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Overcoming five key challenges to make the energy transition a just labor transition

Luis Fernández Intriago, Sharan Burrow, Shouvik Chakraborty, Reza Daniels, Alan Finkelstein Shapiro, Helena Garcia, Raphael Heffron, Michael Jakob, Markus Janser, Suzi Kerr, Catherine Leining, Dave Maré, Mauro Pucheta, Daniel Raimi, Mandy Rambharos, Euan Richardson, Marcela Tarazona & Alessio Terzi



Shifting rapidly to a low-emissions global economy could severely disrupt workers' livelihoods and their communities, exacerbating inequalities and perpetuating injustice. In a Just Labor Transition, strategic policies prepare workers for new jobs, enable inclusive decision-making with meaningful participation of workers and their representatives (including labor unions and other collective organizations), and secure social license for change.

Delivering on the Paris Agreement's global temperature goal requires a rapid transition toward net-zero emissions. Climate neutrality will demand a comprehensive overhaul of energy, transportation, housing, agriculture, and manufacturing within under three decades¹. This structural shift will profoundly affect workers and communities, requiring avoidance of the painful adjustments seen with globalization and automation that led to concentrated job losses and economic distress². This commentary examines the Just Labor Transition from a mainstream economic perspective, focusing on policies supporting workers and communities through the energy transition; finally, it constitutes an important aspect of the broader literature on Just Energy Transitions and offers a complementary perspective to frameworks grounded in other social science disciplines.

A Just Labor Transition offers a promising path to achieve an equitable shift to a low-emissions economy by creating sustainable and decent work opportunities while safeguarding workers' and communities' rights, livelihoods, and well-being. Emerging from the international labor movement and acknowledged in the [Paris Agreement](#) as *"the imperatives of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities."* Furthermore, it should include the four pillars of decent work: social dialogue, social protection, rights at work, and employment³. Although this comment focuses on the labor aspects of just transition, the concept has evolved to encompass broader dimensions, including energy democracy, climate justice, and regional development⁴, but at its core, it remains about delivering justice and leaving no one behind⁵.

A successful energy transition must recognize people's importance while boosting productivity and reducing emissions. It is as much a social and economic challenge as an environmental one.

Without clear pathways to support their well-being, workers and communities may resist the transition, raising costs and climate risks. Addressing their needs today builds trust and shows the transition can lead to a better future for all.

Challenges and Solutions

Current policies and market forces reflecting business as usual are insufficient to reach net-zero emissions goals by and beyond 2050⁶, let alone ensure just outcomes for workers and communities^{7,8}. Solutions require coordinated policy interventions and inclusive decision-making, ensuring that all stakeholders, including local communities, unions, and other workers' representatives, have a voice in the transition.

Policymakers will need to address five critical challenges to ensure a Just Labor Transition:

Only limited overlap between displaced jobs and jobs created in green sectors

The number of green jobs emerging from the energy transition can be expected to exceed those in the fossil industries. For example, the [International Energy Agency's Net Zero by 2050](#) scenario projects that by 2030, while 5 million jobs may be lost in fossil fuel production, 14 million new jobs will be created in clean energy supply, with an additional 16 million workers needed in efficiency, automotive manufacturing, and construction sectors related to the transition⁹. Still, green jobs require different skill sets and will not necessarily be created in the same regions or time frame where workers will be displaced, thus creating distributional challenges and political tension. In particular, most displaced fossil fuel workers lack the skills needed in the green sectors and are likely to transition to sectors beyond clean energy (e.g., see refs. [10–13](#)). Evidence from India's coal sector shows that workers often prioritize job security over wage¹⁴.

Solutions must include retraining across diverse sectors, aligned with local opportunities, and developed with unions and workers' representatives. Long-term transition policies that embed climate goals into national development strategies are essential to guide investment and education. Effective transitions also require addressing power imbalances to ensure workers and communities have real influence in planning.

Labor market solutions from high-income countries will not always work well in low- and middle-income countries

Labor market policies used conventionally in high-income economies, as classified by the World Bank¹⁵, may not be effective when applied in low- and middle-income economies¹⁵, specific socio-economic,

regulatory, and sectoral contexts. For example, while strong labor protections are essential, poorly designed regulations may inadvertently increase informality in some developing countries without achieving the desired worker protection¹⁶. Institutional and technological capacity to implement complex labor market policies will vary across countries.

Low- and middle-income countries must design context-specific strategies, drawing from global lessons but addressing their unique challenges and capacities. Efforts like the World Bank's work on green job metrics tailored to low- and middle-income economies are a step forward¹⁷. The Global North and South can learn from each other, particularly regarding high labor standards, promoting social dialogue, ensuring workers have a seat at decision-making tables, and ending unfair labor practices, forced labor, and denying the right to organize. Existing platforms like the International Labor Organization should be expanded to focus on Just Labor Transition.

The needs of the informal workforce may be overlooked under conventional labor market policies

Supporting formal fossil fuel workers is crucial, but addressing the needs of informal workers, contractors, and local businesses is equally important. The informal workforce accounts for over 60% of the global labor force and 90% in low-income countries (those with a gross national income per capita of \$1145 or less in 2024¹⁵)¹⁸. Although the share is likely lower in emission-intensive occupations, informal employment (for example, in coal mining) raises concerns because of its lack of social protection, low wages, poor working conditions, limited access to education and training, and vulnerability to exploitation.

Investing in general education can prepare workers for higher-quality jobs with better working conditions. Expanded social security and innovative programs like cash transfers and guaranteed jobs can strengthen support for the informal workforce. Further, upskilling programs can help all workers facing transition adapt to new industries and secure more stable formal employment opportunities. Beyond economic support, informal workers must have representation in decision-making bodies responsible for transition policies, with Argentina's organized informal worker collectives ("organizaciones sociales") offering a potential model for effective participation¹⁹.

Place-based industrial policies have frequently been ineffective

The effectiveness record of revitalization policies targeting economically distressed areas has been mixed. Some studies have shown such initiatives have fallen short of their goals, with many failing to create lasting employment opportunities or stimulate long-term economic growth^{20,21}. At the same time, most workers have not proven keen to move.

Multi-dimensional approaches are needed to prioritize place-based job creation through strategic industrial policy. Governments should support distressed regions by creating favorable conditions for new industries, using tools like [Harvard's Growth Lab Greenplexity](#) to identify green value chain opportunities. Complementary upskilling and reskilling programs are essential to help workers access emerging jobs, addressing both geographic and skills mismatches.

The effectiveness of these approaches depends significantly on inclusive governance structures that give affected workers and communities genuine decision-making power. For example, Vietnam requires employer consultation with unions during restructuring and

supports firm retraining programs²², while [Spain's Just Transition Strategy](#) and its governance model involves unions, governments, and communities in transition planning. These cases demonstrate that worker participation leads to sustainable outcomes while addressing power imbalances.

Implementing the necessary policies requires substantial financial resources

Reskilling workers, enhancing social protection, economic diversification, and infrastructure development require significant public funds. Government budgetary flexibility is constrained by debt obligations, competing priorities, and financial volatility.

The [IPCC](#) projects annual low-carbon investment needs of 3–6 percent of world GDP (Gross Domestic Product) until 2032. Given these constraints, innovative financing mechanisms and international collaboration are essential to ensure progress without overburdening national budgets. In particular, carbon markets, public-private partnerships, Just Energy Transition Partnerships (JETPs), and climate-specific financing from multilateral development banks (MDBs) are promising approaches for international cooperation, but have not provided the necessary incentives for economic transformation. Extending partnerships to include elements of market access could also pave the way for accelerated energy transitions. For example, Studies of South Africa's JETP reveal how financing mechanisms must address complex socio-economic dependencies on coal, not just technical energy system changes²³. Furthermore, the different mechanisms need to reflect justice issues, particularly the inclusion of key stakeholders and the protection of workers.

Recommendations

The five challenge areas discussed above will grow in importance under mounting global pressures to decarbonize. A Just Labor Transition requires proactive planning and reactive measures to mitigate inequitable impacts on workers and communities. Long-term government planning with cross-party support can help attract investment in low-emission jobs and minimize fiscal impacts.

Just Labor Transition policies require inclusive, collaborative processes—co-created with stakeholders through active consultation (for example, as part of local and national just transition pathway programs). Targeted, proactive interventions tailored to industry and regional needs can protect human rights, enhance sustainability, and build resilient labor market solutions amid uncertainty about future job opportunities.

Research is needed to strengthen the evidence base for innovative labor market policies across contexts. Policymakers need clear indicators for continuous monitoring and evaluation of the policy's socioeconomic implications. Tools like the [Climate Investment Fund's Just Transition Planning Toolbox](#), [World Economic Forum's Energy Transition Index \(ETI\)](#), the Energy Justice Index for the Global South (ref. 24), and the Just Labor Transition Progress Scale (ref. 22) can help identify the needs of different countries.

Through a deeper understanding and commitment to evidence-based decision-making on labor market policies, countries can navigate the complex landscape of the global energy transition to deliver a Just Labor Transition. We firmly believe that the global energy transition will need to be just, or there will just be no transition.

While our commentary has focused primarily on mainstream economic policy mechanisms, successful Just Labor Transitions will ultimately require complementary approaches that address deeper

questions of power, representation, and systemic change. More research should explore integrating economic policy tools with broader social justice frameworks. The Just Transition also involves real people with unique and individual lives, and future research should account for this beyond macro-policy.

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Author contributions

E.D.F. and Motu explored the topic of Just Labor Transition as part of the EDF-Motu Dialogue on Just Transitions in Labor Markets. They selected L.F.I. to lead the dialogue process and serve as the lead writer of this commentary. L.F.I. selected the co-authors to increase diversity in expertise, geography, and perspectives across labor market experiences in both low-, middle-, and high-income countries. S.B., S.C., R.D., A.F.S., H.G., R.H., M.J., M.J., S.K., C.L., D.M., M.P., D.R., M.R., E.R., M.T., and A.T. all participated in the dialogue sessions and discussions about the structure and content of the commentary. All authors provided feedback and insights that informed the analysis and text put together by L.F.I. All authors reviewed and approved the final manuscript.

Competing interests

The authors declare no competing interests.

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