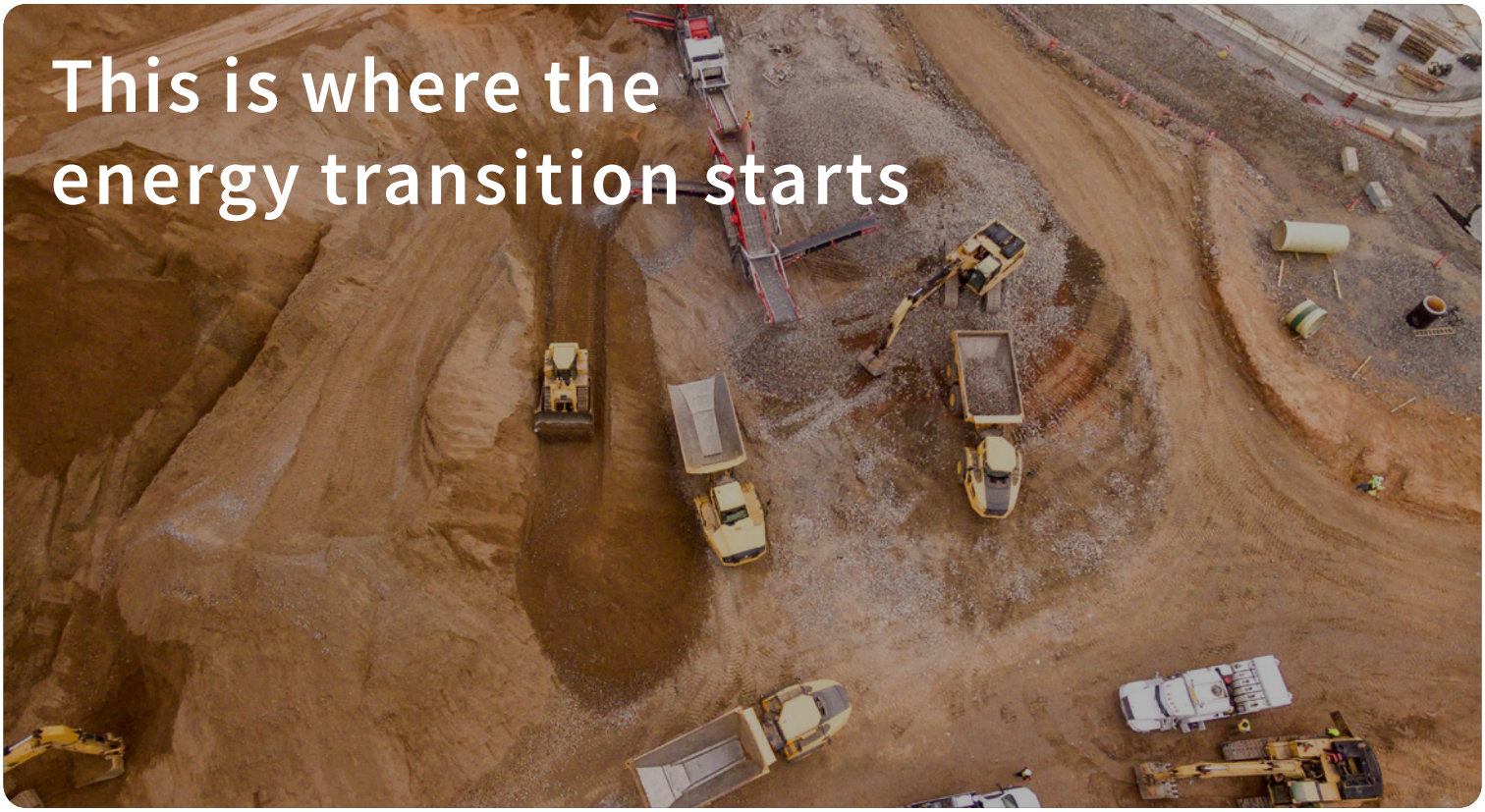
Mining & Critical Minerals
Sector Report



EXECUTIVE SUMMARY

From Platinum to the Energy Transition

MINING REMAINS THE BACKBONE OF SOUTH AFRICA'S INDUSTRIAL ECONOMY, contributing ~7% of GDP and supporting over 450,000 direct jobs. With mineral exports exceeding US$30 billion annually, South Africa anchors global supply chains for platinum group metals (PGMs), manganese, and emerging battery minerals.

THE COUNTRY HOLDS OVER 80% OF GLOBAL PGM RESERVES, supplying ~80% of world platinum for catalytic converters and hydrogen fuel cells. South Africa controls ~70% of global manganese reserves—the world's largest exporter—feeding steel and EV battery production. Over 20 critical mineral projects are under development across lithium, vanadium, rare earth elements, nickel, and graphite.

ANGLO AMERICAN PLATINUM DEPLOYS HYDROGEN HAUL TRUCKS IN LIMPOPO, pioneering fuel cell mining operations. Bushveld Minerals leads vanadium redox flow battery (VRFB) deployment for grid-scale storage, with pilots integrated into Eskom's battery rollout. South32 and Glencore anchor manganese and nickel exports tied to global EV demand. Ivanhoe Mines scales lithium and rare earth output through Platreef. Richards Bay Minerals supplies titanium dioxide and zircon to aerospace and pigment industries globally.

THE DRAFT CRITICAL MINERALS STRATEGY (2024), cadastral reforms, and Special Economic Zones at Coega and Musina-Makhado target beneficiation of batteries, fuel cells, and magnet technology. The World Bank's US$1.5 billion logistics loan (2025) addresses export bottlenecks.

FOR INVESTORS, SOUTH AFRICA DELIVERS UNMATCHED MINERAL ENDOWMENT, R&D leadership (Mintek, Wits Mining Institute), 200+ processing plants, and strategic alignment with global decarbonization value chains.

EXECUTIVE SUMMARY

Sector Highlights

7%
GDP CONTRIBUTION

450,000 +
DIRECT JOBS

$30B +
MINERAL EXPORTS ANNUALLY

80%
GLOBAL PGM RESERVES

80%
PLATINUM SUPPLY

70%
GLOBAL MANGANESE RESERVES

20 +
CRITICAL MINERAL PROJECTS (LITHIUM, VANADIUM, REES)

SEZ
SEZ BENEFICIATION AT COEGA, SALDANHA, MUSINA-MAKHADO

FULL SECTOR BRIEF

The Big Picture

Mining contributes approximately 7% to South Africa's GDP and employs over 450,000 people directly, with millions more supported across the value chain. Mineral exports exceeded US$30 billion in 2024, dominated by platinum group metals, manganese, iron ore, and coal. As the global energy transition accelerates, South Africa's mineral wealth positions it centrally in decarbonization value chains—from PGMs for fuel cells to vanadium for long-duration batteries.

South Africa holds over 80% of global PGM reserves and supplies ~80% of world platinum, essential for catalytic converters (40%+ of global demand) and hydrogen fuel cell technology. The country controls ~70% of global manganese reserves and ranks as the world's largest exporter, feeding steel production and emerging EV battery chemistries. Over 20 critical mineral projects are under development across lithium, vanadium, rare earth elements, nickel, and graphite.

The Draft Critical Minerals Strategy (2024) aligns South Africa with global EV and hydrogen demand, focusing on PGMs, vanadium, manganese, and battery minerals. Cadastral system reforms improve licensing transparency, addressing investor confidence. Special Economic Zones at Coega, Musina-Makhado, and Saldanha offer beneficiation incentives for batteries, fuel cells, and magnet technology. The World Bank's US$1.5 billion loan (2025) for logistics upgrades addresses export bottlenecks

7%

SECTOR CONTRIBUTION TO GDP

40%

DEMAND FOR GLOBAL CATALYTIC CONVERTERS SUPPLY CHAIN MET

20+

CRITICAL MINERAL PROJECTS UNDER DEVELOPMENT

FULL SECTOR BRIEF

PGMs: Powering Catalysts and Hydrogen

South Africa supplies ~80% of global platinum, with applications spanning catalytic converters for internal combustion engines and hydrogen fuel cells for zero-emission vehicles. Anglo American Platinum operates the world's largest PGM mines and pioneers hydrogen applications—deploying hydrogen-powered haul trucks in Limpopo as proof of concept for mining decarbonization.

Platinum demand faces a dual trajectory: declining ICE vehicle production reduces catalytic converter demand, while hydrogen fuel cell adoption creates new markets. Palladium and rhodium remain critical for gasoline catalytic converters. Iridium and ruthenium serve electronics and electrochemistry applications. South Africa's PGM deposits in the Bushveld Complex remain unmatched globally, providing decades of reserves.

INVESTMENT OPPORTUNITY

Equity in PGM-linked hydrogen fuel cell and electrolyser projects. SA supplies ~80% platinum. JVs with Anglo American and OEMs. Anglo's hydrogen haul trucks anchor proof of concept.

FULL SECTOR BRIEF

Vanadium Redox Flow Batteries

Bushveld Minerals leads global vanadium redox flow battery (VRFB) deployment, with South Africa holding significant vanadium reserves. VRFBs provide grid-scale energy storage with 20+ year lifespans, superior to lithium-ion for long-duration applications. Bushveld's pilots power African grids and integrate with Eskom's battery energy storage rollout.

Vanadium beneficiation opportunities span extraction, processing, and battery manufacturing. Special Economic Zones at Coega and Musina-Makhado target VRFB assembly plants, linking mine output to value-added exports. Global demand for long-duration storage positions South African vanadium as strategically critical.

INVESTMENT OPPORTUNITY

Invest in Vanadium beneficiation and VRFB manufacturing. SA holds significant reserves; grid storage demand rising. Partnerships with Bushveld Minerals and SEZs. Bushveld's pilots power African grids.

FULL SECTOR BRIEF

Manganese & Nickel: Feeding EV Supply Chains

South Africa holds ~70% of global manganese reserves and ranks as the world's largest exporter. South32 and Glencore anchor operations, feeding steel production and emerging high-purity manganese sulfate for EV battery cathodes. Beneficiation opportunities include cathode precursor plants at Special Economic Zones.

Nickel deposits in the Bushveld Complex support stainless steel and battery applications. While smaller than Indonesia or Philippines production, South African nickel offers supply chain diversification for battery manufacturers seeking non-Chinese sources.

INVESTMENT OPPORTUNITY

Finance cathode precursor plants and logistics. SA is top manganese exporter. Equity with South32/Glencore or IDC co-funding. South32 feeds global EV supply chains.

FULL SECTOR BRIEF

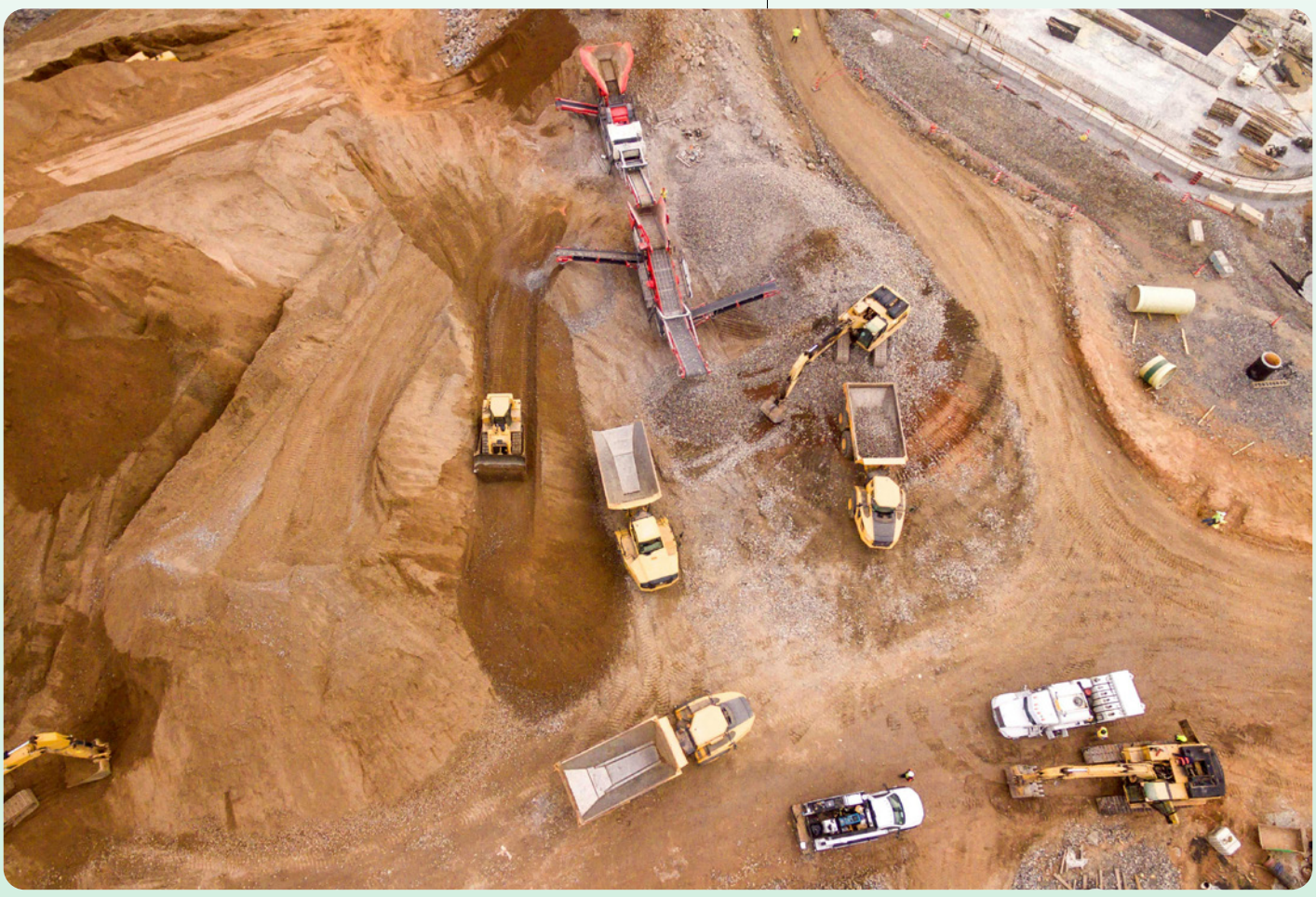
Lithium & Rare Earth Elements: Emerging Frontier

Over 20 lithium, rare earth element (REE), and graphite projects are under development across Limpopo, Northern Cape, and Mpumalanga. Ivanhoe Mines' Platreef expands into nickel and lithium resources. Northern Cape explorers target lithium pegmatites and rare earth deposits for magnets and batteries.

South Africa's REE potential remains early-stage but strategically valuable given Chinese dominance (80%+ global supply). Domestic beneficiation of REEs into magnets for EV motors and wind turbines offers high-value opportunities aligned with global supply chain diversification strategies.

INVESTMENT OPPORTUNITY

Early-stage investment in lithium/REE explorers. Demand for magnets and EV batteries. Risk capital in listed juniors. Ivanhoe's Platreef expands resources.



FULL SECTOR BRIEF

Titanium & Industrial Minerals

Richards Bay Minerals and Tronox supply titanium dioxide (TiO2) and zircon, critical for aerospace alloys, pigments, and additive manufacturing.

South Africa ranks among the top five global producers. Expansion opportunities include higher-purity TiO2 for advanced ceramics and zircon for semiconductor applications.

INVESTMENT OPPORTUNITY

Expand TiO2 and zircon processing. Aerospace, pigments, additive manufacturing markets growing. JVs with Richards Bay Minerals/Tronox. RBM feeds global aerospace.

ON THE GROUND

Policy & Reform Framework

The Draft Critical Minerals Strategy (2024) from the Department of Mineral Resources and Energy prioritizes PGMs, vanadium, manganese, lithium, and REEs. The strategy aligns with international partnerships—EU Critical Raw Materials Act, US Inflation Reduction Act, and BRICS mineral security dialogues.

Cadastral system reforms digitize licensing and improve transparency, reducing approval timelines. Special Economic Zones offer tax incentives, infrastructure, and streamlined permitting for beneficiation projects. Mintek, Wits Mining Institute, and CSIR lead R&D on extraction, processing, and automation.

INVESTMENT OPPORTUNITY

Fund SEZ-linked processing plants for batteries, fuel cells, magnets. Government incentives, logistics integration. Coega and Musina-Makhado anchor opportunities.

LOOKING AHEAD

Investment Opportunities

1 **PGMS & HYDROGEN ECONOMY**

Equity in PGM-linked hydrogen fuel cell and electrolyser projects.
SA supplies ~80% platinum. JVs with Anglo American and OEMs.
Anglo's hydrogen haul trucks anchor proof of concept.

2 **VANADIUM REDOX BATTERIES**

Invest in vanadium beneficiation and VRFB manufacturing.
SA holds significant reserves; grid storage demand rising.
Partnerships with Bushveld Minerals and SEZs. Bushveld's pilots power African grids.

3 **MANGANESE & NICKEL SUPPLY CHAINS**

Finance cathode precursor plants and logistics.
SA is top manganese exporter. Equity with South32/Glencore or
IDC co-funding. South32 feeds global EV supply chains.

4 **LITHIUM & RARE EARTH EXPLORATION**

Early-stage investment in lithium/REE explorers.
Demand for magnets and EV batteries. Risk capital in listed juniors.
Ivanhoe's Platreef expands resources.

5 **TITANIUM & INDUSTRIAL MINERALS**

Expand TiO2 and zircon processing.
Aerospace, pigments, additive manufacturing markets growing.
JVs with Richards Bay Minerals/Tronox. RBM feeds global aerospace.

6 **BENEFICIATION INFRASTRUCTURE**

Fund SEZ-linked processing plants for batteries, fuel cells, magnets.
Government incentives, logistics integration.
Coega and Musina-Makhado anchor opportunities.

LOOKING AHEAD

Challenges & Fixes

- **GRID BOTTLENECKS CONSTRAIN CONNECTION** Eskom's R390B plan and NTCSA concessions address capacity.
- **POLICY DELAYS** NTCSA implementation, wheeling frameworks face 2025 bottlenecks.
- **CAPITAL INTENSITY MITIGATED** through blended finance, DFIs, green bonds.
- **WATER DEMAND FOR HYDROGEN** addressed by desalination at Coega and Saldanha.
- **JET-IP ONLY ~50% DISBURSED** by 2025. Donor partnerships extend financing.
- **SKILLS SHORTAGE** 50,000 workers needed by 2030 mitigated by SAREM training programs.

IN SUMMARY

The Bottom Line

South Africa combines abundant resources (world-class solar/wind in Northern & Eastern Cape), mineral advantage (significant vanadium, 70%+ platinum for fuel cells), industrial base (Sasol expertise, SAREM localization), SEZ integration (Coega, Saldanha hydrogen hubs), reform momentum (Operation Vulindlela, NTCSA, JET-IP $8.5B), and strategic geography (shipping to Europe/Asia).

For investors, it's Africa's only market offering full renewable value chain—generation, storage, hydrogen, transmission, manufacturing—anchored in R300B+ hydrogen pipeline and R390B transmission investment by 2030.

GET IN TOUCH WITH BRAND SOUTH AFRICA

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