

RESEARCH ARTICLE

Low-carbon energy, sustainable development, and justice: Towards a just energy transition for the society and the environment

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Abstract

Governments and civil society are increasingly aware that the decarbonization of energy systems needs to be aligned with justice principles of recognition, distribution, and process. This paper establishes a conceptual linkage between “sustainable development”, “low-carbon energy transitions” and “energy justice” and examines social priorities to address peoples’ competing priorities associated with low-carbon energy interventions. By analyzing a renewable energy project in Vietnam as a case study, the paper shows that linking social priorities to energy justice provides a useful contribution for energy policy makers toward a better understanding of the multi-dimensional and complex aspects of low-carbon energy transitions, and how different segments of society prioritize and perceive them for the achievement of socially just energy decisions.

KEYWORDS

energy, justice, low-carbon transitions, stakeholder engagement, sustainable development

1 | INTRODUCTION

This paper establishes a conceptual linkage between “sustainable development”, “low-carbon energy transitions”, and “energy justice” and examines social priorities associated to low-carbon transitions and a specific renewable energy project in Vietnam.

From a global perspective, low-carbon energy transitions from fossil fuel to renewable energy sources are a solution to the dual challenge of reducing greenhouse gas (GHG) emissions (and therefore mitigating climate change) and providing access to clean and affordable energy in times of anthropogenic environmental change and accelerated global economic development (Urban, 2014; Valentine, Brown, & Sovacool, 2019; WBGU, 2003). The Sustainable Development Goals (SDGs) of the United Nations, whose ultimate aim is to promote global prosperity while protecting the environment, carry along the topic as

a cross-cutting theme and explicitly articulate these two challenges in SDG 7 (ensure access to affordable, reliable, sustainable and modern energy for all by 2030) and SDG 13 (take action to combat climate change and its impacts) respectively. Target 7.2 of Goal 7 highlights the importance of substantially increasing the share of renewable energy in the total energy mix by 2030 to support low-carbon energy transitions (United Nations, 2018). From an historical perspective, the multilateral institutionalization of the low-carbon discourse can be traced back to the United Nations Framework Convention on Climate Change (UNFCCC) adopted in Rio in 1992. It was further strengthened through a decision adopted at the UNFCCC Conference of the Parties held in Cancun in 2011. There, parties agreed that “addressing climate change requires a paradigm shift towards building a low-carbon society that offers substantial opportunities and ensures continued high growth and sustainable development, based on innovative

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technologies and more sustainable production and consumption and lifestyles, while ensuring a just transition of the workforce that creates decent work and quality jobs" (UNFCCC, 2011, Decision 1/CP.16).

Low-carbon transitions, including energy transitions, have therefore been recognized by the international community as a change process that must simultaneously reach multiple goals: greening the economy, providing clean (i.e., renewable) energy access, reducing poverty, ensuring decent jobs, while protecting the environment and mitigating climate change (Lederer, Wallbott, & Urban, 2019; Lederer, Wallbott, & Bauer, 2018; Mulugetta & Urban, 2010; Skea & Nishioka, 2008; Urban, 2010; Urban & Nordensvärd, 2013; Urry, 2013; Verolme & Korduan, 2014).

The concept of low-carbon transitions thus takes a "development-first" approach by integrating climate change goals (i.e., reduction of GHG emissions) with development objectives (Fisher, 2013; Morita et al., 2001), based on the assumption that sustainable development strategies of promoting economic and social prosperity while mitigating the climate mutually reinforce each other (Sathaye et al., 2007). Notably, this agenda, which does not explicitly mention equity and justice principles in the process of achieving those outcomes, has been criticized for its "techno-managerial" approach that would leave procedural (i.e., a fair decision-making) and distributional (i.e., an equitable sharing of environmental "bads" and "goods") dimensions of (in)justice aside (Munro, van der Horst, & Healy, 2017). Consequently, it has been argued that justice-based approaches for fairness in access and allocation of resources and better energy decisions are required (Calzadilla & Mauger, 2018; Fuso Nerini et al., 2018; Kaneti, 2019; Sovacool, Turnheim, Hook, Brock, & Martiskainen, 2021). Numerous studies have put the attention on the urgency called for by both governmental and civil society actors of considering justice principles in the transition to a low-carbon society (Calzadilla & Mauger, 2018; Denton et al., 2014; Fuller & McCauley, 2016; Levenda, Behrsin, & Disano, 2021; Silveira & Pritchard, 2016; Sovacool et al., 2021). Correspondingly, scholarly research on low-carbon energy transitions has over the past years been increasingly concerned with "climate justice" (Caney, 2014; Schapper & Lederer, 2014; Schlosberg & Lisette, 2014; Shue, 2014; Wallbott & Schapper, 2016) and "energy justice" (Bickerstaff, Walker, & Bulkeley, 2013; Jenkins, McCauley, Heffron, Stephan, & Rehner, 2016; McCauley et al., 2019; Sovacool, Burke, Baker, Kotikalapudi, & Wlokas, 2017) that are both considered to have strong implications for the achievement of a just energy transition toward a low-carbon society in terms of equitable distribution of costs and benefits and fair decision-making processes (Carley & Konisky, 2020; Jenkins, 2018). Moreover, several studies highlight that the transition to a just low-carbon society requires a better inclusion and consideration of the social dimension in decision-making through participation of a diverse range of public and private actors, including government ministries, businesses but also civil society and affected people (McCauley et al., 2019; Silveira & Pritchard, 2016; Sovacool, 2021; Tanner & Harvey, 2013; Williams & Doyon, 2019). In this sense, to achieve socially and environmentally just low

carbon transitions, decisions must be based on shared interests through the recognition of social needs and priorities (Chukwumerije & Schroeder, 2009; Edenhofer et al., 2012; Roberts & Parks, 2006; Silveira & Pritchard, 2016). It is therefore important to capture the perspectives and priorities related to just low-carbon transitions of different segments of society: those who are concerned with or accompany the design and implementation of policies and projects, and of those who are affected by them (Bickerstaff et al., 2013; McCauley et al., 2019; Sovacool, Martiskainen, Hook, & Baker, 2019; Williams & Doyon, 2019). In this direction, some studies have demonstrated how to consider equity and justice in the analysis of renewable energy transitions based on social priorities (Chapman, McLellan, & Tezuka, 2016, 2018). Yet, they mainly focus on fairness associated to the distribution of costs and benefits (i.e., distributional justice), employment and economic opportunities.

Taking a broader perspective, this paper combines conceptual insights on sustainable development (looking at its three pillars, economic, environmental, and social as defined in "The 2030 Agenda for Sustainable Development")¹ (United Nations, 2018), low carbon transitions, and energy justice with aspects of recognition, distribution and process to analyze social preferences in relation to low-carbon transitions and a specific case study of renewable energy projects in Vietnam. The prime contribution of this paper lies therefore in offering a social perspective of the multidimensional and complex aspects of low-carbon energy transitions based on people's priorities and their linkages with sustainable development and energy justice. Specifically, we derive various multidimensional goals that are used to assess the linkages between sustainable development, low-carbon transitions and energy justice and we use them to analyze: (i) the importance that different actors attribute to specific sustainable development and energy justice aspects associated with low-carbon energy transitions; and (ii) how this perceived importance differs among different actors, such as people affected by projects, governmental actors, and non-governmental organizations (NGOs). In doing so, we draw our analysis from original data collected during field research and interviews completed in 2018 with different actors that have been concerned or affected by renewable energy transitions and the development of hydropower projects in Lam Dong province in the Central Highlands of Vietnam. Vietnam is a highly interesting case as the country is still strongly dominated by the authoritarian rule of the Communist Party of Vietnam and its energy and environmental issues are thus regulated in a top-down fashion (Lederer, Wallbott, Urban, Siciliano, & Nguyen, 2020). At the same time, the country is establishing sustainable renewable energy schemes and can be perceived as a pioneer in low-carbon energy transitions (Urban, Siciliano, Villalobos, Nguyen, & Lederer, 2020; Urban, Siciliano, Wallbott, Lederer, & Nguyen, 2018).

The paper is organized as follows: Section 2 outlines the conceptual framework that we use based on interdisciplinary research on energy justice that brings together different streams from the Social Sciences. Section 3 provides a description of the case study

area in Lam Dong province, Vietnam and presents the methodology used to elicit social preferences linked to energy justice and low-carbon transitions. Section 4 presents the results of our analysis. Section 5 critically discusses the findings and Section 6 provides some policy recommendations on how social priorities and low-carbon transition objectives can be linked to energy justice principles in politics.

2 | ANALYTICAL FRAMEWORK

2.1 | Energy justice as normative reason and evaluative template

Energy justice is a conceptual, analytical, and decision-making framework used to describe, understand, and analyze fairness and equity in the inclusion and consideration of those affected by energy decisions (i.e., recognition), in the access and allocation of energy services (i.e., distribution) and in the procedures used in the whole process of energy decisions (i.e., process) (Jenkins et al., 2016; Lacey-Barnacle, Robison, & Foulds, 2020; McCauley et al., 2019). The concept thus facilitates the normative and evaluative articulation of claims of rights and responsibilities in association with energy decisions. To enable a socially and environmentally just low-carbon transition, energy justice suggests considering nine principles as key components in energy decisions (Sovacool et al., 2017):

- availability (sufficient energy resources of high quality);
- affordability (access to affordable energy services);
- transparency and accountability (access to high-quality information, fair, transparent and accountable forms of energy decision-making);
- intra- and intergenerational equity (access to energy services for present and future generations);
- responsibility (protection of the natural environment and reduction of energy-related environmental threats);
- due process (respect for human rights in the production and use of energy);
- sustainability (energy resources should not be depleted too quickly);
- resistance (allowing for opposition to energy-related decisions and projects);
- intersectionality (linkage with other forms of injustices, for example, economic, environmental).

The energy justice framework has been designed to provide both normative and empirical assessments of occurring and emerging injustices in the distribution of energy services. It is based on the normative reason that inclusiveness and fair, transparent and accountable forms of energy-decisions across time and space (Bouzarovski & Simcock, 2017; Williams & Doyon, 2019) are at the basis of a just transition to a low-carbon society. Energy justice promotes participatory approaches to energy decisions in which needs and priorities of

different societal actors are fully disclosed and embedded in formal processes of energy policy-making. Framing energy decisions in justice terms can help elicit the relationship between individual and public interests, map and resolve disputes (Fuso Nerini et al., 2018; Islar, Brogaard, & Lemberg-Pedersen, 2017).

The above portfolio of principles flags different dimensions of energy justice. However, if it should be of evaluative value, we need to capture if and to which extent actors that are concerned with and/or affected by energy politics and projects attribute relevance to those different dimensions. Hence, in the following section, we describe the methodology used to link the sustainable development goals that characterize low-carbon transitions with energy justice principles and how different societal actors (i.e., governmental institutions, people affected by energy projects, and civil society organizations) prioritize them according to their experience and involvement in energy decisions. In Section 2.2, we spell out in more detail how the economic, environmental, and social pillars of sustainable development can be related to low-carbon energy transition and the different principles of energy justice mentioned earlier for the definition of socially and environmentally just transitions.

2.2 | Low-carbon energy transitions, sustainable development, and energy justice

Low-carbon energy transitions are change process that have been internationally recognized as a means to reach multiple goals: greening the economy, providing clean (i.e., renewable) energy access, reducing poverty, providing decent jobs, ensuring inclusiveness, while protecting the environment and mitigating climate change (UNFCCC, 2011, Decision 1/CP.16; Urban, 2010; Mulugetta & Urban, 2010; Urban & Nordensvärd, 2013; Skea & Nishioka, 2008; Urry, 2013; Lederer et al., 2019; Lederer et al., 2018; Verolme & Korduan, 2014). In Table 1, we categorize these goals according to the three pillars of sustainable development and we identify how they link with energy justice (Sovacool et al., 2017) and the SDGs (United Nations, 2018). These linkages are further explained hereafter.

2.2.1 | Low-carbon transitions, energy justice, and the economic pillar of sustainable development

First, regarding low-carbon energy transitions and the *economic* pillar of sustainable development, there is a direct interlinkage with Goal 8 of the SDGs “Promote decent work and Economic Growth” and Goal 7 “Affordable and clean energy” (see Table 1). From a justice and economic perspective, low-carbon energy decisions should therefore respond to the energy justice principles of *intra/intergenerational equity*, *intersectionality*, and *affordability*, which means fair access of present and future generations to employment and economic benefits derived from energy decisions and affordable access to energy (Urban, Siciliano, Wallbott, Lederer, & Nguyen, 2017). In the case of low-carbon energy transitions in the Global South, such as for

TABLE 1 Linkages between low-carbon energy transition, energy justice, and the SDGs

Low-carbon energy transition goals and the three pillars of Sustainable Development	Causal relation	Energy justice principles	SDGs goals
Economic			
<i>Economic growth</i>	Stimulating economic growth; creating competitive advantages; fostering strategic industries	Intra/intergenerational equity; Intersectionality; Affordability	Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all
<i>Employment</i>	Creating jobs		
<i>Energy security</i>	Reducing dependence from energy imports; reducing the cost of energy		
Environmental			
<i>Production of low-carbon energy</i>	Climate change mitigation (abatment of greenhouse emissions); reducing dependence from fossil fuels	Intra/intergenerational equity; Responsibility; Intersectionality	Goal 7 (def. above) Goal 13. Take urgent action to combat climate change and its impacts Goal 15. Protect, restore, and promote sustainable use of terrestrial ecosystems, halt biodiversity loss Goal 14. Conserve and sustainably use the oceans, seas and marine resources
<i>Environmental impacts and change</i>	Adaptation to climate change and other environmental changes; reducing pollution (such as air, land and water contamination)		
<i>Conservation of nature</i>	Protecting natural resources		
Social			
<i>Energy access</i>	Providing energy access	Availability; Resistance; Affordability; Intersectionality; Due process; Transparency and accountability; Responsibility	Goal 7. (def.above) Goal 1. End poverty in all its forms everywhere Goal 12. Ensure sustainable consumption and production patterns Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all Goal 8 (def. above) Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
<i>Achieving development goals</i>	Poverty reduction; increasing human welfare; access to affordable energy		
<i>Education</i>	Education toward sustainability practices; greening lifestyles and sustainable consumption/production of energy		
<i>Inclusiveness</i>	Participation, fair, transparent and accountable forms of energy decision-making		
<i>Respecting human rights</i>	Respect human rights (non-discrimination, equality, empowerment, participation, accountability, clean environment etc.) in the production and use of energy		

Source: Authors' compilation based on UNFCCC definition of low-carbon development, the literature on low-carbon energy transitions, UN SDGs, and energy justice principles (UNFCCC, 2011, Decision 1/CP.16; Sovacool et al., 2017; United Nations, 2018; Urban & Nordensvärd, 2013).

instance in relation to the development of renewable energy projects, affordability (SDG 7) of the energy produced for the local poor is not an aspect which is often taken into consideration in the planning phase of projects. The same inadequacy—pointing towards the spatial expansion of energy justice—can be identified for fairness in the distribution of the economic benefits associated to the energy produced between different geographic areas and populations, such as rural and urban, resulting in a geographical uneven economic growth (Calzadilla & Mauger, 2018; Carley & Konisky, 2020; Siciliano, Urban, Tan-Mullins, & Mohan, 2018). Moreover, in countries in the Global South, energy low-carbon transitions are usually highly dependent on foreign financial support and technology transfer for renewable infrastructure development, which directly links to issues of energy security, such as the capacity to become independent from energy imports by increasing domestic energy production. In terms of jobs creation, the development of renewable energy infrastructures can surely have a positive effects on the creation of new job opportunities for the local population (SDG 8), however, the literature has also showed that often this is only a temporary change for the duration of the projects' construction and for low-skilled workers, especially in the Global South (Calzadilla & Mauger, 2018; Urban et al., 2015). Instead, long-term employment and structural change requires the creation and improvement of skills and knowledge over longer periods of time. Moreover, the literature has also showed that in Europe people employed in the renewable energy sectors are subject to renewable energy markets' instability and global competition which occasionally results in losing their jobs (Sovacool et al., 2021). From an economic and justice point of view, low-carbon energy decisions should therefore take into consideration how economic benefits and costs are distributed between different segments of society and create the conditions to ensure their consistency over time and across generations.

2.2.2 | Low-carbon transitions, energy justice, and the environmental pillar of sustainable development

Second, in terms of *environmental* aspects, which directly refers to Goal 7 of the SDGs “Affordable and clean energy”, Goal 13 “Climate action,” Goals 14 and 15 “Conservation of natural resources and biodiversity”; from a justice perspective, low-carbon energy decisions should in addition respond to *intra/intergenerational equity, intersectionality, sustainability, and responsibility*. These principles all refer to reducing the use of non-renewable sources (SDG 7), such as fossil fuel, to guarantee access to clean energy services for present and future generations while also respecting the environment by mitigating climate change (SDG 13) and preserving natural resources for present and future generations (SDGs 14 and 15). For example, in the case of large renewable energy infrastructures, which are an essential part of low-carbon energy transitions, the environmental implications of these projects can be severe. According to a comprehensive review of the environmental justice implications of renewable energy technologies, one of the reasons of the negative environmental implications of these projects is that the energy justice principles of *intra/*

intergenerational equity, intersectionality, sustainability, and responsibility are not incorporated in the decision-making process, resulting in various negative impacts on the environment, such as biodiversity loss, natural resources degradation and pollution (Levenda, Behrsin, & Disano, 2021). Other studies have also showed that the energy justice principle of *responsibility* linked to reducing “other environmental threats” in addition to GHG emissions, and to the SDGs 14 and 15 of conserving natural resources is not always considered in the localization of the projects, which occasionally are built in natural parks or areas with high biodiversity values (Atkins, 2020; Siciliano et al., 2018). From an environmental and justice point of view, low-carbon energy decisions should therefore take into consideration all environmental implications, which accompany low-carbon energy transitions, and how these are distributed across different segments of society and across different generations.

2.2.3 | Low-carbon transitions, energy justice, and the social pillar of sustainable development

Third, in terms of *social* aspects, low-carbon goals are linked to the SDGs 1 “End Poverty”, Goal 7 “Affordable and clean energy”, Goals 4 and 8 “Inclusiveness of the decision-making process and education”, Goal 12 “Sustainable production and consumption,” and Goal 16 “Peace and Justice”. From a justice perspective, energy decisions for a low-carbon transition should in addition respond to the energy justice principles of *availability, resistance, affordability, intersectionality, due process, transparency, and accountability, responsibility*, to guarantee accountable, transparent, and fair forms of participation in energy decision-making, recognizing oppositions, while providing energy at affordable prices for the entire population. In the case of low-carbon energy transitions, this implies the preservation of socially vulnerable areas for renewable project localization, such as those with highly social and cultural values and areas under customary land use rights (SDG 16). It means giving voice to oppositions and power to affected people and local communities and consider the possibility for local communities to play a significant role in defining low-carbon transition alternatives to those presented by governments and companies by means of a co-production of knowledge and mutual learning toward sustainability and sustainable practices (SDGs 4, 8 and 12) (Del Bene, Scheidel, & Temper, 2018). These aspects are oftentimes not taken into consideration in the case of low-carbon energy projects in the Global South (Calzadilla & Mauger, 2018). Instead, customary and statutory land and water use rights are often disregarded when renewable energy projects are planned and constructed, people are only marginally consulted, availability and affordability of energy services for local communities not always considered (Levenda, Behrsin, & Disano, 2021; Ottinger, 2013). These aspects often result in increasing poverty, marginalization and vulnerability of communities losing access to natural resources, but also the loss of their culture and social connections (Hensengerth, 2017; Majid Cooke, Nordensvard, Bin Saat, Urban, & Siciliano, 2017; Siciliano et al., 2018). From a social and justice point of view low-carbon energy decisions

should therefore take into consideration greater respect of human rights, social, and cultural diversity and inclusivity through democratizing decision-making processes based on the inclusion of peoples' views, priorities, and needs, as well as recognizing oppositions as opportunities for the achievement of better solutions.

This conceptual elaboration is useful to capture the linkages between low-carbon energy transitions, energy justice principles and the SDGs. It enhances our understanding of what a socially and environmentally just energy transitions means. In order to democratize energy decision-making it is furthermore important to understand how social actors perceive and prioritize those different dimensions (Sovacool & Blyth, 2015). Hence, in this paper, we elicit social preferences concerning the importance that different actors attribute to the specific sustainable development and energy justice aspects associated with low-carbon energy transitions identified in Table 1.

The method used is a combination of semi-structured qualitative interviews and participatory technique based on a preference ranking method (fully explained in Section 3.2). The framework and method were applied to analyze low-carbon energy transitions and renewable energy projects in the Central Highlands of Vietnam.

3 | RESEARCH METHODS: CASE SECTION AND METHODOLOGICAL APPROACH

3.1 | The case: Low-carbon transition in Vietnam

Vietnam has over the past decades experienced rapid economic development along increasing environmental pressures. And the country's historical record of energy production and consumption is far from "green"—still, its primary energy supply depends to almost 70% on fossil fuels, mainly coal and oil (especially for transport), but increasingly also natural gas (IEA, 2017). Furthermore, fossil fuel subsidies are still high, and the country has one of the lowest energy prices in the world (Smits, 2017, p. 83). But Vietnam is also actively driving forward policies and actions to adapt to climate change and has developed strategies to move toward more low-carbon, climate-friendly energy sources such as hydropower, wind, solar, and modern biomass (Urban et al., 2017). However, trade-offs between economic, social, and environmental aspects and opposition to low-carbon energy projects are also likely to increase due to the poor recognition of energy justice in decision-making (Hirsch, Matthes, & Funfgelt, 2017; Urban et al., 2017). Therefore, to understand how different actors prioritize specific sustainable development and energy justice aspects associated with low-carbon energy transitions could help to address peoples' needs and to improve the substantial and procedural quality of politics overall (Cameron et al., 2018). The research results of this paper are based on interviews that have been conducted in Lam Dong province that was selected together with local researchers due to its significance in terms of low-carbon projects development. To better understand social priorities regarding low-carbon transition in the study area, we interviewed institutional actors as well as people from Krông Nô commune affected by two hydropower projects located in

Lam Dong province, namely Krong No 2 (with a power capacity of 30 MW) and Krong No 3 (with a power capacity of 18 MW) built in 2016 by the Vietnamese company Trungham Krong. The two hydropower plants are located close to each other on Krong no river in Lạc Dương district in Lam Dong province (more details on the people interviewed can be found in the next section). Lam Dong is located in the Southern part of Central Vietnamese Highlands. It is one of the most developed provinces in terms of hydropower development thanks to its abundant water resources and several large rivers; therefore, hydropower represents the main low-carbon energy transition in the area (First Climate, 2016).

3.2 | Methodological approach: Semi-structured qualitative interviews and participatory technique based on a preference ranking method

To analyze social preferences associated with low-carbon energy transitions in the case study area, we used a preference ranking method based on semi-structured interviews with different social actors. Three types of groups were interviewed in the course of primary field work in Vietnam for a total of 26 semi-structured interviews conducted in the period 2016–2018: (a) policymakers from government and bureaucracy; (b) representatives from firms and entrepreneurs; (c) experts from civil society and academia; (d) representatives from multilateral organizations and donors; and (e) people affected by energy projects.²

From an empirical point of view, in this paper, we look at socially and environmentally just low-carbon transitions from a social perspective by looking at social actors' priorities based on in depth semi-structured interviews conducted with nine selected representatives from the above groups of stakeholders: (i) institutional actors which are involved in energy decisions about low-carbon project development providing technical support and environmental impact assessment, such as the National Ministry of Industry and Trade (MOIT), the National Ministry of Natural Resources and the Environment (MONRE), and the Provincial Department of Industry and Trade in Lam Dong Province; (ii) three people from Krông Nô commune affected by the construction of Krong No 2 and Krong No 3 hydropower dams in Lạc Dương district in Lam Dong province (a male fisherman and a female shopkeeper, which were interviewed together, and a male fisherman/farmer)³; (iii) the Institute of Regional Sustainable Development at the Vietnam Academy of Social Sciences (VASS) involved in energy projects' evaluation and advice for the central government on energy aspects; (iv) international donors, such as the Energy Support Programme at GIZ, which also provides support and advice for the central government in relation to renewable energy for the development of policies and guidelines; (v) international NGOs, such as the sustainable energy programme at the Green Innovation and Development Centre (Green ID), which supports the implementation of renewable energy projects especially in remote rural areas without electrification, through capacity building programmes for the local population.

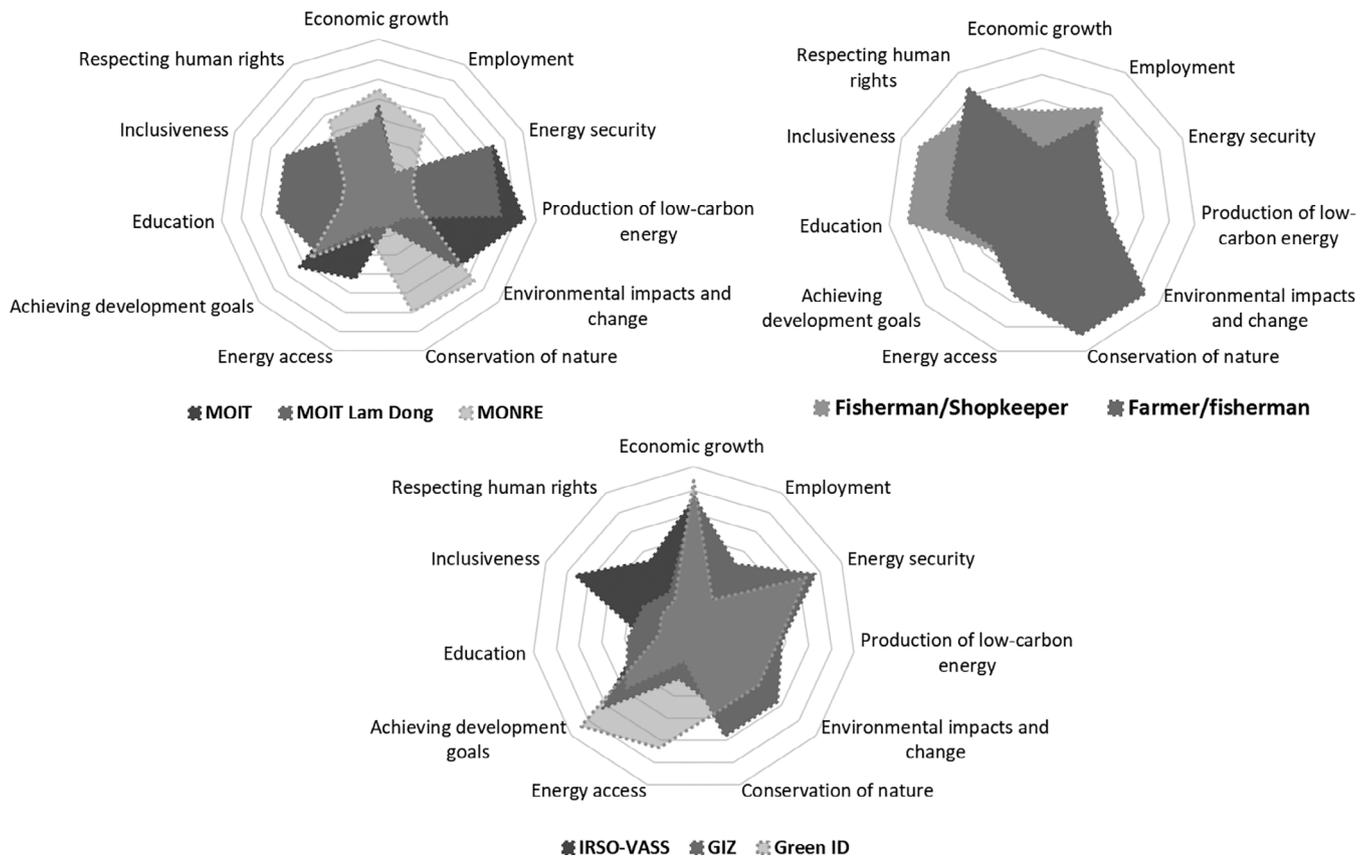


FIGURE 1 Social priorities related to low-carbon sustainability criteria (institutional actors, civil society, and affected people). (These radar charts graphically show the results of the ranking for different actors, the importance attached to the aspects discussed increases when moving from the center to the periphery of the chart) (Table 1 shows how criteria displayed in the chart are linked to specific energy justice principles and SDGs)

To reveal social preferences linked to the low-carbon transition goals indicated in Table 1, we used a qualitative participatory technique, which allowed us to identify preferences and priorities of different stakeholders (Rietbergen-McCracken & Narayan, 1998). During the realization of semi-structured interviews, interviewees were asked to rank the low-carbon goals indicated in Table 1 in ascending order (from the most important to the least important) and comment on them. To facilitate comparisons among different stakeholder's rankings, we used a quantitative preference ranking method called the "Revised Simos" procedure (Figueira & Roy, 2002), which allows obtaining ordinal weights which indicate the importance that each interviewee attach to the items analyzed in the ranking in a scale from 0 (not important) to 1 (very important) (Garmendia & Gamboa, 2012; Kowalski, Stagl, Madlener, & Omann, 2009; Madlener, Kowalski, & Stagl, 2007). The rankings obtained were then discussed with each interviewee and the conversation audio-recorded. The audio-recordings were then analyzed using a narrative thematic analysis. Narrative thematic analysis refers to the analysis of the content of the interviews more than the way the story is told (Butina, 2015). The results of the analysis are presented and discussed in Sections 4 and 5.

Although we are aware of the limited number of interviews carried out due to the restrictions encountered during fieldwork to access areas affected by low-carbon energy projects, we believe that the study provides useful insights on the linkages between low-carbon transition, sustainable development, and energy justice from a societal perspective and across different types of stakeholders.

4 | RESULTS: ELICITING SOCIAL PRIORITIES

In this section, we present the results of the analysis from which it is possible to appreciate the importance and perception that different social actors attribute to the complex and multidimensional aspects, which characterize a low-carbon energy transition from a justice and sustainable development perspective. Figure 1 displays the different priorities (expressed in ordinal weights as percentage) assigned to the different aspects analyzed during the interviews with actors. The greatest differences in opinion regarding the weighting are associated with the criteria "energy security," "inclusiveness," "nature conservation," and "production of low-carbon energy". The results of

TABLE 2 Summary of the aspects highlighted as relevant during the interviews and referred to low-carbon transition and sustainable development

Low-carbon sustainability	Aspects discussed during interviews
Economic	
Economic growth	<ul style="list-style-type: none"> • Low-carbon investments in renewable energy (RE) projects to stimulate economic growth and competitiveness (MOIT-Lam Dong) • Production costs of RE is high, lack of a proper regulation to encourage enterprises, feed-in tariffs have a short duration (MONRE; VASS-IRSO) • Low-carbon development is not only about reducing GHG emissions, it is also about green growth, such as promoting sustainable consumption, green construction or sustainable lifestyle of the people (VASS-IRSO)
Employment	<ul style="list-style-type: none"> • Low-carbon energy creates new jobs, but replaces traditional jobs (i.e., agriculture) (MOIT) • RE benefits local populations with jobs in the construction phase of the projects (GIZ) • Lack of employment alternatives and new opportunities for resettled people due to RE projects (Geen ID)
Energy security	<ul style="list-style-type: none"> • No domestic capacity for RE, that is, technology and domestic expertise (GIZ; VASS-IRSO) • RE can reduce energy security gaps between southern and northern regions (GIZ) • Energy efficiency must be improved (GIZ, MOIT).
Environmental	
Production of low-carbon energy	<ul style="list-style-type: none"> • Low-carbon energy can reduce GHG emissions and air pollution (MOIT; MONRE; VASS-IRSO) • Low-carbon energy can reduce the risk of dependence from import of fossil fuel (Geen ID)
Environmental impacts and change	<ul style="list-style-type: none"> • RE is linked to land loss and livelihood changes for resettled communities (i.e., hydropower) (MOIT- Lam Dong; MOIT) • Reduced access to forest after dam construction due to inundation and clearance of land (affected people) • Land use conflicts between local population, the government and companies apply for RE projects (Geen ID; GIZ)
Conservation of nature	<ul style="list-style-type: none"> • Fish decline after dam construction (affected people); • Deforestation due to land use for RE projects (MONRE; MOIT; affected people)
Social	
Energy access	<ul style="list-style-type: none"> • RE can benefit remote rural areas without electricity where ethnic minorities are located (MOIT; GIZ; MOIT- Lam Dong) • Access to energy through small-grid RE infrastructures to empower local people to produce their own energy (affected people)
Achieving development goals	<ul style="list-style-type: none"> • RE provides better and cheaper energy access to stimulate development (MOIT; MOIT-Lam Dong) • No provision of livelihood alternatives and income reduction due to fish decline and the difficulty to fish in deep water for the construction of the dam (affected people); • Reduced access to forest to collect food for self-sufficiency and the market; no provision of infrastructures (affected people).
Education	<ul style="list-style-type: none"> • Provide better education and training for livelihood diversification to people affected by low-carbon projects (MOIT- Lam Dong; affected people). • Decentralized RE power plants help isolated local communities to reach energy sovereignty, but lack of proper capacity building on how to use the technology leads to unsuccessful projects (Geen ID; affected people)
Inclusiveness	<ul style="list-style-type: none"> • Not specific mechanisms for participation of the local population in case of planning, construction and monitoring phases of the RE projects (GIZ) • No proper negotiation and participation in the different phases of dam construction and energy decision making about alternative energy generation options (affected people)
Respecting human rights	<ul style="list-style-type: none"> • People do not have voice or little voice in the negotiation process regarding energy projects, after conflicts Vietnam introduced a treaty to solve conflicts between affected people, construction companies and local authorities but the resolution process is long, not clear and not effective (Geen ID; affected people).

Source: Interviews with: the Ministry of Industry and Trade (MOIT)—Clean production and Energy Efficiency Project (Interviewed on January 10, 2018); Vietnam Academy of Social Sciences VASS—IRSO Institute of Regional Sustainable Development (Interviewed on January 15, 2018); GIZ—Energy support programme (Interviewed on January 17, 2018); Provincial Department of Industry and Trade MOIT—Lam Dong Province (Interviewed on January 24, 2018); Affected people, Trung Nam Dam (Interviewed on January 27, 2018); Geen ID (Interviewed on January 29, 2018); Ministry of Natural Resources and the Environment (MONRE)—Environmental Science Institute (Interviewed on January 31, 2018).

the thematic narrative analysis of the interviews are displayed in Table 2. From the results shown in Table 2, people affected by a large hydropower development give great importance to the conservation of nature and environmental impacts and to change that comes along with renewable energy infrastructure development, such as land clearance/deforestation and decline in fish stocks (cf. Table 2). The interviewees call for a conservation of nature to preserve their ability to access natural resources, such as land, water, and forest to support their livelihoods as well as the ones for future generations. This is important, as many locals still rely on natural resources for their livelihoods, such as for fishing, farming, and forestry: “we could fish at least 12 to 15 kilos of fish in a day, now only 3 kilos a day and sometimes nothing and fish species are decreasing, we cannot see some species anymore. The amount of fish is 40% less than before [the construction of the dam]” (interview with affected people January 27, 2018).

On the contrary, the institutional actors interviewed established a linkage between the conservation of nature, environmental impacts, and change linked to a low-carbon transition mainly by referring to reduction of GHG emissions while improving energy access, efficiency, and security. Governmental actors (MOIT), international donors, and NGO (GIZ and Green ID) in Vietnam tend to prioritize energy security, energy efficiency, reducing dependence from fossil fuel imports and therefore reducing environmental pollution, through the realization of renewable energy projects: “Renewable energy is important because it can reduce dependence on fossil fuels like coal which is mainly imported and reduce pollution” (interview with MOIT January 15, 2018). At the same time, land clearance due to renewable energy development is considered by institutional actors a social issue only when it refers to agricultural land regulated by established land property rights and loss of crops and agricultural activities and therefore jobs for the local population: “Low-carbon development can create new jobs, but it would remove some job opportunities, such as agricultural jobs for farmers due to land clearance” (interview with MOIT January 15, 2018). Deforestation and land clearance are therefore considered as issues in terms of agricultural loss, without taking into account the potential social impacts derived from the reduced access to “other lands,” such as the forest from which the local population collect products which are vital for their livelihoods and sometimes food security: “We were used to go to the forest to collect honey and bamboo now [after the construction of the dam] we have problems to access the forest” (interview with affected people January 27, 2018). Simultaneously, affected people prioritized the importance of creating long-lasting employment opportunities and the right to an inclusive decision-making process in which their voices are heard, and their priorities taken into consideration (Table 2). However, if we look at perceptions and needs in terms of job creation the results differ between different actors. Institutional actors, such as MOIT and GIZ, emphasize job opportunities created for locals during the different phases of renewable energy project construction, such as hydropower, wind, and solar projects, as specified in the quote above from MOIT. Affected people, however, lamented the temporary and low-skilled aspects of these jobs and the lack of capacity building and training to be able to find alternative energy generation, distribution and

consumption in a way that would be suitable within their ecological, social, economic, and cultural circumstances and that would support the diversification of livelihoods over time: “the government has not provided any training or guidance on how to use energy technologies and find alternative jobs” (interview with affected people January 27, 2018). Similarly, Green ID mentioned that one of the causes of failing mini-grid solar projects, especially in remote rural areas of Vietnam, was the lack of inclusiveness of local people in the decision-making process of energy generation and capacity training on how to use alternative technologies: “we had many bad experiences in the past where, companies go to different provinces and provide renewable energy off-grid technology and after it is broken, it is not used anymore. There is not participation and capacity training, or expertise provided to locals together with finding the right supporting mechanism so that the system could work sustainably” (interview with Green ID January 29, 2018).

These results are supported by the literature, which identifies the lack of technical expertise for building, operation and maintenance as well as a lack of financial assets for project construction and lack of access to technologies as factors restraining the development of renewable energy projects in low-middle income countries (Urban et al., 2017).

Looking at differences between institutional actors, MONRE's key concern has been the conservation of natural resources, whereas MOIT's main concern is on energy security and economic growth. This is in alignment with the formal mandate of these different institutions. Yet, this observation points toward the need for inter-ministerial exchange and collaboration in order to realize a common approach towards sustainability transformations despite diverging official missions and understandings. Differences are also visible regarding different NGOs such as think tanks, civil society, and donors. Research institutions such as VASS emphasize the importance of inclusiveness, achieving development goals and economic growth. Regarding inclusiveness, they ask for a better participation of affected people in project decisions: “people are consulted by the Government only to get information about their livelihood losses” (interview with VASS January 10, 2018).

Whereas donors like GIZ see their mission in helping to achieve energy security, energy efficiency, and environmental protection at the national level: “the problem in Vietnam is not only to produce more energy to meet energy security, but you also have to reduce inefficiencies. Not only the transition to clean energy is important but also energy efficiency” and in relation to clean energy production: “In the National Power Development Plan the government has substantially increased the share of renewable energy to meet the increasing energy demand at the national level” (interview with GIZ January 17, 2018). Regarding energy security at the regional level and renewable energy: “the main energy sources in Vietnam are coal and hydropower, especially the hydropower which is produced mainly in the North, so we have to transmit the electricity from the North to the South, which is costly and inefficient. But solar and wind are very strong in the South and in the Centre. So, we think that now we develop either solar, wind and biomass, Southern regions can stop importing electricity from the North, so they can support their own consumption” (interview with GIZ January 17, 2018).

From a more decentralized perspective, the innovation and development center Green ID considers the most important priorities to be achieving development goals, providing energy access and energy security at the local level by using decentralized off-grid systems, which is more in line with affected people's priorities: "*We support decentralized power plants. We support different renewable energy sources for local communities. We constantly advocate that for rural areas extending the national grid is not an option. It is very costly. So why not providing off-grid solar power, wind power, small hydropower projects, local and smaller projects are really great to provide electricity to rural areas. However, many provincial leaders they can only see extending the centralized grid as an option*" (interview with Green ID January 29, 2018).

5 | DISCUSSION: SOCIAL PRIORITIES AND JUST LOW-CARBON TRANSITIONS

A socially and environmentally just low-carbon transition needs a holistic view of the interrelationship between society, the environment, and the economy in which community perspectives are taken into consideration in policy processes (McCauley et al., 2019). In this view, the production of renewable energy to reach energy security, access and a cleaner environment go along with the preservation of natural resources, not only for conservation but also for satisfying human needs and priorities, such as guaranteeing access and use of resources for livelihoods and cultural aspects for both present and future generations (Calzadilla & Mauger, 2018). Linking the results presented in the previous section to *energy justice principles* and the importance that different actors attribute to them, local people are particularly concerned about *transparency* and *accountability*, *responsibility* with regard to handling natural resources, *due process*, and *intersectionality*, particularly in linking renewable energy projects to opportunities for employment and education. Institutional actors seem to be particularly concerned with availability of energy supply, which links to energy security, *responsibility*, and *sustainability* relating to mitigating climate change and *intersectionality* with regard to economic growth. This is particularly important for analyzing all forms of setting-up renewable energy installations as here—just as in any other development policy—trade-offs as well as new injustices cannot be avoided. Taken together, our research therefore shows that environmental and socio-economic factors that could influence livelihoods, lifestyles, and lives do not represent a priority at the national level, such as energy security and economic growth. But, we also witness that within this broad categorization, more specific nuances of prioritization exist also among the institutional and the non-state actors, as already presented in the results section.

In relation to environmental aspects, what it is interesting is the different understanding of key terms such as environmental protection. For institutional actors, this refers to climate change mitigation and GHG abatement, whereas for local people affected by the energy project this refers to the availability, protection and use of natural resources such as land and water. We also witness a mismatch in

terms of the vision of appropriate decision-making and energy production. Locals call for more inclusiveness and participation in the energy decision-making process. They are more oriented toward solutions that are better linked to their socio-cultural environment and call for energy sovereignty which means the possibility for them to produce and consume their own-produced energy (see people's view under "energy access" in Table 2). In contrast, the dominant view of institutional actors refers to how best to achieve a sufficient level of acceptability of energy infrastructure within communities by providing compensation for livelihood losses. Hence, the institutional actors seem to have a rather narrow understanding of procedural justice, limiting it to the extent to which communication with locals has been used to reduce complaints and oppositions (McCauley et al., 2019). As a consequence, in terms of energy decisions, institutional actors are generally more inclined toward solutions which increase national energy security through connection to the central grid and big infrastructural projects, such as large hydropower dams, solar, and wind parks. From a spatial perspective, this points toward distributional inequalities and the disadvantageous position of provincial and local actors in a de facto centralized set-up (Calzadilla & Mauger, 2018). What remains under-discussed in the interviews is the issue of affordability. For this case study, neither the institutional actors nor the local actors addressed the issue of access to affordable energy services, especially for the poor. During the interviews, energy security and energy access were mentioned as key aspects for the institutional actors, yet the issue of the price of access to electricity was not adequately explored in relation to energy justice. The reason for this could relate to the specific local circumstances in Vietnam where energy prices are comparatively low with respect to other middle-income countries in the Global South thanks to the introduction of a block tariff policy (Ha-Duong & Nguyen, 2018; Lee & Gerner, 2020). Although energy prices are increasing, and affordability of energy is becoming a sensitive issue in Vietnam, too (Neeffjes & Thu Hoai, 2017). This is where future research and future policy intervention may be needed, as also demonstrated by other studies conducted on just clean energy transitions (Carley & Konisky, 2020).

6 | CONCLUSIONS

This paper examined social priorities associated with low-carbon transitions from an energy justice perspective, thereby contributing to the emerging literature on socially and environmentally just transitions in decarbonized societies (Sovacool, 2021). A consideration of justice principles (recognition, distribution, and process) in the transition to a low-carbon society is increasingly called for by both governmental and civil society actors (Silveira & Pritchard, 2016), and can inform the design and implementation of energy-related policies and projects (Calzadilla & Mauger, 2018; Sovacool & Dworkin, 2015). By looking at low-carbon transitions and renewable energy projects in Vietnam as a case study, this paper examined how different segments of society prioritize social, economic, and environmental aspects of low-carbon transitions.

We highlight two main findings from our research. First, local people affected by the renewable energy project under investigation give great importance to the conservation of nature, human-environment interactions, as well as to place-based environmental impacts and change that go along with renewable energy infrastructure development, such as for instance land clearance/deforestation and decline in fish stocks, as well as changes in environmental resource access. Institutional actors are more concerned about the abatement of GHG emissions and opportunities for climate change mitigation, which seems only of marginal interest to the local communities. Second, we found a disparity between priorities regarding socio-economic issues. Whereas institutional actors value particularly the contribution of RE to energy security and economic growth, local actors are more concerned about respecting human rights during and after the construction of the infrastructure projects, as well as opportunities for employment, education, and inclusiveness. This requires governments to have more diverse and inclusive decision-making processes and in the specific case of Vietnam better integrated and more coherent policies and planning procedures for renewable energy projects in place, rather than separate ones by several ministries/authorities.

A socially and environmentally just energy transition should therefore look more comprehensively at the natural environment and human-environment interactions and the impacts that renewable energy projects can have on them in terms of resource access but also in terms of ecosystem impacts, finding a way to include both human and nonhuman aspects in energy decision making (Sayan, 2019). A co-production of knowledge, through exchanges of priorities between different actors and at different governance levels seems to be the way forward for a better definition of a common approach towards just low-carbon energy solutions which respond to the Universal value of the 2030 Agenda for Sustainable Development of “Leave No One Behind”, which represents the commitment of all UN Member States “to eradicate poverty in all its forms, end discrimination and exclusion, and reduce inequalities and vulnerabilities that leave people behind and undermine the potential of individuals and humanity as a whole” in accordance with the International Human Rights Law (United Nations, 2018). This also means that governments and the private sector need to take into account the local knowledge by communities, NGOs and other civil society organizations and to work more collaboratively for renewable energy projects.

Finally, at a certain point particularly donors will also have to realize that trade-offs cannot be avoided and that thus conflicts are always part of any development assistance. The donor community should not shy away from these conflicts but also be aware not to fall back in old paternalistic habits of how these conflicts can be managed (Barnett, 2017). What is needed is thus an understanding of how external governance interventions have to strengthen domestic conflict resolution mechanisms that allow the development of a form of meta-governance in which peoples' voices are constructively heard (Lederer, 2018).

To achieve a more holistic and just approach toward a low-carbon energy transition, it, therefore, seems crucial to fully disclose social priorities and existing conflicts in energy policy-making with evidence-based research grounded in the experience of

individuals that are most affected, civil society organizations, and institutional actors. When developing a set of possible alternative low-carbon energy innovations, the actual implementation of energy justice must be promoted in a way that takes into consideration the divergence between different societal actors' needs and priorities without denying existing trade-offs and conflicts. A socially and environmentally just energy transition thus implies more than simple technocratic fixes and requires the meaningful introduction of competing priorities into the decision-making process (both the formal institutions and the public discourse) around the design and implementation of energy decisions beyond an ex post assessment of acceptability.

In this paper, we examined possible lines of inquiry for low-carbon transitions and large renewable energy infrastructures in Vietnam. Still, we believe that the results presented by linking social priorities to energy justice provide a useful contribution for energy policy decision-making at the global level toward a better understanding of the multidimensional and complex aspects of low-carbon energy transitions if progress toward socially and environmentally just decarbonized energy solutions are to be implemented.

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ENDNOTES

- ¹ The 2030 Agenda for Sustainable Development is an action plan to promote sustainable development through the definition of specific goals and targets related to the social, economic and environmental dimensions, that is, people, planet, prosperity, and peace (United Nations, 2018).
- ² Some of the results of the interviews have been already published by the authors in Urban et al. (2017), which addresses the opportunities, barriers, and trade-offs for green transformations in Vietnam's energy sector.
- ³ The selection of the project has been based on permissions obtained by the local Government to interview the local affected population. Restrictions to access remote areas for fieldwork apply in Vietnam and to get permissions from the government is essential. This aspect reduced the number of affected people (three in total) which we were able to reach and interview during fieldwork.

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