POLICY BRIEF

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Upscaling SA's Critical Mineral Value Chains: Strategic Pathways for Sustainable Trade and Investment

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Trade and Investment

Abstract

This study develops a strategic framework to enhance South Africa's trade and investment opportunities in critical mineral (CM) value chains, focusing on the platinum group metals, manganese, and vanadium. CMs are essential for advanced technologies, renewable energy products, and energy storage solutions. We analyse existing trade patterns and market structures to examine how South Africa can secure greater value from its mineral wealth while advancing G20 sustainability objectives, particularly sustainable and inclusive economic growth. Our research evaluates current trade flows and value chain opportunities to identify areas where South Africa can increase its participation in downstream processing and manufacturing, thereby attracting investment in process facilities and creating high-skilled manufacturing jobs. We also assess existing trade agreements, investment frameworks, and regional integration opportunities to develop targeted policy recommendations that balance economic development with environmental sustainability.

The study proposes four interconnected policy interventions: (1) developing a coordinated G20 investment framework to attract foreign direct investment (FDI) in the CM processing infrastructure; (2) creating enabling regulatory frameworks that incentivise investments while aligning with global environmental, social, and governance standards and supporting inclusive growth; (3) leveraging trade and investment agreements and regional integration within Southern Africa and with key trade partners to enhance value chain participation and market access; and (4) implementing strategic partnerships for technology transfer and supply chain development. Our recommendations offer practical mechanisms for expanding trade relationships, attracting FDI in downstream activities, and strengthening regional integration within Southern Africa. These interventions would empower South Africa's industrial development goals and G20 priorities while ensuring the sustainable development of critical mineral resources.

Keywords: Critical Minerals, Platinum Group Metals (PGMs), Manganese, Vanadium, Global Value Chain, Regional Integration, Investment, Trade Policy, Regulatory Frameworks, Economic Opportunities

Diagnosis

Setting the stage: South Africa's mineral potential

South Africa's vast reserves of critical minerals (CMs) – particularly platinum group metals (PGMs), manganese, and vanadium – position it as a pivotal player in building sustainable, resilient supply chains for the green transition. Yet, the country captures limited value, primarily exporting these minerals in raw or semi-processed form. As the G20 focuses on inclusive growth, green transition, and resilient trade, South Africa's move up the CM value chain aligns with global priorities and presents a clear path for strategic international collaboration.

The country has a strong position in global CM supply but is hamstrung by limited domestic processing capacity for manganese and vanadium and a concentration of exports in a few markets.

South Africa's PGM exports reflect partial movement up the value chain: semi-manufactured platinum exports averaged $2.4 billion (nearly a third of global exports), compared to $1.5 billion in unwrought form.[1] Exports, nevertheless, remain highly concentrated – 38% of unwrought platinum goes to the UK, followed by Japan (18%) and Hong Kong (16%).[2] There are similar trends for palladium and rhodium, with substantial semi-processed exports and limited destination diversity.

Manganese is exported largely as ore, with annual exports of $2.8 billion – more than half exported to China.[3] Semi-processed exports such as ferro-manganese and silicomanganese are limited, with each around $120 million.[4]

[1] These insights draw on 28 HS-6 product codes covering key PGM, manganese, and vanadium exports, based on 2019–2023 average trade values from International Trade Centre Trade Map, accessed April 1 2025, https://www.trademap.org.

[2] *Id.*

[3] *Id.*

[4] *Id.*

Vanadium exports are modest and comprise oxides and ferro-alloys, with limited domestic value addition.

To capitalise on this position, expanding value-added production and strategically leveraging trade and investment frameworks could help diversify export markets, reduce vulnerability to external shocks, and boost long-term industrial competitiveness. Although South Africa participates in several trade agreements – including the African Continental Free Trade Area (AfCFTA), the SADC Trade Protocol, and the SA–EU Economic Partnership Agreement (EPA) – that offer potential for regional integration, these frameworks prioritise tariff liberalisation over sector-specific mechanisms for value-chain development. By leveraging them more strategically, the country could unlock opportunities for joint production hubs, improved trade facilitation, and harmonised regulations across Southern Africa.

South Africa's trade and investment regulatory framework strives to promote sustainable and inclusive economic growth. However, reforms are needed to attract crucial investments.

The mining sector's regulatory regime, anchored in the Mineral and Petroleum Resources Development Act of 2002 (MPRDA), the Black Economic Empowerment ownership requirement, and the National Environmental Management Act of 1998, reflects environmental protection and inclusive economic growth goals but has struggled to incentivise downstream investment.[5] While the MPRDA allows the mining ministry to promote local beneficiation of strategic minerals,[6] the designation process relies on policy formulations lacking transparency in decision-making rather than codified

[5] *Mineral and Petroleum Resources Development Act 28 of 2002* ("MPRDA"); *Broad-Based Socio-Economic Empowerment Charter for the Mining and Minerals Industry, 2018* ("Mining Charter III"), Government Gazette No. 41934 (South Africa), September 27, 2018; *National Environmental Management Act 107 of 1998* (South Africa).

[6] Section 26 of the MPRDA, which allows the mining ministry to enact export controls, levy export taxes, or require local processing on the designated strategic minerals.

rules.[7] Moreover, as discussed above, South Africa lacks a regulatory harmonisation study to promote regional standardisation.

Beyond mining-specific regulations, the Protection of Investment Act of 2015[8] replaced first-generation bilateral investment treaties (BITs), shifting from an international treaty-based approach to a domestic framework. The Act ensures certain protections for foreign investors but eliminates investor–state dispute settlement, relying solely on domestic dispute resolution. This shift has raised concerns among investors, especially in capital-intensive sectors like CM processing.[9] South Africa has acknowledged its investment shortfall in CMs, citing limited downstream processing, infrastructure gaps, and permitting delays as key obstacles to industrialisation.[10] Additionally, it lacks a comprehensive foreign investment screening mechanism to safeguard the mining and processing sectors' strategic industrial policies, economic development, and national security.

This policy brief sets out recommendations on how South Africa can leverage its CM endowments to advance sustainable industrialisation, job creation, and trade competitiveness while directly contributing to the G20's priorities of sustainable economic growth, inclusive supply chains, and climate action.

[7] Targeted Critical Minerals and Metal List, IEA, accessed on April 4, 2025. https://www.iea.org/policies/15877-targeted-critical-minerals-and-metals-list

[8] *Protection of Investment Act 22 of 2015* (South Africa).

[9] The Protocol on Investment to the Agreement Establishing the AfCFTA, adopted in February 2023, represents a notable precedent aimed at boosting intra-African investment flows to foster sustainable development among State Parties. However, while its innovative provisions reflect regional priorities, they may not yet align with global consensus. This divergence could require flexibility in future extra-regional negotiations, where maintaining this balance between investor protections and host state policy space will remain an essential consideration.

[10] Thabisho Kgaditsi, "Speaking Notes by The Honourable Minister Of Mineral and Petroleum Resources, Mr Gwede Mantashe: African Ministers' Round Table," *DMR Newsroom Department of Mineral Resources*, March 2, 2025, https://www.dmre.gov.za/news-room/post/2783#:~:text=One%20of%20the%20key%20impediments,highly%20functioning%20tax%20administrative%20system.

Recommendations

Upscaling South Africa's PGM, manganese, and vanadium value chains

By adopting a strategic approach, South Africa can transform its CM sector from a primary exporter into a hub for value-added production, supporting G20 goals while addressing domestic challenges like unemployment and trade imbalances. To achieve this, it must prioritise attracting foreign direct investment (FDI) into downstream processing facilities and deepen integration into regional value chains. Four key recommendations can guide this transformation. These reforms are achievable with deliberate action, and prioritising them now – particularly amid global trade uncertainties – would help secure long-term stability and growth.

1. Develop a coordinated G20 investment framework to attract FDI in CM processing

To secure long-term investment in downstream CM activities, South Africa could advocate for a G20-coordinated CM Investment Facility to attract and de-risk private investment in the CM processing infrastructure. This multilateral investment platform could:

- provide blended finance mechanisms,[11] including concessional loans from existing multilateral financial institutions (eg, the African Development Bank [AfDB], the International Finance Corporation [IFC], or the Development

[11] Blended finance platforms are in different formats, including multilateral development bank platform, regional and bilateral platforms, sector-specific platforms, private sector-led initiatives, impact investment platforms, thematic funds. For example, the extractive sector-specific platforms include the Extractive Industries Transparency Initiative (EITI) Multi-stakeholder Trust Fund and the Critical Minerals Security Partnerships. Blended finance platforms with G20 cooperation opportunities may include country donor funds, EU G20 members' collective initiatives (eg, the European Fund for Sustainable Development Plus and the European Investment Bank External Action), and cross-G20 collaborative platforms (eg, Development Finance Institution Working Groups and the Climate Investment Funds). G20 members also operate specialised funds, eg, GAVI, and this opens opportunity for a G20 specialised CRM fund in the future.

Bank of Southern Africa), private capital, sector-specific platforms, and G20 collective initiatives, as well as donor funds. For instance, the AfDB's Sustainable Energy Fund for Africa offers a relevant template;[12]

- implement risk-sharing instruments such as first-loss guarantees (eg, the IFC's MCPP platform)[13] and currency hedging instruments (eg, MIGA guarantees);[14]
- Support public–private partnerships to co-finance and de-risk investments in smelters, refineries, battery precursor plants, and other manufacturing facilities; and
- Endorse standardised environmental, social and governmental (ESG) criteria to promote sustainability and responsible sourcing principles.

Exploring opportunities working with G20 countries, this proposal builds on successful G20 investment initiatives such as the G20 Infrastructure Working Group (2018)[15] and the Compact with Africa (2017),[16] which de-risked projects through blended finance mechanisms. A similar model can be adapted to CM processing, helping South Africa attract strategic investment and enhance its role in global supply chains.

2. Create an enabling regulatory framework that incentivises investments while aligning with global ESG standards and supporting inclusive growth

[12] African Development Bank, "Sustainable Energy Fund for Africa," accessed April 7, 2025, https://www.afdb.org/en/topics-and-sectors/initiatives-partnerships/sustainable-energy-fund-for-africa.

[13] The IFC's MCPP offers a 20% first-loss tranche to crowd in private investors. International Finance Corporation, "Managed Co-Lending Portfolio Program (MCPP)," *International Finance Corporation*, accessed April 7, 2025, https://www.ifc.org/en/what-we-do/sector-expertise/syndicated-loans-and-mobilization/portfolio-syndications.

[14] Multilateral Investment Guarantee Agency (MIGA), "Sub-Saharan Africa," *World Bank Group*, accessed April 7, 2025, https://www.miga.org/sub-saharan-africa.

[15] G20, "Infrastructure Working Group", *G20 South Africa*, accessed April 7, 2025, https://g20.org/track/infrastructure-iwg/.

[16] G20 Compact with Africa, *Compact with Africa World Bank Group*, accessed April 7, 2025, https://www.compactwithafrica.org.

Despite South Africa's robust regulatory framework to promote sustainable and inclusive growth in the mining industry, the following enhancements are needed to attract significant investment in the mining and processing sectors:

- codifying the definition of critical minerals to provide policy and regulatory clarity; help align mining, trade, environmental, and energy policies with national priorities; create investment incentives and confidence through legal certainty; and identify vulnerabilities in strategic sectors like defence, energy, and tech (eg, the EU's Critical Raw Materials Act [2023][17] and the US's Energy Act of 2020 legally define a critical mineral);[18]
- evaluating regulatory alignment opportunities, including harmonising mineral processing and ESG regulations across partners and streamlining cross-border permitting to reduce costs in regional value chains; and
- establishing a national investment screening mechanism to safeguard South Africa's strategic interests in the mining and processing sectors and ensure local economic benefits from foreign investments (eg, Canada's Investment Canada Act and Australia's Foreign Investment Review Board).[19]

These regulatory updates would foster legal certainty, improve economic efficiency, and safeguard South Africa's strategic interests and economic

[17] European Parliament and Council of the European Union. 2023. "Regulation (EU) 2023/1651 of the European Parliament and of the Council of 6 September 2023 on Establishing a Framework for Ensuring a Secure and Sustainable Supply of Critical Raw Materials and Amending Regulation (EU) 2023/956." Official Journal of the European Union L 259/1 (September 27, 2023), which determines the criticality of a mineral by examining its high economic importance and high supply risk.

[18] Section 7002 of the Energy Act of 2020, 42 U.S. Code § 16012, which defines a critical mineral:

1. Is essential to the economic or national security of the U.S.
2. Has a supply chain vulnerable to disruption.
3. Serves an essential function in the manufacturing of products.

[19] Australian Government. 1975. "Foreign Investment Review Board." Treasury Portfolio. Established under the Foreign Acquisitions and Takeovers Act 1975 (Cth); Government of Canada. 1985. "Investment Canada Act." R.S.C., 1985, c. 28 (1st Supp.). Last amended on April 1, 2021. (Specifically, the Investment Canada Act reviews significant foreign investments for "net benefit" to Canada; Australia's Foreign Investment Review Board reviews foreign investments against the "national interest" test and expanded scrutiny for critical infrastructure and sensitive sectors.)

benefits, creating a favourable regulatory environment to attract greater investment.

3. Leverage trade and investment agreements and regional integration within Southern Africa and with key partners to enhance value chain participation and market access

To position itself as a regional CM processing hub while enhancing participation in global/regional value chains, South Africa should prioritise conducting comprehensive economic and regulatory analyses to:

- map CM global/regional value chains, identifying strategic African partners for joint production hubs (eg, prospective battery material clusters combining the Democratic Republic of Congo's [DRC] cobalt and Zimbabwe's lithium) and international markets for targeted agreements; and
- assess complementary industrial capabilities (eg, Mozambique's graphite and South Africa's vanadium) or tech expertise (eg, Germany for vanadium electrolytes, South Korea for battery gigafactories), infrastructure gaps (transport/energy for processing plants), and priority investments (eg, vanadium electrolyte facilities versus PGM refineries).

- These findings should inform regional integration priorities under the AfCFTA and SADC and bilateral negotiations with technology leaders like the EU, the US, and South Korea. Further steps include:

- enhancing trade facilitation measures under the AfCFTA to reduce barriers to intra-African CM trade and support cross-border processing and manufacturing investments. This includes developing regional content rules to incentivise cross-border processing investments; and
- negotiating new-generation investment agreements with key partners that balance market access and investment protection with sustainability and

other legitimate public policy objectives, considering the limitations of its terminated BITs and the Protection of Investment Act of 2015. These agreements could also include investment facilitation clauses, eg, to streamline permitting for CM processing plants.

4. Implement strategic partnerships for technology transfer and supply chain development

To maximise the developmental impact of CM endowments, South Africa should pursue targeted industrial partnerships linking resource access to local value addition, including processing, manufacturing, and innovation. Through bilateral and multilateral agreements, key mechanisms include joint investment, technology transfer, and skills development. Actionable pathways cover:

- negotiating resource-for-industrialisation agreements with partners (eg, Germany, South Korea, Japan), linking mineral supply to co-investment in battery precursors, vanadium systems, and PGM-based hydrogen technologies (eg, mirroring the South Korea–Indonesia LG EV battery deal, linking manganese supply to local cathode production);[20]
- operationalising existing frameworks (eg, the EU–SA Clean Tech Partnership)[21] via task forces with targets for licensing, infrastructure, and joint ventures;
- leveraging blended finance tools (eg, Global Gateway, PGII, AfDB) to de-risk refining, component manufacturing, and clean energy projects;
- embedding technology transfer mechanisms in partnership agreements through licensing, training, and technical secondments; and

[20] Fransiska Nangoy and Stefanno Sulaiman, "Hyundai Motor, LG Energy Solution launch Indonesia's first EV battery plant," Reuters, July 3, 2024, accessed April 6, 2025, https://www.reuters.com/business/autos-transportation/hyundai-motor-lg-energy-solution-launch-indonesias-first-ev-battery-plant-2024-07-03/.

[21] European Commission, "European Commission President Ursula von der Leyen Announces EU–South Africa Clean Tech Partnership," *European Commission Press Corner*, February 15, 2025, https://ec.europa.eu/commission/presscorner/detail/en/ac_25_788.

- expanding CM-specific protocols in existing agreements, such as integrating technology transfer guarantees into the EU–SADC EPA, drawing on the US–DRC–Zambia battery partnership.[22]

These measures would anchor South Africa's long-term supply chain integration and solidify its role in a sustainable, high-value CM economy while advancing national industrial priorities.

[22] Catherine Chiang, "The U.S.–Zambia–DRC Agreement on EV Battery Production: What Comes Next?" *Center for Strategic and International Studies (CSIS)*, December 8, 2022, https://www.csis.org/analysis/us-zambia-drc-agreement-ev-batteries-production-what-comes-next.

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