# Energy justice in the developing world: a review of theoretical frameworks, key research themes and policy implications

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**Highlights:**

* First systematic review of energy justice studies in developing world contexts.
* Research emphasis on renewables, qualitative methods and specific regions noted.
* Three-tenets approach dominates; environmental/social/climate justice also central.
* Energy decentralisation advocated to increase access and/or enhance sustainability.
* Policy emphasis on increasing participation; little on reducing power of elites.

**Abstract:** Energy justice, building on foundations within both the field of environmental justice and wider justice scholarship, has grown rapidly as a research field over recent years. However, the dominant energy justice theoretical frameworks, and many of the field’s core case studies, originate fromwork in developed countries, with energy justice research only recently spreading to new areas of the world. This paper thus systematically reviews the current state of ‘developing economy’ and ‘economy in transition’ literature in the energy justice field. In doing this we analyse the (1) methods, energy types and locations explored thus far, unearthing key gaps, as well as (2) the multitude of ‘justice-led’ theoretical frameworks used. We also identify core themes illuminated by energy justice research in the developing world, including: (3) decentralisation, access and sustainability, (4) exposing institutional instability and corruption, (5) acknowledging marginalised communities and gender inequalities, whilst extracting key (6) policy implications. Vital questions are raised for the continued advancement of energy justice research into new contexts and thus its conceptual evolution. Our review highlights the potential for energy justice-led attention to expand current institutional, contextual and empirical scope in specific ways, including greater attention to the poorest global regions, and certain energy technologies including nuclear and CCS. We suggest four ways in which future theoretical developments of the field might take place: (i) greater attention to spatial analyses of neglected regions; (ii) expanding the field to further include non-western philosophical traditions; (iii) more work on applying tenets, frameworks and principles specific to energy justice and (iv) systems approaches to developed-developing country relations, with an emphasis on how they relate to low-carbon transitions. Thus, whilst we explore past and present applications of energy justice in developing world contexts, we also offer guidance on the ways in which it could be applied in the future alongside encouraging dialogue between different ‘justice’ fields.

**Keywords (max 6):** three-tenets, environmental justice, decentralisation, energy access, marginalised communities, renewable energy

**Introduction**

### 1.1. Background context: frameworks of energy justice and its ‘developed world’ roots

In a world where the benefits and impacts of energy systems are distributed highly unevenly, ‘energy justice’ as a concept has rapidly risen in prominence in the energy-related Social Science and Humanities over the last five years (Sovacool & Dworkin 2014). Energy justice involves critical analyses of where (in)justice occurs within energy systems, or how justice might be achieved, particularly in the context of the rapid pace of low-carbon transitions (e.g. Bickerstaff et al 2013; McCauley et al 2013; Jenkins et al 2016). This research agenda is part of the wider proliferation of different ‘justice’ concepts for sustainability issues, including the ‘CEE’ dimensions of climate, environment and energy justice (Heffron & McCauley 2018) and the ‘just transitions’ concept (Swilling & Annecke 2010; Newell & Mulvaney 2013).

Energy justice literature, for its part, draws heavily on two dominant theoretical frameworks. Firstly, the three core tenets framework (*procedural justice* – participation in energy decision-making; *distributional justice* – sharing of energy system benefits and burdens; and *recognition justice* – acknowledging marginalisation and social inequalities), with a recently proposed fourth tenet of *restorative* *justice* (Heffron & McCauley 2017; Siciliano et al 2018) – a process of remediation in response to a perceived energy injustice – influenced by legal theory on criminal justice. Secondly, as a field built around a key ‘problem’ (energy), much work in energy justice has sought to directly influence policy. Here, the eight-principle decision-making framework (Sovacool & Dworkin 2015) aims to provide clear tools for policymakers through the consideration of: availability; affordability; due process; transparency and accountability; sustainability; intra-generational equity; inter-generational equity; and responsibility.

With the three-tenets in particular directly building on the threefold-tenet approach to global environmental justice (see Schlosberg 2004), energy justice evidently has roots in the field of environmental justice which emerged in the late 20th century (Bullard 1994; Harvey 1996; Schlosberg 2004). There is ongoing debate between the energy justice and environmental justice fields, with some proposing that energy justice offers distinct and novel advantages, such as its explicit focus on policy relevance as highlighted earlier (Jenkins 2018) which somewhat sets it apart. In contrast, with environmental justice having a longer and deeper history (Bullard 1994; Walker 2012), some energy justice scholars have outwardly acknowledged that the field is very much rooted *within* environmental justice (e.g. LaBelle 2017). In a more conciliatory move, other scholars are beginning to assert that climate, energy and environmental justice require deeper forms of collaboration and unification, working more consistently with one another rather than against each other, for example under a ‘just transitions’ framework (Heffron & McCauley 2018; Cardaso & Turhan 2018).

Whether one seeks to distinguish between or bring together these justice fields, literature review work is a vital tool in enabling cross-field interdisciplinary discussions, which allows us to more explicitly and in more detail showcase what different fields can produce theoretically and empirically (Jesson et al 2011; Petticrew and Roberts 2008). This we feel is an important part of establishing constructive dialogue between these fields, in order to, for example, understand how they differ, complement and/or directly assist one another. For example, to date, the ‘triumvirate of tenets’ (McCauley et al 2013) appears to have been the most widely used theoretical framework in the energy justice field (Jenkins et al 2016), but there has been no field-wide assessment of the variety of theoretical frameworks actually being used. Indeed, regardless of geographic context, there have been very few energy justice specific literature reviews to date, which is markedly apparent when considering the number of environmental justice specific literature reviews (e.g. Bowen 2002; Neimanis 2012; Walker 2011; Reed & George 2011). The few energy justice reviews that have been done have also been limited in scope and remit, for instance, by being predominantly non-systematic narrative-led reviews/summaries of the field (e.g. Jenkins et al 2016), a literature review oriented towards the contribution of an *explicitly spatial* focus on energy justice (Bouzarovksi & Simcock 2017), or reviews of energy literatures more generally using an energy justice framework (e.g. Banerjee et al 2017 looked at renewable energy literatures using the prohibitive and affirmative principles, derived from Sovacool & Dworkin 2014). Whilst narrative reviews are useful for exploratory exercises that open-up new streams of enquiry in emerging fields – as per e.g. Heffron & McCauley (2017) and Sovacool et al (2017) when proposing new conceptual priorities for energy justice – a systematic approach is urgently needed to offer an appropriate synthesis of the state of the literature at a thematic level (Petticrew and Roberts 2008; Sorrell 2007; Sovacool et al 2018).

One potential limitation of energy justice, in direct contrast to environmental justice scholarship which has a rich history of global research, is that it still largely has its roots in specific parts of the developed world. Core foundational texts and active networks stem from ‘western’ academics and institutions, with particular geographical origins found in the United Kingdom, the United States and Europe (e.g. Bickerstaff et al 2013; McCauley et al 2013; Sovacool & Dworkin 2014; Sovacool & Dworkin 2015; Jenkins et al 2016; Energy Justice Network; International Energy Justice Council). When considering global energy transitions, the International Energy Agency has predicted that developing countries, in their push for rapid industrialisation, will account for over two thirds of the world’s energy demand in the coming decades(IEA, 2017).However, while the young research field of energy justice has *begun* to take on global dimensions (Baker 2016; Munro et al 2017; Damgaard et al 2017) it cannot yet be said to be widely deployed in developing country contexts. A recent example is the 2018 special issue on *‘low-carbon energy systems and energy justice’,* featured in the *Applied Energy* journal, which contains some of the latest developments in energy justice research. Interestingly, it draws nearly *all* of its case study data and empirics from developed country contexts; out of 19 new papers, only two feature developing countries (Broto et al 2018; Cardaso & Turhan 2018).

To date then, there has been little review work to showcase the state of play of energy justice research in developing country contexts, and to assess if (and bring together how) energy justice scholarship may be starting to offer insights of relevance globally. In addition, there are few evaluations of particular energy justice issues or themes arising in developing country contexts, and which therefore either require new theoretical approaches, could start a dialogue to compare these themes with those arising in developed country contexts, or indeed which may offer new lessons for developed country contexts. We see great potential for further energy justice-led attention to the developing world to both address current institutional, contextual and empirical bias within the field and expand its scope and relevance as a research field. This paper seeks to advance that cause by providing a baseline assessment of the contemporary status of the field.

### 1.2. Research aim and objectives

The overall aim of this study is to systematically review research focussed on energy and justice in ‘developing economies’ and ‘economies in transition’. In undertaking this novel review, our objectives are to:

1. Explore diversity in *locations, methodologies used* and *energy types studied* to both highlight the current empirical pool of primary data, and identify potential gaps and priorities.
2. Identify and reflect on the range of *theoretical frameworks* being used.
3. Describe *key research themes* within developing economy and economy in transition contexts, which may offer both *conceptual challenges and policy implications* for justice researchers and energy policy workers, including within ‘developed’ countries.
4. Discuss the *strengths and weaknesses* of the different theoretical frameworks identified in addressing these challenges/implications.

In fulfilling these research objectives, this paper also seeks to advance interdisciplinary debate between energy justice and relevant work which relates to issues of inequality, ethics, and poverty, as well as the fields of climate, social and environmental justice more broadly. The paper proceeds as follows: we begin by detailing the methodological approach to our review, including the procedures used in sourcing and analysing the literature (section 2). In section 3 we then analyse both the empirical foci and methods of the selected literature, and conceptual frameworks used therein, before discussing three key themes from our inductive review processes, finishing by drawing out how this body of literature is currently engaging with policy. In Section 4, our concluding discussion, we highlight critical questions raised for the development of energy justice theory, as well as encouraging dialogue between different ‘justice’ fields.

## Systematic literature review criteria and methods

In conducting our search of energy justice literature,we chose to use ‘Web of Science’ (WOS) as our search engine due to its prolific standing within the world of academia and its extensive database (going back to 1970) and coverage of research outputs across the globe. Since we were interested in papers which directly and indirectly used an energy justice framing, we searched WOS for all papers containing the words “Energy” and “Justice” in the title, abstract, author-defined keywords and ‘keywords plus’ (additional set of keywords automatically generated by WOS from the titles articles cited)[[1]](#footnote-1). A first search returned 694 results on the 31 January 2018, with a second search of papers published between 31 January and 7 May 2018 returning 60 further papers[[2]](#footnote-2). Any potentially relevant papers not picked up are due to the specifics of the WOS search engine’s algorithm. However, the number of journals covered at the time of the search exceeded 32,000, while the WOS platform contained 148 million records of journals, books and proceedings in its database[[3]](#footnote-3).

We then reviewed these 754 papers, to find those with an empirical focus which included a country / countries that fell under the UN’s ‘developing economy’ or ‘economies in transition’ list[[4]](#footnote-4) in their country classification table published in the ‘World Economic Prospects 2018’ document (UN 2018). The UN publication uses ‘basic economic country conditions’ and comparative levels of development according to per capita gross national income (GNI) to place each country into its respective country classification, whilst summarising the geographical regions for ‘developing economies’ as: Africa, East Asia, South Asia, Western Asia, and Latin America and the Caribbean. ‘Economies in transition’ are found throughout South-Eastern Europe and Central Asia (see UN 2018 p.139-141 for more information).

When scanning through the search results, where the title was not clear on the empirical focus of the study, the abstract was read to determine which country/countries were looked at. If the abstract was not clear about which region it was focussing on, the paper would be opened and a more detailed examination took place: either by skim-reading the paper (e.g. introduction, methodology, results, conclusions) or by searching for countries mentioned in the keywords or abstract to confirm the use of that country as an example or area of focus. Papers that compared or focussed on both developing and developed countries or spanned geographical areas encompassing both developing and developed countries were also included. This way, we felt that any publication that looked at developing economies and economies in transition could be included, even if the main focus was on a developed country.

This process resulted in 68 papers focussed in whole or in part on either developing economies and/or economies in transition. We then further separated the papers out into ‘primary’, ‘secondary’ and ‘tertiary’ papers. In our categorisation, primary papers referred to ‘energy justice’ (both words together) in the title, abstract or keywords & keywords plus of the paper. This category therefore includes 18 papers which either explicitly used an *energy justice framework* in their analysis, or explicitly referred to/built upon energy justice scholarship. Secondary papers in contrast had ‘energy’ and ‘justice’ (separately) in the title, abstract and/or keywords (or keywords plus) of the paper *and* used a justice framework (e.g. environmental, climate, social), or related social science framework (e.g. political ecology, energy ethics; poverty; equity; sovereignty) in their analysis of energy in a developing economy / economy in transition; there were 43 secondary papers. Tertiary papers did have ‘energy’ and ‘justice’ (separately) in the title, abstract and/or keywords (or keywords plus) of the paper, but did *not* use a justice framework or other related social scientific framework in their analysis. These seven tertiary papers covered studies on conservation efforts in Cuba (Davey 2005), energy saving behaviour change schemes in China (Zhang et al 2013), a legal analysis of energy regulation in South Africa (Murombo 2015), a comparative analysis of nuclear energy law in India and the US (Ameye 2015)[[5]](#footnote-5), the role of trust in conflicts over energy development in Chile (Vellejos-Romero et al 2016), governance challenges associated with carbon market mechanisms in both Thailand and Vietnam (Smits 2017), and systems thinking in teaching where energy was an example (Ateskan 2018). While these papers focus on sustainability issues and themes associated with low-carbon transitions in developing countries, they do not draw upon any justice frameworks, or only refer to justice explicitly in a legal sense. We therefore discarded the 7 tertiary papers as they were ultimately not relevant to our literature review aims.

We acknowledge that, as well as the omissions that using English-language search terms entails, our search method also does not capture all papers that consider topics and themes of relevance to energy justice issues in the developing world. This is because papers may use a wide range of terms or conceptual frameworks (e.g. energy equity, or justice-related aspects of energy access); indeed, identifying this range is part of the aim of the current paper. No set of search terms would be exhaustive, however our method gives both a clearly defined and replicable set of boundaries but also, importantly, by identifying a set of frameworks related to energy justice (see subsection 3.2 and the ‘theoretical frameworks’ column of Table 2) now makes future wider searches possible in a more systematic way.

To confirm the categorisation of our search method, the primary papers are therefore the closest obtained results to *explicit energy justice studies* on developing economies and economies in transition. This distinction identifies whether or not a paper’s authors were specifically using an energy justice framework, and engaging with ‘energy justice’ literature, as opposed to using a framework broadly relevant to issues of ‘energy’ and ‘justice’ in developing economies and economies in transition, and potentially building on other relevant literatures. This primary/secondary separation was important for two reasons. Firstly, it allowed us to develop more precise conclusions when assessing the conceptual frameworks being used within, and on the boundaries of, the ‘energy justice’ field; this is covered in subsection 3.2. The secondary papers do not have such a close link to energy justice frameworks, e.g. different tenets, principles of justice or the 8-principle decision-making framework. Secondly therefore, the distinction enables more precision when it comes to conclusions about how energy justice literature is being explicitly invoked in studies (the primary papers), which we felt may be of use to future studies. Nevertheless, we note that in some of the findings subsections the insights generated across the two categories were similar.

### The next step of our method facilitated a deeper review of the primary and secondary papers. This review involved both a structured, deductive content analysis, and a thematic review. Specifically, for the deductive content analysis, the following eight dimensions (linked to our core research objectives) were summarised for each primary paper: ‘Location’, ‘Scale’, ‘Energy type’, ‘Research aims’, ‘Energy justice theoretical framework(s)’, ‘Methods’, ‘Policy implications’ and finally ‘Areas for future research’. A reduced version of this is given in Table 1. The following four dimensions were summarised for each secondary paper: ‘Location’, ‘Energy type’, ‘Theoretical framework(s)’, ‘Methods’ (see Table 2). The detailed thematic review then sought to identify *common themes* amongst the papers, which highlighted broadly similar areas of research interest. Of particular importance in undertaking this part of the review was considering what various scholars saw as fundamental aspects of gauging the potential justice impacts of developing world energy futures.

## Findings

This Findings section has six subsections. We first provide a brief overview of common methods, energy types and locations in energy justice research in the developing world, unearthing key gaps in the literatures analysed (sub-section 3.1). We then turn to a deeper analysis of the theoretical frameworks used across these literatures (sub-section 3.2). Next we outline three inductively identifiedcore themes that are particularly pertinent to justice analyses of energy systems in the developing world (sub-sections 3.3-3.5). These three core themes are: decentralisation, access and sustainability; institutional instability and corruption; and marginalised communities and gender inequalities. We finish by examining the policy implications drawn out by the papers (sub-section 3.6).

### 3.1. Identifying the gaps – methods, energy types and locations

The primary and secondary papers share strong similarities in the areas of methods, energy types and locations focussed on, and these similarities also demonstrate potential research gaps. We discuss these each in turn in the following sections.

#### Methods: the importance of the qualitative

Throughout the primary papers, there was an overwhelmingly strong use of qualitative research methods. Of the 18 found, 9 papers used qualitative methods to gather primary data, 8 papers used literature/documentary review or analysis, drawing upon secondary sources (without additional primary data collection), while only 1 paper used a mixed methods approach. When looking at the secondary papers, similar trends appear. Out of 43 papers, there is an overarching use of qualitative (13) research to obtain primary data, while literature/documentary review or analysis (without primary data collection) form the majority of the methods used within these studies (21). Out of the nine remaining papers, four papers used a mixed methods approach, while five papers used a quantitative only approach. Our findings therefore point to the way in which energy justice theories, and the epistemic communities within which they are used, may orient themselves towards qualitative research methodologies (and vice versa) and see this is as a vital part of answering questions related to energy justice. Interestingly there are recent efforts to develop more quantitative measures of understanding energy justice (Heffron et al 2018), while McCauley et al (2019) emphasise the need for more methodological diversity in energy justice research going forward. This stands in somewhat sharp contrast to environmental justice research, with a richer history of methodological pluralism evidenced by past research, critical reviews and specific calls to diversify methodological approaches to environmental justice research going forward (e.g. Weinberg 1998: Liu 2000; Reed & George 2011).

#### Energy types: a focus on renewables (especially hydropower) and bioenergy

When looking at the different energy types researched, the primary papers focussed on renewables such as hydropower, wind, solar, tidal, geothermal power (10), bioenergy[[6]](#footnote-6) (2), oil (3) and coal (2), while one had a mix of different energy types crossing the renewable and non-renewable divide. A graphical representation of this, including a percentage split of the energy types, is presented in Figure 1:

**Figure 1. Energy foci of the primary papers. Note that where a paper had multiple foci, it was taken to contribute to multiple categories.**

This trend was broadly similar within the secondary papers, as nearly half of the papers focussed on renewables (19), with critical analyses of hydropower projects in developing economies being a prominent focus amongst these papers. Indeed, amongst the secondary papers, analysis of the impacts of hydropower schemes on varying local communities appears to be the most prominent technologically (11). Following these hydropower studies, the remaining secondary papers focused on: bioenergy (5), oil & gas (5), and mixed energy sources (5). The rest varied between studies of electric vehicles (2), energy policy (2), energy access (1), energy efficiency (1), energy services (1), manufacturing (1) and water desalination and energy systems (1). Another graphical representation of this, including a percentage split of the secondary paper energy types, is presented in Figure 2:

**Figure 2. Energy foci of the secondary papers. Note that where a paper had multiple foci, it was taken to contribute to multiple categories.\*The 9 individual cases (one paper each) comprise: Energy access, Electricity access, Mining, Waste-to-Energy, Energy services, Water-energy-food nexus, Energy efficiency, Manufacturing, Energy system - various**

Interestingly, *not* *one paper* within the primary and secondary papers reviewed focused on the role of nuclear power or Carbon Capture and Storage (CCS) technologies in developing economies or economies in transition. This may be, in part, due to the lack of technological deployment and infrastructural development when viewed against the comparative use of nuclear power in the developed world (Mounfield 2017) and uncertainty around the effectiveness of CCS deployment globally (Zhang & Huisingh 2017). However, given the forecast roles for these infrastructures in the developing world, critical analyses of these infrastructures should be a clear concern to energy justice researchers, particularly when considering the respective energy transition pathways in rapidly developing countries such as China and India (Xunzhang et al 2017; Gambhir et al 2014).

#### Locations

Whilst the locations of the case studies varied across the globe, what is particularly noticeable (from Table 1) is a lack of case studies within the primary papers drawn from South-East Asian (only 1, in a paper which considered many locations), Central American (2) and Sub-Saharan African (3) contexts. Even more important to note is that, while signs are emerging of energy justice research spreading to new parts of the globe, so far new datasets are limited in both number and scale with only half of these studies (9) sourcing primary data. Further, while India has three energy justice studies using primary data, these papers focused on the *same* case study of Charanka Park in Gujarat. A fourth paper, Villavicencio & Mauger (2018), also devotes a section of their paper to critical analysis of this case study drawing on secondary data sources (p.247-251). Similarly, while Nepal has two energy justice studies, both had a similar focus on small-scale *rural* energy deployment, focussing on bioenergy (Damgaard et al 2017) and micro-hydro schemes (Islar et al 2017) in Nepal. Only one Sub-Saharan African case study involved primary data collection, with a focus on traditional energy practices in Sierra Leone (Munro et al 2017). Similarly, the primary paper on Oaxaca, Mexico, draws on relatively small-scale case studies of community wind to draw out wider implications for Mexico’s national energy policy strategy (Baker 2016), with the same case study also featured in Villavicencio & Mauger (2018). We note also that the primary papers exhibited a preference for individual country analyses (13) over multi-country analyses (5).

When turning to the various locations studied within the secondary papers, while there is certainly a greater diversity of countries studied, with China (6), Colombia (4) and Brazil (3) receiving the most individual attention, similar patterns to the primary papers arise relating to a lack of research across large regions of multiple countries, including South East Asian (3), Central American (4) and Sub-Saharan African (4) contexts. Thus, whilst the sample is statistically small, within the bounds of our review the very poorest countries have received the least energy justice research attention to date.

### 3.2. Use of energy justice, and related, theoretical frameworks

This section discusses the use of both explicit energy justice theoretical frameworks and related (but not energy justice) theoretical frameworks in the literature reviewed. As can be seen in Figure 3, overall there has been a marked increase in their use, in particular in the last 5 years.

**Figure 3: Increase in papers linked to ‘energy’ and ‘justice’, and relating to the developing world, over time (2000 – 2018)**

Across the literature reviewed, the dominance of the three-tenets framework within energy justice research is clear. This is evidenced (Table 1) by either *some or all of the three*-*tenets* appearing as a theoretical basis for analysing data in 9 of the primary papers, and *some or all of the eight-principles* appearing in only two primary papers. One paper *combines* the three-tenets and eight-principles, in order to understand the multifaceted justice implications (e.g. temporal, legal, social, political, environmental) of energy policies in a post-conflict setting (Lappe-Osthege & Andreas 2017). In the remaining six papers, we see: referencing lesser-used energy justice principles, such as: the ‘affirmative’ and ‘prohibitive’ principles (Banerjee et al 2017); framing ‘prudence’ as an energy justice concern (Sovacool 2016); the use of ‘spatial justice’ to critically analyse land acquisition for renewable energy development (Yenneti et al 2016); the use of a *Rawlsian conceptualisation of justice/sustainable development* in which developed countries support the worlds ‘energy poor’ via intermediate energy access using Appropriate Sustainable Energy Technologies (ASETs) (Guruswamy 2011); drawing on theories from environmental and climate justice to inform an original use of energy justice (Baker 2016); and a connecting to energy justice literatures under the banner of a wider environmental justice theoretical framework (Temper & Del Bene 2016), evidencing further the strong and ongoing links to environmental justice.

A larger variety of theoretical frameworks are then contained within the secondary papers. As seen in Table 2, an environmental justice or tenets-led (distributive and/or procedural) approach is the most common (12), followed by foci on social justice (4), climate justice (3), studies of justice/human rights including a legal component (3) and political ecology (3) approaches respectively. The use of a broadly defined ‘sustainability’ framework in five papers (one of which is also counted in those papers with a legal component) all contain implicit or explicit justice concerns, with, for example, Sovacool & Bulan (2013) drawing upon principles of international law to inform their use of ‘sustainability’ and Feron et al (2016a; 2016b) and Feron (2016) using a four-principle sustainability framework that includes *institutional, economic, environmental* and *socio-cultural* aspects. Turning specifically to energy-led frameworks, energy equity (Xu & Wang 2017), energy sovereignty (Broto 2017), energy poverty (Herington & Malakar 2016) and energy ethics (Smith & High 2017) theoretical frameworks all appear. Lastly, nine papers draw on the respective authors’ own framework(s) or definition(s) that connect loosely to ‘energy’ and ‘justice’ (rather than a pre-existing theoretical framework from the literature). Whilst the exact numbers using each framework is less important (since this is a small sample), this helpfully demonstrates the wider conceptual links of the energy justice field, particularly when focussing on developing country case studies.

There is a clear contribution across the papers to the rising field of *energy geography*, either directly (acknowledging space/spatial analyses as integral or part of their study) or indirectly (focussing on particular geographical sites of energy infrastructure development and deployment). These seek to emphasise the critical role of space and spatial analyses in energy and environmental justice (e.g. Bouzarovski et al 2017; Bouzarovski & Simcock 2017), unravelling particularly important issues around siting dynamics, questions of territorial governance and critical multi-scalar and systems analyses that expose spatial connections and interdependencies, alongside offering analysis of independent and off-grid set-ups of energy systems across multiple scales. The prominence of hydropower as an object of research interest in the field also influences the types of geographical regions being studied in the field. Within the three-tenet framework, distributional justice *partially* acknowledges issues around siting dynamics in emerging and established energy infrastructures. However there is significant scope to expand *explicitly spatial* analyses of energy justice in developing economies and economies in transition, as seen in Yenneti et al’s (2016) critical analysis of land acquisition for large-scale solar deployment in India and thus to further develop research that advances the energy geographies of energy justice in developing world contexts.

What then, are the strengths of these theoretical frameworks when considering developing country contexts, and how did authors justify using them?Interestingly, few authors sought to deliberately critique alternative energy justice approaches that they could have taken but didn’t. Rather, they tended to emphasise what their particular approach enabled, and we discuss two of the most invoked areas here.

First, these frameworks are deliberately being invoked as a tool to counter the dominance of techno-economic analyses and narratives in business and government, advancing understandings of the *social* and *political* impacts of energy systems. For example, Lappe-Osthege & Andreas (2017) see their (combined three-tenets/8 principals) energy justice framework as facilitating deeper analysis of the political, societal and environmental impacts of energy policies in Kosovo. Munro et al. (2017), using a three-tenets approach, also highlight how “*an ‘energy justice’ lens can aid in unpacking the critical social and political economic issues surrounding fuelwood dynamics”*(p. 640)and that this inevitably raises into view *“messy … political economic processes”* (p. 640).Whilst of relevance to both developed and developing country energy research, there may be less of a tradition of energy-related social science in developing countries, due to the dominance of Western institutions in the field. Authors further propose this social focus is a strength of energy justice since it can encourage (and raise into view the issues of) participation and inclusion, with frameworks able to: *“ensure and enhance the dialogue among opposing interest groups.”*(Lappe-Osthege & Andreas 2017 p.605). This links forward to vital themes in developing country research ‘Institutional instability’ (see subsection 3.4) and ‘Acknowledging marginalised communities’ (subsection 3.5). ‘Justice’ is thus being used to generate insights in contexts where researchers feel strongly that such critical analyses may be lacking, especially where the balance of power means certain voices are consistently overlooked.

Secondly, for some, a key consideration is around the ‘use-ability’ of frameworks chosen, by governments or similar: *“The energy justice framework used herein [affirmative and prohibitive principles] provides … a concrete tool for assessing both the energy justice potentials of technology and the avenues available for future research”* (Banerjee et al 2017 p.783). This is particularly seen as important to start to offer tangible ways to expose injustices: *“the [three-tenets based] analysis revealed that energy injustices are linked to the unequal distribution of benefits and ills where people lose access to their land but do not benefit from the project … These injustices need to be addressed in the planning and rollout of renewable energy projects … within the framework of SDG7, particularly in developing countries’* (Villavicencio & Mauger 2018 p.253). Some began to discuss how quantitative and qualitative tools may be important for different parts of this process: *“Our [three-tenets, combined with notions of responsibility, agency, capabilities] quantitative analysis showed how energy justice may be applied to study national processes of decentralised energy development, to investigate processes of distributive justice, while qualitative enquiry provided a micro-scale investigation into the ‘post-distributive’ issues of procedures, agency and empowerment”* (Damgaard et al 2017). Thus, energy justice is seen as a useful mechanism to understand the transformative *social* potential of renewable energy technologies (Banerjee et al 2017), to mitigate *against* potential injustices in low-carbon transitions (Villavicencio & Mauger 2018) and provide insight into *past and present* processes of injustice and empowerment in relation to energy infrastructure deployment (Damgaard et al 2017). Nevertheless, the actual development of policy frameworks or tools to do so is still in the early stages

Other justice frameworks share many similar aims. Therefore, we must ask: How does energy justice sit alongside or in opposition to other justice frameworks in developing country research? As seen in the secondary papers, many scholars (i.e. Siciliano et al 2018; Yenneti & Day 2015; Yenneti & Day 2016) see themselves as taking forward the field of environmental justice, but choosing cases which focus on energy systems as an important part of wider environmental systems. Others see themselves as part of the drive for energy justice to take on a momentum of its own, arguing that its exclusive analysis of energy systems enables it to be “*more targeted in its topic of concern”* and potentially more policy-relevant than other justice-oriented frameworks (see Jenkins 2018 p.120). Revisiting first principles and the broad political-philosophical underpinnings of both environmental and energy justice, therefore, could serve to resolve antagonisms between the two fields.

Furthermore, what brings the majority, indeed perhaps all, of the papers together is how they draw more broadly on liberal and egalitarian traditions of political philosophy, which sees the reduction of inequality in society as a fundamentally *just* pursuit, alongside intrinsic merit in giving greater voice and representation to more marginalised and disadvantaged parts of society (Rawls 2009). Evidence of this can be seen in specific references to the ideas of Rawls in concluding points around unequal distributions in energy systems disproportionately impacting the worse-off (e.g. Yenneti & Day 2016), in specific subsections i.e. *“Rawlsian Sustainable Development as It Applies to the Energy Poor”* (Guruswamy 2011 p.152), and, in more direct assertions that energy justice itself is *“based on classic theories of justice, especially the theory proposed by Rawls dubbed ‘justice as fairness’”* (Villavicencio Calzadilla & Mauger 2018 p.241), found within the primary papers.

In addition however, there is a developing strand drawing upon scholars of justice outside of the western Rawlsian philosophical tradition, as seen by Damgaard et al’s (2017) references to Sen’s (2001) capabilities approach to energy justice:

*‘While a Rawlsian perspective would focus on equality of access to primary goods, the capability approach insists […] on equality of capabilities or opportunities to function. In the context of energy justice, a concern with equality of capabilities transcends questions of access to energy as a ‘good’ or a service, to include also a focus on individuals’ freedoms and functioning in terms of agency’* (Damgaard et al 2017 p.2)

An interesting future point of development would be to consider how such a capabilities approach contributes towards reshaping understandings of energy justice in the developing world, and how this may align with a concern for energy access rights, as discussed next.

### 3.3. Decentralisation, access and sustainability: a complex development triad

This section emphasises how the role of decentralisation – a very prominent theme within developing country studies reviewed – is motivated by two goals: (1) increased access to energy/energy rights vs. (2) a means to achieve greater deployment of renewables or more sustainable energy sources. Although in many cases these goals are seen to align, this is not always the case.

One of the most notable themes within the primary papers is the degree to which various authors stress the potential for energy justice considerations to be incorporated into decentralised energy transitions in the developing world. Whilst research on decentralised energy initiatives is most often associated with renewables (particularly for developed countries e.g. Strachan et al 2015) or low-carbon sources such as wind, solar, geothermal and hydro-electricity (Guruswamy 2011; Baker 2016; Banerjee et al 2017; Villavicencio & Mauger 2018), this is not always the case in developing country contexts where attention is also paid to bioenergy sources such as fuelwood and gas in the form of Liquefied Petroleum Gas (LPG) (Munro et al 2017). It is important to note here that decentralised energy is not an exclusive focus of the developing world, but rather, exhibits *some* markedly different characteristics to energy decentralisation in developed world contexts.In the developing world, energy decentralisation can involve core considerations of providing communities with energy *access* (or a more reliable supply), sometimes for the first time (Guruswamy 2011). In contrast, developed world energy decentralisation can focus on; shifting patterns of ownership and production away from long-established centralised energy systems (e.g. Strachan et al 2015; Lacey-Barnacle 2019); contributing to the decarbonisation of local energy systems / grids (e.g. Van Der Schoor & Scholtens 2015); enhancing the power and agency of civil society actors and institutions in energy markets (Hewitt et al 2019); regenerating local economies (Johnson & Hall 2014) and reconfiguring the geographies of energy production (Creamer et al 2018).[[7]](#footnote-7)

Considering our development triad as outlined above, several of our primary papers argue, in quite specific terms, that small-scale and local renewable energy schemes are particularly important considerations for developing countries, and are necessary to achieve ‘justice’ in energy access, much more so than in developed country energy justice research, where industrialisation has largely taken place. Villavicencio & Mauger (2018, p.251) assert in no uncertain terms, when linking renewable energy to energy justice, that:

*“Energy policies should […] promote decentralised community-based renewable energy projects, especially small-scale ones, as they can provide safe, reliable, affordable and sustainable energy to local communities in developing countries.”*

In terms of solutions emphasising the connection between smaller and more local scales of deployment and various renewable energy technologies, Guruswamy (2011) proposes ‘Appropriate Sustainable Energy Technologies’ as a potential pathway to energy access for the developing world, while Baker (2016) proposes the potential for community-owned renewable energy schemes to expand in Mexico. Banerjee et al (2017), in assessing the energy justice potential of renewables, deliberately focus only on those sources which they see as possible to be scaled to decentralised energy configurations (wind, water, solar). Thus we see a strong interlinking between energy justice research in these contexts and energy decentralisation.

Some papers look to assess how small-scale systems can bring sustainable forms of energy access to those without it in the years to come, with Kotikalapudi (2016) expressing an optimistic outlook for Bangladesh specifically and relating this to justice outcomes:

*‘Bangladesh has seen a dramatic increase in Solar Home Systems (SHS) over the last decade, with roughly 4.5 million households now owning a system. With falling costs and creative financing, the country is on the path to putting an SHS in the hands of the remaining third of its population that still lives in the dark. Studies have shown how growth in distributed solar has resulted in a variety of micro-benefits starting from an absolute reduction of kerosene use for lighting, a decrease in indoor air pollution and a large number of direct and indirect jobs and income creation’* (Kotikalapudi 2016 p.163)

In contrast to this stream focussing on *renewable* deployment schemes, some implicitly emphasise that the reality of continued *bioenergy* usage in the developing world in order to facilitate ongoing access to energy cannot be ignored by justice researchers. Whilst wood bioenergy is somewhat disputed as a sustainable energy source (Sterman et al 2018), bioenergy usage has been shown to fulfil crucial energy needs in, for instance: post-disaster cases involving vulnerable communities, as Islar et al (2017) and Herington & Malakar (2016) demonstrate in Nepal; as well as in communities which lack grid access (Broto 2017). In some cases transitions away from bioenergy / ‘fuelwood’ energy sources (which are more harmful for human health) are seen as embodying heavily top-down processes. Thus Munro et al (2017), in their study of fuelwood, charcoal and LPG use in local communities in Sierra Leone, frame the proposed transition to the use of ‘Liquefied Petroleum Gas’ (LPG) energy sources as an imposition of “*elite interpretations of modernist development ideology”* (p.640). They note that the use of charcoal by local communities requires a more bottom-up understanding of energy use, which is often unsupported and lacks more thorough consideration by policymakers.

We therefore conclude that this complex development triad of decentralisation, access and sustainability is a specific justice issue of interest in developing country energy justice related research.

### 3.4. Exposing institutional instability and corruption

This subsection reviews many of the papers’ emphasis on the presence of effective, accountable and reliable institutions being key for the governance of energy systems and transitions.

Many of the papers analysed within our literature review sought to explicitly ‘expose injustice’ within energy systems in developing economies and economies in transition. Whilst this energy injustice, in some circumstances, relates to the mistreatment of marginalised communities in relation to energy systems (Yenneti & Day 2015; 2016) discussed next in subsection 3.5, much of the work referenced in this theme looks more critically at the role of elites, with reference to institutional instability (Lappe-Osthege & Andreas 2017), excessive corporate and government power (Sovacool 2016) and corruption (Sovacool & Bulan 2013; Sovacool 2016; Kotikalapudi 2016). It also acknowledges both post-conflict (e.g. Lappe-Osthege & Andreas 2017; Munro et al 2017, Kotikalapudi 2016) and post-disaster (e.g. Herington & Malakar 2016; Islar et al 2017) settings as sub-themes of the exposing energy injustice theme.

Looking first at the primary papers,Lappe-Osthege & Andreas (2017), Munro et al (2017) and Kotikalapudi (2016) note when discussing the impacts of both post-conflict contexts in Kosovo & Sierra Leone and political corruption in Bangladesh respectively, energy policy and/or energy use may explicitly prioritise issues of access and availability over sustainability and environmental impact (interestingly, echoing an emphasis found in the research, see previous key theme found in subsection 3.3). In these papers, this lack of capacity or willingness to consider sustainability implications is perceived to be, in part, exacerbated by institutional instability and the lack of proper state governance infrastructure as a result of destabilising past conflicts or widespread corruption in governing institutions (Lappe-Osthege & Andreas 2017; Kotikalapudi 2016). Therefore, energy justice scholars should be mindful that *‘the challenge of just energy decision-making is particularly pronounced in countries that have experienced economic and political crises or conﬂict’* (Lappe-Osthege & Andreas 2017 p.601).

Interestingly, in exploring various forms of corruption, Lappe-Osthege & Andreas (2017), Kotikalapudi (2016) and Sovacool (2016) are also united by their study of fossil fuel sources. However, Yenneti & Day (2015; 2016) explore how the concerns of local communities may be largely ignored by elites in renewables projects, taking the case study of the implementation of a large-scale solar park in Charanka, Gujurat in Western India which is part of India’s three-phase ‘National Solar Mission’ (2010 – 2022) to expand solar generation capacity. The authors note that, if justice concerns are not factored into low-carbon transitions, the decision making procedures and accrued economic benefits surrounding low-carbon transition initiatives are likely to be dominated by:

*‘The educated, higher status and more affluent […] and other development agents such as local governments, private investors, and the central state in any policy decisions or legal mechanisms, including renewable energy’* (Yenneti & Day 2015, p.672)

This ability to capture the economic value of various energy initiatives is also bound up with the ‘exposing energy injustice’ theme across the papers. For example, Sovacool (2016) highlights the potential for governments to appropriate wealth from oil exploration and production, highlighting in particular the estimated hundreds of billions of dollars misappropriated in Nigeria since independence in 1960. Moore (2013 p.187) makes clear that *“elites in Europe and Morocco may benefit from the system while poorer Moroccans are negatively affected or bypassed”* in the planning of ‘Desertec’, one of the largest solar power projects ever imagined, which would have connected the Middle East, North Africa and Europe had its vision been instantiated. Herein, the direct connection to developed world economic interests is brought out, which was also noted by Kotikalapudi(2016) in his critique of the Bangladeshi government’s plans to rapidly expand coal power production. Kotikalapudi (2016) is critical of the national government kowtowing to the interests of multinational energy corporations, noting in particular how a London based energy firm was seen as placing direct pressure on the Bangladeshi government to approve mining contracts that would allow them to reap financial benefits from their investments in the planned rapid increase of mining for coal reserves. These aspects point towards the utility of taking a systems approach in energy justice research (Jenkins et al 2014; Healy & Barry 2017), to expose injustices within a globalised energy system, where the economic interests of different nations are increasingly intertwined. Interestingly, despite a theoretical emphasis on energy *system* justice this does not seem to have transitioned seamlessly into empirical work although certain studies do emphasise its importance (Jenkins et al 2014; Healy & Barry 2017). This suggests that a systems approach that devotes explicit attention towards exposing exploitative developed-developing country relations – via institutional instability and corruption – could be a particularly fruitful avenue for future research on energy injustices in the developing world.

Turning to our secondary papers, McNeish (2017), situating his justice-oriented study in a framework of human rights, critically questions the Colombian government’s commitment to expanding the mining and energy economy further to generate revenues and ‘pay for peace’ in an unstable post-conflict context. McNeish (2017) argues that, with the continued support of corrupt government institutions, further violence and instability will arise from the violation of human rights and the destruction of the environment by mining and energy companies, painting a bleak picture of the future of ‘justice’ for Colombian people after decades of internal conflict. While not setting out to explicitly address the post-conflict context of Colombian hydroelectricity development, Duarte-Abadía et al (2015), Velasco (2016) and Martínez & Castillo (2016) all acknowledge a degree of corruption and various abuses of power by elite actors, aligning with many of McNeish’s findings (2017). Looking further at secondary paper connections to corruption, Sovacool & Bulan (2013), in their critical analysis of the Sarawak Corridor of Renewable Energy (SCORE) in Malaysia, which aims to develop *“20,000 megawatts (MW) of hydroelectric dams by 2030 along a 320 km corridor comprising more than 70,000 km2 to provide electricity to energy-guzzling industries”* (p.121), draw upon a wealth of qualitative data, interviewing various elite stakeholders such as regulators, state departments and electric utility and energy companies. Using a seven-principle framework of ‘sustainability’ derived from principles of international law, which demonstrates strong links to the eight-principle framework of energy justice incidentally developed by Sovacool & Dworkin (2015), they deem that SCORE fails to provide an example of a ‘just’ deployment of new renewable energy technologies. The authors note that:

*‘SCORE might have produced optimal or at least justifiable results if it was intended to enrich local livelihoods, if government planners in Sarawak were held accountable for corruption and violence, if indigenous claims on land were recognized and respected, and environmental and social impact assessments carefully conducted […] SCORE does none of these things’* (Sovacool & Bulan 2013 p.132)

These analyses concerning ‘exposing injustice’ are explicitly critical of elite groups in relation to energy system development and technological deployment, seeking to use justice principles to hold accountable those that occupy positions of power in energy systems. However, these analyses inevitably contain some crossover with impacting and acknowledging marginalised communities in energy system and energy transition processes, which we turn to next.

### 3.5. Acknowledging marginalised communities and gender inequalities

One theme that many of both the primary papers and secondary papers share is seeking greater recognition of marginalised and vulnerable communities in relation to energy systems; indeed this was one the strengths identified of the energy justice and related theories chosen by these researchers.

Marginalised communities – in particular indigenous people and rural and nomadic communities – are often perceived as being particularly vulnerable to processes of economic development. Many of the papers’ research questions and aims directly incorporate this concern, and these aims go to the heart of what much ‘justice’ oriented social science research within the global academy attempts to do, namely, facilitate research with or on communities where is there is none, where people have no voice, where the researchers may feel no one else will expose injustice. Giving this voice to the powerless connects strongly to the ‘recognition justice’ tenet within energy justice frameworks, as seen in the desire for many authors to highlight the plight or unjust treatment of marginalised communities.

For example, Baker (2016) seeks to highlight potentially negative social impacts on Mexico’s indigenous communities, as reforms within Mexico’s energy sector *“specifically targets the vast oil and gas reserves in the country, exploration of these reserves requires development of land and ocean resources that are vital to indigenous communities”* (Baker 2016 p.370).Emphasising again that this threat of energy-led development to vulnerable communities is not specific to any energy type, Moore (2013 p.187) notes, when looking at how vast solar infrastructures may impact desert communities, that: *“For just outcomes to be achieved, trade-offs should be weighed and disadvantaged populations in the region should be recognized and their needs considered”*.Guruswamy (2011) focuses almost exclusively on what he terms the ‘energy poor’ – those throughout the world without access to energy (at that time 1.2 billion) and those who rely on harmful sources, such as indoor biomass use, for their everyday energy needs (at that time around 3 billion). In this sense, Guruswamy (2011) takes a *global approach* to defining marginalised communities in relation to the global population, by critically reflecting on the immense disparity between the developed and developing world. In his conclusion, he draws on a Rawlsian call that outlines a *“duty of developed peoples”* to assist the development of this globally marginalised community, reducing the energy injustice in access *between* developed and developing nations (Guruswamy 2011 p.157) – again highlighting the importance placed on egalitarian traditions in this stream of work, as discussed in subsection 3.2.

Looking at how this theme presented in our secondary papers, the studies focused on hydropower deployment in many cases seek to advance understanding of how hydropower developments impacted upon marginalised indigenous communities. In addition, work by Martínez & Castillo (2016) connects explicitly to McNeish’s work (2017) here, as the authors detail a disproportionate effect of the energy and mining sectors on rural communities and indigenous people:

*“In 2013, it was estimated that 80% of human rights violations occurring in Colombia happened in energy and mining towns; 87% of forced displacement was out of the municipalities that receive royalties for mining and energy production; 78% of crimes against trade unionists, and 90% against people of indigenous and African descent, were committed in mining and energy areas.”* (Martínez & Castillo 2016 p.76)

This finding is echoed byDuarte-Abadía et al’s (2015) study on Sogamoso, Colombia, in which the development of a large hydropower project negatively impacted upon local communities and resulted in *“profound changes in the ecosys­tems on which their livelihoods depend”* (Duarte-Abadía et al 2015 p.244).

Extending this theme of addressing marginalised communities, it is also important to emphasise a growing recognition of the connections between issues of gender inequality and energy justice within vulnerable and marginalised communities. Here, the argument is that energy justice can directly connect to enhancing understandings of ‘gender justice’ in a context of global climate change disproportionately affecting developing world communities (as discussed in the context of climate, rather than energy, justice by Terry 2009; Mendelsohn et al 2006). For example, from our review, Guruswamy (2011) notes that the deployment of new energy technologies may have significant impacts on gender roles in communities where women disproportionately bear the burden of activities such as cooking and fuelwood collection. This theme therefore provides connections to the theme of decentralisation, as various different localised and decentralised energy configurations and types are argued in many studies as being instrumental in lifting these burdens. Damgaard et al (2017), continuing further linkages with decentralised energy activity, examine how small-scale biogas deployment may positively affect gender equality in rural Nepalese communities. They note that material and health benefits arise from bioenergy development in the communities they worked with:

*‘The primary connection made between biogas and gender is the important health benefits of improving indoor air quality and the reduced time and effort spent collecting traditional sources of fuel […] These are direct, instrumental benefits, overwhelmingly benefiting women due to typical gender roles in the household’* (Damgaard et al 2017 p.12).

We therefore see a strong connection here between our decentralisation theme and issues of gender inequalities, noting the potential for future research to further inform energy justice scholars of how these two themes may be in dialogue in developing world contexts.

### 3.6. Policy implications – integrating justice principles into policy frameworks

This final theme explores how the developing world energy justice literature engages with policy and policymaking, either in terms of the recommendations it provides, or as an object of enquiry in itself. Which of the papers sought to make recommendations, and of what nature? In order to focus explicitly on energy justice frameworks, our analysis concentrates on the primary papers.

Firstly, as highlighted in subsection 3.1., the eight-principle decision making framework, despite its desire to influence policy and decision-making, has beenless favoured than the three-tenets approach, including in papers seeking to make policy recommendations. Instead, across the literature reviewed, it is apparent that the integration of justice principles into relevant policy frameworks is the most common suggestion**,** and more specifically,concerns about facilitating procedural and distributional justice via policy changes take centre stage. Many of the authors promote the embedding of one of the three-tenets (or, in some cases, the eight-principles) into relevant energy policy frameworks. This is evident in Villavicencio & Mauger’s (2018) assertion that the global energy system *“has to be re-established progressively on the basis of energy justice and its three dimensions […] using law and policy tools”* (p.253) in the global sustainable development agenda. In addition, Kotikalapudi (2016) suggests that the threat of violence in Bangladesh in response to energy-led protests against the rapid increase in coal power production requires the recognition of energy justice principles across governance institutions. This of course emphasises how policy recommendations may be directly shaped by theoretical choice or the adherence to an analytical use of core tenets that underpin both environmental and energy justice. It is also interesting to reflect on whether, and how, this body of work is actually offering practical advice on energy system design and planning in developing world contexts. A small but significant number of papers sought to put their chosen theory to use in tools to aid the on-the-ground planning of new energy developments. This included Siciliano et al (2018), who put forward an “Energy Justice Framework for Dam Decision-Making” for hydro-electric dam planning in various contexts, alongside Tysiachniouk et al’s (2018) policy recommendations on ‘benefit sharing arrangements between extractive industries and indigenous communities’ and Villavicencio & Mauger’s (2018) emphasis on fair energy facility siting & community-based development as energy policy priorities in amongst the SDG7 goals.

In addition, the ‘opening up’ of policy processes to inputs and involvement from a much wider range of actors and interests is a repeated suggestion. This can been seen in Sovacool’s (2016) call for a spread of governance across various independent institutional bodies to increase scrutiny and accountability in energy decision-making. This links to the overall sense of taking a more networked approach to energy governance, whereby multiple actors and coalitions of actors are factored into visioning processes, consultation measures and decision-making procedures wherever possible to increase accountability. Thus, Yenneti & Day (2015; 2016) and Yenneti et al (2016), alongside Tysiachniouk et al (2018) and Damgaard et al (2017), all point towards the importance of ‘opening up’ decision-making and policy processes to otherwise excluded or marginalised actors affected either directly or indirectly by energy initiatives, systems and transitions. Yenneti & Day (2015) connect this explicitly to *procedural justice*, noting in their conclusion the aspects of procedural justice that need to be factored into policymaking:

*“The framework for procedural justice that we have implemented, covering two way information exchange, meaningful participation, and adequate representation of all groups including the marginalised, signposts the major elements of procedural justice that need to be addressed. Governance arrangements surrounding economic and infrastructure development in India need to be strengthened, especially with regard to their interface with existing local institutions through which community interests may be addressed”* (p.672)

Damgaard et al (2017) suggest that policy should address the ‘horizontal dimension’ of power in community energy projects i.e. within and between associated actors in local initiatives, while Munro et al (2017, p.640) suggest a “*need to bring fuelwood producers, traders and users into policy debates”* around traditional energy practices, to counter any potentially counterproductive top-down impositions from elites. Tysiachniouk et al (2018), in their study of ‘benefit sharing’ policies between the extractive industries and indigenous communities on Sakhalin Island, Russia, suggest that these practices should:

*“Evolve from consultation to engagement with indigenous peoples so that communities are empowered to lay the foundation for their future economic development, thereby increasing procedural equity […] the perceptions of indigenous community members and their visions of justice must be at the center of any research”* (p.148)

Indeed,Tysiachniouk et al (2018) hope to inform other countries of the potential pitfalls of benefit sharing practices if justice principles fail to be realised in their creation.

Interestingly, fewer recommendations focussed explicitly on the actions of elites (although implicitly of course all these calls are to some degree made towards those in positions of political power), however Moore (2013), concentrating specifically on the ‘visioning’ stage of large-scale (solar) technology implementation, stresses how policy elites must develop new methods and processes that anticipate widespread social impacts. Alvial-Palavicino & Ureta (2017), looking critically at Chile’s energy ‘tariff equity law’, explore how the Chilean government attempted to enact justice through legislation that tries to ensure a fair pricing system for Chilean bill payers. Viewed in contrast to the corruption of elites outlined in our ‘exposing injustice’ theme, this offers a focus on elites attempting to create a situation that fosters energy justice in a developing country. Alvial-Palavicino & Ureta (2017, p. 647) find that: (1) “*policy needs to enact wide framing processes in the earliest stages”*; and (2) “*economic devices can contribute decisively to increasing levels of social equality*” if they can foster some form of distributional equity in which the pricing systems for energy and resulting energy costs are fair, and do not place an increased burden on low-income areas, communities and families.

Finally, connecting to the theme of decentralisation, Baker (2016) suggests that Mexico offers a model of development that the developing world can look to for inspiration when thinking about facilitating steps towards a more *distributed* and decentralised system:

*“Mexico's energy reform efforts could provide a blueprint for other developing countries to leapfrog the traditional system of centralized energy generation and electricity distribution to a more modern, resilient system rooted in community participation and energy justice”* (p.390)

These types of broad policy recommendations around models for bypassing conventional grid development have the potential to be critically interrogated much further by energy justice researchers, specifically when looking at comparative analyses of different developmental models and their wider applicability or replicability in differing contexts. Furthermore, while Baker (2016) notes that the ‘ejido’ system of land tenure amongst indigenous communities in Mexico could help facilitate community-ownership of renewables, each context in which this pathway is advocated or pursued will have different legal arrangements for land ownership and tenure. Baker’s (2016) study connects strongly to Banerjee et al’s (2017) suggestions for widespread local and community ownership of distributed energy systems, which also connects back to the policy implications of earlier literatures such as Alstone et al (2015) and Alanne & Sari (2006) on the promising potential of decentralised energy initiatives in the developing world.

Thus, while overall this review has highlighted a stronger emphasis on *procedural* justice concerns, *distributional* justice is also coming to the fore, particularly if strong governance arrangements, the equitable distribution of economic benefits and, where possible, a high level of community participation and involvement occurs alongside a drastic increase in decentralised energy systems.

## Concluding discussion: Future challenges for energy justice research in the developing world

There are strong connections between the core themes found through our review. Namely, if the (subsection 3.3) decentralisation of low-carbon energy sources is a critical process via which developing world communities can gain access to (more sustainable) energy, researchers and policymakers must be wary of the potential for (3.4) unstable institutions to exploit (3.5) marginalised communities in new decentralised energy configurations that lack robust (3.6) policy and regulatory frameworks and sufficient oversight. In particular, the interlinked priorities of decentralisation and access upon which this chain is built, and how these priorities are promoted or enacted, are key empirical foci for energy justice research in developing country contexts. In this concluding section, we build on this to discuss how energy justice scholarship in the developing world is throwing up a number of new challenges with scope for further exploration and theory development, which arguably differ from those within the developed world context.

Firstly, in subsection 3.1, we recognised that certain regions (and often, the poorest countries in the developing world) are receiving less research attention in terms of social energy justice impacts. Linking this to our discussion of theoretical frameworks, there is room for more explicitly spatial analyses of energy justice in developing economies and economies in transition. Thus while we noted a lack of geographical attention paid to South East Asian, Central American and Sub-Saharan African contexts to date, we see ample room to match these under researched areas to advancing our understanding of the energy geographies of energy justice in developing world contexts. That is to say, more explicit spatial analyses of energy development/transitions in these regions would offer novel contributions to the fields of both energy geographies and energy justice.

Second, emerging work is starting to move outside of the western philosophical tradition (e.g. Broto et al 2018; Malakar et al 2019; Bombearts et al 2020) and this could be further expanded. This would assist the field of energy justice in its conceptual and applied resilience in new and unfamiliar contexts, simultaneously enhancing its capacity for greater expansion as a field. Relatedly, interest in capabilities approaches has been gaining traction recently, and may align with the important concerns for energy access rights. Damgaard et al’s (2017) links to the capabilities approach forces scholars to think about the benefits of energy infrastructures *beyond* access and availability, moving towards core concerns about facilitating the realisation of individual’s diverse potentials and abilities to participate more productively in social, economic and political life. This is a necessary reminder of the multiplicity of ways energy can radically transform lives.

Third, energy justice researchers in developing country contexts clearly see an important role of their work as giving voice to the marginalised. Whilst this is vital, it interestingly perhaps downplays emphasis on the roles of elites (or solely focusses their responsibility on opening up decision making, rather than actively considering their own disproportionate power). This was carried through to policy recommendations, where the integration of *procedural* and *distributional* justice principles into relevant policy frameworks was the most common suggestion. There is arguably scope to focus more on policy initiatives directed towards those in positions of authority, in which an emphasis on *recognition* justice in policy frameworks brings the ‘triumvirate of tenets’ together, to complement the existing emphasis on ‘opening up’ decision-making and policy processes to otherwise excluded or marginalised actors. Indeed, this core interrelatedness between the three tenets is conceptually vital for comprehending a fuller and more rounded form of energy justice (Gillard et al 2017) and is empirically useful for applied research on the ground (Lacey-Barnacle & Bird 2018). This supports the notion that distributional and procedural justice are, to a large degree, underpinned by recognition justice.

Related to this third point above, despite the importance attached to making marginalised communities more visible across the papers reviewed, an empirical area that is yet to be fully explored in energy justice research is the role of activism and how it directly affects energy system development. The impact of activism in shaping energy infrastructure dynamics in the developing world undoubtedly takes on significantly different characteristics to activism in the developed world, with environmental justice research that considers the role of activism evidencing the potential for more severe implications via human rights abuses and political repression (Adeola 2000). Indeed, amongst our secondary papers, Riethof’s (2017) examination of hydro-electric dam construction in Brazil notes that:

*‘Dam construction projects have become associated with a wide array of human rights infringements, from forced labour and violent repression of protests to displacement and the destruction of the natural environment and people’s livelihoods. Consequently, since the 1980s dam construction sites in Brazil have turned into significant sites of contestation, involving protests drawn from local communities, indigenous groups, environmental activists and workers’* (Riethof 2017 p.484)

We therefore suggest a rich underexplored area for research would combine activism and energy justice approaches in developing world contexts more deeply. Such work could draw upon Fuller & McCauley’s (2016) call to expand the activist and advocacy dimensions of energy justice research, whilst also building on work by scholars such as Bedi (2018)[[8]](#footnote-8) which connects energy justice to activism in developing world contexts.

Lastly, a ‘systems’ approach has been advocated as integral to energy justice research (Jenkins et al 2014; Jenkins et al 2016; Healy & Barry 2017). However, our review suggests that the theoretical usage of systems approaches for energy justice are not as widespread as proponents might like, with our review evidencing few uses of this specific approach in developing world contexts. This may suggest that a systems approach that devotes attention towards exposing exploitative developed-developing country relations – via institutional instability, corruption and in vulnerable post-conflict settings – could be a particularly fruitful avenue for future research on energy injustices in the developing world. A recent exchange between energy justice scholars connecting strongly to this ‘developing-developed country relations’ topic can be found in Todd et al’s (2019) and Monyei et al’s (2019) correspondence. Here, Monyei et al (2018b) advance the claim that in the context of the global energy transition, the developed world is engaged in ‘energy bullying’ via the promotion and encouragement of renewables deployment in the developing world (in which the developed world reaps commercial benefits). Todd et al (2019) respond by emphasising the need for more constructive developed-developing world relations in tackling climate change, while Monyei et al (2019) respond by noting that *resilience* in electrical power systems is fundamental (in contrast to *some* intermittent renewable power generation sources), as is a ‘paced’ approach to ensuring energy access in the global south. In this exchange, we see the validity of both perspectives. Our review demonstrates the fundamental need to integrate core principles of energy justice into future developing-developed world relations, particularly if the developed world seeks to support (low-carbon) energy decentralisation as a means of securing energy access in developing world contexts. The application of our reviewed energy justice frameworks to such relations would also help to expose institutional instability and corruption, whilst a critical questioning of unequal power dynamics (via tenets/principles) would indeed place emphasis on reducing the power of developed world elites, particularly when such elites are encouraging greater participation of marginalised developing world actors and communities in low-carbon transitions.

This was the first systematic review to consider the spread of theoretical approaches being used in (a defined subset of) energy justice research. As suspected, tenets-led (distributive and/or procedural) theoretical approaches were found to be the most commonly used to date, however social justice, climate justice, legal studies of justice/human rights, political ecology, sustainability frameworks, energy equity, energy sovereignty, energy poverty and energy ethics all featured (as well as authors’ own frameworks). Interestingly, there was little formal critique between these approaches with authors choosing to highlight the advantages of the theoretical approach they had chosen, rather than reject others. There is therefore scope for further work which seeks to tailor a tenets approach to developing country contexts further, and this could include greater attention to how these theories treat themes including: energy decentralisation, elites, corruption, conflict and a greater acknowledgement of marginalised communities and gender inequalities in relation to rapid energy system development.

Finally, what have we learnt of practical use in promoting dialogue between different justice fields? We would suggest researchers might consider the following four areas, particularly when working collaboratively:

1. Considering how their fields are drawing, explicitly or implicitly, on philosophical notions of justice. And how these philosophical roots might be expanded to include those from non-western cultures.
2. Paying greater attention (e.g. in research papers) to which theoretical approaches are, through others being chosen, being rejected, and why.
3. A strong connection was observed between themes of decentralisation and gender inequalities, especially within vulnerable and marginalised communities. This gives even more evidence for the potential for energy and gender scholars to come together in working in developing world contexts.
4. Future expansion of energy justice could require application of new tenets (i.e. not commonly used within the environmental/climate justice traditions) – such as restorative justice – in developing world contexts. This would help energy justice research distinguish itself through further development of its own frameworks.

In conclusion, we hope this review strengthens the momentum behind the rapid global expansion of energy justice research, supporting a very tangible energy and enthusiasm amongst both the research and policy communities to combat energy injustices going forward.

**Figures**

**Figure 1 - Energy foci of the primary papers.**

**Figure 2 - Energy foci of the secondary papers.**

**Figure 3 - Increase in papers linked to ‘energy’ and ‘justice’, and relating to the developing world, over time (2000 – 2018)**

**Tables**

**Table 1 – 18 primary papers of systematic review**

**Table 2 – 43 secondary papers of systematic review**

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1. This involves searching WOS for publications where the ‘Topic’ includes energy AND justice. [↑](#footnote-ref-1)
2. Between 1 Jun 2018 (and our analysis for the current paper) and 5 Jan 2020, a further 392 papers have been published which meet this search criteria within WOS. These include e.g. Monyei et al 2018a/2018b; Malakar et al 2019; Sanusi & Spahn 2020. Whilst the majority of these papers would not have met the full criteria for inclusion in our review (since they either do not consider developing world contexts, or fall into our categorisation of ‘tertiary’ papers as defined later) this illustrates well the dynamism of the energy justice field, as well as supporting our argument that a formal review of this developing area of work is of current interest. [↑](#footnote-ref-2)
3. We note that these figures have further increased since the search, see: <https://clarivate.libguides.com/webofscienceplatform/coverage> [↑](#footnote-ref-3)
4. These categories cover a very wide variety of unique contexts, and we emphasise that our aim was not to presume similarity across countries within these groupings but rather to acknowledge that they are likely to give rise to markedly different issues than developed economies, where the majority of energy justice scholarship has been concentrated to date. [↑](#footnote-ref-4)
5. Although some studies including a legal component were included within the secondary papers, in these two instances the framing was very specifically on technical legal frameworks. The term ‘justice’ thus appeared but without linkages to wider social science ‘justice’ frameworks. [↑](#footnote-ref-5)
6. Since bioenergy still has an ongoing questionable status for being classified as ‘renewable’ (Sterman et al 2018), we created a separate ‘bioenergy’ category. [↑](#footnote-ref-6)
7. While an extensive comparative analysis of energy decentralisation is beyond the scope of our review, this could form the basis of another (significant) review paper that explores thematic similarities and differences between energy decentralisation in developing and developed world contexts. [↑](#footnote-ref-7)
8. This study was not captured in our search.The work explores energy justice and activism through the examination of activist and stakeholder opposition to a coal power plant in Bangladesh via an ‘energy rights discourse’. [↑](#footnote-ref-8)