



Whose Energy Transition? Rethinking Energy Sovereignty, South–South Cooperation, and Community-Centered Governance from the Global South

Amina El Mekaoui^{1*}

¹ Centro de Investigaciones Regionales Dr. Hideyo Noguchi, Universidad Autónoma de Yucatán, Mérida, Yucatán, Mexico - ORCID: 0000-0002-6648-0743

* Corresponding author: amina.mekaoui@secihti.mx

Abstract. Energy transition is commonly framed as a universal technological pathway from fossil fuels to low-carbon systems. From the Global South, however, the central question is not only how rapidly energy systems decarbonize, but who controls the technologies, territories, finance, knowledge, and benefits through which decarbonization occurs. This article asks: whose energy transition is being built? It develops a critical conceptual framework connecting energy justice, energy sovereignty, South–South cooperation, and community-centered governance. Methodologically, the study undertakes a critical integrative review of peer-reviewed scholarship and comparative analytical reading of evidence from Mexico, Morocco, and wider Global South debates. It argues that neither renewable deployment nor South–South cooperation is inherently emancipatory. Both can reproduce centralized decision-making, territorial dispossession, technological dependency, and unequal benefit distribution. Building on research on Maya communities in southeastern Mexico and scholarship on Morocco’s large-scale solar transition, the article proposes a multiscalar model of energy sovereignty that links state capacity with community authority. It identifies five conditions for a transformative Global South transition: territorial recognition, meaningful decision-making power, distributive and restorative justice, endogenous technological capacity, and horizontal cooperation with accountability. South–South cooperation is therefore reconceptualized not as a geopolitical label but as a testable governance practice. The article concludes that a just transition from the Global South must redistribute not only energy sources, but also authority over energy futures.

Keywords: Global South; energy sovereignty; South–South cooperation; energy justice; just transition; community energy

Resumen. La transición energética suele presentarse como una ruta tecnológica universal desde los combustibles fósiles hacia sistemas de bajas emisiones. Desde el Sur Global, sin embargo, la

cuestión central no es únicamente la velocidad de la descarbonización, sino quién controla las tecnologías, los territorios, el financiamiento, el conocimiento y los beneficios mediante los cuales dicha transición ocurre. Este artículo pregunta: ¿de quién es la transición energética que se está construyendo? Se desarrolla un marco conceptual crítico que articula justicia energética, soberanía energética, cooperación Sur–Sur y gobernanza centrada en las comunidades. Metodológicamente, el estudio realiza una revisión integradora crítica de literatura académica arbitrada y una lectura analítica comparada de evidencia proveniente de México, Marruecos y debates más amplios del Sur Global. Se sostiene que ni el despliegue de energías renovables ni la cooperación Sur–Sur son inherentemente emancipatorios: ambos pueden reproducir decisiones centralizadas, desposesión territorial, dependencia tecnológica y distribución desigual de beneficios. A partir de investigaciones sobre comunidades mayas del sureste de México y estudios de la transición solar marroquí, se propone un modelo multiescalar de soberanía energética que vincula capacidad estatal con autoridad comunitaria. Se identifican cinco condiciones para una transición transformadora: reconocimiento territorial, poder efectivo de decisión, justicia distributiva y restaurativa, capacidades tecnológicas endógenas y cooperación horizontal con rendición de cuentas. La conclusión sostiene que una transición justa desde el Sur Global debe redistribuir no sólo las fuentes de energía, sino también la autoridad sobre los futuros energéticos.

Palabras clave: Sur Global; soberanía energética; cooperación Sur–Sur; justicia energética; transición justa; energía comunitaria

1. Introduction

The energy transition has become one of the defining political projects of the twenty-first century. Yet the apparent consensus surrounding decarbonization often conceals a more difficult question: transition toward what, designed by whom, financed under whose conditions, and for whose benefit? The dominant policy vocabulary treats the transition as a shift in technological composition—less coal, oil, and gas; more solar, wind, storage, electrification, and efficiency. Such a description is indispensable but insufficient. Energy systems are simultaneously infrastructures, property regimes, territorial arrangements, labor systems, regulatory architectures, and distributions of political authority. Changing the source of electrons does not necessarily change the social relations through which energy is produced and governed.

This problem is particularly visible from the Global South. Many Southern countries must decarbonize while simultaneously expanding reliable and affordable energy access, addressing

infrastructural deficits, financing development, and responding to climate impacts for which they bear comparatively limited historical responsibility. Research increasingly demonstrates that the justice implications of these transitions cannot be captured by models derived exclusively from high-income settings. Castán Broto et al. (2018), for example, argue that energy justice in postcolonial contexts requires situated approaches attentive to autonomy and self-determination. More recent work has similarly questioned whether universalized justice frameworks adequately capture coloniality, territorial conflict, and culturally differentiated energy relations (Tornel, 2023; De las Heras & Gupta, 2024).

The Global South is not treated here as a homogeneous geographical bloc. It is an analytical and political category that draws attention to historically produced asymmetries in finance, technology, trade, extraction, and knowledge. Countries commonly grouped within the South differ profoundly in income, state capacity, political regime, energy endowment, industrial structure, and geopolitical power. Indeed, the category can obscure internal hierarchies if it is used carelessly. For this reason, the article employs the Global South relationally: to examine how energy transitions are structured by unequal positions in the world economy while also asking how inequalities are reproduced within Southern states and territories.

This relational approach matters because low-carbon transitions can create new forms of dependency even while reducing dependence on fossil fuels. Solar modules, batteries, critical minerals, digital control systems, financing instruments, patents, and grid technologies are embedded in global value chains. A country may improve its renewable-energy share while remaining dependent on external technology, capital, or expertise. At the same time, national energy sovereignty can be pursued through projects that displace costs onto rural, Indigenous, or otherwise marginalized communities. State autonomy and community autonomy therefore cannot be assumed to coincide.

Amina El Mekaoui's previous research provides an instructive entry point into this tension. Her work on San José Tipceh in Yucatán examined the Mexican energy transition through the experience of a Maya community, highlighting the social and political dimensions of renewable-energy megaprojects (El Mekaoui & Baños Ramírez, 2021). Subsequent work developed an adaptive-participative approach to sustainable energy through solar pumping in a Maya community, emphasizing empowerment and community participation (El Mekaoui et al., 2024). This trajectory—from observing the local effects of large projects to analyzing participatory

alternatives—raises a broader theoretical question: how can lessons from community-centered energy governance inform the architecture of energy transition at national and transnational scales?

This article addresses that question through the provocative formulation “Whose energy transition?” It asks how energy sovereignty and South–South cooperation can be reconceptualized from the Global South so that decarbonization redistributes decision-making power rather than merely substituting technologies. The central argument is that a transformative energy transition requires two linked forms of sovereignty: state energy sovereignty, understood as the capacity to shape national energy futures without structurally subordinating dependence, and community energy sovereignty, understood as the effective capacity of affected communities to influence, co-design, benefit from, and where appropriate control energy systems in their territories. Neither scale is sufficient alone.

The article makes three contributions. First, it connects literatures that are often discussed separately: energy justice, energy sovereignty, South–South cooperation, and community energy governance. Second, it uses evidence from Mexico and Morocco as analytically productive sites—not as perfectly symmetrical case studies—to show how renewable transitions can simultaneously advance national goals and reproduce local asymmetries. Third, it proposes a five-dimensional framework for evaluating whether South–South energy cooperation is genuinely horizontal and sovereignty-enhancing. The aim is not to romanticize the South or community governance, but to establish criteria by which claims of justice, sovereignty, and horizontality can be evaluated.

2. Conceptual Framework: From Energy Justice to Energy Sovereignty

Energy justice has become a major interdisciplinary framework for evaluating the distribution of energy benefits and burdens, participation in energy decision-making, and recognition of affected groups. The now-familiar triad of distributive, procedural, and recognition justice has provided a productive vocabulary for examining energy poverty, infrastructure siting, affordability, and transition policy. Yet the framework has also been criticized for insufficient attention to colonial histories, political economy, and the ontological plurality of energy relations. Tornel (2023) argues that without a decolonial critique, energy justice risks reproducing the very hegemonic relations it seeks to transform. Baasch (2023) similarly emphasizes the need to recognize multiple energy justices rather than assume a single universal model.

For the Global South, these critiques are not peripheral. Energy infrastructure has historically been connected to colonial extraction, centralized state-building, and unequal incorporation into

global markets. Contemporary renewable systems may differ technologically from fossil infrastructures while reproducing familiar patterns of land acquisition, enclave development, external financing, and unequal value capture. The concept of “energy colonialism” has therefore been used to analyze how corporate low-carbon transitions may reproduce neo-extractive relations in both Southern territories and peripheral regions of the North (Sánchez Contreras et al., 2023). The analytical point is not that renewable energy is equivalent to fossil extraction, but that technological greenness does not automatically produce social justice.

Energy sovereignty adds a distinct dimension because it foregrounds self-determination and non-domination. Timmermann and Noboa (2022) conceptualize energy sovereignty in terms of the capacity of people to determine energy systems and emphasize access to productive means, information, organizational capabilities, and participatory policy. Earlier Global South scholarship also linked sovereignty with autonomy and the need to develop energy justice beyond universalist assumptions (Castán Broto et al., 2018). Recent work on “energy sovereignty from below” further emphasizes territorial movements that seek control over the definition, modalities, and scales of socioecological transition (Andreucci et al., 2025).

This article distinguishes sovereignty from autarky. Energy sovereignty does not require complete national self-sufficiency, isolation from markets, or rejection of international cooperation. Modern energy systems are technologically and financially interdependent. The relevant question is whether interdependence is governed under conditions that preserve meaningful agency. Sovereignty is therefore better understood as the capacity to negotiate interdependence without domination and to retain sufficient authority to define priorities, distribute benefits, protect rights, and develop endogenous capabilities.

At the state scale, this includes diversified supply, regulatory capacity, technological learning, resilient infrastructure, and the ability to avoid excessive dependence on a single foreign supplier, lender, or technology. At the community scale, it includes recognition of territorial rights, access to information, meaningful participation before decisions become irreversible, benefit-sharing, the capacity to reject or reshape projects, and opportunities for local ownership or co-governance. These two scales can conflict. A state may invoke national energy sovereignty to justify a megaproject while limiting community autonomy. Conversely, local control without broader public coordination can be insufficient to provide universal access, grid stability, or national decarbonization.

The analytical challenge is therefore multiscalar: a just transition must increase collective capacity at one scale without producing domination at another. This is especially important in Indigenous territories, where energy projects intersect with land, cultural identity, customary governance, livelihoods, and historical dispossession. Research published in 2026 on Indigenous peoples and renewable energy confirms the paradox that technologies celebrated for planetary sustainability can generate new injustices when deployed in or near Indigenous territories without adequate recognition and control (Long et al., 2026).

From this perspective, the phrase “Whose energy transition?” is not rhetorical decoration. It is an analytical device that shifts attention from installed capacity to authority. It asks who defines the problem, selects technologies, controls finance, owns infrastructure, determines land use, produces knowledge, bears risk, and captures value. A transition can be rapid in megawatts yet shallow in sovereignty.

3. South–South Cooperation: Promise, Ambivalence, and Energy Governance

South–South cooperation (SSC) emerged from histories of anti-colonial solidarity, non-alignment, and efforts to transform unequal international economic relations. Contemporary SSC encompasses trade, investment, technical cooperation, policy transfer, scientific exchange, development finance, and institutional partnerships. Gray and Gills (2016) describe its resurgence as part of the growing political and economic significance of the Global South. Yet the category contains a persistent tension: cooperation among Southern states can challenge North–South hierarchies, but it can also reproduce asymmetric relations among Southern partners.

This tension is especially relevant in energy. Clean-energy technology trade among Southern economies has expanded, and South–South flows include photovoltaic equipment, hydropower technologies, electric mobility, finance, and engineering services. Quitzow et al. (2020) showed that South–South trade in clean-energy technologies is not marginal to global low-carbon transformation. More recent research on China’s renewable-energy role in Africa emphasizes the importance of financing structures, technology transfer, host-country institutions, and capacity building in determining whether cooperation produces durable development benefits (Odoom & Chiyemura, 2026).

The normative language of horizontality must therefore be treated as a hypothesis rather than a fact. Southern partners vary dramatically in market power, industrial capacity, access to finance, and diplomatic leverage. Cooperation can be formally South–South while functionally

reproducing dependency if one partner exports turnkey infrastructure, retains technological control, captures most value added, or transfers environmental and social costs to weaker territories. Conversely, cooperation can strengthen sovereignty when it builds local capabilities, diversifies technological options, supports joint research, develops regional value chains, and expands the bargaining space of recipient countries.

The same principle applies below the state. A project negotiated between two Southern governments is not necessarily horizontal from the perspective of the community where infrastructure is located. This is a central blind spot in conventional SSC discourse. State-to-state equality does not guarantee state-to-community justice. A genuinely transformative South–South energy agenda must therefore be evaluated simultaneously across international, national, and territorial scales.

This article proposes five tests for sovereignty-enhancing SSC in energy. First is the capability test: does cooperation transfer knowledge and create endogenous technological, regulatory, and scientific capacity? Second is the distribution test: are economic benefits, risks, and value added shared in ways that reduce rather than deepen asymmetry? Third is the governance test: are affected communities and subnational institutions able to participate meaningfully in decisions? Fourth is the territorial test: are land, water, cultural, and livelihood impacts recognized and remedied? Fifth is the reversibility and accountability test: are agreements transparent, reviewable, and institutionally capable of correcting harmful outcomes?

These criteria distinguish solidarity as rhetoric from solidarity as institutional design. They also connect SSC with energy sovereignty. Cooperation becomes sovereignty-enhancing when it expands the capacity of partners and communities to make future choices. It becomes sovereignty-reducing when it locks actors into technologies, debts, contracts, or territorial arrangements that they cannot meaningfully alter.

4. Methodology: A Critical Integrative and Comparative Analytical Approach

The study uses a critical integrative review combined with comparative analytical reading. It is conceptual rather than a new primary field study. The corpus combines peer-reviewed scholarship on energy justice, energy sovereignty, just transition, South–South cooperation, and Global South energy governance with published empirical research on Mexico and Morocco. Particular attention is given to studies that examine territorial impacts, community participation,



Indigenous rights, technological dependence, and the political economy of renewable-energy deployment.

The review was organized around four clusters: (1) energy justice and postcolonial/decolonial critiques; (2) energy sovereignty and community control; (3) South–South cooperation, policy transfer, and clean-energy trade; and (4) empirical scholarship on renewable transitions in Mexico and Morocco. The author’s previous publications on Maya communities are treated as part of the empirical literature rather than as new data. This distinction is important: the article does not claim new interviews, participant observation, or project-level measurements.

Mexico and Morocco are used as analytical anchors because both illustrate central Global South dilemmas while occupying different regional and political positions. Mexico combines significant renewable resources, an industrialized economy, persistent territorial inequalities, Indigenous rights claims, and repeated changes in energy governance. Morocco has pursued a highly visible renewable-energy strategy, particularly large-scale solar development, while scholarship has documented tensions involving land, centralized governance, livelihoods, and local participation. The comparison is heuristic rather than controlled: the purpose is to identify recurring governance mechanisms and contrasts that illuminate the proposed framework.

The analytical unit is not the country as a whole but the governance relation surrounding energy transition. Evidence is coded conceptually according to five dimensions: authority, territory, distribution, capability, and cooperation. The analysis asks whether each governance arrangement expands or restricts the capacity of states and communities to shape energy futures. This approach avoids treating renewable deployment as a proxy for justice and avoids treating SSC as inherently horizontal.

5. Mexico: From Renewable Megaprojects to Community-Centered Energy

Mexico demonstrates why the social content of energy transition cannot be inferred from the technological category of a project. Renewable-energy expansion has intersected with agrarian property, Indigenous territories, consultation, local livelihoods, national energy reform, and changing models of state-market coordination. El Mekaoui and Baños Ramírez (2021), studying San José Tipceh in Yucatán, showed how a renewable-energy megaproject became a site of negotiation among community, government, and corporate actors. Their analysis challenged the assumption that renewable infrastructure is socially sustainable merely because its energy source is low-carbon.

Earlier work by El Mekaoui et al. (2020) similarly examined sustainability, sociocultural challenges, and the power relations associated with renewable-energy megaprojects in a Maya community. The significance of this literature lies in its attention to the institutional and cultural environment into which energy technologies are inserted. Projects encounter pre-existing land regimes, collective identities, histories of marginalization, and local forms of authority. When these dimensions are treated as implementation obstacles rather than constitutive elements of governance, procedural participation can become a mechanism for legitimizing decisions already made.

The Mexican case also demonstrates the limits of reducing transition politics to a binary opposition between centralized megaprojects and local resistance. Community-centered alternatives can involve technological innovation, public institutions, universities, and external expertise. El Mekaoui et al. (2024), for example, developed an adaptive-participative approach to solar pumping with a Maya community. The relevant distinction is therefore not external versus local technology, but whether technological systems are designed through relations that build local capabilities and respond to locally defined needs.

This distinction is crucial for energy sovereignty. A community does not become sovereign merely because a solar panel is physically located within its territory. Sovereignty depends on the governance of the system: who selected the technology, who understands and can repair it, who owns the equipment, who pays replacement costs, how water or other resources are governed, how benefits are distributed, and whether the community can modify the arrangement. Technological access without institutional capacity can produce a new dependency at a smaller scale.

The lifecycle dimension reinforces this point. Research involving El Mekaoui has examined photovoltaic-panel recycling and life-cycle impacts, showing that renewable sustainability extends beyond operational emissions to transportation, end-of-life management, and social and environmental dimensions (Hernández-López et al., 2022; Hernández-López et al., 2024). A sovereignty framework must therefore include control over technological lifecycles and waste, not merely generation.

Recent work on sustainable Indigenous energies in southeastern Mexico extends the argument toward resilience. Guzmán et al. (2025) connect risk management, Indigenous energy systems, and climate resilience in Maya communities. Taken together, this body of work suggests a progression from critique of externally structured megaprojects toward models in which communities participate in defining energy needs, technologies, and risk strategies. The broader

lesson is that justice is not an external social safeguard attached to transition; it is part of the architecture that determines whether transition is sustainable.

Mexico also illustrates the importance of national institutional volatility. Energy sovereignty at the state level can be invoked in competing ways: market liberalization may be defended as a route to investment and technological modernization, while stronger public control may be defended as protection against external dependence. El Mekaoui and coauthors analyzed the structural changes and implementation challenges associated with the 2013 energy reform, underscoring that regulatory transformation does not automatically resolve institutional and social tensions (Cruz May et al., 2022). A multiscalar approach therefore asks not only whether the state or market is stronger, but whether governance arrangements enhance democratic capacity, technological learning, territorial justice, and long-term resilience.

6. Morocco: Green Leadership and the Territorial Politics of Scale

Morocco offers a different but complementary perspective. Its renewable-energy strategy has made the country an important reference in African and Global South transition debates. The Noor Ouarzazate complex became emblematic of large-scale solar ambition and state-led green modernization. Yet scholarship on the project demonstrates the gap that can emerge between national transition success and local justice.

Rignall (2016) analyzed the Ouarzazate solar project as a political and territorial project, showing how land acquisition drew on institutional practices with colonial genealogies and how community demands were translated into technocratic development problems. Ryser (2019) further examined the effects of large-scale land acquisition on communal resources and gendered livelihoods, arguing that official development narratives can obscure losses of access to land, water, and common-pool resources. These studies complicate celebratory accounts of renewable-energy leadership.

At the same time, the Moroccan evidence is not reducible to a simple story of failure. Terrapon-Pfaff et al. (2019) found differentiated social impacts around Noor I and emphasized information management and benefit distribution as significant determinants of livelihood outcomes. The implication is that infrastructure scale alone does not determine justice; governance design matters. However, large centralized projects create specific challenges because decisions concerning finance, land, technology, and grid integration are often made far from affected communities.



Okpanachi et al. (2022) explicitly connect Morocco's experience to energy sovereignty and just transition, drawing lessons for West Africa from issues of ownership, land use, livelihoods, and environmental footprints. Their analysis is especially relevant to the present argument because it demonstrates that a project can strengthen national renewable capacity while raising unresolved questions about whose sovereignty is being advanced. National energy strategy and local territorial authority can move in different directions.

Morocco also reveals why the Global South should not be treated only as a recipient of transition policy. The country has developed institutional experience, renewable-energy expertise, diplomatic visibility, and potential for knowledge exchange with other African and Southern partners. This creates opportunities for South–South learning. But policy transfer should not reproduce only the visible technical features of successful projects. If other Southern countries learn from Morocco, the lessons must include the governance controversies surrounding land, participation, benefit distribution, and centralization.

This point transforms comparative learning. Conventional policy transfer often asks which technologies or institutions can be replicated. A sovereignty-centered approach asks which relations should not be replicated and which institutional safeguards are necessary for adaptation. South–South cooperation becomes more valuable when it transfers not only success stories but also critical knowledge about conflict, failure, and unintended effects.

7. Whose Energy Transition? A Multiscalar Model of Sovereignty

The Mexican and Moroccan literatures converge on a central proposition: renewable energy can advance decarbonization while leaving underlying distributions of authority largely intact. This does not make transition meaningless; it makes governance decisive. The question “Whose energy transition?” can therefore be operationalized through five dimensions.

First, territorial recognition asks whether energy planning recognizes land as more than an empty surface for infrastructure. Territory can embody livelihoods, collective property, cultural identity, ecological relations, and political authority. A just transition must identify these relations before siting decisions are finalized. Recognition also requires attention to differentiated impacts within communities, including gender, age, class, and livelihood.

Second, decision-making power goes beyond consultation as information delivery. Procedural justice requires institutions capable of changing project design in response to affected actors. Community participation that begins after core technological, financial, and territorial decisions

have been fixed is structurally limited. Community energy sovereignty therefore requires participation early enough to influence scale, ownership, siting, technology, and benefit arrangements.

Third, distributive and restorative justice asks who receives electricity, revenue, employment, infrastructure, skills, and ownership, and who bears land loss, environmental risk, debt, or technological obsolescence. Compensation cannot be treated as equivalent to justice when a project transforms collective resources or social relations. Restorative mechanisms are necessary where transition projects generate identifiable harms.

Fourth, endogenous capability concerns the knowledge and material capacity to sustain energy systems. Technology transfer should be assessed not by the arrival of equipment but by the creation of engineering, maintenance, manufacturing, regulatory, scientific, and organizational capabilities. This dimension connects state and community sovereignty. National industrial policy and local technical training are different scales of the same problem: whether actors can govern systems after external experts or financing cycles end.

Fifth, horizontal cooperation with accountability applies these principles to South–South relations. Cooperation should diversify options rather than create new lock-in; build joint capacity rather than reproduce turnkey dependency; and include mechanisms for transparency, social safeguards, and learning from affected territories. The “South” in South–South cooperation cannot refer only to governments. Universities, municipalities, communities, cooperatives, public enterprises, civil-society organizations, and Indigenous institutions are also potential agents of horizontal exchange.

These dimensions can be represented as a nested model. State sovereignty provides the macro-capacity to negotiate global markets, finance, and technology. Community sovereignty provides the territorial legitimacy and situated knowledge necessary for socially sustainable implementation. South–South cooperation can connect the two by expanding technological and policy options. Energy justice provides the normative criteria through which outcomes are evaluated. The model rejects the assumption that sovereignty is a zero-sum choice between state and community. Properly designed institutions can create shared or layered sovereignty, although tensions will remain.

The framework also clarifies what does not count as transformative transition. A renewable project financed by a Southern bank, built by a Southern company, and endorsed by a Southern government is not necessarily South–South justice if affected communities lack decision-making

power and most technological value remains external to the host territory. Likewise, a small community project is not automatically sovereign if it depends on inaccessible proprietary technology, lacks maintenance capacity, or distributes benefits unequally. Scale and origin are insufficient; governance relations must be examined.

8. Toward a South–South Energy Sovereignty Agenda

If South–South cooperation is to contribute to a distinctive Global South transition, it should be organized around capability, reciprocity, and territorial accountability. This requires moving beyond the transfer of finished technologies toward co-development. Joint research programs, open technical standards, regional training networks, public-interest intellectual-property arrangements, shared laboratories, and reciprocal mobility of engineers and social scientists can create forms of cooperation that expand the technological agency of partners.

A second priority is to link energy cooperation with social-science and legal expertise. Transition programs frequently privilege engineering and finance while treating participation, land tenure, cultural rights, and conflict as secondary implementation issues. The Mexican and Moroccan cases show why this hierarchy is counterproductive. Social legitimacy, land governance, and community knowledge affect project durability and therefore belong within core energy planning.

Third, South–South cooperation should develop community-to-community and institution-to-community channels. Most SSC remains state-centered. Yet many of the most innovative energy practices emerge from municipalities, cooperatives, Indigenous organizations, universities, and local technical networks. Horizontal exchange among these actors could circulate knowledge about solar pumping, microgrids, community ownership, maintenance, water-energy governance, and culturally appropriate participation without requiring every lesson to pass through central diplomatic institutions.

Fourth, financing should be evaluated through sovereignty effects. Low-cost capital is important, but debt structure, procurement conditions, currency risk, ownership, and revenue allocation shape long-term autonomy. A project that accelerates renewable deployment while creating unmanageable fiscal or technological dependence can weaken sovereignty. Financing criteria should therefore incorporate local value creation, capability development, and social accountability.

Fifth, Global South energy cooperation requires epistemic plurality. Technical models developed for one context cannot simply be transferred to another. Energy demand, reliability, land use, cultural meanings, and acceptable governance arrangements vary. The objective is not to reject universal scientific knowledge but to combine it with situated knowledge and plural development priorities. Recent scholarship on Global South energy communication similarly shows that transition is interpreted through survival, trust, local control, and culturally specific meanings rather than through decarbonization metrics alone.

Finally, the Global South itself must remain open to critique. The category can become a diplomatic shield that obscures domestic inequality or the expansion of powerful Southern corporations. Santer (2025) warns that invocations of the Global South can flatten internal power struggles. A sovereignty agenda must therefore be reflexive: it should challenge North–South asymmetry without assuming moral equivalence among all Southern actors or treating national sovereignty as a substitute for social justice.

The practical implication is a shift in evaluation. Instead of asking only how many megawatts were installed, how much carbon was avoided, or how much investment was mobilized, transition assessment should ask how much decision-making capacity was created, how much technological learning remained locally, how benefits were distributed, whether affected groups could alter decisions, and whether cooperation expanded future options. These are measurable governance questions, not abstract ethical aspirations.

9. Discussion

The proposed framework helps reconcile several debates that are often separated. Energy justice identifies distributive, procedural, recognition, restorative, and broader cosmopolitan concerns. Energy sovereignty adds the question of who possesses the capacity to decide. Decolonial and political-ecology approaches reveal how apparently neutral transition infrastructures can reproduce historical relations of dispossession. South–South cooperation introduces an international mechanism through which technological and institutional alternatives might be developed. Community-centered governance grounds these debates in the territorial scale where many transition consequences are lived.

The framework also reveals a central contradiction in contemporary climate governance. Rapid decarbonization is urgent, but speed can be invoked to compress democratic processes. Conversely, procedural complexity can be used to delay necessary infrastructure indefinitely. The



solution is not to choose between justice and speed. It is to design institutions in advance so that recognition, participation, benefit sharing, and capability development are built into transition pathways rather than negotiated only after conflict emerges.

From the Global South, this institutional challenge is intensified by fiscal constraints and unequal access to capital. Countries may accept externally structured projects because available alternatives are limited. South–South cooperation can expand those alternatives, but only if it avoids reproducing the same asymmetries. The most meaningful measure of cooperation is therefore whether it increases the recipient’s future bargaining power and capacity for autonomous choice.

This argument also has implications for research. Global South energy scholarship should move beyond a division in which Northern institutions produce theory while Southern cases provide empirical illustration. The experiences of Maya communities, Moroccan territorial politics, African energy access, Latin American energy democracy, and Asian industrial transformation are not deviations from a universal transition model; they are sites from which transition theory itself should be reconstructed. The Global South is thus not only a location of transition but a source of concepts.

Energy sovereignty is one such concept, but it must remain analytically precise. If it becomes synonymous with any national energy policy, it loses critical value. The multiscalar approach proposed here defines sovereignty through capabilities and non-domination rather than ownership alone. Public ownership may strengthen sovereignty under some conditions, but centralized public systems can marginalize communities. Private or cooperative arrangements may empower local actors under some conditions, but can also fragment provision or reproduce market inequalities. Institutional form must be evaluated through effects on authority, capability, distribution, and accountability.

The article has limitations. It is a conceptual and integrative study rather than a systematic review or new comparative field investigation. Mexico and Morocco are used as analytical anchors, and the evidence cannot represent the diversity of the Global South. Future research should test the five-dimensional framework across additional countries and project types, including distributed solar, wind corridors, green hydrogen, critical-mineral extraction, storage, and regional grids. Quantitative indicators could complement qualitative assessment, particularly in measuring local value capture, participation, technological learning, and ownership.

10. Conclusions

The question “Whose energy transition?” exposes what carbon metrics alone cannot answer. Decarbonization changes energy sources; justice requires changing the governance relations through which energy futures are decided. For the Global South, this distinction is decisive because transitions unfold within historical and contemporary asymmetries of finance, technology, territory, and political power.

This article has argued that energy sovereignty should be understood at both state and community scales. State sovereignty concerns the capacity to negotiate interdependence, develop technological and regulatory capabilities, and pursue energy goals without structurally subordinating dependency. Community sovereignty concerns meaningful authority over projects, territories, benefits, risks, and knowledge. A transition that strengthens one while eroding the other remains incomplete.

South–South cooperation can help bridge these scales, but it is not inherently emancipatory. Its transformative potential depends on whether cooperation creates endogenous capability, distributes value fairly, recognizes territorial rights, includes affected communities, and remains accountable and revisable. Horizontality must be demonstrated institutionally rather than assumed geopolitically.

Mexico and Morocco illustrate both the promise and the danger. Renewable energy can support national climate and energy objectives while generating local conflicts over land, livelihoods, participation, and benefit distribution. Community-centered experiences, meanwhile, demonstrate that technological innovation can be combined with locally defined needs and participatory governance. The lesson is not that small is always just or that large is always unjust. It is that scale must be governed through institutions that distribute authority.

A Global South energy transition should therefore be judged by more than installed renewable capacity. It should be judged by the new capabilities it creates, the dependencies it reduces or reproduces, the communities it recognizes, the knowledge it values, and the futures it leaves open. The transition becomes genuinely transformative when the answer to “whose energy transition?” is no longer confined to states, investors, or technology providers, but includes the societies and territories whose lives are being reorganized in the name of a low-carbon future.

Table 1. A multiscale framework for evaluating energy sovereignty in the Global South

Dimension	Core question	State scale	Community / SSC scale
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Territorial recognition	Whose land, resources, and identities are implicated?	Legal recognition and spatial planning	Territorial rights, differentiated impacts, local knowledge
Decision-making power	Who can alter project choices?	Regulatory autonomy and policy capacity	Early participation, co-design, consent/negotiation mechanisms
Distribution & restoration	Who receives benefits and bears costs?	National value capture and universal access	Benefit sharing, remedies, livelihood protection
Endogenous capability	Who can operate, repair, adapt, and innovate?	Industrial, scientific, and regulatory learning	Local technical skills, ownership, maintainability
Horizontal cooperation	Does cooperation expand future choices?	Diversified partners, transparent finance	Reciprocity, accountability, community/institutional exchange

Note. The framework synthesizes the article's argument and is intended for comparative application across energy projects, national strategies, and South–South cooperation arrangements.

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12. References

- Andreucci, D., García-López, G., & Franquesa, J. (2025). Energy sovereignty from below: Visions and practices of socioecological transformation in Puerto Rico and Catalonia. *Human Geography*, 18(2), 162–177. <https://doi.org/10.1177/19427786251317182>
- Apergi, M., Eicke, L., Goldthau, A., Hashem, M., Huneus, S., Lima de Oliveira, R., Otieno, M., Schuch, E., & Veit, K. (2024). An energy justice index for the energy transition in the Global South. *Renewable and Sustainable Energy Reviews*, 192, 114238. <https://doi.org/10.1016/j.rser.2023.114238>
- Baasch, S. (2023). Towards an integrative understanding of multiple energy justices. *Geographica Helvetica*, 78(4), 547–558. <https://doi.org/10.5194/gh-78-547-2023>

-
- Castán Broto, V., Baptista, I., Kirshner, J., Smith, S., & Neves Alves, S. (2018). Energy justice and sustainability transitions in Mozambique. *Applied Energy*, 228, 645–655. <https://doi.org/10.1016/j.apenergy.2018.06.057>
- Cruz May, E., El Mekaoui, A., Livas-García, A., Mejía-Montero, A., & Bassam, A. (2022). Towards the liberalization of the energy market: Structural changes and implementation challenges of the 2013 Mexican energy reform insights in the energy nexus. *Energy Nexus*, 5, 100045. <https://doi.org/10.1016/j.nexus.2022.100045>
- De las Heras, A., & Gupta, J. (2024). Fossil fuels, stranded assets, and the energy transition in the Global South: A systematic literature review. *WIREs Climate Change*, 15(1), e866. <https://doi.org/10.1002/wcc.866>
- El Mekaoui, A., & Baños Ramírez, O. (2021). La transición energética mexicana en una comunidad maya: El caso de San José Tipceh, Yucatán. *Región y Sociedad*, 33, e1417. <https://doi.org/10.22198/rys2021/33/1417>
- El Mekaoui, A., Cetina-Quñones, A. J., Casillas-Reyes, A., San-Pedro, L., Tapia, J., Canto-Esquivel, J.-C., & Bassam, A. (2024). Empowering indigenous groups: Unveiling a new approach to adaptive-participative sustainable energy in solar pumping projects via a Mayan community in Central America. *Energy Research & Social Science*, 114, 103589. <https://doi.org/10.1016/j.erss.2024.103589>
- El Mekaoui, A., Tariq, R., Baños Ramírez, O., & Méndez-Monroy, P. E. (2020). Sustainability, sociocultural challenges, and new power of capitalism for renewable energy megaprojects in an Indigenous Mayan community of Mexico. *Sustainability*, 12(18), 7432. <https://doi.org/10.3390/su12187432>
- Gonda, N. (2025). Democratizing energy justice: Rethinking energy justice in authoritarian times. *Progress in Environmental Geography*, 4(2), 208–229. <https://doi.org/10.1177/27539687251342264>
- Gray, K., & Gills, B. K. (2016). South–South cooperation and the rise of the Global South. *Third World Quarterly*, 37(4), 557–574. <https://doi.org/10.1080/01436597.2015.1128817>
- Guzmán, G., El Mekaoui, A., Torres Wong, M., Cetina-Quñones, A. J., Bassam, A., & Castro-Salazar, J. I. (2025). Risk management in sustainable indigenous energies in the Mexican southeast: Towards new resilience routes for Mayan communities to climate change. *Energy Research & Social Science*, 104194. <https://doi.org/10.1016/j.erss.2025.104194>
- Hernández-López, D.-A., Tariq, R., El Mekaoui, A., Bassam, A., Vega De Lille, M., Ricalde, L. J., & Riech, I. (2022). Does recycling solar panels make this renewable resource sustainable? Evidence supported by environmental, economic, and social dimensions. *Sustainable Cities and Society*, 77, 103539. <https://doi.org/10.1016/j.scs.2021.103539>
- Hernández-López, D.-A., Vega-De-Lille, M. I., Sacramento-Rivero, J. C., Ponce-Caballero, C., El-Mekaoui, A., & Navarro-Pineda, F. (2024). Life cycle assessment of photovoltaic panels including transportation and two end-of-life scenarios: Shaping a sustainable future for renewable energy. *Renewable Energy Focus*, 51, 100649. <https://doi.org/10.1016/j.ref.2024.100649>
- Long, L. A. N., Lee, D., & Kim, R. E. (2026). Indigenous peoples and renewable energy: Impacts, contestations, and collective action. *Environmental Research Letters*, 21(7), 073002. <https://doi.org/10.1088/1748-9326/ae5674>

- McCauley, D., Ramasar, V., Heffron, R. J., Sovacool, B. K., Mebratu, D., & Mundaca, L. (2019). Energy justice in the transition to low carbon energy systems: Exploring key themes in interdisciplinary research. *Applied Energy*, 233–234, 916–921. <https://doi.org/10.1016/j.apenergy.2018.10.005>
- Odoom, I., & Chiyemura, F. (2026). From North–South to South–South cooperation: China’s role in renewable energy development in Africa. In V. T. Tang, K. T. Hanson, K. P. Pupilampu, & P. Arthur (Eds.), *Green development and finance in a globalized Africa* (pp. 19–45). Palgrave Macmillan. https://doi.org/10.1007/978-3-032-04703-8_2
- Okpanachi, E., Ambe-Uva, T., & Fassih, A. (2022). Energy regime reconfiguration and just transitions in the Global South: Lessons for West Africa from Morocco’s comparative experience. *Futures*, 139, 102934. <https://doi.org/10.1016/j.futures.2022.102934>
- Oliveira, O. P. de, & Milani, C. R. S. (2022). Brazilian perspectives on policy transfer and South–South cooperation. *Contexto Internacional*, 44(1). <https://doi.org/10.1590/S0102-8529.20224401e20210059>
- Quitrow, R., Bersalli, G., Eicke, L., Jahn, J., Lilliestam, J., Lira, F., Marian, A., Süsner, D., Thapar, S., Weko, S., Williams, S., & Xue, B. (2020). The greening of South–South trade: Levels, growth, and specialization of trade in clean energy technologies between countries in the Global South. *Renewable Energy*, 160, 931–943. <https://doi.org/10.1016/j.renene.2020.06.014>
- Rignall, K. E. (2016). Solar power, state power, and the politics of energy transition in pre-Saharan Morocco. *Environment and Planning A: Economy and Space*, 48(3), 540–557. <https://doi.org/10.1177/0308518X15619176>
- Ryser, S. (2019). The anti-politics machine of green energy development: The Moroccan solar project in Ouarzazate and its impact on gendered local communities. *Land*, 8(6), 100. <https://doi.org/10.3390/land8060100>
- Sánchez Contreras, J., Matarán Ruiz, A., & Campos-Celador, Á. (2023). Energy colonialism: A category to analyse the corporate energy transition in the Global South and North. *Land*, 12(6), 1241. <https://doi.org/10.3390/land12061241>
- Santer, K. O. (2025). Locating the Global South across carbon borders. *Economy and Society*. Advance online publication. <https://doi.org/10.1080/03085147.2025.2571327>
- Siciliano, G., Wallbott, L., Urban, F., Dang, A. N., & Lederer, M. (2021). Low-carbon energy, sustainable development, and justice: Towards a just energy transition for society and the environment. *Sustainable Development*, 29(6), 1049–1061. <https://doi.org/10.1002/sd.2193>
- Terrapon-Pfaff, J., Fink, T., Viebahn, P., & Jamea, E. M. (2019). Social impacts of large-scale solar thermal power plants: Assessment results for the NOORO I power plant in Morocco. *Renewable and Sustainable Energy Reviews*, 113, 109259. <https://doi.org/10.1016/j.rser.2019.109259>
- Timmermann, C., & Noboa, E. (2022). Energy sovereignty: A values-based conceptual analysis. *Science and Engineering Ethics*, 28(6). <https://doi.org/10.1007/s11948-022-00409-x>
- Tornel, C. (2023). Decolonizing energy justice from the ground up: Political ecology, ontology, and energy landscapes. *Progress in Human Geography*, 47(1), 43–65. <https://doi.org/10.1177/03091325221132561>

Tornel, C. (2026). De-modernizing energy justice: Ivan Illich and the struggles for pluriversal territorialities in the Global South. *World Development*, 202, 107343. <https://doi.org/10.1016/j.worlddev.2026.107343>