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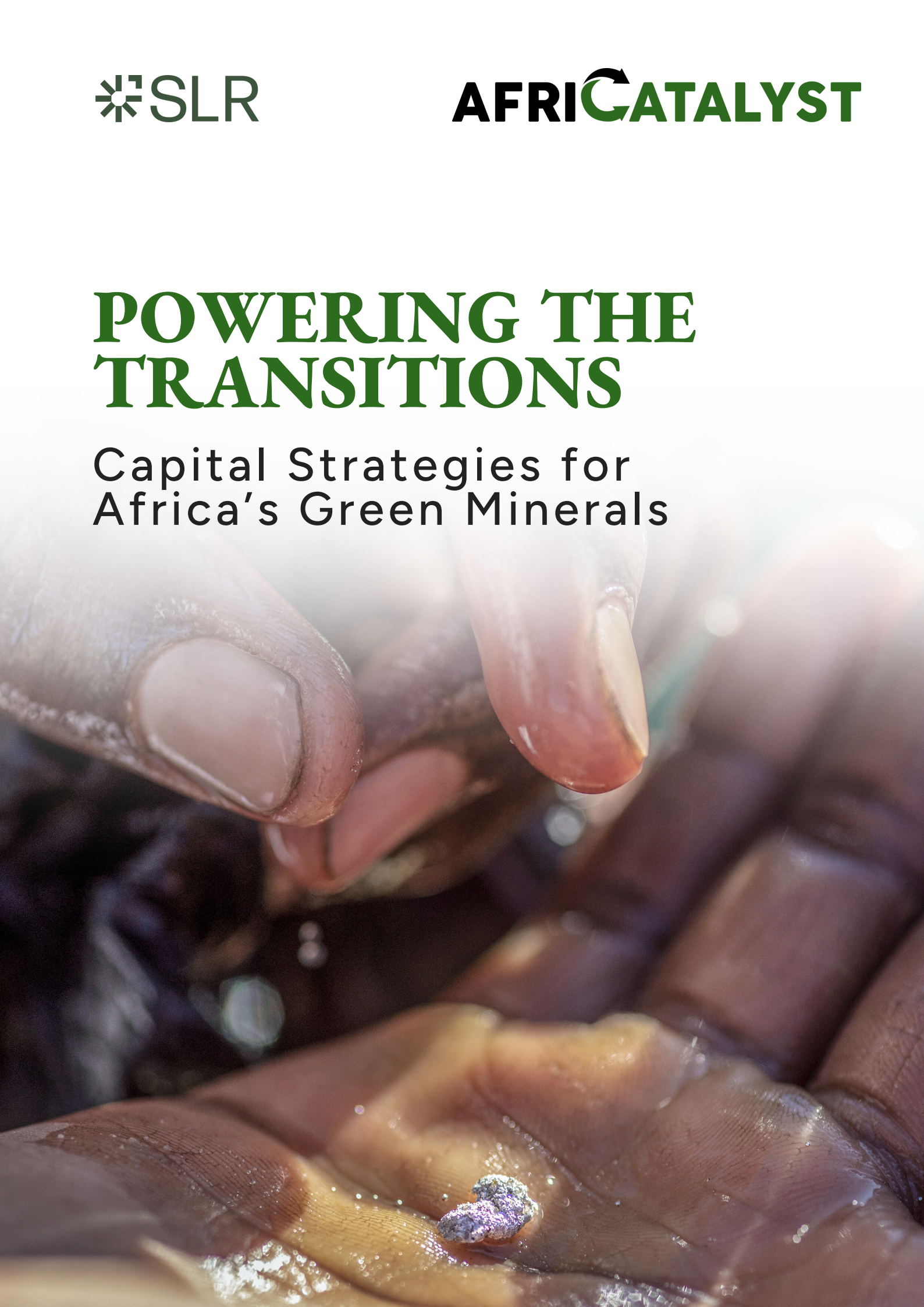
Capital Strategies for Africa's Green Minerals



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EXECUTIVE SUMMARY

Why Green Minerals Matter for Africa

Africa is central to the global energy transition, holding significant reserves of critical minerals such as cobalt, lithium, manganese, copper, and graphite; essential inputs for batteries, renewable energy systems, and electric mobility. Global demand for these minerals is expected to increase up to fourfold by 2040.

Yet Africa remains largely positioned as an exporter of raw materials, with limited participation in refining and manufacturing. A key constraint is chronically low investment in mineral exploration: despite hosting roughly 30% of global critical mineral reserves, Africa attracts only about 10% of global exploration spending. Even where exploration advances to production, local processing remains minimal, with most value added captured outside the continent.

Unlocking this opportunity requires sustainable and scalable financing, broader adoption of ESG frameworks that meet global standards while reflecting local development realities, and deeper regional integration, particularly under the AfCFTA, to support both upstream exploration and competitive downstream industrialisation.

A USD 68–108 Billion Financing Gap

Africa faces an estimated financing gap of USD 68–108 billion by 2030 to develop integrated green-mineral value chains. While Southern Africa alone hosts nearly one-third of global reserves, investment in exploration and midstream processing remains severely underfunded.

Financing is heavily concentrated in late-stage projects and state-owned enterprises, systematically excluding SMEs and artisanal and small-scale miners. Infrastructure deficits, regulatory uncertainty, and elevated ESG risks further constrain investor appetite and limit the development of diversified, resilient value chains.

Why Existing Financing Is Not Delivering

Existing financing instruments, concessional loans, guarantees, and blended finance, remain underutilized in the mining and minerals sector. Multilateral development banks and DFIs play a catalytic role, yet allocate less than 5% of their climate portfolios to mining-related activities.

Green bonds and carbon credits remain marginal for extractives due to taxonomy exclusions and methodological challenges. While blended finance has demonstrated strong potential, mobilizing private capital at leverage ratios of up to 4:1, Sub-Saharan Africa captures only about 7% of global blended-finance flows. Private equity and venture capital interest is growing but remains cautious, reflecting high perceived risk, long project timelines, and limited exit options.

Governance and ESG as Investment Enablers

Regulatory fragmentation, slow permitting processes, and inconsistent fiscal regimes continue to undermine investor confidence. Although ESG standards and responsible-sourcing frameworks are increasingly recognized, adoption remains uneven: only an estimated 38% of projects integrate ESG criteria consistently across the project lifecycle.

Greater regional harmonization under the AfCFTA, alongside alignment with global frameworks such as the EU Taxonomy and the OECD Due Diligence Guidance, is critical to crowd in sustainable finance while ensuring responsible and transparent mineral supply chains.

Environmental, Social, and Inclusion Challenges

Critical mineral extraction poses material risks to biodiversity, water resources, and community livelihoods. Securing and maintaining a social license to operate is therefore essential, as inadequate stakeholder engagement can result in costly delays and disruptions.

Gender and inclusion gaps persist across mineral value chains, with women-led SMEs facing systemic barriers to finance and participation. While financing mechanisms increasingly incorporate ESG safeguards, capacity constraints and weak monitoring and verification systems continue to limit their effectiveness.

A USD 68–108 Billion Financing Gap

A new generation of financing instruments offers viable pathways to close existing gaps and de-risk investment:

- **Debt-for-Climate Swaps**, which convert sovereign debt into climate-aligned investments, with potential annual flows of USD 6–8 billion.
- **Sustainability-Linked Loans**, which tie pricing to ESG performance indicators, representing a projected Sub-Saharan African market of USD 5–7 billion by 2030.
- **Results-Based Financing**, rewarding verified environmental and social outcomes, with an estimated USD 2–3 billion opportunity.
- **South–South partnerships**, particularly involving China, Gulf States, Asia, and Latin America, alongside regional platforms such as the AfDB's AGMFF to pool risk and scale blended finance.

Strategic Recommendations

- **Align Policy and Regulation**
  Harmonize mining codes with climate and industrial policies under the AfCFTA, and adopt national green-finance taxonomies alongside IFRS S2 disclosure standards.

- **Strengthen Institutional Architecture**
  Establish Green-Mineral Finance Facilities to channel blended finance and guarantees, and scale Project Preparation Facilities to build bankable pipelines and reduce transaction costs.

- **Embed ESG and Inclusion**
  Mandate ESG benchmarks and digital traceability systems, and expand gender-responsive finance windows and SME guarantee schemes.

- **Scale Innovative Instruments**
  Deploy debt-for-climate swaps, sustainability-linked loans, and results-based financing through MDB-backed guarantees and robust MRV systems, while integrating carbon-credit revenues into mineral-corridor decarbonisation strategies.

- **Deepen Regional and Global Integration**
  Anchor green-mineral financing within COP-aligned climate funds (GCF, CIF), strengthen South–South co-investment platforms, and harmonise ESG standards across regions.

Conclusion

Africa's critical mineral endowment presents a unique opportunity to align industrialisation with global climate objectives. By closing financing gaps, strengthening governance and ESG compliance, and scaling innovative financing instruments, Sub-Saharan Africa can position itself as a competitive and responsible supplier of green minerals, transforming natural resource wealth into long-term, sustainable prosperity.

CONTEXT AND BACKGROUND

The global energy transition is accelerating demand for minerals that underpin clean energy technologies, electric mobility, and renewable power systems. As countries pursue ambitious decarbonization pathways, the resilience, sustainability, and geographic diversification of mineral supply chains have become critical strategic concerns. In this context, Africa occupies a pivotal yet underexploited position. The continent holds vast reserves of minerals essential to the low-carbon transition, but continues to capture only a limited share of the value generated along global supply chains.

This section provides the foundational context for the report. It situates Africa's green mineral endowment within global energy transition dynamics, examines structural challenges to building integrated and resilient value chains, and highlights the central role of sustainable finance in unlocking responsible investment at scale. It also outlines the study's methodology, partnerships, and alignment with global climate, development, and just transition frameworks, setting the analytical basis for the sections that follow.

0.1 AFRICA'S GREEN MINERAL POTENTIAL IN THE GLOBAL ENERGY TRANSITION

Africa is emerging as a cornerstone of the global energy transition, endowed with vast reserves of minerals essential for clean technologies. The continent hosts significant shares of cobalt, manganese, chromium, and platinum group metals, alongside growing lithium, and rare earth deposits: Africa accounts for approximately 70% of global cobalt production, over 40% of manganese ore supply, and holds around 6% of known lithium reserves. It also contributes roughly 80% of platinum group metals and significant shares of chromium used in stainless steel and advanced alloys (IEA, 2024; UNCTAD, 2023; USGS data).

These resources position Africa not only as a supplier of raw materials but as a potential hub for integrated value chains that can drive industrialization, job creation, and sustainable economic growth. Unlocking this potential requires balancing extraction with environmental stewardship and community benefits to ensure a just and inclusive transition.

0.2 BATTERY AND RENEWABLE ENERGY MINERALS: STRATEGIC VALUE AND SUPPLY CHAIN CHALLENGES

Battery minerals such as lithium, cobalt, nickel, and copper are indispensable for electric vehicles, energy storage systems, and renewable energy infrastructure. Global demand for these minerals is projected to multiply - potentially up to fourfold by 2040 (IEA, 2023a) - driven by electrification and decarbonization targets. However, supply chains remain highly concentrated, creating vulnerabilities linked to geopolitical risks, processing bottlenecks, and ESG concerns. Although Africa holds roughly 30% of the world's critical mineral reserves, it attracts only about 10% of global exploration spending, with total exploration investment amounting to just US$1.27 billion in 2023. This underinvestment limits the pipeline of future projects and compounds the continent's already minimal participation in refining and manufacturing. Today, less than 5% of Africa's critical minerals are processed locally, while more than 80% of global cobalt refining capacity is in China (IEA, 2024). Targeted investment in exploration, beneficiation, precursor production, and recycling will be required to shift Africa's participation from ore exports to higher-value segments and build integrated, resilient value chains.

0.3 ROLE OF SUSTAINABLE FINANCE IN UNLOCKING MINERAL VALUE

However, public–private co-investment at the scale required is currently hindered by ESG risks associated with mining - particularly at the upstream end and in projects outside those operated by established mining majors. These risks elevate due-diligence costs, restrict access to affordable capital, and create hesitancy among institutional investors, even where project fundamentals are strong. As a result, financing remains concentrated in a narrow set of large, lower-risk projects, leaving much of Africa's green-minerals pipeline underfunded. This underscores the need to rethink financing instruments and to expand eligibility of transition finance to responsible green-minerals mining, recognising its essential role in decarbonisation.

Mobilizing capital at scale hinges on sustainable finance mechanisms that align profitability with environmental and social responsibility. According to UNEP FI and OECD guidance, investors increasingly require robust ESG integration to mitigate reputational and operational risks and to access concessional or blended capital (UNEP FI, 2023; OECD, 2023). These mechanisms are critical because they reduce perceived risk and improve bankability for projects in emerging markets.

Instruments such as blended finance, sustainability-linked loans (SLLs), and results-based financing (RBF) have demonstrated effectiveness in de-risking projects and attracting private capital. Blended finance can mobilize up to four dollars of private investment for every dollar of concessional funding (IFC, 2024). SLLs reached USD 809 billion in cumulative issuance globally since 2017, with pricing incentives tied to ESG performance (BloombergNEF, 2024). Results-based financing is gaining traction in climate and infrastructure sectors, rewarding verified outcomes and strengthening investor confidence (World Bank, 2024).

Green bonds, while widely used for renewable energy and infrastructure, remain largely ineligible for mining under major taxonomies such as the EU Taxonomy Regulation and Climate Bonds Initiative criteria due to Do No Significant Harm provisions (European Commission, 2020; CBI, 2022). They are, however, suitable for financing enabling infrastructure - such as renewable power for mineral corridors - critical to African mineral development.

Embedding ESG principles into financing frameworks is therefore essential to ensure that mineral development supports climate goals, respects human rights, and generates long-term socio-economic benefits. Alignment with IFC Performance Standards and OECD Due Diligence Guidance is now a prerequisite for access to global capital markets and concessional finance (IFC, 2012; OECD, 2023).

0.4 STRUCTURE AND LOGIC OF THE REPORT

The report is organized to guide readers from context to action:

- Africa's mineral potential and global supply chain dynamics.
- ESG risks and regulatory frameworks shaping investment decisions.
- Financial strategies and instruments for unlocking capital.

Recommendations for policy and industry action, emphasizing transparency, circularity, and just transition principles. This structure ensures a logical progression from problem definition to practical solutions.

> **"Instruments such as blended finance, sustainability-linked loans (SLLs), and results-based financing (RBF) have demonstrated effectiveness in de-risking projects and attracting private capital.**



0.5 ALIGNMENT WITH COP, SDGS, AND JUST TRANSITIONS PRINCIPLES

The analysis aligns with global climate and development commitments, including the Paris Agreement, Sustainable Development Goals, and Just Transitions principles. It emphasizes equitable benefit-sharing, gender inclusion, and environmental safeguards, ensuring that mineral development contributes to climate resilience and socio-economic progress. By embedding these principles, the report supports transitions that are not only green but fair, inclusive, and future-proof. Alignment also reflects evolving COP outcomes relevant to industrial decarbonization; notably Article 6 cooperation for results-based payments and JETP-style arrangements for baseload renewables in mineral corridors; these channels can be tapped to lower the cost of capital for compliant projects (UNFCCC, various; GCF guidance).



I. MAPPING FINANCING GAPS

As global demand for critical minerals accelerates, attention is increasingly shifting from geological availability to the financial and structural constraints that limit supply-chain development. For Africa, the challenge is not only identifying which minerals matter most for the energy transitions, but understanding where and why financing fails to flow along the value chain. Despite abundant reserves and growing strategic interest, capital mobilisation remains uneven, concentrated in a small number of large, late-stage projects, while exploration, processing, and smaller operators remain chronically underfunded. This section maps financing gaps across selected transition minerals by combining a structured mineral-selection framework with an assessment of supply-chain dynamics and investment needs. It examines how financing constraints vary by mineral, project stage, enterprise type, and region, and identifies the bottlenecks that prevent Africa from moving up the value chain and capturing greater economic value from its green-mineral endowment.

1.1 MINERALS SELECTION FRAMEWORK

1.1.1. Selection criteria: criticality, market relevance, strategic value

The global shift toward low-carbon, technology-driven economies is redefining the strategic landscape for mineral resources. As countries commit to net-zero targets and invest heavily in clean energy technologies, demand for certain "transition minerals" , those essential for renewable power, energy storage, e-mobility, and digitalisation , is rising sharply. For Africa, this transformation represents both a challenge and an unprecedented opportunity: the continent is home to many of the world's most important mineral reserves, yet it must also navigate how to turn geological wealth into sustainable economic value.

Against this backdrop, the selection of key minerals for this study is not arbitrary. It is guided by a structured framework that combines market analysis, policy relevance, and developmental priorities. Specifically, the selection rests on three complementary dimensions - criticality, market relevance, and strategic value - each addressing a different but interrelated question about how Africa's mineral endowments intersect with the global energy transition.

- **Criticality:** Minerals are assessed based on their importance to key transition technologies, their supply concentration risk, and the lack of viable substitutes. Minerals with a narrow supply base or concentrated production - especially where Africa is a major supplier - are ranked as highly critical.
- **Market Relevance:** Minerals are prioritised according to current and projected demand growth linked to global energy transitions trends (electric mobility, energy storage, renewable power generation, and digital technologies). Demand elasticity under net-zero scenarios serves as an indicator of long-term market relevance.
- **Strategic Value:** This criterion considers the potential of each mineral to contribute to Africa's broader industrialisation and regional integration goals. Minerals that offer downstream value-addition potential, through beneficiation, processing, or participation in global clean-tech value chains, are considered strategically important.

Together, these criteria ensure that the selected minerals are not only globally significant but also relevant to Africa's socio-economic development and industrial policy ambitions



1.1.2. Profiles of selected minerals

Building on the three-part selection framework outlined above - criticality, market relevance, and strategic value - this section presents the outcome of a structured assessment of Africa's mineral endowment against these criteria. The minerals profiled here represent those that are both geologically significant within the continent and strategically aligned with the demands of the global energy transitions. Despite limited renewable-energy deployment and currently low direct demand for critical minerals in Africa, the accelerating global push for electrification offers a substantial and timely opportunity for the continent.

Despite limited renewable-energy deployment and currently low direct demand for critical minerals in Africa, the accelerating global push for electrification offers a substantial and timely opportunity for the continent. It is against this backdrop that each mineral was evaluated not only for its global importance and market potential, but also for its capacity to drive industrialisation, regional integration, and value-chain participation across Africa. In essence, these profiles capture the intersection of Africa's natural resource strengths with the emerging requirements of clean energy, advanced manufacturing, and digital technologies.

The following brief summaries highlight the role of each selected mineral in the transition economy, its market outlook, and the specific African context in which it is found. Together, they illustrate how the continent's geological advantage can be leveraged into long-term economic and strategic positioning within global supply chains.

Lithium

- **Role:** A core input in lithium-ion batteries used in electric vehicles (EVs) and stationary energy storage. Over 90 % of global lithium consumption is now linked to battery production (mainly EV batteries and energy-storage batteries).
- **Criticality & Market Relevance:** Demand is expanding rapidly under all energy transitions pathways. According to the latest IEA data, global lithium demand rose by ≈ 30% year-on-year in 2023, reaching about 1.1 million tonnes of lithium-carbonate-equivalent (LCE).
- **Strategic Value:** Offers potential for local beneficiation into battery-grade lithium hydroxide.
- **African Context:** Significant reserves in Zimbabwe, Namibia, and Mali position the region as an emerging lithium supplier. According to one recent survey of African lithium-rich countries, the major African lithium reserve-holders (including DRC, Mali, Zimbabwe, Ghana and Namibia) together hold about 4.9 million metric tonnes of lithium reserves , roughly 6% of global lithium reserves.

Graphite (Natural)

- **Role:** Key anode material in lithium-ion batteries and essential for energy storage.
- **Market Relevance:** Demand set to grow sharply as EV adoption accelerates.
- **African Context:** Mozambique and Tanzania host some of Africa's most significant graphite resources: Mozambique's Balama mine alone produced nearly 97,000 tonnes of natural graphite in 2023 and represents one of the world's largest graphite deposits, while Tanzania's major projects, including Bunyu and Epanko, contain substantial graphite resources, estimated to account for roughly 5 % of global reserves, and have the potential to contribute increasingly to global supply as exploration and project development advance.

Cobalt

- **Role:** Used in high-performance battery cathodes and superalloys.
- **Criticality:** High, global supply heavily concentrated in the DRC (~70%).
- **Strategic Value:** Scope to expand refining and ethical-sourcing frameworks to capture greater downstream value.
- **African Context:** Although the DRC dominates global production, Zambia and Madagascar provide additional - albeit smaller - volumes and, as comparatively underexplored jurisdictions, have the potential to gradually increase their contribution as exploration and investment progress.

Copper

- **Role:** Essential for renewable power infrastructure, EV wiring, and grid expansion.
- **Market Relevance:** Electrification keeps copper central to global transition efforts.
- **African Context:** The DRC and Zambia's Copperbelt continue to underpin African mining, producing roughly 1.2 million tonnes and 840,000 tonnes of copper respectively in 2023, together representing a substantial portion of Africa's total copper production and global supply.

Manganese

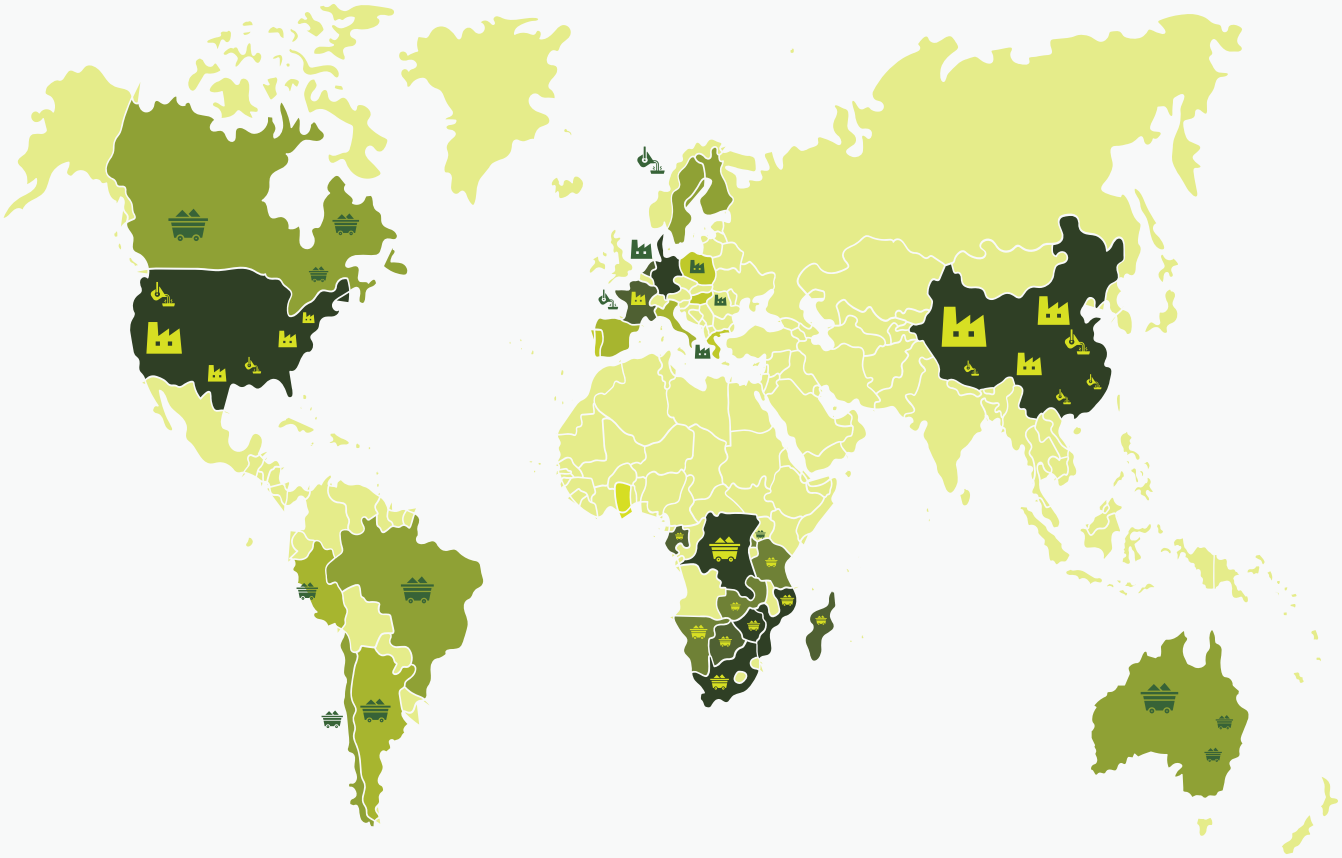
- **Role:** Used in steelmaking and emerging as a component in manganese-rich battery chemistries.
- **Strategic Value:** Offers beneficiation opportunities for cathode materials.
- **African Context:** South Africa and Gabon collectively dominate global manganese exports. By 2023, South Africa and Gabon together exported roughly 84 % of the world's manganese ores and concentrates (about 42 % from South Africa and 46 % from Gabon), underscoring their dominant position in global manganese exports.

The 3Ts – Tin, Tantalum, and Tungsten

- **Role:**
  - Tin – Used in soldering for electronics and increasingly in next-generation batteries.
  - Tantalum – Crucial for capacitors in advanced electronics, EVs, and aerospace systems.
  - Tungsten – Used in hard metals, semiconductors, and renewable-energy equipment.
- **Criticality:** All three are considered critical due to limited supply sources and importance to high-tech manufacturing.
- **Strategic Value:** Artisanal and small-scale production across Central and East Africa underpins global supply chains for advanced technologies.
- **African Context:** The Great Lakes region , notably Rwanda, Democratic Republic of the Congo (DRC), and Burundi , remains a major global hub for the 3Ts: the region supplies roughly half of the world's tantalum, while Rwanda alone accounts for over 22% of global tantalum production as of 2024. This offers substantial economic potential, but persistent challenges around traceability and responsible sourcing continue to raise ESG concerns.



1.2 BATTERY & OTHER RENEWABLES SUPPLY CHAIN MAPPING



1.3 FINANCING NEEDS ASSESSMENT

Across Africa, global interest in critical minerals has surged as the energy transition accelerates - the global critical minerals market is projected to grow at a CAGR of ~7.5% through 2032, underlining the intensifying demand for clean technology inputs. Minerals such as the ones under review here are essential to batteries, renewable energy systems and electronics, yet the financing needed to unlock their full potential remains uneven and insufficient. Southern Africa alone hosts nearly a third of the world's proven critical mineral reserves, including significant shares of global cobalt and copper, but the region receives only a small fraction of global exploration spending (World Economic Forum, 2025). This mismatch between mineral endowment and capital mobilisation continues to limit Africa's capacity to participate fully in global clean-technology value chains.

1.3.1. Investment requirements by stage and mineral

Financing needs differ markedly by mineral and project stage. Copper exploration remains underfunded across Africa despite the long history of mining in Zambia and the Democratic Republic of the Congo (DRC). While major firms continue to invest in known assets, early-stage exploration struggles to attract capital, largely due to geological risk, regulatory uncertainty, high infrastructure costs, and ESG-related risks, which are often cited as a key constraint on participation by institutional investors and development finance institutions. The challenge persists into the feasibility stage, where policy instability, energy constraints, transport bottlenecks, and ongoing ESG considerations continue to depress investor appetite. Large-scale copper-cobalt projects such as those in the Congolese Copperbelt require substantial capital to expand capacity, yet local value addition remains limited; in Zambia, for example, recent analysis identified £4.7–6.5 billion in potential investment for domestic copper and cobalt processing, but only a small portion has been realised (UK Growth Gateway, 2023).

Manganese, which is produced mainly in South Africa, Gabon and Ghana, attracts steady investment at the extraction stage, given its established role in steel production. However, the shift toward battery-grade manganese for electric vehicles requires a different profile of investment, long-term capital for refining, purification and processing facilities. Such facilities are scarce across Africa, and their absence represents a missed industrialisation opportunity. Even where reserves are substantial, investment in beneficiation remains constrained by energy costs, policy uncertainty and the absence of integrated regional value chains (IMF, 2024).

The 3Ts demonstrate an even more pronounced financing gap. Production is heavily dominated by artisanal and small-scale miners (ASM), particularly in Rwanda and eastern DRC. These operations, though significant in volume, remain informal, dispersed and weakly capitalised. Lacking geological surveys, legal status or collateral, ASM actors are largely excluded from formal financing. This inhibits their ability to mechanise, formalise or comply with international traceability standards. The AfricaMaVal initiative emphasises that the region's inability to attract investment for midstream capacity, such as tin smelters or hydrometallurgical plants, is directly linked to the fragmented nature of ASM production and the absence of coordinated regional strategies (AfricaMaVal, 2025).

Cobalt, highly concentrated in the DRC, has seen more substantial investment due to its central role in battery manufacturing. Yet most financing targets large industrial copper-cobalt operations rather than early-stage exploration or domestic processing. Over 70% of the world's cobalt originates from the DRC, but the vast majority is exported in intermediate form and refined elsewhere (IMF, 2024). Efforts to develop downstream capacity in neighbouring Zambia illustrate growing regional ambitions, although success depends on policy coordination, improved infrastructure and long-term offtake agreements.

> **"While major firms continue to invest in known assets, early-stage exploration struggles to attract capital, largely due to geological risk, regulatory uncertainty, high infrastructure costs, and ESG-related risks...**



1.3.2. Disaggregation by enterprise type: SOEs, SMEs

Financing availability also reflects the nature of enterprises operating in the sector. State-owned enterprises (SOEs) play an outsized role in several African mining jurisdictions. In the DRC, for instance, Gécamines holds stakes in major copper-cobalt joint ventures, including the Deziwa mine, and its involvement can attract large-scale capital through state backing and international partnerships (find good reference). However, SOE participation can also raise investor concerns related to governance, political interference and fiscal instability, which in turn affect financing costs and appetite.

In contrast, small and medium-sized enterprises (SMEs) and artisanal miners face far greater financing constraints. This is particularly evident in the 3T sector, where production is dominated by small operators with limited access to formal financial institutions. Their informality, lack of collateral and inconsistent production volumes reduces lender confidence. Without blended finance instruments - combinations of grants, concessional lending, and technical assistance, these enterprises struggle to formalise or scale. AfricaMaVal's recommendations underscore the importance of targeted support for ASM operators, both to unlock financing and to improve ESG performance in line with international market requirements (AfricaMaVal, 2025).

Even in copper and cobalt sectors, local SMEs often lack access to the capital, technological capabilities and global market linkages possessed by multinational firms. As a result, domestic participation in higher-value segments of the value chain remains shallow, limiting the broader developmental impact of critical minerals.

1.3.3. Regional disparities and bottlenecks

Financing patterns vary widely across African regions. Southern Africa, despite its vast reserves, suffers from chronic underinvestment in exploration and mineral processing. Policy unpredictability, inconsistent fiscal regimes and infrastructure gaps, particularly in rail, road and electricity, undermine investor confidence. The Lobito Corridor, a major regional infrastructure initiative linking the DRC and Zambia to the Angolan coast, illustrates both the scale of the opportunity and the magnitude of investment required. If completed, it could significantly reduce logistics costs for copper and cobalt exports, yet mobilising adequate capital remains a challenge (DBSA, 2025).

Central Africa offers enormous geological prospects but presents some of the most complex investment environments. In the DRC, governance challenges, political instability and conflict dynamics continue to constrain financing, particularly for exploration and SME-level activity. Academic research suggests that cobalt-rich regions sometimes attract greater government security presence, potentially reducing local conflict, but this effect is uneven and does not fully mitigate nationwide risk perceptions (Tarimo & Li, 2024).

The dynamics in West Africa are different again. While countries such as Nigeria and Ghana are beginning to attract interest in lithium and rare earth elements, the region lacks comprehensive geological data and proven exploration track records. Consequently, international investors often gravitate toward more mature jurisdictions, even where the geological potential is less promising.

Across the continent, several bottlenecks cut across minerals and regions. Policy uncertainty - particularly in relation to taxes, royalties, and beneficiation mandates - remains a top concern for investors (World Economic Forum, 2025). Infrastructure deficits, especially in energy and transport, increase capital and operating costs. Limited midstream capacity continues to result in the export of raw or semi-processed minerals, depriving African economies of higher-value industrial opportunities. ESG risks, including community impacts, environmental degradation, and labour concerns, also weigh heavily on financing decisions, particularly for institutions bound by strict ethical standards.

Africa's rich deposits of copper, cobalt, manganese and the 3Ts position the continent at the heart of the global energy transitions. Yet financing remains skewed toward late-stage industrial projects and SOEs, leaving exploration, SMEs, ASM operators and domestic processing underfunded. This imbalance suppresses value addition, local participation, and long-term industrial development. Addressing the continent's financing challenges will require regulatory stability, improved infrastructure, targeted SME support, regional cooperation, and the use of blended finance to de-risk early-stage investments. If these efforts succeed, Africa could significantly expand its role in global critical mineral supply chains and capture a much larger share of the associated economic benefits.

II. EVALUATION OF EXISTING MECHANISMS

Without the right policies, governance standards, and strategic investments, the continent risks to remain a supplier of raw materials rather than become a major industrial player in global value chains. Existing financing for green-mineral development remains limited and often highly constrained. Companies, state-owned enterprises (SOEs) and small and medium-sized enterprises (SMEs), face numerous barriers to accessing capital due to regulatory gaps, high perceived risk, insufficient ESG capacity, and weak project preparation.

In this section, we analyse the main barriers to financing and review the financing instruments and mechanisms currently available to support the development of Africa's green-mineral sector.

2.1 BARRIERS TO FINANCE FOR SOES AND SMES

2.1.1. Regulatory and institutional constraints

Financing for Africa's green-minerals sector is shaped by the same systemic regulatory and institutional constraints that affect firms across Sub-Saharan Africa, while also facing additional sector-specific challenges. More than 25% of firms in SSA identify the "availability and cost of finance" as their biggest obstacle, almost twice the rate in any other region, and over 60% of MSMEs report needing but being unable to access loans (World Bank, Enterprise Surveys, 2023). For SOEs, unclear mandates, mixed commercial and policy objectives, and weak reporting systems heighten investor concerns and raise perceived contingent liabilities. Evidence from the IMF Fiscal Transparency Handbook (2023) and OECD SOE Governance Guidelines (2022) shows that such governance weaknesses can increase borrowing costs by up to 200 basis points. For SMEs, fragmented regulations, weak collateral regimes, shallow credit markets, and limited credit information increase transaction costs and discourage lending (World Bank Doing Business Report, 2020). Broader constraints, such as foreign-exchange restrictions, inconsistent capital-account policies, and the absence of robust PPP/project-preparation systems, further limit the structuring of bankable projects (OECD Blended Finance Report, 2023; World Bank, PPP Frameworks in Emerging Markets, 2022). Addressing these weaknesses through SOE governance reforms, stronger insolvency and collateral systems, improved credit information, harmonised FX and tax rules, and investment in project-preparation facilities could reduce the cost of capital by 10–20% and expand financial instrument availability (World Bank, Financing the Sustainable Energy Transition, 2023).

In addition to these general regulatory and institutional constraints, green-mineral investments face unique constraints and opportunities. For SOEs and major operators, large-scale extraction and processing require significant upfront capital, long payback periods, and stable regulatory environments; unclear mandates and governance gaps increase the risk of fiscal or environmental contingencies, deterring investors (OECD, 2023). For SMEs and junior miners, limited collateral, complex licensing, fragmented regulations, and weak credit reporting systems make traditional lending difficult, pushing them toward alternative financing structures such as equity, streaming, royalty agreements, or offtake prepayments (African Business, 2025). The financial ecosystem also remains underdeveloped: few dedicated green-mineral financing instruments exist in SSA, though blended finance, sustainability-linked loans, and risk-sharing tools can help de-risk projects, especially in downstream processing of battery-grade graphite, refined lithium, and cobalt (IMF, 2024). Despite abundant reserves, less than 10% of green-mineral projects in Southern Africa have secured financing, reflecting high perceived risks, long development timelines, and stringent ESG requirements. Strengthening harmonised regulatory frameworks, establishing public project-preparation facilities, and designing tailored green-mineral financial instruments would substantially improve project bankability and reduce financing costs for both SOEs and private operators (WEF, 2025).

2.1.2. Risk perceptions and creditworthiness

Risk perception, driven by creditworthiness assessments, critically shapes whether finance reaches green-mineral SOEs and SMEs in SSA, and on what terms. For green-mineral SMEs, surveys indicate that only 10% have bank loans or lines of credit, while 73% rely primarily on internal funds for investment (IFC–World Bank, 2025). Between 20% and 33% of SMEs are fully credit-constrained, unable to access financing even when needed (IFC–World Bank, 2025). These gaps hinder investment in decarbonised extraction, processing, and downstream value chains (AfDB, 2024).

For SOEs engaged in green-mineral operations, lenders evaluate both corporate balance sheets and sovereign support. Lack of independently audited financials, frequent state-directed transfers, or operations in politicised mineral sectors prompts creditors to demand higher spreads or sovereign guarantees (AfDB, 2024). Weak fiscal accounts increase perceived sovereign risk, raising lending costs and shortening tenors. Political-economy factors - management turnover, opaque procurement, and related-party transactions - further depress credit profiles, making long-term green-mineral infrastructure financing difficult (AfDB, 2024).

SME creditworthiness is also affected by data poverty: many firms lack audited statements, formal payrolls, or acceptable collateral (IFC–World Bank, 2025). Lenders often rely on relationship banking or proxies (supplier contracts, utility payments), which do not replace robust credit histories. This drives high interest rates (20–25% or more) and short maturities, limiting expansion of sustainable mining practices and ESG-compliant operations (IFC–World Bank, 2025). Across SSA, the MSME finance gap remains substantial, constraining capital for green-mineral extraction, battery feedstock projects, and renewable energy-linked mining facilities (IFC–World Bank, 2025). Perception gaps, banks overestimating default risk relative to actual loss rates, can be mitigated through targeted guarantees and first-loss facilities, which demonstrate portfolio performance and build lender confidence (Mobilizing Private Finance for Development, 2024).



Mitigants for Green-Minerals Financing

Standardized financial reporting and audits for SOEs and SMEs in mineral sectors (AfDB, 2024).

Expansion of credit bureaus and alternative data sources (mobile payments, utility bills, off-taker contracts) (IFC–World Bank, 2025).

Political-risk insurance for long-tenor capital expenditures (AfDB, 2024).

Capacity building in accounting, ESG reporting, and governance for green-mineral operators (AfDB, 2024).

Performance-based partial credit guarantees to reduce perceived risk (Mobilizing Private Finance for Development, 2024).

Sustainability-linked loans (SLLs) tying interest margins to verified ESG performance and decarbonisation metrics (IFC, 2022).

MDBs and DFIs can play a catalytic role by co-financing green-minerals projects, demonstrating commercial viability, and using blended finance to crowd in private investors while reducing perceived risk (AfDB, 2024; Mobilizing Private Finance for Development, 2024).

2.1.3. Capacity gaps and lack of bankable projects

Significant capacity gaps across institutions, SOEs, and private operators limit the ability of African countries to prepare green-mineral projects to investment-ready standards. Public agencies and geological services often lack specialized project-preparation units capable of producing high-quality technical, financial, and ESG documentation. Analyses by the African Minerals Development Centre (AMDC, 2022) and the World Bank (2020) highlight persistent gaps in high-resolution geological data, resource modelling capacity, and permitting systems, all of which create uncertainty for investors' face similar challenges in procurement, financial modelling, risk assessment, and ESG compliance, reducing their credibility as project sponsors (AMDC, 2022; World Bank, 2021). Junior miners and SMEs frequently lack the technical expertise required to prepare robust feasibility studies, cost estimates, or environmental and social impact assessments (ESIA). Local financial institutions also have limited capacity to evaluate sector-specific instruments such as royalties, streaming agreements, or sustainability-linked loans. According to the African Development Bank (AfDB, 2022), these institutional gaps increase due-diligence costs and slow project advancement.

These capacity constraints directly contribute to a second, closely related challenge: the scarcity of fully bankable projects in the green-minerals sector.

A major obstacle to financing green minerals is the limited pipeline of bankable projects meeting investors' technical, financial, ESG, and contractual requirements. The World Bank (2020) and the International Energy Agency (IEA, 2023) note that many African mineral assets stall at exploration or pre-feasibility stages because they lack the rigorous studies and risk-mitigation elements required by institutional financiers.

Africa also receives less than 10% of global exploration expenditure, constraining geological certainty and long-term investment planning (IEA, 2023).

Bankability is further hindered by lengthy permitting processes, unclear land and community-engagement frameworks, and inconsistent application of ESG standards. These issues, documented in the World Bank's Extractive Industries Sourcebook (2021), elevate project risk and delay financial close. Downstream beneficiation projects, such as lithium refining, battery-grade graphite, or cobalt sulphate production, face additional challenges related to grid constraints, infrastructure gaps, and the absence of long-term offtake agreements, which the World Economic Forum (WEF, 2023) identifies as key deterrents to investment.
As emphasized by the AfDB (2022), improving bankability requires stronger feasibility and engineering studies, predictable and transparent permitting frameworks, early community engagement, and integrated planning for power, water, and logistics needs. Without these elements, many promising green-mineral opportunities fail to reach financial close.

Practical steps to close the gap include establishing a national Project Preparation Facility (PPF) dedicated to preparing green-minerals projects to MDB standards; providing targeted technical assistance for feasibility studies, ESIA preparation, and financial modelling; streamlining permitting and ESIA processes supported by standardized templates for PPPs and offtake agreements; and creating an online project-pipeline dashboard to connect projects with investors. Early community engagement and the integration of power, water, and transport needs into project design are also essential. In parallel, building the capacity of local banks to underwrite emerging asset classes is critical.

“These capacity constraints directly contribute to a second, closely related challenge: the scarcity of fully bankable projects in the green-minerals sector.



2.1.4. Gender and inclusion barriers

Gender and social inclusion constraints significantly compound financing barriers in Sub-Saharan Africa. Women-led and women-owned SMEs face persistent structural disadvantages, including lower collateral endowments due to land and property-rights gaps, smaller average firm size, concentration in informal sectors, limited financial literacy, and disproportionate unpaid care responsibilities that constrain business growth. These factors translate into lower access to formal credit, shorter loan maturities, and smaller loan sizes. Evidence from IFC analyses during and after the COVID-19 period documents the disproportionate impact of shocks on women-led MSMEs and underscores the importance of blended finance and guarantee mechanisms to mitigate perceived risks and expand lending to these firms (IFC, 2022).

Inclusion barriers extend beyond gender. Youth-led enterprises, microentrepreneurs, and firms located in remote or rural mineral corridors are often excluded from formal finance due to weak links to value chains, limited access to bank branch networks, and gaps in digital identification systems that prevent digital onboarding. These constraints are particularly acute in low-density and resource-rich regions, where financial infrastructure remains sparse. Addressing them requires targeted financial instruments, including gender-tagged blended-finance windows, partial credit guarantees incorporating gender or youth-sensitive scoring, simplified lending products (such as group lending or warehouse-receipt systems), and the use of alternative data, including mobile money transactions and pay-as-you-go energy payments, to build credit histories. However, financial tools alone are insufficient: effective inclusion strategies must combine finance with non-financial support, such as skills development, market linkages, and childcare solutions, to enable sustained enterprise growth (UNEP, 2023, p. 22).

These challenges are particularly pronounced in the green-minerals sector, where women- and youth-led SMEs are often concentrated in artisanal and small-scale mining, limiting their access to formal finance and excluding them from higher-value segments such as mineral processing and battery-grade production (UNDP, 2024, p. 15; OECD, 2023, p. 28). Gender and inclusion barriers are further amplified by ESG compliance requirements: without targeted support for technical standards, reporting, and certification, women-owned and youth-led firms struggle to meet investor requirements and participate in downstream value chains (IFC, 2022, p. 36). Integrating gender-responsive design features, including gender KPIs, disaggregated reporting, procurement quotas, and inclusion-linked incentives within sustainability-linked loans, can strengthen local value chains, improve ESG performance, and attract donor and impact capital, while generating measurable social and financial returns (World Bank, 2023, p. 19; IFC, 2022, p. 37).

Operationally, this implies designing gender-responsive blended-finance facilities with explicit inclusion targets, expanding partial guarantee schemes for women and youth, investing in digital ID and credit-data infrastructure, and mainstreaming gender and inclusion indicators into project procurement and SLL frameworks. Monitoring outcomes through disaggregated indicators, such as loan volumes to women-led firms, repayment performance, and job creation, and publishing results can further crowd in donor and private capital and reinforce accountability.



Barriers	Description	Recommended Policy Instruments	Responsible Ministries/ Institutions	Priority Donor/DFI Partners
Regulatory and institutional constraints	State-Owned Enterprises (SOEs) and Small and Medium Enterprises (SMEs) in Sub-Saharan Africa (SSA) face fragmented and often outdated regulatory frameworks. Inefficient licensing processes, weak insolvency laws, and limited protection for minority shareholders discourage investment. Additionally, limited inter-agency coordination creates regulatory uncertainty and deters private financing.	Streamline business registration and licensing systems through one-stop investment platforms Modernize insolvency and collateral laws to improve credit recovery Introduce SOE governance reforms in line with OECD Guidelines Establish clear PPP frameworks to attract blended finance	Ministry of Finance and Budget; Ministry of Industry and Trade; Public Enterprise Reform Agency; Central Bank of Madagascar; National Investment Promotion Agency	World Bank; African Development Bank (AfDB); International Finance Corporation (IFC); Agence Française de Développement (AFD); USAID; European Union (EU)
Risk perceptions and creditworthiness	Financial institutions often perceive SMEs and SOEs as high-risk due to lack of credit history, volatile markets, and perceived political interference. Inadequate credit rating systems and limited access to long-term capital exacerbate these challenges, raising financing costs.	Develop national credit guarantee schemes and partial risk-sharing facilities Establish sovereign-backed SME credit bureaus Strengthen macroeconomic stability through prudent fiscal policy Promote risk-based lending tools and blended finance platforms	Central Bank; Ministry of Economy and Finance; Credit Bureau Authority; Financial Sector Supervisory Commission	IFC; AfDB; World Bank; FMO; DEG; Norfund; KfW; UK Foreign, Commonwealth & Development Office (FCDO)

Barriers	Description	Recommended Policy Instruments	Responsible Ministries/ Institutions	Priority Donor/DFI Partners
Capacity gaps and lack of bankable projects	SOEs and SMEs frequently lack the technical, managerial, and financial skills needed to prepare bankable projects. This results in underdeveloped pipelines for investment and low absorption of available funding. Public institutions also struggle with project appraisal and contract management capacities.	Create dedicated Project Preparation Facilities (PPFs) within national investment agencies Introduce technical assistance programs for feasibility and financial modelling Foster university–industry partnerships for innovation and entrepreneurship Integrate ESG and impact-investing criteria in project design	Ministry of Planning and Development; Ministry of Higher Education; Investment Promotion Agency; Chamber of Commerce; National Training Institutes	World Bank; AfDB; UNDP; JICA; USAID; Proparco; EU's Global Gateway Initiative
Gender and inclusion barriers	Women-led and youth-led enterprises face systemic barriers in accessing finance, including gender bias in lending, limited asset ownership, and exclusion from formal business networks. These disparities limit inclusive growth and economic diversification in Madagascar and SSA more broadly.	Expand gender-responsive financial products and microfinance Enforce equal access to collateral and property rights Create women-focused entrepreneurship accelerators and credit lines Implement mandatory gender quotas in SOE boards and SME funding programs	Ministry of Gender and Social Inclusion; Ministry of SMEs and Entrepreneurship; National Microfinance Council; Central Bank Gender Unit	UN Women; AfDB's Affirmative Finance Action for Women in Africa (AFAWA); IFC; Mastercard Foundation; UNDP; FCDO; USAID; World Bank Gender Innovation Lab

2.2 MULTILATERAL AND PRIVATE SECTOR ROLES

2.2.1. MDBs: AfDB, IFC, World Bank – mandates, instruments, case studies

Multilateral Development Banks (MDBs) have become increasingly central to Africa's efforts to transform its mineral endowment into a driver of low-carbon industrialization. Beyond traditional development lending, MDBs deploy concessional capital, blended-finance instruments, guarantees, safeguards, and institutional support that directly shape who can invest, at what stage, and under what conditions along green-minerals value chains. Their interventions have differentiated implications for SOEs, private firms, SMEs, artisanal miners, and projects at different stages of maturity.

MDBs are particularly influential in mobilising finance for capital-intensive and high-risk segments of the green-minerals sector. Through concessional loans, blended-finance vehicles, and guarantees, MDBs help bridge the gap between early project risk and private-sector investment readiness. This role is most visible in mid- to late-stage projects, where feasibility studies exist but financing remains constrained by infrastructure gaps, ESG risks, or long payback periods.

The World Bank's Climate-Smart Mining Facility illustrates how MDBs support renewable-energy integration, water efficiency, waste management, and traceability systems for minerals such as cobalt, lithium, and copper, using concessional and blended resources to align extraction with sustainability standards (World Bank, 2019). Similarly, the African Development Bank (AfDB), through its climate-finance windows and implementation of the African Green Minerals Strategy, provides concessional co-financing and guarantees to support local processing, transport corridors, and clean-energy infrastructure critical to sustainable beneficiation (AfDB, 2024).

- For SOEs, MDB participation lowers borrowing costs and enhances credibility, particularly for large processing plants, refineries, and shared infrastructure.
- For large private operators, MDB guarantees and co-financing crowd in commercial lenders.
- For early-stage exploration, MDB involvement remains limited, as this phase typically falls outside MDN core mandates, leaving a financing gap that still constrains pipeline development.

MDBs also shape green-minerals development by strengthening governance, regulatory, and traceability frameworks, which increasingly determine access to global markets. Through the World Bank's Extractives Global Programmatic Support (EGPS), countries such as the DRC and Zambia have implemented digital mining cadastres, traceability systems, and revenue-management reforms, key prerequisites for participation in OECD- and EU-regulated supply chains (World Bank, 2023).

At the continental level, the AfDB–African Union Commission African Green Minerals Strategy aligns mineral industrialisation with the Paris Agreement and Agenda 2063, embedding renewable-energy use, transparency, and local-content requirements as conditions for competitiveness in global markets (AfDB, 2024).

- For SOEs and large firms, improved governance reduces policy risk and facilitates export access.
- For SMEs and junior miners, compliance costs can be prohibitive without MDB-supported technical assistance.
- For artisanal and small-scale miners (ASM), traceability and formalisation programs are often the one of the few viable pathways to market inclusion.



EVALUATION OF EXISTING MECHANISMS

MDB safeguard frameworks, the IFC Performance Standards, World Bank Environmental and Social Framework (ESF), and AfDB Integrated Safeguards System (ISS), set the benchmark for responsible mining. These standards are already applied in projects such as Kamoa–Kakula (DRC) and the Guinea Alumina Corporation, where MDB financing required biodiversity management, resettlement frameworks, and community-development mechanisms aligned with international norms (IFC, 2025; WEF, 2023).

MDBs also invest in long-term institutional capacity. Through the AfDB's African Natural Resources Centre (ANRC) and the World Bank's RISE Partnership, MDBs support geological mapping, fiscal-regime reform, and responsible supply-chain development (World Bank, 2024). In parallel, initiatives such as the African Financial Alliance on Climate Change (AFAC) promote sustainable-finance taxonomies that enable banks to channel capital toward ESG-compliant mineral projects, while IFC- supported sustainability-linked bond programs also help compliant African producers access global ESG-oriented capital markets.

- For SOEs, MDB safeguards strengthen negotiating power and social licence.
- For SMEs, ESG compliance becomes a gateway, but also a barrier, without dedicated support.
- For ASM, formalisation programs supported by MDBs are often essential to meet minimum ESG thresholds.

Despite their central role, MDB impact remains below potential. Deployment cycles are slow, mandates remain risk-averse, and MDB engagement in early-stage exploration and junior mining, where Africa's financing gaps are most acute, is limited. Many countries struggle to meet the technical and policy prerequisites required to access concessional windows, while weak project-preparation ecosystems constrain pipeline development. As a result, MDB instruments such as guarantees, blended finance, and climate-linked facilities are not deployed at sufficient scale, leaving Africa's green-mineral assets underdeveloped despite their strategic importance to global energy-transition supply chains.

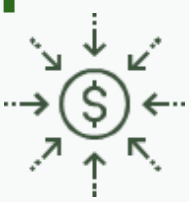
MDBs are most effective in mid- to late-stage, capital-intensive projects and in building the governance and ESG foundations of Africa's green-minerals sector. To unlock greater impact for SMEs, artisanal miners, and early-stage projects, MDB engagement must be complemented by stronger project-preparation facilities, exploration-risk capital, and targeted inclusion instruments, areas where current financing remains insufficient.

2.2.2. Private equity and venture capital – trends, appetite, constraints

Private equity (PE) and venture capital (VC) have emerged as pivotal sources of risk-tolerant, long-term finance in Africa, filling critical gaps left by commercial banks and supporting capital-intensive activities such as exploration, processing, and technological upgrading (AVCA, 2024; S&P Global, 2024). In 2024, African private-capital fundraising across the continent more than double to USD 4 billion across 22 funds, the third-highest total in a decade, driven by growing specialization in infrastructure, energy, and industrial value chains (AVCA, 2024). Venture capital flows amounted to roughly USD 3.6 billion, although less than 7% of total African private-capital activity involved extractives or minerals, reflecting persistent risk perceptions and the long gestation periods typical of the mining sector (AVCA, 2024; BCG, 2025).

Within this ecosystem, PE and VC play complementary roles in advancing Africa's green-minerals agenda.

PE funds, typically deploying USD 40–70 million per transaction, focus on advanced-stage or near-production mining and midstream assets such as beneficiation, materials processing, and logistics, where governance upgrades and operational efficiency can generate returns.



Notable examples include Greenstone Resources' investment in the Tulu Kapi gold project (Ethiopia) and the Africa Finance Corporation's investments in African midstream mineral infrastructure, demonstrating how PE capital finances infrastructure and modernization for high-capex ventures. For SOEs, PE participation can bring governance discipline, operational expertise, and co-financing for processing plants and transport corridors. For SMEs, PE is generally inaccessible unless firms are aggregated, formalised or integrated into larger platforms

VC activity in minerals remains relatively limited but is growing in adjacent technologies. Early-stage companies developing AI-assisted mineral exploration, traceability technologies, recycling solutions, and low-carbon processing innovations are beginning to attract funding. KoBold Metals, backed by Breakthrough Energy Ventures, Andreessen Horowitz, and other major investors, has become a prominent example of how deep-tech exploration models are being deployed in Zambia, Namibia, and the DRC to map copper, cobalt, and lithium deposits using machine learning and geophysical modelling (TechCrunch, 2025). Impact-oriented VC funds in Kenya, South Africa, and Nigeria are also expanding investment in circular-economy and clean-energy technologies, though less than 10% are linked directly to mineral value chains (AVCA, 2024). Investor's appetite is rising for battery metals, graphite, and rare earths, but persistent challenges, high perceived sovereign and operational risk, information asymmetries, exit illiquidity, and regulatory unpredictability, continue to constrain sector growth. For artisanal and small-scale miners (ASM), venture capital rarely invests directly in mining operations; engagement is typically indirect, through investments in traceability, formalisation, aggregation, and responsible-sourcing platforms. For SMEs and start-ups, VC is most relevant in services, digitalisation, and environmental compliance, not extraction.

Development Finance Institutions (DFIs) such as Proparco, and Norfund are helping de-risk private capital. They co-invest alongside PE funds, provide subordinated capital, and offer risk-mitigation instruments that make high-capex mineral projects more investable. Their blended-finance structures lower the cost of capital and attract private investors into value-addition segments such as beneficiation, renewable-power integration, and responsible-sourcing infrastructure.

To fully unlock the potential of private capital in green minerals, governments and regional bodies will need to introduce regulatory incentives, such as tax-preferenced impact funds, clearer ESG standards, and predictable licensing frameworks, while DFIs scale up their blended-finance windows and provide clearer investment and exit pathways. Additionally, DFIs need to come in earlier where the risk is higher and where upfront capital is most needed by junior miners in Africa. When strategically aligned, PE and VC can accelerate Africa's green-industrial growth, helping convert mineral endowments into long-term, value-added economic transformation rather than extractive dependence.

In summary, PE is most effective in mid- to late-stage, capital-intensive green-minerals projects, while VC supports early-stage innovation and enabling technologies. Neither instrument alone can finance the full value chain. When strategically aligned with DFI risk-sharing and regulatory reform, PE and VC can accelerate Africa's green-industrial transformation, shifting the sector from extractive dependence toward value-added, low-carbon growth.



2.2.3. Sovereign and public sector initiatives – national funds, guarantees

African governments are no longer content to collect royalties while value creation happens elsewhere. A new model is emerging, one where states co-invest, share risk, and shape strategy in the green-minerals economy. Across the continent, sovereign funds, development banks, and public guarantees are redefining how capital flows into critical minerals and green infrastructure.
The first major role played by sovereigns is direct participation in mineral assets. Through equity stakes and free-carry arrangements, African states are positioning themselves as active owners rather than observers. Ghana's Minerals Income Investment Fund (MIIF), which holds a 6% share in the Atlantic Lithium Ewoyaa Project, and Zimbabwe's Mutapa Fund, which has stakes in Kuvimba Mining House covering lithium, platinum and gold, illustrate this shift. Uganda's National Mining Company, with up to 15% free-carry equity in large-scale projects, reflects the same dynamic. For SOEs, equity participation can strengthen balance sheets and bargaining power but also increases governance and transparency requirements. For SMEs and ASM, direct equity participation is generally less relevant; benefits are indirect, through improved sector coordination and infrastructure.

The second role is the use of sovereign funds, pension funds and national development banks to anchor green industrialisation. Several countries are now using public investment vehicles to channel capital into clean energy, midstream processing, and the enabling infrastructure required for sustainable mineral value addition. Nigeria's Sovereign Investment Authority (NSIA) is expanding its clean-energy and industrial value-chain initiatives. Botswana's Public Officers Pension Fund (BPOPF) has earmarked part of its portfolio for green industrial projects, and the DBSA Infrastructure Fund in South Africa - supported by the Just Energy Transition Partnership- is mobilising large-scale financing for renewable power and infrastructure that directly enhance mineral-processing competitiveness. State-backed DFIs are also bridging the "valley of death" between exploration and commercialisation. In South Africa, the Industrial Development Corporation is financing projects linking renewables, green hydrogen and rare earths, such as Steenkampskraal (Discovery Alert, 2025). In Nigeria, the SMDF is working to co-fund early-stage lithium, cobalt and nickel ventures alongside the Africa Finance Corporation (AFC, 2023). Regional DFIs including DBSA and TDB are scaling renewable power systems and logistics corridors that support mineral beneficiation and trade. For SOEs and large firms, public capital lowers financing costs for processing plants and shared infrastructure. For SMEs, access is usually indirect, through supplier roles, industrial parks, or aggregated investment platforms. For early-stage projects, public DFIs can provide catalytic capital where private investors remain hesitant.

A third role centres on risk mitigation through guarantees and fiscal innovation. Guarantee instruments remain underutilised, but they are increasingly recognised as essential for mobilising private investment in green minerals projects. Promising structures are emerging: in 2024, ATIDI and MIGA created a joint framework to expand political-risk and credit guarantees across infrastructure, energy and industrial sectors, mechanisms highly relevant for mineral-linked processing and regional corridors even if they are not mining-specific (ATIDI, 2024; MIGA, 2024). Under the AfCFTA, Afreximbank's Collaborative Transit Guarantee Scheme is standardising customs bonds and reducing export costs for copper and cobalt along the Lobito Corridor (Afreximbank, 2024). Meanwhile, the World Bank Group, through MIGA and IFC, has announced a target of US$20 billion in guarantee issuance by 2030 for sustainable infrastructure (World Bank, 2024), indirectly supporting mineral-sector decarbonisation and midstream investment. Governments are also designing new fiscal tools such as Ghana's proposed US$500 million Green Minerals Bond, which represents an early attempt to link sovereign borrowing directly to mineral-sector industrialisation.

The World Bank Group, through MIGA and IFC, has announced a target of

$20 billion

in guarantee issuance by 2030



Guarantees are most effective for mid- to late-stage projects with defined cash flows. They are less suited to high-risk exploration, unless paired with concessional or grant funding. For SMEs and ASM, guarantees matter indirectly, by enabling downstream buyers, processors, or aggregators to invest.

Sovereign wealth funds with green mandates play a complementary role by aligning long-term national savings with climate and industrialisation objectives. Namibia's Welwitschia Sovereign Wealth Fund, launched in 2022, invests in green-hydrogen and grid infrastructure and demonstrates how public capital can anchor the energy systems and industrial corridors needed for competitive mineral processing (Bank of Namibia, 2022; IEA, 2024).

Sovereign and public-sector initiatives reflect a reconfiguration of the developmental state. African governments are increasingly acting as co-owners, anchor investors, and risk mitigators in the green-minerals economy. Their interventions are most impactful in infrastructure, processing, and mid- to late-stage projects, while early-stage exploration and SME-level activities still face significant gaps. Africa's green-minerals trajectory will therefore depend on how effectively governments consolidate fragmented public funds, scale guarantee schemes, and coordinate with MDBs and DFIs to strengthen project preparation and crowd in private capital.

2.3 CLIMATE FINANCE INSTRUMENTS

Building on the analysis of financing barriers and the roles of multilateral, sovereign, and private actors, this section examines the climate-finance instruments, green bonds, carbon credits, and blended finance, through which capital could be mobilised and aligned with climate objectives in the green-minerals sector.

2.3.1. Green bonds – issuance, uptake, barriers

Green bonds have become one of the world's fastest-growing asset classes, channelling capital toward clean infrastructure. But Africa remains on the margins, less than 0.3% of global issuances (FSD Africa, 2025). Most proceeds fund renewable energy, water, waste, and transport, not mining or mineral processing.

Early movers, such as South Africa, Namibia, and Morocco, have leveraged development banks and utilities including DBSA and MASEN to back solar and wind projects. A second wave issuers, Zambia, Madagascar, Botswana, and Tanzania, has launched smaller sustainability bonds, such as Zambia's USD 200 million CEC Renewables bond serving the Copperbelt grid.

To date, no African green bond has directly financed a mineral value chain. This is largely due to investor scepticism regarding the "green" credentials of extractives, and the fact that green-taxonomy frameworks exclude mining altogether. Until regulators recognize renewable-powered operations and circular mining practices as eligible "green use-of-proceeds," the sector will remain outside the bond market. For now, green bonds finance the infrastructure around mining, not the mines themselves.

2.3.2. Carbon credits – methodologies, market access, pricing

Carbon credits represent certified reductions or removals of greenhouse gas emissions, each equal to one tonne of CO_2e. They operate through compliance markets - regulated systems such as the EU ETS and South Africa's Carbon Tax Offset System - and voluntary carbon markets (VCM) used by companies to meet climate commitments. African and mining-relevant methodologies include methane capture (CDM/ACM0008), renewable-energy displacement (VCS AMS-I & III), industrial energy efficiency (VCS AMS-II), electrification/fuel switching, and land-restoration or mine-rehabilitation protocols (AFOLU).

Africa currently generates less than 4% of global voluntary carbon credits (ACMI, 2024). Participation is limited by weak baselines and MRV systems, high

verification costs, methodological gaps for mining operations, and buyer caution following global integrity concerns. Mining-sector crediting is especially challenging due to complex emissions profiles, additionality risks, and the absence of sector-specific methodologies for ore processing, haulage, and energy intensity.

Although there are no large-scale, clearly documented African cases where carbon-credit revenues have directly financed an entire green-minerals value chain, several mining-related decarbonisation projects show what is technically feasible and offer building blocks for future crediting

Sibanye-Stillwater (South Africa)
Methane-capture at Beatrix mine, registered under the CDM and generating tens of thousands of CERs annually (UNFCCC, 2022).

Gold Fields' South Deep "Khanyisa" Solar Plant
Designed to cut more than 110,000 tCO_2e/year by replacing coal-heavy grid power (Gold Fields, 2023).

IAMGOLD Essakane (Burkina Faso)
Hybrid solar–diesel facility reducing about 18,500 tCO_2e/year (Wärtsilä, 2021).

Ghana Landscape Restoration & ASM Rehabilitation Project
Laying groundwork for future carbon revenues through land regeneration (World Bank, 2023).









These examples illustrate that mining-chain decarbonisation can generate verifiable, creditable emissions reductions, although scaling remains complex. Africa is rapidly building the institutional foundation needed to participate in both voluntary and emerging compliance markets. The Africa Carbon Markets Initiative (ACMI) aims to scale the continent's credit issuance to 300 $MtCO_2e$ per year by 2030. At the national level, countries such as Ghana, Kenya, Rwanda, and Senegal are developing Article 6 authorisation procedures, carbon registries, and clear rules for credit ownership and benefit-sharing. MDBs and DFIs are supporting MRV readiness, baselines, and sector-specific crediting guidance.

COP30 in Belém launched the Open Coalition on Compliance Carbon Markets, led by Brazil, to improve interoperability between compliance markets, strengthen integrity standards, and expand space for high-quality credits from developing regions, including Africa. This complements ACMI efforts and opens future pathways for African industrial decarbonisation projects, including copper, cobalt, manganese, and lithium operations, to access both voluntary and compliance-driven demand.

Despite progress, mining-value-chain crediting faces structural obstacles. Establishing robust baselines is difficult because ore grades, production intensity, and energy use fluctuate significantly; additionality is hard to prove for technologies (renewables, efficiency, electrification) that are becoming commercially viable; and MRV systems for multi-source mining emissions remain costly and technically demanding. Buyers also perceive mining-linked credits as higher risk, reducing pricing relative to nature-based solutions.

For the green-minerals sector, carbon credits could be primarily an operational and late-stage financing complement, rather than a core source of upfront capital. They are most relevant for SOEs and large private operators with established production, where investments in mine electrification, renewable-power integration, fuel switching, energy efficiency, or land rehabilitation can generate measurable and verifiable

emissions reductions. For these actors, carbon revenues can modestly improve project bankability by lowering operating costs or supporting debt service. By contrast, early-stage projects face significant barriers due to uncertain baselines, additionality challenges, and high MRV costs. SMEs and artisanal and small-scale miners (ASM) rarely access carbon markets directly; participation is typically indirect, through aggregation schemes, rehabilitation programs, or renewable-energy mini-grids developed at site or corridor level. In practice, carbon credits work best when integrated into broader industrial or corridor strategies, supporting decarbonisation of processing hubs or mining regions, rather than as standalone financing tools for individual mining projects. In this context, cluster- or corridor-level Article 6 agreements, where buyer countries provide upfront climate finance for authorised mitigation outcomes, could help anchor renewable-powered mineral-processing hubs and scale industrial decarbonisation.

To unlock this potential, African governments need sector-specific methodologies, clear Article 6 legal frameworks, transparent benefit-sharing rules, and strong national MRV and registry systems. Mining companies must incorporate decarbonisation investments into capital planning and develop high-integrity projects aligned with NDCs and industrial strategies. With credible standards, traceability and robust governance, carbon credits can support Africa's ambition to develop low-carbon, globally competitive green-mineral value chains.

2.3.3. Blended finance – structures, examples, scalability

Among all instruments, blended finance stands out as the most practical, scalable, and transformative tool for advancing Africa's green-minerals agenda. By combining concessional public or philanthropic capital with private investment, blended finance shares risk, lowers capital costs, and improves bankability. It's the model turning potential into measurable progress.

Success stories already exist. In the DRC, Rawbank structured a USD 400 million syndicated loan for the Kamoa–Kakula Copper Project, integrating ESG standards and rehabilitating 178 MW of hydropower to replace diesel generation, illustrating how concessional elements and sustainability conditions can transform a high-risk project into a commercially and environmentally viable one. In Guinea, the IFC's USD 1.4 billion Alumina Corporation project mixed concessional loans, syndicated capital, and an Environmental and Social Action Plan covering biodiversity and resettlement, demonstrating how development finance can crowd in private lenders while enforcing ESG performance. In Mozambique, the USD 1.3 billion Mozal Aluminium Smelter, backed by a USD 40 million MIGA guarantee, exemplified how public risk-mitigation instruments can unlock private investment in post-conflict environments, making large industrial projects bankable and generating substantial macroeconomic spillovers by tripling exports and contributing nearly 5% to GDP in its early years.

These examples show how blended finance can attract private capital while embedding sustainability. Estimates suggest that, in some contexts, each dollar of concessional funding can mobilize up to four dollars of private investment (IFC, 2024). Scaling such mechanisms across the continent could bridge financing gaps between exploration, processing, and clean energy integration.

In sum, while green bonds and carbon credits have an essential role in Africa's broader climate-finance landscape, their direct impact on mineral-sector development remains limited by structural and credibility barriers. Blended finance stands out as the most adaptable and effective mechanism for advancing the continent's green-minerals agenda.



The next stage of policy innovation must therefore focus on aligning taxonomies, carbon-market frameworks, and blended-finance instruments to direct sustainable capital toward mining projects that genuinely contribute to global decarbonization. Only through such integrated financial architecture can Africa transform its mineral wealth into an engine of low-carbon, inclusive industrialization.

Among climate-finance instruments, blended finance stands out as the most practical, scalable, and adaptable mechanism for advancing Africa's green-minerals agenda. By combining concessional public or philanthropic capital with private investment, blended finance reduces risk, lowers capital costs, and improves bankability in a sector characterized by long project timelines, high upfront capital requirements, and elevated ESG and country risks.

In practice, blended finance operates through several complementary structures: concessional or subordinated debt to absorb early losses; partial credit and political-risk guarantee to crowd in commercial lenders; risk-sharing facilities implemented through local banks; and grants or technical assistance for project preparation, ESG compliance, and institutional strengthening.

For mid- to late-stage projects led by SOEs or large private operators, blended finance has proven most effective in financing capital-intensive processing assets and enabling infrastructure. The Kamoa–Kakula Copper Project in the DRC, a large operating asset, illustrates this model: a USD 400 million syndicated facility arranged by Rawbank combined commercial capital with ESG conditions and the rehabilitation of 178 MW of hydropower, replacing diesel generation and strengthening both environmental performance and project bankability. Similarly, the Guinea Alumina Corporation project, supported by IFC, blended concessional loans, syndicated financing, and a comprehensive Environmental and Social Action Plan covering biodiversity and resettlement, demonstrating how development finance can crowd in private lenders while enforcing international ESG standards. In Mozambique, the Mozal Aluminium Smelter, backed by a USD 40 million MIGA guarantee, shows how public risk-mitigation instruments can unlock private investment in fragile or post-conflict contexts, making large industrial projects bankable and generating substantial macroeconomic spillovers.

For early-stage projects, blended finance plays a different role, focusing primarily on risk reduction and project preparation. Concessional public capital is typically used to fund geological surveys, pre-feasibility and feasibility studies, ESG compliance, community engagement, and enabling infrastructure, thereby reducing upstream risk and creating pipelines of bankable projects. In Nigeria, the Solid Minerals Development Fund (SMDF) has deployed public capital alongside the Africa Finance Corporation (AFC) to co-finance early-stage lithium, cobalt, and nickel ventures at exploration and pre-feasibility stages, with the explicit objective of crowding in later private investment. More broadly, programs such as the World Bank's Extractives Global Programmatic Support (EGPS) strengthen cadastre systems, environmental governance, and regulatory capacity. While not green-mineral-specific, these interventions underpin the institutional conditions increasingly required by green-minerals investors.

For SMEs, blended finance it operates indirectly through cross-sector portfolio guarantees, risk-sharing facilities, and trade-finance instruments that explicitly include mining and mineral-processing supply chains among eligible activities. Institutions such as the African Guarantee Fund (AGF), IFC, Afreximbank, and Trade and Development Bank (TDB) support these mechanisms by enabling local banks and trade-finance providers to extend credit to SMEs supplying mining and processing operations (e.g. logistics, services, light processing). These facilities are not mineral-specific but could help reduce financing constraints along mineral value chains.
For artisanal and small-scale mining (ASM), financing remains predominantly informal. Blended finance plays an indirect and system-level role, supporting formalization, traceability, environmental remediation, clean-energy access, and community infrastructure rather than financing ASM production itself. In green-mineral value chains, the clearest examples are found in ASM cobalt in the DRC, where donor- and corporate-backed initiatives such as the Fair Cobalt Alliance, Better Mining, and World Bank–supported formalization programs have improved traceability, safety, and ESG compliance without providing direct production finance. These initiatives illustrate the limits, but also the potential, of blended finance for integrating ASM into responsible green-mineral supply chains.

> **Among climate-finance instruments, blended finance stands out as the most practical, scalable, and adaptable mechanism for advancing Africa's green-minerals agenda.**

Across these structures and use cases, blended finance has demonstrated meaningful leverage effects. IFC estimates suggest that, in some contexts, each dollar of concessional funding can mobilise up to four dollars of private investment (IFC, 2024). Scaling blended-finance mechanisms, particularly for mineral processing capacity, renewable-power integration, and shared infrastructure, offers one of the most credible pathways to bridging Africa's financing gaps between exploration, production, and downstream value addition.

In sum, while green bonds and carbon credits play important roles in Africa's broader climate-finance ecosystem, their direct impact on mineral-sector development remains constrained by taxonomy exclusions, credibility concerns, and timing mismatches. Blended finance remains the most adaptable and effective instrument for advancing the continent's green-minerals agenda across project stages and actor types. The next phase of policy innovation should therefore focus on aligning taxonomies, carbon-market frameworks, and blended-finance structures to channel capital toward mining and processing projects that genuinely contribute to global decarbonization and inclusive industrialization.



2.4 EFFECTIVENESS AND GAPS

2.4.1. ESG safeguards and sustainability alignment

Environmental, Social, and Governance (ESG) safeguards have become a defining feature of financing for green minerals in Sub-Saharan Africa (SSA), reflecting rising investor expectations for responsible mining and sustainable value chains. Multilateral institutions such as the International Finance Corporation (IFC), the African Development Bank (AfDB), and the World Bank have established comprehensive safeguard frameworks, including the IFC Performance Standards, the World Bank Environmental and Social Framework (ESF), and the AfDB Integrated Safeguards System, to guide extractive-sector investments and manage environmental and social risks (IFC, 2023; AfDB, 2022). These frameworks have significantly improved risk management and accountability for large-scale mining and processing projects, particularly those led by SOEs or major private operators.

Despite this progress, ESG implementation across SSA remains uneven. Structural and institutional constraints, including weak regulatory enforcement, limited disclosure systems, and insufficient technical capacity, continue to undermine consistent application. According to the OECD (2023), only 38% of mineral projects in SSA integrate ESG criteria throughout the full investment lifecycle, compared with more than 70% in Latin America. This gap is reinforced by a fragmented policy environment: only 12 SSA countries currently mandate environmental and social impact reporting for mining companies, and few have established standardised ESG benchmarks tailored to critical minerals such as lithium, cobalt, and graphite (UNCTAD, 2023; World Bank, 2024).

Supply-chain traceability and data reliability represent additional challenges. While the OECD Due Diligence Guidance for Responsible Mineral Supply Chains is widely endorsed, it remains largely voluntary in many African jurisdictions, resulting in partial or uneven compliance, particularly among artisanal and small-scale miners (ASM). Limited deployment of digital traceability systems further constrains buyers' ability to certify minerals as responsibly and sustainably produced, reducing investor confidence and access to sustainability-linked capital (IMF, 2024).

From a financing perspective, ESG alignment has become both a gateway and a constraint. Many concessional and blended-finance facilities now embed ESG scoring systems that directly influence eligibility and pricing. Yet fewer than 30% of active green-mineral projects in SSA have accessed ESG-linked credit facilities, highlighting persistent gaps in compliance capacity, certification systems, and intermediary expertise (AfDB, 2023). Regional development banks and export credit agencies often lack the specialized skills needed to assess ESG risks in complex mineral projects.

Climate-alignment frameworks are further reshaping financing conditions. Disclosure standards such as the Task Force on Climate-related Financial Disclosures (TCFD) and the International Sustainability Standards Board's IFRS S2 increasingly shape investor expectations around emissions accounting, transition planning, and climate-risk management. While MDB-supported and blended-finance operations typically integrate these standards, alignment remains inconsistent across other instruments. Green bonds, for instance, often rely on national taxonomies or issuer-defined frameworks that exclude mining activities altogether or provide limited guidance on low-carbon mining and processing pathways.

Carbon markets introduce additional integrity concerns. Although carbon credits can support decarbonization investments in mining, challenges related to baseline definition, additionality, and monitoring, reporting, and verification (MRV) are particularly acute in mineral operations. These issues, combined with high transaction costs and limited institutional capacity, have constrained demand for mining-linked credits relative to nature-based solutions.

Yet fewer than 30% of active active green-mineral projects in SSA have accessed ESG-linked credit facilities...



A central limitation of current ESG frameworks is their uneven inclusiveness. High compliance costs and technical requirements mean that ESG-aligned finance overwhelmingly favors large, formalized projects, while SMEs and ASM struggle to meet eligibility thresholds. Without complementary technical assistance, aggregation mechanisms, and capacity-building support, sustainability safeguards risk reinforcing exclusion along mineral value chains, even as they improve environmental and social outcomes.

Overall, ESG safeguards and sustainability alignment have strengthened the credibility of climate finance in Africa's green-minerals sector, particularly for large-scale projects. However, significant gaps remain in harmonizing standards across instruments, extending ESG frameworks to upstream and smaller actors, and aligning sustainability requirements with industrialization objectives. Addressing these challenges is essential to ensure that ESG frameworks enhance, rather than constrain, the sector's contribution to low-carbon and inclusive development.



From a consulting perspective, the gap lies not in the absence of ESG standards, but in the lack of operationalization tools. Technical assistance should therefore target

- The establishment of regional ESG benchmarking systems across the African Continental Free Trade Area (AfCFTA).
- Digital traceability infrastructure for critical mineral value chains.
- Strengthening national regulatory agencies' audit and monitoring functions.
- Developing local ESG certification bodies to reduce dependency on foreign verifiers.

2.4.2. Coverage gaps and underutilized instruments

Sub-Saharan Africa has seen a proliferation of financing instruments designed to support sustainable mineral development, ranging from sovereign guarantees, blended finance, green bonds, carbon credit, and project preparation facilities to DFI-backed equity funds. However, the utilization of these instruments remains low and unevenly distributed.

According to the AfDB (2023), only USD 2.6 billion of concessional finance was directed toward mining-related projects between 2018–2023, representing less than 5% of total DFI climate portfolios. Most of these resources are concentrated in large economies such as South Africa, Nigeria, and Zambia, leaving frontier markets underfinanced. The main reasons are the small project pipeline, weak governance, and perceived political risk.

Similarly, green bonds, a growing instrument globally with over USD 3 trillion issued by 2023 (Climate Bonds Initiative, 2024), are largely absent in SSA's mining finance landscape. Only South Africa and Nigeria have issued sovereign green bonds that include mining-linked sustainability objectives. Multilateral facilities such as the Sustainable Energy Fund for Africa (SEFA) and the Global Infrastructure Facility (GIF) have shown potential, but disbursement efficiency remains below expectations, averaging 45% absorption rates (World Bank, 2024).

Another critical underutilized mechanism is blended finance, the strategic use of concessional capital to de-risk private investments. Between 2017–2023, SSA captured only 7% of global blended finance for energy transition minerals, with most flows directed to Latin America and Southeast Asia (Convergence, 2023). Transaction sizes in SSA remain small (<USD 50 million), limiting their attractiveness to institutional investors seeking scale and liquidity.



Coverage gaps are also evident in the early-stage project preparation phase. Project Preparation Facilities (PPFs) such as the Africa50 Project Development Fund have mobilized technical support, but their reach is limited relative to demand: only 11% of critical mineral projects in SSA have benefited from structured pre-feasibility funding (Africa50, 2023). As a result, many viable deposits fail to advance to bankability, perpetuating the perception of high risk among financiers.

Strategically, improving instrument utilization will require developing regional mineral financing platforms, promoting green guarantee facilities, and expanding ESG-compliant blended finance structures to attract institutional investors and climate funds.



From a consulting lens, three systemic gaps emerge

Instrument asymmetry
DFIs portfolios still favor power and infrastructure over mining-linked sustainability.

Low absorption
Weak institutional coordination between ministries, national mining agencies, and DFIs results in disbursement delays.

Risk aversion
Commercial banks in SSA maintain restrictive collateral requirements, often demanding up to 130–150% asset coverage ratios for mining borrowers (AfDB, 2024).



2.4.3. Recommendations for improving access and impact

Closing the financing and implementation gaps identified above requires more than incremental adjustments; it demands a financing architecture that is deliberately aligned with the risk profile, time horizon, and sustainability requirements of green-minerals value chains. Effective reform must operate simultaneously at the level of policy, financial instruments, and institutional capacity.

Policy and Regulatory Alignment

Governments should harmonize mineral governance frameworks with climate and industrial policies under African Continental Free Trade Area (AfCFTA). This includes tax incentives for ESG-aligned investments, standardized reporting obligations, and sovereign green bond programs tailored to critical minerals (OECD, 2024). Harmonization will also enhance regional value addition and cross-border investment flows.

Building Local Capital Market Linkages

Regional stock exchanges - such as the West African BRVM and East African Securities Exchanges - should be leveraged to list green mineral bonds or ESG-certified equity vehicles, creating new liquidity channels for sustainable projects. A Pan-African Green Minerals Fund could further attract pension and sovereign wealth fund participation, enabling large-scale capital mobilization for midstream and downstream value addition.

Expanding De-Risking and Credit Enhancement Tools

Development partners should scale up guarantee mechanisms such as the African Guarantee Fund (AGF) and the AfDB's Partial Risk Guarantee Facility. Evidence shows that risk-sharing instruments can increase private participation by up to 40% in high-risk sectors (World Bank, 2023). Moreover, DFI-supported green credit lines could be tailored to SMEs in the mining supply chain, improving access to finance for smaller operators and early-stage developers.

Strengthening Capacity and Data Systems

Establishing mineral data repositories, ESG performance dashboards, and digital traceability will enhance investor confidence. Capacity-building programs targeting financial institutions and mining regulators should be integrated into DFI technical assistance portfolios, ensuring that project preparation, monitoring, and compliance are standardized and scalable.

Enhancing Coordination Among DFIs and Donors

Current financing efforts are fragmented across multiple initiatives. Establishing an African Critical Minerals Financing Taskforce, co-chaired by the AfDB and the African Union, would improve alignment between global climate finance and regional industrialization objectives.

Taken together, these gaps reveal the limits of static financing tools in a sector defined by high risk, long timelines, and evolving sustainability requirements. Overcoming them will require more adaptive financing approaches, capable of reallocating risk over time, linking financial terms to performance and transition outcomes, and strengthening partnerships between public and private actors across the value chain.

III. GOVERNANCE & POLICY FRAMEWORKS

Beyond the availability of financial instruments, the ability of African countries to mobilise capital for green minerals is fundamentally shaped by governance quality, regulatory coherence, and policy credibility. As energy-transition minerals become strategically central to global climate and industrial agendas, investors increasingly scrutinise not only project economics but also the policy environments that determine permitting efficiency, fiscal stability, ESG compliance, and long-term risk.

This section examines how national, regional, and international governance frameworks influence financing flows and investor confidence across Africa's green-minerals value chain. It first analyses mining codes, fiscal regimes, and permitting processes, and their alignment with climate, industrial, and investment policies. It then explores governance best practices, including transparency, stakeholder engagement, institutional coordination, ESG standards, and data availability, that underpin responsible mineral development. Finally, the section assesses how governance conditions translate into financing outcomes, shaping investor perceptions, risk pricing, and cross-country disparities in access to capital.

3.1 POLICY AND REGULATORY LANDSCAPE

3.1.1. Mining codes, fiscal regimes, permitting processes

The governance of energy transition minerals is entering a critical phase. As global demand accelerates, the ability of national frameworks to facilitate responsible investment is under scrutiny. Across many jurisdictions, permitting remains slow, fragmented, and opaque - undermining investor confidence and delaying project timelines. The AfDB has called for streamlined "one-stop-shop" permitting systems and independent ESG monitoring bodies to improve efficiency and accountability. Concrete progress exists: the DRC and Zambia have deployed digital mining cadastres and traceability reforms supported by the World Bank's EGPS program; these measures reduce information asymmetry, curb discretionary licensing, and cut time to approval for compliant operators (World Bank, 2023).

Fiscal regimes and mining codes must evolve to reflect the strategic importance of transition minerals. Without clarity and consistency in licensing and taxation, governments risk deterring the very capital needed to unlock their mineral potential (World Bank EGPS, 2023). Harmonization under AfCFTA and regional frameworks should prioritize standardized fiscal incentives for beneficiation, transparent royalty regimes, and stable VAT import rules for critical equipment; the African Green Minerals Strategy offers a template for coordinated fiscal and environmental incentives across jurisdictions (African Union, 2025).

> **"The AfDB has called for streamlined "one-stop-shop" permitting systems and independent ESG monitoring bodies to improve efficiency and accountability. Concrete progress exists..."**



3.1.2. Alignment with climate, industrial, and investment policies

The convergence of climate ambition and industrial strategy is reshaping the regulatory terrain. Instruments such as the EU Taxonomy Regulation and Sustainable Finance Disclosure Regulation (SFDR) are redefining what qualifies as sustainable investment (European Commission, 2024; European Commission, 2020). Meanwhile, the US Inflation Reduction Act (IRA) is catalysing domestic supply chains through targeted tax incentives, though implementation challenges persist.

Emerging frameworks such as the EU Carbon Border Adjustment Mechanism (CBAM) and the Corporate Sustainability Due Diligence Directive (CSDDD) are embedding ESG and human rights into the core of trade and investment decisions. These measures will directly affect African mineral exports, as compliance with emissions reporting and responsible sourcing becomes a condition for market access.

At least 18 African countries hold significant reserves of cobalt, manganese, lithium, graphite, copper, and platinum group metals (IEA, 2024; UNCTAD, 2023). Yet few jurisdictions currently mandate comprehensive ESG or environmental and social impact reporting for mining projects. Only three jurisdictions, South Africa, Kenya (draft), and Rwanda - have developed green-finance taxonomies (AfDB, 2024). Two countries have published roadmaps for IFRS S2 climate-disclosure adoption (Nigeria and Kenya), while regional frameworks such as AfCFTA and the African Green Minerals Strategy remain in early implementation stages (African Union, 2025). This mismatch between mineral wealth and enabling policy frameworks underscores the urgency of integrating mining codes, industrial strategies, and sustainable-finance regulations to maintain competitiveness in CBAM- and IRA-linked supply chains.

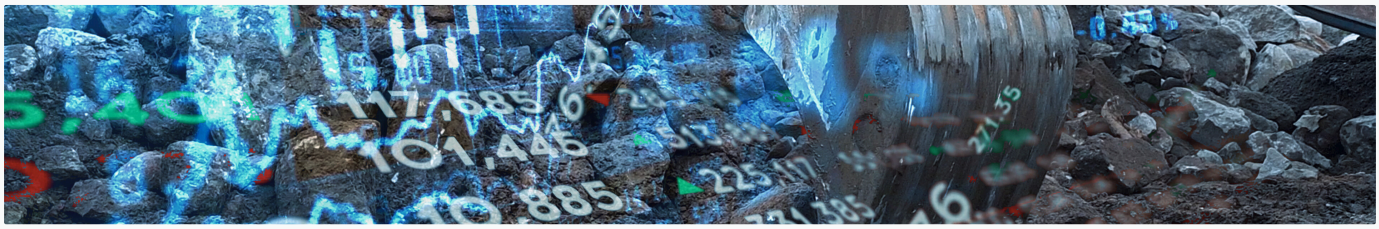
These developments signal a structural shift: mineral governance is no longer peripheral to climate policy; it is central. Countries that fail to align mining and industrial strategies with global sustainability frameworks risk losing competitiveness in critical mineral markets shaped by low-carbon and responsible sourcing requirements.

> **“Countries that fail to align mining and industrial strategies with global sustainability frameworks risk losing competitiveness in critical mineral markets shaped by lowcarbon and responsible sourcing requirements.**

3.1.3. Role of national development plans and regional strategies

National development plans must integrate mineral strategies with broader economic and climate goals. Regional platforms such as the African Continental Free Trade Area (AfCFTA) offer a pathway to harmonised standards and shared infrastructure, while global initiatives like the Minerals Security Partnership (MSP) and emerging UN-level initiatives on critical minerals are setting new norms for responsible sourcing and just transition principles (U.S. Department of State, 2022; UNCTAD, 2023).

The AfDB has emphasised the importance of aligning global investment programmes, such as the IRA and EU Green Deal, with African value-addition strategies. This alignment is essential to ensure that resource-rich countries are not merely suppliers of raw materials, but participants in the full value chain.



3.2 GOVERNANCE BEST PRACTICES

3.2.1. Transparency, anti-corruption, stakeholder engagement

Investor confidence hinges on transparency. Yet ESG data remains inconsistent, and rating methodologies lack clarity. Concerns over greenwashing have led some firms to reduce public reporting, further eroding trust (ESMA, 2024; EBA, 2023). The Extractive Industries Transparency Initiative (EITI) has played a critical role in improving disclosure standards across resource-rich African countries. As of 2024, 28 African countries are EITI members, including major mineral producers such as the Democratic Republic of Congo, Zambia, Ghana, and Nigeria. These countries have adopted mandatory publication of mining revenues, contracts, and beneficial ownership data, which strengthens fiscal transparency and reduces corruption risks (EITI, 2024). Recent progress includes digital cadastre systems in the DRC and Zambia and public reporting of production and export data, creating a foundation for ESG-linked financing and investor confidence.

Stakeholder engagement is no longer optional. Over 40 legal cases have been filed globally against mining operations since 2011, underscoring the need for Free, Prior and Informed Consent (FPIC) and inclusive consultation (Business & Human Rights Resource Centre, 2024). In 2024, local community impact was the most scrutinised ESG factor by investors (EY, 2024). Several African jurisdictions are now embedding FPIC requirements into mining codes and permitting frameworks. In Ghana, community development agreements and local-benefit obligations are being formalised through revisions to the Minerals and Mining Act, 2006 (Act 703), including Minerals Commission proposals for mandatory Community Development Agreements (Minerals Commission, 2025). In the DRC, the 2018 Revised Mining Code requires operators to comply with social responsibility obligations to local communities, including legally binding community development responsibilities (DRC Mining Code, 2018). In Zambia, the Minerals Regulation Commission Act (No. 14 of 2024) formalises stakeholder consultation within licensing and permitting processes (ICLG Zambia, 2026). These reforms aim to reduce social conflict risk and align with international standards such as IFC Performance Standard 1.

3.2.2. Institutional coordination and capacity

Governance capacity within mining companies varies widely. Many boards lack ESG expertise, and junior miners often struggle to meet reporting requirements due to limited resources (IFC, 2012; OECD, 2023). Development finance institutions are stepping in to fill this gap.

DFIs such as IFC, AfDB, and EIB are supporting early-stage and midstream mineral projects through targeted technical assistance and blended-finance structures (IFC, 2024; AfDB, 2024).

3.2.3. ESG integration and reporting standards

Voluntary standards such as IRMA, ICMM, Copper Mark, and TSM are increasingly used to demonstrate ESG performance. However, implementation remains costly and complex, particularly for smaller operators (IRMA, 2024; ICMM, 2024). The Consolidated Mining Standard Initiative (CMSI) seeks to unify these frameworks into a single, practical standard (CMSI, 2024).

Efforts to align European Sustainability Reporting Standards (ESRS) with the Global Reporting Initiative (GRI) are helping reduce duplication and improve consistency: an important step toward harmonised ESG disclosure (European Commission, 2024).

> **"The Consolidated Mining Standard Initiative (CMSI) seeks to unify these frameworks into a single, practical standard...**



National adoption of voluntary standards is emerging but uneven. South Africa has integrated sustainability risk into banking regulation through Prudential Authority Guidance Note 4/2022, requiring lenders to assess ESG factors in credit decisions. Kenya's Capital Markets (Green Finance Instruments) Regulations formally recognise sustainability-linked instruments and reference global ESG principles. Nigeria has issued Sustainable and Responsible Investment Guidelines encouraging ESG-linked disclosure for corporates.

In mining, Ghana and Zambia have begun referencing OECD Due Diligence Guidance in their updated codes, while the DRC mandates traceability aligned with OECD and ICGLR frameworks for 3T and cobalt supply chains. These steps indicate a gradual shift from voluntary adoption to regulatory embedding, though coverage remains fragmented and enforcement capacity limited (South African Reserve Bank, 2022; Government of Kenya, 2023; SEC Nigeria, 2021; OECD, 2023).

3.2.4. Availability of data

Environmental metrics such as GHG emissions are more readily available than social or governance indicators. Qualitative data, on anti-corruption, community impact, or human rights, is harder to verify, reducing confidence in ESG ratings (Business & Human Rights Resource Centre, 2024). Traceability remains a critical barrier. Investors require visibility across the full value chain, yet many companies cannot guarantee the origin of their minerals. This lack of transparency increases reputational and financial risk (OECD, 2023).



3.3 IMPACT ON FINANCING FLOWS

3.3.1. Investor perceptions and risk mitigation

The mining sector continues to face a trust deficit. It ranks among the least trusted industries globally, with legacy ESG risks and regulatory uncertainty deterring capital flows (ICMM, 2020; EY, 2024). Investors are increasingly cautious, demanding robust ESG commitments backed by credible data.

Accusations of greenwashing can stall or derail projects (ESMA, 2024). DFIs and export credit agencies are playing a pivotal role in de-risking investments, particularly in high-risk jurisdictions. Their involvement is helping unlock private capital and build investor confidence (IFC, 2024; AfDB, 2024).

3.3.2. Comparative analysis across African jurisdictions

Africa's mineral potential is vast, but financing remains constrained by currency risk and credit ratings. The AfDB identifies exchange rate volatility and convertibility issues as major barriers, especially when debt is serviced in hard currency (AfDB, 2024a).

Credit rating agencies are criticised for applying methodologies that fail to reflect local realities. In 2023, only Botswana and Mauritius were rated above sub-investment grade, increasing the cost of capital for projects across the continent (The Economist, 2023). Stakeholders are calling for reform, including greater local representation in rating processes.

A major step toward addressing this challenge is the planned Africa Credit Rating Agency (ACRA), endorsed by the African Union in 2022 and now moving toward operationalisation. The initiative aims to provide an Africa-led alternative to global rating agencies, incorporating regional economic contexts and development priorities into credit assessments. By reducing reliance on external methodologies that often overstate risk, ACRA is expected to improve sovereign and corporate ratings, lower borrowing costs, and enhance investor confidence in strategic sectors such as critical minerals (AfDB, 2024a).

Its mandate includes harmonising rating standards across member states, building analytical capacity, and integrating ESG and climate-risk metrics into credit evaluations, aligning with global sustainable-finance trends while reflecting commercial realities.

3.3.3. Recommendations for policy reform and harmonization

Streamline permitting through centralised entities and independent ESG monitors. Streamline permitting through centralised entities and independent ESG monitors.

Consolidate ESG standards across jurisdictions and stages of the value chain.

Promote regional strategies such as AfCFTA to support integrated supply chains and local beneficiation.

Strengthen partnerships with DFIs to de-risk investments and support infrastructure development.

Align ESG metrics with long-term financial strategies and ensure consistent implementation across the mining lifecycle.

Implement traceability mechanisms and third-party audits to improve supply chain transparency.



IV. ENVIRONMENTAL & SOCIAL SUSTAINABILITY

The rapid expansion of critical mineral supply chains - driven by global efforts to scale clean energy technologies, digital infrastructure, and electric mobility - has heightened scrutiny of the environmental and social sustainability of mineral extraction, processing, and trade. Ensuring responsible and resilient supply requires a clear understanding of the risks that arise throughout these value chains, particularly as mining increasingly intersects with water-stressed regions, sensitive ecosystems, and communities whose livelihoods may be affected by industrial development.

This surge in demand has triggered what many observers describe as a "new gold rush," where mineral-rich countries are becoming geopolitical battlegrounds for competing interests from major economies and multinational corporations. While this competition can accelerate investment, it often amplifies governance pressures, strains local institutions, and risks marginalizing community priorities. In several African jurisdictions, rapid concession awards and opaque negotiations have led to social tensions, land disputes, and uneven benefit-sharing, underscoring the need for strong regulatory safeguards and inclusive development frameworks (IEA, 2025; UNCTAD, 2023; Business & Human Rights Resource Centre, 2024).

This section identifies the key environmental and social risks associated with the production of critical minerals such as lithium, cobalt, graphite, copper, manganese and the 3Ts. It describes how these risks manifest across different geographies and mining contexts, and highlights the implications for ecosystems, water, emissions, and local populations. Importantly, it also evaluates how financing mechanisms - through ESG safeguards, responsible investment standards and sustainability-linked instruments - can help mitigate these risks and support more inclusive and equitable development outcomes. The analysis highlights opportunities for governments, companies, and financiers to consider as they work towards supply chains that better integrate environmental stewardship, respect for community rights, and sustainable development.

4.1 ENVIRONMENTAL RISKS AND MITIGATION

4.1.1. Biodiversity, water use, emissions, land degradation

Critical mineral mining in Africa can result in significant environmental impacts, including habitat destruction, water stress, greenhouse gas emissions, and soil degradation. For example, cobalt and copper mining in the Democratic Republic of Congo (DRC) has been linked to deforestation, soil contamination, and river pollution, threatening local biodiversity and water quality (Atlantic Council, 2024; WWF, 2025). Similarly, graphite mining in Madagascar has raised concerns over land degradation, sedimentation of waterways, and impacts on forested areas (Global Witness, 2023). Lithium extraction, increasingly under development in countries such as Zimbabwe, also involves water-intensive processes that could exacerbate local water scarcity if not properly managed (IEA, 2022).

Environmental management strategies, including progressive rehabilitation, water recycling, and emissions control, are critical to reducing these impacts. Increasingly, mining companies are seeking certifications such as those offered by the Initiative for Responsible Mining Assurance (IRMA) or ICMM membership to demonstrate compliance with international standards. This trend is driven not only by regulatory expectations but also by demand from downstream actors, such as battery and electric vehicle manufacturers in Europe and the United States, who require proof of responsible sourcing for their supply chains.

For example, large automakers like Tesla and BMW, as well as electronics companies such as Apple, have begun requesting that their cobalt and lithium suppliers adopt recognized ESG standards (ICMM, 2021; IRMA, 2022). Similarly, upstream financiers and commodity traders, including Trafigura and Glencore, increasingly integrate certification requirements into offtake agreements to ensure that environmental and social risks are managed before minerals reach global markets (Atlantic Council, 2024).

> **"... companies are increasingly seeking a Social License to Operate (SLO) alongside financial returns.**



4.1.2. ESG standards and safeguards in financing

Financing mechanisms increasingly incorporate ESG standards to manage risk and encourage responsible practices across critical mineral supply chains. Lenders, investors, and commodity traders are integrating frameworks such as the IFC Performance Standards, OECD Guidance on Responsible Minerals, and voluntary ESG initiatives into their due diligence and risk assessment processes (OECD, 2021; IFC, 2012). These frameworks provide a basis for evaluating environmental and social risks before committing capital and can influence the terms, conditions, and structuring of financing agreements.

In addition to meeting investor requirements, companies are increasingly seeking a Social License to Operate (SLO) alongside financial returns. This reflects recognition that community acceptance and trust are critical for operational continuity and risk mitigation. Mining firms now embed SLO considerations into project design, stakeholder engagement plans, and ESG-linked financing covenants, as failure to secure local legitimacy can lead to costly delays, reputational damage, and even project suspension (ICMM, 2024; Business & Human Rights Resource Centre, 2024).

Downstream markets also indirectly shape financing conditions by requiring proof of responsible sourcing from suppliers. Financial institutions and commodity traders often adopt these same ESG criteria when structuring loans, project finance, or offtake agreements to ensure that funded operations meet the expectations of their clients and investors (ICMM, 2021; IRMA, 2022). For example, ESG-aligned financing may include covenants tied to certification achievement, independent ESG audits, or reporting obligations on water use, emissions, and biodiversity management.

By embedding ESG safeguards into financing mechanisms, upstream producers are incentivized to align operational practices with recognized standards, reducing reputational and regulatory risk while improving access to international capital and markets. However, these requirements can also pose challenges for smaller-scale producers or operations in lower-income regions, highlighting the need for financing approaches that are flexible, context-sensitive, and supportive of capacity building.

Furthermore, a key structural challenge in applying ESG safeguards in African critical mineral projects is that many host-country governments do not yet have comprehensive national legislation or regulatory frameworks on ESG, particularly on issues such as biodiversity protection, community engagement, or climate-related reporting. This regulatory vacuum complicates due diligence for investors and increases perceived risk premiums, as financiers must rely heavily on voluntary standards or international benchmarks rather than enforceable national requirements (African Legal Support Facility, 2023). As a result, the absence of clear statutory guidance often delays investment decisions or pushes financiers to impose more stringent conditions to mitigate uncertainty (UNEP FI, 2022).

Even when national regulations exist, the definition of what constitutes an acceptable ESG standard often differs between global expectations and local institutional realities. Global standards, such as IFC Performance Standards or OECD Due Diligence Guidance, assume the presence of regulatory enforcement capacity, functioning monitoring institutions, and established consultation processes, which may not align with the socio-economic realities of lower-income resource-producing countries (NRGI, 2021). These mismatches can result in unrealistic expectations placed on mining developers, particularly junior operators, and can create friction between financiers requiring global compliance and governments applying more flexible, context-driven rules (World Bank, 2020,).

Additionally, international ESG frameworks may not fully reflect the real aspirations or priorities of host communities, whose expectations are shaped by immediate development needs rather than global sustainability indicators. Communities may value projects that deliver tangible short-term benefits, such as a classroom, borehole, or health post, even when these initiatives do not directly align with internationally recognized ESG materiality or impact metrics (IIED, 2023, p. 11).

This divergence can create tension: a mining company may meet global ESG requirements while failing to satisfy local expectations, or conversely, fulfil community requests that do not significantly advance long-term sustainability goals. Aligning ESG strategy with both global standards and local aspirations therefore requires participatory planning and ongoing consultation to avoid misinterpretation of what "good ESG performance" means on the ground (OECD, 2021).

4.1.3. Monitoring and enforcement mechanisms

Monitoring compliance with environmental standards requires robust regulatory frameworks, independent verification, and oversight from both upstream and downstream actors. For example, in Zambia, copper mining operations are monitored by the Environmental Council of Zambia to ensure compliance with water use, emissions, and land management regulations (Zambia Environmental Council, 2023). In Zimbabwe, emerging lithium and graphite projects are subject to environmental impact assessments and ongoing audits under national environmental legislation to mitigate water stress and land degradation risks (IEA, 2022).

In addition to regulatory oversight, third-party certification schemes, such as IRMA, play a key role in independent verification, providing assurance to downstream buyers and investors that ESG commitments are being met (IRMA, 2022). Downstream companies, including major battery and automotive manufacturers, increasingly require periodic ESG audits and reporting from suppliers as a condition of purchase (ICMM, 2021). Similarly, upstream financiers and commodity traders use these certifications and audit results to inform risk assessments, structuring financing agreements to incentivize continuous improvements in environmental performance.

By linking environmental compliance to both market access and financing terms, these mechanisms create a reinforcing cycle that encourages mining operations across Africa to adopt and maintain higher environmental standards throughout the critical minerals value chain.

However, critical voices from the Global South have highlighted that ESG standards can be challenging to implement in practice, particularly for small-scale and artisanal operators. Some stakeholders argue that the expectations around decarbonisation, emissions reduction, and other ESG metrics are sometimes unrealistic given local economic constraints, infrastructure limitations, and capacity gaps (Canon Collins Trust, 2024; RRII, 2023). These critiques underscore the importance of tailoring ESG frameworks to local contexts and providing practical support to ensure compliance does not unintentionally marginalize producers in resource-rich, lower-income regions.



4.2 SOCIAL INCLUSION AND COMMUNITY BENEFITS

4.2.1. Social license to operate

Maintaining a social license to operate (SLO) is essential for mining projects, reflecting community acceptance beyond legal requirements. Building and managing positive relationships with local communities should be considered a vital risk management mechanism, not an optional activity, as it directly influences the resilience and stability of the supply chain. Lack of meaningful consultation and engagement with local stakeholders can result in protests, operational delays, regulatory sanctions, or reputational harm, which may disrupt production and market access (IEA, 2022).

For example, in Zambia, the Mwembeshi Copper Project experienced a government-ordered halt in operations due to environmental non-compliance concerns, delaying production and incurring additional remediation costs (TradingView, 2023).

These disruptions not only affected the company's revenues but also created potential ripple effects along the value chain, delaying delivery to downstream manufacturers and investors.

Proactive engagement, transparent communication, and inclusion of local stakeholders in decision-making are therefore critical to mitigating social risk, protecting financial performance, and ensuring mining operations can continue sustainably while contributing positively to local development.



4.2.2. Benefit-sharing models and local development

Benefit-sharing mechanisms can complement efforts to maintain a social license by ensuring that mining translates into tangible local economic development. When companies align their projects with national development plans and are recognized as development partners, they create mutually beneficial outcomes: communities gain access to skills, infrastructure, and employment opportunities, while companies benefit from more stable operations and enhanced reputation.

For example, Pact's "Children Out of Mining" program in the DRC provides training for adolescent miners, transitioning them into apprenticeships and alternative livelihoods (Wilson Center, 2024). Legal reforms in the DRC now require extractive firms to contribute to local community development projects, formalising benefit-sharing in copper and cobalt operations (Atlantic Council, 2024). By linking mining activity to broader development goals, companies can reinforce legitimacy, reduce social risk, and create win-win situations for both communities and the mining sector.

4.2.3. Indigenous rights and gender equity

Respecting Indigenous rights and promoting gender equity are integral to maintaining a social license to operate and ensuring that mining delivers positive outcomes for local communities. Effective implementation of Free, Prior, and Informed Consent (FPIC) helps secure community trust, reduces the risk of conflict, and supports long-term operational stability. While FPIC challenges are often highlighted in Latin America - for example, lithium extraction in the Andean "lithium triangle" (Symington, 2025) - similar considerations are increasingly relevant in African contexts, particularly for communities living on or near mining concessions in Zambia, South Africa, and Tanzania, where customary land rights and local governance structures require careful consultation to avoid disputes.

Gender equity is another critical dimension of social inclusion. Mining remains heavily male-dominated across Africa, and limited opportunities for women can exacerbate social inequalities and reduce community support for operations. Initiatives in countries such as South Africa, where mining companies are encouraged to integrate women into skilled roles and leadership positions, demonstrate how improving gender representation and working conditions can strengthen local legitimacy and foster more inclusive development outcomes (Chamber of Mines, 2023).

By embedding Indigenous rights protections and gender equity into broader social strategies, alongside social license maintenance and benefit-sharing programs, mining operations can create a more resilient, socially responsible supply chain. These practices not only enhance community trust and stability but also help align projects with national development priorities and the expectations of both local stakeholders and international partners.

...for example, the Africa Finance Corporation has embedded ESG into its investment strategy, deploying over USD$700

4.3 FINANCING FOR ESG OUTCOMES

4.3.1. Integration of ESG metrics into financing criteria

Investors are increasingly integrating ESG metrics into financing decisions, linking capital access to performance in environmental management, community engagement, and human rights (Reconciliation & Responsible Investment Institute, 2023).

In Africa, for example, the Africa Finance Corporation has embedded ESG into its investment strategy, deploying over US$700 million into mining projects based on sustainability criteria (African Mining Week, 2024).



4.3.2. Case studies of ESG-aligned investments

Case Study: Appian-IFC Critical Minerals & Metals Fund

Appian Capital Advisory and the IFC (International Finance Corporation) have launched a US$1 billion fund dedicated to critical minerals and metals in emerging markets, including Africa. This fund explicitly applies IFC's ESG and performance standards to all its investments, requiring mining projects to meet rigorous environmental and social benchmarks as part of receiving capital (Mining Focus Africa, 2025). By linking financial returns to development impact, such as job creation, stakeholder engagement, and community benefits, this fund demonstrates how a specialist investment vehicle can align ESG outcomes with commercial mining.



Case Study: FG Capital – Battery Metals Value-Add Fund I

FG Capital Advisors runs a Battery Metals Value-Add Fund I, targeting copper, cobalt, lithium, and nickel projects in Africa. The fund's strategy includes "ESG upgrades" for identified licences, improving environmental management and community engagement while enhancing project value (FG Capital Advisors, 2025). This specialist fund works on underdeveloped mining assets, embedding ESG improvements into both operational and financial performance.

Case Study: Regional Development Financial Institutions (DFIs) Supporting ESG-Driven Projects

The Industrial Development Corporation (IDC) of South Africa, DBSA, and CRDB Bank of Tanzania co-financed US$179 million into the Mahenge Graphite Project in Tanzania. These DFIs integrate ESG criteria, covering environmental compliance, community engagement, and local development, into project financing (African Mining Week, 2024). This illustrates how public-sector finance can act as specialist ESG-aligned capital, supporting critical mineral supply chains in Africa while mitigating social and environmental risks.



4.3.3. Recommendations for inclusive and sustainable financing

Building on the lessons from specialist ESG-aligned investment vehicles- such as the Appian IFC Critical Minerals & Metals Fund and FG Capital's Battery Metals Value-Add Fund I, which link financial returns to environmental and social outcomes - financiers can further promote inclusive and sustainable development by adopting context-sensitive, flexible approaches tailored to local realities, project maturity, and developer size.

Recognising that mining operations vary widely in scale, capacity, and local context, financing mechanisms should allow room for projects to progressively align with ESG standards rather than requiring full compliance from day one. Smaller-scale or early-stage projects may need time, technical support, and phased financing to implement environmental safeguards, community engagement programs, and social protections effectively. For instance, emerging lithium and graphite projects in Zimbabwe and Zambia may face infrastructure and capacity limitations that necessitate gradual adoption of water management, biodiversity protection, and community development practices (IEA, 2022; Zambia Environmental Council, 2023).

Phased ESG Integration

Embed ESG objectives as milestones rather than immediate requirements, allowing project developers to adopt best practices over time. This ensures compliance is achievable and not prohibitive, particularly for smaller operators.

Local Context Sensitivity

Tailor financing conditions to the socio-economic, regulatory, and cultural realities of host countries, accounting for local labour markets, land tenure systems, and governance structures.

Capacity-Building Support

Provide technical assistance, training, and advisory services alongside capital to help projects meet ESG goals, particularly for early-stage or under-resourced developers.

Monitoring and Reporting

Establish realistic, context-appropriate reporting requirements that enable progress tracking while encouraging continuous improvement rather than penalizing incremental adoption.

Linking Development Outcomes to Financing

Encourage projects to align with national development priorities, contribute to local economic growth, and maintain strong community relations, ensuring that ESG-aligned financing reinforces tangible benefits for stakeholders on the ground.

By adopting these recommendations, financiers can support a pipeline of responsible and resilient critical mineral projects in Africa, promoting social inclusion, environmental stewardship, and sustainable development without inadvertently excluding smaller or emerging operators from capital markets.

V. INNOVATIVE FINANCING MODELS

While existing financing mechanisms, governance frameworks, and ESG safeguards provide an essential foundation for sustainable green-minerals development, they remain insufficient to meet the scale, speed, and risk profile required by the global energy transition. Bridging Africa's growing financing gap will therefore depend on the deployment of innovative financing models that can mobilize new pools of capital, align incentives across stakeholders, and link financial flows more directly to climate and development outcomes.

This section examines emerging instruments and partnerships that extend beyond traditional project finance, including debt-for-climate swaps, sustainability-linked loans, results-based financing, and new forms of international and South–South cooperation.

These approaches offer flexible ways to address sovereign debt constraints, reward measurable sustainability performance, and crowd in private investment where conventional tools have fallen short.

By analysing how these innovative models can be applied to green-mineral value chains, from extraction and processing to enabling infrastructure and community development, this section highlights opportunities for African countries to reshape their financing strategies. It also underscores the importance of strategic partnerships, policy alignment, and robust measurement frameworks to ensure that innovation in finance translates into durable environmental, social, and economic gains.

5.1 DEBT-FOR-CLIMATE SWAPS

5.1.1. Structure, feasibility, and case examples

Debt-for-climate swaps (DfCS) are negotiated arrangements through which a sovereign government converts part of its existing external debt into a commitment to finance climate-related investments. Under these agreements, creditors cancel, exchange, or sell a portion of debt, often at a discount, while the debtor commits to redirecting part of the resulting debt-service savings toward pre-agreed climate objectives. These commitments affect fiscal space and budget allocation but are typically not recorded as new debt liabilities under standard debt statistics.

For Sub-Saharan Africa, DfCS are increasingly relevant given the convergence of three constraints identified earlier in this report: high public-debt burdens, limited fiscal space for climate-aligned infrastructure, and the capital-intensive nature of green-mineral value chains. While mining and mineral processing are often energy- and emissions-intensive, most African governments lack the fiscal capacity to finance the renewable power, transport corridors, grid upgrades, and environmental rehabilitation required for low-carbon mineral development. DfCS offer a mechanism to link debt relief directly to climate-positive investments that enable sustainable mineral value chains, while aligning expenditures with Nationally Determined Contributions (NDCs) and Paris Agreement objectives.

> **"...most African governments lack the fiscal capacity to finance the renewable power, transport corridors, grid upgrades, and environmental rehabilitation required for low-carbon mineral development.**



A standard DfCS involves four institutional layers:

Creditor
Bilateral or commercial lender (e.g., Paris Club, private bondholder) agreeing to cancel, exchange or sell a portion of the debt, often at a discounted price, thereby generating fiscal savings for climate investment. Bilateral swaps are negotiated government-to-government, and commercial swaps involve buybacks of private debt, often facilitated by a donor-backed intermediary.

Intermediary
Often MDB, DFI or international NGOs facilitating the transaction through discounted buybacks, guarantees, political-risk insurance, or blended-finance structures.

Sovereign
Committing to invest the debt service savings-usually in local currency, into a climate fund.

Implementation vehicle
Typically, a national trust or SPV established to manage and disburse the savings who finance pre-identified climate projects, ensure transparency, governance, and accountability.

Figure 1: Debt-for-Climate Swap Flow

STEP 1
Negotiation: Government + MDB/DFI identify eligible external debt for conversation.

STEP 2
Valuation: Creditors aggree to sell debt at discount; MDB arranges finance.

STEP 3
Swap Execution: New Instrument (Blue/Green Bond or Grant) replaces old debt.

STEP 4
Climate Fund Setup: National SPV receives local-currency savings annually.

STEP 5
Project Deployment: SPV finances ESG-aligned projects (renewables,green minerals).

STEP 6
MRV & Reporting: Independent audits report emissions reductions & social co-benefits.

Financially, swaps are structured around net-present-value (NPV) savings generated by discounted repurchases or extended maturities. In the Seychelles case, a 5–10 % discount on face value was sufficient to create sustainable-finance space amounting to 0.4 % of GDP annually (World Bank, 2019). Preliminary analysis by the IMF (2024) estimates that restructuring 10 % of SSA external public debt through climate swaps could mobilize USD 10–12 billion in domestic fiscal resources over a decade.

Table 2: Case evidence and lessons

Country	Transaction	Value (USD mn)	Climate Focus	Lessons for SSA	Source
Seychelles (2016)	Debt-for-nature swap and first sovereign "Blue Bond" supported by TNC, U.S. DFC, and GEF	21.6	Blue-economy protection	Independent trust, transparent fund allocation, and annual impact reporting + concessional blending	UNEP FI, 2023
Barbados (2022)	Debt-conversion and blue-green bond transaction with IDB Invest and TNC	~150	Marine protection, coastal-resilience infrastructure, and climate adaptation.	Integration of IMF Resilience and Sustainability Trust	Debt for Nature Coalition, 2022
Ecuador (2023)	Galápagos Swap , exchange of legacy bonds into a new climate-linked loan with multi-donor guarantees.	~1 600 (refinanced) / 656 (new loan)	Marine biodiversity protection	Large-scale commercial buyback possible with political commitment, strong creditor coordination and guarantee layering.	Reuters, 2023
Belize (2021)	Blue Bond Swap backed by U.S. DFC political-risk insurance and arranged with The Nature Conservancy (TNC).	~553 (refinanced) / 364 (new loan)	Marine protection	Structured as a private placement with clearly defined conservation milestones. Demonstrates how political-risk guarantees and milestone-linked governance can lower sovereign risk premia and ensure accountability.	Debt for Nature Coalition, 2021

Country	Transaction	Value (USD mn)	Climate Focus	Lessons for SSA	Source
Gabon (2023)	Debt-for-nature swap / "Blue Bond" issuance	~500	Marine conservation (ocean protection, sustainable fisheries, marine spatial planning)	Strong MRV, clear use-of-proceeds, and governance continuity under changing political conditions.	The Nature Conservancy, 2023
Potential pipeline	Zambia, Ghana, Cabo Verde	500 – 700	Forests, minerals, renewables	Regional replication under AfDB ADCF	AfDB (2024); Climate Policy Initiative (2023); Proparco (2024)

Notes: Refinanced vs. new-loan values: For Belize and Ecuador, both the total debt refinanced, and the nominal value of the new blue-loan instrument are shown, following official disclosures. For other countries, only aggregate transaction values are publicly reported.

5.1.2. Legal and institutional requirements

DfCS are not suitable for all countries. They are most appropriate for economies facing liquidity constraints but retaining medium-term debt sustainability, and they cannot substitute for comprehensive restructuring in cases of deep insolvency. Prior to implementation, governments must assess debt sustainability impacts, net fiscal benefits after transaction costs, and opportunity costs relative to alternative uses of public resources.

Effective swaps require robust legal and institutional foundations, including:

- **Legal authorization:** clear mandate allowing the government to restructure or convert public debt and reallocate budgetary resources. (In some countries, parliamentary approval or an executive decree is required).
- **Formal agreements:** legally binding documents outlining rights and obligations of all parties, including financial terms, governance arrangements, and performance indicators.
- **Institutional arrangements:** clearly assigned roles across the Ministry of Finance, central bank, and implementing agencies to guarantee transparency, fiscal integrity, and policy coherence.
- **Transparent financial-management systems:** mechanisms ensuring that swap-related expenditures are integrated into national budgets and comply with fiscal rules.
- **Monitoring and accountability mechanisms:** independent verification of results, public reporting, and regular audits of fund utilisation.
- **Regulatory recognition:** where relevant, national regulations must allow the issuance of domestic-currency green or climate-linked instruments associated with swap commitments.

Beyond financial integrity, swap-financed expenditures must reinforce national development and industrial strategies. Excessive earmarking or overly complex governance arrangements can undermine efficiency, particularly in lower-capacity environments. Proportional design and strong oversight are therefore essential.

5.1.3. Investor perspective and risk analysis

From an investor perspective, DfCS offer dual value propositions: predictable financial returns and verifiable environmental impact. Participation can take several forms: creditors exiting debt positions at market value, impact investors purchasing climate-linked instruments backed by swap proceeds, or DFIs providing guarantees to mitigate sovereign risk. Their attractiveness depends on four enabling conditions:

- Credible MRV and ESG transparency;
- Firm sovereign commitment to reinvest fiscal savings in climate priorities;
- Blended participation by DFIs and MDBs providing guarantees; and
- A pipeline of bankable projects aligned with NDCs and regional development plans.

When these conditions are met, DfCS instruments can deliver returns comparable to emerging-market sovereigns (around 4–6 percent in USD terms) while offering a differentiated ESG profile (IMF, 2024; Proparco, 2024; World Bank, 2024). Properly structured, these swaps could align with Paris-aligned sustainable-finance taxonomies, delivering measurable and auditable impact metrics (Table 2: DfCS instruments alignment with sustainable finance).

Risk Dimension	Mitigation Feature
Sovereign-credit risk	MDB guarantees or escrow mechanisms; external trustees (AfDB, 2023)
Currency risk	Local-currency fund deployment with FX-hedged bond issuance (EIB, 2022)
ESG integrity	Independent MRV verification and annual impact audits
Liquidity	Tradable "green performance bonds" post-swap (Standard Chartered, 2023)

5.1.4. Feasibility outlook for green minerals development

Sub-Saharan Africa (SSA) holds approximately USD 240 billion in external public debt owed to private and bilateral creditors (IMF, 2024). Of this, nearly USD 90 billion could be eligible for conversion into climate-linked instruments if paired with measurable emission-reduction or resilience outcomes (World Bank, 2024). This scale of indebtedness presents both a challenge and an opportunity: well-structured debt-for-climate swaps (DfCS) could transform fiscal constraints into sources of investment for low-carbon industrialization, particularly across critical-mineral value chains. Countries such as Kenya, Ghana, and Mozambique, with active Nationally Determined Contribution (NDC) implementation plans and sound macro-governance, are well positioned for pilot programs.

To institutionalize this mechanism, the African Development Bank (AfDB) is developing an African Debt-for-Climate Facility (ADCF) under its 2025–2030 Climate Action Plan. The ADCF aims to operationalize debt conversions by: (i) providing standardized legal templates for swap negotiations; (ii) offering partial-risk guarantees through the Sustainable Energy Fund for Africa (SEFA); (iii) maintaining a central MRV repository for transparency and accountability; and (iv) co-financing transaction costs for participating countries (AfDB, 2023). Global precedents suggest the approach is economically viable: average transaction timelines range from 12 to 18 months, with total costs of 2–5 percent of face value, far below new-issuance bond costs (UNCTAD, 2023).

Applied to the green-minerals agenda, DfCS could target the decarbonization of critical-mineral corridors such as the Zambia–DRC Copperbelt, where proceeds might finance renewable baseload generation, grid interconnections, low-carbon transport (electrified rail and ports), and industrial-waste management. Assuming adoption by ten SSA countries between 2025 and 2030, debt conversions could reach USD 6–8 billion, unlocking roughly USD 1 billion per year in new climate-aligned investment (IMF, 2024; AfDB, 2023).

However, tailoring DfCS to the mineral sector would require innovative program design. Traditional swaps focus on conservation or adaptation, whereas mineral-sector decarbonization demands a clear definition of eligible expenditures - renewable baseload power for mines and smelters, grid upgrades for mineral corridors, methane capture, mine-site rehabilitation, and water-resource restoration. Disbursements should be linked to quantified KPIs, such as renewable MWh supplied to mines, tCO_2e reduced, share of renewables in processing loads, or hectares of land restored.

MRV systems must comply with international standards - and, where feasible, connect to Article 6 carbon-crediting frameworks - to unlock private-sector participation and additional revenue. Embedding just-transition clauses (local-content obligations, skills-development funds, community reinvestment) would further strengthen social license and enhance downstream bankability.

While this architecture builds on proven sovereign-swap mechanics (IMF, 2022 ; African Legal Support Facility, 2023), extending it to the mining-energy nexus remains experimental. Pilot transactions will therefore be critical to test governance, valuation, and verification frameworks before scaling continent-wide. Nevertheless, the emerging AfDB-led infrastructure, coupled with MDB guarantees and credible MRV, positions DfCS as a feasible and high-leverage instrument to redirect fiscal space toward the decarbonization and sustainable expansion of Africa's green-minerals sector.



Table 4: Debt-for-Climate Swaps - Structure and Potential

Table 4 summarizes the structure, typical terms, and potential scale of Debt-for-Climate Swap (DfCS) transactions applicable to Sub-Saharan Africa (SSA). Figures and terms shown are illustrative and based on case studies (Seychelles, Belize, Barbados), AfriCatalyst modelling, and MDB/DFI mobilization patterns. Transaction economics (discount rates, NPV savings, investor returns) are highly country- and creditor-specific and require: (i) a Debt Sustainability Analysis (IMF/World Bank), (ii) creditor negotiations, and (iii) legal enabling instruments at national level (e.g., trust legislation). The table is intended as an investor-ready template; country rows must be populated with primary transaction documents and DSA outputs before commitment. Sources are provided for each row.

Country	Seychelles	Belize (benchmark)	Barbados (benchmark)	Zambia (template)	Ghana (template)	Kenya (template)
Instrument Type	Debt-for-Nature / Blue-bond swap	Debt-for-Nature / Blue bond (benchmark)	Debt-for-Climate Resilience Swap	Debt-for-Climate / Debt-for-Energy Swap (pilot potential)	Debt-for-Climate Swap (potential)	Debt-for-Climate / Debt-for-Beneficiation (potential)
Concrete transaction(s)	Debt conversion into SeyCCAT trust; issuance of domestic blue bond	Debt swap + issuance of Blue Bond; conservation trust financing	Sovereign debt conversion into resilience fund	Concept: conversion of specified external debt to finance forest restoration & mineral corridor electrification	Concept: debt conversion to fund renewable-powered processing hubs	Concept: convert select debt to fund battery-minerals beneficiation & renewable power
Year	2016	2021	2022	Pilot concept	Concept	Concept
Creditor Type	Bilateral + commercial holders	Bilateral + philanthropic	Bilateral + commercial	Bilateral / commercial	Bilateral / commercial / concessional	Bilateral / commercial
Face Value (USD)	21,600,000	364,000,000 (bond issuance scale)	~150,000,000	[to be filled]	[to be filled]	[to be filled]
Discount / Restructuring Terms	Commercial buyback at discount; concession + grant blending (case specifics)	Buyback + bond issuance; blended concessional support	Discount/buyback terms + resilience fund capitalization	[to be negotiated: e.g., 5–10% discount]	[to be negotiated]	[to be negotiated]
Estimated Annual Local-Currency Savings (USD equiv)	~USD 0.8–1.0m p.a. (initial trust disbursements; illustrative)	Shifts to trust for marine conservation & sovereign projects	Domestic fund capital for resilience projects	[model estimate; requires DSA]	[requires DSA modelling]	[requires country DSA]
Implementation Vehicle (SPV / Trust)	SeyCCAT (Seychelles Conservation & Climate Adaptation Trust)	Belize Blue Bond Trust	National Resilience Fund (SPV)	National Climate Trust / Mineral Corridor Fund	National Green Minerals Facility (proposed)	National Climate & Industrial Trust
Legal Instrument / Enabling Law	SeyCCAT Act (enabling trust & reinvestment of savings)	National enabling arrangements; trust documents	Enabling legislation for swap proceeds	New trust act / MoF decree required	Enabling legislation (draft)	Enabling law / MoF approvals
MRV Standard	ISO 14064; independent annual audits	Verra / independent verification	National MRV + independent audit	ISO 14064 / Verra	ISO 14064 / national MRV	Verra / ISO
Independent Verifier	Independent auditors; TNC/World Bank audit support	Independent verification entities	Third-party auditors	Independent MRV firm	Accredited verifier	Third-party auditor
Lead Implementers / Partners	Govt of Seychelles; The Nature Conservancy; World Bank; local partners	Govt Belize; Nature Conservancy; creditors	Govt; MDBs; donors	MoF; MoM; AfDB/ World Bank support	MoF; MoM; AfDB/IFC interest	MoF; MoE; AfDB & development partners
Potential Investors / Entry Points	Impact funds; green bond investors; conservation finance vehicles	Impact investors; philanthropic capital	Green bond markets; resilience investors	Green bond buyers; DFI co-finance	Institutional investors; green bond markets	Impact funds; DFIs
Risk Mitigants / Guarantees	Donor concessional tranche; DFI technical assistance; escrow account	Donor grants, guarantees	IMF coordination; donor concessionality	AfDB partial risk guarantee; escrow	DFI guarantees; partial-credit guarantee	Escrow + MDB guarantees

Country	Seychelles	Belize (benchmark)	Barbados (benchmark)	Zambia (template)	Ghana (template)	Kenya (template)
Timeline (months)	12–18	12–24	12–18	12–24	12–30	12–36
Key Preconditions / Constraints	Parliamentary authority; creditor agreement; DSA clearance	Creditor buy-in; sovereign fiscal space	DSA considerations; parliamentary approval	Creditor willingness; DSA headroom; legal enabling law	Fiscal space; creditor agreement; project pipeline	DSA headroom; legal framework; investor-ready projects
Expected Investor Return (USD)	3–5% (green/impact bond yields may vary)	3–6% indicative	3–5% indicative	[TBD]	[TBD]	[TBD]
Source (Source, Title, Year, p., URL)	World Bank, The Seychelles Debt Conversion Case Study, 2019	World Bank, Belize Blue Bond – Case Study, 2021	Barbados Govt, Debt-for-Climate Transaction Note, 2022	MDBs & DFIs, Joint Report on Mobilization of Private Finance by MDBs & DFIs, 2022	IMF, Sub-Saharan Africa Regional Economic Outlook, 2024	World Bank, Minerals for Climate Action, 2020

5.2 SUSTAINABILITY-LINKED LOANS

5.2.1. Structure and relevance for green minerals

Sustainability-Linked Loans (SLLs) are a rapidly expanding segment of sustainable finance that link loan pricing to a borrower's achievement of predefined environmental, social, or governance (ESG) performance targets. Unlike green or project-linked loans, SLL proceeds are not earmarked for specific investments; instead, they provide general-purpose corporate financing, with incentives embedded through performance-based pricing.

Globally, cumulative SLL issuance exceeded USD 1.1 trillion by 2023, growing more than ten-fold since 2018 (BloombergNEF, 2024).

Yet Sub-Saharan Africa (SSA) represents less than 1% of global volumes (CPI, 2023), reflecting structural barriers discussed earlier in this report: weak ESG data systems, limited verification capacity, and conservative bank risk appetites. For the green-minerals sector, SLLs are best suited to mid- and late-stage operators, including large private firms and SOEs, with established production, revenue streams, and measurable ESG baselines. They are not designed to finance early-stage exploration or greenfield mining, but rather to incentivise operational improvements such as emissions reduction, renewable-energy integration, water efficiency, and community outcomes once projects are operational.

5.2.2. Integration with ESG and performance frameworks



A standard SLL structure includes four core elements

Baseline ESG metrics
Quantifiable indicators such as Scope 1–2 emissions intensity, renewable-energy share, water use per tonne, or local employment ratios.

Sustainability Performance Targets (SPTs)
Time-bound (typically 3–5 years) and calibrated to international benchmarks such as the Science-Based Targets initiative or national NDCs.

Pricing mechanism
Interest-rate step-ups or step-downs, typically ±25–75 basis points, depending on target achievement.

Verification and disclosure
Annual third-party assurance in line with the Sustainability-Linked Loan Principles (SLLPs) jointly issued by the LMA, APLMA, and LSTA.

These features align SLLs closely with the ESG safeguard frameworks discussed in Section 2.4. Unlike green bonds, which depend heavily on national taxonomies that often exclude mining, SLLs allow mineral producers to demonstrate transition progress even where "green" eligibility remains contested, provided KPIs are credible and verified.

Table 5: Case Studies and Lessons

Case	Value (USD mn)	Lender(s)	KPI Focus	Outcome/ Lesson	Source
Anglo American (SA, 2022)	**100**	IFC	Education outcomes, job creation (social KPIs)	Introduced SLL structures tied to social metrics in mining	IFC, 2022.
Harmony Gold (SA, 2021)	**400**	ABSA, RMB, Standard Bank	GHG reduction, water efficiency, gender KPIs	One of Africa's first mining SLLs; showed pricing-link viability	Harmony Gold, 2021
KenGen (Kenya, 2023)	**415**	TDB, AfDB, KfW	Renewable energy expansion; gender	First East African quasi-sovereign SLL with DFI backing	TDB, 2023
Codelco (Chile, 2021)	**1,200**	BNP Paribas, Scotiabank, Mizuho, SMBC, MUFG	85% renewable electricity in mining operations	Benchmark for climate-linked mining SLLs	Codelco, 2021
MTN Nigeria (2022–23)	**332–450**	UBA, Zenith, Access, GTBank	Governance KPIs, diversity, digital inclusion	Demonstrated applicability of governance-focused SLLs	MTN, 2022
Teck Resources (2021)	**4,000**	BMO Financial Group	ESG Performance metrics	Benchmark for climate-linked mining SLLs	Teck Resources, 2021

These cases underline that transparent KPI verification and lender engagement are critical to investor confidence.

5.2.3. Investor appeal and risk-return profile

For investors, SLLs provide measurable exposure to ESG performance without being tied to a specific project (IFC, 2022). Their main advantages include

Predictable yield
Floating-rate structures perform well in tightening monetary environments (Norton Rose Fulbright, 2022).

ESG accountability
Pricing is directly linked to verified performance outcomes (ICMA, 2024).

Risk sharing
Many African SLLs involve DFIs as lenders, arrangers, or guarantors

Annual Portfolio Diversification
By financing corporates in resource-rich Sub-Saharan African (SSA) economies, often via co-lending with MDBs or DFIs, SLLs reduce portfolio risk while expanding exposure to emerging markets (TDB, 2024; EIB Group, 2024).

As of 2024, average pricing incentives in emerging markets range from ±15 bps for investment-grade borrowers to ±75 bps for high-yield entities (Refinitiv, 2024). ESG-aligned borrowers typically realise 2–4 % lower cost of capital over loan tenor compared with conventional debt (OECD, 2023).

Key risks include KPI misreporting, inconsistent or unreliable data, and limited secondary-market liquidity. These can be mitigated through third-party verification, robust monitoring, reporting & verification (MRV) frameworks, and guarantee overlays from MDBs such as the IFC or AfDB (IFC, 2022; ICMA, 2024).

Table 6: Sustainability-Linked Loans: Investor Matrix for Africa

Dimension	Description / Opportunity	SSA Example(s)	Investor Entry Points	Source
Instrument Type	General-purpose loan tied to ESG KPIs and SPTs	Anglo American Platinum; KenGen	Corporate lending; syndicated facilities	IFC, 2022
Pricing Mechanism	Margin adjustments ±25–75 bps linked to performance	Harmony Gold SLL	ESG-performance premium/discount	ICMA & LMA, 2024.
Verification	Annual independent ESG audit per LMA Principles	All major SLLs	Third-party assurance services	ICMA & LMA, 2024.
Legal Basis	Loan Market Association SLL Principles (2023) + local banking rules	SA Prudential Guideline 2022	Regulatory alignment and documentation	LMA, 2023; South African Reserve Bank, 2022.
Market Potential	USD 5–7 bn by 2030	SSA regional	Sustainability funds and impact investors	Estimates *
Returns / Risk	4–7 % USD; medium liquidity; ESG impact measurable	Growing market depth	Green credit and blended-finance structures	Norton Rose Fulbright, 2022; IFC, 2022.

Table 6 summarizes the key dimensions of Sustainability-Linked Loans (SLLs) in Sub-Saharan Africa, including instrument type, pricing mechanisms, verification requirements, legal frameworks, market potential, and risk-return profile. It highlights examples of corporate borrowers and investor entry points, illustrating how SLLs provide measurable ESG impact while offering competitive financial returns. The table also underscores the role of DFIs and third-party verification in mitigating risks and ensuring alignment with international sustainability standards

Note: The estimate for market potential is based on modelling using (i) projected global investment needs for critical minerals (IEA, 2023, p.18), (ii) Africa's current share of global mineral output (World Bank, 2020), and (iii) the scale of financing mobilised by MDBs and DFIs in comparable sectors (AfDB, 2018). Market potential = (Global investment requirements for critical minerals × Africa's realistic share of global mineral investment × Addressable segment for sustainability and impact capital), adjusted to reflect effective financing absorption capacity.

5.2.4. Legal and Institutional Enablers in SSA

SLLs in Africa operate under global principles, rather than an Africa-specific regulatory regime. Transactions typically follow the SLL Principles (LMA/APLMA/LSTA), updated in 2025, with model provisions released to standardize KPI design, reporting, and verification. Several Sub-Saharan African (SSA) jurisdictions have taken preliminary regulatory and institutional steps to support sustainable finance and green-minerals investment:

South Africa

The Prudential Authority issued Guidance Note 4/2022, which mandates banks to integrate sustainability risks and enhance ESG disclosures in lending practices. This enables alignment with sustainability-linked loans (SLLs) and strengthens transparency for investors (South African Reserve Bank, 2022).

Kenya

The Capital Markets (Green Finance Instruments) Regulations, 2023 formally recognize sustainability-linked instruments within a national green-finance taxonomy. This facilitates the issuance of SLLs and green bonds while complementing bank-led sustainable finance initiatives (Government of Kenya, 2023).

Nigeria

The Securities and Exchange Commission issued the Sustainable and Responsible Investment Guidelines, 2021, which encourage green finance reporting and adoption of ESG-linked instruments for corporate and project finance (SEC Nigeria, 2021).

Morocco

The Moroccan Capital Market Authority established voluntary disclosure standards for green and ESG-linked debt, aligning with international ICMA SLL Principles and promoting cross-border investor confidence (AMMC Morocco, 2022).

Despite these advances, the region remains fragmented, with varying taxonomies, reporting standards, and enforcement mechanisms. Harmonized regional standards - potentially through the **African Union Green Finance Taxonomy (2025 draft)** - could enhance comparability, reduce due-diligence costs for investors, and accelerate sustainable capital flows into green-minerals and climate-aligned infrastructure projects (African Union, 2025)

5.2.5. Outlook and Feasibility for Green-Mineral Value Chains

SSA's green-minerals sector - holding about 60% of global cobalt reserves and 40% of manganese output (UNCTAD, 2023) - offers strong foundations for sustainability-linked financing. As global ESG-linked capital accelerates, SLL issuance in Africa is expected to grow significantly by 2030. Expected regional SLL issuance could reach USD 5–7 billion by 2030, representing a compound annual growth rate of > 25 % from 2023 levels (AfDB, 2024).

SLLs are well-aligned with the sector's dual challenge: mobilizing capital for exploration, processing and local value addition while driving measurable improvements in environmental and social performance. Because loan pricing is tied to sustainability outcomes, SLLs can incentivize mining companies and SOEs to improve in areas such as emissions reduction, renewable-energy integration, water efficiency, tailings management, gender inclusion, circular-economy practices and community benefits.

For credibility, SLL structures in Africa's mining sector must align KPIs with IFRS S2 climate-disclosure standards, apply the LMA/ICMA SLL Principles, and undergo annual independent ESG verification. When these conditions are met, SLLs provide clear advantages:

- Pricing benefits (interest rate step-downs) for meeting targets
- A stronger sustainability narrative for investors
- Flexible corporate finance aligned with climate and social outcomes

Financial institutions are helping build momentum. African DFIs such as AfDB, DBSA, and TDB are increasingly supporting sustainability-linked approaches through blended finance, ESG frameworks and syndication capacity. Global partners - including IFC, EIB, Proparco, and private African banks - can complement this with guarantees, concessional tranches, and technical support for KPI design and monitoring.

Emerging African examples show that SLL-type structures are feasible when backed by credible data and verification. Côte d'Ivoire's Sovereign Sustainability-Linked Financing Framework (2025), alongside corporate transactions by ETG and Harmony Gold, illustrate how these instruments can be applied in African contexts. Meanwhile, international policies like the EU Critical Raw Materials Act and the U.S. Inflation Reduction Act increase demand for transparent, lower-carbon mineral supply chains - creating an opportunity for African borrowers that adopt robust ESG commitments.

Scaling remains constrained by limited ESG data and verification capacity, fragmented regulations, and low experience among local banks with performance-based lending. As disclosure standards, taxonomies and assurance ecosystems mature, supported by initiatives such as the African Union Green Finance Taxonomy (draft 2025), SLLs could evolve into a scalable mechanism for mobilizing blended public–private capital toward critical-mineral projects aligned with both industrial and climate objectives.

SLLs are most feasible for mid- to late-stage operators, including large private firms and state-owned enterprises (SOEs), where production is established, revenues are predictable, and ESG data systems are in place. In these contexts, SLLs can refinance existing debt, lower the cost of capital through interest-rate step-downs, and incentivize measurable improvements in emissions intensity, renewable-energy integration, water efficiency, tailings management, and local employment. Feasibility is more limited but improving for mid-sized firms and they are generally not appropriate at early-stage projects and exploration.
In short, SLLs offer one of the most promising pathways to link financing costs with real environmental and social performance in Africa's emerging green-minerals economy.

A common KPI set for green-minerals firms includes:

Table 6: Sustainability-Linked Loans: Investor Matrix for Africa

KPI Category	Indicative Target (by 2028)	Relevance	Source
Carbon intensity	–30 % Scope 1 & 2 emissions	Aligns with NDCs	AfDB, 2024; ICMA, 2024
Renewable energy share	≥ 60 % of operations	Decarbonises extraction	AfDB, 2024; ICMA, 2024

KPI Category	Indicative Target (by 2028)	Relevance	Source
Water efficiency	–25 % use per tonne output	Addresses resource stress	AfDB, 2024
Local employment	+40 % national hires in operations	Social impact	AfDB, 2024; AU, 2025
Community investment	2 % of Earnings Before Interest and Taxes (EBIT)	License to operate	AfDB, 2024; AU, 2025

Note: Indicative targets are non-binding reference benchmarks used to guide ESG-linked financing design and performance monitoring. Actual targets are calibrated case-by-case based on baseline conditions, sector characteristics, and country context, and may be adjusted over time.

5.3 RESULTS-BASED FINANCING

5.3.1. Structure and mechanism

Results-Based Financing (RBF) is a financing mechanism in which payments are disbursed only after independently verified results are achieved, rather than for inputs or activities. In simple terms, capital follows outcomes. This approach directly addresses two constraints highlighted earlier in this report: weak project credibility and limited trust in ESG performance. Globally, cumulative RBF commitments across all sectors exceeded USD 30 billion by 2023, with MDBs and bilateral donors accounting for over 85 % of disbursements (World Bank, 2024).

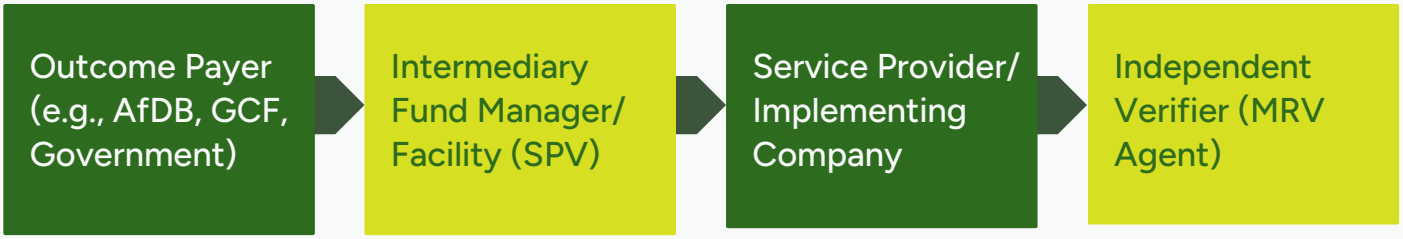
SSA hosts roughly 25 % of these initiatives, primarily in energy access, health, and agriculture, but less than 10 % in mining or industrial decarbonization (CPI, 2023).

For the green-minerals sector, RBF is not a substitute for core project finance. Instead, it functions as a complementary instrument that strengthens ESG credibility, rewards verified decarbonization and social outcomes and improves bankability by reducing performance risk for investors and donors.

5.3.2. Performance metrics and disbursement models

A typical RBF transaction in the sustainable-minerals context involves the following layers:

Figure 2: RBF transaction in the sustainable-minerals



Funds are released only once independent verification confirms target achievement.

The most common RBF modalities are:

Output-Based Aid (OBA)
Payment per verified unit of service (e.g., MWh of renewable energy powering a mining operation).

Performance Based Contract
A government or donor contracts a private or public operator and ties payment to pre-agreed performance indicators.

Payment-for-Results (PforR)
A World Bank instrument where governments receive disbursements only after achieving predefined results, verified through audits and field checks.

Impact Bonds (Social Impact Bonds/ Development Impact Bonds)
Private investors pre-finance interventions and receive outcome-based returns from donor or government once results are achieved.

Results-based Climate finance
Climate funds pay countries or firms after verified emissions reductions or climate outcomes.

This structure directly responds to governance and ESG gaps identified in Sections II–IV by embedding accountability, verification, and transparency into financing flows.

5.3.3. Evidence from Adjacent Sectors and Emerging Mining Applications

RBF is established in sectors with measurable outputs, providing relevant lessons for green minerals:

- **Energy:** The Kenya Results-Based Financing Facility for Off-Grid Solar (2018–2023) linked donor payments to verified household electricity connections. The program mobilised USD 150 million, resulting in over 800,000 new connections and verified avoidance of 600,000 tCO_2 (World Bank, 2023).
- **Agriculture:** The Ethiopia Resilient Landscape RBF Program (2021–2024) channels USD 80 million from the Green Climate Fund (GCF) to private agro-forestry operators based on hectares of land rehabilitated (GCF, 2023).
- **Mining and Industrial Applications:** The concept is now extending to green minerals. The Zambia Sustainable Mining Results Pilot (2023) – an AfDB-backed USD 45 million facility – disburses grants per tonne of CO_2 avoided through renewable energy powering copper smelters. Early results show 15 % energy-intensity reduction and improved ESG ratings (AfDB, 2024).

The Ethiopia Resilient Landscape RBF Program (2021–2024) channels USD 80M from the Green Climate Fund (GCF) to private agro-forestry operators based on hectares of land rehabilitated

Table 8: Benchmark Lessons from Global Cases

Country / Program	Value (USD mn) + Comment	Sector	Outcome Metric	Lesson for SSA	Source
Kenya – Off-Grid Solar RBF (2018–23)	**150** – One of Africa's largest RBF energy programs; proven disbursement efficiency	Energy	Household connections; tCO_2 avoided	Strong PPP model; scalable MRV architecture for distributed energy	World Bank, 2023
Ethiopia – Resilient Landscapes RBF (2021–24)	**80** – Mid-sized RBF demonstrating effective climate–agriculture synergy	Agriculture / Land	Hectares restored; soil productivity	Community-based verification works at scale; supports climate-resilient rural systems	World Bank, 2022
Zambia – Sustainable Mining Pilot (2023–)	**45** – Small pilot; first RBF case applied to mining operations	Mining / Energy Efficiency	Energy intensity reduction; GHG reduction	First extractives-sector RBF pilot; demonstrates feasibility of MRV in mining	UNDP, 2023
Colombia – Payment for Results (2021–)	**150** – Largest forest-related RBF in LATAM with strong donor backing	Forestry / Land	Hectares conserved; tCO_2 avoided	Effective integration of RBF with carbon markets and jurisdictional REDD+	Norway–Colombia Agreement, 2021
Chile – IFC Sustainability-Linked Loan to ENGIE (2023)	**400** – Large-scale SLL supporting industrial decarbonisation at utility level	Energy / Industrial Decarbonization	CO_2 emissions reduction; coal-plant phase-down milestones	Demonstrates SL-financing for heavy industry decarbonization applicable to SSA mining	IFC, 2023

These cases demonstrate that MRV-based payments are technically feasible in mining, particularly where energy use and emissions are concentrated and measurable.

5.3.4. Investor and Market Perspective

From an investor standpoint, RBF provides several advantages:

- **Revenue Predictability:** Pre-agreed payment per verified outcome, with guarantee mechanisms from DFIs.
- **ESG Credibility:** Independent verification enhances transparency and bankability.
- **Risk Diversification:** Performance risk shifts to implementers, while outcome payers secure measurable impact.

Expected returns for private investors range from 5 % to 10 % IRR depending on outcome pricing and guarantee layers (Convergence, 2023).

RBF schemes can also attract blended finance, where concessional capital funds outcome payments and crowds in commercial co-lenders. USAID's Power Africa RBF Facility illustrates this leverage effect, mobilizing USD 5 of private capital for every USD 1 of donor funding (USAID, 2023).

5.3.5. Feasibility, Challenges and Design Considerations

Green-minerals projects align naturally with Results-Based Financing (RBF) because they generate measurable, auditable sustainability outcomes. In this context, RBF can reward results such as:

- Decarbonization (tCO_2 avoided through renewable-energy use),
- Traceability and due-diligence compliance (OECD/IRMA metrics),
- Resource-efficiency gains (water recycling, energy efficiency),
- Social impact (local jobs, gender inclusion, community investments), and
- Environmental rehabilitation (tailings management, land restoration).

RBF is not suitable for early-stage exploration or high-risk extraction finance, where results are uncertain and verification is impractical. However, they can complement debt finance by rewarding operational decarbonization, ESG certification, and community outcomes for mid- to late-stage projects.

DFIs such as AfDB, TDB, DBSA, IFC and EIC play a pivotal role because RBF requires concessional capital to fund outcome payments. Their involvement provides guarantees, concessional outcome funding, results verification, and blended-finance structures to de-risk private investors.

> **RBF is not suitable for early-stage exploration or high-risk extraction finance, where results are uncertain and verification is impractical.**



RBF adoption in SSA is starting to grow, particularly in climate and green-growth sectors:

Operational RBF schemes
Several African countries have operational RBF schemes in energy or climate sectors (World Bank, 2025).

Green-minerals value chains
Africa's critical and green-minerals value chains are identified as major opportunities for climate finance (AfDB, 2025).

Blended finance structures
AfDB has proposed mechanisms to mobilize private capital for green minerals development. Detailed structures combining RBF with instruments such as debt-for-climate swaps are currently conceptual / in planning stages (AfDB, 2024).

Regional economic communities
SADC and ECOWAS could potentially coordinate sovereign demand and harmonize verification systems, although no formal regional RBF frameworks currently exist (AfDB, 2025)

However, several barriers constrain RBF adoption in SSA:

- Weak data and MRV systems, which make performance verification difficult.
- Institutional fragmentation, including outdated mining codes, inconsistent environmental rules, and lack of green finance taxonomies.
- High upfront capital needs, since mining requires significant investment before any results occur.
- Legal gaps, as many countries do not formally recognize outcome-based contracts in their public-finance frameworks.

A practical mitigation model is the creation of a National Results-Trust Facility, managed by an independent SPV and supported by MDBs for guarantees, concessional funding, and accredited verification bodies.

In terms of structure, the most suitable RBF model for green minerals is a hybrid disbursement system. Mining firms would receive an initial tranche to cover activities such as baseline emissions measurement, ESIA studies, MRV system installation, traceability infrastructure, or preparatory renewable-energy integration. This tranche does not finance extraction risk and is contractually linked to clearly defined future performance targets. Most of the financing is disbursed ex post, through milestone-based payments tied to independently verified outcomes: such as emissions reductions, renewable-energy use, water-efficiency gains, responsible-sourcing certification, or community-development indicators. A final performance payment may be released once full sustainability targets are achieved.

This blended design balances liquidity for project viability with strong accountability for measurable environmental and social results.

In sum, when embedded within coherent governance frameworks and ESG safeguards, RBF can strengthen accountability, improve project credibility, and unlock additional climate and impact capital.

> **Most of the financing is disbursed ex post, through milestone-based payments tied to independently verified outcomes...**



Table 9: Results-Based Financing for SSA Green Mineral Projects

Component	Description/ Application	SSA Example/ Status	Mineral Focus	Project Stage	Investor Entry Point	Source
Instrument Type	Payment made only after verified performance outcomes are achieved (e.g., emissions reduction, rehabilitation, efficiency gains)	Zambia Sustainable Mining Pilot – RBF applied to mine-site energy efficiency (2023–)	Copper, Cobalt	Operational / Early CAPEX	Impact bond investors; DFI co-lenders	UNDP, 2023
Outcome Metrics	Typical metrics include emissions reduction, land rehabilitation, water/energy efficiency, local SME procurement, traceability, gender inclusion	Adapted from RBF programs in Kenya and Ethiopia (energy, land restoration)	Lithium, Graphite, Manganese	Feasibility/ Operational	ESG-linked performance revenue	World Bank, 2022; World Bank, 2023
Carbon-Credit Link	Verified CO_2 reductions can be monetized via voluntary carbon credits or Article 6 mechanisms to augment RBF payments	Proposed for lithium and cobalt projects in Mozambique, DRC	Lithium, Cobalt	Operational	Carbon-market investors, blended finance	ACMI, 2024; UNDP, 2023
Financing Mechanism	Blended structure: concessional capital finances early-stage needs; private capital repaid upon verified results	AfDB and GCF blended-finance facilities under design for mineral value chains	All green minerals	Exploration → Early CAPEX	Results-based trust funds; institutional impact investors	AfDB, 2024; GCF, 2023

Component	Description/ Application	SSA Example/ Status	Mineral Focus	Project Stage	Investor Entry Point	Source
Scale Potential	Estimated USD 2–3 bn RBF opportunity by 2030 across SSA green-mineral value chains	Regional expansion incorporated into AfDB's Green Minerals Strategy	Copper, Cobalt, Lithium, Graphite, Manganese	Full value chain	Outcome-financing funds; impact investors	AfDB, 2024
Key Risks	Verification complexity, lack of legal recognition, uneven data quality	Independent SPVs + MRV frameworks increasingly used to de-risk	All green minerals	All stages	Performance-based guarantees; first-loss coverage	CPI, 2023; UNDP, 2023

5.4 INTERNATIONAL PARTNERSHIPS & SOUTH–SOUTH COOPERATION

Sub-Saharan Africa (SSA) attract less than 5 % of global green-finance flows (CPI, 2023). Closing this gap requires more than domestic reforms or individual financial instruments. It also demands international partnerships and South–South cooperation that can mobilize capital at scale, transfer technology, and reduce political, regulatory, and execution risks across borders.



Over the past decade, a new generation of cooperation frameworks has emerged, linking Africa's mineral endowments to global climate, industrial, and supply-chain objectives. These include continental initiatives (AU Green Minerals Strategy), regional platforms (AfCFTA, AGII), and bilateral or triangular partnerships involving the EU, United States, China, Japan, Gulf states, and emerging South–South actors. For investors, these partnerships increasingly function as risk-sharing and pipeline-development platforms, rather than purely diplomatic arrangements.

5.4.1. Role of regional platforms and pooled financing

Regional platforms and pooled-finance mechanisms are increasingly central to Africa's efforts to scale investment in green-mineral value chains.

Their first role is risk-mitigation through pooled guarantees and concessional financing, which reduces investor exposure in high-risk segments such as processing and mineral-corridor infrastructure. A leading example is the emerging African Green Minerals Finance Facility (AGMFF), being developed by the African Union and the African Development Bank to offer pooled guarantees and concessional windows for low-carbon extraction and processing (AfDB,2024).
Second, these platforms help scale blended finance. Platforms such as Africa50's Green Industrial Corridor Window aggregate public and private capital to finance renewable-powered mineral infrastructure. AfDB estimates leverage ratios of 4–6 dollars of private capital per dollar of concessional funding, addressing the scale constraints identified in Sections 2 and 5.1–5.3 (AfDB, 2023).

Third, regional mechanisms support cross-border industrialization and value-chain development, enabling countries to jointly build the industrial clusters needed for processing and manufacturing.

Initiatives such as the Africa Green Industrialization Initiative (AGII), with over USD 100 billion in commitments from African DFIs and banks, support renewable-powered industrial hubs, regional mineral value chains, and AfCFTA-aligned standards. Another example is the UNECA–Afreximbank special economic zone for electric-vehicle and battery manufacturing in the DRC and Zambia, which shows how shared infrastructure can accelerate Africa's entry into higher-value segments of the green-minerals economy (UN, 2025).This marks a structural shift away from raw-material exports toward regional processing and manufacturing (Africa50, 2025).

Fourth, regional platforms play a key role in policy harmonization and standard setting, reducing regulatory fragmentation and creating predictable conditions for investors. Regional economic communities (SADC, ECOWAS, EAC) are increasingly aligning mining codes, ESG protocols, and fiscal incentives. SADC's Battery Minerals Framework demonstrates how harmonised environmental and fiscal rules can lower transaction costs and improve investor confidence across jurisdictions.

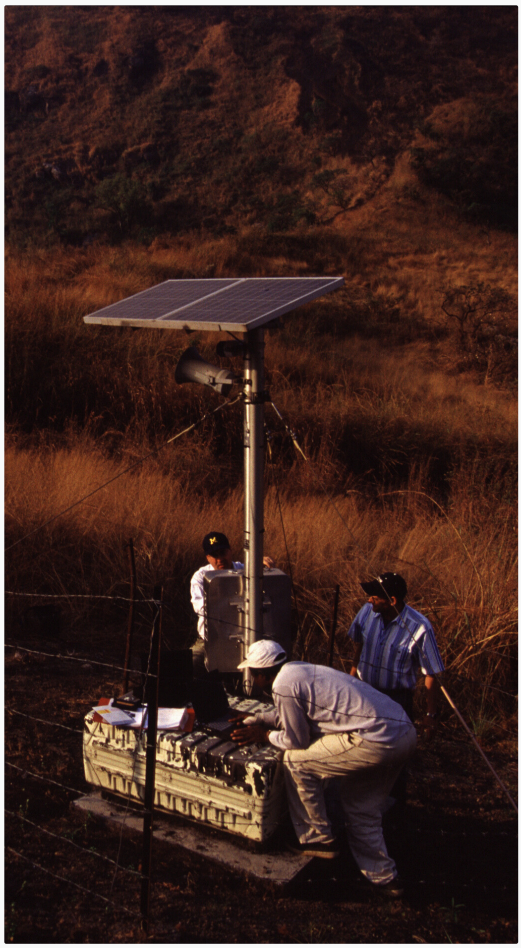
5.4.2. Examples of successful cooperation models

A growing number of international and South–South partnerships are reshaping how capital, technology, and expertise flow into Africa's critical-minerals sector. These cooperation models vary widely in structure - some emphasize concessional finance and technical assistance, while others deploy risk-tolerant commercial capital - but together they are creating new pipelines for exploration, processing, and logistics integration.

Initiatives such as the Africa Green Industrialization Initiative (AGII), with over USD 100M in commitments from African DFIs and banks...



EU–Namibia, EU–Zambia, and EU–DRC Raw-Materials Partnerships (2022–2025)[1]



The European Union has established some of the most comprehensive cooperation frameworks across Africa's mineral-rich regions. The partnerships with Namibia (2022) and Zambia (2023) were expanded in 2024–2025 to include the Democratic Republic of Congo (DRC) under updated Raw Materials Act arrangements (European Commission (2022; 2023a; 2023b; 2024), EIB, 2023, BGR AfricaMaVal, 2024). These agreements combine:

- Large-scale technical assistance for geological data, ESG compliance and traceability systems,
- Pipeline preparation for EU-aligned sustainable mining and early-stage processing,
- Concessional and blended finance through EU instruments, EIB, and Global Gateway, and
- Support for the Lobito Corridor logistics upgrade to integrate Zambia–DRC with Atlantic export routes.

Early progress includes Namibia's green-hydrogen/lithium platforms and Zambia's exploration-to-processing pipelines supported by the EU's AfricaMaVal programme (2022–2025).

U.S.–DRC–Zambia Electric-Vehicle (EV) Battery Value-Chain Partnership (2022–2025)



The United States has consolidated its 2022 MoU with DRC and Zambia into a more operational framework by 2024–2025. Backed by the U.S. Department of State, DFC, and USAID (U.S. State Department, 2022; U.S. Embassy Zambia, 2023, USIP Senior Study Group Report, 2024):

- Feasibility studies for midstream battery-precursor processing are under development,
- Capital mobilization targets are linked to the Lobito Corridor upgrade, and
- U.S. agencies are supporting governance, traceability, and clean-supply-chain standards.

The initiative is one of the first to focus on establishing a regional EV-battery ecosystem in Africa, rather than solely increasing mineral extraction.

[1]*However, some criticism includes that its efforts are often theoretical, and programs are not followed by practical steps, such as helping to secure EU offtake.*

Recent research from the Center for Strategic & International Studies (CSIS) indicates the U.S. is evaluating a broader strategy to deepen minerals engagement with Africa, especially in cobalt, copper, and lithium supply-chain security (CSIS, 2024). Priorities include reducing dependency on China in midstream processing, enhancing African governance and transparency, and supporting resilient battery-material supply chains.



Japan's JOGMEC Model in Southern & Central Africa (Ongoing; Expanded 2023–2025)

Japan's approach - driven by JOGMEC - remains one of the most technically structured (JOGMEC, 2023; Energy Capital & Power, 2023). Through agreements across Namibia, Botswana, Zambia, South Africa and the DRC, JOGMEC provides:

- High-resolution geological mapping,
- Early-stage co-financing for exploration,
- Technology transfer in ore-processing efficiency and mine safety, and
- Capacity building for African geological surveys.

The model has enabled joint ventures and pre-feasibility work, particularly in cobalt and rare-earth projects.

Gulf States' Investment-Led Partnerships (UAE and Saudi Arabia, 2023–2025)



The UAE and Saudi Arabia have emerged as major investors in African critical minerals, prioritising rapid deployment of large-scale commercial capital (Lusaka Times, 2023; Enterprise News, 2024; Saudi Gazette, 2024).

Key examples include:

- UAE's USD 1.1bn acquisition in Mopani Copper Mines (Zambia) and a USD 1.9bn investment partnership with DRC's Sakima, signalling a willingness to take early-stage and political-risk exposure.
- ·Saudi Arabia's Manara Minerals (Ma'aden + PIF) forming investment alliances with Senegal, Mauritania, Nigeria, Chad, Egypt, Morocco, and Zimbabwe, focusing on copper, nickel, and strategic battery minerals.

These partnerships stand out for their high-risk tolerance, speed of execution, and commercial capital intensity.

Turkey's Geological-Exploration and Technical-Capacity Model (2017–2025)

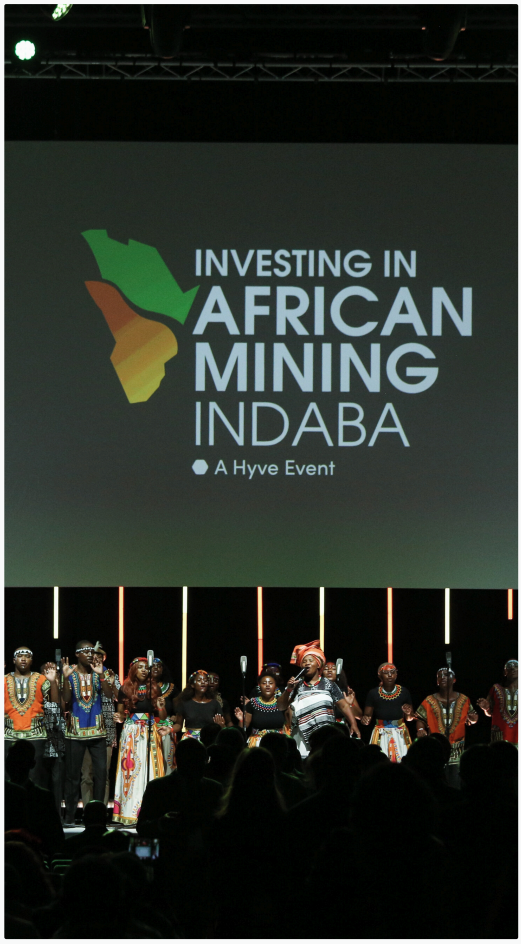


Turkey continues to expand its mining cooperation agreements with Ethiopia, Niger, Sudan, Guinea, Morocco, and Nigeria (FAO 2017a; 2017b; 2018; Nordic Monitor, 2020). Through MTA International Mining Inc, the model prioritises:

- Geological mapping,
- Joint exploration teams,
- Technical training for African geoscientists, and
- Early-stage project development.

Notably, Niger and Sudan have reported concrete exploration results attributable to Turkish surveying and drilling programs.

New Cross-Continental Platforms: SEforALL & Africa-Europe Foundation Partnership on Critical Transition Minerals (2024–2025)



A major new cooperation platform was launched in 2024 by Sustainable Energy for All (SEforALL) and the Africa-Europe Foundation (SEforALL, 2024). The initiative aims to:

- Coordinate continental-scale policy dialogue on mining, energy transition and industrial value chains,
- Create a pipeline of "transition-ready" mineral projects aligned with Net Zero,
- Mobilize blended finance into exploration, processing, and logistics, and
- Improve ESG, community engagement, and traceability systems across Africa.

This platform is designed to serve as a continental convening mechanism, complementing bilateral agreements.

China–Africa Critical-Minerals Cooperation (Ongoing; 2010–2025)

China has established extensive partnerships across Africa's mineral-rich countries, focusing on cobalt, copper, lithium, and rare-earth minerals (CFR, 2025; Resource Justice, 2025; AP News, 2025). These cooperation models combine:

- **Infrastructure-for-resources agreements**, such as the Sicomines deal in DRC, linking mining rights to investments in roads, hospitals, and urban infrastructure.
- **Direct investment and acquisition of strategic mineral projects**, including lithium (Mali), copper (Botswana), cobalt and copper (DRC & Zambia), and rare-earths (Tanzania).
- **Joint ventures and operational partnerships**, e.g., Zijin Mining with Ivanhoe Mines at Kamoa-Kakula (DRC), integrating extraction with downstream processing capacity.
- **Logistics and transport integration**, such as the refurbishment of the Tanzania–Zambia Railway (TAZARA) and rail/port upgrades supporting export corridors.
- **Capacity building and technology transfer**, with Chinese state-owned enterprises providing expertise in ore processing, mine management, and safety protocols.

Early progress includes enhanced cobalt and copper production pipelines in DRC and Zambia, lithium extraction in Mali, and improved mineral export logistics through upgraded rail corridors.



5.4.3. Cross-cutting risks across cooperation models

While some cooperation models have generated real outcomes - expanded exploration, improved logistics corridors, and significant new capital inflows - they also carry structural risks:

- **High concentration of ownership**, especially in the DRC where some foreign actors' control significant part of cobalt–copper output, weakening national bargaining power.
- **Limited in-country value addition**, as refining and battery precursor manufacturing often remain offshore.
- **Governance and transparency concerns**, including concession undervaluation and unmet infrastructure commitments.
- **Inconsistent ESG safeguards**, especially in partnerships where sustainability is not a central requirement.

Without stronger African regulatory leadership, improved contract governance, and industrial-policy coherence, cooperation risks reinforcing dependency rather than enabling structural transformation.



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5.4.4. Investor perspective and institutional implications

For private investors, these partnerships present three principal advantages:

- **Risk-mitigation:** MDB and bilateral co-lending platforms provide political-risk insurance, first-loss protection, and currency hedging.
- **Pipeline development:** Access to pre-verified projects under AU and AfDB regional frameworks shortens due-diligence cycles.
- **Impact alignment:** Participation demonstrates measurable ESG compliance and supports corporate decarbonisation commitments.

A growing number of asset managers - including Ninety-One, Standard Bank Group, and Proparco - are structuring blended finance portfolios under these frameworks, aligning financial returns with ESG-verified impact metrics (Standard Bank, 2024; Proparco, 2023).

For investors, the key is early participation – engaging through co-investment platforms, guarantee facilities, and regional trust funds – that offer measurable impact and structured ESG reporting. The convergence of regional initiatives with global climate-finance architecture positions SSA as the next frontier for climate-aligned resource financing, balancing return, resilience, and responsibility.

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5.4.5. Challenges and gaps

Despite progress, significant challenges remain

Fragmented frameworks and overlapping mandates.

Africa's green-minerals ecosystem is spread across multiple uncoordinated initiatives - AU Green Minerals Strategy, AfDB's Africa Green Minerals Facility (2023), AFC's battery-metals programme, bilateral mineral partnerships (EU–Namibia, EU–Zambia, U.S.–DRC–Zambia), and value-chain platforms such as AfricaMaVal (AU, 2025; AfricaMaVal, 2023).

This fragmentation leads to duplicated project pipelines, inconsistent eligibility criteria, and higher transaction costs for investors and governments (AU, 2025).

Limited negotiating and technical capacity.

Many African governments lack specialized skills in mineral economics, ESG structuring, climate-finance instruments, and battery-value-chain analytics (AfDB, 2023). Partner governments, in contrast, deploy large multidisciplinary teams, creating asymmetrical negotiations and weaker value-addition terms for host countries (AU, 2025).

Weak monitoring and verification systems (MRV).

Continental systems to track green-minerals financing, climate additionality, and ESG performance remain underdeveloped (AU, 2025). Mining cadastres rarely integrate climate or sustainability KPIs, while independent verification is limited. This reduces investor confidence and restricts access to concessional climate-finance platforms such as GCF, GEF and CIF (AfDB, 2023).

Regulatory misalignment and inconsistent ESG taxonomies.

National sustainability frameworks (South Africa, Kenya, Nigeria, SADC) remain heterogeneous and lack a unified African ESG taxonomy. The AU's Draft Green Finance Taxonomy is promising but not yet operational (AfDB, 2025; ACCF, 2024). Misaligned definitions, reporting rules, and carbon-market regulations increase compliance costs and slow cross-border capital flows.

5.4.6. Opportunities and Pathways for Scaling

Regional Green Finance Observatory.

The African Union's Green Minerals Strategy (AGMS) explicitly calls for enhanced tracking of capital flows, ESG metrics, and supply-chain carbon disclosures in green-mineral value chains (AU, 2025).

Pooled-Guarantee Mechanism.

The African Development Bank (AfDB) has launched the Alliance for Green Infrastructure in Africa (AGIA) to mobilize capital for early-stage green infrastructure through de risking instruments, project preparation support, and blended finance, leveraging partners such as the European Investment.

Technology-Transfer Partnerships.
The AGMS underscores the importance of cooperation with global partners to transfer ESG governance, carbon tracking, and mining best practices, particularly through South–South channels.

African Green Minerals Summit.
The annual Africa Green Economy Summit (AGES), convened by the African Union and AfDB, has become a critical platform for policy–investor matchmaking, innovation, and scaling of green-mineral value chains.

Integration into the Global Climate Finance Architecture.
The AfDB is already accredited as a regional "Accredited Entity" to the Green Climate Fund (GCF), positioning it to channel GCF resources into African green-mineral projects.

If effectively coordinated, international and South–South partnerships could play a significant role in closing part of SSA's green minerals financing gap.

The AfDB estimates that Africa will need USD 68–108 billion to develop its green-mineral value chains (AfDB, 2024) and mobilizing tens of billions in blended capital by 2030 would be a meaningful contribution toward this target.

5.5 RECOMMENDATIONS FOR SCALING INNOVATION

Sub-Saharan Africa (SSA) faces two parallel challenges: financing the energy transition and managing rising public debt. Although the region holds around 30% of global transition-mineral reserves (UNCTAD, 2023), it receives less than 5% of climate finance (CPI, 2023). Public budgets alone cannot close the investment gap. As shown in Sections 5.1–5.4, tools such as Debt-for-Climate Swaps (DfCS), Sustainability-Linked Loans (SLLs), Results-Based Financing (RBF) and South–South partnerships can mobilise blended finance when supported by strong policies and institutions.

This section consolidates those lessons into three pillars: enabling conditions, institutional architecture, and regional and global alignment.

The region holds around **30%** of global transition-mineral reserves yet receives less than **5%** of climate finance



5.5.1. Enabling conditions, institutional support, and Governance

5.5.1. Enabling conditions, institutional support, and Governance

Stable macroeconomic policy is essential to attract private investment. With SSA's debt-to-GDP ratio rising from 35% to 61% between 2013 and 2023 (IMF, 2024), investors require credible medium-term fiscal and debt strategies that integrate innovative financing instruments such as DfCS and sustainability-linked sovereign instruments.

Adopting IFRS S2 climate-disclosure standards across ministries and SOEs would improve transparency, reduce risk premiums, and strengthen sovereign credit signals (IFRS, 2023).



5.5.1.2. Develop Domestic Green-Finance Frameworks

Most African financial systems lack green-finance taxonomies and enabling regulations. Scaling innovative finance requires:

- Legal recognition of SLLs and sustainability-linked sovereign borrowing;
- Central-bank guidance on climate-risk supervision;
- Targeted fiscal incentives (e.g., tax relief for verified green loans).

The forthcoming African Union Green Finance Taxonomy (2025) is a critical step toward harmonisation and investor confidence. (AU, 2025).

5.5.1.3. Build Bankable Project Pipelines

Only about 15% of mineral-sector proposals in Sub-Saharan Africa meet DFI bankability standards (AfDB, 2023). Governments can accelerate pipeline readiness by:

- Establishing National Project-Preparation Facilities with MDB/DFI co-financing;
- Using public–private feasibility and ESG-assessment grants linked to strong MRV systems;
- Developing digital investment pipelines integrated with Africa50 and AfDB tools, showcasing verified, de-risked opportunities.



5.5.1.4. Establish Dedicated Green-Mineral Finance Facilities



Fragmented financing mechanisms can be integrated into national GMFFs capitalised through DfCS savings, RBF windows, concessional loans, and DFI co-finance. These facilities would:

- Act as intermediaries between DFIs and domestic investors;
- Deploy capital to ESG-screened mining, processing, and mineral-corridor infrastructure;
- Offer guarantees and co-lending for SMEs within mineral value chains.

Pilot facilities could be developed in resource-rich economies such as Zambia, Ghana, and South Africa in alignment with AfDB's regional African Green Minerals Finance Facility (AGMFF). These countries combine strong green-mineral reserves, credible institutions, active regulatory reforms, and large pipelines of investable projects capable of delivering fast, scalable demonstration effects for the continent.

5.5.1.5. Strengthen MRV and domestic financial institutions



Credible monitoring, reporting, and verification systems are essential for all innovative instruments discussed in this report. Governments should invest in digital MRV registries aligned with ISO 14064, IFC Performance Standards, ICMM, and IRMA, while building capacity across ministries, regulators, and statistical agencies (IFC, 2023). In parallel, mobilising domestic banks, through green-refinancing windows, MDB-backed risk-sharing facilities, and ESG-credit training, reduces FX risk and improves SME access to mineral value chains.

5.5.2. Integration with national and regional strategies

Innovative finance will only scale if embedded in national development planning and regional integration frameworks. Mineral strategies must be aligned with energy-transition plans, industrial policies, Medium-Term Expenditure Frameworks, and Nationally Determined Contributions (NDCs).

At the regional level, harmonisation under SADC, ECOWAS, EAC, and AfCFTA can synchronise fiscal regimes, ESG standards, and local-content rules, reducing investor uncertainty and enabling cross-border project structuring.

Embedding DfCS, SLLs, and RBF instruments into regional platforms, such as the African Green Minerals Finance Facility, Africa50 corridors, and the Africa Green Industrialisation Initiative, creates scale, lowers transaction costs, and enables joint development of downstream processing that no single country could finance alone.

Regional infrastructure integration is equally critical. Renewable baseload power, rail, ports, and logistics corridors must be coordinated through power pools (SAPP, EAPP, WAPP) and AfCFTA trade frameworks to make green-mineral projects bankable and scalable.

5.5.3. Role of COP and global climate finance architecture

The global climate-finance architecture plays a pivotal role in scaling innovative financing instruments for Africa's green-minerals sector. For African countries, COP outcomes shape the rules, incentives, and funding channels through which debt-for-climate swaps, sustainability-linked loans, results-based financing, and blended-finance platforms can be expanded.

5.5.3.1. Creating eligibility and demand for climate-aligned minerals



Global climate commitments are driving unprecedented demand for transition minerals (copper, cobalt, manganese, nickel, lithium). The Paris Agreement's mitigation targets and COP decisions on clean-energy deployment are accelerating investment into "climate-critical" supply chains. However, COP processes increasingly emphasize low-carbon, transparent, and socially responsible sourcing, which means that African countries must align their mineral strategies with: IFRS S2 and TCFD-style disclosure standards, science-based emissions pathways for the mining sector and responsible-sourcing frameworks (OECD, IRMA, ICMM, CRAFT) (OECD, 2023). Without alignment, African minerals may face reduced competitiveness in markets shaped by the EU Critical Raw Materials Act, U.S. IRA sourcing rules, and Asian battery-manufacturing standards.

5.5.3.2. Expanding access to global climate funds for mineral-sector decarbonisation and direct access to climate funds



To date, less than 2% of all global climate finance has flowed into mining decarbonisation or mineral-value-chain infrastructure (CPI, 2023). COP27, COP28 and COP29 negotiations have opened new pathways for Africa through:

- Green Climate Fund (GCF) windows for industrial decarbonisation
- Global Methane Pledge support for mine-methane abatement
- Just Energy Transition Partnerships (JETPs) expanding to mining-energy linkages
- Article 6 mechanisms, enabling results-based payments for verified emissions reductions in mineral corridors

As of 2024, dozens of Sub Saharan African institutions are accredited to the Green Climate Fund (GCF), including key regional development banks and financial intermediaries (ADFI, 2024; GCF, 2024).

African governments can leverage this accreditation to underwrite mechanisms like concessional debt-for-climate swaps (DfCS), results-based financing (RBF), and sustainability linked loans (SLLs).



Expanding accreditation to national development banks, regional DFIs, and emerging Green-Mineral Finance Facilities (GMFFs) would:

- Allow countries to secure long-tenor concessional loans,
- Support guarantees and blended structures for mineral-sector decarbonisation,
- Channel climate finance directly into energy, transport, and processing infrastructure supporting green minerals.

5.5.3.3. Leverage COP to Integrate Minerals into Climate-Finance Mandates



COP28's renewable-capacity commitments increase demand for transition mineral such as copper, cobalt, lithium, manganese, rare earths. African governments can use COP to advocate for:

- Recognition of mineral-sector decarbonisation as eligible climate-finance expenditure,
- Priority access to concessional finance for renewable baseload power, grid upgrades, and low-carbon transport in mineral corridors,
- Article 6 mechanisms allowing results-based climate payments tied to verified emission reductions in mining and processing,
- Integration of minerals into Just Energy Transition Partnerships (JETPs) where relevant (e.g., South Africa, Senegal).
- This would align the mineral-industrialization agenda with global climate commitments and unlock new financing windows.

Recent developments from COP29 and COP30 have further elevated critical minerals in global climate finance discussions. COP29 highlighted the need for equitable benefit sharing, responsible extraction, and infrastructure investment to ensure developing countries, especially in Africa, benefit from growing demand for transition minerals. Dialogues emphasized diversifying mineral value chains toward sustainable midstream and downstream processing, while African negotiators pushed for in-country processing, climate-aligned industrialization, and ESG-compliant project development. COP30 continued these efforts, supporting a continental framework for mineral value addition and integrated climate-finance mechanisms, reinforcing the strategic role of minerals in Africa's clean-energy and industrial agendas (UNCTAD, 2025; African Business, 2025).

5.5.3.4. Positioning Africa within global governance

A unified African position at COP - via AU, AfDB, AUC-AMDC - can promote fair standards, concessional access to climate funds, stronger commitments for technology transfer while affirming minerals as core to the global energy transition.



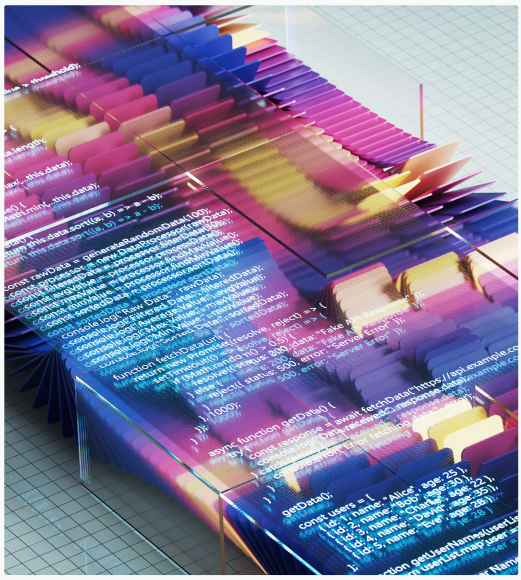
5.5.3.5. Mobilizing Concessional and Blended Capital Through COP-Aligned Mechanisms

Africa's green-minerals sector is heavily exposed to early-stage and infrastructure risks that private capital alone will not shoulder. COP outcomes influence the scale and direction of concessional finance. Stronger COP mandates can help unlock first-loss tranches, guarantees, FX-hedging windows, and long-tenor loans, essential for de-risking mineral-corridor projects.

5.5.4. Investor Engagement and Blended-Finance Design

5.5.4.1. De-Risking Instruments

For private investors, the primary barriers remain political risk, regulatory uncertainty, and currency exposure. MDBs and DFIs can address these constraints through partial-risk and partial-credit guarantees, first-loss tranches, and FX-hedging facilities (e.g., TCX, GuarantCo).



Standardised ESG metrics, aligned with international rating frameworks, enable clearer pricing of sustainability performance and support uptake of SLLs and RBF structures. Early investor engagement through co-investment platforms, guarantee facilities, and regional trust funds offers both risk mitigation and credible ESG impact, positioning SSA as a frontier for climate-aligned resource financing.

5.5.5. Financing Outlook to 2030

If enabling reforms are implemented, SSA could potentially mobilize tens of billions of USD annually in innovative green-mineral financing by 2030. This scale of mobilization would contribute meaningfully toward closing the continent's estimated financing gap of USD 68–108 billion for green-mineral value chains (AfDB, 2019).

Table 10: Green-mineral financing instruments

Instrument	Potential Annual Flow (USD bn)	Key Enablers	Source
Debt-for-Climate Swaps	6 – 8	Legal frameworks, IMF coordination	UNDP (2024)
Sustainability-Linked Loans	5 – 7	ESG taxonomies, KPI verification	UNDP (2024)
Results-Based Financing	2 – 3	MRV systems, outcome-trust funds	UNDP (2024)
South–South and PPP Facilities	8 – 10	Regional cooperation, guarantee pools	CPI (2024)
Other (Green Bonds, Carbon Credits)	4 – 7	Domestic capital-market deepening.	UNDP (2024)

This represents nearly a six-fold increase over current levels of climate-aligned investment in SSA (CPI, 2023).

Table 11: Scaling Innovative Finance for Green-Mineral Development

Strategic Pillar	Key Actions	Lead / Supporting Actors	Expected Impact by 2030
Enabling Conditions	Adopt national green-finance laws; fiscal incentives; ESG disclosure mandates	Ministries of Finance, Central Banks	Improved creditworthiness and investment climate
Institutional Support	Create Green-Mineral Finance Facilities; MRV registries; SME guarantee funds	AfDB, IFC, national DFIs	Mobilisation of blended capital and verified ESG impact
Global Integration	GCF/CIF accreditation; JETP alignment; South–South fund participation	AU, RECs, MDBs	Access to concessional climate finance and technology
Investor Engagement	Risk-sharing, currency-hedging, ESG reporting	DFIs, Private Banks, Institutional Investors	Higher private-capital participation (6–9 % USD IRR) (Convergence, 2023)
Digital Innovation	Digital traceability; online MRV platforms	AfCFTA Secretariat, UNECA	Transparent and compliant mineral supply chains

VI. CONCLUSION

Africa's critical minerals stand at the centre of the global energy transition. They offer a historic opportunity to advance Agenda 2063, expand industrial capabilities, and strengthen Africa's position in global supply chains. Yet the ability to translate geological wealth into transformative development outcomes depends on something far more complex than resource endowment: it relies on the continent's capacity to build a coherent, climate-aligned, investment-ready financing and governance architecture.

This report shows that the primary barriers are structural. Regulations remain fragmented, project-preparation systems are under-resourced, midstream and infrastructure gaps persist, SMEs struggle to access capital, and ESG performance varies widely across countries and operators. These challenges elevate risk premiums, delay bankability, and limit Africa's share of value-added processing. Addressing them is central to the mandates of African governments, the African Union, the African Development Bank Group, and all development partners committed to supporting a just and inclusive energy transition.

A credible pathway forward requires a **continental compact for financing Africa's green-minerals future**, grounded in five pillars:

Policy and Regulatory Alignment.

Governments must streamline permitting, harmonize fiscal and mining frameworks, and integrate climate and industrial policies under the AfCFTA umbrella. This clarity is essential for lowering investor risk, attracting long-tenor capital, and accelerating project timelines.

Regional Integration and Shared Infrastructure.

Mineral development cannot advance without efficient logistics, energy, water, and digital infrastructure. Corridor-level investments, Lobito, Nacala, Maputo, Beira, Abidjan–Lagos, must be treated as regional public goods that enable competitive industrial clusters and cross-border value chains.

Scaled De-Risking and Blended Finance.

DFIs and donors must expand partial guarantees, first-loss facilities, sustainability-linked finance, and concessional capital to unlock private investment for exploration, processing, and renewable-powered industrial zones. These instruments are central to building bankable pipelines in a high-risk environment.

ESG Leadership and Traceability.

Africa's competitiveness will increasingly depend on its ability to supply **low-carbon, responsibly sourced minerals.** Harmonized ESG benchmarks, institutional capacity building, and traceability systems are essential to meeting global due-diligence requirements and securing long-term market access.

Inclusive Industrialization and Local Value Capture.

A just transition demands that communities, women- and youth-led enterprises, and ASM stakeholders share in the benefits. Local content, skills development, SME financing, and community benefit-sharing must be core components of mineral-led growth.

Together, these pillars form the foundation of a continental financing ecosystem capable of blending public, private, and philanthropic capital through instruments such as Debt-for-Climate Swaps, Sustainability-Linked Loans, Results-Based Financing, South–South co-investment platforms, and regional guarantee facilities.

If implemented with coherence, discipline, and coordination, Africa can transition from a supplier of raw minerals to a globally competitive hub for low-carbon industrialization, resilient supply chains, and green-technology manufacturing.

The opportunity is generational: to convert mineral endowment into value addition, exports, jobs, and long-term climate resilience. The decisions made today, by governments, DFIs, development partners, and investors, will determine whether Africa captures this strategic dividend or remains on the periphery of global decarbonization.

With the right governance, financing structures, and partnerships, the continent has both the capability and the momentum to shape its green-minerals future on its own terms, and to emerge as a central actor in delivering the global clean-energy transition.



ANNEXES

A.1 ACRONYMS

ACCF	African Climate Change Fund (AfDB)
ACM0008	CDM: abatement of methane from coal mines
ACMI	Africa Carbon Markets Initiative
ACRA	Africa Credit Rating Agency
ADCF	African Debt-for-Climate Facility
ADFI	African Digital Financial Inclusion Facility (AfDB)
AFAC	African Financial Alliance on Climate Change
AFC	Africa Finance Corporation
AFOLU	Agriculture, Forestry and Other Land Use
AGES	Africa Green Economy Summit
AGF	African Guarantee Fund
AGIA	Alliance for Green Infrastructure in Africa
AGII	Africa Green Industrialisation Initiative
AGMFF	African Green Minerals Finance Facility
AGMS	African Green Minerals Strategy
AGMTS	African Green Minerals Traceability System
AI	Artificial Intelligence
AMDC	African Minerals Development Centre
AMMC	Autorité Marocaine du Marché des Capitaux
AMS-I	Small-scale CDM Type I methodologies (renewable energy)
AMS-II	Small-scale CDM Type II methodologies (energy efficiency)
ANRC	African Natural Resources Centre (AfDB)
APLMA	Asia Pacific Loan Market Association
ASEAN	Association of Southeast Asian Nations
ASM	Artisanal and Small-scale Mining
ATIDI	African Trade and Investment Development Insurance
AU	African Union
AU-AMDC	African Union – African Minerals Development Centre
AUC	African Union Commission
AUC-AMDC	African Union Commission – African Minerals Development Centre
AVCA	African Private Capital Association
BCG	Boston Consulting Group
BGR	German Federal Institute for Geosciences and Natural Resources
BII	British International Investment
BMW	Bayerische Motoren Werke
BPOPF	Botswana Public Officers Pension Fund
BRVM	Bourse Régionale des Valeurs Mobilières

CAGR	Compound Annual Growth Rate
CAPEX	Capital Expenditure
CBAM	Carbon Border Adjustment Mechanism
CBI	Climate Bonds Initiative
CDM	Clean Development Mechanism
CEC	Copperbelt Energy Corporation (Zambia)
CIF	Climate Investment Funds
CMSI	Consolidated Mining Standard Initiative
COP	Conference of the Parties
COP27	27th Conference of the Parties
COP28	28th Conference of the Parties
COP29	29th Conference of the Parties
COP30	30th Conference of the Parties
COVID	Coronavirus Disease
CPI	Climate Policy Initiative
CRAFT	Code of Risk-mitigation for ASM Financing and Trading
CRDB	Cooperative Rural Development Bank
CSDDD	Corporate Sustainability Due Diligence Directive
CSIS	Center for Strategic & International Studies
DBSA	Development Bank of Southern Africa
DFC	U.S. International Development Finance Corporation
DFI	Development Finance Institution
DRC	Democratic Republic of the Congo
DSA	Debt Sustainability Analysis
EAC	East African Community
EAPP	Eastern Africa Power Pool
EBRD	European Bank for Reconstruction and Development
ECOWAS	Economic Community of West African States
EGPS	Extractives Global Programmatic Support
EIB	European Investment Bank
EIC	Ethiopian Investment Commission
EITI	Extractive Industries Transparency Initiative
ESF	Environmental and Social Framework
ESG	Environmental, Social, and Governance
ESIA	Environmental and Social Impact Assessment
ESMS	Environmental and Social Management System
ESRS	European Sustainability Reporting Standards
ETG	Export Trading Group
ETS	Emissions Trading System
EU	European Union
EV	Electric Vehicle
EY	Ernst & Young
FAO	Food and Agriculture Organization of the United Nations
FG	FG Capital Advisors
FI	Financial Institution
FPIC	Free, Prior and Informed Consent
FSD	Financial Sector Deepening Africa

FX	Foreign Exchange
GAC	Guinea Alumina Corporation
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEF	Global Environment Facility
GFANZ	Glasgow Financial Alliance for Net Zero
GHG	Greenhouse Gas
GIF	Global Infrastructure Facility
GRI	Global Reporting Initiative
ICGLR	International Conference on the Great Lakes Region
ICMA	International Capital Market Association
ICMM	International Council on Mining and Metals
ID	Identification (digital ID context)
IDC	Industrial Development Corporation
IEA	International Energy Agency
IFC	International Finance Corporation
IFRS	International Financial Reporting Standards
IMF	International Monetary Fund
IOM3	Institute of Materials, Minerals & Mining
IRA	Inflation Reduction Act
IRMA	Initiative for Responsible Mining Assurance
IRR	Internal Rate of Return
ISO	International Organization for Standardization
ISS	Integrated Safeguards System
ISSB	International Sustainability Standards Board
JETP	Just Energy Transition Partnership
JOGMEC	Japan Oil, Gas and Metals National Corporation
JSE	Johannesburg Stock Exchange
JUMP	Junior Mining Programme
KPI	Key Performance Indicator
LCE	Lithium Carbonate Equivalent
LMA	Loan Market Association
LSTA	Loan Syndications and Trading Association
MASEN	Moroccan Agency for Sustainable Energy
MDB	Multilateral Development Bank
MIGA	Multilateral Investment Guarantee Agency
MIIF	Minerals Income Investment Fund
MRV	Monitoring, Reporting and Verification
MSME	Micro, Small and Medium Enterprises
MSP	Minerals Security Partnership
MTA	General Directorate of Mineral Research & Exploration
MW	Megawatt
NDC	Nationally Determined Contribution
NEI	Northwest & Ethical Investments
NPV	Net Present Value
NSE	Nairobi Securities Exchange
NSIA	Nigeria Sovereign Investment Authority
OBA	Output-Based Aid
OECD	Organisation for Economic Co-operation and Development

PE	Private Equity
PIF	Public Investment Fund
PPF	Project Preparation Facility
PPP	Public-Private Partnership
RBF	Results-Based Financing
RISE	Resilient and Inclusive Supply-chain Enhancement Partnership
RRII	Reconciliation and Responsible Investment Initiative
SADC	Southern African Development Community
SAPP	Southern African Power Pool
SEC	Securities and Exchange Commission
SEFA	Sustainable Energy Fund for Africa
SFDR	Sustainable Finance Disclosure Regulation
SLL	Sustainability-Linked Loan
SLO	Social Licence to Operate
SLR	SLR Consulting
SMDF	Solid Minerals Development Fund (Nigeria)
SME	Small and Medium-sized Enterprise
SOE	State-Owned Enterprise
SPV	Special Purpose Vehicle
SSA	Sub-Saharan Africa
TA	Technical Assistance
TCFD	Task Force on Climate-related Financial Disclosures
TCX	The Currency Exchange Fund
TDB	Trade and Development Bank
TEG	Technical Expert Group on Sustainable Finance
TSM	Towards Sustainable Mining
UAE	United Arab Emirates
UK	United Kingdom
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNECA	United Nations Economic Commission for Africa
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
US	United States
USAID	United States Agency for International Development
USD	United States Dollar
USGS	United States Geological Survey
USIP	United States Institute of Peace
VAT	Value-Added Tax
VC	Venture Capital
VCM	Voluntary Carbon Market
VCS	Verified Carbon Standard
WAPP	West African Power Pool
WEF	World Economic Forum
WWF	World Wide Fund for Nature

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