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The Spanish Experience with National Government-Led Plans for a Just Energy Transition

La experiencia española con los planes de transición energética justa impulsados por el gobierno nacional

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ABSTRACT

Just energy transitions are one of the main goals in political agendas worldwide, as governments assume the responsibility to lead the process in the presence of global public goods and social asymmetries. This paper suggests studying the Spanish case, in which the national Government leads through specific organisms, laws, and tools. The main tool to accomplish the public intervention aimed at mobilising local resources and motivating investments is the Agreement of Just Transition or CTJ. Notwithstanding, CTJs present limitations that this paper classifies into three categories: concept and design, diagnosis, and participative processes. There is a prevalent emphasis on quantifying job risks and labour income, prioritising socioeconomic consequences over the environmental devastation caused by abandoned facilities, neglecting the indirect job losses, and frequently evaluating impacts belatedly. Job quality analysis is also absent in this framework. Additional limitations arise from incorporating gender considerations, barrier criteria, territorial boundaries, and analytical tools like SWOT analysis. The final discussion suggests corrections and warns against similar weaknesses in other potential contexts.

Keywords: Energy transition, social justice, just transition, government initiatives.

RESUMEN

Las transiciones energéticas justas son uno de los principales objetivos en las agendas políticas a nivel mundial, a medida que los gobiernos asumen la responsabilidad de liderar el proceso en presencia de bienes públicos globales y asimetrías sociales. Este trabajo sugiere estudiar el caso español, en el que el Gobierno nacional lidera a través de organismos específicos, leyes y herramientas específicas. La principal herramienta para llevar a cabo la intervención pública destinada a movilizar recursos locales y motivar inversiones es el Acuerdo de Transición Justa o CTJ. Sin embargo, los CTJ presentan limitaciones que este trabajo clasifica en tres categorías: concepto y diseño, diagnóstico y procesos participativos. Existe un énfasis predominante en cuantificar los empleos y las rentas del trabajo, lo que prioriza las consecuencias socioeconómicas sobre la devastación ambiental causada por las instalaciones abandonadas, descuida las pérdidas de empleo indirectas y evalúa con frecuencia los impactos tardíamente. El análisis de la calidad del empleo también está ausente en este marco. Se derivan limitaciones adicionales de la incorporación de consideraciones de

género, criterios de barrera, límites territoriales y herramientas analíticas como el análisis DAFO. La discusión final sugiere correcciones y previene debilidades similares en otros contextos potenciales.

Palabras clave: *Transición energética, justicia social, transición justa, iniciativas gubernamentales.*

I. INTRODUCTION

The idea of a just energy transition is permeating political agendas worldwide to tackle social and environmental deterioration (Green and Gambhir 2020; Abram et al. 2022). Energy transitions have happened at several points in history, motivated by changes in profitability and technology, inter alia (Fouquet 2016). In contrast, the current process is a socially conscious political procedure with time goals (Newell and Mulvaney 2013).

Many diverse stakeholders ought to participate in the process, which can be organised in multiple ways depending on the institutional context. Notwithstanding, a key agent emerges to motivate and lead the transition: the government. Multiple agendas, discourses, and scholarly literature consider that markets cannot be completely trusted to perform a shift in energy sources that involves the management of global public goods and social impacts (Fay et al. 2013). Hence, governments are increasingly assuming the role of enablers.

This paper examines the dynamics characterising Spain's just energy transition, with particular emphasis on the establishment of specialised governmental entities. These initiatives primarily revolve around the quantification of employment within the fossil fuel sector and its ancillary workforce. However, such a focal point overlooks broader issues encompassing environmental deterioration, secondary employment displacements, and historical fluctuations in job markets. Furthermore, there exists a conspicuous absence in the examination of job quality, especially concerning the socio-economic ramifications for workers.

The paucity of data in rural locales underscores the imperative for comprehensive data strategies to effectively inform policy formulation. Despite organisational involvement, the integration of gender equality principles into actionable measures within just transition policies remains deficient. Moreover, the delineation of obstacles and territorial confines in public interventions poses challenges necessitating heightened flexibility and adaptability. Additionally, this paper critiques the limited scope of SWOT analyses, which yield redundant insights, and advocates for a more holistic approach to ensure the comprehensive coverage of factors influencing the transition process.

Given the multiplicity of areas of interest, this contribution uses the case of the province of León to illustrate the happenings with real practical examples. León congregates most of the governmental interventions due to its historical

dependence on coal mining and the thermoelectric production of electricity based on it. The Spanish experience in implementing just energy transition policies, with a particular focus on the case study of León, offers insights for scholars, policymakers, and stakeholders abroad, especially in Latin American countries and other European countries. While the analysis centres on Spain and highlights León as an example, its relevance extends far beyond national borders.

With an increasing number of countries aligning their political frameworks with the principles of just energy transition, those who have already embarked on this journey serve as crucial laboratories, showcasing both successful strategies and pitfalls to avoid. The emulation of successful policies from comparable countries, particularly those facing similar challenges in their electric sectors, holds significant promise. Research indicates that policy emulation is often influenced by both political peers and donor countries. Policy diffusion often occurs through the emulation of effective policies from similar countries (Baldwin et al. 2019). For example, policy diffusion and emulation within the EU are driven by the EU's cohesive regulatory framework, which encourages sharing best practices and successful policy models. This dynamic fosters a collaborative approach to addressing energy challenges, promoting innovation, and achieving collective sustainability targets across the region.

Section 2 presents a contextualisation of the just energy transition and Section 3 revises the main tool to organise the just transition currently in Spain: The Agreement of Just Transition or CTJ. Section 4 indicates the methodology. Sections, 5, 6, and 7 disclose the limitations of the CTJ, concerning their concept and design, diagnosis, and processes of public participation, respectively. Section 8 discusses the limitations and derives lessons that could be applicable in similar contexts. Section 9 gathers the main conclusions.

II. A JUST ENERGY TRANSITION

The concept of a just energy transition emerges at the forefront of contemporary environmental discourse, reflecting the imperative to reconcile socio-economic justice with environmental sustainability. This transition, situated within the broader framework of socio-ecological transformation, encompasses shifts in energy generation, distribution, and use, impacting societies at multiple levels. At its core lies the principle of justice, evolving from its origins in North American union movements to comprehend broader environmental and climate justice concerns (García-García et al. 2020).

The notion of a just energy transition encompasses three key dimensions: distributional, procedural, and recognition justice (McCauley et al. 2013; Finley-Brook and Holloman 2016; Jenkins et al. 2016; Chapman et al. 2018; Williams and Doyon 2019). Distributional justice pertains to how the benefits and drawbacks of energy policies are shared across societies. Procedural justice

emphasises the equitable involvement of all stakeholders in the policymaking process. While justice in energy transitions is often perceived as an outcome, it is equally crucial to recognise it as an ongoing process (Steenbergen and Schipper 2017). Recognition justice focuses on acknowledging and addressing the concerns of marginalised groups impacted by energy transitions. Additionally, emerging perspectives are incorporating the notion of restorative justice, which seeks to rectify injustices suffered by individuals because of the transition (Galvin 2020).

As discussions around just transition gain momentum globally, it becomes imperative to discern between initiatives genuinely contributing to social and ecological liberation and those diluting its promise. The essence of a just transition lies in its people-oriented approach, transcending mere job creation to prioritise the needs of historically marginalised communities. Genuine endeavours prioritise the common good, ensuring equitable distribution of benefits and democratised decision-making processes (Stevis 2018). Furthermore, according to Stevis (2018), ecological justice stands as a paramount consideration, demanding decarbonisation and the mitigation of environmental harm. A holistic approach acknowledges the interconnectedness of social, economic, and environmental systems, fostering systemic transformation (Abram et al. 2020).

The journey towards achieving a net-zero carbon economy, as underscored by the Paris Agreement (2015) and the Silesia Declaration (2018), necessitates a fair and inclusive transition, embodied in the concept of just transition. Integrating just transition principles into nationally determined contributions is essential for aligning climate policies with social justice imperatives. Effective implementation requires tailored interventions informed by robust research and facilitated by social dialogue (Jenkins 2019).

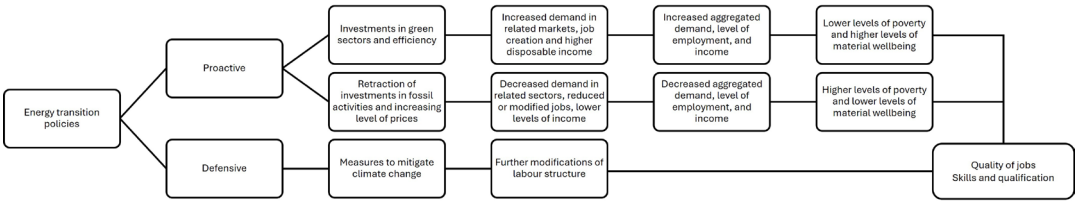
Case studies from various sectors provide nuanced insights into the complexities inherent in transition processes, highlighting the importance of addressing socio-economic upheaval caused by neglecting the needs of affected workers and communities. Labour's role in international climate diplomacy is pivotal, emphasising the potential synergy between just transition principles and ambitious climate action (Morena et al. 2020). Many case studies predominantly feature national examples or broad sub-national instances, accentuating Germany and the US significantly. This trend is prevalent throughout the literature, where these recurring cases dominate the discourse. For example, the Ruhr area's transition has shown collaborative efforts involving the government, municipalities, employers, and trade unions. Visionary leadership and strategic investments laid the groundwork for sustainable reindustrialisation, emphasising the importance of aligning investments with regional competencies (Galgóczi 2014).

Central to achieving just transitions is the empowerment of workers and grassroots activism, exemplified by the efficacy of militant unionism in negotiating transitions. Meaningful worker involvement in decision-making

processes is essential to challenge existing power structures and ensure equitable outcomes (Abraham 2017). Existing literature emphasises the critical necessity of delineating and executing a just transition, particularly in the face of conflicting interests. This underscores the indispensability of proactive government involvement, strong labour advocacy, and a departure from outdated ideas. By placing primacy on principles of justice, equity, and sustainability, stakeholders have the potential to catalyse a worldwide shift towards social and ecological liberation.

The processes of just energy transition in Spain are built over a wide political-normative framework, in which every administrative level has provided its own goals and regulations to develop the global core principles of the SDGs and the ILO. The ILO has been the main sponsor of the just energy transition. Its framework (Poschen 2017; ILO 2018) pictures a shift to green economic activities motivated by public policies concerning demand and investment. A summary of this framework is shown in Figure 1.

Figure 1. Diagram of the ILO framework for just transitions.



Source: Own elaboration.

The European Union's environmental and energy transition policies, as outlined in the 2030 Climate & Energy Framework, are steps towards combating climate change and promoting sustainability. The framework, initiated by the European Commission in 2014 (European Commission 2014) and later bolstered by the European Green Deal in 2020 (European Commission 2020a), reflects the EU's commitment to reducing greenhouse gas emissions, transitioning to renewable energy sources, and fostering a greener economy. However, acknowledging that such transitions can bring about socio-economic challenges, the EU introduced the Mechanism of Just Transition in 2020 (European Commission 2020c). This mechanism represents a proactive approach to address the inevitable impact of energy rearrangements, particularly in regions heavily dependent on fossil fuels or high-carbon industries. The allocation of EUR 150 million between 2021 and 2027 underscores the EU's commitment to supporting affected regions through targeted investments (European Commission 2020b). Three key pillars guide these investments:

First, the Just Transition Fund is a financial instrument to aid regions in transitioning to a low-carbon economy. It provides targeted support for initiatives such as reskilling workers, promoting entrepreneurship, and revitalising local economies to mitigate the socio-economic impacts of the transition.

Second, InvestEU "Just Transition". Through this initiative, the EU aims to leverage public and private investment to facilitate the transition process. By mobilising additional financial resources, InvestEU complements the Just Transition Fund, enabling a more comprehensive approach to supporting affected regions.

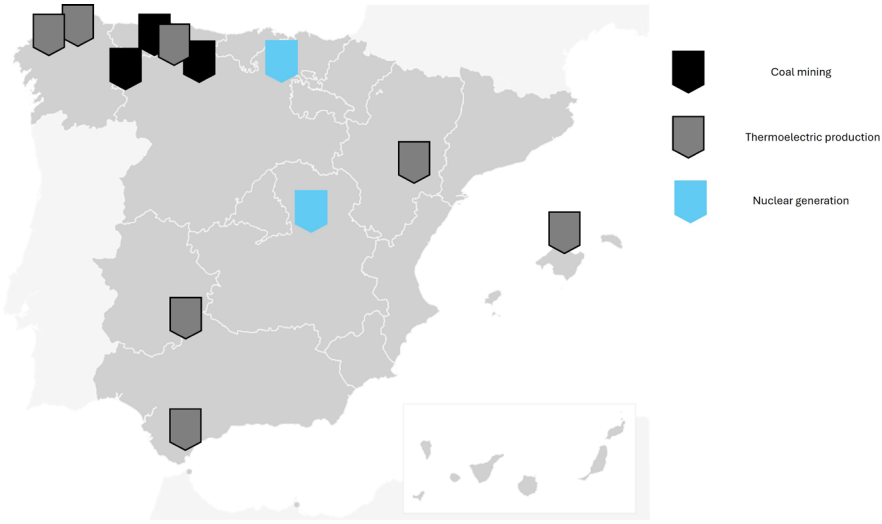
Third, the European Investment Bank (EIB) Loans provide favourable financing options for projects aligned with the principles of just transition. By offering loans with preferential terms, the EIB encourages investments in renewable energy infrastructure, energy efficiency measures, and sustainable development projects, further advancing the goals of the transition framework.

Together, these pillars form the framework designed to ensure that no region or community is left behind in the transition towards a greener, more sustainable future. By prioritising both environmental objectives and social equity, the EU's approach to just transition exemplifies a holistic approach to tackling the challenges of climate change mitigation and adaptation.

III. THE AGREEMENTS OF JUST TRANSITION IN SPAIN

In Spain, the ecological transition has been designated as a prominent national priority, as evidenced by the establishment of the Ministry of Ecological Transition and Demographic Challenge (MITECO). Positioned as one of the three Vice Presidencies of the Government, MITECO underscores the nation's commitment to addressing environmental concerns within the governance structure. The Strategic Framework for Energy and Climate, anchored by Spain's National Integrated Plan for Energy and Climate, the Law of Climate Change and Energy Transition, and the Strategy of Just Transition, is a comprehensive roadmap propelling Spain towards a sustainable future. This approach prioritises the gradual phase-out of fossil and nuclear installations (Figure 2).

Figure 2. Key fossil energy installations in Spain, incorporating nuclear power plants.



Source: Own elaboration based on MITECO (2020).

Within this framework, the Strategy of Just Transition assumes significance, aiming to mitigate socio-economic impacts associated with transitioning to a greener economy. The system of Agreements of Just Transition (CTJs) functions as a mechanism for dialogue and collaboration between stakeholders, facilitating consensus and cooperation in pursuit of a fair and sustainable transition (MITECO 2020k). By engaging government, industry, labour unions, and civil society, CTJs enable communities to participate in shaping their futures.

The Institute of Just Transition, established to oversee and coordinate these efforts, plays a pivotal role in advancing principles of justice throughout the transition process. Through research, advocacy, and capacity-building, the Institute contributes to embedding justice into Spain's energy and climate policies. While the Institute endeavours to uphold the principles of justice, its efforts are tempered by the recognition of inherent challenges and limitations. Within the Institute's purview, each facet of justice is acknowledged, though the reality may diverge from theoretical aspirations:

Recognition Justice: The Institute strives to ensure that the voices of various stakeholders impacted by the transition, including workers, communities, and marginalised groups, are acknowledged and heard. By valuing their perspectives and experiences, it aims to cultivate inclusivity and comprehension in decision-making processes.

Distributive Justice: Through advocacy and research, the Institute addresses the equitable distribution of costs, benefits, and burdens associated with the transition. It advocates for the fair allocation of resources and opportunities,

working to mitigate disparities and prevent any group from bearing disproportionate disadvantages.

Procedural Justice: The Institute advocates for fairness and transparency in the mechanisms and procedures governing the transition. It endeavours to establish inclusive decision-making frameworks, facilitating meaningful stakeholder participation and information accessibility, thus ensuring democratic and accountable decision-making.

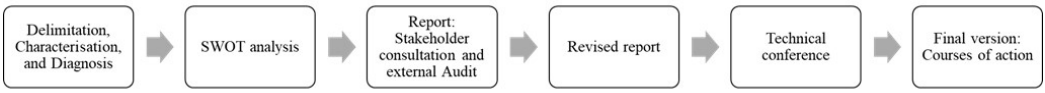
Restorative Justice: Acknowledging historical injustices and environmental harms disproportionately affecting certain communities, the Institute aims to rectify these injustices. It supports initiatives aimed at remedying past wrongs, restoring ecosystems, and empowering affected communities to engage in and benefit from the transition.

CTJs are solely focused on the zones that are affected by the cease of mining, thermoelectric or electronuclear activities and pursue the creation of jobs through the mobilisation of local resources and the attraction of investments. Their elaboration begins with a report of "Delimitation, Characterisation and Diagnosis", which determines both the territorial borders of the CTJ and the sociodemographic and economic situation of the area and proposes an analysis of Strengths, Weaknesses, Opportunities, and Threats (SWOT). The SWOT analysis is a widely used strategic planning tool designed to identify internal and external factors that influence a process or system. By categorising these factors, SWOT enables the development of informed strategies to leverage strengths, mitigate weaknesses, capitalise on opportunities, and defend against potential threats.

In the context of Spain's CTJs, SWOT is employed to diagnose the conditions of areas affected by the decline of fossil industries. It serves as a method to inform policymaking by identifying local capacities and challenges, thereby guiding the reorientation towards sustainable economic activities. This diagnosis is then sent to the stakeholders of the area together with a questionnaire to evaluate it and is also reviewed by external auditors. The Institute has considered SWOT analysis as an effective tool for fostering stakeholder participation, particularly in contexts where stakeholders are diverse. Clear and straightforward categories are easily comprehensible to participants regardless of their level of expertise. This accessibility allows for broad stakeholder engagement, encompassing representatives from communities, businesses, policymakers, and social organisations, thus facilitating inclusive participation. Furthermore, the structured framework provided by SWOT analysis is seen as instrumental in guiding discussions in a balanced manner, ensuring that diverse viewpoints are systematically organised and considered. By encouraging reflection on both the strengths and weaknesses of a transition, SWOT promotes dialogue and collaboration among stakeholders with varying interests. However, although the SWOT framework provides a structured approach to diagnosis, this work contends that its application within the CTJ has faced notable limitations.

Afterwards, the Institute elaborates a second report including the answers obtained in the questionnaires and organises a technical conference, i.e., a group of workshops in which stakeholders are asked to participate to present and discuss the conclusions. With this information, the initial report is revised to concretise the courses of action (Figure 3).

Figure 3. Process of elaboration of the CTJs.



Source: Own elaboration.

In CTJs, the fundamental territorial unit is the municipality, with employment impact serving as the primary determinant for inclusion in the scope of interventions, quantified under worst-case scenarios. These actions undergo further adjustments to ensure coherence and territorial cohesion (MITECO 2020c; 2020b; 2020e; 2020d; 2020a). To decide the inclusion or exclusion of a municipality in the coverage of a CTJ, the Institute applies the following steps (Figure 4):

Figure 4. Diagram of decision for the delimitation of coverage in the CTJs.

Source: Own elaboration.

First, there is the need to identify the affected installations (fossil and nuclear plants) and the municipality in which they are located. These are promptly encompassed within the coverage area. Subsequently, the affected workforce, comprising both internal and outsourced personnel, is quantified. This involves determining the municipalities where they reside and calculating the impact of

their unemployment in reference to the local working-age population. If the impact on the municipality is greater than the mean of all municipalities where the affected workers live, the municipality is included in the coverage zone, as long as it belongs to the autonomous community of the CTJ. At the end of this process, at least 85% of the affected workers must be gathered by the executed municipal selection. After the phase of public participation and audit, the Institute has introduced additionally the impact over labour income, as an analogous criterion to that of impact over employment (MITECO 2020f; 2020i; 2020g; 2020j; 2020h).

Finally, there is the application of the criteria of territorial coherence and cohesion, which are motivated by three requisites: geographical continuity, respect for the sub-regional (in Spanish "comarcal") structure, and belonging to the groups of rural development. The first establishes that the selected municipalities must be adjoining. The second and third determine the inclusion in the CTJ of a sub-region (or group of rural development) if the population of the municipalities that have been selected under the criteria of impact overflows 70% of the population of the sub-region (or group). After the phase of public participation, two additional criteria have been introduced. First, is the inclusion of those municipalities where at least two miners of coal were present in 2011. Second, is the inclusion of those strictly rural municipalities (DEGURBA 3) that belong to the mining basin where mining workers were present in 2001.

With numerous interventions underway in Spain, this contribution relies on the Leonese case to provide tangible, real-world examples. Additionally, it underscores the importance of acknowledging the subnational scale, which is frequently overlooked in the existing literature. The province of León congregates 5 of the 18 interventions at a national level (7 at a regional level), hence illustrating the strategical relevance of the case to satisfy the goals of these political plans.

León, nestled in the northwest of Spain, has long been intertwined with the fortunes of coal mining and thermoelectric production, forming the bedrock of its economic and social identity (Pérez Díaz and Tomé Gil 2020). From the 19th century onwards, coal mining experienced a boom driven by industrialisation and escalating energy demands. Rich coal reserves and favourable geological conditions fuelled rapid expansion, fostering mining communities and ancillary industries across the region. Simultaneously, thermoelectric power plants emerged as vital nodes in the energy infrastructure, supporting urbanisation and industrial growth.

However, this prosperity was not without its challenges. Shifts in global energy dynamics, coupled with environmental concerns and technological advancements, heralded the decline of coal mining and thermoelectric production in León. Declining reserves, escalating costs, and competition from alternative energy sources eroded the economic viability of coal extraction. Moreover, mounting environmental regulations and public health concerns underscored

the unsustainability of coal-fired power generation. Leonese mining, once employing 45,212 workers in 1990, has seen a stark decline. Presently, 960 workers face the risk of losing their jobs, according to the diagnostic of CTJs (MITECO 2020f; 2020i; 2020g; 2020j; 2020h). The signs of socioeconomic decline are clear and accumulating over time. In response, the province finds itself at a crossroads, navigating the complexities of just energy transitions.

IV. METHODOLOGY

To analyse the current efforts in Spain, cross-check the just transition framework, and derive potential lessons, this study has performed a comprehensive review of the Agreements of Just Transition (CTJs) launched by the Ministry for the Ecological Transition and the Demographic Challenge (MITECO). The methodology consists of a systematic and multi-step approach, ensuring a thorough examination and validation of the CTJs.

The primary sources for this analysis include the initial drafts and the final drafts of the CTJs. The initial drafts provide details on the proposed zones or priority areas under restructuring, focusing on the general criteria for delimitation and the procedures employed for diagnosis. The final drafts, which were revised based on public consultation and external expert audit, offer insights into the modifications made in response to feedback. Secondary sources encompass the ILO framework and scholarly insights on just energy transitions. The ILO framework, based on Poschen (2017) and ILO (2018), serves as a global benchmark, while current academic perspectives (García-García et al. 2020) offer additional evaluation criteria for the political plans.

The methodology involves an initial review of the drafts to understand the operationalisation of criteria and procedures. A thorough examination of the final drafts follows, identifying changes made post-consultation. The differences between the initial and final drafts are then systematically compared to pinpoint significant changes and improvements. To uncover any remaining shortcomings, the operative framework of the CTJs is contrasted with the ILO framework and scholarly insights. This methodology was applied to two specific CTJs in the Leonese region: Bierzo-Laciana and Montaña Central-La Robla. The CTJ of Bierzo-Laciana, further divided into four priority areas—Fabero-Sil, Bierzo Alto, Laciana-Alto Sil, and Cubillos-Ponferrada—served as practical contexts for testing the robustness of the CTJs.

The application of this methodology revealed several weaknesses in the Agreements, which were categorised into three primary areas: concept and design, diagnosis, and participative processes. This complete analysis of the CTJs highlights both their strengths and areas for improvement, providing valuable insights for future policy formulation and implementation.

The first area of weakness, concept and design, pertains to the foundational principles and structural elements of the Agreements. This includes the theoretical frameworks, underlying assumptions, and the strategic planning that guided the formulation of the Agreements. Issues in this area involve inconsistencies or gaps in the conceptual model, lack of coherence in the policy framework, or inadequacies in addressing the intended objectives comprehensively.

The second area, diagnosis, refers to the processes and methodologies used to assess the current situation or baseline conditions that the Agreements aim to address. Weaknesses in this area include insufficient or inaccurate data collection, flawed analysis, or failure to identify critical issues and trends. This can result in a misinformed understanding of the problems at hand, leading to ineffective or misdirected policy measures.

The third area, participative processes, concerns the extent and quality of stakeholder engagement and public involvement in the policy development process. This includes the mechanisms for involving various stakeholders, the transparency of the process, and the responsiveness to feedback from affected parties. Weaknesses here involve limited stakeholder inclusion, inadequate communication channels, or superficial participation that does not genuinely incorporate stakeholder input into the final Agreements.

By identifying and categorising these weaknesses, the analysis systematically addresses the shortcomings in the current CTJs. This, in turn, can inform the development of more robust, effective, and inclusive policies in the future, ultimately enhancing the overall impact and sustainability of the initiatives governed by these Agreements.

V. LIMITATIONS OF CONCEPT AND DESIGN

Given the theoretical framework of just transitions and its contextualisation, some limitations can be observed. First, processes focus exclusively on the quantification of jobs, the primary goal of the CTJs. Afterwards, the Institute considered labour income too. Even if the quantification of jobs includes both direct employees and outsourced workers, it is performed at the time of the facility's closure. Thus, in León, CTJs consider the loss of 1,014 jobs (960 after revision). However, the diagnosis states that 5,156 jobs were destroyed between 1994 and 2009. Likewise, they document the presence of 45,212 mining workers in 1990 (MITECO 2020c; 2020b; 2020e; 2020d; 2020a). Consequently, it may be questioned if a criterion of impact at the closure of the facility, when the situation of decline is terminal, can be considered just in the presence of historical destruction of jobs a couple of times higher. The new criteria about the presence of miners in 2001 and 2011, introduced during the revision, have tried to solve this limitation (MITECO 2020f; 2020i; 2020g; 2020j; 2020h). Nevertheless, from the distributive and recognition viewpoint of the just transition, they are insufficient due to the avoidance of the historical quantification of the affected jobs.

The affected jobs have been quantified in direct terms (over mining and thermoelectric production), but indirect and induced impacts have not been determined, although they can be supposed high given the socio-economic situation. Moreover, this impact is measured over the working-age population instead of the workforce due to a "lack of data at a municipal scale" (MITECO 2020h; 2020j; 2020g; 2020i; 2020f; 2020a; 2020d; 2020e; 2020b; 2020c). Groups of the non-active working-age population, like the so-called "discouraged workers", can cause situations that are not adjusted to real impact. The focus on the creation of jobs omits the considerations highlighted by the ILO about its quality. The creation of precarious employment as a result of the transition has a negative impact. Yet, there are no clear lines to ensure the quality of new or reconverted jobs beyond the spontaneous courses that arise in the Tripartite Dialogue.

In contrast with the consideration of the quality of jobs, there is an explicit and sound mention of gender equality goals, to which MITECO concedes an essential role in the transition (MITECO 2020k). Hence, it establishes ways of cooperation between the Institute of Just Transition and the Women Institute to execute consultive actions with local women's associations to create equalitarian projects. At the same time, it acknowledges that the activities affected by the transition are widely linked with the male population. Therefore, justice implies that the net impact of these projects must be widely positive under this interpretation. Compensation between destroyed and new jobs is not enough, even in the case of variation of sociodemographic profiles, like the increase of women in technical professions. Not only must those projects cover the affected workers, but also ensure new possibilities for the "excluded female workers", in the words of the Institute (MITECO 2020k). Again, given this goal, it may be questioned the justice of the criterion of affected jobs at the closure of the facility. At this moment, there is not any concretion in the CTJs about the precise contribution of women's associations.

Furthermore, in light of findings from the ILO (ILO 2015; Poschen 2017), it is imperative to broaden the scope of the just transition beyond solely employment concerns. Environmental degradation, highlighted by the CTJs, underscores the necessity to address the fallout from abandoned facilities. This deterioration, akin to the impacts on employment and income, bears asymmetric consequences with far-reaching distributive implications. These impacts have been relegated in the diagnosis, even if they are recurrently cited as a problem and possible source of opportunities derived from their restoration. Diagnosis is in consequence of strict socioeconomic nature, and thus, it omits environmental justice, despite its potential to ease (e.g., by minimising the environmental impact to favour tourism or potentiate the biodiversity areas) or hinder the reconversion.

Similarly, the design of the CTJs motivates the consideration of other limitations derived from the remaining criteria. The criterion of coverage to 85% of the affected workers implies the introduction in the CTJs of those municipalities

that suffer an impact on their working-age population (or labour income after the revision) below the average until the consecution, but also the exclusion of municipalities with similar impacts to those that have been included. The case of León provides a clear example of this limitation (Table 1). The criterion would have stopped the process of inclusion in Ponferrada (90.94% of workers covered), a town that should have been excluded for having a population greater than 70,000 inhabitants and being diversified. Its inclusion goes against the criteria of the MITECO, which refuses to cover non-rural areas, and is justified because the town is "the leading and extensive sub-regional urban area and registers a high number of affected workers" (MITECO 2020e; 2020h). This calculation would have left out of coverage the village Palacios del Sil, despite showing an impact of 0.0561 points below Ponferrada and being a non-diversified rural area. Nonetheless, Palacios del Sil has been included without an explicit explanation of this issue. Its inclusion has probably tried to solve the error that would have implied the exclusion of the municipality. This event reflects the problematic nature of barrier criteria to delimit areas of interest for a just transition plan.

Table 1. Application of the criterion of coverage in the inclusion of municipalities by impact.

Municipality	Jobs	Working-age population	Impact	Accumulated Affected Workers
Cabrillanes	12	476	2.5210%	1.81%
Páramo del Sil	20	796	2.5126%	4.83%
Fabero	41	2953	1.3884%	11.03%
Villablino	70	5825	1.2017%	21.60%
Cubillos del Sil	14	1187	1.1794%	23.72%
Toreno	23	1992	1.1546%	27.19%
Bembibre	52	5739	0.9061%	35.05%
Ponferrada	370	41667	0.8880%	90.94%
Palacios del Sil	5	601	0.8319%	91.69%
TOTAL	607	61236		

Source: Own elaboration.

In the CTJ, affected municipalities are also excluded when they do not belong to the autonomous community of reference to "respect the territorial scope", despite the processes and the Institute being national institutions. This issue is especially delicate in the case of León, where the affected areas are adjacent to the communities of Galicia and Asturias: if a Galician or Asturian municipality had been significantly affected by the closures in León, they would have been ineligible for their inclusion in the CTJ despite having a similar socioeconomic situation and being distanced for few kilometres.

For its part, the criterion of territorial coherence has procured coverage to municipalities with a lower impact than those included, e.g., the village of Folgoso

de la Ribera has been included with a 0.3% score while the village of Priaranza del Bierzo has been excluded with a 0.66% score. This problem has been solved narrowly through the criterion of territorial cohesion. Given that, at the end of the process, the population of the selected municipalities represents 70.42% of the population of the sub-region, the sub-region has entered as a whole in the coverage of the CTJ. In the absence of such a modest margin, the described contradictions would have persisted. As happened with the criteria of barrier, it may be questioned the operativity of this criterion of territorial cohesion in circumstances close to the 70% limit.

VI. LIMITATIONS OF THE DIAGNOSIS

In the case of diagnosis, the main limitations derive from the selection of indicators and the SWOT analysis. Regarding indicators, there is a need to highlight the limitations of sociodemographic and income variables. Sociodemographic variables, notably those related to the level of education, have been gathered in the census in 2011 as the sole available source. Hence, they register a lag of more than 10 years, a decade that has resulted in the decline of the mining and thermoelectric generation, as well as the impact of COVID (Le Billon et al. 2021). Likewise, CTJs take the average labour income of the municipalities. Such income variable is solely calculated for those municipalities of higher size or relevance, therefore biasing the diagnosis, and subsequently, the delimitation through this new criterion. These incomes are presented in current EUR monetary units; hence, their variations could hide a "monetary illusion" in relatively wide and fluctuant periods as the ones analysed in the CTJs. The limitations of diagnosis through these indicators motivate a reflection on the need for a data strategy before the strategy of transition, in which the availability and quality of statistical information are tested and improved.

Regarding the SWOT method, there is a lack of specificity in the analyses, which have been reused from a previous process of diagnosis at an autonomous community level, and redundancy of statements. This limitation can be observed in Tables 2 and 3, which derive the percentage of coincidence by CTJ and area of interest. The lack of specificity and redundancy poses challenges to the effectiveness and precision of policy development and implementation. While some degree of overlap in diagnoses across different areas may be expected due to their shared socioeconomic contexts and common structural problems, the extensive coincidence observed in the case of León suggests deeper methodological shortcomings.

Table 2. Percentage of coincidence among the statements of the SWOT diagnosis by CTJ, initial version.

Strengths		CTJ Bierzo-Laciana				CTJ Montaña Central-La Robla
		Fabero-Sil	Bierzo Alto	Laciana-Alto Sil	Cubillos-Ponferrada	
CTJ Bierzo-Laciana	Fabero-Sil	-	22%	22%	22%	11%
	Bierzo Alto	22%	-	26%	33%	15%
	Laciana-Alto Sil	22%	26%	-	30%	19%
	Cubillos-Ponferrada	22%	33%	30%	-	11%
CTJ Montaña Central-La Robla		11%	15%	19%	11%	-
Weaknesses		**CTJ Bierzo-Laciana**				**CTJ Montaña Central-La Robla**
		Fabero-Sil	**Bierzo Alto**	**Laciana-Alto Sil**	**Cubillos-Ponferrada**	
CTJ Bierzo-Laciana	Fabero-Sil	-	56%	52%	40%	36%
	Bierzo Alto	56%	-	68%	52%	52%
	Laciana-Alto Sil	52%	68%	-	48%	52%
	Cubillos-Ponferrada	40%	52%	48%	-	40%
CTJ Montaña Central-La Robla		36%	52%	52%	40%	-
Opportunities		**CTJ Bierzo-Laciana**				**CTJ Montaña Central-La Robla**
		Fabero-Sil	**Bierzo Alto**	**Laciana-Alto Sil**	**Cubillos-Ponferrada**	
CTJ Bierzo-Laciana	Fabero-Sil	-	23%	23%	23%	27%
	Bierzo Alto	23%	-	27%	23%	27%
	Laciana-Alto Sil	23%	27%	-	23%	27%
	Cubillos-Ponferrada	23%	23%	23%	-	27%
CTJ Montaña Central-La Robla		27%	27%	27%	27%	-
Threats		**CTJ Bierzo-Laciana**				**CTJ Montaña Central-La Robla**
		Fabero-Sil	**Bierzo Alto**	**Laciana-Alto Sil**	**Cubillos-Ponferrada**	
CTJ Bierzo-Laciana	Fabero-Sil	-	46%	46%	31%	31%
	Bierzo Alto	46%	-	54%	31%	31%
	Laciana-Alto Sil	46%	54%	-	31%	31%
	Cubillos-Ponferrada	31%	31%	31%	-	23%
CTJ Montaña Central-La Robla		31%	31%	31%	23%	-

Source: Own elaboration.

Table 3. Percentage of coincidence among the statements of the SWOT diagnosis by CTJ, revised version.

Strengths		CTJ El Bierzo-Laciana				CTJ Montaña Central-La Robla
		Fabero-Sil	Bierzo Alto	Laciana-Alto Sil	Cubillos-Ponferrada	
CTJ El Bierzo-Laciana	Fabero-Sil	-	22%	19%	16%	13%
	Bierzo Alto	22%	-	19%	25%	13%
	Laciana-Alto Sil	19%	19%	-	16%	13%
	Cubillos-Ponferrada	16%	25%	16%	-	16%
CTJ Montaña Central-La Robla		13%	13%	13%	16%	-

Weaknesses		CTJ El Bierzo-Laciana				CTJ Montaña Central-La Robla
		Fabero-Sil	Bierzo Alto	Laciana-Alto Sil	Cubillos-Ponferrada	
CTJ El Bierzo-Laciana	Fabero-Sil	-	36%	31%	33%	25%
	Bierzo Alto	36%	-	42%	33%	42%
	Laciana-Alto Sil	31%	42%	-	31%	36%
	Cubillos-Ponferrada	33%	33%	31%	-	28%
CTJ Montaña Central-La Robla		25%	42%	36%	28%	-

Opportunities		CTJ El Bierzo-Laciana				CTJ Montaña Central-La Robla
		Fabero-Sil	Bierzo Alto	Laciana-Alto Sil	Cubillos-Ponferrada	
CTJ El Bierzo-Laciana	Fabero-Sil	-	14%	10%	17%	21%
	Bierzo Alto	14%	-	14%	17%	17%
	Laciana-Alto Sil	10%	14%	-	10%	10%
	Cubillos-Ponferrada	17%	17%	10%	-	24%
CTJ Montaña Central-La Robla		21%	17%	10%	24%	-

Threats		CTJ El Bierzo-Laciana				CTJ Montaña Central-La Robla
		Fabero-Sil	Bierzo Alto	Laciana-Alto Sil	Cubillos-Ponferrada	
CTJ El Bierzo-Laciana	Fabero-Sil	-	26%	32%	16%	21%
	Bierzo Alto	26%	-	32%	21%	21%
	Laciana-Alto Sil	32%	32%	-	16%	21%
	Cubillos-Ponferrada	16%	21%	16%	-	26%
CTJ Montaña Central-La Robla		21%	21%	21%	26%	-

Source: Own elaboration.

Initially (Table 2), the highest percentages of coincidence appear in the determination of weaknesses (MITECO 2020a; 2020d; 2020e; 2020b; 2020c). CTJs share more than 30% of the statements. Bierzo Alto and Laciana-Alto Sil show a 68% coincidence; Fabero-Sil and Laciana-Alto Sil, Bierzo Alto and Cubillos del Sil-Ponferrada, and Montaña Central-La Robla, Bierzo Alto and Laciana-Alto Sil record a 52% coincidence. CTJ in Bierzo Alto and Laciana-Alto Sil again show the highest coincidence scores in the section of threats (54%) and opportunities (27%), as well as a high percentage, although in a medium range, regarding strengths (26%). Cubillos del Sil-Ponferrada and Bierzo Alto have the most elevated concordance score concerning strengths (33%). The delimitation of opportunities presents a lower coincidence and range than the rest of the sections. In the phase of revision (Table 3), the coincidences are attenuated (MITECO 2020h; 2020j; 2020g; 2020i; 2020f). In effect, additional elements have been introduced in the SWOT analyses with a slight increase of specificity: for instance, there is a citation to the ski resort in Leitariegos as an alternative economic activity in the CTJ Laciana-Alto Sil, the European PCI in Cúa in Fabero-Sil (even if the PCI of Bierzo Alto has been omitted), inter alia.

In addition to this coincidence, redundancy is abundant in the SWOT analyses. These redundancies consist of the repetition of a statement by analytical category with an identical implication, but a different expression, and thus, they do not provide additional valuable information and disperse the conclusions of the diagnosis. Percentages of redundancy in the SWOT have been calculated per CTJ (Tables 4 and 5).

Table 4. Percentage of redundancy of SWOT statements, initial version.

Redundancy	CTJ El Bierzo-Laciana				CTJ Montaña Central-La Robla
	Fabero-Sil	Bierzo Alto	Laciana-Alto Sil	Cubillos-Ponferrada	
Strengths	27%	18%	20%	25%	0%
Weaknesses	37%	26%	28%	14%	15%
Opportunities	0%	0%	0%	27%	20%
Threats	29%	29%	29%	22%	0%

Source: Own elaboration.

Table 5. Percentage of redundancy of SWOT statements, revised version.

Redundancy	CTJ El Bierzo-Laciana				CTJ Montaña Central-La Robla
	Fabero-Sil	Bierzo Alto	Laciana-Alto Sil	Cubillos-Ponferrada	
Strengths	42%	36%	22%	21%	0%
Weaknesses	45%	18%	12%	12%	13%
Opportunities	0%	29%	0%	24%	18%
Threats	22%	0%	25%	18%	0%

Source: Own elaboration.

The CTJ of Fabero-Sil presents the highest redundancies, both initially (Table 4) (MITECO 2020a) and after the revision (Table 5) (MITECO 2020i). Surprisingly, after the revision redundancy has increased: 45% of weaknesses, 22% of threats, and 42% of strengths are repetitive statements. The same applies to strengths (from 18% to 36%) and opportunities (from 0% to 29%) in Bierzo Alto (MITECO 2020d; 2020g) and the strengths in Laciana-Alto Sil (from 20% to 22%) (MITECO 2020b; 2020j). In the comparison, there is an attempt to reduce these redundancies, as proved by the remaining quadrants, but this attempt has failed. With the phase of revision, there are new redundancies, not only regarding SWOT categories but also among them.

Both phenomena, coincidence and redundancy, configure diagnoses that are more limited and dispersed than expected in the case of a proposal for a just transition with a high specificity between areas. These issues point to a dysfunctional application of the SWOT methodology, considering the end that is presented in the CTJ. Firstly, reusing SWOT analyses from a previous diagnostic process, without proper contextual adaptation, undermines the capacity to capture the unique and localised conditions of the priority areas within León. The absence of tailored, region-specific insights means that key regional nuances, such as variations in industrial base, employment patterns, demographic dynamics, and environmental factors, are likely to be overlooked. This lack of specificity reduces the diagnostic utility of the analysis, limiting its ability to inform localised interventions that adequately address the distinct challenges and opportunities in different areas.

Secondly, the redundancy of statements within the analysis signals a possible failure to fully engage with the particularities of each region. A SWOT analysis that merely reiterates general or previously established findings does not provide the necessary granularity to design strategies that target specific vulnerabilities or leverage distinct regional strengths. In the context of just energy transitions, where the aim is to ensure that economic, social, and environmental justice principles are upheld, particularly for communities most affected by the phasing out of carbon-intensive industries, a more refined and place-sensitive diagnostic is crucial. Failure to do so leads to the formulation of generic or mismatched policies that do not align with the region's actual needs, potentially exacerbating inequalities or leading to ineffective use of resources.

Moreover, an unnecessary disaggregation of the SWOT analysis in the priority areas, coupled with high rates of coincidence in findings, results in inefficiencies. When analyses are artificially segmented without substantive differentiation, it may create administrative burdens and convolute the policy-making process without yielding additional insights. Instead of promoting a more thorough understanding, such fragmentation could obfuscate the real priorities and needs of the region by diluting focus. Consequently, it is highly recommended that the Institute and the groups of interest explore alternative techniques of diagnosis and correct this lack of specificity and the dispersion that the Leonese CTJs exemplify.

VII. LIMITATIONS OF THE PARTICIPATIVE PROCESSES

From a procedural viewpoint, channelled in the CTJs through questionnaires and technical meetings (MITECO, 2020k, 2020g, 2020f, 2020i, 2020h), apart from the mentioned doubts about gender equality that have been previously disclosed due to their conceptual nature, diagnoses have not included the worries of the growing movements of opposition to the installation of renewables in the affected areas. The opposition in León is based on three main conflicts: the displacement of farmers, the management of the communal woodlands, and the environmental-landscape impacts of the installations.

In the affected areas and many other locations, the installation of renewable infrastructures is motivating a change in land uses. Currently, many smallholdings that are suitable for the renewable generation of electricity are abandoned or rented to farmers. The massive and profitable deployment of renewable technologies during the transition has led energy corporations to offer greater renting proposals than those agreed with the lessee farmers. The highest profitability of renting for renewables in comparison with the primary renting involves the expulsion of farmers, incapable of equalising or improving the corporate offers. Those affected see their sustenance at risk while, in the best of situations, they are offered non-satisfactory jobs in the new renewable installations.

Simultaneously, there are frictions between the demand for land and the management of the traditional woodlands. Even if the impacts on these collectively managed woodlands have serious implications regarding justice and affect rural agroecological development, their precise case has not been addressed in a specific way in the processes of transition. This omission can be related to two issues: one connected with the design, already mentioned, and the other distinctly procedural. At first, CTJs are of an eminently social and economic nature, and relegate the environmental impacts, including land uses, despite their implicit socioeconomic character. Secondly, from a procedural point of view, the model of communal management is sufficiently specific at a local scale to be overlooked in the absence of inclusive participatory processes. Again, this paper reveals a lack of specificity linked with a possible omission of relevant stakeholders.

Aligned with the changes in land uses, the environmental-landscape issue is linked to the need of releasing the territory from biodiverse uses or uses with an aesthetic value to enable the installation of generating technologies. Strategies to tackle this matter remain to be specified in the CTJs. In brief, the procedural problem of the CTJs is rooted in the implicit socioeconomic and environmental effects of changes in land use, not so much in labour issues, widely covered, despite the indicated limitations.

VIII. DISCUSSION

The Spanish experience offers valuable insights that could refine current political strategies in Spain and serve as a guide to prevent similar pitfalls abroad. In Spain, the emphasis on quantifying job risks within both fossil fuel companies and their outsourced workforce is a primary focus of energy transition plans. However, this approach presents several challenges. Firstly, it disproportionately prioritises socioeconomic impacts, overlooking the environmental devastation caused by abandoned fossil fuel facilities and its subsequent socioeconomic repercussions. Secondly, by solely focusing on direct job losses, it fails to account for the indirect and induced effects, particularly the interdependence within industrial networks. Thirdly, the timing of impact quantification, often occurring at facility closure, does not capture the full extent of historical employment peaks in the fossil fuel industry, leading to an incomplete understanding of transition needs. Lastly, the plans overlook job quality analysis, which is crucial alongside historical employment, income, and environmental data.

Furthermore, the reliance on objective, quantifiable parameters for delimitation and diagnosis has frequently encountered data scarcity, especially in rural areas. This underscores the necessity for robust data strategies before the formulation of transition plans, particularly on local scales, to ensure accurate decision-making. These strategies should identify relevant variables, address data gaps through estimation or acquisition, and promote transparency through the dissemination of public data.

Despite the attention given to gender equality in the design of just transition policies, the practical implementation has fallen short. The involvement of organisations like the Women's Institute and local women's associations is acknowledged, but concrete actions to address gender disparities are lacking. Gender equity must remain a central concern throughout the transition process, requiring continuous commitment from policy design to execution.

Additionally, the use of barrier criteria for delimitation and the consideration of territorial borders in public intervention coverage have proven problematic. Adjustments made to these criteria lack transparent justification, while the rigidity of territorial borders fails to account for spillover effects typical of transition contexts. Hence, more adaptable and nuanced criteria are necessary to ensure effective coverage delineation. Analyses should be undoubtedly specific. An ambition for specificity in the Spanish case has resulted in an inoperative execution of the SWOT analyses, due to the high coincidence and redundancy of the statements. This could point to an excessive disaggregation of areas of interest, hence suggesting the necessity for more holistic and wide coverages.

Examining these limitations can provide important lessons for refining political plans and academic discussions abroad to ensure more effective and equitable transitions away from fossil fuels. Here are the key points to consider:

Comprehensive Impact Assessment: While quantifying job losses and income impacts is essential, it is crucial not to overlook the broader environmental consequences of fossil fuel phase-outs. Plans should incorporate assessments of environmental degradation caused by abandoned facilities, as well as consider indirect and induced effects on the industrial network. Achieving a truly equitable transition demands a holistic strategy that harmonises socioeconomic and environmental factors. Avoiding excessive dissection of analyses is key, as it can breed redundancy and undermine effectiveness.

Timely Quantification: Waiting until the closure of fossil fuel facilities to quantify impacts may result in a skewed understanding of the transition's effects. Historical data on employment and economic activity should be considered to provide a more accurate picture and ensure that transition plans adequately address the peak employment period of the fossil fuel industry.

Quality of Jobs: Transition plans should not only focus on the quantity of jobs but also assess the quality of employment opportunities. Analysing factors such as job stability, wages, and working conditions is essential to gauge the true impact of the transition on affected communities.

Data Availability and Transparency: Prioritise data strategies to ensure comprehensive and accurate information, especially at the local level. Access to transparent data not only facilitates effective policy design but also enhances accountability and allows for scholarly research to inform decision-making processes.

Gender Equality: While gender equality is often included in transition plans, there is a gap between ambition and implementation. Continuous commitment to addressing gender disparities throughout the transition process, supported by dedicated resources and institutional mechanisms, is crucial for achieving meaningful outcomes.

Flexible Delimitation Criteria: Rigid criteria for delimiting coverage areas can be problematic, particularly in the presence of spillover effects. Transition plans should adopt more sensitive and flexible criteria to ensure that all affected communities receive adequate support, even beyond predefined territorial borders.

By addressing these lessons learned from the Spanish experience, political plans and academic discussions can be better equipped to design and implement just energy transition initiatives that are more inclusive, sustainable, and effective.

IX. CONCLUSIONS

Just energy transitions have gained momentum in the last years and reached increasing presence as a goal in political agendas worldwide. There is the idea that markets cannot be trusted to perform the transition in the presence of glob-

al public goods and asymmetric social consequences. Hence, governments are assuming the leadership of the process.

In Spain, the Government has set up a Ministry of Ecological Transition and Demographic Challenge that has founded an Institute of Just Transition to organise a fair process of shift from fossil to renewable energy sources. The main tool to accomplish this is the Agreement of Just Transition or CTJ, which initially performs a delimitation of the area of potential coverage, a diagnosis of the level of socioeconomic deterioration, and a SWOT analysis. Subsequently, the conclusions are sent for public consultation through questionnaires and external audits. After the presentation of the consolidated insights in technical conferences that gather local stakeholders, the CTJs indicate the courses of action.

Since the national government-led processes of just energy transition are currently ongoing in several Spanish regions, this paper takes the case of the province of León to illustrate the challenges and limitations that have been found. León is a fossil-dependent area, historically focused on coal mining and thermoelectric production, which has undergone a process of socioeconomic deterioration for three decades. It is now congregating the most relevant share of the interventions of the CTJs at a national level due to its strategic relevance.

The CTJs suffer from three types of limitations: those related to concept and design, diagnosis, and public participation. The CTJs focus exclusively on the quantification of impacts through affected jobs in direct terms and labour income at the moment of closure of the fossil facility. Thus, the plans relegate the environmental impacts of the abandonment of facilities and the natural ravages of fossil exploitation, neglecting indirect and induced impacts, which are considerable given the dependence of these areas on fossil industries, as well as the historical figures of occupation. Furthermore, they omit the analysis of the quality of jobs and the ambition for gender equality has not any real concretion in the final plans.

The biggest challenge to carry out the diagnosis is the unavailability of data at a municipal scale in reduced areas. Data concur with barrier criteria to delimit the areas of coverage. Such criteria are problematic and have required posterior correction to avoid incoherent selections of municipalities. Besides, although the plans are led by the national Government, they include limits to the autonomous community (regional level), thus generating potentially unjust choices due to the acceptance of political borders as social delimitations.

Finally, the SWOT analysis in León's just transition proposal lacks specificity, relying on outdated, redundant findings that fail to capture unique local conditions. This broad, repetitive approach limits the diagnostic value, obstructing the design of tailored strategies essential for addressing distinct regional needs, which could otherwise better support just energy transition efforts and resource allocation. These findings could serve to motivate discussion in Spain,

correct the processes, and prevent similar weaknesses in government-led plans for a just energy transition abroad.

Declaration of interest statement

The author reports there are no competing interests to declare.

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