

Planning for energy justice? A discourse analysis of energy planning and climate policy in South America[☆]

Daniel Lewis Wuebben^{a,*}, Duilio Lorenzo Calcagno^{b,c}, Maclane Henry^d

^a Faculty of Social Sciences and Humanities & Institute for Research in Technology (IIT) Pontifical Comillas University, Madrid, Spain

^b Grupo CLIOPE - Ambiente, energía y desarrollo sustentable, Facultad Regional Mendoza, Universidad Tecnológica Nacional, Mendoza, Argentina

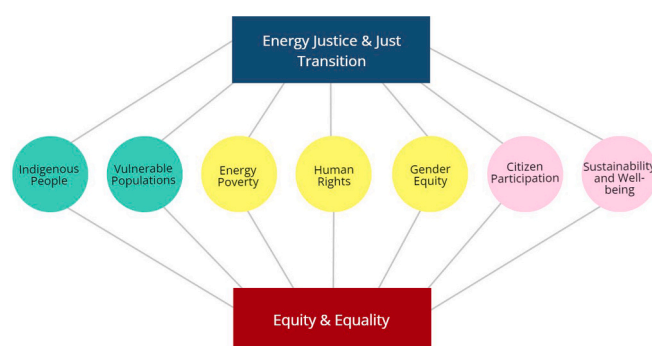
^c Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Argentina

^d Earth Commons Institute and Walsh School of Foreign Service, Georgetown University, Washington, DC, USA

HIGHLIGHTS

- Analyzes energy justice themes and implications in key policy documents from Argentina, Brazil, and Chile.
- Expands the understanding of how energy justice (EJ) is incorporated into energy and climate planning.
- Compares how EJ principles are applied in policy documents in South America.
- Illuminates tensions within and beyond EJ perspectives.

GRAPHICAL ABSTRACT



ARTICLE INFO

Keywords:

Energy justice
Energy planning
Climate planning
Global south
Discourse analysis

ABSTRACT

Energy justice (EJ) frameworks strive for the equitable distribution of the costs and benefits of energy resources and systems. However, the meanings, values, and connections between EJ and energy planning remain ambiguous. This study employs a discourse analysis of top-level energy planning and climate policy documents from Argentina, Brazil, and Chile. The analysis identifies distinct EJ themes and maps these differences across seven primary social dimensions: Indigenous peoples, vulnerable populations, energy poverty, human rights, gender equity, citizen participation, and sustainability and well-being. The results indicate intertextual and extratextual tensions. For example, intergenerational and non-human justice adds new perspectives to planning policy, however, adoption of phrases like ‘citizens at the center’ and ‘leave no one behind’ in the analyzed documents indicate a homogenized view of EJ that may be directed by Global North discourse and downplay local struggles. This homogenization reflects implicit tensions and discrepancies between international agendas and the nuanced EJ needs and realities outside the Global North. Our analysis directly engages with questions on reconciling competing theories of energy justice and conceptualizing conflicting priorities between regions, offering insights into the complex landscape of energy transitions.

[☆] This article is part of a Special issue entitled: ‘Tensions in Transitions’ published in Applied Energy.

* Corresponding author at: Faculty of Social Sciences and Humanities, Pontifical Comillas University, C. de Alberto Aguilera, 23, Centro, 28015 Madrid, Spain.

E-mail address: dlewis@comillas.edu (D.L. Wuebben).

1. Introduction

As energy systems have far-reaching impacts beyond technical and economic spheres, energy planning must account for wide-ranging goals and consequences [24,57]. The political, environmental, and social priorities for planned energy systems may coexist, compete, or clash [23,64]. Therefore, to study energy planning in a regional or national context involves the investigation of complex processes, where authorities, established energy actors, research teams, entrepreneurs, and civil society must interact to express interests and achieve specific outcomes [51]. The research on energy planning is vast, as shown by recent literature reviews [1,33]. Despite the growing recognition of energy justice principles in energy transitions, the interplay between energy justice and energy planning remains under examined.

Energy justice (EJ) implies inclusive stakeholder participation, equitable sharing of energy benefits and burdens, and addressing social inequalities that may be systemic in the design and operation of energy systems. Sovacool and Dworkin [56] have outlined eight principles for energy justice decision-making: availability, affordability, due process, good governance, sustainability, intergenerational equity, intragenerational equity, and responsibility. These EJ frameworks have been crucial for understanding its application in distinct contexts [34,41]. Over the past decade, EJ principles, embedded in the SDGs and the Paris Agreement, have influenced key legal decisions [21]. The legal cases that adopt energy justice perspectives may indicate the “development at-all-costs approach is receding, and a wave of justice is sweeping the energy sector” ([21], p. 6). Is that “wave of justice” sweeping (or leaking) into energy and climate planning and, to follow the analogy, what is the shape, force, and frequency of that wave?

Despite the growing influence of EJ in academic studies and political appeals for a “just” transition, there remains a significant gap in the understanding of how energy justice frameworks impact energy and climate policy. This gap is particularly pronounced when considering the tensions between energy justice and planning in different political contexts such as South America. To address this gap, we perform a discourse analysis of 12 high-level energy and climate documents from Argentina, Brazil, and Chile. As a methodological approach, discourse analysis is particularly suited to unpack EJ and some of its socio-political dimensions and thereby help answer the following research questions:

1. How is energy justice defined and framed in planning and climate policy documents?
2. In these documents, how is energy justice positioned in relation to other social dimensions?

Answering these questions reveals some of the tensions arising from the different frames given to energy justice and related topics such as fairness, equity, and equality. In general, energy justice aims to prevent inequities and injustices while energy planning is founded upon “sound research on the national energy consumption and energy supply, energy prices, demand and supply technologies, population growth, environment and social impacts, success of an energy harnessing technology and influence of political situation of a country” ([50], p. 687). The inclusion of “environmental and social impacts” in the planning processes means that, ideally, in addition to the technical complexities and projections such as infrastructure planning, water levels, fuel price forecasts, etc., energy plans include a forward-looking social perspective that considers past, current, and future needs for energy and justice.

The article is organized as follows: Section 2.1 covers energy justice frameworks; and Section 2.2 discusses social elements of energy planning. Section 2.3 examines current national-level research on energy justice and energy planning, with a specific emphasis on the Global South. Section 3 describes the qualitative methodology used in this study. Section 4 begins by offering context of recent energy planning trends in Argentina, Brazil, and Chile and then discusses the results of the content analysis of EJ and social dimensions in the select documents.

The concluding section highlights the scope, limitations, and emergent research lines.

1.1. Conceptualizing and understanding energy justice

Energy justice encompasses procedural, distributional, and recognition justice, focusing on stakeholder participation, equitable sharing of energy benefits and burdens, and addressing social inequalities [40]. While the three-tenets framework remains foundational, EJ has also expanded to include perspectives such as restorative justice to address past harms and cosmopolitan justice to promote more inclusive energy transitions [22]. Recent systematic reviews show the volume of EJ literature has grown substantially in recent years [31,32,62].

Beginning with early calls for greater non-Western and non-anthropocentric conceptualizations of energy justice [41], recent scholarship has highlighted the need to approach themes of EJ from a wider array of intersecting social locations and pre-existing structures of power. For example, Apergi et al. [4] position intergenerational justice as a component of distributional justice, arguing that the fair allocation of energy benefits and costs must be considered not only across current populations but also between present and future generations. Sovacool et al.’s [55] critical perspective of dominant EJ scholarship also calls for the greater incorporation of postcolonial, feminist, anti-racist, and Indigenous perspectives. In parallel, Dunlap and Tornel [11] contend that current formulations of EJ run the risk of failing to challenge larger structures of domination such as capitalism and the state. Viewing EJ as the “bare political minimum,” helps scrutinize calls for energy autonomy, increased knowledge production, and modern development ([11], p. 1).

Many studies of energy justice beyond the Global North emphasize the need for EJ frameworks that are sensitive to local contexts and histories [35]. Castán Broto et al. [9] argue that current EJ frameworks might not be able to challenge existing structural power relations that hinder more environmentally sustainable futures and ‘energy sovereignty.’ They examine how Mozambique’s historical experiences of Portuguese rule and exploitation have helped shape the country’s current conditions: one of the world’s lowest rates of electrification while approximately 3 million people are still employed in the charcoal industry [9]. Gonzalez’s [18] research in Peru suggests new formulations of energy justice might be rooted in a sense of place and shaped by the community’s connection to the land. Research by Araya and Sannazzaro [5] in Southern Chile highlights the need for more gendered perspectives to EJ as women in unpaid domestic labor positions unevenly bear the burden of warmth deprivation due to a lack of access to energy resources. However, the uneven coverage of Latin American situations continues to indicate a lack of geographical diversity in academic EJ production. Ferrall-Wolf et al.’s [13] review of energy justice literature found that only 11 of the 4196 reviewed papers had at least one Latin American author.

This lack of representation seems to contradict the region’s long tradition of energy-related injustices and grassroots mobilization around energy issues [20,58]. Nevertheless, understanding the various geographical contexts and intersectional, socio-cultural conflicts is crucial for developing more comprehensive and equitable energy policies and practices.

1.2. Tensions between social dimensions and energy planning: A focus on energy justice

This section examines the challenges of implementing EJ in energy policies and strategies, with a specific focus on the social dimensions of energy planning. Energy planning inherently involves foresight, anticipation, and the organization of complex socio-technical systems. For the sake of efficiency, planners and engineers may view these energy systems as ‘closed’ and isolated from uncertainties related to the trade of fossil fuels, new innovations, or market competition for limited natural

resources. On the other end of the spectrum, planning for energy justice requires the acknowledgment and repair of past injustices and ongoing mitigation of present and future injustices. Such systems are fully “open” in the sense that one must acknowledge how these systems are fundamentally linked and influenced by these other external forces [10,48]. When viewing energy planning through an “open” systems approach, it is understood that the overall performance of the planning and system itself is highly interlinked to current social conditions and contexts, and such plans must be able to respond to this external environment to be successful.

Despite advancements in the planned substitution of fossil fuels with renewable sources, expansion of electric vehicle fleets, reinforcement of energy supply security, and increased electrification of energy consumption, the integration of social dimensions into energy policies and energy planning remains incomplete. More than a decade ago, Ferreira et al. [14] and Ribeiro et al. [52] showed that while economic and environmental issues are quantifiable in energy planning, social concerns were less considered. Heleno et al. [25] construct a linear programming model that helps to promote decision-making and heterogeneous policy interventions that fit the specialized needs of local communities. With specific emphasis on a Global North country, Roddis et al. [53] suggest that social acceptance of onshore wind and solar farms is reliant on several factors, such as the visual and aesthetic effects of the projects. Furthermore, results show that approval or rejection of these projects is highly subjective and community specific. Projects are also more likely to be “accepted” (i.e. remain uncontested) in disadvantaged and underserved communities, further perpetuating existing injustices.

Amidst these persistent challenges in incorporating social considerations into energy planning, a growing number of international initiatives and national policy frameworks have begun to explicitly foreground energy justice as a guiding principle. The Just Energy Transition Partnerships, Alliance for a Just Energy Transformation, and the Global Energy Alliance for People and Planet—and reports by the IEA, UNDP, and World Economic Forum each highlight a “fair and just” transition. The 2019 Clean Energy for All Europeans package helped further integrate concepts such as consumers’ rights, and “citizen-energy communities” in energy justice debates [45]. The United States and Colombia have incorporated energy justice principles into important law and policy documents, while Chile has developed specific national energy strategies to foster energy justice [22]. Finally, international grassroots initiatives like the Pacto Ecosocial e Intercultural del Sur (Ecosocial and Intercultural Pact of the South) and accompanying manifesto [39] aim to connect diverse experiences of energy and socio-ecological transformation across Latin America, where, “a regional internationalist perspective strengthens itself against the new green colonial perspectives being imported to the region,” particularly evident in conflicts over who has rights to exploit rare earth metals and critical elements such as silicon and lithium needed for global energy transitions ([37], p. 381). Overall, these efforts and initiatives suggest that equitable and sustainable energy transitions require that energy planning and energy justice are gauged against various social dimensions of energy systems.

1.3. National Level Research on energy justice and energy planning in the Latin America

Scholarship on the often-contentious relationships between energy justice and energy planning within Latin America illustrates how current attempts at creating more just energy systems often assemble around the issues of mapping, siting, extracting, operating, and financing, and distributing the costs and benefits of planned energy systems. In Mexico, top-down mapping practices have been utilized to perpetuate the dispossession of energy resources and decision-making abilities of Indigenous communities [6]. In response, practices such as “counter-mapping” have been suggested to challenge the state’s cartographic

practices and help reimagine energy geographies while granting greater authority and autonomy to affected communities. Tornel [59] has also demonstrated how Mexico’s regulatory frameworks embed a technocratic vision of energy governance, largely ignoring social, spatial, and structural dimensions in the pursuit of “efficient” management. Similar tensions are evident in Chile, where the push for electricity tariff equity reveals how energy justice is often reframed in economic terms during the policy-making process [3]. While such initiatives aim to improve affordability, they may sideline broader justice concerns related to land use, ownership, or participation. Other research emphasizes the need to rethink the life cycles of renewable energy projects and the visible and invisible grievances they generate [43]. For example, in the Isthmus of Tehuantepec, communities affected by utility-scale wind projects raise concerns about the uneven distribution of benefits, the absence of national manufacturing industries, and environmental degradation caused by infrastructure development. These critiques do not align neatly along pro or anti-renewable energy lines—both landowners (propietarios) and communal landholders (comuneros) express complex, sometimes overlapping concerns [42]. Over simplifying justice as a debate of “fossil fuel vs renewable” has also been identified in Chile and Brazil, where large-scale projects such as hydroelectric dams have also been known to degrade ecosystems, force the relocation of individuals and communities, and threaten local ways of living and knowledge systems [19]. These cases underscore the intersectional and context-dependent nature of justice claims, shaped by the socio-political realities of those navigating the energy transition.

Furthermore, efforts to resist extractivism are also taking root at the policy and planning levels. Ecuador’s Yasuní initiative serves as a prime example, garnering global attention for its attempt to protect Amazonian biodiversity by leaving oil reserves untapped—a direct challenge to dominant extractive logics (Alarcón [39]). In Brazil, opposition to the Galinhos wind farm illustrates how distributive justice claims—such as concerns over employment and environmental impacts—become central to resistance efforts [17]. The authors stress that one must be suspicious of universalist understandings of justice, and dialogue between postcolonial and energy justice scholars is imperative. Colombia’s 2022–2026 *Potencia Mundial de la Vida* plan, for instance, aims to halt new hydrocarbon exploration as part of a broader vision to counter extractive models of development [2]. Yet contradictions remain as national energy plans continue to prioritize resource exploitation for export over reductions in consumption or transitions to renewable sources. Tellingly, up to 80 % of human rights violations in Colombia occur in municipalities linked to energy and mining industries [60].

Case studies from Latin America highlight complexities and contradictions in formulating energy justice. Theoretical work and the lived realities illustrate that EJ is a complex concept that holds a multiplicity of meanings to various actors. Energy planning frameworks will have to reconcile with these varying understandings, and having more just policies will rely on a more robust understanding of the multitude of systems that interact with the energy matrix.

2. Methodology

We applied discourse analysis as a means of addressing two primary research questions: 1) How is energy justice defined and framed in planning and climate policy documents and 2) How is energy justice positioned in relation to other social dimensions?

Discourse analysis examines how language constructs social realities and reflects power dynamics [49]. Our application of discourse analysis builds upon several qualitative studies of energy justice discourse. Hermwille et al. [26] employed narrative policy analysis to understand “just transition” narratives across European coal regions. Fischer et al. [15] have studied the development of justice concerns in political debates, underscoring the iterative nature of qualitative analysis. Finally, von Malmberg [61] has applied “argumentative discourse analysis”—which analyzes the political framing and sites of arguments in addition

Table 1

Showing the 12 documents analyzed from the three countries and a brief description of how they present and frame energy justice.

Abbreviated Title	Document	Year	Dominant Framing of Energy Justice
Argentina Energy Transition 2050	Hacia una visión compartida de la transición energética argentina al 2050	2019	Sustainable energy development offers enormous potential to contribute to the new objectives of the 2030 Agenda, including Goal 16 (peace, justice, and strong institutions).
Argentina NDC	National Determined Contribution (Updated)	2021	Suggests the approach to the concepts of equity, justice, and ambition must be made considering its national circumstances and based on the principle of common but differentiated responsibilities.
Argentina Energy Transition 2030	Lineamientos para un Plan de Transición Energética al 2030	2021	Explains that the use of national resources for the energy transition must go along with holding more developed countries accountable for facilitating a just, affordable, and sustainable transition.
Argentina 2050 Emissions Strategy	Estrategia de desarrollo resiliente con bajas emisiones a largo plazo a 2050	2022	International financing for adaptation is key to achieving climate justice, understood within the framework of the principle of common but differentiated responsibilities.
Chile NDC	National Determined Contribution (Updated)	2020	Expands on the cross-cutting pillars related to socio-environmentally sustainable development and minimizing potential negative impacts on the most vulnerable in society. The NDC reiterates the need to include traditionally marginalized groups negatively affected by climate change.
Chile Energy Transition Policy	Transición Energética de Chile	2022	Promotes an inclusive development approach that guarantees the equity of benefits, with particular attention to the most marginalized groups: women, Indigenous people, and people with disabilities, among others.
Chile Just Transition Strategy	Estrategia de Transición Justa en el sector Energía	2021	Focused particularly on the process of decarbonizing the electricity generation matrix, and the difficulties and needs of those who are particularly vulnerable during this process of change.
Chile Climate Policy 2050	Estrategia Climática de Largo Plazo 2050	2021	Shows why the transition towards a socially and environmentally sustainable and just economy must be an engine for decent employment, social justice, and eradicating poverty.
Brazil Climate Adaptation Plan	Plano Nacional de Adaptação à Mudança do Clima Volume 1–2	2016	Acknowledges the negative impacts of climate change on Indigenous lands and argues that strengthening the adaptive capacities of Indigenous peoples can help overcome inequalities, promote climate justice, and safeguard human rights.
Brazil NDC	National Determined Contribution (Updated)	2020	The text claims “a robust public consultation process” can help ensure “socially just and economically viable” strategies, a supplementary transparency analysis finds: “Brazil’s NDC does not contain evaluations, comparisons on justice or any references to equity actions.”
Brazil Energy Plan 2050	Plano Nacional de Energia 2050	2020	Argues that an integrated approach to planning will help promote competitiveness, economic efficiency, consistency, and harmony within the energy sector, ensuring supply security and long-term predictability, as well as intra-generational and inter-generational justice.
Brazil Energy and Well-Being	Indicadores de Bem-Estar Energético	2022	Relates practical applications of the concept of energy justice in other countries. In the case of this document, however, justice is primarily framed with two academic studies of energy justice in Brazil (Novo et al., 2019 [17]).

to the arguments themselves—to reveal some of the narrative conflicts embedded in the ways “energy efficiency first” principles have circulated throughout European Union policy discourse.

We adopted similar methods to understand how EJ is integrated into national energy planning in three countries: Brazil, Chile, and Argentina. During the document selection process, we searched for climate and energy plans, strategies, and related policy documents. Our purposive sampling strategy ensured that our analysis captured a broad spectrum of approaches and energy policy environments. At the same time, the spectrum was also limited in that these three countries from the same region do share several common opportunities and challenges as outlined in Section 4.1, 4.2, and 4.3.

We then performed a scoping process to select the most recent and apparently high-level policy documents to help answer our research question. Our scoping method assumed that energy justice must be understood within a complex of socio-technical factors and therefore, even when EJ is not present or defined, justice concerns may still be present in one way or the other. Some documents that we reviewed, such as Brazil’s “Diretrizes para uma estratégia nacional para neutralidade climática” (Developing a national strategy for climate neutrality) and “Plano Decenal de Expansão de Energia” (Ten-Year Energy Expansion Plan) were too heavily focused on planning to be directly relevant to our study of energy planning and energy justice, so they were omitted from further review. Others, such as “Energia 2050: Política Energética de Chile” (Ministerio [46]) seemed to be outdated compared to more recent energy and climate policy documents. To maintain a somewhat balanced data set, we decided to limit our analysis to four documents from each country including each of their most recent Nationally Determined Contributions (Table 1).

The initial coding process was performed with Atlas.Ti software by the first two authors during online synchronous meetings over eight months. During this phase, we became familiar with the data and began to identify concepts that could directly relate to EJ, such as “fairness,” “equity,” and “equality.” Each document was then thoroughly reviewed

by each coder, and we each began to create a list of codes regarding potentially relevant social dimensions such as energy poverty, access, gender equality, sustainable development, citizenship, and Indigenous rights. We thoroughly coded and debated broader themes to help refine the codes and potential themes to answer our first research question related to the definitions and dominant framing of EJ. For example, during this process, we debated whether codes such as “citizenship” and “public participation” required distinct codes or if they could be merged and, if merged, how they might be defined based on the primary data. This iterative coding process involved revisiting the coded data, refining categories, and introducing finer-grained codes to capture the complexities and nuances in the framing of EJ.

When we settled on a manageable group of themes, we began to further analyze how they answered our second research question regarding the relative position of energy justice and other social dimensions. This was a qualitative process that required debating and combining the inductive themes pulled directly from the data. At this stage, we turned back to existing energy justice literature, particularly the eight principles for making just energy decisions [56]. The process of inductively extracting the definitions and dimensions from the data and then comparing these original findings with previous frameworks helped assure that our initial results were not overly influenced by the search for dimensions that may or may not exist in these texts. Finally, we performed a code co-occurrence analysis to explore relationships between social dimensions and identify patterns of association between energy justice concepts. This comparative analysis across the three countries’ documents revealed both commonalities and differences in how EJ is presented and prioritized in different national contexts.

3. Results

In line with the proposal for a more contextualized consideration of EJ both as a research strategy and as a transformative tool within the energy transition, this section summarizes the recent trajectories of the

three countries selected as cases for this study.

3.1. Argentina

In recent years, Argentina's energy landscape has been characterized by a reliance on natural gas, a primary energy source, overshadowing the marginal role of coal. Efforts to exploit the Vaca Muerta shale formation, one of the world's largest oil and gas reserves, have been a key focus of various Argentine administrations. The Argentine power sector also benefits from significant capacity of hydropower and nuclear energy [28]. However, since 2015, there has been a strong emphasis on developing renewable energy sources, particularly wind and solar power [8]. Argentina's vast reserves of critical minerals like copper and lithium also position it as a crucial player in batteries and renewable energy. The dual reliance on traditional and green energy sources has led to the term "energy diversification" being applied to Argentina, similar to Brazil [36]. However, Argentina faces significant challenges. The country has struggled with finding a transition model that enhances local productive and technological capacities (Serrani & Barrera, 2023). Furthermore, socio-economic disparities pose challenges in ensuring equitable access to clean energy, with roughly a fifth of the population experiencing energy poverty [36]. Finally, since the election of climate-denier Javier Milei [38], Argentina's energy sector has forecast major capital inflows into the energy and mining sectors. Meanwhile, energy poverty remains a significant challenge for the current administration which will likely take any measures necessary to lowering energy prices in the short term at the expense of planning for renewable energy deployment and related decarbonization goals [47].

For the purposes of this review, we can note that EJ is cited in each of the four cited documents selected for Argentina. In Argentina Energy Transition 2050 (2019), EJ is framed around job transformation and adaptation. Another main concern for justice in Argentina's planning is the principle of common but differentiated responsibilities, which links to the more globally accepted definitions of EJ found in the Argentina NDC (2022); Argentina 2050 Emissions Strategy (2022). This is also reflected in the call for more open cooperation and stronger accountability of developed nations (Argentina Energy Transition 2030, 2021).

3.2. Chile

Since 2016, with the first version of "Energía 2050: Política Energética de Chile" which included a special focus on "energy equity" (Ministerio [46]), Chile has emerged as a regional leader in renewable energy, driven by clear energy policies and favorable natural conditions [30]. The country's vast solar potential and considerable wind resources have been harnessed to reduce its dependence on imported fossil fuels. As part of the Lithium Triangle with Bolivia and Argentina, Chile holds some of the world's largest lithium reserves, critical for global electrification. Additionally, copper mining remains a key industry [16]. Despite these advancements, Chile faces challenges such as grid infrastructure limitations due to the ongoing phase out of coal power plants [12] and the need for technological innovation to integrate variable renewable energy sources effectively. Social acceptance of large-scale renewable projects can also be contentious, particularly concerning impacts on local communities [27]. Addressing these issues is crucial for Chile to maintain its leadership in renewable energy and ensure a just and equitable transition.

Chile's Climate Policy 2050 (2021) and Just Transition Strategy (2021) position Chile as a leader in Latin America regarding energy justice by linking inclusive development with specific themes: women, Indigenous people, and differently abled populations. Both documents outline how diverse groups are incorporated into planning through fair participation and access to benefits of energy projects related to their lands, territories, or resources. Similarly, the updated Energy Transition Policy (2022) reinforces Chile's commitment to climate action commitment to achieving 70 % of its electricity from renewable sources

by 2050 while improving quality of life through equitable access to energy. Finally, Chile's Nationally Determined Contribution (NDC) also emphasizes a just transition that addresses the specific needs of vulnerable communities and promotes active citizen participation in policy design and implementation. It contains a section on the Social Pillar, which connects social factors in Chile to the Sustainable Development Goals.

3.3. Brazil

Brazil's energy planning has traditionally focused on leveraging its vast renewable energy potential, particularly through hydropower, wind, and biomass. The country is a global leader in hydropower and has significantly expanded its wind and solar capacity in recent years. The bioethanol sector is also a major player, with Brazil ranking second worldwide in production [29]. Additionally, Brazil possesses important rare earth reserves. Brazilian administrations have a long history of energy planning, issuing various documents to manage the transition towards more sustainable and just energy systems (Brazil Climate Adaptation Plan, 2016; Brazil Energy Plan 2050, 2020), in alignment with international commitments (Brazil NDC, 2020; Brazil Energy and Well-Being, 2022). However, Brazil faces several challenges. Its heavy reliance on hydropower makes the energy system vulnerable to droughts, which have become more frequent and severe. Furthermore, the discovery of vast hydrocarbons in the offshore Pre-Salt formation has led to increased oil exploitation, highlighting the ambivalence of Brazil's energy strategy [29]. The past years have shown fluctuations in energy policy. The Bolsonaro administration sought to advance a liberalization program in the sector and succeeded in privatizing Latin America's largest electricity company, Eletrobras, although progress with Petrobras was more limited. The current Lula administration, in turn, has resumed the ambition of positioning Brazil as a global player in sustainable energy [44]. In contrast to Argentina, Brazilian focus has returned to an environmental focus calling for emission neutrality and sustainable economic development.

For a sustainable socio-energy transition, Brazil must address vulnerabilities of individuals and communities impacted by large infrastructure projects and ensure the benefits of renewable energy are equitably distributed across its population. Brazil's 2050 Energy Plan forwards considerations of intra-generational and inter-generational justice. Other goals such as competitiveness, economic efficiency, and supply security are also noted. Brazil's Energy and Well-Being (2022) is one of the most unique documents analyzed. It establishes indicators that can be used to monitor social aspects of sustainable development. EJ occupies a central role in defining "well-being" and relates to energy poverty and equity (Brazil Energy and Well-Being, 2022). Finally, Brazil's Climate Adaptation Plan also highlights the importance of a just transition by ensuring that adaptation measures promote social inclusion and reduce regional inequalities.

4. Seven social dimensions for energy justice

After our initial coding, we identified 37 distinct codes related to energy justice within the analyzed documents (included in supplementary material). Through extensive review and discussion, we condensed these codes into thirteen key themes: Energy Access, Consumers, Work & Employment, Citizen Participation, Community, Gender, Energy Poverty, Future Generations, Human Rights, Indigenous Peoples, Quality of Life & Well-Being, Vulnerable Populations, and International Cooperation. To create a more focused and manageable framework, we further merged some of these themes into seven primary social dimensions (Fig. 1). Specifically, "Future Generations" and "Quality of Life & Well-Being" were combined into "Sustainability and Well-Being," reflecting their overlapping concerns for long-term impacts and overall societal health. Similarly, "Community" was integrated into "Citizen Participation," highlighting the importance of active involvement at

both individual and community levels.

We excluded “Consumers” and “Work & Employment” from our final analysis. The “Consumers” and “Energy Access” themes were deemed less critical as their aspects were sufficiently covered under “Citizen Participation” and “Energy Poverty.” Similarly, “Work & Employment” was excluded because its core elements were better encapsulated within broader dimensions like “Vulnerable Populations” and “Sustainability and Well-Being.” This refinement allowed us to concentrate on the most salient social dimensions essential for understanding energy justice in diverse national contexts.

4.1. Indigenous peoples

Addressing the historical and ongoing injustices faced by Indigenous communities requires ensuring their active participation in energy policies. Chile’s Climate Policy 2050 clarifies that “Indigenous communities inhabit territories rich in biodiversity and possess ancestral knowledge and practices that contribute to conservation and climate change adaptation.” Similarly, other plans emphasize “facilitating the participation of specially protected groups, such as Indigenous peoples” (Chile Just Transition Strategy). Argentina shows support for “the resilience of Indigenous agriculture,” and their NDC like many of the other countries analyzed, highlights “commitment to local communities and Indigenous peoples, with a gender perspective” (Argentina NDC). Brazil’s documents emphasize “formal guidelines to guide the construction of participatory dialogue with civil society, Indigenous and traditional peoples” and make special mention of the potential exploitation of natural resources in Indigenous lands, to establish forms of compensation and economic participation of these communities (Brazil Energy Plan 2050). Collectively, these policies underscore the importance of respecting Indigenous rights, incorporating their knowledge, and ensuring their active participation in the energy transition, thus

promoting resilience within these communities.

4.2. Vulnerable populations

Ensuring equitable access to energy for vulnerable populations is a core objective of energy transitions that “leave no one behind.” All three countries’ documents include numerous links between their energy plans and “the needs of the most vulnerable communities” (Brazil Energy Plan 2050). This vulnerability to exclusion is countered by efforts for diversity and *inclusion*, both socially and economically, such as a “fair distribution of benefits for vulnerable sectors” including those who work in fossil fuel extraction activities or coal and gas-fired power plants (Chile Climate Policy 2050). In Argentina, the goal is to “reduce vulnerabilities by improving institutional capacities and strengthening infrastructure and services” (Argentina 2050 Emissions Strategy).

Each of the country’s documents also shows an awareness of their vulnerabilities to climate-related catastrophes, with Chile mentioning the “ecosystems vulnerable to climate change” (*Chile Just Transition Strategy*). Brazil relates the vulnerability of its “hydrological regimes” and for various energy sectors to “review their vulnerability to such phenomena and ensure that the electrical grid is more resilient” (Brazil Energy Plan 2050).

4.3. Energy poverty

Addressing energy poverty is a critical aspect of energy justice. In the documents from the three countries studied, energy poverty is often linked to vulnerability. Brazil’s documents explain that “energy poverty and energy vulnerability are interconnected concepts, although vulnerability refers to a potential situation and poverty to an established one” (Brazil Energy and Well-Being).

In Brazil, energy poverty is primarily characterized by the lack of

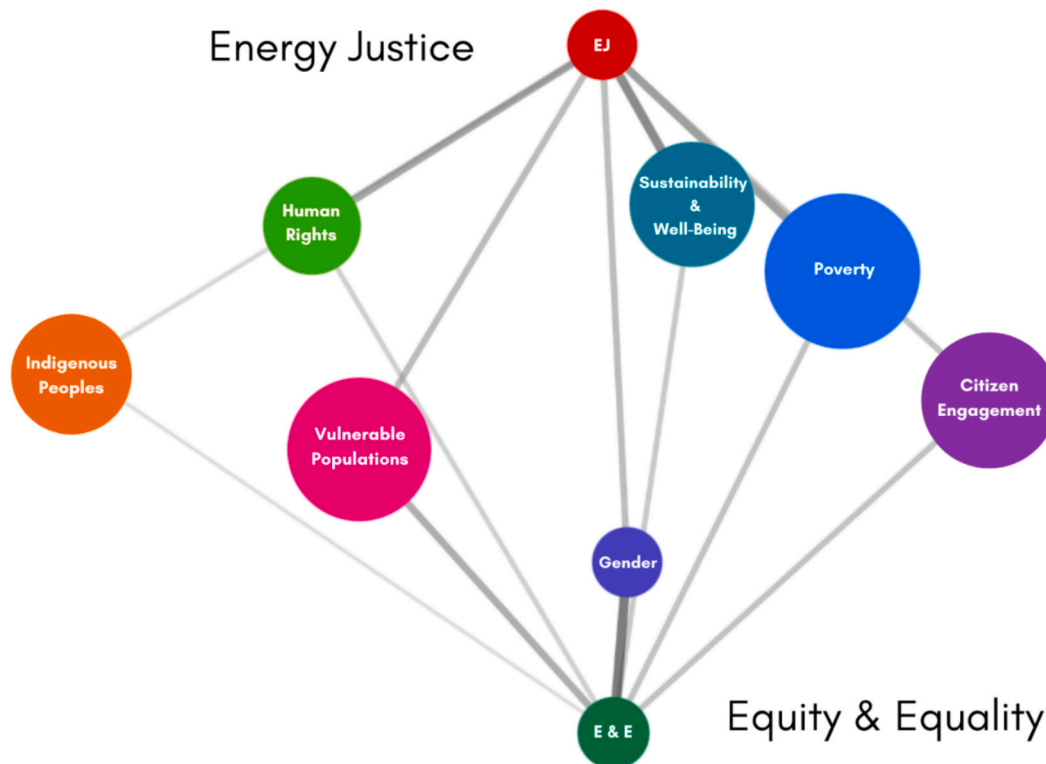


Fig. 1. Showing the code co-occurrence between the concepts between the poles of Energy Justice and Equity and Equality. As indicated by the thicker lines, “Sustainability & Well Being” concepts appear more closely aligned with EJ than Equity & Equality. One explanation is that sustainable development is often used to frame the process of a “just” transition. Meanwhile, the concepts of Indigenous Peoples were more closely aligned with Human Rights and Citizen Engagement more directly correlated with mentions of Poverty.

access to electricity, which hinders progress and affects numerous development indicators such as health, education, food security, gender equity, and poverty reduction. Chile has made great strides in addressing poverty in the twenty-first century, and the NDC suggests that “the percentage of the population in poverty is under 10%” although the “supplementary figure for multidimensional poverty stands at 20.7%” (Chile NDC). Chile also links environmental efforts directly to poverty eradication, suggesting that planting new forests will contribute to soil protection, water regulation, timber production, reduced fire and flood risks, biodiversity conservation, community development, and “reduction of poverty.” Finally, Argentina adopts a more hopeful approach to eradicating energy poverty, explaining the path to carbon neutrality must be “compatible with human development needs, social inclusion, and the eradication of poverty” (Argentina 2050 Emissions Strategy) and sharing a vision of 2050 in which “The country has eliminated energy poverty, defined according to international standards” (Argentina Energy Transition 2050).

4.4. Human rights

Integrating human rights principles into energy and climate strategies ensures that policies promote equity, inclusivity, and social justice. In their NDCs, all three countries cite some form of international agreements on human rights such as the Universal Declaration of Human Rights of 1948. Chile has one of the clearest statements of how human rights fit into their energy transition strategy, explaining that their “intercultural approach” helps to “enable an energy transition based on people’s trust”: “The energy transition must be sustainable, resilient, efficient, accessible, inclusive, and respectful of human rights and the diversity of cultures in the territory” (Chile Energy Transition Policy). Brazil’s climate policies reflect constitutional guarantees and international commitments to protect Indigenous and tribal peoples’ rights. Furthermore, the “Adaptation to climate change must ensure social participation and respect for human rights” (Brazil Climate Adaptation Plan). These frameworks highlight the importance of protecting and empowering all individuals and communities in the pursuit of a just energy transition.

4.5. Gender equity

Promoting gender equity in energy planning is a process of making decision-making more diverse and ensuring that all citizens benefit equally from sustainable energy transitions. The NDCs are explicit in implementing “a fair allocation of charges, costs, and benefits, with a focus on gender.” Efforts to create gender balance in the planning process are also apparent. The Argentina Energy Transition 2050 document (2019) also notes addressing the “asymmetry in the participation of women” in their advisory council and outlines a plan to rectify this imbalance. Brazil’s energy planning emphasizes the importance of gender equity, with the NDC relating to the constitutional establishment of “ample rights and guarantees for all Brazilian citizens, paying due attention to the special needs of women and Indigenous peoples (2020).” The Brazil Climate Adaptation Plan (2016) also underlines the need for the “application of gender-sensitive and racial and ethnic criteria,” recognizing that “women, due to the nature of some of their tasks and the multiple work shifts, can be the most affected” by the impacts of climate change. Chile’s Energy Transition Policy similarly emphasizes that “inclusivity will also require decisively advancing the promotion of gender equity in all areas of energy development, especially contributing to reducing the gaps in the inclusion of women in the sector” (2022). These policies are essential for creating an inclusive energy transition that empowers women and ensures gender equity in all aspects of energy policy and practice.

4.6. Citizen participation

Empowering citizens to actively engage in climate and energy decision-making processes is crucial for promoting transparent and accountable governance. Chile’s Just Transition Strategy emphasizes this by highlighting the need to engage local communities in energy projects: “Adaptation to climate change must ensure social participation and respect for human rights” (2021). Similarly, Argentina’s 2050 Emissions Strategy calls for the “institutionalization of participation, education, and environmental culture as constituent parts of the design and implementation of public climate policy” (2022), ensuring that citizens are informed and actively involved.

However, the Argentina Energy Transition 2030 (2021) document notes that “mere participation in global trading does not guarantee growth with social equity,” and stresses the importance of boosting domestic productive, technological, and innovative capacities. Chile’s 2050 Climate Policy (2021) further advocates for the promotion of citizen participation in all levels of climate change policy, particularly emphasizing the inclusion of vulnerable and underrepresented communities: “Promote citizen participation in the development, updating, and implementation of climate change policies, programs, plans, and actions... with special emphasis on the participation of communities most vulnerable to its effects and underrepresented groups, applying an intergenerational approach.” Corresponding initiatives such as the “Acción por el Empoderamiento Climático” (ACE)” aim to empower Chilean citizens and make them protagonists of climate action.

4.7. Sustainability and well-being

Combining quality of life, human rights, and future generations, sustainability and well-being emphasize the importance of just energy transitions. We chose to focus less on “sustainable development” and the Sustainable Development Goals and more on distinct ways the possibilities of living sustainable lifestyles would improve the well-being of current and future generations (i.e., “intergenerational justice”). This approach prioritizes equitable treatment across generations, ensuring that actions taken today do not compromise the needs of tomorrow. Similarly, Chile’s NDC underscores this principle by advocating for “development that meets the needs of the present without compromising the ability of future generations to meet their own needs, and balances social, economic, and environmental interests (2020).” This balanced approach is crucial for maintaining a sustainable trajectory that supports both current and future populations. Argentina’s Emissions Strategy 2050 reinforces the “resilience of different social, economic, and environmental sectors through measures that integrate and prioritize vulnerable communities and social groups, incorporating gender and intergenerational equity perspectives” (2022). Sustainability efforts are inclusive and equitable, addressing the needs of the present population while considering long-term impacts. Brazil’s 2050 Energy Plan recognizes the transformative potential of new technologies for well-being: “In the coming decades, disruptive technologies such as electrification and vehicle automation, new mobility services, telecommunications advances, and storage technologies have the potential to transform not only how people move but also the quality of life of citizens” (2020) and the Chilean Energy Transition Policy (2022) shows the importance of balancing “well-being of society as a whole” with the new paradigm of multi-dimensional development” which includes “international integration of energy trade.”

5. Discussion and conclusion

Global discourse on ‘just’ transitions often homogenizes energy justice concepts, failing to address the specific needs of diverse regions, particularly in the Global South. The current study adds to research on the sometimes-contradictory nature of EJ interventions in South America by providing a comparative study of ways justice frameworks

and other social dimensions are adopted in the planning documents of three countries. Our results show some of the rhetorical tensions and action gaps encountered by planners and policymakers when constructing energy plans and climate policy within distinct geographical and sociopolitical contexts.

The performance and delivery of these various energy planning documents cannot be understood without also examining the sociopolitical opportunities and challenges that each country faces. Argentina and Chile, located within the Lithium Triangle, have immense opportunities in the energy transition; however, economic and political uncertainty coupled with human rights concerns surrounding the mining of copper and other minerals pose distinct challenges for reconciling energy plans and energy justice. Brazil's existing hydroelectric resources and expanding economy present significant energy transition opportunities. Ensuring equitable energy access and achieving distributional justice remains a significant challenge. Indeed, our analysis corresponds with other recent claims about Brazil's "critical weaknesses" in energy planning and energy justice [7]. Brazil will be hosting the Clean Energy Ministerial in 2024 and the United Nations COP30 meeting in 2025, and this international spotlight may inspire clarification and further commitments to merge their energy transition with energy justice.

Regarding the dimension of justice for Indigenous peoples, the general acknowledgement and "support" of these groups in the various documents seems to be contradicted by the dispossession of ecosystems and other natural resources. The tension found within incorporating Indigenous groups into state energy planning can also be identified along gendered lines and among the incorporations of vulnerable populations as well. This discrepancy highlights the gap between the frequent use of terms like "participation" in state energy planning documents and the actual meaningful involvement of communities. This performative inclusion of marginalized groups in planning documents without substantive changes to extractive practices represents a disconnect between stated principles and actual practices. This disconnect resembles what scholars have termed "ethics washing," or the performance of "ethical considerations" without "substantive ethical theory, argument, or application is in place or ethicists involved" [54]. This approach creates an illusion of ethical consideration while fundamental power imbalances persist. In what we might call "EJ washing" social justice language serves to legitimize continued resource exploitation. One can hope that the documents' symbolic acknowledgment of marginalized peoples will eventually translate into meaningful decision-making power or veto rights over projects directly affecting their livelihoods and territories and thereby help de-colonize power structures through true participatory planning.

Another core rhetorical tension can be found in state energy planning documents that involve shifting towards renewable energy sources. Argentina's "2050 Emissions Strategy" (2022), notes that sustainable energy development can help achieve the agenda laid out in its 2030 Energy Transition plan, yet its continued reliance on natural gas and efforts to exploit the Vaca Muerta shale formation illustrates a reality that is at odds with this document. Similarly, Brazil's Energy Plan 2050 (2020) expresses a need for intra- and intergenerational justice, yet the pursuit of offshore oil in the Pre-Salt formation threatens both a transition towards greater usage of renewables and the overall well-being of future generations. Chile's energy plans help convey shifting towards more renewable energy sources and doing so in a way that does not compromise local communities or Indigenous peoples, but the country's challenge of garnering social acceptance towards large-scale renewable projects could threaten this dimension. The contradictions between stated commitments to justice and simultaneous expansion of fossil fuel infrastructure expose how these documents may serve to legitimize business-as-usual approaches that favor short-term economic interests over substantive social and environmental justice concerns.

The rhetoric-reality gap in South American energy planning points to a deep issue raised by Yanez and Moreno, who argue that transforming energy systems in the Global South requires fundamentally rethinking

the temporal frameworks that govern transition planning [63]. They suggest the need to "descarbonizar nuestro lenguaje y desterrar al CO₂ como referente central de nuestro discurso" (decarbonize our language and banish CO₂ as the central reference in our discourse) and, instead of a transition towards net zero we might adopt Indigenous perspectives such as the Ecuadorian Kichwa concept of *tukuna* ("to transform and convert oneself") and challenge linear, future-oriented transition models in favor of more cyclical approaches that approach the future from the lens of history and heritage ("andar con el pasado delante") ([63], p. 131).

Finally, these documents belie certain geopolitical tensions and the strategic pursuit of resources. When countries prioritize economic growth while merely deploying justice rhetoric, energy planning—including both policy documents and the technical tools used to implement them—risks becoming political instruments instead of genuine frameworks for equitable energy transitions. There is a strategic asymmetry between these three countries, their material-rich geographies and energy justice discourse. In other words, these nation-states may, like many of the Global North, tailor their EJ rhetoric to protect economic interests in extractive regions while simultaneously positioning themselves as climate leaders on the global stage—a phenomenon particularly evident in places where the material foundations of the global energy transition often directly conflict with local conceptions of territorial rights and environmental justice.

This study has contributed to the literature on energy justice and energy planning in South America through an analysis of key climate and energy documents. One limitation was the relatively small sample size of three countries used in the analysis. An in-depth reading of four documents from these countries may not be indicative of the broader trends in energy planning across South America or the Global South. Future research could focus on different regional and national contexts to help generate a better understanding of the multiple ways that energy justice is conceptualized and enacted from planning to policy to politics. The select number of social dimensions was another limitation of this study. Future research could review additional social dimensions, such as energy justice and its relation to social class, specific demographics, or how energy justice may be enacted in both urban and rural settings.

Coordinating energy justice according to international guidelines and normative frameworks seems desirable, yet energy justice and national planning documents also need to be formulated with a given country's specific socio-political circumstances. In an increasingly interconnected and complex system, states must be able to frame energy justice according to their plans and priorities whilst coordinating and cooperating to enact aggressive and transparent energy transitions. In our interconnected world, the boundaries between international and domestic concerns have blurred. Energy has become a strategic asset where national interests and security considerations frequently take precedence over fair decarbonization goals.

CRedit authorship contribution statement

Daniel Lewis Wuebben: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Project administration, Methodology, Formal analysis, Data curation, Conceptualization. **Duilio Lorenzo Calcagno:** Writing – review & editing, Writing – original draft, Investigation, Formal analysis, Data curation, Conceptualization. **Maclane Henry:** Writing – review & editing, Writing – original draft, Formal analysis.

Declaration of competing interest

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

Acknowledgements

The authors extend heartfelt thanks to the special issue editors and the anonymous reviewers—the unsung heroes and quiet cartographers of rigor and style—whose thoughtful feedback helped guide this work to its final form. The article is part of a broader project CARE COMM (Climate Action and Renewable Energy Communication) sponsored by the Universidad Pontificia Comillas.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.apenergy.2025.126041>.

Data availability

Data will be made available on request.

References

- Akpahou R, Mensah LD, Quansah DA, Kemausuor F. Energy planning and modeling tools for sustainable development: A systematic literature review. *Energy Rep* 2024;11:830–45. <https://doi.org/10.1016/j.egyr.2023.11.043>.
- Alarcón P. Old and new challenges of the energy transition: insights from South America. *South African J Int Affairs* 2023;30(2):263–78. <https://doi.org/10.1080/10220461.2023.2221227>.
- Alvial-Palavicino C, Ureta S. Economizing justice: turning equity claims into lower energy tariffs in Chile. *Energy Policy* 2017;105:642–7. <https://doi.org/10.1016/j.enpol.2017.02.013>.
- Apergi M, Eicke L, Goldthau A, Hashem M, Huneeus S, Lima de Oliveira R, et al. An energy justice index for the energy transition in the global south. *Renew Sustain Energy Rev* 2024;192:114238. <https://doi.org/10.1016/j.rser.2023.114238>.
- Araya P, Sannazzaro J. Entanglements of energy justice and dignity in Latin America. Weaving a gender perspective into the right to energy. In: Lazaro LLB, Neiva SDA, Serrani E, editors. *Energy poverty, justice and gender in Latin America*. Springer; 2024. p. 227–40. https://doi.org/10.1007/978-3-031-80068-9_10.
- Avila S, Deniau Y, Sorman AH, McCarthy J. (counter)mapping renewables: space, justice, and politics of wind and solar power in Mexico. *Env Plan E: Nat Space* 2022;5(3):1056–85. <https://doi.org/10.1177/25148486211060657>.
- Azevedo Dos Santos A, Pereira Medeiros R, Megrè M, Peyrel D. Democracy and Energy Justice: A Look at the Brazilian Electricity Sector. In: Peyrel D, Relva S, Da Silva V, editors. *Energy Transition in Brazil. The Latin American Studies Book Series*; 2023. p. 57–73. https://doi.org/10.1007/978-3-031-21033-4_4.
- Canafoglia EC. Techno-productive experiences for climate action in Argentina: insights from renewable energy projects. *NPJ Clim Action* 2024;3(51). <https://doi.org/10.1038/s44168-024-00134-0>.
- Castán Broto V, Baptista I, Kirshner J, Smith S, Neves Alves S. Energy justice and sustainability transitions in Mozambique. *Appl Energy* 2018;228:645–55. <https://doi.org/10.1016/j.apenergy.2018.06.057>.
- Cloke J, Mohr A, Brown E. Imagining renewable energy: towards a social energy systems approach to community renewable energy projects in the global south. *Energy Res Soc Sci* 2017;31:263–72. <https://doi.org/10.1016/j.erss.2017.06.023>.
- Dunlap A, Tornel C. Pluralizing energy justice? Towards cultivating an unruly, autonomous and insurrectionary research agenda. *Energy Res Soc Sci* 2023;103:103217. <https://doi.org/10.1016/j.erss.2023.103217>.
- Feng K, Song K, Viteri A, Liu Y, Vogt-Schilb A. Kammen DM. A bibliometric review of energy justice literature. *Front Sustain Energy Policy* 2023;2:1175736. <https://doi.org/10.3389/fsep.2023.1175736>.
- Ferreira P, Araújo M, O'Kelly MEJ. The Integration of Social Concerns into Electricity Power Planning: A Combined Delphi and AHP Approach. 2010. https://doi.org/10.1007/978-3-642-02493-1_15.
- Fischer A, Joosse S, Strandell J, Söderberg N, Johansson K, Boonstra WJ. How justice shapes transition governance – a discourse analysis of Swedish policy debates. *J Env Plan Manage* 2024;67(9):1998–2016. <https://doi.org/10.1080/09640568.2023.2177842>.
- Flores-Fernández C. The Chilean energy “transition”: between successful policy and the assimilation of a post-political energy condition. *Innovation: Euro J Soc Sci Res* 2020;33(2):173–93. <https://doi.org/10.1080/13511610.2020.1749836>.
- Frate CA, Brannstrom C, de Moraes MVG, Caldeira-Pires ADeA. Procedural and distributive justice inform subjectivity regarding wind power: A case from Rio Grande do Norte, Brazil. *Energy Policy* 2019;132:185–95. <https://doi.org/10.1016/j.enpol.2019.05.027>.
- Gonzalez A. What justice and for whom? A political ecology of voice study into ‘senses of justice’ in Peru’s Loreto region. *Env Plan E: Nat Space* 2022;5(1):473–504. <https://doi.org/10.1177/2514848621989612>.
- González ABP, Yunesky MM, Ferreira LDaC, Valdes J. Socio-Ecological Controversies from Chilean and Brazilian Sustainable Energy Transitions. 2023. <https://doi.org/10.3390/su15031861>.
- Healy N, Stephens JC, Malin SA. Embodied energy injustices: unveiling and politicizing the transboundary harms of fossil fuel extractivism and fossil fuel supply chains. *Energy Res Soc Sci* 2019;48:219–34. <https://doi.org/10.1016/j.erss.2018.09.016>.
- Heffron RJ. Applying energy justice into the energy transition. *Renew Sustain Energy Rev* 2022;156:111936. <https://doi.org/10.1016/j.rser.2021.111936>.
- Heffron RJ. Energy justice – the triumvirate of tenets revisited and revised. *J Energy & Nat Res Law* 2024;42(2):227–33. <https://doi.org/10.1080/02646811.2023.2256593>.
- Heffron RJ, McCauley D. The ‘just transition’ threat to our energy and climate 2030 targets. *Energy Policy* 2022;165:112949. <https://doi.org/10.1016/j.enpol.2022.112949>.
- Heffron RJ, McCauley D, Sovacool BK. Resolving society’s energy trilemma through the energy justice metric. *Energy Policy* 2015;87:168–76. <https://doi.org/10.1016/j.enpol.2015.08.033>.
- Heleno M, Sigrin B, Popovich N, Heeter J, Jain Figueroa A, Reiner M, et al. Optimizing equity in energy policy interventions: A quantitative decision-support framework for energy justice. *Appl Energy* 2022;325:119771. <https://doi.org/10.1016/j.apenergy.2022.119771>.
- Hermwille L, Schulze-Steinen M, Brandemann V, Roelfes M, Vrontisi Z, Keskiä E, et al. Of hopeful narratives and historical injustices – an analysis of just transition narratives in European coal regions. *Energy Res Soc Sci* 2023;104:103263. <https://doi.org/10.1016/j.erss.2023.103263>.
- Hernando-Arrese M, Rasch ED. The micropolitical life of energy projects: A collaborative exploration of injustice and resistance to small hydropower projects in the Wallmapu, southern Chile. *Energy Res Soc Sci* 2022;83:102332. <https://doi.org/10.1016/j.erss.2021.102332>.
- IEA. Argentina: Countries & Regions. <https://www.iea.org/countries/argentina;2024>.
- IEA. Brazil: Countries & Regions. <https://www.iea.org/countries/brazil;2024>.
- IEA. Chile: Countries & Regions. <https://www.iea.org/countries/chile;2024>.
- Iwińska K, Lis A, Mączka K. From framework to boundary object? Reviewing gaps and critical trends in global energy justice research. *Energy Res Soc Sci* 2021;79:102191. <https://doi.org/10.1016/j.erss.2021.102191>.
- Jenkins KEH, Sovacool BK, Mouter N, Hacking N, Burns MK, McCauley D. The methodologies, geographies, and technologies of energy justice: a systematic and comprehensive review. *Environ Res Lett* 2021;16(4):043009. <https://doi.org/10.1088/1748-9326/ABD78C>.
- Kang JN, Wei YM, Liu LC, Han R, Yu BY, Wang JW. Energy systems for climate change mitigation: A systematic review. *Appl Energy* 2020;263:114602. <https://doi.org/10.1016/j.apenergy.2020.114602>.
- Lacey-Barnacle M, Bird CM. Intermediating energy justice? The role of intermediaries in the civic energy sector in a time of austerity. *Appl Energy* 2018;226:71–81. <https://doi.org/10.1016/j.apenergy.2018.05.088>.
- Lacey-Barnacle M, Robison R, Foulds C. Energy justice in the developing world: A review of theoretical frameworks, key research themes and policy implications. 2020. <https://doi.org/10.1016/j.esd.2020.01.010>.
- Lampis A, Ibañez Martín MM, Zabaloy MF, Schirmer Soares R, Guzowski C, Mandai SS, et al. Energy transition or energy diversification? Critical thoughts from Argentina and Brazil. *Energy Policy* 2022;171:113246. <https://doi.org/10.1016/j.enpol.2022.113246>.
- Lang M, Bringel B, Manahan M. Introducción: Transiciones lucrativas, colonialismo verde y caminos hacia una justicia ecosocial transformadora. In: Lang M, Bringel B, Manahan M, editors. *Más allá del colonialismo verde: Justicia global y geopolítica de las transiciones ecosociales*. CLACSO; 2024. p. 15–48.
- Lorca J. Milei retira a la delegación argentina de la cumbre del clima COP29. El País. <https://elpais.com/argentina/2024-11-13/milei-retira-a-la-delegacion-argentina-de-la-cumbre-del-clima-cop29.html>; 2024, November 13.
- Manifiesto de los Pueblos del Sur-Por una Transición Energética Justa y Popular Un llamamiento a líderes, instituciones y nuestros hermanos y hermanas. <https://paetoecosocialdelsur.com/manifiesto-de-los-pueblos-del-sur-por-una-transicion-energetica-justa-y-popular-2/>; 2023.
- McCauley D, Heffron R. Just transition: integrating climate, energy and environmental justice. *Energy Policy* 2018;119:1–7. <https://doi.org/10.1016/j.enpol.2018.04.014>.
- McCauley D, Ramasar V, Heffron RJ, Sovacool BK, Mebratu D, Mundaca L. Energy justice in the transition to low carbon energy systems: exploring key themes in interdisciplinary research. *Appl Energy* 2019;233–234:916–21. <https://doi.org/10.1016/j.apenergy.2018.10.005>.
- Mejía-Montero A, Jenkins KEH, van der Horst D, Lane M. An intersectional approach to energy justice: individual and collective concerns around wind power on Zapotec land. *Energy Res Soc Sci* 2023;98:103015. <https://doi.org/10.1016/j.erss.2023.103015>.
- Mejía-Montero A, Lane M, van der Horst D, Jenkins KEH. Grounding the energy justice lifecycle framework: an exploration of utility-scale wind power in Oaxaca, Mexico. *Energy Res & Soc Sci* 2021;75:102017. <https://doi.org/10.1016/j.erss.2021.102017>.
- Melo dos Santos ME, Nem Singh J, Castro R, Santos H, Costa HK De M, Dos Santos EM. SWOT analysis of Brazilian energy policy: A comparative panel data analysis of the twenty largest economies. *Energy Policy* 2024;191:114172. <https://doi.org/10.1016/j.enpol.2024.114172>.

- [45] Mengolini A, Masera M, Farahani S, Lukszo Z, Weijnen M. EU energy policy: A socio-energy perspective for an inclusive energy transition. In: *Shaping an inclusive energy transition*; 2021. p. 141–61.
- [46] de Energía Ministerio. Energía 2050: Política Energética de Chile. 2016. <https://www.cne.cl/wp-content/uploads/2016/01/LIBRO-ENERGIA-2050.pdf>.
- [47] Nori J, Valenzuela AEJ, Camino M, Abraham E, Agostini G, Aizen MA, et al. Argentina's rejection of 2030 agenda undermines environmental sustainability and human well-being. *Biol Conserv* 2024;299:110832. <https://doi.org/10.1016/J.BIOCON.2024.110832>.
- [48] Patorniti NP, Stevens NJ, Salmon PM. A systems approach to city design: exploring the compatibility of sociotechnical systems. *Habitat Int* 2017;66:42–8. <https://doi.org/10.1016/J.HABITATINT.2017.05.008>.
- [49] Phillips N, Hardy C. *Discourse analysis: Investing processes of social construction*. Sage Publications; 2002.
- [50] Prasad RD, Bansal RC, Raturi A. Multi-faceted energy planning: A review. *Renew Sustain Energy Rev* 2014;38:686–99. <https://doi.org/10.1016/J.RSER.2014.07.021>.
- [51] Pregger T, Naegler T, Weimer-Jehle W, Prehofer S, Hauser W. Moving towards socio-technical scenarios of the German energy transition—lessons learned from integrated energy scenario building. *Clim Change* 2020;162(4):1743–62. <https://doi.org/10.1007/S10584-019-02598-0/FIGURES/4>.
- [52] Ribeiro F, Ferreira P, Araújo M. The inclusion of social aspects in power planning. *Renew Sustain Energy Rev* 2011;15(9):4361–9. <https://doi.org/10.1016/J.RSER.2011.07.114>.
- [53] Roddis P, Carver S, Dallimer M, Norman P, Ziv G. The role of community acceptance in planning outcomes for onshore wind and solar farms: an energy justice analysis. *Appl Energy* 2018;226. <https://doi.org/10.1016/j.apenergy.2018.05.087>.
- [54] Schultz MD, Conti LG, Seele P. Digital ethicswashing: a systematic review and a process-perception-outcome framework. *AI Ethics* 2024. <https://doi.org/10.1007/s43681-024-00430-9>.
- [55] Sovacool BK, Bell SE, Daggett C, Labuski C, Lennon M, Naylor L, et al. Pluralizing energy justice: incorporating feminist, anti-racist, indigenous, and postcolonial perspectives. *Energy Res Soc Sci* 2023;97:102996. <https://doi.org/10.1016/J.ERSS.2023.102996>.
- [56] Sovacool BK, Dworkin MH. Energy justice: conceptual insights and practical applications. *Appl Energy* 2015;142:435–44. <https://doi.org/10.1016/J.APENERGY.2015.01.002>.
- [57] Sovacool BK, Heffron RJ, McCauley D, Goldthau A. Energy decisions reframed as justice and ethical concerns. *Nat Energy* 2016 1:5 2016;1(5):1–6. <https://doi.org/10.1038/nenergy.2016.24>.
- [58] Temper L, Avila S, Bene D, Gobby J, Kosoy N, Billon P, et al. Movements shaping climate futures: A systematic mapping of protests against fossil fuel and low-carbon energy projects. *Environ Res Lett* 2020;15(12):123004. <https://doi.org/10.1088/1748-9326/ABC197>.
- [59] Tornel C. Integrating social and justice dimensions to energy transitions: the case of Mexico. *Reg Policy Latin Am Energy Trans* 2020:283–301. <https://doi.org/10.1016/B978-0-12-819521-5.00016-4>.
- [60] Viviana M, Castillo OL. Colombian energy planning - neither for energy, nor for Colombia. *Energy Policy* 2019;129:1132–42. <https://doi.org/10.1016/J.ENPOL.2019.03.025>.
- [61] von Malmberg F. Combining the advocacy coalition framework and argumentative discourse analysis: the case of the “energy efficiency first” principle in EU energy and climate policy. *Politics Policy* 2023;51(2):222–41. <https://doi.org/10.1111/POLP.12525>.
- [62] Wang X, Lo K. Just transition: A conceptual review. *Energy Res Soc Sci* 2021;82: 102291. <https://doi.org/10.1016/J.ERSS.2021.102291>.
- [63] Yanez I, Moreno C. Acumulación y desposesión por descarbonización. In: Lang M, Bringel B, Manahan MA, editors. *Más allá del colonialismo verde: Justicia global y geopolítica de las transiciones ecosociales*. CLACSO; 2024. p. 121–37.
- [64] Zapletalová V, Komínková M. Who is fighting against the EU'S energy and climate policy in the European Parliament? The contribution of the Visegrad group. *Energy Policy* 2020;139:111326. <https://doi.org/10.1016/J.ENPOL.2020.111326>.