

Rethinking transition minerals and just energy futures in Africa: The cases of Namibia, Guinea and Morocco

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Abstract: *Africa is home to abundant transition minerals that are central to global decarbonisation efforts. Yet, the continent's experience reveals deep inequities in how the benefits and burdens of the energy transition are distributed. This chapter applies the framework of energy justice to examine how the extraction and governance of transition minerals shape Africa's development trajectory. Drawing on case studies from Guinea, Morocco and Namibia, it analyses how distributive, procedural, recognitional, restorative and cosmopolitan dimensions of energy justice intersect with national and regional transition-minerals policy regimes. The analysis highlights persistent injustices arising from land displacement, labour exploitation, marginalisation of indigenous and local communities, gendered exclusion and the externalisation of environmental costs. The chapter argues that achieving a just energy transition in Africa requires moving beyond extraction-driven and investment-centric models toward governance that prioritises human rights, community participation and environmental restoration. By centring energy justice, the chapter reframes Africa's role in transition minerals and the global*

decarbonisation agenda as a struggle not merely for green growth, but for equitable, dignified and sustainable development.

1 Introduction

This chapter examines the meaning, role and regulation of transition minerals in Africa's energy transition through a human rights lens. The global shift toward low-carbon futures has intensified demand for transition minerals such as cobalt, lithium and rare earths.¹ Africa, which holds these resources in abundance, has become the focus of a new resource rush – one that is driving significant social and environmental challenges.² Communities in mineral-rich regions frequently experience dispossession, exploitative labour practices, gender-based harms and environmental destruction.

Existing studies have acknowledged the relevance of laws and policies governing transition minerals.³ However, what is largely missing is an in-depth examination of the justice deficits that hinder a rights-based approach to transition minerals management. The absence of such an approach weakens the protection of human rights in the extraction and use of transition minerals across the continent. This chapter addresses this gap by highlighting the need for a human rights-based approach to Africa's energy transition, one that prioritises distributive, procedural, recognitional, restorative

1 O Abe 'Towards a human rights-based approach to energy transition in Africa' (2025) 10 *Business and Human Rights Journal* 11-33.

2 T Alex-Oke and others 'Renewable energy market in Africa: Opportunities, progress, challenges, and future prospects' (2025) 59 *Energy Strategy Reviews* 101700.

3 D Brown, R Zhou & M Sadan 'Critical minerals and rare earth elements in a planetary just transition: An interdisciplinary perspective' (2024) 19 *The Extractive Industries and Society* 101510.

and cosmopolitan dimensions of energy justice. The chapter situates Africa's transition minerals within the energy justice framework, which provides a holistic lens to assess equity, participation and accountability across the energy value chain. The concern, therefore, is not only to transition to renewable energy, but also to ensure that this transition does not exacerbate inequality, labour displacement, or environmental harm.

The chapter adopts a multi-regional perspective, drawing on case studies from Guinea, Morocco and Namibia, to examine how diverse African states are incorporating regional legal and policy instruments into their national frameworks. The chapter argues that a just transition in Africa must be anchored on development that prioritises energy access, poverty reduction and economic sovereignty. This involves reimagining development in ways that challenge colonial economic models and prioritise justice. To ensure this, African governments must formulate home-grown national action plans, grounded in energy justice principles, thereby reducing reliance on external actors and securing long-term sustainability. The chapter advances just energy futures, framing the production and management of transition minerals not simply as a response to global decarbonisation demands, but as a pivotal opportunity to reimagine Africa's sustainable development pathways.

The chapter is structured as follows: After this introduction, part 2 discusses energy justice dimensions and how they regulate the sustainable extraction of transition minerals. It further examines how the costs and burdens of extracting transition minerals are distributed in Africa. Part 3 discusses the legal and governance frameworks that guide energy transitions in Africa, highlighting national and continental policies that can ensure a just transition. Part 4 examines key gaps in the legal and governance frameworks and limitations in applying the energy justice framework to

energy transition projects across the case study countries. Part 5 presents practical recommendations for promoting the responsible production and management of transition minerals, while part 6 concludes the chapter.

2 Theoretical framework: The dimensions of energy justice

The shift toward renewable energy has placed two key concepts into sharp focus: transition minerals and energy justice. Transition minerals refer to raw materials such as lithium, cobalt, nickel and copper.⁴ These resources are indispensable for manufacturing technologies such as electric vehicle (EV) batteries, solar panels and wind turbines. Their importance lies not only in their role in decarbonisation, but also in the global competition for their supply. However, extracting these minerals is fraught with environmental and social risks. Mining these minerals often causes deforestation, water pollution, biodiversity loss and land degradation. The local communities where these minerals are extracted often bear the brunt of displacement, unsafe labour conditions and limited economic benefits.⁵ Accordingly, discussions about transition minerals increasingly emphasise the need for responsible, rights-respecting and sustainable management.

Several international and regional instruments – such as the United Nations (UN) Guiding Principles on Business and Human Rights and the African Union (AU)’s 2012 Resolution on a Human Rights-Based Approach to Natural Resource Governance

4 IEA ‘The role of critical minerals in clean energy transitions’, <https://iea.blob.core.windows.net/assets/ffd2a83b-8c30-4c9d-980a-52b6d9a86fdc/TheRoleofCriticalMineralsinCleanEnergyTransitions.pdf> (accessed 24 September 2025).

5 As above.

– affirm that companies, including those in the energy sector, must uphold human rights and apply a justice lens in their practices and investments.⁶ Without integrating an energy justice lens, efforts to expand access to modern energy risk causing harm, worsening climate change and aggravating human rights challenges, particularly for already vulnerable populations.⁷ Therefore, this chapter utilises energy justice as the theoretical framework.

Energy justice is a framework designed to ensure equity across the entire energy system, including in the extraction of transition minerals. Energy justice is about who benefits from the end product of transition minerals, who bears the costs of energy decisions, and whose voices are heard in the production of raw materials for public consumption.⁸ This is especially important because transition minerals constitute the starting point of the energy system. The energy transition does not begin with electricity generation or end-use consumption; rather, it begins upstream, at the point of mineral extraction.⁹ Accordingly, the energy justice framework must be applied across the entire energy lifecycle, which encompasses mineral extraction, processing and refining, manufacturing, consumption and eventual disposal. Scholars often distinguish five dimensions

6 O Abe *Implementing business and human rights policies in Africa: Law and policy interventions* (2022) 8.

7 D Olawuyi 'Energy (and human rights) for all: Addressing human rights risks in energy access projects' in R Salter, CG Gonzalez & WE Kronk (eds) *Energy justice: US and international perspectives* (2018) 73-104.

8 K Jenkins and others 'Energy justice: A conceptual review' (2016) 11 *Energy Research and Social Science* 174-182; N Bruehwiler and others 'Energy justice in innovative living spaces: Examining positive energy districts and ecovillages in Europe' (2025) 127 *Energy Research & Social Science* 104248.

9 As above.

of energy justice: distributive, procedural, recognitional, restorative and cosmopolitan.¹⁰

Distributional justice addresses the unequal allocation of benefits and burdens, as well as the uneven distribution of the responsibilities associated with them.¹¹ The dimension demands the fair distribution of environmental benefits and harms across society, irrespective of income, race or social status.¹² In the energy context, distributional justice directs attention to the spatial concentration of environmental risks and harms, such as those experienced by communities near energy production facilities, where justice concerns frequently arise.¹³ These costs frequently manifest in the form of environmental degradation, displacement, labour exploitation and social conflict.¹⁴ In the Democratic Republic of the Congo (DRC), for example, the growth of large-scale mining projects has led to widespread displacement, with families and entire communities being removed from their homes and farmland. These evictions are often carried out without meaningful consultation or participation, with limited or no prior notice, insufficient information provided in advance, unfair compensation and little access to effective remedies.¹⁵ Moreover,

10 A Babalola & DS Olawuyi 'Overcoming regulatory failure in the design and implementation of gas flaring policies: The potential and promise of an energy justice approach' (2022) 14 *Sustainability* 6800.

11 G Walker & R Day 'Fuel poverty as injustice: Integrating distribution, recognition and procedure in the struggle for affordable warmth' (2012) 49 *Energy Policy* 69.

12 N Ulibarri, OP Figueroa & A Grant 'Barriers and opportunities to incorporating environmental justice in the National Environmental Policy Act' (2022) 97 *Environmental Impact Assessment Review* 106880.

13 A Garvey and others 'A "spatially just" transition? A critical review of regional equity in decarbonisation pathways' (2022) 88 *Energy Research & Social Science* 102630.

14 As above.

15 As above.

because women in many communities already face systemic disadvantages – such as entrenched discrimination, traditional practices and gender stereotypes – the consequences of distributive injustice are disproportionately borne by them.¹⁶ In the absence of an energy justice lens, legal and regulatory frameworks designed to regulate the extraction of transition minerals risk overlooking the disproportionate burdens borne by women and marginalised communities, leaving them exposed to disproportionate harms. Distributional justice also includes a global element, as the benefits associated with transition minerals – including access to clean energy and economic profits – are disproportionately concentrated in consuming states, mostly the Global North countries. By contrast, the costs of extraction are largely borne by producing regions in the Global South, particularly by indigenous peoples and rural communities situated within weakly regulated jurisdictions.

Second, procedural justice requires that community voices be meaningfully included in decisions about new mining projects.¹⁷ Local communities, including indigenous peoples, women and other marginalised groups, are often excluded from crucial decisions regarding mining operations that directly affect their land and livelihoods.¹⁸ Decision-making processes often fail to include adequate public consultation or informed consent, while mining projects frequently encroach on the traditional territories of indigenous peoples, whose land rights may not be legally recognised

16 Babalola and Olawuyi (n 10) 4.

17 B Spiller, T Htun & K Shah 'Community engagement and participatory inclusion in mining: Challenges, barriers, and opportunities', https://media.rff.org/documents/WP_25-08_PHBFNYf.pdf (accessed 2 November 2025).

18 As above.

or are disregarded.¹⁹ This severely weakens their bargaining position and can lead to land dispossession and the loss of cultural heritage.²⁰ In the absence of an energy justice framework that ensures the involvement of marginalised and at-risk groups in governance processes, regulatory frameworks governing the mining of transition minerals may leave affected communities without effective remedies.

Third, recognitional justice requires that individuals and groups be fairly acknowledged as rights-bearing actors, protected from physical harm, and afforded standing in decision making.²¹ Injustice arises not only through non-recognition but also through misrecognition – where individuals or communities are stereotyped, marginalised, or their perspectives distorted in ways that are demeaning or contemptuous.²² There are concerns about how the process of extracting transition minerals may fail to recognise and value the diverse identities, cultures and knowledge of marginalised groups. A lack of acknowledgment of these groups' histories, rights and experiences can lead to recognition injustice, resulting in systemic exclusion and identity-based discrimination that exacerbate the environmental burdens borne by local or indigenous communities.²³ Consequently, the unsustainable extraction of transition minerals can deepen social exclusion, especially for marginalised groups such as women, the youth and indigenous peoples.²⁴ Ignoring these

19 Abe (n 6).

20 Abe (n 1).

21 Walker & Day (n 11).

22 Jenkins and others (n 8).

23 O Asiamah and others 'Natural resource dependence and institutional quality: Evidence from sub-Saharan Africa' (2022) 79 *Resources Policy* 102967.

24 ES Rentier, C Hoorn & AC Seijmonsbergen 'Lithium brine mining affects geodiversity and Sustainable Development Goals' (2024) *Renewable and Sustainable Energy Reviews* 114642.

lived realities risks perpetuating systemic injustices, eroding trust between communities, governments and industry, and undermining the legitimacy of energy governance frameworks. The failure to ensure recognitional justice at the local level has broader global repercussions: It impedes the attainment of energy security, weakens commitments to just transition, and threatens progress toward international climate and sustainable development goals.

Fourth, restorative justice provides a framework for addressing the harms caused by the extraction of transition minerals.²⁵ The rapidly increasing demand for these minerals, critical for green energy technologies, places African communities at risk of repeating the exploitative and extractive patterns of the past. For instance, solar energy projects demand vast areas of land, while hard-rock lithium mining and processing are highly water-intensive.²⁶ These activities often result in land and water pollution, soil degradation and biodiversity loss, thereby damaging ecosystems on which local communities rely for survival. When policies on remediation or environmental restoration are vague, insufficient or enforced inconsistently, the extraction of transition minerals creates restorative injustice. Many African states lack comprehensive legislation addressing energy justice and just transition.²⁷ Even where regulatory frameworks impose penalties or fines, these measures are often minimal and inadequate to deter irresponsible mineral extraction.

25 M Hazrati & RJ Heffron 'Conceptualising restorative justice in the energy transition: Changing the perspectives of fossil fuels' (2021) 78 *Energy Research & Social Science* 102115.

26 C Dowling & G Otero 'Mirages or miracles? Lithium extraction and the just energy transition' (2025) 119 *Energy Research & Social Science* 103862.

27 O Abe & V Azubike '(Re)examining the intersection between energy justice and energy transition in Africa' (2024) 42(3) *Journal of Energy & Natural Resources Law* 279-299.

For example, a 2023 Global Witness report noted that mining projects for ‘clean energy’ minerals in Zimbabwe and Namibia have replicated historical patterns of exploitation, environmental degradation and human rights abuse.²⁸

Fifth, the extraction of transition minerals could implicate cosmopolitan justice negatively. Cosmopolitan justice requires energy operators to consider the global impacts of their resource extraction activities on all people, not just those within national borders.²⁹ For energy operators, this means recognising that the benefits and burdens of energy production are often unequally distributed globally. For example, the extraction of raw materials in developing countries for clean energy technologies can lead to environmental degradation and human rights abuses borne by local populations, while the benefits are enjoyed in other global regions. Most African countries export raw, unrefined minerals rather than adding value through domestic processing. This means that most of the profits are captured by foreign corporations and governments, continuing a historical trend of resource exploitation that benefits the Global North at the expense of African development.³⁰ Thus, irresponsible extraction of transition materials poses significant cosmopolitan injustice that could undermine the clean energy transition it enables. The International Energy Agency projects that by 2040,

28 28 Global Witness ‘Annual report 2023: Challenging polluters, championing people’ 2023, <https://globalwitness.org/en/about-us/annual-reports/annual-report-2023-challenging-polluters-championing-people/> (accessed 19 September 2025).

29 N Healy, JC Stephens & SA Malin ‘Embodied energy injustices: Unveiling and politicising the transboundary harms of fossil fuel extractivism and fossil fuel supply chains (2019) 48 *Energy Research & Social Science* 219–234.

30 O Abe ‘Between control and confrontation: The pitfalls and potentials of corporate-community participatory development in Africa’s energy and extractive industries’ (2022) 11 *The Extractive Industries and Society* 101095.

the demand for key minerals could rise by as much as 40 times for lithium and 20 to 25 times for cobalt and nickel compared to 2020 levels in a net-zero emissions scenario.³¹ More than 67 litigation cases have been filed against companies involved in mining transition minerals since 2009, by affected indigenous peoples, communities and workers.³² The vast majority of suits allege environmental and human rights abuses.³³ To design and implement holistic energy policies that address cosmopolitan injustices, policy makers and energy sector stakeholders must recognise that climate solutions in one country can create unintended socio-environmental problems elsewhere. Holistic strategies require embedding justice and equity throughout the energy value chain and coordinating efforts across different sectors and borders.

Given these significant energy justice implications of transition minerals, there is an urgent imperative for energy policy makers in Africa to design and implement effective transition mineral policies that address all dimensions of the energy justice risks related to transition minerals. Understanding the root cause of the failure of transition minerals to elevate robust clean energy technology in Africa will enable energy policy makers to be better equipped to design effective policies that can overcome such gaps.

31 International Energy Agency 'Mineral requirements for clean energy transitions', <https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions/mineral-requirements-for-clean-energy-transitions> (accessed 21 September 2025).

32 Business & Human Rights Resource Centre 'Justice in the transition: Litigating corporate abuse in the shift to clean energy for all – 2025 analysis' 2025, https://media.business-humanrights.org/media/documents/2025_JT_litigation_-_Executive_summary_EN.pdf (accessed 24 September 2025).

33 As above.

3 Regulation of transition minerals in Africa: Case studies from Guinea, Morocco and Namibia

This part of the chapter examines the regulation of transition minerals in three select country case studies, as a basis for comparative analysis through an energy justice lens. Drawing on case studies from Guinea, Morocco and Namibia, it identifies energy justice challenges and gaps that must be addressed to prevent policy failures in the governance of transition minerals, making the case for effective transition mineral policies that enable African nations to control and benefit from their own mineral wealth. These case studies have been selected as they provide several interesting points of comparison.

First, the three countries occupy distinct positions within the transition minerals value chain. Guinea is a paradigmatic extractive country, hosting some of the world's largest reserves of bauxite, a critical input for aluminum used in renewable energy infrastructure. Its economy remains heavily dependent on raw mineral exports, with limited domestic value addition. Namibia represents an emerging transition mineral producer, particularly in lithium, rare earths and uranium, while simultaneously positioning itself as a green hydrogen hub. This dual role places Namibia at the intersection of mineral extraction and downstream energy transition ambitions. Morocco, by contrast, occupies a more advanced position, combining control over transition minerals with significant investments in renewable energy generation, industrial policy and export-oriented green manufacturing.

Second, the cases reflect different governance and regulatory models. Guinea illustrates the challenges of weak regulatory capacity, contested land tenure and limited community participation in large-scale mining. Namibia offers a hybrid model, with comparatively stronger legal institutions and environmental frameworks, yet

persistent tensions around indigenous land rights, benefit sharing and foreign investor dominance. Morocco exemplifies a centralised, state-led development model in which strategic planning and industrial policy have enabled rapid deployment of renewable energy projects, but often with constrained civic participation and uneven regional benefits.

Third, the selected cases capture different historical and geopolitical relationships with global markets. Guinea's mineral sector is deeply embedded in post-colonial extractive dependency;³⁴ Namibia's transition strategy reflects a post-settler-colonial state negotiating sovereignty within green industrial competition;³⁵ and Morocco leverages geopolitical positioning, trade agreements and regional influence to integrate into European energy transition agendas.³⁶

3.1 Guinea's energy transition framework

Guinea is central to Africa's energy transition debates because of its immense bauxite reserves – estimated at 7,4 billion metric tons, the largest in the world – making it a key player in global aluminium supply for solar and power grid infrastructure.³⁷ However, the

34 C Wilhelm '“In Guinea, there are two types of mining companies”: An analysis of the diverse local content approaches of the bauxite mining companies in Guinea' (2023) 83 *Resources Policy* 103581.

35 J Tunn and others 'The German scramble for green hydrogen in Namibia: Colonial legacies revisited?' (2025) 118 *Political Geography* 103293.

36 K Sakhraoui and others 'Energy policy in Morocco: Analysis of the national energy strategy's impact on sustainable energy supply and transformation' (2024) 1 *Next Research* 100072.

37 CS Hendrix 'Guinea faces challenges in building capacity around a critical mineral for energy transitions', <https://www.piic.com/blogs/realtime-economics/2022/guinea-faces-challenges-building-capacity-around-critical-mineral> (accessed 3 November 2025).

country's bauxite-driven development model exposes the paradox of Africa's participation in the global 'green' economy: While its resources enable global decarbonisation, the benefits remain unevenly distributed and the social-ecological costs localised. Guinea's case highlights how a resource-rich nation can simultaneously advance and undermine just-transition principles.

For instance, distributive justice demands equitable sharing of the costs and benefits of resource extraction. In Guinea, this ideal remains largely unrealised. The rapid expansion of bauxite mining in the Boké region has displaced subsistence farmers and degraded farmlands and water sources, resulting in social, environmental and governance challenges that deeply affect local communities.³⁸ Although the 2011 Mining Code (amended in 2013),³⁹ and 2019 Environmental Code,⁴⁰ mandate environmental and social impact assessments and community development funds, compensation remains inconsistent. A 2018 Human Rights Watch report found that many families lost farmland without notice or fair compensation, while men – not women – farmers received most payments.⁴¹ The unequal distribution of compensation and project benefits mirrors the historical patterns of extractive injustice.

Furthermore, although Guinea's Mining Code requires stakeholder consultation and environmental management plans, participation often remains formalistic,⁴² posing a challenge to

38 Human Rights Watch 'What do we get out of it?' 4 October 2018, <https://www.hrw.org/report/2018/10/04/what-do-we-get-out-it/human-rights-impact-bauxite-mining-guinea> (accessed 2 November 2025).

39 Mining Code, art 30-II; art 37-II.

40 Law L/2019/0034/AN of 4 July 2019, on the Environmental Code of the Republic of Guinea.

41 Human Rights Watch (n 38).

42 Wilhelm (n 34) 103581.

recognitional justice. Community consultations are typically confined to information sessions rather than genuine consent processes, leaving local actors without influence over resettlement design or compensation valuation.⁴³ Limited transparency in environmental and social impact assessment review further erodes accountability, while grievance mechanisms – though legally mandated – remain fragmented and inaccessible. As such, procedural justice deficits transform what could be a participatory energy transition into an extractive process that reproduces exclusion.⁴⁴

Despite progressive legislation, Guinea's institutions are insufficiently prepared to translate environmental obligations into practice. For instance, companies often delay or underfund rehabilitation, and there is no clear framework for post-closure community support.⁴⁵ The resulting pollution of rivers and the loss of agricultural productivity illustrate a failure to internalise the ecological costs of extraction.⁴⁶ Additionally, Guinea's bauxite exports feed global aluminium and solar-infrastructure supply chains, yet the developmental gains accrue mainly to foreign corporations and consumer states.⁴⁷ The environmental burdens – deforestation, air pollution, loss of livelihoods – are borne locally. This asymmetry epitomises cosmopolitan injustice: Africa shoulders

43 As above.

44 Natural Resource Governance Institute 'Guinea', <https://resourcegovernance.org/countries/guinea> (accessed 2 November 2025).

45 Human Rights Watch 'Complaint filed against bauxite mining company in Guinea 11 March 2019, <https://www.hrw.org/news/2019/03/11/complaint-filed-against-bauxite-mining-company-guinea#:~:text=The%20communities%20are%20represented%20by,harms%20the%20company%20has%20caused.> (accessed 2 November 2025).

46 As above.

47 Human Rights Watch (n 38).

the ecological cost of the world's decarbonisation without reaping its economic dividends.

3.2 Morocco's energy transition regime

Morocco has emerged as one of Africa's most ambitious and strategically positioned countries in the renewable energy transition. With limited fossil fuel reserves but abundant solar and wind potential, Morocco has roughly 70 per cent of the world's phosphate rock reserves,⁴⁸ the country has pursued an aggressive renewable energy agenda aimed at achieving over 50 per cent of its electricity generation from renewables by 2030.⁴⁹ Morocco's 2015 renewable energy law (Law 58-15) promotes solar, wind, geothermal, biomass, waste and biogas, but does not exclude all hydraulic (hydroelectric) projects. The law raises the minimum installed capacity for such hydro projects from 12 mw to 30 mw, effectively allowing only smaller-scale projects to be included under the renewable energy framework, while larger ones are managed separately.⁵⁰ Excluding hydraulic energy projects above 30 mw would limit opportunities for large-scale hydroelectric projects, which could be a significant renewable energy source. Morocco's reliance on large hydropower

48 K Tachfine 'Morocco holds 7 of the world's rarest tech minerals, here is how they are used' *Hespress English* 8 June 2024, <https://en.hespress.com/86388-risk-watch-june1-8-key-risks-facing-morocco-this-week.html> (accessed 23 September 2025).

49 H Hafdaoui, A Khallaayoun & S Al-Majeed 'Renewable energies in Morocco: A comprehensive review and analysis of current status, policy framework, and prospective potential' (2025) 26 *Energy Conversion and Management* X 100967.

50 Royaume du Maroc 'Loi n° 13-09 relative aux énergies renouvelables' 2010, https://cdn.climatepolicyradar.org/navigator/MAR/2010/law-on-renewable-energies_042c524bd467633a3efdb9ca2e800d4b.pdf (accessed 22 September 2025).

projects brings both significant benefits and serious challenges. Hydropower provides a stable and flexible source of clean energy that supports Morocco's growing electricity needs and ambitious climate targets. Unlike solar or wind, it can produce a more consistent power output and help balance the grid during periods of high demand. However, these advantages are offset by substantial environmental and social costs. Large dams often flood extensive areas, destroy ecosystems and farmland and displace communities, including indigenous peoples, disrupting livelihoods and cultural heritage.⁵¹ Prioritising large hydropower diverts resources from smaller, decentralised renewable projects that could offer cleaner and more equitable energy solutions.⁵² Furthermore, water-intensive mining in Morocco's arid regions intensifies ecological stress and threatens biodiversity and community access to water.

Distributive injustice in Morocco's energy landscape manifests through the tension between national energy independence and local socio-economic inclusion. Projects such as the Noor Ouarzazate Solar Complex – one of the world's largest concentrated solar power plants – symbolise national progress toward low-carbon development. However, the benefits of these projects have not been equitably distributed.⁵³ Studies reveal that while national and international investors capture long-term economic returns, local

51 A Arora 'Dams: Economic assets or ecological liabilities?' *Global Commons* 18 January 2024, <https://earth.org/dams-economic-assets-or-ecological-liabilities/> (accessed 23 September 2025).

52 L Castro-Diaz and others 'Impacts of hydropower development on locals' livelihoods in the Global South' (2023) 169 *World Development* 106285.

53 H Hamouchene 'The energy transition in North Africa: Neocolonialism again!' 14 October 2022, <https://www.tni.org/en/article/the-energy-transition-in-north-africa> (accessed 5 November 2025).

communities near Ouarzazate and Midelt have faced limited access to affordable energy and insufficient employment opportunities.⁵⁴

While institutions such as the Moroccan Agency for Sustainable Energy and the National Office of Electricity and Drinking Water – operating under a centralised, technocratic governance model – have been effective in project implementation, they often limit local participation in energy planning,⁵⁵ challenging procedural and recognitional justice. Consultations tend to occur after project design, and this focuses on mitigation rather than consent.⁵⁶ Furthermore, Morocco's energy transition has often overlooked the specific needs of women, rural populations and indigenous Amazigh communities.⁵⁷ Women in rural regions remain underrepresented in decision-making processes and continue to bear disproportionate energy burdens, particularly in domestic energy use and informal labour sectors.⁵⁸ Morocco's commitment to regional cooperation through initiatives such as the Africa Renewable Energy Initiative and the Desert to Power programme demonstrates procedural leadership at the transnational level. Yet, the procedural justice gap persists domestically, with local voices, particularly those from rural and Amazigh communities, marginalised in shaping the renewable energy agenda.⁵⁹

54 As above.

55 C Haddada and others 'Imagined inclusions into a 'green modernisation': Local politics and global visions of Morocco's renewable energy transition' (2022) 43 *Third World Quarterly* 393.

56 As above.

57 Hamouchene (n 53).

58 As above.

59 A Aoui, M Amrani & K Rignall 'Global aspirations and local realities of solar energy in Morocco' 6 October 2020, <https://www.merip.org/2020/10/global-aspirations-and-local-realities-of-solar-energy-in-morocco/#:~:text=Piercing%20Narratives%20of%20>

Protests in mining regions such as Imider, Bou-Azzer and Midelt highlight growing frustration over unequal resource distribution and environmental harm.⁶⁰ Large-scale solar plants in arid regions such as Ouarzazate and Midelt worsen water scarcity and disrupt local livelihoods,⁶¹ yet mechanisms for environmental restoration or compensation remain limited.⁶² Although environmental and social impact assessments exist, enforcement is inconsistent, leaving Morocco's impressive progress in renewable energy vulnerable to significant ecological and social trade-offs. Without robust social and environmental safeguards, these energy projects risk reproducing the same injustices and environmental harms they are intended to address.

3.3 Namibia's critical rare earths project

Namibia's Lofdal heavy rare earths project is among Africa's most advanced sources of dysprosium (Dy) and terbium (Tb) – two scarce heavy rare earth elements (HREEs) used in high-performance permanent magnets for EVs, wind turbines, robotics and defence systems.⁶³ Operated by Namibia Critical Metals Inc (NCMI) in

Techno%2DOptimism&text=Many%20residents%20and%20civil%20society,corporate%20interventions%20in%20the%20region (accessed 5 November 2025).

60 As above.

61 E Ahmed 'Moroccan solar plans hampered by dispute over technology' 27 February 2024, <https://www.reuters.com/world/africa/moroccan-solar-plans-hampered-by-dispute-over-technology-2024-02-27/> (accessed 4 November 2025).

62 As above.

63 Namibia Critical Metals 'Lofdal heavy rare earths project under joint venture with JOGMEC', <https://www.namibiacriticalmetals.com/projects/lofdal-heavy-rare-earths-project> (accessed 25 September 2025).

a joint venture with Japan's state-backed JOGMEC,⁶⁴ Lofdal is being managed through a Japan-European Union (EU) aligned push to diversify critical-materials supply chains beyond China.⁶⁵ Unlike light rare earths, Dy and Tb are required in small quantities to maintain magnet strength at high temperatures – vital for EV traction motors and direct-drive wind turbines. Despite its small population and relatively low carbon footprint, the country occupies a strategic position in Southern Africa's renewable energy future, with vast potential for solar, wind and green hydrogen development. Namibia's energy transition is guided by the National Energy Policy (2017), the Renewable Energy Policy (2020) and the Green Hydrogen Strategy (2022), which align with its broader ambitions under the Harambee Prosperity Plan II and the African Green Minerals Strategy. However, while Namibia's energy transition vision has been internationally praised for its ambition and transparency, applying the energy justice framework reveals deep-seated challenges relating to inequality, governance and environmental protection.

In terms of distributive justice, for example, Namibia's current energy mix is dominated by imports – mainly from the Southern Africa region.⁶⁶ However, the benefits of these energy imports do not reach the broader population. Large infrastructure projects are

64 Junior Mining Network 'Namibia Critical Metals applauds JOGMEC investment into rare earth separation and provides update on accelerated value engineering at Lofdal dysprosium-terbium project', <https://www.juniorminingnetwork.com/junior-miner-news/press-releases/532-tsx-venture/nmi/178069-ncmi-applauds-jogmec-investment-into-rare-earth-separation-and-provides-update-on-accelerated-value-engineering-at-lofdal-dysprosium-terbium-project.html> (accessed 26 September 2025).

65 Namibia Critical Metals (n 63).

66 NamPower 'Integrated annual report (2022)', https://www.nampower.com.na/public/docs/annual-reports/NamPower_2022%20Annual%20Report_210223.pdf (accessed 2 November 2025).

concentrated in coastal and southern regions (for instance, Lüderitz and Tsau/Khaeb National Park), while rural communities in the north and northeast continue to face energy poverty. The distributive imbalance thus raises critical justice questions about how national wealth from energy investments is distributed among citizens and whether local populations directly benefit from resource exploitation. Without redistributive mechanisms – such as community ownership schemes or targeted electrification programmes – Namibia's transition risks reproducing the same geographic and economic inequalities characteristic of past extractive regimes.

In June 2023, the Namibian government banned the export of unprocessed critical minerals to drive local beneficiation and job creation. The policy is explicitly aligned with Namibia's Mineral Beneficiation Strategy (2021-2030), which seeks to shift the country from raw material exports toward domestic processing and higher-value products.⁶⁷ In this context, Lofdal's development plan is evidence that the project is oriented toward local value addition rather than simple concentrate exports. However, Namibia must intensify its efforts to ensure that local beneficiation does not heighten risks or undermine human rights. Rural communities – many of whom are indigenous or semi-nomadic pastoralists – have been disproportionately affected by the allocation of land for large-scale energy projects.⁶⁸ As a result, weak participation, limited

67 N Nyaungwa 'Namibia bans export of unprocessed critical minerals' *Reuters* 8 June 2023, <https://www.reuters.com/markets/commodities/namibia-bans-export-unprocessed-critical-minerals-2023-06-08/> (accessed 26 September 2025).

68 I Sasada 'Namibia's first peoples struggle to access their traditional lands (commentary)' (19 April 2023), <https://news.mongabay.com/2023/04/namibias-first-peoples-struggle-to-access-their-communal-lands-commentary/> (accessed 10 January 2026).

recognition of marginalised groups and poor enforcement could potentially undermine procedural and recognitional justice goals. Achieving a truly just transition requires shifting from investment-focused strategies to inclusive, accountable and equitable energy governance.

4 Rethinking Africa's transition minerals approach through energy justice

The case studies demonstrate that while legal and policy reforms have advanced, deep justice deficits persist across social, environmental and governance dimensions. Applying the energy justice framework provides a coherent lens for evaluating these challenges and charting a pathway toward a truly just and sustainable transition.

The question of who benefits and who bears the burden of energy transitions is central to distributive justice. Across the three case studies, a persistent pattern emerges: While mineral wealth contributes to national revenues and foreign exchange, its direct benefits rarely reach local communities. In Guinea, the expansion of bauxite mining has displaced subsistence farmers, polluted water sources and disrupted livelihoods. Compensation is often inadequate or unevenly distributed, privileging male elites and excluding women who depend on land for subsistence agriculture.⁶⁹ Similarly, in Morocco, large hydropower and solar projects, such as the Noor Ouarzazate complex, have generated clean energy for national and international markets. Yet, neighbouring communities experience water scarcity, limited employment and minimal access to affordable

⁶⁹ I Dibattista and others 'Socio-environmental impact of mining activities in Guinea: The case of bauxite extraction in the region of Boké' (2023) 387 *Journal of Cleaner Production* 135720.

electricity.⁷⁰ In Namibia, energy wealth remains geographically uneven, concentrated in southern industrial corridors, while rural populations in the north continue to face energy poverty.⁷¹ Thus, distributive justice requires more than economic growth; it demands targeted redistributive mechanisms. Community benefit-sharing agreements, local electrification programmes and gender-responsive compensation schemes are essential to ensure that the wealth generated by transition minerals contributes to human well-being rather than deepening inequality.

Procedural deficits remain a defining feature of Africa's transition-minerals governance. Local community consultations and participation processes rarely include the very people whose voices are essential in decisions about development projects and the management of their resources. In Guinea, environmental and social impact assessments are mandatory but are often conducted as a formality. Consultations occur after project approval, leaving communities without genuine influence over resettlement or compensation.⁷² Morocco's renewable energy sector, though internationally lauded, operates through centralised agencies such as the Moroccan Agency for Sustainable Energy and the National Office of Electricity and Drinking Water that prioritise technocratic efficiency over participatory governance. Local and Amazigh

70 H Hafdaoui, A Khallaayoun & S Al-Majeed 'Renewable energies in Morocco: A comprehensive review and analysis of current status, policy framework, and prospective potential' (2025) 26 *Energy Conversion and Management: X* 100967.

71 A Mpako & S Ndoma 'Namibians grow more dissatisfied with government's efforts on electricity provision', <https://www.afrobarometer.org/wp-content/uploads/2024/09/AD849-Namibians-grow-more-dissatisfied-with-government-efforts-on-electricity-provision-Afrobarometer-5sept24.pdf> (accessed 12 January 2026).

72 Human Rights Watch (n 38).

communities are typically consulted post-design rather than as co-planners.⁷³ In Namibia, despite progressive policies such as the Green Hydrogen Strategy (2022) and the Mineral Beneficiation Strategy (2021-2030), decision making remains concentrated in government and corporate hands, with limited rural representation.⁷⁴ Enhancing procedural justice requires institutional reforms that make consultation binding, ensures free, prior and informed consent (FPIC) processes for indigenous peoples, and integrate community monitoring into environmental governance. Only through genuine participation can energy transitions gain social legitimacy and prevent the recurrence of 'green dispossession'.

A recurring recognitional injustice in Africa's transition-mineral economies is the marginalisation of indigenous peoples, rural women and smallholder farmers, along with the disregard for the identities and knowledge systems of those most affected by energy transitions. In Namibia, indigenous and semi-nomadic pastoralist groups in regions such as Erongo region have lost traditional grazing lands to hydrogen and solar projects, often without recognition of customary land rights.⁷⁵ Morocco's energy expansion has similarly displaced Amazigh pastoral communities, whose cultural ties to land are rarely acknowledged in project design or compensation frameworks.⁷⁶ Guinea's compensation policies, which privilege male title holders, further entrench gender-based inequalities.⁷⁷

73 Haddad and others (n 55).

74 'Namibia's aspirations towards green hydrogen are going nowhere' *Business Day* 2024, https://www.businessday.co.za/bd/world/africa/2024-10-07-namibias-aspirations-towards-green-hydrogen-are-going-nowhere/#google_vignette (accessed 27 December 2025).

75 Sasada (n 68).

76 Hafdaoui (n 70).

77 Dibattista and others (n 69).

Recognitional justice, therefore, requires embedding cultural sensitivity, gender equity and respect for customary tenure into all stages of project planning. It also demands the inclusion of indigenous governance structures and the enhancement of local ecological knowledge as essential components of sustainable energy planning.

Consistent deficits in restorative justice are also evident. In Guinea, for example, the rapid expansion of bauxite and other mineral extraction projects has led to widespread environmental degradation, including deforestation, water pollution and loss of agricultural land.⁷⁸ Although mining companies are legally required to rehabilitate sites and fund community development projects, enforcement is sporadic, and post-mining landscapes often remain scarred. The state's dependence on mining revenue undermines its willingness to impose strict sanctions, thereby allowing corporations to externalise environmental costs onto local communities.⁷⁹ This failure of enforcement erodes public trust and perpetuates a cycle where environmental damage is normalised as a cost of progress. In Morocco, projects such as the Noor Ouarzazate solar complex have displaced communities and intensified water scarcity while, in Namibia, the hydrogen and rare earth extractions are framed as environmentally progressive. Yet, weak environmental governance and resource constraints hinder effective restoration. In this context, a restorative justice approach to Africa's energy transition requires confronting and repairing these harms – both social and ecological – through accountability, remediation and long-term community recovery. This approach aligns with the idea that energy

78 Human Rights Watch (n 38).

79 As above.

development should leave communities and ecosystems better off – or at least not worse off – than before. However, in practice, many African states struggle to operationalise these commitments due to weak institutional capacity, limited regulatory oversight, and asymmetrical power relations between governments, investors and affected communities.

In terms of cosmopolitan justice, Africa's minerals are vital for the world's clean-energy technologies, yet the continent captures only a fraction of the value generated. Guinea's bauxite fuels global aluminium and solar industries; Morocco's phosphates and cobalt underpin electric vehicle and battery production; and Namibia's rare earths power the magnets essential to wind turbines. However, the profits accrue primarily to foreign corporations and consumer countries. This asymmetry reflects enduring structural dependency while the continent bears the ecological cost of decarbonisation without commensurate economic return. A cosmopolitan justice approach calls for global governance reforms that ensure fair pricing, ethical sourcing and equitable distribution of clean-energy benefits. Africa must negotiate international supply chains on terms that recognise its environmental sacrifices and developmental needs, including through stronger enforcement of due diligence frameworks such as the UN Guiding Principles on Business and Human Rights.

Applying the energy justice framework shows that the pursuit of a green economy in Africa must not only decarbonise energy systems but also decolonise their governance. A just transition requires that distributive, procedural, recognition, restorative and cosmopolitan principles be mainstreamed into national laws, regional frameworks and corporate practices.

5 Recommendations

To move from extractive dependency to equitable and sustainable energy futures, Africa's transition-mineral governance must be explicitly grounded in the five dimensions of energy justice.

5.1 Fair allocation of benefits and burdens

African states must align energy policies with economic gains that translate into tangible social and developmental outcomes. Revenue from resources should directly support rural electrification, local infrastructure and community development initiatives, especially in regions where minerals are extracted. A distributive justice-aligned transition mineral project must ensure that the communities bearing the social and environmental costs of extraction receive priority access to energy, equitable economic benefits, and long-term development outcomes through binding, transparent and gender-responsive redistribution mechanisms. Distributive justice in Guinea's transition-mineral sector requires legally binding benefit-sharing mechanisms that prioritise land-dependent communities in bauxite-producing regions through gender-responsive compensation, local electrification and domestic value addition. A central component of this approach could be the establishment of community development funds, paid into community-managed structures in regions such as Boké and earmarked for electricity access, water infrastructure and the restoration of agricultural livelihoods. In Morocco, distributive justice would require the decentralisation of benefit allocation from large-scale renewable energy and mineral-linked projects to ensure equitable access to energy, water and employment for rural and Amazigh communities. Large solar and hydropower projects – such as those in Ouarzazate and Midelt – should be legally required to

provide subsidised electricity to neighbouring communities. In addition, revenues from phosphate-linked and solar projects could be directed toward community water infrastructure to offset water stress caused by energy and mining operations. Such measures are essential to ensure that Morocco's green leadership does not reproduce internal spatial and cultural inequalities under a technocratic transition model. In Namibia, distributive justice in transition-mineral and green-hydrogen projects requires redistributive mechanisms that address geographic energy inequality, indigenous land dispossession, and unequal value capture in strategic mineral supply chains. To achieve this, the government could allocate a defined portion of mineral and hydrogen revenues to rural electrification programmes in Northern and North-eastern Namibia, where energy poverty remains acute.

5.2 Strengthening consultation and consent

Decision making in the transition-mineral sector remains overly centralised and technocratic. Governments need to adopt binding participation frameworks that move beyond symbolic consultation toward meaningful community influence. Meaningful consultation and engagement with local communities during project planning and implementation enables corporations to engage openly about potential benefits, risks and strategies to prevent or mitigate harm.⁸⁰ In Guinea, procedural justice requires strengthening environmental and social impact assessment processes by transforming them from formal compliance exercises into binding decision-making tools. Community consultations in bauxite-producing regions such

80 Abe (n 6).

as Boké should occur prior to licence issuance, include women and land-dependent farmers, and directly shape resettlement, compensation and land-use decisions. In Morocco, procedural justice demands the decentralisation of energy-planning authority within a highly centralised renewable-energy regime. Large-scale solar, hydropower and mineral-linked projects require early participation of rural and Amazigh communities at the planning stage, not only during post-design mitigation. Procedural reforms should mandate local representation in energy-planning institutions and ensure consultations are conducted in culturally appropriate formats that allow communities to influence siting, water use and benefit-sharing arrangements. In Namibia, procedural justice requires embedding community consent and monitoring within green-hydrogen and rare-earth projects, particularly where indigenous and pastoral communities are affected. While Namibia's policy frameworks are comparatively progressive, decision making remains investor driven. Procedural alignment would require FPIC-based consultation, community representation in project oversight bodies, and sustained participation throughout implementation and closure, especially in regions experiencing land pressure and energy poverty.

5.3 Respecting identity, land and knowledge

A just energy transition must recognise affected communities as rights-bearing actors, not passive beneficiaries. Policy makers should prioritise the formal recognition of customary land tenure systems, particularly where statutory law fails to reflect lived land-use practices. In Guinea, recognitional justice requires reforming compensation and resettlement frameworks to acknowledge women's subsistence land use and informal agricultural labour, rather than privileging male title holders alone. Project documentation

and environmental and social impact assessment processes need to incorporate gender-disaggregated data and recognise community-specific land tenure practices to prevent systematic exclusion. In Morocco, recognitional justice demands the explicit acknowledgment of Amazigh communities' cultural, linguistic and territorial identities in renewable-energy and mineral-linked projects. Project design should recognise Amazigh land-use systems and cultural attachments to land, rather than treating rural areas as neutral development spaces. In Namibia, recognitional justice requires the formal acknowledgment of indigenous and pastoralist land-use systems, particularly in regions affected by green-hydrogen and rare-earth projects. Customary grazing rights and semi-nomadic livelihoods need to be recognised as legitimate forms of land tenure within project planning and compensation frameworks.

5.4 Repairing social and environmental harm

A just energy transition requires not only preventing harm but repairing damage already caused by extractive activities. For this, governments need to mandate environmental bonds, enforceable rehabilitation plans and post-closure community support mechanisms as conditions for project approval. Regulatory authorities should be adequately resourced to conduct independent inspections, impose meaningful sanctions and publish compliance reports. Community-level grievance mechanisms can be strengthened to ensure access to remedy for displacement, pollution and livelihood loss. Where communities have already suffered displacement, restoration should include sustained compensation beyond project closure. Failure to enforce rehabilitation obligations should trigger sanctions and the suspension of the licences. Across Guinea, Morocco and Namibia, restorative justice in transition-mineral development requires

moving from weak mitigation to enforceable repair and long-term community recovery as core conditions of project approval.

5.5 Rebalancing global energy transitions

Africa's transition minerals underpin global decarbonisation, yet the continent captures only a fraction of the resulting value. Addressing this imbalance requires reforms beyond national borders. Cosmopolitan justice in transition-mineral governance requires that global decarbonisation efforts internalise the social and environmental costs borne by African producers through fair value sharing, ethical supply chains and transnational accountability. Consequently, African states should leverage regional and international platforms to demand fair pricing, ethical sourcing and responsible supply-chain practices, including the robust enforcement of human rights due diligence obligations under instruments such as the UNGPs. When carefully designed, export restrictions on unprocessed minerals can further support domestic beneficiation and strengthen bargaining power within global value chains.

6 Conclusion

Africa's vast endowment of transition minerals places it at the centre of the clean energy revolution, yet the governance of these resources continues to mirror extractive patterns rooted in historical inequality and external dependency. This chapter has argued that without a justice-centred reorientation, the continent's green transition risks exacerbating harm. A rights-based approach can convert transition minerals from sources of harm into instruments of dignified work and diversified industry. The cases of Guinea, Morocco and Namibia reveal both the diversity and the commonality of Africa's

energy transition governance challenges. Each country demonstrates significant ambition in aligning national policy with global climate goals, but also exposes deep justice gaps in distribution, participation, recognition and restoration. Guinea's bauxite and mineral extraction highlight the persistence of unequal benefit sharing and environmental degradation; Morocco's renewable energy expansion exposes trade-offs between technological progress and local ecological integrity; while Namibia's hydrogen and rare earth projects highlight the tensions between global investment interests and community inclusion.

Reframing Africa's energy transition through an energy justice lens reveals that achieving sustainability requires more than scaling up renewable capacity or attracting foreign investment. It demands redefining the purpose and governance of energy itself – from serving external markets to advancing human dignity, social inclusion and ecological resilience. Policies must thus move beyond efficiency and growth indicators to prioritise fairness, participation and accountability. Local communities must not remain passive recipients of development but active partners in decision making and benefit sharing. At the same time, Africa's role in the global energy landscape must evolve from that of a supplier of raw materials to that of a strategic actor shaping the terms of global decarbonisation.

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