

# Energy justice as a search light for gender-energy nexus: Towards a conceptual framework

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## ARTICLE INFO

### Keywords:

Energy justice  
Energy policy  
Gender analysis  
Gender policy  
Conceptual framework  
Literature review  
Policy analysis

## ABSTRACT

Differences between women and men in their access to and use of energy services constitutes the core of gender-energy nexus research. In early 2010s, the concept of energy justice has emerged as a response to the need to address justice issues in energy access, use and policy making. However, the gender-energy nexus research lacks the conceptual basis to analyse energy policies from a justice perspective. This paper aims to bridge this scientific and policy knowledge gap by developing and applying a conceptual framework by juxtaposing the three tenets of energy justice (distributive, recognitional and procedural justice) and the three engendering policy discourses (women empowerment, gender mainstreaming and social inclusion). To develop the framework, we conducted a conceptual review of 56 scientific publications by identifying, examining and synthesising the key ideas and debates in energy justice and engendering energy policy. Then we applied the framework to the current body of scientific knowledge on gender and energy justice and identified future research directions. Given the limited scientific literature on gender and energy justice, the framework contributes to conceptualising energy justice for researchers analysing energy systems in their social, cultural, economic and political contexts. This paper makes a first attempt in doing so, and invites further elaboration and operationalisation of the framework. A comprehensive application of the framework requires further empirical evidence and the development of indicators to assess energy policies from an integrated gender and energy justice perspective.

## 1. Introduction

Access to sustainable energy for all is a challenge for energy policy makers world-wide. Availability, affordability and reliability are three indicators of the access to energy services, which is crucial to reduce poverty and sustain economic growth [1]. This global commitment to energy access is embedded in Sustainable Development Goals (SDGs), specifically SDG7 that aims “to ensure access to affordable, reliable, sustainable and modern energy for all”. In both the Global South and North, energy poverty and limited access to energy have a strong gender face [2]. Women and men are unequally affected by limited access to energy services both in society and within households. There is strong evidence on the link between energy poverty in the household and other factors, such as women’s health burdens, time use, education and access to information [3–7].

In the early 2010s, the concept of energy justice has emerged as a response to the need to address justice issues in energy access, use and policy making. Sovacool and Dworkin define energy justice in their seminal work of 2014 as “a global energy system that fairly disseminates

both the benefits and costs of energy services, and one that has representative and impartial energy decision-making” [8,9]. Energy justice has evolved as a conceptual, analytical and decision-making framework around three tenets: distributive, recognitional and procedural energy justice [9]. The focus on justice in energy policy provides insights into the multiple dimensions of injustice across all global energy systems that can lead the way to a more just energy policy [10]. Justice is a key element in human rights discourses seeking to overcome inequality in society, such as the inequality between women and men arising out of gendered roles in society.

Differences in access to and use of energy services between women and men is at the core of gender-energy nexus research. Drawing from Khamati-Njenga and Clancy, we define gender as “the roles, privileges, attributes and relationships between women and men that are socially constructed and not biologically determined” [11]. This definition emphasizes gender as a social construct, which changes over time, space and context. Hence, the gender dimensions of energy access and use vary across social, cultural, economic and political contexts. The objective of gender and energy policy research is an engendering energy policy that

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enables a fair energy distribution between women and men, recognises gendered energy needs, and contributes to equal participation of women and men in the energy sector. Early research on gender mainstreaming in energy policy that called upon human rights discourses lacked a theoretical foundation for a fair distribution of energy services [12]. The energy justice discourse offers this crucial feeding ground to understand the gender-energy nexus by asking normative questions about the energy-related costs and benefits and the fair distribution of those linked to power, status and governance [13,14].

The scholarly literature on energy and gender often focuses on the household level, where women suffer greatly under the burdens of energy poverty [2]. However, conceptual frameworks and empirical evidence on the analysis of macro-level energy policy through a gender lens remains scarce. This is remarkable given that the earliest publication on gender and energy policy by Parikh [15] has already argued for integrating gender at the macro-level policy. Parikh contests the emphasis on household level for four reasons. First, women's role goes beyond household energy use through their work in agriculture, food processing, service and manufacturing. Second, households are not a homogeneous entity and intrahousehold allocations of time and resources differ between genders. Third, women are not only energy users, but also participants of the energy supply chain. Fourth, women have diverse roles in designing, adapting and using new energy technologies. All four arguments are still valid in the energy transition debate and should be tackled to design and implement sustainable energy policies. Further, the research on national energy policies often lack an analytical framework to reflect upon the impact of energy policies on gender roles and relations [12,15,16].

This paper aims to bridge the scientific and policy knowledge gap in understanding gender just energy policy by developing and applying a conceptual framework that integrates energy justice and gender approaches in energy policy. By juxtaposing the main engendering policy discourses with the three tenets of energy justice, the main concepts of the gender-energy nexus are identified. The gender just energy policy framework can serve as a conceptual framework to understand the interlinkages between energy justice and gender-energy nexus. Future research can develop the analytical and decision-making application for research and policy. The main research question that we seek to answer is: *How can energy justice be applied to conceptualise engendering energy policy?* This question is broken down into two sub-questions: 1) Which gender discourses are used to contribute to engendering energy policy? 2) How applicable is energy justice for analysing energy policy through a gender lens? To answer these questions, we set the scene in section 2 by elaborating on gender and energy justice as an emerging nexus. In section 3 we develop and apply the framework based on the findings from a conceptual review of scientific literature. Finally in section 4, we draw conclusions and identify future research directions.

## 2. Gender and energy justice: an emerging nexus

Concepts of justice have emerged in the climate change debate from the environmental justice movement of the 1970s [10,17–20]. Taylor [21] defines environmental justice as “an established movement connecting environment, race, class, gender and social justice issues”. Environmental justice is concerned with the distribution of environmental hazards and access to natural resources, representing distributive and procedural justice concerns [10]. More recently, environmental justice has been complemented with climate justice, in which the connections between climate change and human rights are seen as being central [19,22–24]. Out of these two justice approaches, energy was separated from the wider range of topics concerning the environment and climate change, creating the concept of energy justice in the 2010s [10,19].

Energy justice has received attention in the scholarly literature since 2013, but the social justice dimension of energy policy was used earlier by non-governmental organisations in the development cooperation

sector [25]. The first framework of energy justice is a triumvirate of tenets – distributive, procedural and recognitional – to be applied throughout the energy system [26]. Justice dilemmas are in the forefront and include concerns about the material infrastructure of energy technologies, the access to and cost of energy services and intergenerational equity. When energy justice is applied to policy research, the central concepts are energy production and energy consumption, in terms of procedural decision-making and distributive outcomes [19]. Consideration of the justice dimension is a vital decision-making framework to make fully informed and comprehensive choices [9]. Energy justice through a governance perspective attempts to find answers to three key questions: Where resources should be focused (distributive justice), whose needs should be recognised (recognitional justice) and how democratic legitimacy should function (procedural justice) [26].

As Sovacool and Dworkin stipulate, the concept of justice is more important for what it *does* than for what it *is*: a framework with multiple functions that are revealed by observing its effects on actual decisions [9]. Energy justice functions as a *conceptual* framework to unite justice concerns that are usually distinct. The *analytical* function of the energy justice framework helps to understand the underlying values of energy systems, or to resolve common energy problems. The *decision-making* function assists energy planners and consumers in making informed energy choices [9,10]. The decision-making function of energy justice is developed around eight core principles: availability, affordability, due process, transparency and accountability, sustainability, intra- and inter-generational equity and responsibility [9,27]. Sovacool and Dworkin drafted an energy justice checklist supporting the decision-making function for practitioners to design an energy just policy and for researchers to assess existing energy policies on justice awareness [9]. However, energy justice remains an academic concept that is not yet adopted by policy-makers to embed justice principles into energy policy design [10]. Heffron and McCauley highlight that little reflection is given to the energy justice frameworks of how it is translated into practice, creating just energy policies and resulting in equitable outcomes of energy policy interventions [25]. At the same time, within the growing body of literature on energy justice, the intention to apply justice-oriented concepts in energy policy is emerging [10].

These questions give rise to another question: can energy justice be used as a universal concept in striving to clean energy for all? Or, more specifically within the scope of this paper, could it be applied to gender relations in both the Global South and North? Given the climate change challenges combined with the global commitment to provide access to sustainable energy for all, an increasing attention is paid to the ethics of decisions and behaviour linked to energy supply, demand and consumption [28–31]. As Jenkins et al. pointed out, energy justice is a field in development, in need for empirical examples outside energy poverty and the dichotomy between the Global South and North [20]. There is a need to contextualise the abstract concepts of energy justice. Wiese questions the applicability of energy justice in socially unequal and culturally diverse contexts [32]. Her research in Ethiopia demonstrates that although all three tenets of energy justice are identified, context influences justice implications. Furthermore, the meanings given to energy justice concepts change over time and they need to be placed into their social, economic, political and cultural contexts. The majority of the gender-energy nexus research is based on empirical data of the Global South and the energy justice debate mainly stools on data from the Global North [7]. Juxtaposing these two streams creates a global understanding of both gender inequalities and broader social injustices in energy access and use, with room for contextualisation.

While energy justice is a global concern, it argues for policy interventions to ensure energy solutions that are contextually embedded [20]. Contributions to the energy justice debate from an energy poverty perspective plea for increased attention to be given to contextual factors, such as the social determinants of energy consumption [14,33]. The contextual dimension of energy justice was identified by Fuller and

McCauley within the spatial and temporal dimensions of energy justice activism [19]. Their empirical work demonstrated that energy justice activism involved temporary interventions in the energy system, which focused on energy production or consumption, rather than scrutinising the energy system as a whole. Sovacool et al. add the concept of ‘decarbonisation divide’ to this debate: energy transition may contribute to decarbonisation in the Global North, but the environmental and social costs of the energy supply chain are outsourced to the Global South [31].

Bouzarovski and Simcock pinpointed that much of the energy justice literature and current debate focuses on social inequalities and energy deprivation that jeopardise energy justice [34]. They added the spatial dimension of justice to the already existing socio-economic and politico-legal dimensions, claiming that spatial inequalities were operating throughout the energy system, causing a geographical spread of energy poverty. The spatial aspect of energy justice is an emerging dimension that intersects with all three energy justice tenets to analyse how they play out in public and private spaces. The contribution of this spatial dimension to the theoretical debate is that it disturbs the production vs. consumption binary positioning of the current energy poverty debate, and it reveals that all three energy justice tenets have a spatial aspect. The same argument holds for adding the gender element to the energy justice debate. The spatial aspect and gender dimension could be interlinked to strengthen the contextual understanding of inequalities and injustices in energy access.

Gender inequalities can be found at all levels in the energy system that create gender injustices [6,16,35]. The gender-energy justice nexus could be criticised for adding another binary dimension to the supply vs demand binary that exists in the energy transition debate. Sovacool et al. argue for a multi-scalar and whole system approach to energy transition and development pathways in order to have equitable outcomes [31]. Their study shows the importance of ensuring justice in the energy supply chain as well, e.g., for the workers involved in e-waste processing in Ghana. The current divide of consumers vs producers in the energy system can be bridged by acknowledging women’s triple role (the producer, the decision-maker, and the consumer) as agents of change in the whole energy system [16,36].

2.1. The gender dimension of energy justice

Conventional social science research on energy was criticised for approaching energy issues as matters of national security, economic competitiveness or environmental degradation, but not as a matter of social justice [27]. As an emerging theme, energy justice recognises the ethical dimension of (re)allocating the societal outcomes of the energy transition [28,37]. Social justice focuses on two tenets: procedural justice, which addresses representation and participation; and, distributive justice, which focuses on the distribution of the benefits and costs of the energy transition [27,37]. Sovacool et al. applied procedural theories of justice to analyse governance and decision-making processes in the energy transition [27].

Table 1 shows the evaluative and normative questions of energy justice across its three tenets. These tenets can also be applied to the gender-energy nexus. Acknowledging that humans’ energy needs are determined by gender relations resonates with the recognitional tenet of energy justice. Further, participation and power both have a strong gender dimension, since gender relations are prone to cause power asymmetries between women and men and their unequal participation

**Table 1**  
The evaluative and normative contributions of energy justice to policy design.

Tenets	Evaluative	Normative
Distributive	Where are the injustices?	How should we solve them?
Recognition	Who is ignored?	How should we recognize?
Procedural	Is there fair process?	Which new processes to develop?

Based on: Jenkins et al. [20].

in decision-making processes [38]. Bell et al. argue that a feminist approach reveals these power asymmetries and injustices in energy systems [39]. Procedural justice moves beyond the quest for an equal numeric representation in decision-making to an equal participation in all policy phases. That can still be challenging to achieve at all decision-making levels, particularly for national governments. For instance, as Fraune pointed out, the German government organised citizens’ dialogue sessions to enhance public acceptance of the energy transition, but men were significantly overrepresented [40]. According to the survey of Sorman et al., 51% of the female respondents believe that the role of women is excluded from the current Spanish energy transition decision-making [41]. Clancy and Feenstra concluded that women were under-represented at all levels of decision-making in the energy sector in the EU and this led to gender inequality in the energy transition [16]. Although equal representation of women and men is important, more factors are influencing engendering energy policy than only appointing women in decision-making positions [42].

Research on gender and energy has evolved in parallel and more or less unconnected to social science research on energy [40]. This is remarkable since both scholarly streams investigate the relationships between individuals and energy systems within their context depending on time, location and governance structures. Some research has focused on women’s representation in energy-related occupations, with an emphasis on industrialised countries [16,40,42–44]. As Fuller and McCauley demonstrated through an energy justice perspective, specific normative claims of justice, such as identifying vulnerable groups, can be overlaid with questions about energy in a whole systems approach [19]. Vulnerable energy consumers or marginalised groups, such as deprived households, migrant communities, and the poor, are the main research entities in energy poverty research in the Global North [33]. Fuller and McCauley concluded that there is scope for a more comprehensive representation of injustice to reflect the expansion of energy issues [19]. Lee and Byrne expanded the analytical and conceptual basis of the energy justice framework by adding the institutionalisation of dominant modern energy systems [45]. Healy and Barry emphasised the political dimension of striving for a just energy transition as a response to existing injustices and unsustainability [46]. By enlarging the scope identifying existing injustices, a deeper analysis of the representation of energy consumers will provide a nuanced understanding of vulnerable groups. If the unit of analyses goes beyond the entity of households, a gender gap in access to energy can be revealed, as women are disproportionately affected more by energy poverty than men [2,16,47]. Thus, the injustice of energy policy in relation to gender relations in society calls for engendering energy policy. The effectiveness of energy policy improves when gender is acknowledged, optimising outcomes for all actors involved in the energy system [13,35].

2.2. Towards a framework for engendering energy policy

The need for a framework is eminent in any attempt to analyse gender and energy policy from an energy justice perspective. A research framework reflects how the research problem is defined, the kind of questions to be asked in any analysis, and the type of solutions to be proposed to solve the problem. In their gender-energy nexus work, Khamati-Njenga and Clancy [11] define a framework as a system of ideas or conceptual structures that help understand the social world. They pinpoint that a framework is based upon certain assumptions about the social world. Multiple frameworks can be developed to analyse a given problem, because people make different assumptions about the nature of the problem in particular contexts. Different frameworks that explain the same social phenomenon co-exist and, depending on the context, one framework can be more applicable than another. As Ostrom stipulated, “given the multiple languages used across disciplines, a coherent institutional framework is needed to allow for expression and comparison of diverse theories and models of theories applied to particular puzzles and problem settings” [48]. Following Ostrom’s

approach, we propose a framework for engendering just energy policy that reflects different approaches to the gender-energy nexus research, brings together the concepts and ideas from multiple disciplines, and can be applied in different contexts.

To develop the framework, we first identify the main concepts in gender and energy policy with a focus on how gender approaches are included in energy policy design. By doing so, we might omit including aspects of the gender-energy nexus like gender politics and feminist derived leadership. These gendered aspects could be part of the operationalisation of the framework and the applicability in empirical data analyses. Since the 1970s, the gender and energy literature has evolved, demonstrating an epistemological shift from a gender-neutral to a more inclusive concept in energy research [49]. The development of gender discourses in policy development since the 1970s has resulted in several gender approaches developed after United Nations (UN) conferences that aimed to build international commitment for gender equality. Fig. 1 summarises this historical development of six gender approaches, which includes the welfare approach, women in development, gender in development, transformative approach, intersectional approach and social justice. These six approaches can be clustered into three gender discourses: women empowerment, gender mainstreaming and social inclusion.

As shown in Fig. 1, the historical development of gender policy and planning approaches is marked by three global milestones: 1) the First Global Conference on Women in 1975, 2) the Fourth World Conference on Women in 1995 and 3) the UN Sustainable Development Summit in 2015. These resulted in the adoption of the document ‘Transforming our World: the 2030 Agenda for Sustainable Development’ in which 17 SDGs are identified, of which SDG5 is – achieving Gender Equality.<sup>1</sup> In parallel to these global milestones, many countries have their own milestones in gender policy development, whether it is adoption of gender equality in legislation or a first female president. The most relevant developments for national gender policy were the UN declarations, such as the Platform for Action in 1995 and the eight Millennium Goals to eradicate poverty in 2000 [12]. All countries that rectify these UN declarations are part of the global commitment to implement them locally. While the SDGs are not legally binding, countries are being monitored in terms of their progress in achieving the targets.

A gender-neutral policy makes no distinction between women and men. It uses general terms, such as ‘households’, ‘citizens’, ‘consumers’, to identify its target group, and assumes that it equally impacts women and men [49–51]. Engendering policy counteracts this gender-neutral approach. Within the engendering policy process, several stages can be identified towards reaching a gender-equal policy impact. As Fig. 1 demonstrates for the 1970s and 1980s, a women-only approach results in empowering policies and a focus on women’s rights: the women empowerment discourse. To develop an engendering policy framework, we start the historical overview in 1970, the year in which the seminal book by Boserup recognised women’s contribution to the economy through agricultural production [52]. The development of feminist research in the 1970s rapidly grew and penetrated the political process. Academics, practitioners and activists were engaged in the dialogue on women’s rights and led to the first UN Conference on Women in 1975 [38,53]. As Cecelski points out, the UN Conferences in 1992 and 1995 opened up the debate on the role of women in energy policy and research [52]. She calls for expanding the scope to demand analysis and management of the energy sector, shifting the focus to the end-user and the gendered differences in access to energy sources. The UN Decade for Women 1975–1985 focused on women’s empowerment in taken a women-only approach.

At a certain point in the process, women are no longer seen in isolation and a shift to gender relations emerges as socially constructed

relations between women and men. This is the start of the gender mainstreaming discourse in which gender-aware policies are developed. In 1995, the Beijing Platform for Action endorsed governments to achieve gender equality and the empowerment of women through gender mainstreaming of their policies [12,38,53,54]. Gender mainstreaming was defined by the United Nations in 1997 as “the process of assessing the implications for women and men of any planned action, including legislation, policies or programmes, in all areas and at all levels” [55]. As this definition emphasizes, gender mainstreaming is a process with multiple stages, each having its own obstacles for implementation. Clancy and Mohlakoana demonstrate that gender mainstreaming in national policy takes time and needs political commitment and institutional support for both developing and implementing gender mainstreaming [56].

However, gender equality might not even be the ultimate goal in engendering policy. With the recent aim of many international organisations, gender equality should be considered the starting point towards social inclusion. Social inclusion discourse acknowledges that the target group of a policy is diverse and that a policy should reflect the diversity of individual lives and the social practices of individuals [57]. Social inclusion resonates with the concept of intersectionality in gender discourses, which moves beyond the binary ‘women vs. men’ distinction and acknowledges that differences in age, education, nationality, ethnicity, race, disabilities, social class, religion and marital status, equally influence the access of women and men to resources, their needs, interests and rights [49,58]. More recently, the social justice approach has been emerging with social groups claim their rights and position in policy [24]. However, aiming at social inclusion in policy might dilute intersectionality. This means the differences between social groups and, more specifically, between gender relations are not considered, since the overall goal of social inclusion is equality of all. This brings us back to the starting point of the gender and policy cycle: gender neutrality.

The historical overview in Fig. 1 identifies three major discourses to engendering policy: women empowerment, gender mainstreaming and social inclusion. We define engendering policy as “the process that creates a gender just policy in which the needs of both women and men are addressed and universal human rights are acknowledged leading to a gender just policy impact.”. Although the gender discourses emerge in different eras, they can be identified in current policies and publications, and are often used interchangeably and inconsistently. Thus, different gender discourses co-exist and there is no hierarchy between them. As reflected in the above definition, the outcome of engendering energy policy process is a gender just energy policy. Our definition of a gender just energy policy is based on the gender-aware energy policy definition given by Clancy and Feenstra [59]. A gender just energy policy 1) acknowledges that women and men have different energy dynamics, such as their roles in the household, decision-making areas, energy needs, responses to crises or coping mechanisms; 2) creates access to energy technologies and services that match those dynamics; 3) recognises women’s and men’s rights in policy processes that provide an enabling environment for equal participation.

### 3. A conceptual framework for engendering just energy policies

Taking the engendering policy process as a reference point, the question is whether the stages of women empowerment, gender mainstreaming and social inclusion can be discerned in energy policy design. The energy justice framework provides sufficient anchor points to integrate the needs and rights of women and men into an energy policy. Energy justice recognises the ethical dimension of reallocation of societal outcomes of the energy transition [37,60–62]. Sovacool et al. applied procedural theories of justice to analyse governance and decision-making processes in the energy transition [27]. Acknowledging the rights and needs of energy consumers in a demand-driven policy is central in the energy justice framework. This acknowledgment is represented both in a just distribution of energy services, equal recognition

<sup>1</sup> Paragraph 54 of the United Nations General Assembly Resolution A/RES/70/1 of 25 September 2015.

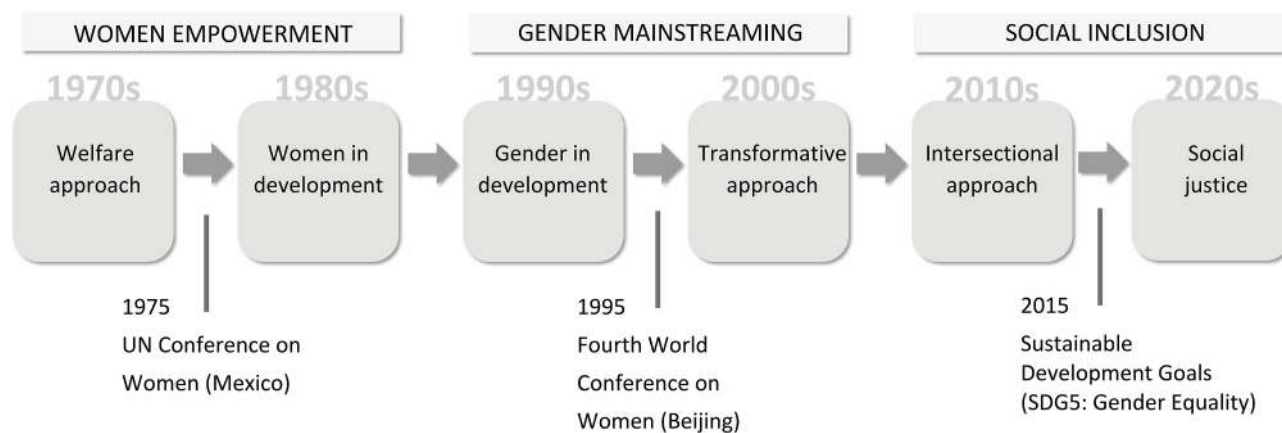


Fig. 1. Historical development of gender discourses and international commitment.

of all consumers' needs, and fair procedures for consumers to claim and exercise their rights to energy. The three tenets of energy justice resonate with the gender-energy nexus debate for acknowledging gender relations in energy systems. The challenge towards conceptualising the gender just energy policy is to integrate the gender discourses in energy policy into the energy justice framework. By reviewing and synthesising the relevant scientific literature, we made a first attempt to realize this integration and thereby to develop a gender just energy policy framework.

### 3.1. Review methodology

We conducted a conceptual review, which aims to synthesise the scientific knowledge that can contribute to a better understanding of the key ideas and debates, rather than an exhaustive review of all publications [63]. To identify the publications relevant for the review, we applied four search strings in Scopus. Each search string was executed following the same procedure. The first step, "searching", was a general search of publications between 1995 and June 2020. The year 1995 was chosen as a starting point for gender analysis as the number of publications increased after the Global Conference on Women [38]. This initial search included book chapters and peer-reviewed journal articles, and resulted in many publications, some of which were not relevant for the gender-energy nexus. The second step, "scoping", set the main scope on gender and energy and excluded all publications that were written in languages other than English or referred to irrelevant energy uses, e.g., metabolic, spiritual and sexual. The third step, "screening", was a limiting search to select the publications by reading the titles and abstracts. Furthermore, in this step we limited our review to peer-reviewed journal articles and publications that address both gender and energy. The final step "selecting" was scanning the full-text versions of the remaining publications if they presented data or analysis that went beyond only mentioning 'women' or 'gender'.

A potential limitation of this review is that it excludes grey literature. Numerous publications on gender-energy nexus exists in the grey literature, e.g., international organisations' reports, policy briefs and governmental position papers. This literature mostly reflects the normative approaches of non-governmental organisations and funding agencies to gender mainstreaming in energy policy. Such normative approaches are not necessarily a limitation, but the grey literature often lacks methodological soundness and transparency, and such publications are often not peer-reviewed. Therefore, we chose to concentrate on peer-reviewed scientific publications to be able to critically review and synthesise the key ideas and debates in the current body of scientific knowledge.

The results of each search were saved under a numbered bibliography. Then the four bibliographies were merged into one and omitted

the duplicated publications. We then checked the accessibility of remaining publications. If the full-text versions of the publications were not accessible, they were removed from the bibliography. This bibliography was cross-checked with a Web of Science search, using the same keywords and procedures as for the Scopus search strings. In this cross-check, no additional publications were found to include in the review. Fig. 2 and Table 1 illustrate the steps and search strings leading to the final bibliography of 44 publications included in the full-text review. An additional 12 publications were added using a snowballing technique in which we used the references of the 44 reviewed publications.

A review matrix was developed and applied to systematise the review of the selected publications. The matrix is based on the concepts related to energy justice and gender discourses in energy policy. This provided a standard structure to review each publication according to their coverage of the gender discourses and the tenets of energy justice. Publications were analysed as to how they defined and applied gender as a concept, whether their gender approach belonged to one of the three engendering policy processes and, if not, the publication was identified as using a gender-neutral approach. Furthermore, publications were categorised based on the dominant energy justice perspective they used. Table 3 summarises the results of the review of the selected 56 publications.

Table 4 shows how the publications intersect the three tenets of energy justice and the three discourses in engendering policy processes. The engendering policy discourses also includes a "gender neutral" discourse, since some publications used sex-disaggregated data, but remained gender neutral in their conceptualization and conclusions. The three subsequent sections elaborate on how these intersections are addressed in the reviewed publications.

### 3.2. Energy justice and women empowerment

Women empowerment emerged from feminist movement and is one of the key topics in feminist research. We identified a strong women empowerment focus in the early stages of the energy justice debate in the 1990s and 2000s. Eco-feminism is the frame that has often been used by feminist researchers engaged in the gender-energy nexus in those years. According to Gaard, "ecofeminism illustrates the way in which gendered, cultural assumptions about water, power and human relations have led to creating a water-power infrastructure that perpetuates environmental sexism, environmental racism, and environmental classism" [66]. This ecofeminism frame is also applied outside the water sector, addressing that women are unequally affected by climate change and carry the burden of limited access to sustainable and clean energy sources [15,53]. These publications reflect the zeitgeist of the time when they were published, and their women empowerment approach resonates with the empowerment focus in the aftermath of the Beijing

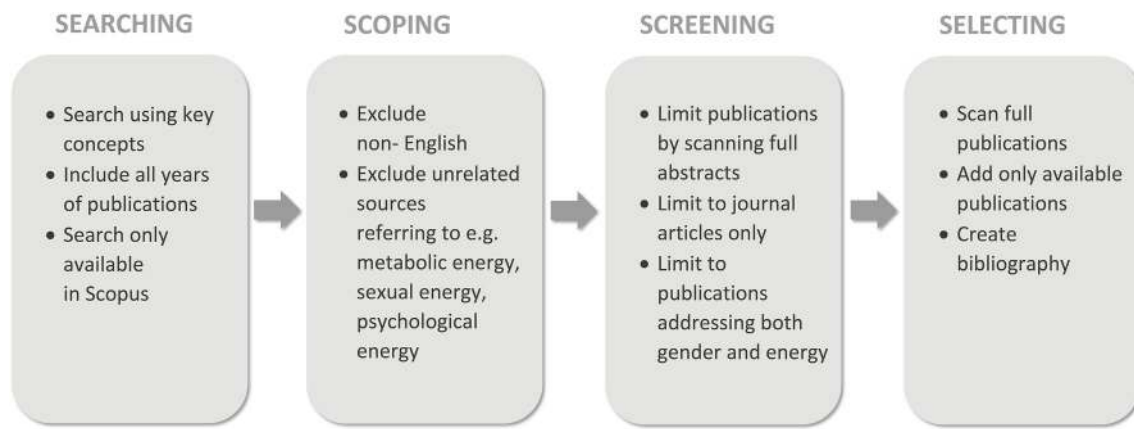


Fig. 2. Selection of the publications for conceptual review.

**Table 2**  
Search strings and steps to create the database of review publications.

Search string	Step 1	Step 2	Step 3	Step 4
	Searching	Scoping	Screening	Selecting
I: gender AND energy	11,117	332	117	10
II: gender AND energy AND policy	624	318	49	39
III: gender AND energy justice	54	42	21	16
IV: energy justice AND energy poverty	158	96	22	6

Conference in 1995. Their message is still powerful in the current energy transition debate.

The earliest publications included in the review demonstrate the activist motivations of the environmental justice literature, in which the gender-energy nexus was positioned within a broader environmental scope [15,53]. Since the 1980s, the objectives of energy were promoting economic growth and increasing households’ access to energy services in order to reduce poverty [49]. Nathan and Kelkar [64] and Palmer-Jones and Jackson [65] argued that innovative approaches to poverty alleviation and sustainable development are labour-intensive, unsustainable and not improving gender equity. They recognised the gendered division of labour concerning energy-intensive work in which women carried the heaviest burden. Gaard, on the other hand, took an ecofeminist standpoint against the emerging problems of water pollution and energy production by hydropower plants impacting health and living conditions of women and deepen their poverty [66].

The other publications that build on the women empowerment discourse address the different energy justice issues at stake in the gender-energy nexus. Reddy and Nathan discuss the nexus between poverty, health, education, energy and gender, concluding that women are responsible for household fuel use without having the authority over fuel choice, technology adoption or usage methods [91]. Wickramasinghe focuses on health issues related to biomass energy use in the domestic sphere and argues that women were disproportionately affected, reporting physical exhaustion, psychological deterioration and ill-health related to their role in the biomass energy cycle from collection to end-use [67]. Parikh argues based on a study in India of women’s unpaid work to collect energy sources and the health impacts of indoor air pollution and walking to collect biomass that energy policy is not recognizing women’s needs and their rights to health [4]. Ding et al. conclude based on their quantitative case study in Tibet, that the traditional gender roles are affirmed by the current policy of the energy sector in distributing renewable energy sources, leaving women the sole responsible for household energy without reducing their drudgery in collecting biomass for cooking and their exposure to polluting smoke [79]. As a response, numerous policy interventions and donor funded

projects focus on the uptake of clean cookstoves. Their impacts on women’s drudgery and health benefits are contested and women’s involvement in these projects are limited, which can be overcome by integrated policy approaches [80].

Sunikka-Blank et al. demonstrate the interlinkages of urban planning, domestic energy use and gender relations, and how current rehabilitation policies in India resulted in increased energy use and drudgery for women hindering their participation in society and work force [85]. Thoyre in her research of uptake of energy efficient light bulbs in American households, finds that climate change solutions in households increase women’s unpaid labour and expands gender inequality [23]. Willow and Keefer follow an ecofeminist approach towards environmental justice concerns over shale energy [22]. They argue that women who are opposed to shale energy were called to political action motivated by both personal and political arguments. From an energy justice perspective, both recognition as well as procedural justice, are essential to ensure distributive justice. Allen et al. focus primarily on women’s role as decision-makers in the energy transition process [62]. They advocate for the critical role of women’s leadership in accelerating the transition away from fossil fuels toward a renewable-based future. This has not been widely recognised or analysed in the social sciences. Allen et al. contribute to the applicability of the energy justice framework, not only to the demand-side of energy systems, but also equally to the supply-side [62]. Winther et al. focus on the role of women as entrepreneurs and energy service providers and how women’s involvement in the energy sector can contribute to their empowerment [36]. Energy justice as a conceptual framework contributes to the women empowerment discourse, since it appeals to those wishing to improve women’s position in energy policy decision-making, i.e., procedural justice.

The investigation of the gender-energy justice nexus within the energy poverty debate is uncommon. Moniruzzaman and Day provide one of the few empirical studies on the feminization of energy poverty from an energy justice perspective [14]. They argue that applying the energy justice framework clarifies how feminization of energy poverty is contextual due to traditional gender roles and policies overlook and devalue women’s energy needs. With the current acknowledgment of energy poverty in the energy justice debate, the feminization of poverty has only been picked up by donor organisations and international institutions, such as the EU [2,16]. Lack of sex-disaggregated data is among the main reasons that the feminization of energy poverty does not receive sufficient attention, despite the urgency of the problem. Furthermore, the female face of energy poverty is often portrayed as a development issue, assuming that only the women in the Global South suffer from a lack of clean cooking fuel options. This assumption ignores the fact that, even in the EU countries, women use biomass, despite the negative health consequences, as their only available and affordable energy option. This brings justice claims to the forefront of the energy

**Table 3**  
Overview of reviewed publications on gender and energy justice.

Author	Year	Engendering policy discourse	Energy justice principle	Contribution	Geographical focus
Cecelski [53]	1995	women empowerment	* all three	conceptual	South
Parikh [15]	1995	women empowerment	* recognitional	conceptual	South
Nathan and Kelkar [64]	1997	women empowerment	* recognitional	empirical	South
Palmer-Jones and Jackson [65]	1997	women empowerment	* recognitional	empirical	South
Gaard [66]	2001	women empowerment	* procedural	empirical	North
Wickramasinghe [67]	2003	women empowerment	* recognitional	empirical	South
Clancy et al. [50]	2007	gender mainstreaming	* all three	empirical	South
Parikh [4]	2011	women empowerment	* recognitional	empirical	South
Goldthau and Sovacool [68]	2012	gender mainstreaming	all three	conceptual	Global
Reddy and Nathan [69]	2013	women empowerment	* distributive	empirical	South
Galvin [70]	2015	gender mainstreaming	distributive	empirical	North
Reddy [1]	2015	gender-neutral	* distributive	empirical	South
Willow and Keefer [22]	2015	women empowerment	recognitional	empirical	North
Jenkins et al. [20]	2016	gender mainstreaming	all three	conceptual	Global
Simcock and Mullen [71]	2016	gender mainstreaming	all three	conceptual	Global
Banerjee et al. [72]	2017	gender-neutral	distributive	conceptual	Global
Bouzarovski and Simcock [34]	2017	social inclusion	recognitional	conceptual	North
Bouzarovski and Tirado Herrero [33]	2017	social inclusion	recognitional	empirical	North
Damgaard et al. [73]	2017	gender mainstreaming	all three	empirical	South
Islar et al. [74]	2017	gender mainstreaming	distributive	empirical	South
McCauley [75]	2017	gender-neutral	all three	conceptual	Global
Rasch and Köhne [60]	2017	gender-neutral	distributive	empirical	North
Sovacool et al. [28]	2017	gender mainstreaming	all three	conceptual	Global
Bartiaux et al. [76]	2018	social inclusion	distributive	empirical	North
De Wildt et al. [29]	2018	gender-neutral	all three	conceptual	Global
Jenkins et al. [61]	2018	gender-neutral	all three	conceptual	Global
Kumar [77]	2018	women empowerment	distributive	empirical	South
Van Veelen and Van der Horst [78]	2018	gender-neutral	all three	conceptual	Global
Winther et al. [36]	2018	women empowerment	* all three	empirical	South
Allen et al. [62]	2019	women empowerment	procedural	empirical	North
Ding et al. [79]	2019	gender mainstreaming	* recognitional	empirical	South
Graff et al. [30]	2019	gender mainstreaming	all three	conceptual	Global
Karanja and Gasparatos [80]	2019	women empowerment	* distributive	empirical	South
Kumar et al. [81]	2019	gender-neutral	distributive	empirical	South
Mohlakoana et al. [82]	2019	gender mainstreaming	* distributive	empirical	South
Osunmuyiwa and Ahlborg [49]	2019	gender mainstreaming	* all three	empirical	Global
Petrova and Simcock [47]	2019	gender mainstreaming	* recognitional	empirical	North
Pueyo and Maestre [83]	2019	gender mainstreaming	* distributive	empirical	South
Sovacool et al. [84]	2019	gender mainstreaming	all three	empirical	North
Sunikka-Blank et al. [85]	2019	women empowerment	* recognitional	empirical	South
Thombs [86]	2019	social inclusion	all three	conceptual	Global
Walker et al. [87]	2019	social inclusion	all three	empirical	North
Wood and Roelich [88]	2019	social inclusion	all three	conceptual	Global
Xu and Chen [89]	2019	gender-neutral	distributive	empirical	North
Bell et al. [39]	2020	women empowerment	* all three	conceptual	Global
Clancy and Mohlakoana [56]	2020	gender mainstreaming	* recognitional	empirical	South
Kooijman-Van Dijk [35]	2020	gender mainstreaming	* all three	conceptual	South
Lacey-Barnacle et al. [7]	2020	social inclusion	all three	empirical	South
Lieu et al. [13]	2020	gender mainstreaming	all three	empirical	Global
Moniruzzaman and Day [14]	2020	women empowerment	all three	empirical	South
Sorman et al. [41]	2020	gender mainstreaming	all three	empirical	North
Sovacool et al. [31]	2020	social inclusion	all three	empirical	South
Sovacool and Griffith [90]	2020	social inclusion	* all three	empirical	Global
Thoyre [23]	2020	women empowerment	* distributive	empirical	North
Wiese [32]	2020	gender mainstreaming	all three	empirical	South
Winther et al. [6]	2020	gender mainstreaming	all three	empirical	South

\* = energy justice not used as a theoretical framework.

**Table 4**  
Number of publications that intersect energy justice tenets and engendering policy discourses.

		Engendering policy discourses				
		gender neutral	women empowerment	gender mainstreaming	social inclusion	total
Tenets of energy justice	distributive	5	4	4	1	14
	recognitional	0	7	3	2	12
	procedural	0	2	0	0	2
	all three	4	4	14	6	28
	total	9	16	21	9	56

poverty debate in the EU [2,16].

### 3.3. Energy justice and gender mainstreaming

In the 2010s, a gender mainstreaming approach was chosen in the energy policy literature with a normative claim for addressing injustice in policies and their outcomes still stressing unequal power relations between women and men and the need to recognize women's unpaid domestic work. The more recent publications included in the review present a solid analysis of the energy justice framework and, in the light of the SDGs, represent an awareness on gender relations and the need to mainstream gender in policy and practice. However, the reviewed publications that take a mainstreaming focus on the gender-energy nexus predominantly used the distributive justice tenet. They focus on energy consumption, tackling climate change, improving energy efficiency and access to sustainable energy. These publications can also be distinguished as to whether they adopted an empirical or conceptual approach with either a focus on the Global North or Global South (see Table 2 for their categorisation).

The empirical publications that take a distributional approach to energy justice advocate for equal distribution of energy services among end users, acknowledging the marginalised position of deprived households. Analysing the distribution of energy access reveals social inequalities within the socio-cultural context. These inequalities have a strong gender face, reflecting the vulnerable situation, of say female-headed households, and the gender demographic gap resulting in more elderly women than men. Islar et al. demonstrate that the energy justice framework can serve to understand the energy system and its connectivity with other systems, such as political, social and economic systems, within a socio-cultural context characterised by normative values [74]. This application of energy justice to conceptualise the gender-energy nexus is reflected in the work of Wiese [32] and Winther et al. [6]. Wiese applies the energy justice framework in the Ethiopian context, studying gendered and differentiated energy access and use [32]. She argues for further conceptualization of energy justice to reflect gendered and intersectional dimensions of energy policy in the Global South. Winther et al. apply the energy justice framework at the micro-level to examine the wider implications of gender relations on using lights and electric appliances when households were connected to electricity [6].

Many of the publications that focus on gender mainstreaming in energy policy are based on empirical data collected in the Global South. Energy justice is not used by the majority of these scholars, but their work can be placed in a justice tradition and the tenets of energy justice are identified without being explicitly mentioned in the publications. For instance, the ENERGIA gender and energy research programme does not use an energy justice perspective [35]. Nevertheless, all three tenets of energy justice can be identified and are addressed in ENERGIA's call for engendering energy policy. Kooijman-Van Dijk concludes that appropriate energy interventions can benefit women, only if persisting gender inequalities are challenged [35]. However, these gender inequalities are often invisible for policy makers due to the lack of gender-disaggregated data on energy use and energy needs [50]. Clancy and Mohlakoana contribute to the engendering energy policy debate by demonstrating the use of gender auditing as a methodology to identify gender outcomes of energy policy [56]. While they do not apply energy justice as a theoretical framework, gender auditing could be applied in monitoring procedural energy justice through a gender lens. Where the main body of literature is focusing on gender and household energy, a growing research field is gender and productive uses of energy. Mohlakoana et al. [82], Osunmuyiwa and Ahlborg [49], and Pueyo and Maestre [83] applied the gender-energy nexus perspective to small enterprises and the productive use of electricity focusing on women entrepreneurs. They all find the same gender inequality in access to clean and affordable energy sources as within households. Despite not using energy justice as a theoretical framework, their conclusions argue for

distributive justice.

The conceptual publications included in our review highlight gender mainstreaming as essential for analysing energy justice from a normative and ethical perspective. Even though these publications touch upon all tenets of energy justice, the gender dimension was either conceptualised within recognitional justice (e.g., gendered energy needs and consumption patterns based on women's role in society) or distributive justice (e.g., access to energy services). Goldthau and Sovacool pleaded for including a gender dimension in the energy justice debate [68]. They selected normative aspects, such as externalities or equity, in which justice provided a starting point for reaching out to neighbouring disciplines, such as gender studies. However, a conceptual debate on the gender-energy nexus was lacking in this publication. The systematic review of Lieu et al. provide a strong argumentation for including gender in all energy justice principles and how energy justice can be achieved only through gender justice [13].

Four recent publications on energy justice shift between engendering policy processes characterised by the discourse change of this area: Bartiaux et al. [76], Galvin [70], Kumar [77] and Petrova and Simcock [47]. In all these publications, the authors argue that energy poverty is the main concern of injustice in energy policy. Energy use and energy consumption of vulnerable consumers and marginalised groups, such as female-headed households and elderly women living alone, reflects the engendered approach adopted in these publications. Kumar [77] and Petrova and Simcock [47] specifically focuses on the gendered division of energy needs and the gender inequality regarding energy services and resources, calling for gender mainstreaming in energy access and strengthening women's role as agents of change in overcoming energy poverty.

### 3.4. Energy justice and social inclusion

The number of publications that study energy justice from a gender lens have been increasing over the past decade. Out of the 56 publications reviewed, seven of them were published before 2010, while 49 were published between 2010 and 2020. This can be explained by the emerging applications of the energy justice concept in the energy poverty literature. However, the gender approach in such studies is often limited to addressing women's role in society, putting them in a marginalised position as vulnerable consumers. This reflects the policy discourse of social inclusion in the Global North, designing policy interventions to protect the vulnerable consumers and the recent political agendas to address the energy poverty of marginalised groups.

The approach of Bartiaux et al. illustrates the recent social inclusion debate that focuses on vulnerable or marginalised groups [76]. Bartiaux et al. implied that female-headed households were more represented in energy-poor households, but continued their analyses in a gender-neutral way, not elaborating on the gendered dimension of energy poverty [76]. Although they used the energy justice framework, their incorporation of the gender dimension was limited to present sex-disaggregated data to categorise household consumption. By doing so, the analysis remained at the inter-household level, not the intra-household level by examining the gender relations within households. Taking a household level approach is contested due to the fluidity of households in western societies. With many single-headed households, separated couples, part-time caregiving responsibilities for children or elderly family-members, the commonly applied standard household entity of a male/female couple with children is no longer the standard. Therefore, Clancy et al. advocated for an energy poverty policy that moves beyond the front-door and considers the gendered relations within households [2].

Social inclusion can also dilute the gender debate towards gender neutrality. With the policy focus as highlighted above on vulnerable consumers, other marginalised groups claim, rightfully so, that their position in the political debate and research arena. An example of such research was conducted by Snell et al. on the lived experiences of the



energy poor in England [92]. They identified a strong link between energy poverty and disability. This form of distributional justice was grounded in the misrecognition of vulnerable groups and their energy needs, such as life-threatening situations, when people that depend on breathing support are disconnected from power. Snell et al. demonstrated that recognitional justice was elementary for distributional justice [92]. By using an intersectional approach to social inclusion, vulnerable groups were identified using characteristics, such as age, ethnicity and religion. In the review of Lacey-Barnacle et al. acknowledging gender inequality and marginalised groups was identified as one of the core energy justice research themes in the Global South [7]. However, gender is not one of these characteristics applied in an intersectional approach, but instead a crosscutting relation within all these groups. The social inclusion discourse could contribute to an intersectional approach to gender, moving beyond the binary distinction between women and men and recognizing other intersectional characteristics. Sovacool et al. demonstrates the inequalities due to gendered and power relations in the energy system through confronting testimonies of women, children and minorities involved in mining and e-waste recycling in the Africa [31]. Their empirical research makes a strong conceptual contribution highlighting that a just energy transition should challenge the global distribution of power to become more accountable, equitable and just.

#### 4. Conclusions

Access to clean, sustainable and affordable energy services is a global commitment embedded in the SDGs and translated in national energy policies. However, it remains a challenge to integrate the social dimensions and address existing inequalities in energy policy. Lack of such integration leads to generic policy instruments which ignore and potentially exacerbate injustices among social groups and their access to energy [93]. Energy injustice has a strong gender face, especially women are struggling to have access to clean, sustainable and affordable energy services. Engendering energy policies is a concern shared by donor agencies with yet limited recognition in the global North. Accordingly, several engendering policy processes have been developed, mainly in the grey literature, and endorsed in programmes and policies by practitioners. A scholarly contribution to equal access to energy services is embedded in the energy justice debate that emerged in academic publications a decade ago and constitutes a growing body of research. This paper bridges the gender-energy nexus in international policy documents of donor agencies with the energy justice concept to contribute to the conceptualization of engendering energy just policies.

The main research question we sought to answer was: *How can energy justice be applied to conceptualise engendering energy policy?* This question was broken down in two sub-questions: 1) Which gender discourses are used to contribute to engendering energy policy? 2) How applicable is energy justice for analysing energy policy through a gender lens? The first sub-question was answered by examining the historical discourses of gender approaches in energy policies. Three main engendering policy discourses were identified, starting with the women empowerment movement in the 1970s, the gender mainstreaming discourse of the Millennium Development Goals in the 2000s and the recent social inclusion policy reflected in the SDGs. Our focus was on engendering policy discourses in energy policy. As a consequence we have not looked into all aspects of the gender-energy nexus, such as gender derived social factors of energy sustainability, gendered roles as change agents in the energy transition, etc. These aspects of the gendered face of energy policy are important in the context of gender discourses and could be further components into the operationalisation of the framework in future research. In parallel to the gender and energy research, the energy justice concept emerged in the 2010s, adding the principles of social justice to energy policy debates.

Our second sub-question addresses the applicability of energy justice for analysing energy policies through a gender lens. To this end, we

developed a gender just energy policy framework that integrates the engendering policy processes with the three tenets of energy justice. Within the scope of this paper, we applied the gender just energy policy framework as a conceptual framework by reviewing and synthesising the scholarly literature of peer-reviewed journal articles. The review results show that the existing body of scientific knowledge addresses the possible intersections of energy justice and engendering energy policy, albeit to varying extents and depths. Out of the dataset of 56 publications, nine publications are considered gender-neutral in their approach, as their approach is limited to using gender-disaggregated data. The remaining 47 publications reflect the three discourses of engendering energy policy and address the three tenets of energy justice. However, energy justice was not applied explicitly in 23 publications (marked with \* in Table 3). In these publications, the three tenets of energy justice can be discerned, but energy justice is not the underlying conceptual framework. This is especially the case in the publications that focus on a Global South context.

The current scientific literature on the gender-energy nexus is too limited to test the applicability of the analytical and a decision-making functions of the gender just energy policy framework, especially because the operationalisation of energy justice in empirical cases has only recently started, as observed in energy poverty literature [14,33,75]. Nevertheless, our review revealed several illustrative examples of engendering energy policy based on previous research. A comprehensive application of the framework requires further empirical evidence and the development of indicators to assess energy policies from an integrated gender and energy justice perspective. Although the conceptual review presented in this paper synthesises empirical and theoretical insights from both the Global North and South, the North-South nexus in gender and energy research needs to be further explored [7]. The gender just energy policy framework is open to contextualisation. Further, the spatial aspect of energy injustices and unequal access should be addressed, when operationalising the conceptual framework to reflect contextual and spatial aspects that intersect with all three tenets of energy justice. Such research would also contribute to testing the decision-making function of the framework for just energy transitions [90]. Future research is essential to operationalise the gender just energy policy framework for analytical use by researchers and to develop its decision-making function for designing and implementing gender just energy policy. This also resonates with the call from Jenkins et al. to consider the societal impact of energy justice and to motivate energy justice scholars and practitioners to “practice what we preach” [94].

When the underlying premises of the gender just energy policy framework are applied to analyse energy policies in different contexts, the full potential of the framework can be demonstrated. Given the limited research on gender and energy justice, the framework contributes to conceptualising energy justice for researchers analysing energy systems in diverse political, social, cultural and economic contexts. The gender-energy nexus literature has roots in the 1970s and the more recent energy justice debate deepens the understanding of the gender-energy nexus. This paper is a first attempt to conceptualise these debates. The gender just energy policy framework advances the understanding that the energy justice debate and the gender-energy debate are interlinked and intertwined. By conceptualising this juxtaposition, we invite for further elaboration and application of the framework to contribute to a just and sustainable energy policy that acknowledges, addresses and enables access to clean, sustainable and affordable energy services for all.

#### Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Acknowledgements

The authors like to express their acknowledgements to the reviewers for their thorough revision and helpful suggestions. An earlier version of this article was presented at the General Conference of the European Consortium for Political Research. We are thankful for the insightful feedback of the Energy Justice and Equity panel.

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