POLICY BRIEF

Unlocking Africa's Green Energy Potential: Advancing Critical Energy Transition Mineral Supply Chains

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Accelerating Climate Action and the Just Energy Transition

Abstract

Africa holds a pivotal position in the global green energy transition, accounting for about 30% of the world's critical mineral reserves including 70% of global cobalt production and 92% of platinum group metals. Revenues from copper and battery minerals already surpass $20 billion annually, with projections indicating a 65% market value increase by 2030. Despite this potential, Africa largely exports unprocessed minerals, missing out on significant economic opportunities from mineral beneficiation and value addition. Inadequate infrastructure, limited financing, weak governance, and trade dynamics favouring raw material exports hinder sustainable and equitable development within Africa's critical mineral sector. This policy brief therefore advocates for G20 interventions to promote economic equity and benefit-sharing, sustainable financing, and governance reforms, positioning Africa as a value-added hub for critical minerals.

Building on the principles and outcomes of the UN Panel on Critical Energy Transition Minerals, the G20 New Delhi Leaders' Declaration, and the Africa Minerals Strategy Group, this brief advocates for the promotion of Green Tech Manufacturing Partnerships (GTMPs) to foster local mineral processing, technology transfer, and capacity building. This includes expanding the membership of The Critical Minerals Mapping Initiative, Mineral Security Partnership (MSP), and Sustainable Critical Minerals Alliance (SCMA) to include the African nations for equitable participation in global value chains. To navigate competitive dynamics in developing Africa's critical mineral processing capabilities, the brief proposes alternate scenarios and recommended modalities, thereby addressing geopolitical challenges. It also emphasises G20's role in promoting responsible supply chains by supporting Africa's adherence to environmental, social and governance (ESG) standards, backed by regulatory and fiscal mechanisms. Further, through G7's Partnership for Global Infrastructure and Investment (PGII), the G20 can facilitate essential public and private investments to enhance mineral processing and transportation capabilities.

The brief proposes an effort vs impact framework to guide G20's priorities, driving industrialisation and fostering just and equitable value distribution and sustainable practices, enabling Africa's transition from being a raw material exporter to a key player in critical mineral value addition.

Keywords: G20, Critical Minerals, Industrial Development, Just Energy Transition, GTMPs, Technology Transfer, Value Addition, Beneficiation, Green-tech Manufacturing, Mineral Governance, Critical Energy Transition Minerals, MSP, PGII, SCMA, JETP, Value Chain, Supply Chain, Infrastructure, Investment

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Diagnosis

Africa is poised to play a vital role in the global green energy transition, given its vast reserves of critical minerals essential for electric vehicles (EVs), battery storage, and hydrogen technologies. By 2040, the demand for cobalt and battery minerals is projected to surge by 60–70%,[1] while the demand for platinum group metals, instrumental in advancing fuel cell and hydrogen-based energy solutions, is projected to reach 35% of total annual platinum demand.[2] Currently, the US, EU, and China dominate Africa's mineral value chains, with European and Chinese firms controlling a third of the Democratic Republic of Congo's (DRC) cobalt production, while African firms account for less than 5% of output.[3] Despite its vast mineral wealth, Africa remains at the lower end of the global mineral value chain, capturing only 40% of the potential revenue from its mineral resources.[4] Estimates by the UN suggest that processed lithium, graphite, and cobalt generate three to four times the value of unprocessed exports, underscoring the economic opportunity in mineral processing and manufacturing for Africa.[5]

The critical mineral sector in Africa offers huge opportunities for value addition. Recognising this potential, the African Mining Vision (AMV) was adopted in 2019 to promote downstream value addition, while the African Minerals Development

[1] International Energy Agency, *The Role of Critical Minerals in Clean Energy Transitions* (Paris: IEA, 2021), https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions

[2] CME Group, "Platinum: The Critical Mineral for Energy," CME Group, November 14, 2022, https://www.cmegroup.com/articles/2022/platinum-the-critical-mineral-for-energy.html.

[3] International Energy Agency, *Global Critical Minerals Outlook 2024* (Paris: IEA, 2024), "Market Review," https://www.iea.org/reports/global-critical-minerals-outlook-2024/market-review

[4] United Nations Economic Commission for Africa, "Africa's Critical Mineral Resources, a Boon for Intra-African Trade and Regional Integration," *United Nations Economic Commission for Africa*, December 22, 2024, https://www.uneca.org/stories/africa%E2%80%99s-critical-mineral-resources,-a-boon-for-intra-african-trade-and-regional-integration

[5] United Nations Department of Economic and Social Affairs, *Harnessing the Potential of Critical Minerals for Sustainable Development*, in *World Economic Situation and Prospects 2025*, chap. 2 (New York: United Nations, January 2025), https://desapublications.un.org/sites/default/files/publications/2025-01/WESP%202025_Harnessing%20the%20Potential%20of%20Critical%20Minerals%20for%20Sustainable%20Development_WEB.pdf

Centre was formed to oversee AMV's implementation. Initiatives like the African Continental Free Trade Agreement (AfCFTA) (2021) and the African Union Commodity Strategy (2022) also laid down strengthening of value-added trade and employment through vertical and horizontal integration as one of the key tenets, while regional industrialisation strategies included initiatives like the SADC Industrialisation Strategy and Roadmap (2015–2063). However, despite modest growth in intra–African trade and initial efforts by some countries to enhance value addition in critical minerals, the anticipated value addition in the mineral processing sector has been slower to materialise.[6] Several barriers limit Africa's ability to move up the mineral value chain including the following:

1. Infrastructure deficits and energy constraints

Many mineral-rich African nations lack the infrastructure needed for local mineral processing. While the DRC faces chronic power shortages and an absence of reliable power supply, limiting its ability to refine cobalt domestically, Zambia (a major copper producer) struggles with poor road and rail networks, making local value addition costly and inefficient. Further, while Zimbabwe lacks sufficient smelters, refineries, and battery-grade processing facilities, Mozambique and Tanzania face port and logistics challenges.

2. Investment and financing gaps

Research conducted by UNCTAD shows that the Global South, including Africa, faces a $225 billion investment gap in critical mineral mining projects, with financing shortages particularly acute in downstream processing and manufacturing.[7] Limited access to development finance coupled with high-risk

[6] Wamkele Mene, "Intra-African Trade and Its Potential to Accelerate Progress Toward the SDGs," *Brookings Institution*, January 29, 2025, https://www.brookings.edu/articles/intra-african-trade-and-its-potential-to-accelerate-progress-toward-the-sdgs/

[7] UN Trade and Development (UNCTAD), Threads post, December 2024, https://www.threads.net/@unctad/post/DCT3lHHgP8j

perception due to political instability and weak regulatory frameworks of certain African nations are major barriers to investment in processing infrastructure, technology, and skilled labour.

3. Governance and policy bottlenecks

At the policy level, regulatory uncertainties (sudden export bans under Tanzania's 2017 mining reforms), weaker enforcement and implementation, and corruption and associated inefficiencies have significantly limited value addition in Africa's critical minerals sector. The absence of clear incentives and local content policies has further slowed industrialisation.

4. Limited skills and technology transfer

The lack of technical expertise in mineral processing and advanced manufacturing is another barrier. Unlike Indonesia's nickel-processing industry which has attracted $21 billion in investment and created 150,000 jobs through industrial policies,[8] Africa is yet to implement structured policies for local capacity-building in mineral value addition.

5. Unfavourable business environment for local players

The lack of incentives, mechanisms for securing raw materials at competitive rates, and programmes for skills development, capacity building, and business incubation, have created an unfavourable environment for domestic players' participation. This creates an ecosystem that favours foreign ownership over local industrial participation.

[8] Boston Consulting Group, "The Mineral Shortage Is a Growing Problem. Hubs Offer a Solution," *Boston Consulting Group*, January 14, 2025, https://www.bcg.com/publications/2025/mineral-shortage-growing-problem-hubs-offer-solution

Recognising the strategic importance that critical minerals hold globally, the G20's High-Level Principles on Critical Minerals and the UN Secretary-General's Panel on Critical Energy Transition Minerals highlight the need for secure, responsible, and sustainable supply chains to ensure energy security and economic stability. Africa's full integration into these supply chains is not only crucial for global supply security but also for promoting regional green industrialisation, job creation, and economic resilience. Failure to comply with these principles by the G20 and African nations will lead to continued dependence of Africa on China-dominated supply chains and increasing geopolitical vulnerabilities for G20 nations, lost economic potential for Africa, and environmental and social consequences of raw material extraction without local processing. Thus, the upcoming G20 Summit in South Africa presents a pivotal opportunity to solidify Africa's role in global mineral governance, ensuring that critical minerals drive inclusive growth, industrial development, and a just energy transition.

Recommendations

Africa's pursuit of value addition in minerals as part of a just energy transition hinges on securing a strategic position in global critical minerals supply chains. Being part of the G20 platform strengthens the continent's ability to advocate for sustainable development and industrial transformation. Establishing GTMPs – collaborative initiatives between African governments, local firms, and international partners to establish local manufacturing and processing capabilities for green technologies – can support the integration of mineral supply chains. By leveraging frameworks like MSP, SCMA, PGII, and Just Energy Transition Partnerships (JETPs) that find alignment with GTMPs, Africa can evolve from being a raw material exporter to a green–tech manufacturing hub.

The G20 forum, through GTMPs, can advance priorities of African governments by focusing on the following key areas.

1. Mobilising investments through green alliances

As a global economic forum, the G20, by leveraging platforms such as the Finance Track, including the G20 Framework Working Group (FWG) and Infrastructure Working Group (IWG), can facilitate the creation of blended financing platforms that bring together development banks, sovereign funds, and private investors to support mineral processing and green industrial projects in Africa. The PGII presents an important opportunity in this context with a goal of mobilising $600 billion by 2027.[9] By aligning PGII priorities with GTMP objectives, the G20 can help direct financing toward mineral refining plants, renewable energy systems, and transport networks that link mining zones to industrial hubs.

2. Enabling technology transfer and training

The G20, as part of its coordination role, can promote technology transfer and local workforce development by encouraging its member institutions and development partners to support the establishment of research centres, technical institutes, and training programmes in mineral-rich African nations. The G20 forum can create a platform for sharing and learning from best practices like the Africa Renewable Energy Manufacturing Initiative, which demonstrates how international support can be aligned with domestic upskilling efforts.[10]

[9] Ministry of Foreign Affairs of Japan, *G7 Leaders' Statement on the G7 Partnership for Global Infrastructure and Investment* (Hiroshima: Ministry of Foreign Affairs of Japan, 2023), https://www.mofa.go.jp/files/100506918.pdf

[10] Sustainable Energy for All, "Renewable Energy Manufacturing Initiative," *Sustainable Energy for All*, accessed April 3, 2025, https://www.seforall.org/programmes/un-energy/South-South-Cooperation

3. Encouraging domestic value addition with enabling policies

Africa's shift toward value addition requires an enabling policy environment and effective international engagement. The G20 can leverage its Trade and Investment Working Group (TIWG) and Development Working Group (DWG) to facilitate knowledge sharing on policies that support domestic processing such as clear local content requirements, investment incentives, and the creation of special economic zones. Further, the T20 group can play a complementary role by producing policy research and cross-regional case studies to guide evidence-based policymaking.

4. Leveraging international frameworks for mineral governance

The G20 can serve as a key platform for promoting Africa's alignment with international mineral governance frameworks. Through TIWG and DWG, the G20 can facilitate structured engagement between African institutions (the AfCFTA Secretariat, AMDC, and the African Union Commission) and global initiatives like MSP. The G20 can champion Africa's full participation in MSP, enhancing the integration of ESG compliance and traceability standards into its scope. Additionally, the G20 can highlight the advantages of membership in SCMA, helping African nations institutionalise just transition practices and sustainable mining standards. At the regional level, the G20 can facilitate formation of an expert advisory group, guided by AfCFTA and AMDC, to support continent-wide coordination, regional integration, and strategic negotiations.

5. Promoting low-carbon processing

The G20 can play a convening role in aligning GTMPs with the broader principles of JETPs. While JETPs have traditionally focused on reducing fossil fuel dependence, their scope for the African Union can be extended to promote value addition in critical minerals through investments in renewable-powered processing plants, localising EV battery value, and the development of small and

medium enterprises. The G20's Environment and Climate Sustainability Working Group can help identify synergies between JETPs and GTMPs through enhanced collaboration and sharing of experiences as well as mobilising climate finance for the integration of low-carbon value addition into just transition planning.

While the majority of aforementioned frameworks are West–led, Africa should simultaneously build intra-continental value chains. It is essential for African nations to adopt smart, forward-looking policies that balance global compliance with domestic development goals. A regional cluster approach – where minerals are mined in one country, refined in another, and assembled elsewhere – can enhance competitiveness and attract investments. South Africa has already championed this integrated model, which is reinforced by the G7 and World Bank's RISE Partnership supporting regional smelting, refining, and manufacturing.[11]

The brief, through an effort-impact matrix (see appendix), proposes the following roadmap for implementation:

- *Short-term (0–3years):* Focus on domestic policy reforms including local content regulations, fiscal incentives, and investment-friendly institutional frameworks.
- *Medium-term (3–5 years):* Secure international partnerships (MSP, SCMA etc.), negotiate better trade terms, and formalise technology transfer agreements.
- *Long-term (5+years):* Mobilise large-scale investments, upgrade infrastructure, and foster regional integration to transform Africa into a green-tech manufacturing hub.

[11] The RISE Partnership: Securing the Green Energy Transition Is an Opportunity to Support Africa's Development," *Update Note for G7 Finance Ministers and Central Bank Governors*, May 2024, https://www.g7italy.it/wp-content/uploads/Annex-IV.-Update-note-on-the-Rise-Partnership_G7-FMCBG-23-25-May-2024-Stresa.pdf

By facilitating discussions based on these recommendations, the G20 can ensure that short-term gains build momentum, while long-term initiatives drive lasting systemic transformation.

Appendix

Recommendation	Effort*	Impact	Priority (Short, Medium, Long-Term)
Mobilising investments through green alliances	High	High	Long-term
Enabling technology transfer and training	Medium	High	Medium-term
Encouraging domestic value addition with enabling policies	Medium	High	Short to Medium-term
Leveraging international frameworks for mineral governance	Medium	High	Medium-term
Promoting low-carbon processing	High	Medium-High	Long-term

*Effort defines how resource-intensive and complex the suggested recommendation will be to implement and considers factors like financing, policy changes, infrastructure, partnerships, and stakeholder engagements. The impact defines the potential outcome in terms of the continent's global positioning in critical minerals supply chain resilience and governance, transformation from exports to value addition and beneficiation, economic growth inclusive of just transition principles, and investment attraction.

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