called upon somewhat randomly and ritually as decoration for descriptive research on the social aspects of energy transitions. If that were indeed the case, which we believe some of our evidence shows it is, this draws significant concern with our research practice and raises further questions about its quality and the very possibility of learning beyond individual cases. To go full circle in

² We thank two of the anonymous reviewers for the comments on which this and the preceding paragraph draws.

our argument, it also undermines knowledge building and the radical potential for change which is inherent in the two concepts and their applications.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

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Data availability

Data will be made available on request.

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Appendices. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.erss.2023.103266>.

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