



ENERGY JUSTICE

a social sciences and humanities
cross-cutting theme report



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Executive summary

Energy justice seeks to embed principles of justice, fairness and social equity into energy systems and energy system transitions. This report gives an overview of emerging research in 'energy justice' and explores how ideas within different Social Sciences and Humanities (SSH) disciplines interact with key concepts in this rapidly expanding new field. Focusing on three different disciplines - Economics, Business Studies, and Gender Studies - this report highlights the different ways in which an interdisciplinary approach can contribute towards mutually beneficial learning between these disciplines and energy justice research. Specifically, we explore: (1) the energy justice challenges posed by pursuing efficiency over equity in mainstream Economics; (2) the potential for businesses to be facilitators of energy justice; and (3) the importance of integrating issues of gender inequality into energy justice research. These interdisciplinary discussions are relevant for Horizon 2020, wider European Union (EU) energy policy, and SHAPE ENERGY's objectives.

As energy systems and transitions operate at different scales, energy justice can be local, regional, national and international in both approach and application. Drawing on 'top-down' and 'bottom-up' perspectives, it is also underpinned by two frameworks: a decision-making framework, and the three core tenets of energy justice. Firstly, the decision-making framework consists of eight key principles: availability; affordability; due process; transparency and accountability; sustainability; *intra*-generational equity; *inter*-generational equity; and responsibility. According to the framework these principles should be used by decision-makers when formulating energy policy, to provide more equitable and just energy policy outputs. Secondly, the three core tenets of energy justice can be applied across energy systems and are applicable at a variety of scales. The application of these tenets aims to identify where injustice occurs within energy systems, and, how justice can be achieved:

- **procedural justice** - the ability of people to be involved in decision-making procedures around energy system infrastructures and technologies;
- **distributional justice** - questions of the siting of energy infrastructure and economic issues of benefits and burdens ('who gets what'); and
- **recognition justice** - understanding the basis for social inequalities and the acknowledgement or dismissal of marginalised and deprived communities in relation to energy systems.

Given the rise in social inequality within many EU states because of multiple converging structural, financial and economic crises, EU energy policy needs to focus more heavily on its social impacts. This focus is also needed for the diverse efforts of member states to instigate low-carbon and renewable energy transitions. Consequently, energy justice needs much greater attention so as to effectively meet many of the EU's future energy challenges. This has serious relevance to many of Horizon 2020's 'Societal Challenges', such as the 'Secure, Clean and Efficient Energy' theme, and can contribute to analysis of the broader social impacts of the EU 'Energy Strategy and Energy Union' plan.

This report thus concludes with the following recommendations: (1) funding new areas of energy justice research to sit alongside all areas of EU energy policy; (2) a cross-disciplinary energy justice framework to advance research with STEM researchers; and (3) a specific 'Energy justice in the EU' session at the SHAPE ENERGY *Pan-European conference*.

Our research priority lies in ensuring that a fair, just and equitable energy system emerges within the EU over the coming decades. As our report states, in all policy and decision making scenarios regarding energy; fairness, equity, inclusiveness and justice are increasingly sought to ensure wider social acceptance, alongside enabling more efficient implementation of new energy technologies. We feel energy justice is fundamental to the realisation of these scenarios in practice.



1. Introduction to 'justice' in the Social Sciences and Humanities (SSH)

As an output of *Social Sciences and Humanities for Advancing Policy in European Energy* (SHAPE ENERGY) project, this report aims to present the important role of energy justice for energy policy makers and researchers across diverse fields, including Economics, Business Studies, and Gender Studies. This is especially important in, for instance, EU circles where there is little to no consideration given to energy justice in all energy policies on meeting EU energy transition targets. In addition to presenting useful guidance to policy makers who want to design 'socially conscious' energy policies, this report also serves as a benchmark review for future energy research (in SSH and beyond) that seeks to integrate energy justice into their analyses. Our review of research literature emphasises the importance of energy justice in relation to, for example, issues of climate change and developments in energy technologies. In all policy and decision making situations regarding energy and environmental issues, fairness, equity, inclusiveness, and justice are increasingly sought to ensure wider acceptance, alongside enabling more efficient implementation. This argument for the macro economy also holds for businesses at the micro level - i.e. productivity, reputation, efficiency, and customer loyalty are affected by whether a company's energy related strategies are perceived as just or not.

Justice is implicit to almost every social issue, including: social divisions (Payne, 2006); social stratification (Giddens, 1981; Kerbo, 2012; Crompton, 2008); and social equality (Turner, 1986). In different ways, justice has always been a concern of the classical and contemporary forerunners of social theory (Kant, 1963; Hegel, 1991; Rousseau, 2009; Marx and Engels, 2002; Weber, 1964; Durkheim, 1964; Rawls, 1971; Sen, 2009). In the context of this wider interest in justice, it is important to note that (more specifically) much of the energy justice theory and research is built on the foundations of older social justice and environmental/climate justice research - we now briefly summarise each of these in turn.

Social justice has traditionally been focused on distribution in accordance with people's conditions, merits, and needs. Social injustice may therefore be experienced basically as maldistribution, exclusion, and disempowerment. These are not mutually exclusive and in worst-case scenarios benefits and burdens can be improperly distributed, while at the same time individuals and groups are excluded, which consequently disempowers and marginalises them (Bufacchi, 2012). Social (in)justice is observable through various appearances of social relations such as poverty, class, race, ethnicity, gender, sexual orientation, environment, and law (Frey, 2014).

In contemporary societies, more social justice issues have been made visible. Yet social *injustice* has also spread towards new social spaces and has crosscut different social relations. Keeping its primary focus on the fair distribution of rights, opportunities, and resources, social in/justice can also be considered in terms of global in/justice. The core criteria for social justice in a globalised society include the prevention of poverty, the necessity of education, inclusion in the labour market, sustained social security standards, fair distribution of wealth and income, the pursuit of generational justice, and greater gender equality for all citizens of the world (Cramme and Diamond, 2009).

Environmental/climate justice research, which is itself an outcome of a comprehensive understanding of interconnections between changing human-environment interactions in the modern world (Campbell et al., 2015), serves as a guide to the development of energy justice theory. The objective of environmental justice is to strive for fair and equitable treatment of all people, as well as ensuring participation in all key decisions around a multitude of environmental issues (Cohen and Robbins, 2011; Pavlich, 2010). However, while the environment is a source of prosperity for some, it can actually be a source of threat and risk for others. Environmental injustice therefore means a disproportionate exposure to risks, unequal access to environmental goods and less opportunity to participate in environmental decision-making (Shrader-Frechette, 2005; Visgilio and Whitelaw, 2003).

While environmental justice highlights inequalities within environmental systems, energy justice focuses on inequalities within energy systems and transitions. A hydroelectric dam, constructed to generate electricity to be consumed by construction companies in a developing region, may serve to pollute a biodiversity



hotspot or force indigenous people to migrate. Decisions on where to build nuclear waste repositories may raise severe concerns over the health of underdeveloped rural communities. Recognition that some renewable resources are unevenly distributed, such as wind and solar energy, may require re-thinking the distribution of energy costs and subsidies in societies that play host to high levels of social stratification and division. For example, a transition to renewable energy systems may deprive low-income households of meeting basic energy demand, due to increasingly higher prices as the costs of subsidies are passed on to consumers. Redefinition of the ownership of renewable energy technologies, such as wind farms, may change the local community's attitude and level of acceptance. In addition, ensuring better representation of different ethnic groups in energy policymaking institutions potentially offers a more proactive approach in achieving justice.

In unpacking the literature related to energy justice, this report is structured as follows: the next section provides a definition of energy justice and briefly reviews related literature. Section 3 explores how three disciplinary fields within SSH - Economics, Business Studies, and Gender Studies - are beginning to engage with the concept of energy justice and, as such, bring forth new insights. Recommendations for the funding of EU energy research, interdisciplinary energy projects and platforms, and SHAPE ENERGY activities by SSH practitioners and researchers are provided in Section 4.



2. Defining Energy Justice

Energy justice advocates for the equitable sharing of both the benefits and burdens of energy system services and for more inclusive decision-making processes; it can also be used as a framework for to identify when, where, and how injustices occur within energy systems and how these injustices can be eliminated (Simcock, 2016; Jenkins et al., 2016; Sovacool and Dworkin, 2015).

Emphasising that the term is currently being used across many academic disciplines, Heffron and McCauley (2017) review two major frameworks¹ thus far developed to define and apply the concept of energy justice to research on energy systems at various scales. Not being mutually exclusive, and perhaps complementing each other, these frameworks conceptualise and clarify the application of energy justice to theory and practice, and are now discussed in turn. The first approach establishes the concept of energy justice based on three core tenets of modern justice (McCauley et al., 2013; Jenkins et al., 2016; Sovacool, 2016; LaBelle, 2017; Silveira, 2016):

1. *Procedural justice* highlights the importance of 'justice as public participation' (Barry, 1995; Adger et al., 2006; Sovacool, 2016) and explores the ways to achieve 'just' outcomes through local knowledge mobilisation, greater information disclosure, and better institutional representation (Jenkins et al., 2016).
2. *Distributional justice* focuses on the distribution of energy as a 'social good' and investigates where harms of energy provision arise as a 'social ill'; hence where injustices emerge in energy system processes².
3. *Recognition justice* considers groups in society that are ignored or misrepresented, and calls for greater recognition of these groups to reduce social inequalities³.

In addition to the three core tenets, Sovacool (2016) also proposes *cosmopolitan justice*, a fourth tenet of the energy justice framework. This tenet states that energy justice is not merely a national problem, but instead that injustice is a universal problem that applies to all human beings in all nations. This represents ethical responsibilities applying to all agents capable of understanding, facilitating and acting on them. Heffron and McCauley (2017) and Jenkins et al. (2014) also emphasise the importance of this wide-ranging approach in developing a comprehensive framework to consider energy justice within an energy system, and, to apply the core tenets to each element of the energy lifecycle throughout energy market supply chains⁴.

These tenets are intended to be applied at each stage of decision-making throughout the design of the whole energy system; from extraction of raw materials and resources, to the siting of infrastructure, to production, operation, pricing, use/consumption and waste management. The three core tenets, alongside cosmopolitan justice, can be applied from local to global levels, giving energy justice an inherently multi-scalar (energy, economic, environmental and cultural) dimension.

Energy justice also has the potential to act as a decision-making conceptual aid that serves as a guide to the creation of energy systems in practice (Islar et al., 2017). This departure from the core tenets approach introduces a second approach developed by Sovacool et al. (2016). Here, energy justice is defined based on a core set of principles to evaluate using a decision-making framework. These eight principles are: (1) availability; (2) affordability; (3) due process; (4) transparency and accountability; (5) sustainability; (6) intra-generational equity; (7) inter-generational equity; and (8) responsibility. Compared to these eight principles, the core tenets framework therefore aims to achieve a more just and fairer balance of competing

¹ Heffron and McCauley (2014) identify one additional framework: a whole system approach as in Jenkins et al. (2014).

² It applies, for instance, in cases where the proximity of some energy infrastructures to some communities may result in serious health inequalities (Holifield, 2012).

³ For instance, supply and efficiency-oriented solutions to energy provision may result in the unfair location of power plants close to ethnic minority communities, often not having any voice in decision-making processes (Pastor et al. 2001).

⁴ See Sovacool (2016) and Heffron and McCauley (2017) for detailed discussions of the conceptual frameworks and how different approaches can be reconciled.



targets in energy policy, and aims for societal outcomes to be more equitable. However, the eight-principle decision-making framework is considerably more complex, in terms of practically operationalising it in research and policy. As such, energy justice research has largely drawn on the tenets approach (in particular, the original three tenets) to critically analyse energy systems and emerging energy system transitions (Jenkins et al., 2016) and it underpins the approach of the European Energy Justice Network⁵. There is still room, however, to further apply the decision-making framework to energy policy implementation, as practiced by the International Energy Justice Council, whose work is underpinned by six of the eight principles⁶.

These two energy justice approaches - (1) the three/four core tenets and (2) eight principled decision-making framework - are the core markers of the early stages of the development of the field. Taken together, they embody the contemporary foundations of energy justice theory. In terms of its disciplinary scope, the field has drawn heavily on perspectives from Philosophy and policy-oriented approaches for to lay these theoretical foundations, while clearly displaying conceptual influences stemming from environmental justice.

5 Please visit the European Energy Justice Network website for more information: <https://www.energyjustice.eu/>

6 Please visit the International Energy Justice Council website for more information: <http://energyjusticecouncil.org/index.html>



3. Disciplinary synergies, conflicts, and opportunities

3.1. Economics and energy justice

Energy system transitions are major components of climate change policies. Large-scale transitions of energy production (and use) systems – from fossil fuel to renewable and low-carbon energy systems – are defined in an unequal environment. This means energy transitions are likely to contribute significantly to unequal outcomes in different dimensions – horizontally across different (local) geographies, income groups, ethnic groups, genders etc. and vertically across different generations. Such challenges will inevitably raise questions that mainstream economic approaches will struggle to grapple with (Storm, 2009; Foster et al., 2009; Lohman, 2010). This is because these questions point to deep and often multifaceted problems, including fossil fuel technology lock-in, inherent market failures⁷, negative spill-over effects⁸ and distribution – problems that will force the field of economics to adapt, in order to keep up with these structural changes (Stiglitz, 2008; Lohman, 2009a; Horwarth and Norgaard, 1990).

Economics has been a prominent player both in the intellectual discussions and in political debate on policy formation within the energy sector. Yet, data-driven research can unquestionably show that focusing on the solutions offered by (pure) mainstream economics (efficient and low-cost alternatives) has contributed significantly to the continued reliance on fossil fuels (Global Studies Initiative, 2010). The energy justice conceptual approaches, reviewed briefly in Section 2, hence call for a broader scope to see where the tenets and the principles fit within the energy system. Therefore, any application of the concept of energy justice requires (i) questioning how costs and benefits of energy production and use are distributed horizontally across states/space and vertically across time; (ii) exploring and identifying where injustices occur; (iii) investigating which geographies/sectors/groups/communities/generations etc. are affected by such injustices, and (iv) exploring which procedures can be implemented, to reveal and reduce such injustices (Jenkins et al., 2014; McCauley et al., 2013; Sovacool and Dworkin, 2015; Islar et al., 2017). Such an approach in the field of Economics undoubtedly requires a move away from the pure mainstream economic approach, which perhaps for too long, has been dominant in energy systems research (Heffron and McCauley, 2015).

The mainstream approach focuses on low-cost and efficient energy outcomes and reflects the underlying Coasean perspective (Coase, 1960) in Economics that issues regarding efficiency can be separated from the issue of equity⁹. Hence, the Coasean framework classifies the problems regarding efficiency as within the context of Economics, and the problems of equity/fairness/justice as in the domain of ethics and political discourse (Howarth and Norgaard, 1990; Daly, 1992). The immediate implication of such an unbundling framework is that the efficiency question can be undertaken in a separate context. Such an analysis of efficiency would then take place under a purely utilitarian framework, trying to maximise a well-defined social welfare function, and focusing on the internalisation of external costs. The cost-benefit approach, which has long been the dominant framework in energy economics and energy policy, arises from this utilitarian (maximum efficiency) approach, and offers a practical estimation of the changes in social welfare (Dasgupta and Heal, 1972; Dietz, 2009).

Thus, the major outcome of this dominant approach in Economics, is that for realising an efficient outcome, it does not matter how the rights of the public good/bad are assigned. Hence, separately from the issue of efficiency, if any policy/outcome turns out to be unfair/unjust/unequal, corrective measures can be taken ex-post (via policies of redistribution) or ex-ante (by re-allocation of the policy rights), without changing the 'efficient' nature of the outcome.

7 Includes coordination failures, information asymmetries, using beliefs about future energy sources and prices, or externalities.

8 For example, promotion of biofuels as sustainable energy supply option leading to food crises (Rao, 2009).

9 The Coase theorem, briefly put, states that, in absence of transaction costs, the market exchange will lead to an efficient resource allocation regardless of the distribution of the rights. In other words, the Coase theorem suggests that the process of minimising the burden of internalising an externality is independent of the burden sharing scheme. This result means that the market efficiency and equity are separate issues.



Yet as the examples provided in Section 1 clearly point out, resource allocation can be efficient, but at the same time can be perfectly ill-designed if, for instance, future generations are deprived of the most vital resources to sustain a productive economy (Storm, 2009). In fact, research on the conceptualisation of energy justice, through all the tenets and/or principles, indicate that within the broader context and with respect to the nature of the problem, issues of efficiency and distribution cannot and should not be separated (Lohmann, 2009b; Martinez Alier, 2008). Hence, energy justice thinking, applied to (economic) policy making, requires economists to move beyond the simple maximisation of efficiency/minimisation of cost framework.

For one thing, efficiency is not a purely 'neutral' economic concept. In its general form, under the utilitarian approach, it depends on how social welfare is defined. As the definition of the benefit, it also depends on what is defined and considered as cost. Moreover, the whole process is disciplined by who actively participates in the decision of the cost-benefit elements.

Applied to energy systems, this (Coasean) economic approach aims for efficiency in achieving a given target – i.e. attaining a well-defined level of energy efficiency, supplying a given level of energy demand, providing the best mix of energy sources etc. to against a minimum (monetary) cost. Hence, 'efficiency' depends on the chosen target and also on the classification of what is counted as cost and what is not counted. How and by whom the target is set, and how the means to achieve the target are set up, become crucial in the process. Given that many groups' control over such choices are constrained, shaped and often forced by political processes, one has to be extremely cautious in applying only the standard tools of economics in the evaluation of policies regarding energy systems.

If energy justice is to become embedded within energy policy making, it will clearly need to develop a more interdisciplinary and pluralistic approach (Heffron and McCauley, 2017). A critical examination of energy justice and the relationship between energy research and Economics can also assist in evaluating how/where Economics can contribute to the research and policy making agenda.

Thus, one can revive and press for a well-structured discussion of how Economics currently engages with justice issues and how it is possible to advance the role of justice in the context of addressing the immense energy transition challenge ahead. An alternative framework suggested by Heffron and McCauley (2017) to the energy trilemma framework of the World Energy Council (2016) is certainly a prominent effort in this direction¹⁰.

The energy life-cycle, by its very nature, demands a comprehensive, systems approach, from extraction to production, operations and supply, use, and waste management. This includes considering the local and global levels, different spaces, and changes throughout time. Economics puts an emphasis on interdependence and comparability to changes in social well-being (Sen, 1987; Broome, 1999). Hence, it can be of use for to identify and evaluate alternative energy systems and the injustices that each alternative embodies (Jenkins et al., 2014). More crucially, energy justice must be considered as an important part of social well-being which policy makers aim to maximise.

3.2. Business Studies and energy justice

Through drawing on Business Studies, this subsection explores several ways in which energy justice can or does play a role in modern business practices. Business ethics have long been an important consideration in maximising long-run shareholder wealth, along with other factors (Tenbrunsel and Smith-Crowe, 2008). With the rise of environmental risks and also consumer awareness, managerial decisions are expected to be increasingly scrutinised from an environmental ethics perspective, causing environmentally responsible investments to become a potential influence on the returns to stock holders and financial risk (Galema et

¹⁰ The 'energy trilemma' framework of the World Energy Council proposes to take into consideration three attributes in energy decision-making: energy affordability and accessibility, environmental sustainability, and energy security. See WEC (2016) for details and see Heffron and McCauley's (2017) discussion of how the framework can be extended and developed into a more balanced and 'just' alternative.



al., 2008). Energy justice has, to date, played a smaller role than the broader topics of environmental ethics in business and corporate social responsibility (Sovacool and Dworkin, 2015).

A global energy system contains extraction, production, operation or supply, consumption, and waste management stages, and thus businesses operate as producers and consumers of energy within that system. Stakeholders ranging from individual consumers and citizens, communities, institutions like NGOs, corporations, governments, or regional bodies such as the EU, form a network of relations. The stakeholder theory of the business, originally proposed by Freeman (1984), has become the dominant approach businesses can use to manage the complex network of relationships with the many constituent groups to achieve economic sustainability. The stakeholder theory evolved to address current societal issues in business ethics, marketing, and critical management literature (Laczniak and Murphy, 2012; Steurer, 2006). However, this perspective is limited because of its micro corporate basis, economic value focus, and dyadic stakeholder relationship management approach (Banerjee, 2008; Harrison and Wicks, 2013; Laczniak and Murphy, 2010). Such limitations seem to be especially relevant to the injustices of current energy systems. Understanding energy systems as a network of relationships (rather than simply two-way corporate-stakeholder relationships) where multiple value types are co-created is important, as it facilitates the demands and interests of multiple stakeholders (Harrison and Wicks, 2013; Karababa and Kjeldgaard, 2014).

A company exchanges different forms of value (economic, symbolic, and social values) with the many stakeholders within the energy system, and through production or marketing practices they create and transform these value types (Karababa and Kjeldgaard, 2014). Building upon Karababa and Kjeldgaard (2014), it can be proposed that an energy company which provides affordable energy services to the poor as a part of corporate social responsibility creates a social value for the society in general and this: helps to eliminate distributional injustice; creates functional value to the impoverished community; gains a symbolic value in the form of corporate image and reputation; loses economic value in the short run to finance the corporate social responsibility campaign but in the long run, as a result of changes to corporate image, may gain economic value. Hence, the multiple types of values that are created and transformed (economic to social, symbolic to economic) throughout interactions among the multiple actors, should be considered (Harrison and Wicks, 2013). Thus, based upon stakeholder theory (e.g. Banerjee, 2008; Harrison and Wicks, 2013; Laczniak and Murphy, 2010) and research on creating and sustaining value in marketing (e.g. Karababa and Kjeldgaard, 2014) it is proposed that performance measures based on economic, environmental and social sustainability domains should be developed and administered to companies and other actors within the energy systems.

In addition to corporate social responsibility efforts, energy companies can seek to shape consumption patterns of their target markets in order to promote distributional justice. For example, middle-class consumer segments not only have availability and affordability of energy but their daily energy consumption is also higher. Shove (2003) studied the notion of comfort in British middle-class families and showed that 21 degrees is socially accepted as a normal room temperature. Alongside the development of modern urban life, it is viewed as the standard of comfort. Higher consumption of energy by middle classes can create injustices in the distribution of energy to others. So, it is argued, socially and environmentally conscious companies could study these routine consumption practices and potentially influence these social practices. Lastly, companies can utilise integrated marketing communications to create alternative meaning systems, such as changing the standard of comfort. An example of institutional efforts to shape consumption patterns of energy consumers is the 'Cool Biz' campaign of the Environment Department of Japan. The 'Cool Biz' campaign encourages workers to dress more casually and set air conditioners at 28 degrees Celsius from early May to late September. Hundreds of businesses participate in the initiative. Recent research in Consumer Culture Theory argues for the strong role of understanding practices in achieving changes in consumption patterns (Prothero, 2011).

Businesses are not only crucial actors in the production and consumption of energy, but they create or eliminate injustices at both human and non-human dimensions. These relations are complex and exist at multiple scales, including international policy, the national context, or local/community scales (Mistry et al., 2014; Sovacool et al., 2017). The examples given in earlier paragraphs are mostly about producer-



consumer relationships, but multinational energy companies operating globally face different energy frameworks in different market contexts. Rather than standardising their strategic decision-making, they adapt to the context at two scales: the national legislative frameworks and norms, and, demands of the local communities (Darmani et al., 2016). At both these levels, businesses can be facilitators of energy justice.

Amending the traditional corporate-based stakeholder theory perspective to an alternative one, which equally includes evaluation of the needs and expectations of the stakeholders, can be one step towards eliminating procedural injustices. Transformative consumer research and organisational theory have introduced 'participatory action research' as a democratic technique which more fully includes all relevant stakeholders in decision-making and implementation stages (Ozanne and Saatçioğlu, 2008). The aim is that communities, disadvantaged groups, companies, local governments, NGOs and other stakeholders in the energy system are better represented in a participatory process and work together in the identification of the current problems and solutions, and sometimes even in the implementation of these solutions. For example, if a community is exposed to negative effects of an energy plant in the region, related stakeholders including the representatives from the local community government, municipality, NGOs, and other relevant groups start working together in order to achieve a democratic means in decision-making. This procedure repeats itself periodically in order to get feedback, identify new problems and solutions and start implementing them.

Such democratic approaches, which seem necessary for companies to eliminate the strength of traditional stakeholder theory perspectives, also necessitate alternative conceptualisations of ethics, or how to delineate what is just for whom. Operating at multiple scales and embedded in multi-actor networks, businesses will inevitably encounter situations of justice or injustice. Rather than sticking to an understanding of singular ethics such as corporate ethics, a shift to an understanding of ethical pluralism will help to take into consideration the needs, expectations and, most importantly, injustices that wider stakeholders face (Boltanski and Thevenot, 1991). For Boltanski and Thevenot (1991), the occurrence of disputes can be resolved through compromise which involves seeking congruence between diverging principles of different stakeholder groups. Then, stakeholders can search for a common good by using creative techniques, such as through participatory action research.

3.3. Gender and energy justice

Gender is defined as a social category in which people represent themselves as male or female (Magazines and Savers, 2001). Gender is thus related to psychological and/or sociological features and attributes, in contrast to sex which is defined on a biological basis. One of the most important problems related to gender is discrimination - most commonly (although not always) against women. In many parts of the world, women may be discriminated against, subjected to different maltreatments and stereotypes. They may be seen as powerless, paid less than men, and pay the costs of raising their children more than men (Cawthorne, 2008; Sorensen, 1994).

The world around us has been traditionally male-dominated in many ways (e.g. Acker et al., 1982), especially with regard to the value system of professionalism (Lebra, 1981). The energy sector is reflective of this male domination. When we consider the importance of access to energy sources globally, the widespread nature of women's lack of access to certain energy sources (Farhar et al., 2014; Reed and George, 2011) has been a critical concern for people who work in energy studies. .

Whilst energy and gender covers multiple issues, as discussed further in the SHAPE ENERGY cross-cutting theme report on *Energy and gender* (Anfinsen and Heidenreich, 2017), here we focus on particular themes of relevance to energy justice, such as the equal distribution of energy sources in terms of gender and health issues and gender representation amongst decision makers. All of these are intertwined and consideration of them can help develop an environment in which both genders are treated more equally. Furthermore, gender may be a factor in Economics and Business Studies research on energy justice. For example, one explanation of differences in the estimated magnitude of the rebound effect across countries in Economics studies may be due to gender issues (i.e. male dominant culture vs. not) (Galvin, 2015).



Across the world, women are generally responsible for household work. Wrangham (2009) denominates this as a 'gendered division of labour'. They are generally thought to be cooks, cleaners and care-givers, as Anderson calls: "*the three C's*" (as cited in Altman and Pannell, 2012, p.3; Anderson, 2000) - that is, they are often domestic labourers. Farhar et al. (2014) claim that energy justice is closely related to accessibility to health care (see also Wickramasinghe, 2003). In poor and developing countries, women generally tend to suffer adverse health consequences from energy use. This is because activities such as cooking, lighting, and heating with traditional fuels cause serious diseases in developing countries (World Bank, 2010). For example, wood fuel and water collection, according to Kramarae and Spender (2004), has been causing risky health problems for women such as spinal damage, problems during pregnancy and an increase in the probability of maternal mortality. Moreover, according to the World Bank (2010), child pneumonia, lung cancer, chronic pulmonary problems and low birth weight are some of the diseases and problems caused by indoor air pollution due to burning fossil fuels and biomass. Since women are responsible for cooking in many countries, and children are spending most of their time indoors, both groups are disproportionately affected by these diseases (World Bank, 2010). Thus, it cannot be said that there is an equal or gender-neutral distribution of energy sources (Clancy et al., 2003), as the literature on gendered inequalities provides strong evidence of severe energy injustices and inequalities between women and men in developing and underdeveloped countries.

Furthermore, in workplace contexts, gender inequality exists in many sectors, but this is becoming more acute in the energy sector (Herring, 2009) where there is less opportunity for women for working and decision-making in the energy sector than men, particularly in developing countries (Pearl-Martinez and Stephens, 2016). However, McElhane and Mobasser (2012) indicate that the number of women working on the board of directors within the energy sector is related to increased interest in investment in renewable energy and reducing carbon emissions. Moreover, women are inclined to reveal more concern about the environment and exhibit more pro-environmental attitudes and behaviours (e.g. Kennedy and Dzialo, 2015; Tilikidou, 2007).

Recent initiatives concentrate on developing evidence and understanding experiences around the gender issue, in order to get fair, effective and sustainable results in the energy sector. There is also the need to advance the promotion, in both national and international contexts, of the significance of conveying a gender-oriented point of view within both planning and strategy; capacity building and support for energy projects; and creating local, national and universal schemes to support these initiatives (Cecelski, 2003).

In brief, the gender dimension within energy justice is beginning to be taken into consideration. In order to create a 'de-gendered' environment in energy usage, women would need to be enabled to have greater representation within policymaking processes through a greater presence within parliaments or governments. Moreover, to work towards a gender-neutral environment, equal distribution and access to energy sources for both women and men should be emphasised; equal gender representation amongst decision makers should be considered, and, since health risks are of paramount importance, gender specialists must take certain responsibilities to train and empower women to tackle the energy-based sources of these health risks, by, for example, seeking more sustainable energy sources. These efforts will help to raise awareness of the potential of energy justice approaches to addressing gender inequality.



4. Recommendations

For the funding of EU energy research

- Although energy transitions have the potential to create inequalities and injustices, neither the Strategic Energy Technology Plan, the 2016-17 energy work programme of Horizon 2020, nor the research and innovation priorities of the Energy Union include any consideration of energy justice. We recommend that funding be made available for complementary energy justice research to sit alongside all areas of EU (energy) policy and research.
- Research is needed to further explore how economists and energy justice academics could work together in identifying and exploring new frameworks of 'just' economic energy policy, such as measuring and including energy justice in quantitative economic models or in decision making tools.
- More research is needed on the multiple roles of businesses as (1) facilitators of energy justice for their consumers, (2) targets of energy justice, and (3) participants in just energy policy-making procedures.
- New research partnerships between gender specialists and energy justice academics will need to be enabled and encouraged by future funding, to increase awareness at the household, firm, and industrial levels and to create a gender-neutral energy sector. The struggle for greater gender equality is central to global justice movements around the world, but needs further integration into energy justice.

For interdisciplinary energy projects and platforms

- Researchers from across the SSH disciplines need to establish a cross-disciplinary framework to advance energy justice research with STEM researchers and energy stakeholders. By engaging with a more diverse set of actors and disciplines, it will ultimately reach a wider audience and have greater impact as a discipline.
- A quantifiable measure of energy justice could be a part of a more general quality of life or social welfare measure, which could in turn be utilised in energy, economy, environment and society (E3S) models or multi-criteria decision-making mechanisms, which may especially be of use to industry-led EU platforms that are focused on technology research and development.

For SHAPE ENERGY activities

- There are many opportunities for a session at the SHAPE ENERGY *Pan-European Conference* that directly addresses the opportunities and challenges of integrating energy justice ideas into EU energy policy. Such a session could critically discuss a number of EU initiatives, such as the 'Clean Energy For All Europeans' package or the 'Citizens Energy Forum'. It would ideally involve a range of EU energy system stakeholders coming together with leading energy justice academics.
- Ensure the input and involvement, where possible, of members of both the 'International Energy Justice Council' and 'European Energy Justice Network' in future SHAPE ENERGY activities.



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