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Towards an integrative understanding of multiple energy justices

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Abstract. Energy justice is a rapidly developing area of research and policy advocacy. Recently, some critiques have been formulated, particularly from postcolonial, political ecology, and more-than-human perspectives, such as the concept's rootedness in Western thought and its too narrow anthropocentric focus. This paper presents an integrative model of various energy justices including perceptions that allow for a more nuanced and expanded understanding, drawing on recent concepts of environmental and energy justice. This analytic perspective integrates understandings of justice as a subjective belief, including increased consideration of the role of emotion in evaluating justice. According to this understanding, there is no "one" energy justice. Instead, there are multiple, sometimes contradictory, and fluid perceptions of justice.

1 Introduction

In the last 2 decades, the field of energy justice has developed into a dynamic and rapidly growing field of research, which is reflected in an increase of conceptual papers, empirical case studies, and literature reviews. In this context, different concepts of energy justice have been and are being developed, which essentially refer to the three basic concepts of environmental justice – distributive justice, procedural justice, and recognition justice (Schlosberg, 2007; Walker, 2012) – and extend them by different concepts. Critical perspectives on energy justice, especially from postcolonial, political ecology, and more-than-human perspectives, point out that energy justice concepts are drawing on universalist understandings of justice, rooted in Western philosophical concepts, and have a too narrow, overly applied, and anthropocentric focus. Based on these critiques, this paper explores the potential of an extended approach through a more nuanced understanding of energy justice. This concept integrates current calls for pluralistic conceptions of energy justice (Sovacool et al., 2023a) with calls for more-than-human justices (Tschakert et al., 2020), and with an understanding of the justice-as-perception approach that originated in the psychology of justice (Montada, 2012) and whose transferability to human geography justice research has recently been discussed in the context of environmental justice (Baasch, 2020).

This paper is structured as follows: the first part provides a brief overview of recent energy justice concepts, their meaning, and scope and recent critique from postcolonial, political ecology and more-than-human justice approaches. This also shows that energy justice is primarily based on rather vague definitions of justice; i.e., studies of energy justice generally leave unclear *why* something is judged to be just or unjust and what considerations led to that judgment. The second part discusses the potentials of understanding multiple energy justice(s) and highlights the mostly overlooked emotional influence on justice assessments in energy transitions till now. Regarding current concepts of environmental and energy justice, an integrative model of multiple energy justices is presented here to contribute to a more nuanced and expanded understanding that intends to contribute to a better inclusion of the multiplicity of permeable, changeable, contradictory, dynamic, contextual, situational, emotional, social, and individual aspects as integral components of justice assessments and, with this more differentiated understanding, thus to contribute to greater recognition justice.

Table 1. Energy justice dimensions and their evaluative and normative contributions (based on Jenkins et al., 2016; Hess and Costa Ribeiro, 2016).

Tenets justice dimensions	Analytical focus	Applied focus
Distributional benefits and burdens along the energy supply chain	Where are the unequal distributions?	How can we address them?
Procedural implementation of projects, including participation in decision-making	Is there a fair process?	Which new processes are needed?
Recognition of affected groups, traditional cultures, and local knowledges	Who is ignored?	How should we recognize?

2 Energy justice

The following is a brief overview of energy justice concepts and research. Due to the dynamic development of the research field, the aim is not to provide a complete overview but rather to focus on the core characteristics as they have been elaborated in particular in recent systematic and narrative literature reviews (Williams and Doyon, 2019; Lacey-Barnacle et al., 2020; Pellegrini-Masini et al., 2020; Jenkins et al., 2021; Shelton and Eakin, 2022; Qian et al., 2022; Sadiqa et al., 2023). As a basic definition, energy justice is a field built around a central "problem" (energy) that draws on elements of environmental, climate, and social justice (Lacey-Barnacle et al., 2020). As both a field of research and an analytical tool (Sovacool and Dworkin, 2015; Jenkins et al., 2016), it is characterized by a strong application focus, particularly aimed at influencing energy policy by making injustices visible and addressing them through policy recommendations (Lacey-Barnacle et al., 2020; Jenkins et al., 2021). This normative view is also reflected in the following definition of energy justice: "global energy system that fairly distributes both the benefits and burdens of energy services, and one that contributes to more representative and inclusive energy decision making" (Sovacool et al., 2017:677). Similar to the field of environmental or climate justice, energy justice is typically used to address issues of unjust or unequal treatment, as concepts of justice are primarily invoked in their absence (Syme, 2012). The core concept of energy justice is based on the three fundamental tenets of environmental justice – distributive justice, procedural justice, and justice as recognition (Schlosberg, 2007; Walker, 2012) – and addresses both evaluative and normative contributions as shown in Table 1.

The three tenets have undergone numerous conceptual extensions in the development of energy justice frameworks. Hess and Costa Ribeiro (2016) expanded the three tenets to better account for aspects of community capacity that could not be fully captured by the three tenets. They cite the example of the displacement of rural residents by hydropower projects, who were uprooted from their traditional rural cultures and livelihoods and forced to move to urban slums to work in the international economy. LaBelle (2017) suggested distinguishing between "universal energy justice", which is rooted in legal and philosophical foundations based on issues of procedural, distributive, and cosmopolitan justice, and "particular energy justice", which contextualizes justice within local experiences and relies on justice as a recognition of environmental and cultural factors that influence decisions about energy policies and technologies. Other authors have expanded the three-tenet approach to include concepts such as "restorative justice" to reduce perceived former injustice in energy contexts (Heffron and McCauley, 2017), cosmopolitan understandings of justice (McCauley et al., 2019), and, more recently, to broaden the philosophical focus beyond the Western philosophical tradition to include, for example, religious beliefs (Ruiz-de-Oña Plaza, 2020). Recent systematic literature reviews have shown that the three-tenet approach remains the most widely used framework in energy justice research, with distributive and procedural justice broadly underpinned by recognition justice (Lacey-Barnacle et al., 2020; Jenkins et al., 2021). The predominant thematic focus in energy justice publications is on issues of justice as recognition, with a strong focus on marginalized groups with a high vulnerability to energy injustice (Lacey-Barnacle et al., 2020; Jenkins et al., 2021; Sadiqa et al., 2023). In particular, energy justice studies analyze and develop recommendations for energy policy design in the context of energy transitions. The energy justice perspective could contribute to energy governance that recognizes unexpected, unspoken burdens on those affected and creates spaces for participation that expose rather than avoid issues of (in)justice (Shelton and Eakin, 2022).

One of the most common concepts is the "whole system approach" to energy justice (Sovacool et al., 2017, 2019), which focuses on a multi-scale and multi-level understanding of energy transitions and their processes that transcend geographic space, categories of creation and destruction, and value chains (upstream, midstream, and downstream). In this framework, the three classical tenets are supplemented by cosmopolitan principles, e.g., human rights. The main aim of the whole system concept is to raise awareness among energy system decision-makers about aspects of availability, affordability, due process, transparency and accountability, sustainability, inter- and intragenerational equity, responsibility, re-

sistance (against injustices), and intersectionality (Sovacool et al., 2017). The authors point out that this conception of energy justice has three fundamental limitations: first, the concept is rooted in Western thought and philosophy of justice; second, it is anthropocentric; and third, it is multi-scale in nature (Sovacool et al., 2017).

From this perspective, energy transition justice scholars emphasize the functional significance of justice as an important element in gaining acceptance for energy transitions: "Justice represents not only a moral obligation but can enhance the legitimacy and acceptance of a rapid push toward global decarbonization" (Sovacool et al., 2023a:1). The need for a more sustainable design of the global energy system, defined as multiple interconnected processes of production and consumption, including resource extraction, generation, conversion, delivery, distribution, energy use and consumption, and the provision of energy services (McCauley et al., 2019), is shared by many, particularly the most influential authors on energy justice (Qian et al., 2022). Thereby the need to transition to a less carbon-intensive and more equitable global energy system is seen as irrefutable (McCauley et al., 2019). Some authors argue that justice is central to the sustainability of energy transitions, and therefore an unjust energy transition is considered inherently unsustainable (Williams and Doyon, 2019). Thus, achieving the dual goals of sustainable low-carbon systems and improving the affordability and equity of new innovations also requires a nuanced understanding of social justice concerns (McCauley et al., 2019). In doing so, the legacies of misperceptions and historical inequities in access to resources and livelihood opportunities are being exposed as the global transition to renewable energy reveals new landscapes of benefits and burdens (Shelton and Eakin, 2022). At the local level, the equitable design of spatial energy transition planning requires consideration of the concerns of social groups that are particularly affected by the installation of renewable energy systems, because the social balance and acceptance of the energy transition, which is the basis for sustainable development, will be jeopardized if certain social groups are more spatially and scenically impacted and excluded by energy transition siting decisions (Milbourne and Mason, 2017; Bosch and Schmidt, 2020).

Within the global transition process towards a decarbonized, renewable energy system, the interconnections and injustices of a widening "decarbonization gap" are increasingly coming into focus, broadening the criteria and analytical parameters for assessing the sustainability of low-carbon transitions (Sovacool et al., 2020:1). The latest development in the whole system approach to energy justice therefore calls for an intersectional and transformative approach to energy justice, incorporating feminist, anti-racist, Indigenous, and postcolonial perspectives to integrate or transcend the usually distinct concerns of distributive, procedural, cosmopolitan, and recognition justice (Sovacool et al., 2023a). This conceptual evolution has profound implications, as a comprehensive consideration of the social and environmental costs of energy production and low-carbon transitions "questions the possibility of decarbonization and green transitions without structural changes to the global political economy, trade flows, production and consumption patterns, and unequal access to resources" and "challenges the very idea of conceptualizing renewable energies as sustainable" (Sovacool et al., 2023a:17). This includes a critical examination of the exploitative and environmentally damaging extraction of raw materials and the creation or maintenance of sacrifice zones (Lerner, 2010). In the context of the transition to renewable energy, green extractivism and"sacrifice zones" are sociospatial injustices that are considered to be an unfortunate byproduct, or even a direct consequence, of the high demand for energy that modern society has come to take for granted. This is accompanied by a lack of comprehensive energy policies to protect the areas that produce the energy sources, disproportionately affecting marginalized and vulnerable populations such as rural and low-income communities, Indigenous communities, or communities of color (in the US). (Hernández, 2015; Scott and Smith, 2017; Brock et al., 2021; Verweijen and Dunlap, 2021; Olarte-Sánchez et al., 2022). The embedded inequalities occur on multiple scales, for example in the urban–rural policy divide in renewable energy generation (e.g., Scott and Smith, 2017; Bosch and Schmidt, 2020), to the global scale, which is likely to become an even more pressing issue in the emerging industrial decarbonization and the production of green hydrogen, which depends on globally uneven solar and wind potential (Dillman and Heinonen, 2022; Upham et al., 2022).

To date, most of the numerous conceptual and empirical studies on energy justice show a regional bias, focusing primarily on energy transition processes in the "Global North", although global dimensions have been considered more recently (Lacey-Barnacle et al., 2020; Jenkins et al., 2021; Qian et al., 2022). In their bibliometric literature review of 1910 publications on energy justice, Qian et al. (2022) found a significant and annual increase in the number of publications, particularly from 2015 (68 publications) to 2022 (377 publications). Despite the increasing number, their review shows a low diversity of publications in the research field and a high concentration of a few outstanding contributors (in terms of authors, journals, and countries/regions). For example, in their ranking of the top 20 most influential countries/regions, 16 belong to the "Global North" (exceptions are China in 10th place; South Africa, Thailand, and India in 17th–19th place). Similarly, a systematic analysis of author regions in the academic energy justice literature reveals a preponderance of authors from the "Global North" (Jenkins et al., 2021). Lacey-Barnacle et al. (2020) point out a difference in research approaches and emphasize that whole system approaches are rarely used in energy justice studies in developing world contexts, where single-case studies with specific local references are more common.

2.1 Critical remarks on energy justice

Although the energy justice approach seeks to contribute to reducing injustices in energy transitions, there are several points of critique. From a postcolonial and political ecology perspective, energy justice has been criticized for referring to largely universalized and often too uncritical ideals of ecological modernization and development. It continues to reproduce a Western system of thought by failing to interrogate the fundamental concepts of energy and justice and their embeddedness in historical contexts and unequal power relations, thus excluding and devaluing other non-capitalist development ideas and traditional practices and worldviews (Munro et al., 2017; Villavicencio Calzadilla and Mauger, 2017; Castán Broto et al., 2018; Zografos and Robins, 2020; Knuth et al., 2022; Tornel, 2023). Current sustainability and energy transitions, such as those embedded in Green New Deal proposals, are closely linked to the ideals of ecological modernization, which refers to the notion that sustainable development is generally possible within existing structures (Mol, 2010; Mol et al., 2014). This is based on optimistic assumptions: first, that political, economic, and societal actors have the necessary capacity and motivation to change and, second, that an optimized use of natural resources and environmental media (ecosystems, soil, water, air) can be the source of future green growth and development (Baasch, 2021). For the energy sector, ecological modernization means both a shift in energy production towards renewable energies and an increase in energy and resource efficiency. Critical perspectives on ecological modernization point out that this universal approach does not adequately address social and economic inequalities (York et al., 2010), and that the achievement of sustainability goals is generally questionable within existing unjust capitalist economic structures and imperial modes of living (Brand and Wissen, 2021; Brand, 2022). Other authors point out that climate and environmental protection goals cannot be achieved with (green) growth but only by reducing economic activity (Hickel and Kallis, 2020). The role of ecological modernization as a hegemonic development discourse has led to the widespread displacement of alternative or more radical demands for distributive and procedural justice, such as per capita allocations of greenhouse gas emissions, sufficiency, and degrowth strategies or energy sovereignty (Bäckstrand and Lövbrand, 2007). Following the ideals of ecological modernization, the European Green Deal characterizes just transition by two pillars: decarbonizing the energy system with a focus on clean energy and massive expansion of renewable energy resources while avoiding social hardships such as job losses for workers in carbon-intensive industries. Green New Deal proposals, energy transitions, and green international energy cooperation can also lead to the persistence of old injustices and the emergence of new ones, such as continued coloniality, (green) extractivism, or land grabbing legitimated by the persistence of assumptions about race and social inequality, and unjust knowledge politics through the selective consideration of different knowledge assets (Vieira de Souza et al., 2018; Hunsberger and Awâsis, 2019; Olarte-Sánchez et al., 2022; Zografos, 2022; Alkhalili et al., 2023). It is questionable whether energy transitions will lead to greater justice or to new forms of climate colonialism, i.e., deepening or even expanding the domination of less powerful countries and peoples through exploitation of poorer nations (Zografos and Robbins, 2020). A decolonial turn to energy justice and transitions would need to recognize how values, violence, and structures of coloniality have shaped and continue to shape energy systems and energy itself (Tornel, 2023). Unequal distribution of risks and benefits can also occur within a country, including countries in the Global North, between regions that produce renewable energy and those that consume it (Franquesa Bartolome, 2018; Baasch, 2020).

Another emerging critique is the dominant anthropocentric focus of energy justice (Tschakert et al., 2020; Tornel, 2023). Embedded in the notion of human exceptionalism, such an anthropocentric focus marginalizes or excludes an equal recognition of non-human justice. Multi-species and more-than-human concepts of justice seek a broader understanding by drawing on different worldviews. These include ecocentric perspectives of deep ecology, which are rooted in the normative idea of biospheric egalitarianism and thus reject any primacy of human life over other life forms (Pellegrini-Masini et al., 2020). Another example is the Latin American concept of buen vivir, which treats humans and nonhumans as equals (Gudynas, 2011). The global energy transition is accompanied by significant impacts on landscapes, habitats, and livelihoods through renewable energy installations, energy trade, and mineral extraction. On the one hand, this raises questions about the distribution of benefits and burdens and about procedural justice in implementation. On the other hand, this also requires a consideration of justice as recognition that goes beyond the anthropocentric focus and takes into account the multiple entanglements of nature, habitats, and people based on different cultural, historical, and religious backgrounds (Lacey-Barnacle et al., 2020; Ruizde-Oña Plaza, 2020; Mejía-Montero et al., 2023).

The highly applied nature of energy justice research is another strand of criticism. The strong application focus of energy justice, together with the primary focus on the political design of energy transitions, has little theoretical foundation, especially with regard to a missing or vague conceptualization of the basic concepts of energy and justice. The historical replacement of the ideal of low energy sufficiency (resource conservation) with the ideal of high energy efficiency (in terms of monetary cost–benefit analysis) has led to a modern rationality that leads to ever faster destruction of the environment and appropriation of other people's embodied labor. Energy (in-)justice is therefore inherent in the phenomenon of modern technology itself, since all modern energy technologies represent an accumulation of capital that ultimately requires land and labor elsewhere, with "capital" represent-

ing other people's land and labor. From this perspective, energy and energy technologies are instruments for the redistribution of space and time in a global society. In the development of sustainable energy technologies, a critical consideration of energy justice is the extent to which the feasibility of a particular low-carbon technology depends on purely monetary calculations but physically depends on the asymmetrical social transfer of embodied human time or natural space (Hornborg, 2020). Thus, the strong applied focus of most energy (transition) justice research is the contribution of social sciences to investigate the conditions of human "choices" and norms regarding the adoption or rejection of specific energy technologies rather than working on and reconceptualizing the taken-for-granted categories related to energy use to understand the seemingly neutral, practical, and technical issues as "cultural mystifications of power relations" (Hornborg, 2020:10). In recent years, the term energy itself and its meanings have become increasingly subject to critical analysis. For example, in her profound genealogy of energy, Dagget (2019) points to a Western understanding of energy policy shaped by the ethos of work and waste and criticizes the still underappreciated role of energy as a political logic of domination that has reinforced the assumption that energy "enters the field of political reason as an objective entity, unbound by specific values and interests" (Dagget, 2019:108). Rather, it goes beyond alternative fuels to demand new ways to think about, value, and inhabit energy systems, which enable the transformation of energy cultures and epistemologies, or ways of knowing about energy, and that will entail a profound transformation in habits of energy production and consumption. Similar arguments suggest the need for a detechnification and repoliticization of energy decision-making and energy systems (Shelton and Eakin, 2022). There are currently competing understandings of what energy justice is or should focus on. They range from calls for a more general understanding of energy justice, based on the idea of equality as a common conceptual root (Pellegrini-Masini et al., 2020), to opposing calls for the recognition of diverse understandings that go beyond and also contradict anthropocentric and Western concepts (Tornel, 2023).

2.2 Open questions: what does energy justice mean and why?

Recent concepts of energy justice consider multi-spatial, multi-level, and temporal dimensions and their interrelationships by drawing on a range of different concepts of justice. However, studies of energy justice generally leave unclear why something is judged to be just or unjust and what considerations led to that judgment. Instead, judgments of justice tend to be identified as the status quo from particular perspectives and on specific issues and thus appear as a kind of objective condition or indication of an idiosyncratic notion of what an organization or person considers from their point of view (Syme, 2012). In the following, it will be explored how a different understanding of justice as subjective belief and perception may lead to more expanded, dynamic, and context-specific understanding of multiple justices and thus counters the criticism of an overly universalistic understanding of energy justice.

3 Multiple energy justices

The emerging scholarship on energy justice has focused on multiple conflict potentials in old and new energy transitions, identifying more equitable forms and conditions for shaping energy transition processes from the local to the global scale. However, the basic understanding of justice in sustainability and environmental contexts is often based on rather imprecise concepts of justice that leave much room for different definitions. This is also true for energy justice, where the strong focus on process design has contributed to a primarily descriptive approach to justice in energy transitions. As a result, findings from energy justice studies describe what respondents or stakeholders perceive to be just or unjust but do not explore in depth how these judgments are made and what (possibly different) notions of justice they are based on. Here, objective and functional understandings of energy justice based mainly on Western thought conceptualize energy justice by observing its impact on actual decisions rather than by examining its definition (Sovacool and Dworkin, 2015).

From the perspective of recognition and cognitive justice, such an understanding may have some problematic implications. Crucially, it implies a hegemonic and, therefore, prediscursive perspective on justice, which assumes that justice is universally valid and therefore may not require deeper explanation, discussion, or analysis. As critical interventions from political ecology and postcolonial studies point out, this understanding of justice violates justice as recognition. A decolonial turn in energy justice requires looking at energy injustices through a whole system approach while decoupling understandings of justice from Western notions so that other forms of emancipatory energy projects can emerge, e.g., referencing other, post-Enlightenment epistemologies (Escobar, 2007; Tornel, 2023). In the related field of environmental justice, questions about more inclusive justice concepts have been raised for some time, leading to multiple understandings of justice that encompass human, multispecies, non-human, and biodiversity justice issues from both non-Western and Western philosophical and value systems (Clayton and Opotow, 2003; Schlosberg, 2007; Godden and O'Connell, 2015; Tschakert et al., 2020; De Bruin et al., 2023). Another approach to multiple perspectives might be to change the underlying understanding of justice from universal and objective to perceptual and subjective. This alternative perspective, which originated in the psychology of environmental justice (Montada, 2012), has recently been discussed for human geography research on environmental justice (Baasch, 2020). Although the energy justice literature

(Upham et al., 2022; Sovacool et al., 2023b) has begun to refer to this perspective, it has yet to stimulate profound conceptual developments.

After an explanation of the concept and key components of justice as perception with reference to energy transitions, it will be discussed how this conceptual approach might contribute to further conceptual development.

3.1 Understanding multiple justices as subjective beliefs

A definition of justice as subjective belief and perception contrasts with mainstream concepts of an objective normative understanding, e.g., in philosophy, law, and political science. Drawing on approaches from the psychology of justice, this view rejects any notion of empirically or normatively validated truths about justice, attributing it solely to subjective beliefs shaped by rational and emotional reasoning processes rooted in diverse cultural, social, and individual norms, constructs, and priorities (Clayton and Opotow, 2003; Kals and Russell, 2001; Montada, 2012). This justice-psychological perspective is primarily an analytical one that allows existing notions of justice to be made visible and examined. In this understanding, justice is an abstract system of norms and beliefs that govern relationships between people and their fates, operationalized both through formal legal procedures and laws and through informal shared norms (e.g., reciprocity) and values (e.g., equality). As a result, justice becomes a fluid and malleable construct, even though it is often perceived as objective (Clayton and Opotow, 2003). From this point of view, there is no "one universal" justice, but rather multiple justices that are not stable but rather change dynamically and respond to various influencing factors (experiences, information, social contexts, emotions, etc.). Normative and cultural understandings remain an influencing factor, but only as one of many. Despite its dynamic and malleable nature, the psychology of justice emphasizes the centrality of justice evaluations to both the emergence of conflict and one's motivations for action, as they are a crucial aspect of evaluating one's actions as well as the actions of others (Clayton, 2000; Montada and Kals, 2000; Montada, 2012). While the pursuit of justice is considered universal, what is considered just or unjust is highly variable (Montada, 2012). In this regard, decolonial perspectives point to the influence of colonial power, knowledge, and being on evaluations and processes of consideration (Fannon, 1952; Coulthard, 2014; Maldonado-Torres, 2017). As mentioned above, evaluations of justice are based not only on rational but also on emotional aspects. However, the latter have only received more attention in recent years (e.g., Huijts, 2018; Rohse et al., 2020; Martiskainen and Sovacool, 2021; Biddau et al., 2022; Huijts et al., 2022; Lawrance et al., 2022; Rincón-Rubio and Cedano-Villavicencio, 2023). The role of emotions in the context of energy justice will be discussed in more detail below.

3.2 The role of emotions

Emotional aspects are still often underestimated in energy justice research, although they have a decisive influence on behavior, e.g., on the acceptance or rejection of energy projects and policies, on (non-)cooperation in participation processes, on the moral evaluation of actions, and how people perceive, integrate, or reject information or use certain environmental practices (Müller, 2012; Ford and Norgaard, 2019; Contzen et al., 2021; Biddau et al., 2022). In doing so, emotions not only play a crucial role in individual behavior, but also fulfill a central societal function, as they are the "glue that binds us to norms, the performance of socially sanctioned roles and the maintenance of status hierarchies" (Ford and Norgaard, 2019:221), thus influencing justice assessments. How emotional expressions are evaluated is highly variable and context-dependent. For example, Coulthard (2014) points out that anger and bitterness in the context of ongoing settler–colonial injustice can be a sign of moral protest and political outrage, which should be taken seriously, if not assumed to be a sign of critical consciousness. Instead, such emotions are often discredited as irrational, backward-looking, or even socio-pathological.

As energy transitions are embedded in or closely linked to climate change discourses, they are also influenced by the emotional perceptions and responses within climate change discourses. Climate change generally evokes negative emotions through the experience or fear of substantial climate change impacts and more general negative emotions. Generally, experiences such as extreme weather events and significant changes in the local environment are perceived as related to climate change, thus evoking fear as the most common emotional response to these immediate material threats (Brügger et al., 2015). Potential coping strategies for such immediate fears consist of attempts to avoid, evade, or eliminate the real risks (Pain and Smith, 2008). In the second case, more non-specific negative emotions, such as climate anxiety, can arise even without such specific personal experiences or concrete material threats simply because people are aware of the problem (Clayton, 2020; Clayton and Karazsia, 2020). For example, accepting the scientific consensus on climate change and thinking about the issue evokes unsettling feelings (Norgaard, 2011). This is particularly true for people in countries of the Global North, whose production and consumption patterns cause most of the climate emissions; in contrast the impacts of climate change are more severe in countries of the Global South. Knowledge of the unequal distribution of climate change benefits and burdens is associated with negative emotions and can also increase mental health risks (Norgaard, 2011; Ford and Norgaard, 2019; Lawrence et al., 2022). Energy and other low-carbon sustainability transitions are associated with a wide range of different emotions, from negative emotions such as fear, anger, grief, sadness, frustration, guilt, deprivation, loss, or shame to positive emotions such as desire, interest, hope, pride, or sym-

pathy (Hujits, 2018; Martiskainen and Sovacool, 2021; Biddau et al., 2022; Huijts et al., 2022; Hunsberger and Awâsis, 2019), including empathy and recognition of animals capable of suffering and endowed with emotions (Mejía-Montero et al., 2023). Emotions are not static but can change over an individual's lifetime, as well as across different types of energy technologies and different temporal phases of where that technology is located within the socio-technical regime (Martiskainen and Sovacool, 2021). Emotions can spread dynamically in the social context in the sense of emotional spillovers; i.e., individual emotions can influence the emotions of others. Cuppen et al. (2020) identify three different types of spillovers in energy transitions, which they argue are important but often overlooked dynamics in energy controversies: geographical (between the same energy technology in different locations), technological (between different technologies), and historical spillovers (concerning previous experiences in the same location). Therefore, it is not only the assessment of current situations and cases and related emotions that is relevant to the study of energy justice but also their embeddedness in past, related, or similar contexts elsewhere. Based on a case study of local energy transition processes in the Netherlands, Huijts et al. (2022) point out that legitimate, ethical concerns are at the root of emotions in renewable energy projects and therefore call for more consideration of emotions and their underlying ethical concerns for socially responsible and successful energy policies.

To date, emotions in sustainability transitions and climate change have often been studied from a psychological perspective (Martiskainen and Sovacool, 2021). However, in the last 2 decades, human geography research has increasingly considered emotions as central to human behavior and being, framing the rationality (rather than vice versa) and interacting with the conscious and unconscious selves, memories, and the environment (Jones, 2007). For geographers, the interest in emotion and affect lies in how these aspects of personal and social life relate to questions of place, power, subjectivity, and belonging (Duffy et al., 2019). Poststructuralist and feminist perspectives call for (re)integrating emotions as an intrinsic part of geographical research, thus establishing holistic (research) understandings and concepts that consider natural as well as ecological and sociocultural dimensions, and thus emotional landscape perspectives (e.g., Wright, 2010; Parsons, 2019; Eriksen, 2022; Wright et al., 2022). In this way, emotions are both the subject of research and an important component of self-reflexive research (Militz et al., 2019). However, there has been little interaction between emotional geography and energy geography, even though such an integrative perspective is thought to have great potential for understanding energy systems and their intersections with everyday life. Emotions are relevant here in the consideration of entire energy systems: "affectual dimensions do not belong only to spaces of energy consumption, but also to spaces that surround and are shaped by energy production and transmission, that is, the whole energy system" (Rohse et al., 2020:136). Recent geographic research has highlighted a conceptual perspective on unjust (emotional) energy landscapes in Germany that points to the role of emotions and emotionalized discourses in the context of resistance to and rejection of land use change through renewable energy, with emotions presented primarily as a counterpart to rational (i.e., science-based) factual knowledge (Bosch and Schmidt, 2020). Emotional aspects have also been addressed sporadically in energy transition case studies in recent years, e.g., on emotions and affects in a former coal mining community in South Wales (Rohse et al., 2020), and the complex role of emotional processes in the (temporary) electrification of two villages in southern Mexico, referring to the Latin American concept of "emotional energy communities" (Ricón-Rubio and Cedano-Villavicencio, 2023). Emotions have a decisive influence on the formation of conceptions of justice, so they also need to be considered more closely in the context of energy justice. Emotions need to be given more thought in the context of energy justice as well because they have a significant impact on how perceptions of justice are formed.

3.3 Multiple energy justices as perception: an integrative model

Based on the previous arguments, it is proposed to reformulate multiscale approaches to justice with an understanding of justice as perception and to integrate them into the concepts of multiple justice (Montada, 2012; Clayton, 2000; Sovacool et al., 2019, 2023a; Baasch, 2020; Tschakert et al., 2020; Tornel, 2023). This approach is intended to make different, complex and contradictory perspectives (such as needs, norms, ideas, desires, and priorities) visible and thus accessible not only to scientific but also to societal discussion. This integrative model of multiple justices is intended to motivate a recognition of the multiplicity of permeable, changeable, contradictory, dynamic, contextual, situational, emotional, social, and individual aspects as integral components of justice assessments (Fig. 1).

The top face of the cube shows the underlying understanding of justice as perception and subjective belief, which forms the analytical framework of this model (with reference to Montada, 2012; Clayton, 2000). The right side of the cube lists examples of different perspectives on justice (both more-than-human and anthropocentric), which exemplify the multiple and potentially conflicting understandings of justice that are at play in the context of energy justice (with reference to, e.g., Tschakert et al., 2020; Sovacool at al., 2023a; Tornel, 2023). The front of the cube illustrates the spatial and temporal dimensions of energy justice in a modification of Sovacool et al.'s (2019) multi-scalar or whole energy justice model. The additions (inserted arrow circles) emphasize the interconnections within the spatial and temporal dimensions. For example, to better reflect that production, consumption and waste are not only temporally but also structurally inter-

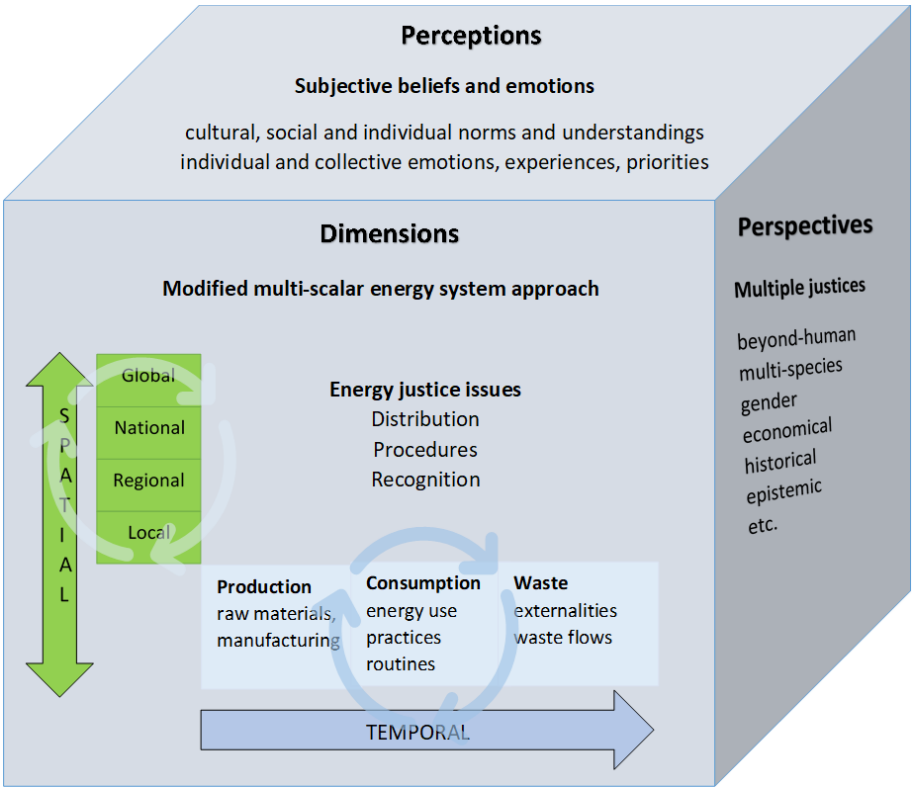

Figure 1. An integrative model of multiple energy justices.

twined (such as more sustainable forms of circular economy versus unsustainable linear or "throwaway" economy).

For social science and human geography research on energy justice, this concept can offer an approach to move away from the previous, often too narrow focus on energy justice in the context of implementation and acceptance research (see Hornburg's critique in Sect. 2) to research approaches that draw on a broader theoretical and methodological potential of the social sciences. Recognizing different conceptions of justice as subjective beliefs can help to see them as objects of discussion and negotiation in application contexts, where different prioritizations need to be considered. However, depending on the case, these processes can be very challenging, especially when there are incommensurabilities, for example between Indigenous and Western ontologies (Behn and Bakker, 2019). An understanding of multiple and contradictory justice can also contribute to a re-politicization of energy justice by critically questioning supposedly universal or common assumptions. The proposed approach does not imply that each aspect is always applied equally in the research process. Instead, it is about critical questioning and openness of perspective that should help to reveal prioritizations as well as inclusions and exclusions in research designs and questions, thus overcoming and addressing prediscursive basic assumptions.

4 Conclusion

As these examples show, framing energy transition per se as sustainable development that is beneficial for "the humanity" is not only a simplification of very complex processes, but this generalized and globalized framing also obscures and suppresses views, practices, and ideas of development that do not correspond to the prevailing idea(l)s of ecological modernization. As a result, energy transition becomes quasi-prediscursive and escapes the need for critical reflection, which violates justice as recognition. Chimamanda Ngozi Adichie's famous Ted talk "The Danger of a Single Story" (Adichie, 2009) reminds us that single stories create incomplete stereotypes and make one story the only story. This can also be applied to the context of energy transitions and energy justice: single stories about universal assumptions about justice or fundamentally positive and sustainable community impacts of energy transitions lead to exclusion, marginalization, colonialism, and other injustices. Thus, analyzing and addressing such complex and interconnected (in)justice requires an understanding that incorporates complex, conflicting and contested perspectives, acknowledges multiple injustices due to different understandings of human-nature relations and futures, and critically considers the embeddedness of transitions in political and historical contexts. Energy justice is the lens to uncover these com-

plexities and to contribute to a broader and deeper understanding of the energy transition, critically examining its impacts and underlying mindsets, and leading to social science engagement that goes well beyond technology acceptance. As argued before, this requires a conceptual expansion of energy justice to include these complexities and interdependencies. This paper proposes to extend and modify existing approaches to the whole energy system by integrating a more nuanced understanding of multiple injustices.

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