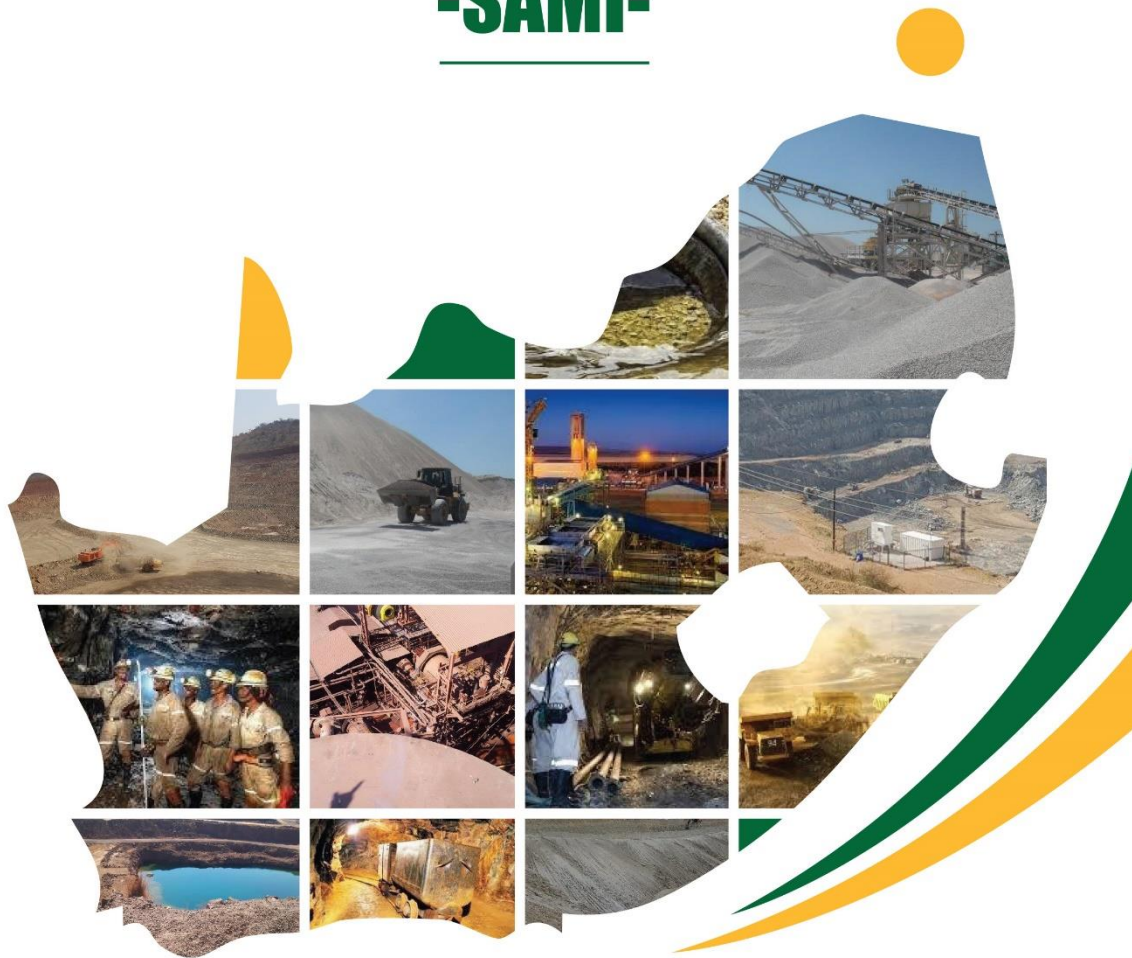

SOUTH AFRICA'S MINERAL INDUSTRY

2022/2023

-SAMI-



**mineral resources
& energy**

Department:
Mineral Resources and Energy
REPUBLIC OF SOUTH AFRICA



**DEPARTMENT: MINERAL RESOURCES AND
ENERGY**

REPUBLIC OF SOUTH AFRICA

Directorate: Mineral Economics and Statistics

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Director: Mineral Economics and Statistics, Trevenna Campus,

70 Meintjies Street, Pretoria 0002, Private Bag X59, Arcadia 0007

Telephone +27 (0) 12 444 3531/3750

www.dmre.gov.za

Editors:

TR Masetlana; L Malebo; M Ikaneng; M Modiselle

Statistics: M Galane & M Mahote

Chief Editor & Co-ordinator: TR Masetlana

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FOREWORD

South Africa's mining sector continues to play an economic and socio-economic role in the country's development. The sector is the fifth largest in terms of gross domestic product (GDP). It contributes about 7 percent to GDP and accounts for about 25 percent of total export earnings. Furthermore, it sits on extensive reserves, remains a world leader in the production of many minerals, and has been producing growing sales revenues. The country continues to have the potential to supply a large share of the global demand for many commodities, but its rich endowment of natural resources and high mineral potential can only be developed and extended through a vibrant exploration sector as well as mineral beneficiation. The country accounts for 91 percent of known global reserves of the platinum group metals (PGMs), 75.2 percent of chrome, 30,2 percent of manganese, 17.5 percent of vanadium and 13.8 percent of gold reserves.

Despite its endowment, the country attracted a relatively low amount of mineral exploration investment, with only around \$117 million (R2 billion), representing 0.9% of the global exploration budget, which is significantly lower than the government's target of 5% set in 2019. In 2022, the figure was even lower at 0.8%, highlighting a continued significant deficit in attracting investment for mineral exploration in the country compared to its potential. However, despite the low overall investment, the growing interest in exploring for critical minerals in South Africa, augers well for the country.

South Africa's mining industry makes a significant direct contribution to GDP. Direct gross domestic product (GDP) from the mining sector totaled about R441.2 billion, equaling 6.3 percent in 2023, compared to 7.3 percent contribution in 2022 at about R474.9 billion. Mining corporate tax totaled about R89.9 billion, increasing by 21.9 percent from about R73.9 billion recorded in 2022. Total royalties from the mining sector totaled R14.1 billion in 2023, compared to about R25.3 billion in 2022, a decline of a 44.3 percent. Mining contribution to value added tax (VAT) reached a total of about R37.2 billion in 2023, an increase of 28.7 percent compared to R28.9 billion recorded in 2022. In terms of employment, mining totaled 479 111 in 2023, having increased by 6.8 percent compared to 2022's 448 536. The corresponding earnings also increased by 9.1 percent to about R178 billion compared to about R163.9 billion in 2022. Pay as you earn (PAYE) from the mining industry totaled about R31.3 billion, representing an increase of 15.5 percent from 2022's about R27.1 billion.

South Africa's minerals industry is open to investment, in exploration, mining and value addition activities. South Africa is leading in known global reserve for platinum, chrome and manganese which accounts for 91 percent, 75.2 and 29 percent correspondingly and, it ranks in the top 10 in 12 mineral commodities. However, most of the identified mineral resources and reserves were discovered by means of obsolete exploration methods. Thus, there is a huge potential for the discovery of other world-class deposits, by means modern exploration technologies. As a leading producer and supplier of a range of minerals, the country offers a highly competitive investment location, ensuring that it can meet specific trade and investment requirements of prospective investors and businessse, whilst also meeting the development needs of its populace.

I wish to, on behalf of Mineral Economics and Statistics team, thank the staff of the Mining, Mineral and Energy Policy Development for their continued sterling performance in contributing to the compilation of this flagship publication, the industry for its support and cooperation, as well the Communication Chief Directorate of the deparment for making sure that it is published to reach its huge readership across the world.



MR RAY MASETLANA

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ABBREVIATIONS AND SYMBOLS

A\$	Australian dollar	LME	London Metal Exchange
bbl	barrel	m	metre
bbl/d	barrels per day	m ³	cubic metre
BGS	British Geological Survey	Ma	million years
billion	thousand million	mic	metal-in-concentrate
CIF	cost, insurance, freight	Mct	million carats
CIS	Commonwealth of Independent States. Part of the former Union of Soviet Socialist Republics (USSR)	Mozt	million ounces troy
		Mozt/a	million ounces troy per annum
China	People's Republic of China	Mt	megaton (million tons)
CPI	Consumer price index	Mt/a	million tons per annum
conc	concentrate	MVA	megavolt ampere
MWh	megawatt hour	ct	carat
ct	carat	na	not available
DM	Deutsche Mark	nar	not as received
DMRE	Department of Mineral Resources and Energy		
ns	not specified		
DRC	Democratic Republic of Congo	NWE	North West Europe
DRI	Direct reduced iron	ozt	troy ounce
e	estimate	pa	per annum
EAF	Electric-arc furnace	PGMs	platinum-group metals
EU	European Economic Union	ppm	parts per million
FOB	free on-board	R	rand (South African currency)
FOR	free on rail	SA	South Africa
FSU	Former Union of Soviet Socialist Republics (USSR)	S.ton	Short ton
		t	metric ton
g	gram	t/a	tons per annum
Ga	giga year	TCF	trillion cubic feet

g/t	gram per ton	UAE	United Arab Emirates
GAR	gross as received	US	United States of America
GWe	net gigawatts electric	USBM	United States Bureau of Mines
ILZSG	International Lead and Zinc Study Group	USGS	United States Geological Survey
INSG	International Nickel Study Group	w	withheld
kcal	kilocalorie	WBMS	World Bureau of Metal Statistics
kg	kilogram	y	year
kg/t	kilogram per metric ton	y-o-y	year-on-year
km	kilometre	\$	US dollar, unless stated otherwise
kt	kiloton	C\$	Canadian dollar
kt/a	kiloton per annum	£	British pound sterling
lb	pound avoirdupois	%	percent

EXPLANATORY NOTES

- Reference** Due to space limitations, only the sources of statistical information are given. The absence of a source reference to statistical data indicates that such data was sourced from the Directorate: Mineral Economics and Statistics database of mineral production, sales, revenue and labour in South Africa. A bibliography is presented in Part Three.
- Mineral Resource** Mineral Resource covers in situ mineralisation as well as dumps or tailings, which have been identified and estimated through exploration/assessment and sampling from which mineral reserves may be derived by the application of modifying factors.
- Minerals Reserve** In this publication, mineral reserve refers to the economically mineable material derived from a measured and indicated mineral resource. It includes diluting materials and allows for losses that are expected to occur when the material is mined. Appropriate assessment to a minimum of pre- feasibility study for a project or a Life of Mine Plan for an operation, must have been carried out, including consideration of, and modification by, realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors.

PART ONE: SOUTH AFRICA'S MINERAL INDUSTRY

GENERAL REVIEW

Ray Masetlana, Bothlale Seageng, Tebogo Phahladira, Landeni Kabini

INFRASTRUCTURE DEVELOPMENTS

South Africa's mining industry is affected by several infrastructure issues, including, rail, electricity, and water. Furthermore, there is also a causal relationship between mining infrastructure and economic growth, meaning that the development of mining infrastructure does promote economic growth. Hence, policy makers should improve and provide infrastructure, which will equip human capital to be more useful in contributing towards knowledge and innovation. Thus, South African government and mining industry should priorities the development of infrastructure as a component that will be sufficient and supportive towards economic development. Hence, the mining industry is working with the government and private sector to address these challenges. For example, in the year 2022, the President of the Republic announced that private sector participants would be introduced to the Durban and Ngqura container terminals, in the KwaZulu-Natal and Eastern Cape provinces, respectively.

As in previous years the mining sector in 2023 was primed to play a significant role in steering economic recovery and to strengthen economic growth. Though the sector's overall performance is plausible, it is still undeniably below expectations, with major mining commodity production contracting in 2023 compared to 2022. This was a consequence of amongst others, weak economic growth, insufficient investment on infrastructure development and electricity disruptions which continued to affect the mining sector performance, during the period under review. The country's overall economic growth remained weak in 2023, with real Gross Domestic Product (GDP) growing by only 0.3 percent partly, because of electricity supply failures, constrained fiscal space, infrastructure bottlenecks and the downgrade of the country's sovereign credit rating by major rating agencies. The national Treasury expected South Africa's economy to grow at 1.6 percent in the next three years, from the year 2024. The GDP growth is expected to rebound to 3.3 percent in 2024, which means the economy will only fully recover in 2024.

Infrastructure as mentioned above is essential for every country's economic growth and development. It is a lever to stimulate economic activity and to raise the standard of living in marginalised communities. Conversely the lack of infrastructure affects productivity, which hinders growth by reducing business competitiveness as well as the ability of government to pursue economy development. According to the National Development Plan (NDP), infrastructure expenditure is set at 10 percent of GDP. However, due to the country's current debt profile and fiscal pressures, infrastructure expenditures remained below that target, over the period under review. According to the 2024 Budget Review, over the next three years, government plans to invest R943.8 billion in infrastructure. This includes investments of R486.1 billion by state-owned companies and public entities, R213.8 billion from municipalities and R224.8 billion from provincial and national government. There is a huge drive to develop the country's rail network and ports infrastructure in a bid to improve the ease of doing business in South Africa and thus, increase the level of investment. This will have a positive signal for future growth in the mining industry and the broader economy.

- **Rail and Ports**

Transnet is the entity that is responsible for the operation of South Africa's port, freight rail and pipeline infrastructure. It is wholly owned by the government and the company maintains extensive rail network which provides strategic links between ports and production hubs and connect with the railways of the SADC region. Transnet has faced significant operational hurdles for several years, including under-investment, equipment theft, vandalism, flooding and the long-lasting impacts of the Covid-19 pandemic. Although, Transnet has performed below its potential in recent years, in 2020 it achieved solid results despite various economic and operational challenges. Constraints on rail infrastructure have led to significant losses in export revenue for South Africa's mining industry. In 2023, the amount of coal transported to the Richards Bay Coal Terminal (RBCT) was the lowest it's been since 1992. This forced mining companies to reduce output and to use alternative ports and increase road transportation. However, there has been some slight improvements as the entity provides security and constantly provides a budget to return the rail infrastructure to normal. That is following the entity's response namely, restructuring and embarking on internal reforms to improve efficiency and management, while committing to decarbonization and carbon footprint reduction initiatives.

The Transnet freight rail plays an important role in the mining sector for both export and domestic flow of minerals. The coal line is the main channel for coal exports, which starts with the mines in Mpumalanga and ends at the port of Richards Bay Coal Terminal (RBCT). An amount of R303 million was invested towards the upgrading of yards, lines and electrical equipment under the coal line investment programme, which will expand the export coal line capacity expansion to 81 Mt per annum. Transnet is exploring the creation of new channels to enable coal fields in neighbouring Botswana to access the global market. The Mozambique channel will also be strengthened to enable South Africa to satisfy regional demand for thermal coal.

Coal mining accounts for approximately 39 percent of rail volume and the entity further plans to increase volumes through shifting more cargo from road to rail and thus ease congestion on the roads and reduce carbon emissions. The iron ore line is the main export channel for iron ore from the mines in the Northern Cape to the Port of Saldanha, with volume capacity of 60 Mt which is less than the actual market demand. Iron ore analyst group, CRU forecasts South Africa's iron ore exports to increase at a compound annual growth rate of 0.5 percent over the next five years to the year 2024. Hence, investment in rail network maintenance and port equipment is prioritised to ensure operational reliability and increased capacity to encourage private investment. To this end, the African Development Bank has released the first tranche of its \$1 billion loan to Transnet. This disbursement is the first in a series of four tranches planned for an unparalleled financing arrangement to support Transnet's business recovery plan. The funding will enable Transnet to commence the first phase of its ambitious ZAR 152.8 billion (USD 8.1 billion) five-year investment plan to upgrade existing infrastructure while enhancing key logistic chain segments. Transnet has notably improved governance practices, particularly in tendering procedures and financial management, as part of its broader reform efforts. The African Development Bank's support for Transnet is therefore crucial for improving South Africa's competitiveness and strengthening the continent's economic integration, while responding to the challenges of the logistics sector, which is vital for Africa's development.

Transnet continues to execute its infrastructure investment programme. Amongst the company's most significant investments, is the acquisition of locomotives, investment in infrastructure and rolling stock, modernisation of its fleet in order to create capacity for general freight volumes and to advance the road-to-rail strategy. The entity's investments are part of its Recovery Plan and align with South Africa's broader economic reforms. Transnet is investing in infrastructure to modernize South Africa's rail and port systems. These include:

Rail investments

- Upgrading signalling systems to improve operational efficiency and sell train slots.
- Acquisition of new wagons to increase freight rail volumes.
- Overhauling locomotives to improve operational efficiency.

- Extending rail sidings to allow longer trains and reduce the cost per.

Port investments

- Procurement of gantry cranes to address slow turnaround times.
- Acquisition of ship-to-shore cranes to address slow turnaround times.
- Deepening and lengthening of berths at Durban Container Terminal Pier 2 to ease backlogs.

• **Electricity**

The state-owned power utility Eskom celebrated its centenary year in 2023, since its establishment in 1923. The entity was established in 1923 as the Electricity Supply Commission, mandated to provide stable electricity supply in a sustainable and efficient manner, to lower the cost of doing business in South Africa and enable economic growth. Eskom owns and operates most of the baseload and peaking generation capacity in South Africa. It owns 30 power stations with a nominal capacity of 46 788MW which generate electricity by transforming inputs from the natural environment, such as coal, fuel oil, diesel, nuclear fuel and water into energy. Power is also purchased from IPPs and imported from cross-border suppliers in several countries in the region. The company supplies roughly 90 percent of South Africa's electricity and, the remainder comes from Independent Power Producers (IPPs) and imports. Eskom buys and sells electricity to countries in the SADC region, supplying approximately 40 percent of the electricity used in Africa and, it ranks among the top ten utilities in the world, in terms of generation capacity. South Africa remains committed to diversifying its electricity generation mix. Currently, about 85 percent of South Africa's generation capacity is from coal-fired power stations, about 5 percent from one nuclear power plant, and 2 percent from hydroelectric plants, with a small amount from a wind station and solar power.

However, load shedding and high electricity prices have characterised its existence in the recent past, causing significant losses for the mining industry. Eskom experienced challenges which include amongst others; difficulties in obtaining funding for its capital expansion programme, load shedding, several credit ratings downgrades and allegations of financial mismanagement. Nonetheless, improving the supply of electricity is urgent and government's plan, to allow municipalities to buy electricity from different sources is in progress. In addition, the Department of Mineral Resources and Energy (DMRE) launched the Risk Mitigation Independent Power Producer Procurement Programme (RMIPPPP) for the emergency procurement of an additional 2000 MW from IPPs by 2022, as a response to the energy supply challenges in South Africa. To strengthen policy certainty, the DMRE issued an Integrated Resource Plan (IRP) in October 2019, which provides more policy certainty in the electricity sector, giving a clear indication of the country's energy mix and strengthening of Eskom's future role in this regard. Furthermore, the ongoing implementation of Department of Enterprise's Eskom Roadmap and the unbundling of the entity continues, providing clarity on the future direction of the electricity supply industry.

The country's electricity supply industry saw numerous key developments recently, such as the announcement of the country's Energy Action Plan, promulgation of the Electricity Regulation Amendment Act, 2024 as well as the release of the draft Integrated Resource Plan (IRP 2023). Specific to electricity policy and direction, the National Energy Crisis Committee (NECOM), led by the Minister of Electricity and Energy, continues to work with earnest to implement the Energy Action Plan announced by President of the Republic in July 2022. The Energy Action Plan has five objectives: 1) Fix Eskom and improve the availability of existing supply; 2) Enable and accelerate private investment in generation capacity; 3) Accelerate new generation capacity; 4) Enable businesses and households to invest in rooftop solar and; 5) Fundamentally transform the energy sector. Tho this end, progress has been made against the Energy Action Plan in the following areas:

- Improved plant performance has already brought down the number of breakdowns this year, with a target of increasing available capacity by 3 000MW by next year.

- Reintroduced the Distribution Demand Management Programme (DDMP) which will pay qualifying businesses to reduce their power usage by investing in energy efficiency technologies or shifting their operations to off-peak times.
- Procured additional capacity, an additional 400MW from Cahora Bassa in Mozambique, with plans to import additional power from neighbouring countries.
- The government approved the procurement of new wind, solar and battery storage projects with capacity of over 14 000MW from IPPs.
- Government introduced special tax incentives for businesses and households who install solar during the 2024 year of assessment, and a revised bounce back loan scheme to help small businesses transition to solar. In certain areas, surplus power generated can be sold back to the grid, as an added benefit.
- The Electricity Regulation Act has been amended to make it possible for the private sector to invest in much larger energy projects without any regulatory limitation on size, resulting in unlocked pipeline of new energy projects. It is estimated that 6.43GW of projects have been registered with NERSA.
- Eskom's Standard Offer and Emergency Generation programmes were implemented to buy power from companies that can provide additional capacity over the next three years. This additional power contributes to further reduction of utilisation, reducing the overall cost of meeting demand.

- **Water**

South Africa is a semi-arid, water stressed country, with an average rainfall of about 450mm, which is well below the world average of about 860 mm per year. The deteriorating public water infrastructure is not helping, as it poses a threat to the water supply for mines and other business sectors. Changes in water availability have severe consequences for most sectors of the economy and, conversely, some of these sectors have profound impact on water resources and availability. Sectors such as agriculture, energy and forestry are among the most demanding water use activities, along with domestic demand. Activities that depend on high water abstraction, such as irrigated agriculture and electricity generation (for the steam turbine processes used in most power plants) also put pressure on the water resources. South Africa's economy is primarily centred on these significant economic activities, making it a water consumptive economy.

The country's aging water infrastructure compounds the water scarcity and should be a priority concern closely linked to water resource management and use. A large part of the water infrastructure is on average 26 years old, as several construction projects were implemented at the start of the democratic dispensation to meet major water use needs. The establishment of the Berg River dam in Western Cape to augment the province's water supply; the implementation of the De Hoop Dam to support mining and domestic use in parts of Limpopo; and the Vaal River pipeline to support activities at Sasol and Eskom, are some examples. Apart from these projects there have been few major water infrastructure developments, while both internal and external pressures continue to increase for the sector. Urbanisation and population concentration in South Africa's largest cities, for instance, is an aspect that contributes greatly to the pressures on water and sanitation supply. Moreover, the country, like many parts of the world, still struggles to implement efficient water use in its industrial processes, including energy production. Some of the key barriers that need to be seriously considered include issues of affordability of the services, and access to land resources for planned human settlement in towns and cities. South Africa will have to start with the need to upgrade the skills and management capacities in the public water sector and clamp down on mismanagement.

REGULATORY FRAMEWORK

The 1998 White Paper on minerals and mining policy for the Republic of South Africa brought about the Mineral and Petroleum Resources Development Act of 2002 (Act No. 28 of 2002) (MPRDA), as amended by Act No: 49 of 2008. The law puts emphasis on internationally accepted principle for the state to exercise sovereignty over nation's minerals on behalf of the citizens; the state's primary obligation to protect the environment and minerals for the benefit of present and future generations. Furthermore, the law advocates for local and rural development as well as social upliftment of communities affected by the mining; promotes equitable access to mineral and petroleum resources to the people of South Africa and eradicate discriminatory practices in the industry. The law appreciates the fact that the minerals and petroleum are non-renewable natural resources, and that they are scarce commodities, which must be shared amongst the citizens.

The objectives of this Act are to:

- Recognize State custodianship of all mineral and petroleum resources within the Republic of South Africa.
- Promote equitable access to the nation's mineral and petroleum resources, especially among historically disadvantaged South Africans.
- Substantially and meaningfully expand opportunities for historically disadvantaged persons, including women, youth and communities, to enter and actively participate in the mineral and petroleum industry.
- Promote economic growth and development of downstream industry through provision of feedstock, and development of mining and petroleum inputs industry.
- Promote employment in the mineral and petroleum industry, thus contributing to the country's economic welfare.
- Provide for security of tenure in respect of existing prospecting, exploration, mining and production operations.
- Give effect to Section 24 of the Constitution of the Republic of South Africa, by ensuring that the nation's mineral and petroleum resources are developed in an orderly and ecologically sustainable manner; and
- Ensure that holders of mining and production rights contribute towards the socio-economic development of the areas in which they are operating.

The Act aimed at eradicating historical imbalance perpetuated by the previous legislation, the Minerals Act, No: 50 of 1991. The previous law created severe segregation on the certain category of human being and provided preference a certain group. The new legislated levelling the playing field for the promotion of fair business practices and contribution to the communities affected by mining. The previous right or licence holders provided an opportunity to convert their old order right into new mining and prospecting rights, for a harmonious and non-disruptive transition. The security of tenure was also provided for the applications which were still in process.

The broader strategy is, promoting economic growth and development of minerals and petroleum resources through processing of winning, recovery, extracting, concentrating, refining, calcining, classifying, sweeping and webbing, crushing, screening, washing, reduction, smelting or gasification, cutting and polishing, as well as manufacturing of diamonds. The law redresses the past discriminatory practices in the ownership patterns, fair recruitment process and inclusive procurement opportunities. It also provides for environmental liability, by provision of financial provision for rehabilitation in advance, during the application stage to avoid historic notorious legacy of ownerless and derelict mines. In the same vein promoting health and safety, thus prompting hygienic protocols.

In the year 2010, the Department initiated the review process of the MPRDA, which culminated into the development of the MPRD Amendment Bill, 2013. The Bill was introduced for tabling in Parliament in 2012. In 2013, Parliament Portfolio Committee on Mineral Resources conducted extensive public

hearings on the Bill involving interested and affected parties. The Bill was also referred to National Council of Provinces (NCOP) in which consultations were held where both houses of Parliament, National Assembly (NA) and NCOP approved the Bill in March 2014. In April 2014 it was referred to the President for assent and promulgation. The Bill was subsequently referred to NCOP for further consultations which then lapsed in the fifth administration of the Parliament.

In July 2023 the department hosted the MPRDA summit to resuscitate the process of amending the MPRDA. The department has initiated the process of reviewing the MPRDA, 2002 as amended and separating petroleum licensing and regulation by establishing **Upstream Petroleum Resources Development Act, 23 of 2024 (UPRDA)**. The UPRDA aims to streamlining administrative processes, strengthening enforcement provisions, reinforcing offences and penalties and amending certain provisions and removal of ambiguities.

The said review of the MPRDA is underway to amend section 110 in the proposed Draft Bill referred to as **Mineral Resource Development Amendment Bill (MPDAB)**, by repealing chapter 6 of the principal Act, the MPRDA. The principal Act will change its naming from MPRDA to be MRDAB and once the Bill is Gazetted then petroleum provisions will be removed from the Act. These drastic changes will lead to two independent legislations that will bring stability and security to both mineral and petroleum sectors. The Department is currently in the process of engaging the mining industry stakeholders to gather inputs which will then be followed by other relevant government processes leading to Bill being gazetted for public comments.

Petroleum Products Act

The Petroleum Product Act, of 1977 (Act No. 120 of 1977) (PPA) is the current legislative framework governing the manufacturing, wholesaling, and retailing of petroleum products. Among other things, the PPA provides for licensing of activities that involve the manufacturing, sale of petroleum products; the promotion of transformation of the South African petroleum and liquid fuels industry; the prohibition of certain activities inherent in the business of the petroleum products industry; and the powers of the Minister.

The PPA's objectives are to:

- Promote an efficient, effective, sustainable and orderly development of the manufacturing, wholesaling and retailing petroleum industry;
- create an environment conducive to efficient and commercially justifiable investment;
- promote the creation of employment opportunities and the development of sustainable and internationally competitive small, medium and micro enterprises in the petroleum sector;
- ensure security of supply of petroleum products and promote access to affordable petroleum products by low-income households;
- ensure governance of the petroleum sector, including the regulation of the quality, trade and pricing of petroleum products in support of the country's economic growth and development;
- promote competition in or for the petroleum products market; and
- to provide for measures to ensure the advancement and economic empowerment of Black People in accordance with the dictates of the BBBEE Act. and Regulations made thereunder.

The PPA was enacted in 1977 and has undergone several amendments in the years. With the ever-changing global and national energy landscape, in particular, the liquid fuels landscape it was

necessary for the PPA to be reviewed. The draft Petroleum Products Bill, 2024 was published for comments in October 2024 to streamline the licensing and appeals processes, remove ambiguities in the interpretation of the PPA and criminalise illegal activities in terms of the Act.

Petroleum Pipelines Act

The Petroleum Pipelines Act, 2003 (Act No. 60 of 2003) (PPL) was promulgated in June 2004 to give effect to the promotion of access to affordable and sustainable energy services of the White Paper on Energy Policy of 1998. The PPL established a national regulatory framework for petroleum pipelines, loading, and storage facilities, with the petroleum pipelines National Energy Regulator of South Africa (NERSA) as the custodian and enforcer of the national regulatory framework through a licensing regime.

The New mining licence system aims for.

- *Effectiveness and efficient administration:* The department is in the process of reviewing its systems to improve the application process and, the cadastral system is being developed to advance effective and efficient administrative processes.
- *Promote transparency:* The proposed new system will promote investor confidence and transparency.
- *Standardisation and consistency:* The operational issues will be common and consistent with the rules and procedure.
- *Fair administrative justification:* The decisions made on the applications will be transparent, standardised and consist of while allowing the affording the aggrieved an opportunity to raise their concern.
- *Time frame:* The time frame for processing of applications will reduce drastically and rights or permits will be issued on time.

Review of the Broad Based Black Economic Empowerment Charter for the South African Mining and Minerals Industry.

The Department has developed the Broad-Based Socio-Economic Empowerment Charter (mining charter) in the year 2002 for South African mining industry. The main purpose of establishing the Mining Charter was to measure level of compliance and set target for the mining industry. The first mining charter was subject to review on every five (5) year period and the first mining charter review was carried out in the year 2010. The measures and target were reviewed to in line with the changing circumstances. The mining charter outlined nine (9) elements of transformation and targets namely ownership, procurement and enterprise development, beneficiation, employment equity, human resources development, mine community development, housing and living conditions, sustainable development and growth of the mining industry and reporting (monitoring and evaluation).

The Mining Charter was reviewed again after second five (5) year period and it was finalised in 2018. However, the review was contested by the mining companies and interested and affected stakeholders. The main concern was on the reviewed targets, as they regarded as too high and unattainable. The mining companies lodged a complaint through their representative, been the Mineral Council of South Africa and later headed to Hight Court. The High Court concurred to the fact that the targets proposed were unattainable and that there should be recognition for the compliant companies.

As a result, some elements if the Charter were set aside by the court, and that the Charter is not binding. However, the elements of the Mining Charter remain vital to measure compliance and set target for the mining industry. The mining charter should be incorporating into law to make it binding, since it is a policy and not law.

The Mine Health and Safety Amendment Bill.

The purpose of the Amendment Bill is to amend the Mine Health and Safety Act 1996 (Act No. 29 of 1996) so as to simplify the administrative process with sound administrative practices. To remove ambiguities, add certain or substitute certain definitions and expressions and to harmonize the Act with other related laws, in particular the MPRDA. The Amendment Bill was gazetted for public comments and the Department considered all comments received. The Amendment Bill was taken through the NEDLAC process and approved by NEDLAC in June 2016. It will be taken through the Cabinet processes and upon Cabinet approval the Bill will be introduced for tabling in Parliament.

Mining Company of South Africa Draft Bill, 2016.

The purpose of the MincoSA Draft Bill 2016 is to provide for the:

- Establishment of Mining Company of South Africa,
- Composition of its Board and the management by the Board,
- Provision for Finances of the company, and
- Appointment of the CEO and the staff of the company.

The objects of MincoSA are to:

- Develop and acquire permits, rights, and interest in terms of the MPRDA, (Act No. 28 of 2002).
- Develop any right or interest acquired by the company on behalf of the State,
- Ensure that mineral resources are developed in a sustainable manner for the interest of the citizens of South Africa.

The draft Bill was gazetted for public comments in January 2016. The Department considered all comments received and the Bill is now being taken through the Cabinet processes. Upon Cabinet approval the Bill will be introduced for tabling in Parliament.

OTHER POLICIES AND LEGISLATION ADMINISTERED BY THE DEPARTMENT

(a) Geoscience Amendment Act 16 of 2010.

The Geoscience Amendment Act, 2010 amended the Geoscience Act, 1993 (Act No. 100 of 1993). The main objectives of the Amendment Act were to mandate the Council for Geoscience to be the custodian of geotechnical information, to be the national advisory authority in respect of geo-hazards related to infrastructure and development, and to undertake reconnaissance operations, prospecting, research and other related activities in the mining sector.

(b) The Geoscience Amendment Act (16/2010) Regulations.

Consequent to the promulgation of the Amendment Act in 2010 the DMR's Mineral Policy Development Directorate, together with the Council for Geoscience, developed Draft Regulations. The purpose of the

Draft Regulations is to prescribe the processes, procedures and requirements for compliance with the Amendment Act. All the relevant stakeholders will be consulted on the Draft Regulations.

(c) The Precious Metals Act, 2005 (Act No. 37 of 2005).

The objective of the Precious Metals Act is to provide for the acquisition, possession, smelting, refining, beneficiation, use and disposal of precious metals. Precious metals include gold and the platinum group metals (PGMs). Since silver is produced as a by-product and has a low value (price) compared to other precious metals, it is excluded from the definition of precious metals.

(d) The Diamonds Amendment Acts, 2005 (Act No. 29 of 2005 and Act No. 30 of 2005).

The rationale for the amendment of the Diamonds Act, 1986 (Act No.56 of 1986) was: to increase access to rough diamonds for jewellery manufacturing in South Africa, to maintain security of supply of rough diamonds, and to promote the beneficiation of diamonds in South Africa, thus creating jobs and increasing participation, especially by Historically Disadvantaged South Africans throughout the diamond value chain.

(e) The Mineral Technology Act, 1989, (Act No. 30 of 1989).

The Mineral Technology Act provides for the continued existence of the Council for Mineral Technology and management thereof by a Board. The objects of the Council are research, development and technology transfer, to promote mineral technology, and to foster the establishment and expansion of industries in the field of minerals and products derived therefrom.

(f) The Mineral and Petroleum Titles Registration Amendment Act, 2003 (Act No. 24 of 2003).

The purpose of the Amendment Act is to amend the Mining titles Registration Act, 1967 so as to re-regulate the registration of mineral and petroleum titles and other rights connected therewith to ensure consistency with the Mineral and Petroleum Resources Development Act, 2002.

MINERAL INDUSTRY STRENGTH

South Africa's mineral wealth is built on the country's enormous resources, most of which are found in the following distinctive geological structures and settings:

- The Witwatersrand Basin (through Mpumalanga, Northwest and Gauteng provinces) yields much of South Africa's gold output, and contains considerable resources of uranium, silver, pyrite and osmiridium.
- The Igneous Bushveld Complex (BIC), which is found in Northwest and Limpopo provinces, hosts platinum group metals (with associated copper, nickel and cobalt mineralisation), chromium and vanadium bearing titanium iron ore formations, as well as large deposits of industrial minerals, including fluorspar and andalusite.
- The Transvaal Supergroup (Northern Cape and Limpopo provinces) contains enormous resources of manganese and iron ore.

- The Karoo Basin extends through Mpumalanga, KwaZulu-Natal, Free State provinces as well as Limpopo Province, hosting considerable bituminous coal and anthracite resources as well as shale gas.
- The Palaborwa Igneous Complex (PIC) in Limpopo Province hosts extensive deposits of copper, phosphate, titanium, vermiculite, feldspar and zirconium ores.
- Kimberlite pipes on the Kaapvaal Craton, through Gauteng, Limpopo, North West and Northern Cape provinces hosts diamonds that also occur in kimberlite dykes, alluvial, fluvial and marine settings.
- Heavy mineral sands lining the coasts of the country, particularly in KwaZulu-Natal contain ilmenite, rutile and zircon.
- Significant deposits of lead-zinc ores associated with copper and silver are found in the Northern Cape near Aggeneys.
- Lithium deposits are being extracted in Port Shepston south of KwaZulu-Natal Province with potential deposits in the Northern Cape Province.

TABLE 1: SOUTH AFRICA'S ROLE IN WORLD MINERAL RESERVES, PRODUCTION AND EXPORTS, 2023.

COMMODITY	RESERVES				PRODUCTION				EXPORTS			
	Unit	Mass	%	Rank	Unit	Mass	%	Rank	Unit	Mass	%	Rank
Aluminium	kt	*	*	*	kt	707,0	*	*	kt	442,0	*	*
Aluminum Silicate	Mt	*	*	*	*	*	*	*	*	*	*	*
Antimony	kt	*	*	*	t	*	*	*	T	*	*	*
Chrome Ore	Mt	2 000	35.1	2	kt	18 000,0	50	1	kt	9 584,0	45	1
Coal	Mt	66 699	6.2	6	Mt	265.1	3.3	7	Mt	77,0	5.4	5
Copper	Mt	10	*	*	kt	50,0	*	*	kt	43,0	*	*
Ferro-chrome		*	*	*	kt	242,0	20	1	kt	198,0	45	1
Ferro-Mn/Fe-Si-Mn		*	*	*	kt	205,0	*	*	kt	98,0	*	*
Ferro-silicon		*	*	*	kt	85,0	*	*	kt	3.9	*	*
Fluorspar	Mt	41	*	3	kt	451,0	*	4	kt	322,0	*	*
Gold	t	5 000	8.4	3,0	t	96.6	*	10,0	T	93,0	*	*
Iron Ore	Mt	670	0.8	9,0	Mt	63.1	2.5	7,0	Mt	56,0	*	*
Lead	kt	*	*	*	kt	40,0	*	*	kt	41,0	*	*
Lithium	kt	*	*	*	kt	416,0	*	*	kt	410,0	*	*
Manganese Ore	Mt	600	31.6	1,0	kt	19,0	58.3	1,0	Mt	18.1	*	*
Nickel	Mt	*	*	*	kt	30,0	*	*	kt	24,0	*	*
PGMs	t	63 000		1,0	t	253,0	*	1,0	T	227,0	24.7	*
Phosphate Rock	Mt	1 500	*	8	kt	1 744,0	1	17	kt	790,0	*	*
Silicon Metas	t	*	*	*	t	*	*	*	T	*	*	*
Silver		*	*	*	t				T			
Titanium	Mt	*	*	*	kt	2 114,0	*	*	kt	114,0	*	*
Uranium	tu	320 900	5.3	6	tu	233,0	*	*	tu	237,0	*	*
Vanadium	kt	750	4	4	kt	14,0	9	3	kt	9.5	*	*
Vermiculite	Mt	14	*	2	kt	169.8	32	1	kt	122.4	*	*
Zinc	Mt	15	*	*	kt	198,0	*	*	kt	376,0	*	*
Zircon	Mt	*	*	*	kt	289,0	*	*	kt	236,0	*	*

Sources: USGS, Mineral Commodity Summaries, 2020

Notes: Full details given in respective commodity chapters

* Information not available

#Resource

The South Africa's mining industry is struggling, but it is far from dead. South Africa is the world's leading producer of platinum, manganese, chrome and vermiculite and third largest producer of vanadium. Platinum and manganese accounts for 91 percent and 31.6 percent of world reserve respectively (Table 1).

The SA mining industry is in transition from a deep level, labour intensive, conventional mining environment to a mechanised shallower, technologically advanced industry. South Africa's mining industry has seen a mixed performance for the 2023 financial year (Table 2). Production for most major commodities including gold, PGMs, coal, and chrome increased by 7.8, 1.1, 0.7 and 3.1 percent correspondingly. Over the last 10 years, overall mining production increased marginally, despite a drastic decline in diamond production at 38.9 percent as well as some decline recorded in iron ore at 0.8 percent, among others. Furthermore, high operational costs have put the mining industry under significant pressure, exacerbated by low electricity availability attributed to loadshedding.

Since most of the identified mineral resources and reserves were discovered by means of obsolete exploration methods. There is still a significant potential for the discovery of other world-class deposits in areas not yet thoroughly explored, using modern exploration technologies. There are several projects that the government through Council for Geoscience is undertaking, such as to work on a high intensity 10-year mapping programme, to develop an integrated, multi-disciplinary geological platform at a scale of one in fifty thousand [1:50, 000], nationwide. Furthermore, the government is coordinating all the research initiatives related to exploration modernization, led by Department of Science, Technology and Innovation, across the mining and minerals value chain to ensure that its impact is optimised.

The Department of Mineral Resources and Energy developed the Exploration Strategy and Implementation Plan and, it was approved in April 2022. The strategy aims to position South Africa as a globally competitive exploration destination, targeting a 5% share of global exploration expenditure. A critical challenge identified in the strategy is the limited access to funding for early-stage exploration, particularly for junior mining companies, which rely on venture capital to conduct greenfield exploration. To address this, the department collaborated with the Industrial Development Corporation (IDC) and the Council for Geoscience (CGS) to establish the Junior Mining Exploration Fund (JMEF), officially launched on 7 February 2024 at the Investing in African Mining Indaba, with an initial allocation of R400 million. The first funding call, which ran from 3 June to 12 July 2024, attracted 113 applications requesting a total of R3.7 billion, highlighting the high demand for exploration funding. Through a rigorous evaluation process, an initial 8 projects were selected for funding, with six legal agreements finalised to date. The funded projects span a diverse range of minerals, including copper, lithium, rare earth elements, and nickel aligning with the strategy's goal of diversifying South Africa's mineral economy and unlocking the country's exploration potential.

Minerals lay the groundwork for advancements in modern technology, prompting nations worldwide to curate lists of critical minerals essential for defence, food security, infrastructure, energy security, greening of industry and energy supply, key industrial sectors, and the inception of groundbreaking technologies. The South African government has also recognised the importance of developing a comprehensive strategy for the management and utilisation of the country's critical mineral resources. To ensure the effectiveness and appropriateness of any policy implications of this work, a transparent, scientific, evidence-based approach which brought together Government, Business, Labour and Academia to develop the Critical Mineral Strategy for South Africa. In October 2023 the department and stakeholders commenced developed guiding Principles for South Africa's Critical Minerals Strategy which was intended to guide the development of the National Critical Minerals Strategy for South Africa, aimed at translating the opportunities from critical minerals. To this end, guiding principles for South Africa's Critical Minerals Strategy were finalised in 2024. It is envisaged that the Strategy for Critical Minerals for South Africa and its implementation plan will be finalised soon.

TABLE 2: SOUTH AFRICA'S PRODUCTION OF SELECTED MAJOR MINERALS, 2014 – 2023.

Commodity	Units	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Chromite	t	14 037 722	15 655 661	14 707 518	16 670 582	17 850 463	17 661 475	1 319 688	18 380 973	19 104 635	19 688 903
Coal	t	261 948 628	252 176 473	250 652 772	252 232 431	253 545 652	258 781 063	250 455 714	234 002 232	230 023 461	231 679 133
Cobalt	t	1332	1362	1101	1065	1007	1027	897	355	250	378
Copper	t	78697	7736	65257	65532	46900	52516	38334	51138	49194	50023
Diamonds	ct	8 058 817	8 232 734	8 305 542	9 692 595	991 183	717 952	8 475 918	9 726 204	9 648 405	5 904 004
Gold	kg	151 622	144 504	142 202	13 729	117 144	1 052	95 781	10 478 118	89 598	96 626
Iron Ore	t	80 759 334	72 805 534	66 455 868	7 509 065	74 272 974	72 406 782	55 635 421	72 980 463	63 714 269	63 187 798
Lead	t	29348	34573	39344	4815	35118	42936	28048	31224	39974	40271
Manganese	t	12 026 819	11 033 717	10 805 809	14 652 247	14 918 236	17 001 786	16 198 506	19 063 159	19 103 667	19 055 124
Natural Gas	t	849 161	1 049 537	645 784	589 705	491 710	526 222	442 951	34 891	36 560	40 080
Nickel	t	54956,0	56689,0	48994,0	48463,0	43236,0	43466,0	34908,0	31848,0	29033,0	2975,0
PGMs	kg	188 444	275 515	263 653	262 756	270 646	268 172	226 468	284 993	250 246	253 037
Phosphate Rock	t	2011 151	1852 348	1696 533	2079 294	2058 098	1825 719	1807 152	1725 751	1985 458	174 435

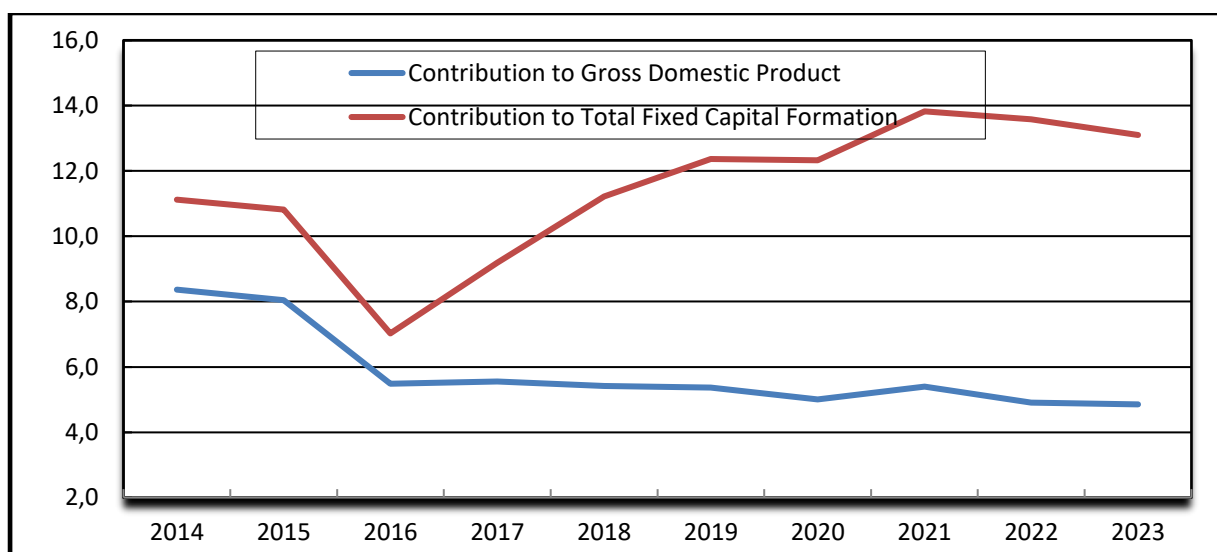
Source: Department of Mineral Resources and Energy, Directorate: Mineral Economics and Statistics, 2022/23

THE ROLE OF MINING IN THE NATIONAL ECONOMY

South Africa is one of the major mining and mineral jurisdiction in the world. The Mining industry has played an important and significant role in shaping the development trajectory of the South African for economy over a century. Cities and towns have been built on the backbone of the mining industry as well as other related industries such as manufacturing, financial services, electricity, transportation, etc. Its influence is far broader than the mere industry data can reflect. However, the contribution of mining to the national fiscus and employment has been declining since the 1990s but, the industry is still regarded as the cornerstone of the economy and greatly contributes to secondary industries, with a huge potential to grow.

Furthermore, South Africa mining industry makes a significant direct contribution to GDP, sits on extensive reserves, remains a world leader in the production of many minerals, and recently has been producing growing sales revenues. In 2023, mining contributed R 203.2 billion or 4.9 percent to gross domestic product from R 204.1 billion in 2022 a decline of R0.9 billion (Figure 1 and Table 3). Investment is regarded as a catalyst in the mining industry and, is essential in stimulating long run sector growth through improvements in productivity, which subsequently enhances job creation and overall economic growth. Investment enhances the country's production capacity and goes a long way in driving economic development.

FIGURE 1: PERCENTAGE CONTRIBUTION OF MINING AND QUARRYING TO GROSS DOMESTIC PRODUCT AND TOTAL FIXED CAPITAL FORMATION OF SOUTH AFRICA, 2014-2023 (CURRENT RENT PRICES).



Source: South Africa Reserve Bank: Quarterly Bulletin, September 2024

Consequently, mining and quarrying contribution to Gross Fixed Capital Formation (GFCF) was 13.1 percent in 2023. Gross Fixed Capital Formation within the mining industry increased to R102.8 billion in 2019 from R91 billion in 2023 (Table 3).

TABLE 3: CONTRIBUTION OF MINING AND QUARRYING TO GROSS DOMESTIC PRODUCT, FIXED CAPITAL FORMATION AND TOTAL NATIONAL EXPORTS OF GOODS, AND 2014 – 2023 (AT CURRENT PRICES)

YEAR	CONTRIBUTION TO VALUE ADDED			CONTRIBUTION TO FIXED CAPITAL FORMATION			CONTRIBUTION TO NATIONAL TOTAL EXPORTS OF GOODS		
	NATIONAL GROSS			FIXED CAPITAL FORMATION			TOTAL EXPORTS		
	Domestic product	From Mining		Total fixed	From Mining		Total Exports	From Mining	
	R' million	R' million	%	R' million	R' million	%	R' million	R' million	%
2013	3 190 960	288 085	9,0	719 785	78 481	10,9	930 908	291 548	31,3
2014	3 420 317	286 163	8,4	781 657	86 962	11,1	1 006 030	279 777	27,8
2015	3 560 588	286 522	8,0	826 286	89 377	10,8	1 038 330	267 514	25,8
2016	4 014 646	220 141	5,5	780 757	54 855	7,0	1 053 623	307 542	29,2
2017	4 061 243	225 420	5,6	764 883	70 261	9,2	1 101 600	334 006	30,3
2018	4 127 833	223 613	5,4	755 594	84 766	11,2	1 177 801	337 175	28,6
2019	4 136 884	222 100	5,4	742 420	91 823	12,4	1 233 208	361 860	29,3
2020	3 897 495	194 985	5,0	632 747	77 994	12,3	1 286 433	452 208	35,2
2021	4 079 331	220 131	5,4	629 747	87 057	13,8	1 689 972	686 527	40,6
2022	4 157 446	204 063	4,9	660 084	89 672	13,6	1 927 706	689 402	35,8
2023	4 184 974	203 137	4,9	685 575	89 794	13,1	1 921 767	585 311	30,5

Sources: Department of Mineral Resources and Energy, Directorate Mineral Economics and Statistics, 2020
South African Reserve Bank, Quarterly Bulletin, September 2019

Notes: *Revised figures

The total state revenue from the mining sector, which includes assessed tax, provisional tax and secondary tax increased by 5.9 percent, from R18.4 billion in 2021/22 tax year to R19.1 billion in 2022/23 tax year (Figure 2 and Table 4). Most commodities contributed positively to the increase in the total revenue, including diamond, copper, platinum, chrome, gold and uranium and iron ore contributing 25.47 percent, 3.31 percent, 200.14 percent, 13.91 percent, 63.81 percent and 88.18 percent correspondingly. During 2019/20, the mining sector grew on the back of a significant improvement in commodities prices such as the Iron ore as well as the Platinum. This export-oriented sector benefitted from the exchange rate depreciated from an average of R/\$14.16 in April 2019 to R/\$16.66 in March 2020, depreciating by 17.7 percent (Table 4).

TABLE 4: CONTRIBUTIONS OF MINING AND QUARRYING TO STATE REVENUE, 2014–2023 (IN R' MILLION)

R' million	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
CEMENT	13,31	165,53	17,61	10,32	10,13	11,66	33,82	11,88	14,70	5,19
CHEMICAL AND FERTILIZER MINERAL MINING	275,09	169,99	173,27	100,87	293,84	208,65	256,84	175,11	228,13	302,14
CHROME	1 973,63	818,23	2 190,51	4 265,50	4 195,93	4 779,64	4 335,90	9 463,44	14 525,24	8 691,04
COAL	1 429,35	1 375,58	3 653,24	3 549,11	4 052,59	2 051,26	1 679,77	3 674,89	15 426,66	6 492,48
COPPER	82,59	151,63	159,22	289,35	112,06	115,79	65,27	175,64	412,23	521,75
CRUDE PETROLEUM & NATURAL GAS	15,05	22,48	58,68	5,03	3,10	0,04	74,97	893,64	986,55	1 351,28
DIAMOND MINING	164,05	57,34	290,71	652,00	248,88	312,29	53,41	226,35	323,98	222,17
GOLD AND URANIUM	599,08	139,21	582,91	501,80	245,31	401,86	150,17	311,51	146,84	982,32
IRON ORE	4 227,42	696,32	5 614,18	4 199,91	4 128,54	7 769,39	11 578,77	15 525,02	7 685,24	9 948,70
MANGANESE	28,32	66,52	82,03	179,92	903,33	852,76	077,79	658,72	399,01	869,08
OTHER METAL ORE MINING	865,38	422,06	1 533,93	1 662,91	658,29	118,99	995,85	3 241,46	3 460,52	2 174,33
OTHER MINING NOT SPECIFIED	1 716,15	1 443,61	1 956,97	1 849,10	2 813,85	2 246,62	1 873,99	2 237,09	2 786,70	2 415,36
PLATINUM	1 824,04	1 208,69	1 910,09	2 243,98	1 240,99	3 724,81	19 166,02	53 418,18	35 203,34	8 006,43
STONE QUARRYING, CLAY AND SAND-PITS	104,16	144,30	264,21	144,59	93,70	104,01	100,14	107,83	71,48	77,27
Grand Total	13 317,62	6 881,50	487,55	644,33	994,34	697,77	442,72	120,76	670,63	049,19

Sources: South African Revenue Service, Directorate Financial Planning and Management Accounting

Notes: # In respect of leased mines

* Revised figure

PRIMARY MINERAL SALES IN 2023

Despite the decline in production, South Africa's mining industry experienced relief in 2019 as gains in commodities, aided by weaker rand, began to bring mining back into profitability. South Africa's total primary minerals sales value increased by 10.78 percent from R498.7 billion in 2018 to R552.5 billion in 2019. Coal remained the major local earner at R86 billion in 2019 contributing 45.3 percent to the local sales, followed by silver, gold, chrome, PGMs and iron ore contributing 25.8, 25.7, 6.2, 6 and 2.9 percent correspondingly. South Africa's mineral export sales revenue increased by 6.9 percent to R361.7 billion in 2019 from R338.2 billion in 2018 (Table 5). The increase in export sales was driven by a weaker Rand Price increase for commodities. Furthermore, the primary minerals export sales

percentage contribution to the country's total exports value of goods also increased significantly by 29.3 percent in 2019 from 28.3 percent in 2018 (Figure 2).

TABLE 5: MINERAL PRODUCTION AND SALES 2023

COMMODITY	PRODUCTION		LOCAL SALES (FOR)		EXPORTS SALES (FOB)		TOTAL SALES	
	Quantity	Quantity	Value (R)	Quantity	Value (R)	Quantity	Value (R)	
1. Precious								
Diamonds ct	5 904 004	1 963 697	8 884 288 190	4 083 522	7 785 958 723	6 047 219	16 670 246 913	
Gold Kg	96 626	4 555	5 346 379 166	93 061	109 057 736 906	97 616	114 404 116 072	
Platinum-group Metals Kg	253 037	12 739	12 755 677 846	213 470	183 330 572 207	226 209	196 086 250 053	
Silver Kg	41 929	1 318	18 373 687	60 399	773 473 458	61 717	791 847 145	
2. Ferrous t								
Chrome t	19 688 903	13 170 229	30 005 938 193	6 260 027	27 168 920 213	19 430 256	57 174 858 406	
Iron Ore t	63 187 798	7 017 366	4 839 318 346	56 059 806	97 424 644 308	63 077 172	102 263 962 654	
Manganese t	19 055 124	3 019 466	1 746 798 308	18 165 892	45 045 081 311		40 610 598 180	
3. Non-Ferrous t								
	3 137 793	1 629 118	5 195 612 104	1 244 663	35 414 986 076	2 873 781		
4. Energy								
Coal t	231 679 133	199 738 740	121 988 115 917	38 589 238	70 632 678 223	238 327 978	192 620 794 140	
Natural Gas t	4 008	3 995	37 927 182	0	0	3 995	37 927 182	
Natural Gas t	1 044	1 044	18 279 969	0	0	1 044	18 279 969	
Uranium Oxide kg	275 191	0	0	278 964	646 871 903	278 964	646 871 903	
5. Industrial Minerals								
	80 326 682	75 665 748	15 474 551 232	1 449 257	7 830 654 682	77 115 005	23 305 205 914	

Source: Department of Mineral Resources and Energy, Directorate Mineral Economics and Statistics, 2020

Notes: All quantities are in metric tons, unless otherwise specified

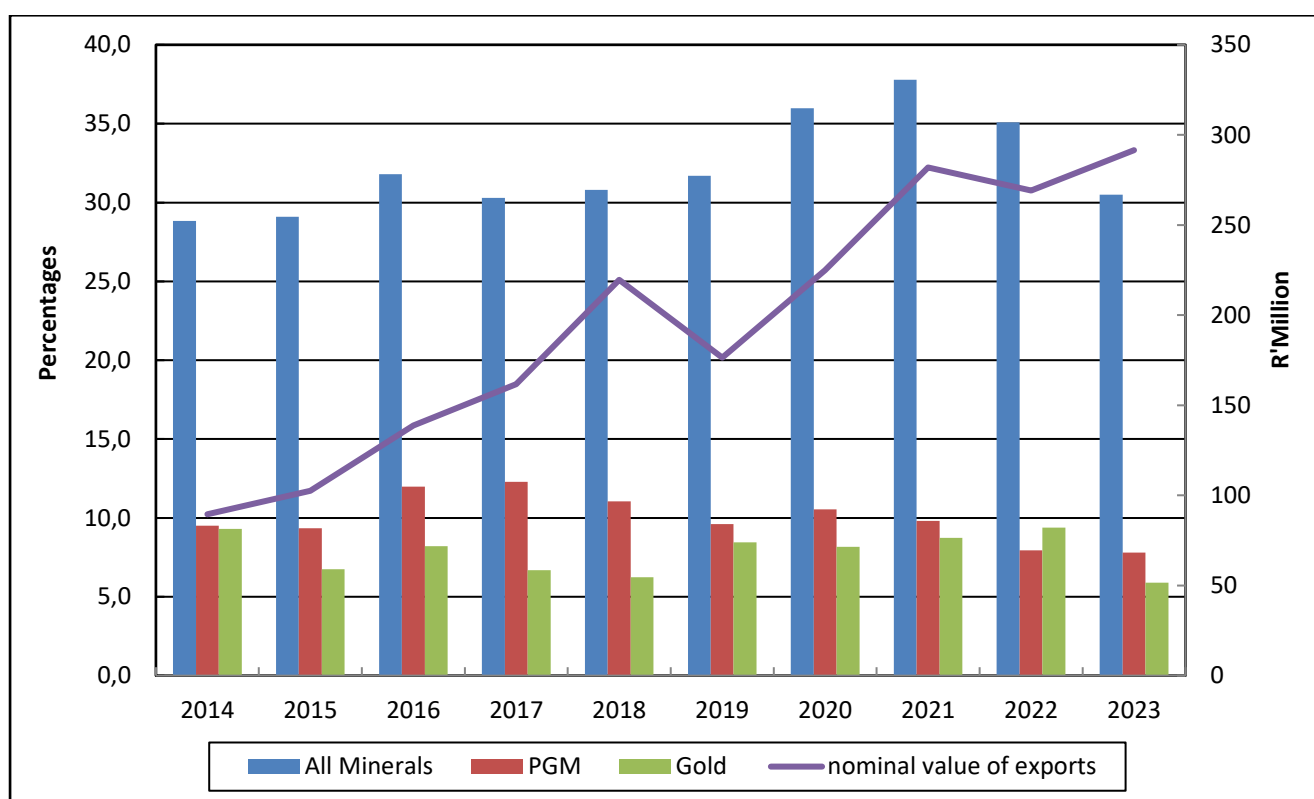
**Not available: where applicable, earnings are included under Miscellaneous'

@ Full details given in respective overview chapters

+ Excludes titanium and zircon minerals which are included under Miscellaneous'

*Nil

FIGURE 2: CONTRIBUTION OF PRIMARY MINERALS TO SOUTH AFRICA'S EXPORTS# 2014-2023.



Sources: Department of Mineral Resources and Energy, Directorate Mineral Economics and Statistics

South Africa reserve bank: Quarterly Bulletin, September 2023

Notes: +Includes gold

Total exports of goods only, including gold

TABLE 6: SOUTH AFRICA'S PRIMARY MINERAL SALES BY PROVINCE, 2023

PROVINCE	Local Sales		Export Sales		Total Sales	
	(FOR)	%	(FOR)	%	(FOR)	%
			Total Sales			0
EASTERN CAPE	809 442 914	0,4%	1 283 000	0,0%	810 725 914	0,1%
FREE STATE	7 943 553 417	3,8%	23 385 639 686	4,0%	31 329 193 103	3,9%
GAUTENG	7 858 523 161	3,8%	60 904 268 733	10,4%	68 762 791 894	8,7%
KWAZULU-NATAL	7 724 514 930	3,7%	9 108 697 826	1,6%	16 833 212 756	2,1%
LIMPOPO	31 109 455 840	14,9%	83 189 735 486	14,2%	114 299 191 327	14,4%
MPUMALANGA	108 507 849 655	52,0%	115 756 634 391	19,8%	224 264 484 046	28,2%
NORTH WEST	27 986 047 454	13,4%	145 509 389 685	24,9%	173 495 437 139	21,9%
NORTHERN CAPE	12 962 358 290	6,2%	143 650 295 981	24,5%	156 612 654 271	19,7%
WESTERN CAPE	3 663 460 163	1,8%	3 805 716 332	0,7%	7 469 176 495	0,9%
TOTAL	208 565 205 825		585 311 661 120		793 876 866 945	

Source: Department of Mineral Resources and Energy, Directorate Mineral Economics and Statistics, 2023

During the period under review, the bulk of the total mineral revenues were generated from Mpumalanga, Northern Cape, North West, Limpopo and Gauteng provinces collectively accounting for 91.2 percent of the total primary mineral sales revenue (Table 6). Mpumalanga was the leading contributor to both local and export sales revenue with 39.1 percent local sales and Northern Cape was the leading contributor to export revenue with 29.9 percent. Mpumalanga is mainly dependent on coal

as a major contributor towards minerals revenue, North West depends on PGMs, Northern Cape on diamonds, and Limpopo on PGMs, diamonds, copper as well as coal and Gauteng on gold.

SELECTED PROCESSED MINERAL SALES

The production of processed minerals declined by 8.2 percent to 2 897 Mt in 2023, as compared to the year 2022. The primary contributor to the decline is the drop in chromium alloy output, by 8.2 percent, compounded by the 17 percent and 6.5 percent decline from manganese alloy and vanadium processed products, respectively. The total processed metals sales increased by 2.7 percent to 3.3 Mt in 2023, largely attributed to the 398.4 percent growth in manganese and 5.2 percent growth in vanadium alloys, managing to offset the marginal 0.4 percent decline in chromium alloy sales. The corresponding sales revenue increased by 3.9 percent to R66.7 billion, on the back of improved sales revenue contributed by the 6.6 percent increase in chromium alloy, supported by a marginal 0.7 percent growth in vanadium processed products, both of which managed to offset 32.4 percent decline recorded by manganese alloy (Table 7).

TABLE 7: SOUTH AFRICA'S PRODUCTION, LOCAL AND EXPORT SALES OF SELECTED PROCESSED MINERAL PRODUCTS, 2023.

COMMODITY	PRODUCTION		LOCAL SALES		EXPORT SALES		TOTAL SALES	
	Mass 1000t	Mass 1000t	Value (FOR) R'000	Mass 1000t	Value (FOR) R'000	Mass 1000t	Value (FOR) R'000	
Chromium alloys	2 897	739	12 961 549	2 342	45 314 316	3 081	58 275 865	
Manganese alloys	205	22	474 528	99	1 977 187	120	2 451 715	
Vanadium+	14	0	181 011	10	4 369 427	10	4 550 438	
Fe-Si	79	23	651 439	32	718 276	55	1 369 715	
Total 2022	3 420	907	15 433 178	2 367	47 359 266	3 126	62 792 444	
Total 2023	3 196	783	14 268 527	2 483	52 379 206	3 266	66 647 733	

Sources: Department of Mineral Resources and Energy, Directorate Mineral Economics and Statistics, 2022/23

:United States Geological Survey

Notes: + Contained vanadium

x silicon alloys

Mpumalanga province was the major contributor to the total selected processed mineral sales accounting for 36.0 percent, followed by KwaZulu-Natal and North-West provinces at 35.8 percent and 22.2 percent respectively (Table 8). Collectively, KwaZulu-Natal, Mpumalanga and North-West provinces accounted for 94 percent of the total processed minerals sales revenue. Chromium alloys dominated Mpumalanga's total revenue contributing 86.9 percent, whilst 60.2 percent of Kwazulu-Natal's total selected processed mineral sales revenue was derived from aluminium metal. The total processed mineral sales revenue of the North West was derived from processed vanadium, which contributed 27.8 percent. The three provinces (KwaZulu-Natal, Mpumalanga and North West) together dominated both the local and export sales revenue of processed minerals, with a collective contribution of 97.1 percent for local sales and 93.4 percent for export sales, respectively.

TABLE 8: SOUTH AFRICA'S LOCAL AND EXPORT SALES OF SELECTED PROCESSED MINERAL PRODUCTS BY PROVINCE, 2023.

PROVINCE	LOCAL SALES		EXPORT SALES (FOB)		TOTAL SALES	
	(FOR)					
	R'000	%	R'000	%	R'000	%
KwaZulu-Natal	9 101 725	38.8	35 615 521	38.3	44 717 246	38.4
Mpumalanga	7 913 145	33.7	33 794 041	36.4	41 707 187	35.9
North West	6 146 414	26.2	19 753 502	21.3	25 899 917	22.3
Gauteng	179 107	0.8	709 206	0.8	888 314	0.8
Western Cape	98 617	0.4	2 989 995	3.2	3 088 613	2.7
TOTAL	23 439 010	100	92 862 268	100	116 301 278	100

Source: Department of Mineral Resources and Energy, Directorate Mineral Economics and Statistics, 2024

TOTAL EMPLOYMENT IN 2023

The previous three years were positive for the mining industry, with employment increasing at an average of over 3 percent from 2021 to 2023, following the full resumption of operations following lockdown that was aimed at containing the spread of Covid-19 virus. Overall mining employment increased by 3.1 percent in 2023 to 479 662 employees compared to the 3.8 percent increase in 2022. The corresponding remuneration increased by 8.6 percent to a total of about R189.6 billion. The increase in employment as well as the corresponding remuneration is attributed to increases across the entire industry.

TABLE 9: EMPLOYMENT AND WAGES IN SOUTH AFRICA'S MINING INDUSTRY, 2014–2023

Year	Number of		Wages		Per worker	
	Employees	%change	Nominal	% change	Nominal	% change
2014	492 936		102 146 421		20 722	
2015	480 209	-2,6	114 084 920	11,7	23 757	14,6
2016	458 214	-4,6	120 504 779	5,6	26 299	10,7
2017	463 907	1,2	128 557 573	6,7	27 712	5,4
2018	456 713	-1,6	134 592 702	4,7	29 470	6,3
2019	459 528	0,6	143 653 521	6,7	31 261	6,1
2020	435 054	-5,3	146 601 555	2,1	33 697	7,8
2021	448 562	3,1	161 697 270	10,3	36 048	7,0
2022	465 505	3,8	174 603 493	8,0	37 508	4,1
2023	480 427	3,2	191 076 219	9,4	39 772	6,0

Sources : Quarterly Labour Force Survey (Stats SA), December 2023

Department of Mineral Resource and Energy, Directorate Mineral Economics and Statistics

Notes: # Export plus local commodity sales

* Deflated by means of the CPI with 2010 as base year

* Revised figures

In 2023, the platinum province, North West, maintained the number one position as the largest contributor to total mining employment and remuneration at 27.7 percent and 26.5 percent, respectively.

Provincial employment distribution was distinctly unequal with five provinces (North West, Mpumalanga, Gauteng, Limpopo and the Northern Cape) employing 91 percent of the total mining workforce at 437 019 employees, as compared to the 88.7 of the previous. The corresponding remuneration from those provinces comprised 91.6 percent of the total mining remuneration at about R 175.1 billion, as compared to the 89.6 percent of the previous year (Table 10).

TABLE 10: EMPLOYMENT AND REMUNERATION BY PROVINCE, 2023

Province	Employees		Total Remuneration	
	Number	%	R million	%
North West	133 186	27,7	50 722	26,5
Mpumalanga	118 103	24,6	46 358	24,3
Gauteng	53 033	11,0	19 583	10,2
Limpopo	88 254	18,4	39 675	20,8
Free State	28 405	5,9	11 535	6,0
Northern Cape	44 443	9,3	18 784	9,8
Kwa-Zulu Natal	8 287	1,7	2 251	1,2
Western Cape	5 601	1,2	1 965	1,0
Eastern Cape	1 115	0,2	202	0,1
South Africa	480427		191076	

Source: Department of Mineral Resources and Energy, Directorate Mineral Economics and Statistics, 2020

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PART TWO: REVIEW OF SELECTED COMMODITIES

PRECIOUS METALS AND MINERALS OVERVIEW

P Perold & V Mutavhatsindi

South Africa is the world largest producer of platinum-group metals (PGMs) and the eighth largest producer of gold in 2023. South Africa's total production of gold and platinum-group metals (PGMs) was estimated at 350.4 tons (t) in 2023, a 3.1 percent increase compared with 2022, (Table 11). The increase in production was notable from both sectors rising by 7.9 percent and 1.2 percent, respectively. Gold production increased to 96.0 tons in 2023, up from 89.0 tons in 2022, with PGMs recording production of 253.8 t in 2023, compared with 250.2 t in 2022. Total sales mass for both stood at 323.8 t, decreasing by a marginal 0.1 percent, compared with 324.2 t from the previous year. Revenue generated from the precious sector was estimated at R310.4 billion, decreasing by 15.7 percent compared with the previous year. The PGMs sector recorded a 29.8 percent y-o-y drop due to lower sales and prices, coupled with a 10.6 percent weaker ZAR/US\$ exchange rate. Gold sector on the other hand recorded a 27.7 percent increase compared with the previous year, due to high sales volume, driven by high local demand and increased uptake from international trading partners. The weaker ZAR/US\$ exchange rate and high gold prices also contributed to the increase in the gold sales revenue.

TABLE 11: SOUTH AFRICA'S PRODUCTION AND SALES OF PRECIOUS METALS, 2023.

COMMODITY	YEAR	PRODUCTION	LOCAL SALES		EXPORT SALES		TOTAL SALES	
		t	t	R million	T	R million	t	R million
GOLD	2023	96.6	4.5	5 346	93.1	109 057	97.6	114 404
	2022	89.6	4.9	4 632	88.1	84 938	93.1	89 570
PGMs	2023	253.8	12.7	12 755	213.5	183 330	226.2	196 086
	2022	250.2	14.6	21 504	216.5	257 892	231.1	279 396
PRECIOUS METALS TOTAL	2023	350.4	17.2	18 101	306.6	292 387	323.8	310 490
	2022	339.8	19.5	26 136	304.6	342 830	324.2	368 966

Source: DMRE, Mineral Economics and Statistics Directorate

South Africa was the sixth largest global rough diamond producer by volume and fifth largest producer by value, after Democratic Republic of Congo and Canada. The country's rough diamond production was estimated at just over 5.9 million carats (Mct) in 2023, recording an annual drop of 38.8 percent in 2023 compared with 2022, driven by weaker global demand. Revenue generated from the diamond sector was estimated at about R16.6 billion, declining by 35 percent from R25.7 billion in 2022, primarily due to lower volumes sold (Table 12).

TABLE 12: SOUTH AFRICA'S ROUGH DIAMOND PRODUCTION AND SALES, 2013-2023

Year	PRODUCTION	LOCAL SALES		EXPORT SALES		TOTAL SALES	
	1000 cts	1000 cts	R mil	1000 cts	R mil	1000 cts	R mil
2022	9 684	2 247	10 852	7 741	14 896	9 989	25 748
2023	5 904	1 963	8 884	4 083	7 786	6 047	16 670

Source: DMRE, Mineral Economics and Statistics Directorate

South Africa's precious sector's average employment was estimated at 292 322 employees in 2023 (Table 13), an increase of 3.0 percent compared with 2022. The largest contributor to total precious employment was the PGMs sector comprising 62.5 percent, followed by the gold and diamond sectors

at 32.1 percent and 5.1 percent, respectively. The increase in employment was notable from the PGMs and diamond sectors, by 4.4 percent and 9.9 percent, respectively while employment in the gold sector went down by 1.0 percent, year on year. In line with the increase in employment, total remuneration went up by 10.0 percent' from R108 billion in 2022 to R 118 billion in 2023.

TABLE 13: SOUTH AFRICA'S PRECIOUS METAL EMPLOYMENT, 2013-2023

YEAR	AVERAGE NUMBER OF EMPLOYEES	TOTAL REMUNERATION (R'000 000)	AVERAGE REMUNERATION R/employee
2014	321 227	62 699	195 186
2015	309 692	70 695	233 934
2016	306 720	75 580	247 711
2017	303 073	82 528	272 406
2018	283 556	82 398	290 749
2019	276 269	86 780	314 255
2020	262 295	88 953	339 136
2021	272 510	100 028	368 002
2022	284 909	108 374	380 381
2023	292 322	118 664	405 938

Source: DMRE, Directorate Mineral Economics

OUTLOOK

South Africa's production for precious metal sector is expected to drop slightly, in line with reduced PGMs capacity, with gold expected to counter some of the losses on the back of increased operational output, driven by improved prices. Gold price could average \$2 100/oz in 2024, on the back of decreased investment flow into gold on the back of decreased investment outflows on the back of geopolitical factors. The Platinum price is expected to average between \$ 1 030/oz and \$1 100/oz in 2023. Palladium is expected to remain stable in 2024 at \$1 050/oz, while Rhodium is expected to face a downward trend at \$4 000/oz. Regardless of the reduction in global rough diamond production, South Africa's rough diamond production is expected to stabilise, mainly due to an increase in ore from final open pit cut at Venetia mine, while employment is expected to remain flat at best across all the sectors.

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DIAMONDS

PJ Perold & V Mutavhatshindi

SUPPLY AND DEMAND

South Africa's rough diamond production was estimated at just over 5.9 million carats (Mct) in 2023, contributing 5.3 percent to global rough diamond production, which was estimated at over 111 Mct. Russian Federation was the largest producer by volume and value contributing 33.5 percent to total

global rough diamond production, with Botswana at 22.5 percent, being the second largest rough diamond producer by value and the second largest producer by volume. South Africa was the sixth largest global rough diamond producer by volume and fifth largest producer value, after Democratic Republic of Congo and Canada. Global rough diamond production declined by 7.6 percent compared with 2022 (Table 14), largely due to an increase in lab-grown diamond production, caused by ongoing disruptions brought about by Covid-19 and its ongoing associated impact on diamond output. The value of global rough diamond production also recorded a decline of 15.6 percent to US\$ 13.5 billion in 2023 compared with 2022.

TABLE 14: GLOBAL ROUGH DIAMOND PRODUCTION BY COUNTRY

COUNTRIES	MASS		VALUE		
	Mct	%	US\$ mil	%	\$/ct
Russia	37.3	33.5	3 678	27.28	98.6
Botswana	25.1	22.5	3 517	26.09	140.2
Canada	16	14.3	1 553	11.52	97.2
Democratic Republic of Congo	8.3	7.5	86.5	0.64	10.4
South Africa	5.9	5.3	988	7.33	167.8
Angola	9.8	8.7	1 588	11.78	162.8
Zimbabwe	4.9	4.4	297	2.20	60.5
Namibia	2.4	2.1	1 050	7.79	440.5
Lesotho	0.5	0.4	243	1.80	515.2
Sierra Leone	0.5	0.5	102.5	0.76	195.1
Other	0.9	0.8	378.3	2.81	-
2023	111.5	100	13 481	100	117.38
2022	120.7		15 970		140.02

Source: KP Statistics 2024, Mass & Value: Adjusted for South African Revised Production

South Africa's diamond industry faced significant declines in production and sales with production declining by 38 percent in 2023 compared with 2022, due to reduced output from Kimberlite mines that had previously dominated diamond production. In line with a drop in production, local and export sales recorded a drop of 12.6 percent and 43.7 percent, respectively. The lower decrease in local sales suggests that domestic demand may have remained relatively stable compared to the production shortfall, while the substantial drop in export sales points to weakened global demand or a reduction in international competitiveness. The overall decrease in total sales reflects a challenging year, with limited supply from primary kimberlite mines and a decline in global market demand impacting South Africa's diamond industry in 2023 (Table 15).

Kimberlite mining remained the primary backbone of South Africa's diamond industry, despite some diversification in other diamond sources, contributing 93.0 percent to total production. with alluvial and marine diamonds contributing only 3.3 percent and 3.7 percent, respectively (Figure 3).

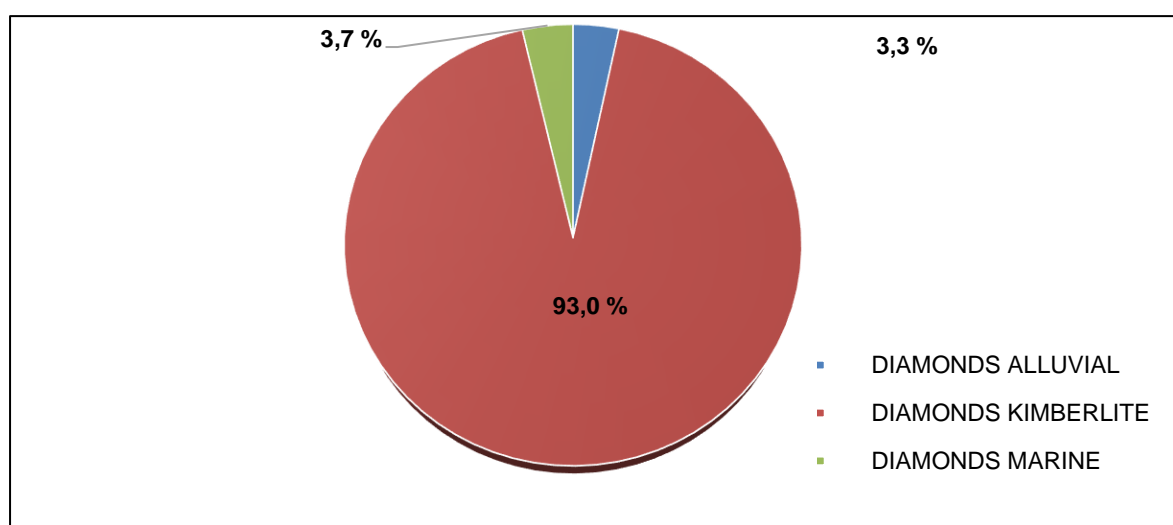
TABLE 15: SOUTH AFRICA'S ROUGH DIAMOND PRODUCTION AND SALES, 2013-2023

Year	Production		Local sales		Export sales		Total Sales	
	1000 cts	1000 cts	R mil	1000 cts	R mil	1000 cts	R mil	
2014	8 059	3 127	8 673	5 620	7 730	8 747	16 404	
2015	8 233	3 141	8 639	4 650	5 811	7 792	14 451	
2016	8 305	1 610	8 295	9 002	12 435	10 613	20 731	
2017	9 693	1 016	7 923	9 119	10 230	10 136	18 154	
2018	9 911	1 429	7 213	8 883	10 079	10 313	17 292	
2019	7 180	949	5 540	6 273	7 644	7 222	13 205	
2020	8 475	1 285	5 176	5 901	8 120	7 187	13 295	
2021	9 726	2 364	8 087	8 285	13 227	10 649	21 314	
2022	9 684	2 247	10 852	7 741	14 896	9 989	25 748	
2023	5 904	1 963	8 884	4 083	7 786	6 047	16 670	

Source: DMRE, Mineral Economics and Statistics Directorate

The limited production figures from these non-kimberlite sources are likely due to higher costs and lower yield rates associated with alluvial and marine mining. Alluvial diamonds come from riverbeds and surface deposits, while marine diamonds are extracted from the seabed, both of which require more intensive processing and environmental compliance measures.

FIGURE 3: SOUTH AFRICA'S ROUGH DIAMOND PRODUCTION PERCENTAGE SPLIT, 2023.



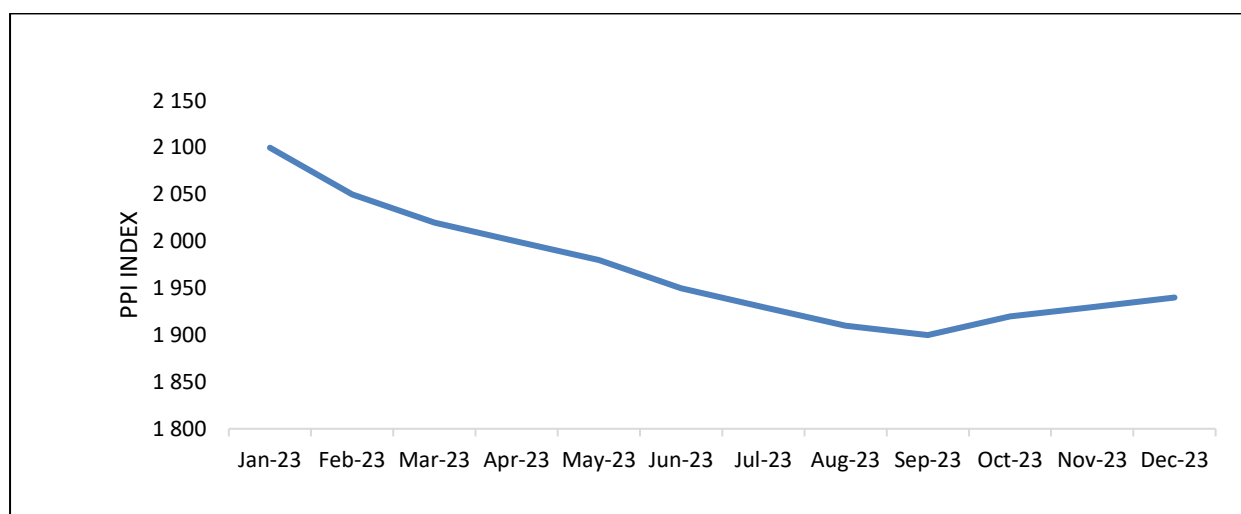
Source: DMRE, Directorate Mineral Economics

REVENUE AND PRICES

Despite a weaker ZAR/US\$ exchange rate, revenue generated from the diamond sector was estimated at about R16.6 billion, contributing 2.1 percent to total mining revenue in 2023. Revenue declined by 35 percent from R25.7 billion in 2022, primarily due to lower volumes sold which resulted from low production following the closure of some operations, coupled with low diamond prices. Mining in the diamond sector became challenging due to low and uncertainty in prices. The year 2023 was marked by a challenging diamond market, as global demand recalibrated against an oversupplied industry, leading to lower prices for most of the year, with signs of recovery only emerging late by the fourth quarter 2023. According to the IDEX Polished Price Index data, the prices of polished diamonds showed

a steady decline during the first three quarters, largely due to a mismatch in global supply and demand, which was especially pronounced in the USA, one of the biggest diamond-consuming markets (Figure 4).

FIGURE 4: THE POLISHED PRICE INDEX, 2023



Source: IDEX International, 2024.

Early in the year, an oversupply of diamonds met softened demand, leading to a continuous decrease in polished diamond prices through September 2023. This trend reflects a correction from the high demand levels that occurred, post- Covid-19 pandemic, where supply constraints and elevated demand from major regions like the USA had previously driven up prices. By mid-2023 however, this demand weakened, exacerbated by economic concerns in key markets, which included slower retail consumption in the USA and other global regions like Europe and parts of Asia.

There was, however, a modest price recovery from October 2023 through December 2023, suggesting a slight rebound in demand during the holiday season. This uptick aligns with reports of supply curtailments from major diamond producers, who aimed to stabilize the market by limiting the rough diamond flow into the polished diamond segment. Additionally, seasonal buying in the USA and recovery in other regions likely supported this trend, as the industry prepared for the high-demand period in Q4 2023. This late-year price stabilization offers cautious optimism that a demand rebound may continue into 2024, contingent on controlled supply and stable or improving global economic conditions.

EMPLOYMENT

South Africa's average employment in the rough diamond sector was estimated at 15,354, representing a 9.8 percent increase compared to 2022 (Table 16). This rise was attributed to increased permanent employees at some operations. Permanent employees grew by 37 percent, while contract employees decreased by 49 percent during the same period. Along with the rise in employment, total remuneration also increased by 6.5 percent, reaching R4.49 billion.

TABLE 16: EMPLOYMENT IN SOUTH AFRICA'S DIAMOND SECTOR, 2013-2023

YEAR	AVERAGE NUMBER OF EMPLOYEES	TOTAL REMUNERATION (R'000 000)	AVERAGE REMUNERATION (R/employee)
2013	13 547	2 870	211 836
2014	15 203	3 629	238 703
2015	17 246	4 359	252 754
2016	18 804	5 073	269 783
2017	17 991	5 243	291 423
2018	16 264	4 988	306 690
2019	15 252	4 803	314 919
2020	13 939	4 460	319 966
2021	12 926	4 934	381 794
2022	13 972	5 891	421 687
2023	15 354	6 897	449 261

Source: DMRE, Mineral Economics and Statistics Directorate

KEY DEVELOPMENTS IN SOUTH AFRICA

The South African diamond industry has been steering the significant developments in 2023, with major producers like De Beers and Petra Diamonds undertaking strategic initiatives to enhance production and sustainability. Known for its high-quality diamond resources, South Africa has a historic diamond mining legacy, and operations that contribute substantially to the national economy and local communities. However, faced with global price fluctuations and pressures from synthetic diamond markets, producers are increasingly focusing on technological advancements and efficient mining practices to maintain their competitive edge. Key projects, like the Venetia Underground Project by De Beers and modernization efforts by Petra Diamonds, highlight the industry's adaptive strategies to extend the life of mine and increase output, benefiting local communities through employment and skill development initiatives.

De Beers' Venetia Mine halted its open-pit operations in December 2022, transitioning to the Venetia Underground Project (VUP) in June 2023, after three decades of open-pit mining. This transition aims to extend the mine's life until 2046, with an anticipated yield of 82 million carats from about 115 million tons of material. The project targets the K01 and K02 kimberlite orebodies, which lie beneath the surface and enable mining to reach depths up to 1,000 meters. Employing over 4,300 workers, predominantly from Musina and Blouberg, the VUP prioritizes local employment, skill development, and community engagement. This shift to underground mining not only secures Venetia's future as a leading South African diamond mine but also reinforces De Beers' commitment to sustainable mining and economic development in the region.

Further to De Beers' efforts, Petra Diamonds has focused on increasing throughput at its Cullinan and Finsch mines, which are known for producing high-quality diamonds, including rare blue diamonds. The Company's operational improvements and technological investments aim to maximize yield and reduce costs, addressing the global challenges of fluctuating diamond prices and competition from lab-grown alternatives. These developments demonstrate Petra's commitment to maintaining the profitability of its South African mines, ensuring long-term contributions to the national economy. Overall, the developments within South Africa's diamond industry illustrate an industry in transition, balancing production needs with sustainability and community impact. These advancements showcase a proactive approach by South African diamond producers to remain resilient in a rapidly evolving global market while strengthening their roles in local development and economic growth.

OUTLOOK

Supply contraction, combined with steady global demand, could push diamond prices higher in 2024, particularly in export markets, where South Africa's reduced production would be felt the most. To adapt, producers may focus on improving operational efficiency, reprocessing stockpiles, and investing in new technology for secondary sources, though these measures might only partially offset the shortfall from kimberlites.

Additionally, increasing environmental and regulatory pressures could restrict the growth of marine and alluvial mining, as the industry faces growing demands for ethical and sustainable practices. As a result, South Africa's diamond sector may experience higher prices due to limited supply and consistent demand in 2024, while efforts to maintain production levels will likely be challenged by resource constraints and rising operational costs.

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GOLD

V Mutavhatsindi

SUPPLY AND DEMAND

South Africa, with 5 000 tons (t) of reserves in 2023, while global gold reserves average at 59 000 tons, is the third largest in reserves at 8.4 percent, following Australia at 20 percent and Russia at 18 percent.

TABLE 17: GLOBAL GOLD RESERVES, PRODUCTION AND EXPORTS: 2022-2023

COUNTRY	RESERVES#			PRODUCTION*			EXPORTS#		
	t	%	Rank	t	%	Rank	t	%	Rank
South Africa	5 000	8.4	3	96.6	3.2	6	93	N/A	N/A
Australia	12 000	20	1	310	10.3	2	18.1	N/A	N/A
Brazil	2 400	4	7	60	2	8	N/A	N/A	N/A
Canada	2 300	3.8	8	200	6.6	3	N/A	N/A	N/A
China	3 000	5	5	370	12.3	1	N/A	N/A	N/A
Indonesia	2 600	4.4	6	110	3.6	5	N/A	N/A	N/A
Peru	2 300	3.8	9	90	3	7	N/A	N/A	N/A
Russia	11 000	18	2	310	10.3	2	N/A	N/A	N/A
United State	3 000	5	4	170	5.6	4	N/A	N/A	N/A
Other	15 400	26.1		1 283.4	42.7		N/A	N/A	N/A
2023	59 000	100		3 000	100		N/A	N/A	N/A
2022	52 000			3 060			N/A	N/A	N/A

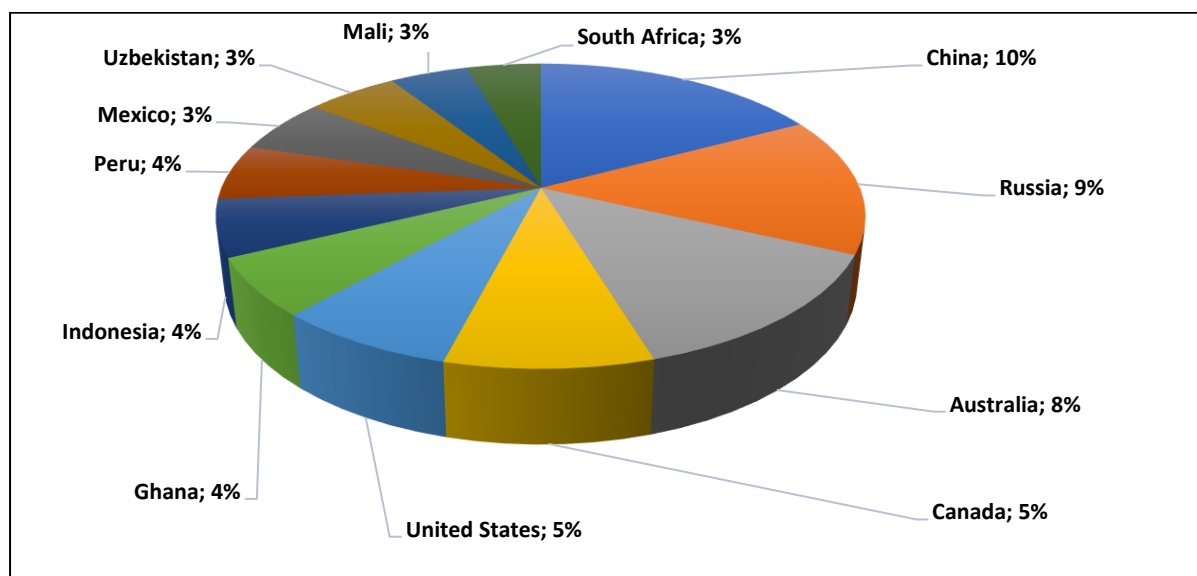
Source: #USGS 2023

DMRE, Mineral Economics and Statistics Directorate

South Africa's gold production was estimated at 96.6 tons (t), contributing roughly 3 percent to total global gold production in 2023. Global gold supply, which includes mine production, scrap supply and producer hedging, stood at 4 898.8 t in 2023 an increase of 3.1 percent year on year (y-o-y). Global mine production contributed 74.4 percent to global gold supply, while scrap supply and producer hedging, jointly contributed the remaining 25.3 percent. For many years, China remained the largest

gold producer, contributing 10 percent to global gold production, followed by Russia at 9, Australia 8, Canada and United States at 5 percent, respectively (Table 17 and Figure 5).

FIGURE 5: SHARE OF GLOBAL PRODUCTION BY COUNTRY, 2023.



Sources: Metals Focus, World Gold Council
DMRE, Directorate Mineral Economics and Statistics, 2023 #

The South African gold sector performed better than expected, with gold production rising by 4.4 percent to 92.6 tons in 2023, up from 92.5 tons in 2022. This increase is attributed to a recovery following a lengthy industrial dispute in 2022, during which employees at the Sibanye gold mine, one of the country's leading gold producers, spent months on strike demanding wage-related benefits (Table 18).

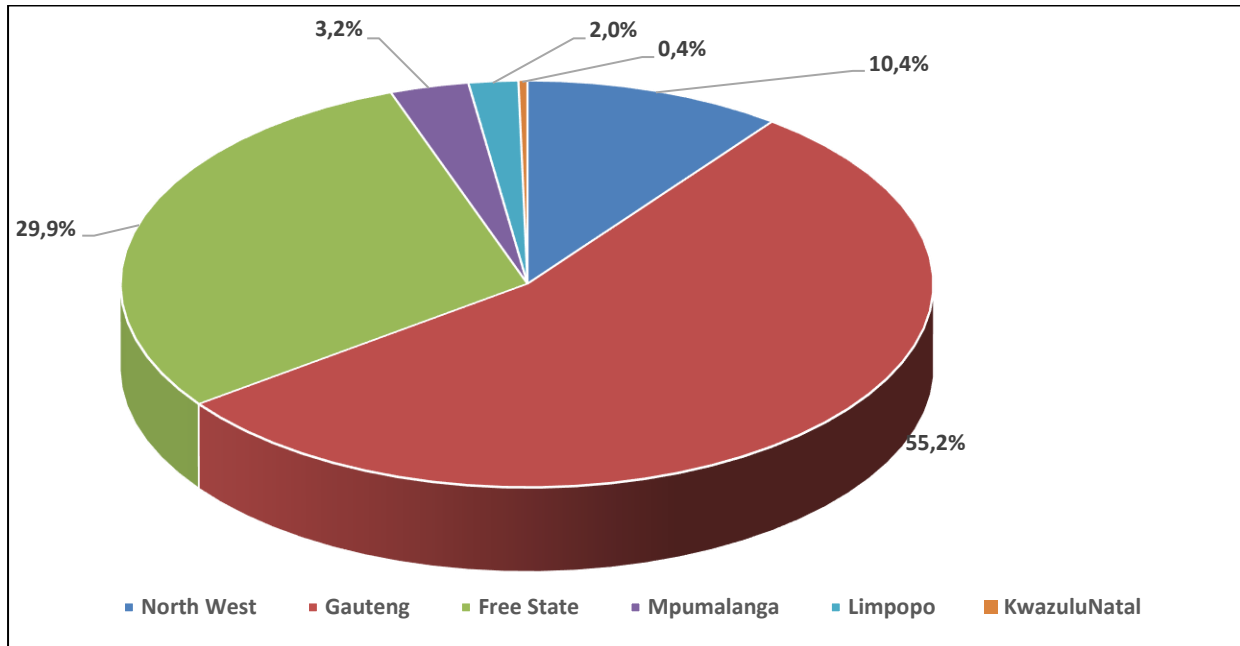
TABLE 18: SOUTH AFRICA'S PRODUCTION AND SALES OF GOLD, 2014-2023.

Year	Production (t)	Local sales		Export sales		Total Sales	
		Mass	Value	Mass	Value	Mass	Value
			R'000		R' 000		R'000
2014	152	8.5	3 450 902	136	59 898 125	145	63 349 026
2015	145	15.9	7 385 852	118	55 314 075	134	62 699 927
2016	142	25.8	15 214 101	122	73 210 641	147	88 424 741
2017	137.2	33.0	19 606 197	119.2	49 785 597	152.2	69 391 795
2018	117.1	66.3	35 201 486	63.6	34 482 018	129.9	69 683 505
2019	105.1	76.0	48 295 654	42.4	28 336 140	118.5	76 631 795
2020	95.8	21.7	17 580 143	70.3	68 855 729	92.11	86 435 873
2021	107.8	10.5	9 155 868	106.6	93 053 602	117.2	102 209 471
2022	89.5	4.9	4 631 910	88.097	84 938 456	93.06	89 570 367
2023	96.62	4.5	5 346 379	93.06	109 057 736	97.61	114 404 116

Source: DMRE, 2009-2022, Directorate Mineral Economics and Statistics, 2023: #

Gauteng Province at 55.2 percent remained the largest producer of gold in the country, followed by the Free State and North-West Provinces at 29.9 percent and 10.4 percent respectively, (Figure 6). Mpumalanga, Limpopo, and KwaZulu-Natal Provinces contributed 3.2, 2 and 0.4 percent correspondingly.

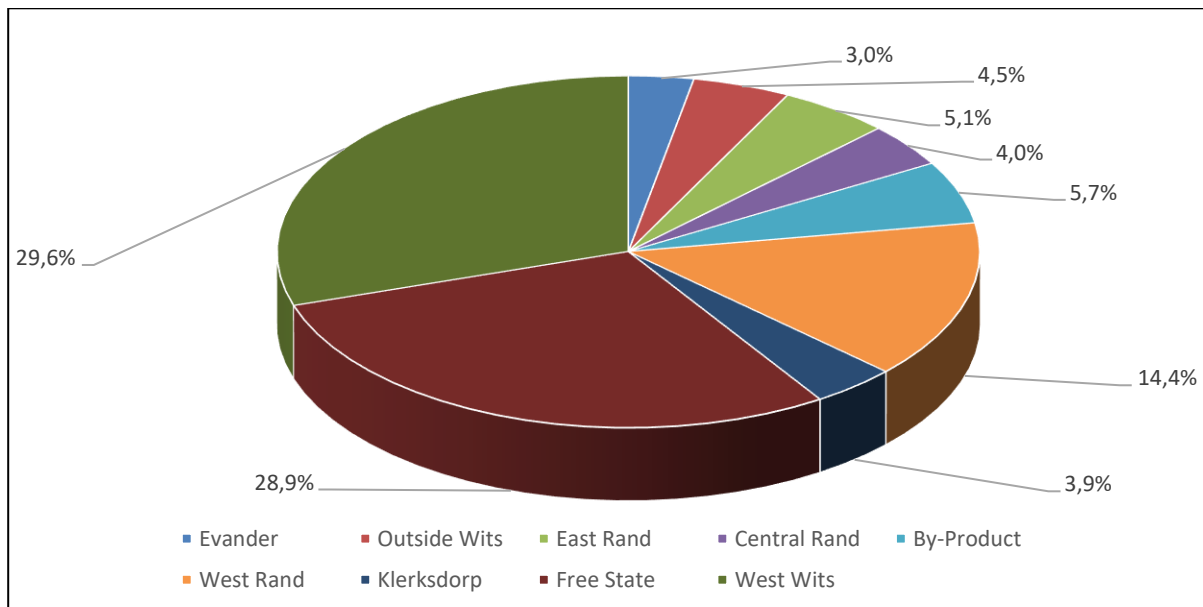
FIGURE 6: SOUTH AFRICA'S PRIMARY GOLD PRODUCTION SPLIT BY PROVINCE, 2023.



Source: DMRE, Mineral Economics and Statistics Directorate, 2023

West Wits and Free State goldfields yielded the largest gold production at 29.6 percent and 28.9 percent, respectively. West rand and by product goldfields followed at 14.4 percent and 5.7 percent, respectively (Figure 7), while the remainder including Klerksdorp, outside wits, Evander, East Rand and Central rand contributed 20.3 percent of total production.

FIGURE 7: SOUTH AFRICA'S PRIMARY GOLDFIELD PRODUCTION, 2023.



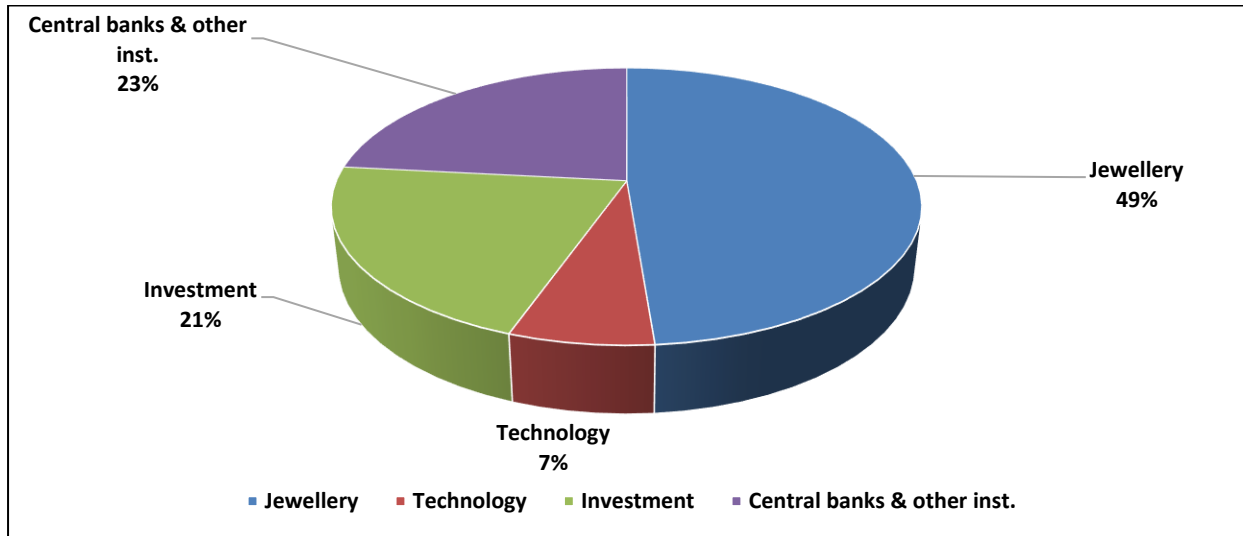
Source: DMRE, Mineral Economics and Statistics Directorate, 2023#

Note: ° Gold mines outside the Witwatersrand Basin.

* Platinum and base metal mines.

Despite the strong US dollar and high gold prices, global gold demand declined by 5 percent, dropping from 4 699 tons in 2022 to 4 448.4 tons in 2023. This decrease is attributed to lower demand investment, Central Banks, technology and jewellery, which declined by 15, 4, 3.5 and 1 percent respectively.

FIGURE 8: WORLD GOLD DEMAND MARKETS*, 2023.

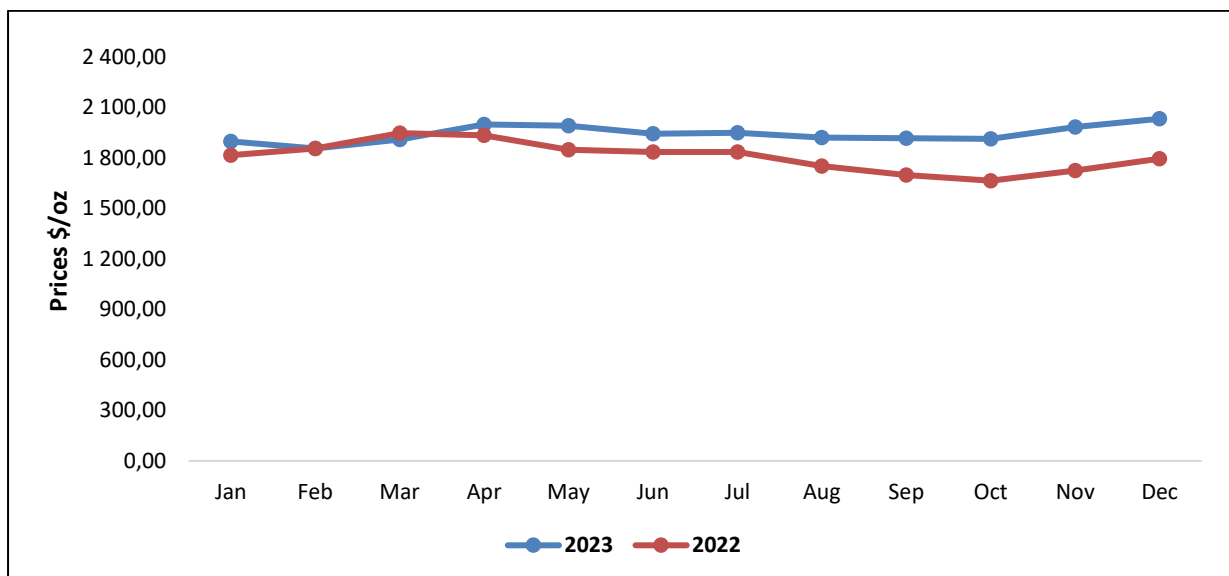


Source: Metals Focus, World Gold Council

PRICES AND REVENUES

Revenue generated from the gold sector was estimated at R114.4 billion in 2023, a 27.7 percent increase compared with the previous year. The increase was due to high sales volume, driven by high local intake and demand from international trading partners. Weaker rand to dollar exchange rate and high gold prices also contributed to the increase in revenue generated by the gold sector. In 2023, the average gold price was estimated at US\$1,943.08, a slight rise of 0.9 percent compared to US\$1,809.15 in 2022. This increase was influenced by various factors, including rising geopolitical risks, concerns about budget deficits, ongoing inflation, and central bank purchases. The conflicts in Russia-Ukraine and Israel-Palestine increased geopolitical uncertainty, while the collapse of China's property market led many investors to turn to traditional safe-haven assets like gold. As a result, South African gold miners benefited from the rising gold prices and the weaker ZAR/US\$ exchange rate, significantly boosting their revenues and profits (Table 19 and Figure 9).

FIGURE 9: AVERAGE GOLD PRICE MOVEMENTS IN RANS AND DOLLARS, 2023.



Source: LBMA, 2022 and 2023
SARB, 2022 and 2023

EMPLOYMENT

South Africa's gold sector continues to play a significant role in the country's economy, employing on average 94 024 employees in 2023, comprising 19.5 percent of total mining employment, positioning it the third largest employer, after platinum group metals (PGMs) and coal sectors. Despite high production levels, employment in the gold sector declined slightly by 1 percent, compared with 94 998 employees recorded in 2022, due to restructuring and voluntary exit packages. However, total remuneration for employees increased by 8 percent, with male employees earning 84.7 percent and female employees earning 15.2 percent of the total remuneration of the gold sector. (Table 19).

TABLE 19: SOUTH AFRICA'S GOLD INDUSTRY'S EMPLOYMENT, 2014 – 2023

YEAR	EMPLOYEES	TOTAL	AVERAGE
		REMUNERATION	REMUNERATION
		R'000	R/employee
2014	119 007	23 383 408	196 487
2015	115 030	24 578 384	213 669
2016	116 572	28 760 523	246 718
2017	112 902	30 167 951	267 204
2018	100 187	27 676 669	276 250
2019	92 898	26 460 664	284 834
2020	94 312	25 108 730	266 230
2021	93 998	31 186 778	331 781
2022	94 998	32 234 126	339 313
2023	94 024	34 953 192	371 78

Source: DMRE, Mineral Economics and Statistics Directorate, 2023: #

Note: *Average number of employees in service, including contractors

OUTLOOK

Given its status as a safe haven gold prices are traditionally expected to experience strong growth during periods of high inflation and economic uncertainty. Therefore, there is a positive outlook for a further uptick in gold prices for 2024 financial year, driven by the anticipated weakening of the US dollar due to the upcoming 2024 elections in the U.S. and a slowdown in interest rate hikes by central banks. This situation should benefit gold miners in the short term. Consequently, demand for gold is expected to improve in 2024 after a decline recorded in 2023.

South Africa's gold reserves are estimated at around 5,000 tons, ranking third in the world and world's eleventh largest producer of gold in 2023, this highlights the country's significant potential. Despite facing challenges, the gold industry is expected to continue in South Africa for over a decade, based on these declared reserves, production level is anticipated to increase slightly in 2024. Additionally, revenue from gold mines is expected to rise, driven by higher gold prices and the anticipated weakening of the US dollar, leading to a stronger rand

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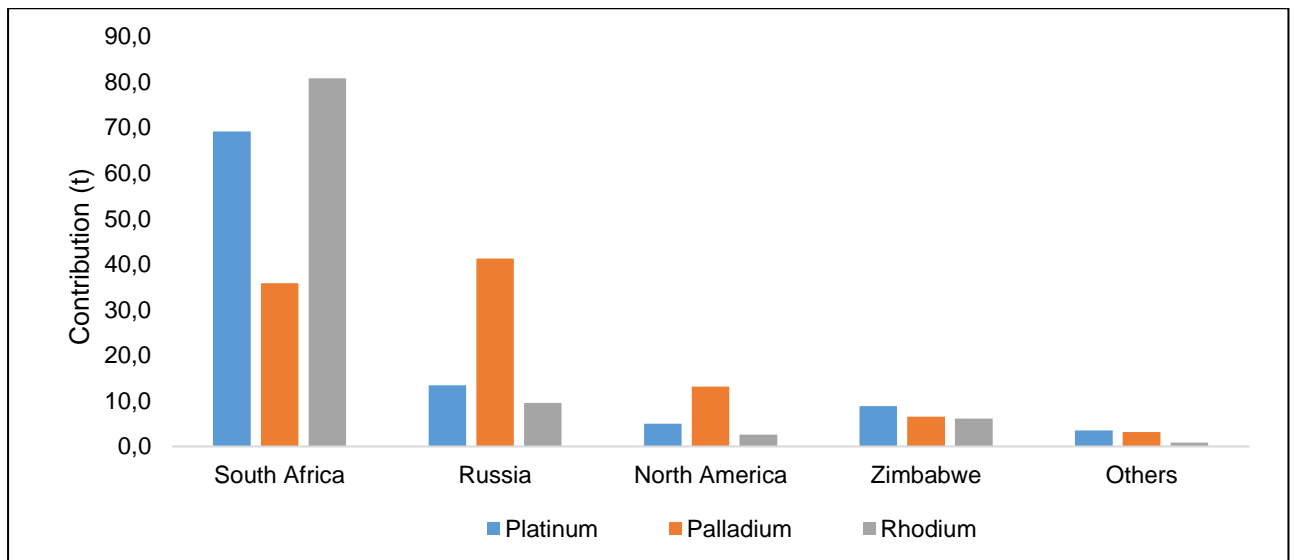
PLATINUM GROUP METALS

PJ Perold

SUPPLY – DEMAND

South Africa’s platinum group metals (PGMs) production was estimated at 253.8 tons (t) in 2023, increasing by 1.2 percent, compared with 250.2 t in 2022 (Table 20). South Africa accounted for 61.9 percent of global Pt supply in 2023, while Russia, the North America, and Zimbabwe contributed 21.4 percent, 6.9 percent, and 7.2 percent, in that order, (Figure 10). Russia at 41.3 percent, retained its ranking as the world’s leading producer of palladium (Pd), despite the ongoing war with Ukraine, followed by South Africa and North America at 35.9 percent and 13.2 percent, respectively.

FIGURE 10: GLOBAL PGMS SUPPLY, 2023.

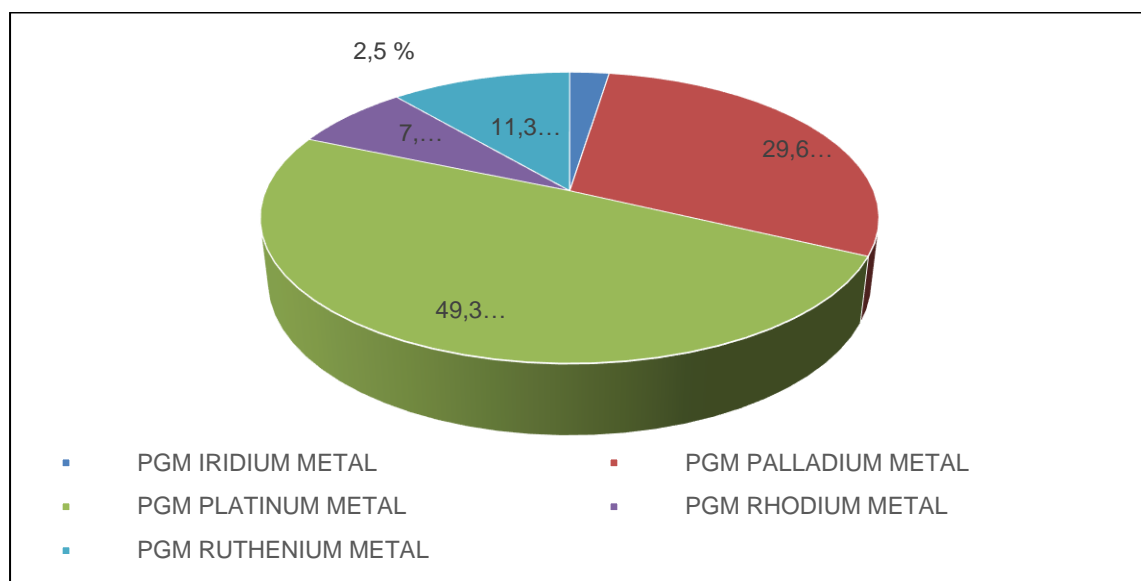


Source: Johnson Matthey’s *Platinum 2023/24*

In 2023, the PGMs market shifted from the surplus seen in 2022, moving into a significant deficit, driven by soaring demand and persistent supply challenges. There was a notable increased in industrial and auto-catalysts demand, particularly for Pt which grew by 13 percent, spurred by its substitution for Pd. Industrial Pt consumption reached record highs, especially in the glass and chemical industries, with overall demand rising by 14 percent, year-on-year to just over 75 t. Jewellery fabrication decreased notably in 2023, primarily due to soaring prices and liquidations, particularly in Japan, where holders of large investment bars, sold back to the market. Although thrifting in some Pd and Rh applications became more common, demand remained resilient, especially for Ruthenium (Ru) and Iridium (Ir), which saw strong usage in industrial applications.

Pt production contributed 49.3 percent to South Africa’s PGMs basket (Figure 11), followed by Pd and Ru at 29.2 percent and 11.3 percent, respectively. South Africa’s PGMs production recorded moderate growth in 2023, despite significant challenges across the PGM sector, primarily due to scheduled annual shutdowns at major operations, which led to reduced Run of Mine (ROM) throughput.

FIGURE 11: SOUTH AFRICA'S PGMS PRODUCTION, 2023.



Source: Johnson Matthey's Platinum 2024

Temporary closures caused a notable decline in production volumes at most refineries. However, Sibanye-Stillwater's Marikana refinery was an exception, as it continued operations during this period, helping mitigate the overall downturn in production. To compensate for the production decline, companies turned to existing stockpiles, which supplemented the reduced ROM throughput across the industry. This strategic adjustment helped maintain a consistent output level despite operational setbacks. The broader industry, including Sibanye-Stillwater, faced disruptions such as load shedding and cable theft, but the Marikana refinery's continuous operation provided stability.

TABLE 20: SOUTH AFRICA'S PGMS PRODUCTION AND SALES, 2014 – 2023.

Year	Production Kt	Local sales		Export sales		Total sales	
		Mass Kt	Value R'000	Mass kt	Value R'000	Mass kt	Value R'000
2014	188	28.5	10 640	201	66 860	230	77 501
2015	275	32.2	11 149	254	82 988	286	94 138
2016	263	31.0	11 093	250	85 318	281	96 412
2017	260	31.8	11 971	251	85 069	283	97 040
2018	270	24.3	10 668	243	94 228	267	104 896
2019	268	15.6	11 441	227	124 585	242	136 026
2020	226	15.1	17 189	177	173 241	192	190 431
2021	285	12.6	25 253	264	321 271	277	346 525
2022	250	14.6	21 504	216	257 892	231	279 396
2023	253	12.7	12 755	213	183 330	226	196 086

Source: DMRE, Mineral Economics and Statistics

The Pt market shifted to a deficit in 2023, primarily due to inventory buildup in the supply chain, caused by challenges at refineries and smelters. Automotive platinum demand saw significant growth, driven by several key factors, such as continued substitution of Pt for Pd in auto-catalysts, helping to offset the higher costs of Pd, while maintaining essential emissions control performance. Additionally, production of both light-duty vehicles (LDVs) and heavy-duty vehicles (HDVs) rebounded following earlier disruptions due to semiconductor shortages and supply chain issues, both increasing by 14.1 percent, particularly in North America, Europe, and China. The increased Pt usage in both gasoline and diesel vehicles, along with the tightening of emissions standards globally (especially in China and India),

fuelled this surge in demand. In diesel vehicles, which require more platinum for effective emissions control, the rise in production and platinum loading further amplified demand. However, the jewellery sector saw a continued decline, especially in China, where consumer preference shifted towards gold.

TABLE 21: GLOBAL PGMS GROSS DEMAND AND RECYCLING, 2023.

Sector	Platinum	Palladium	Rhodium
Automotive	124.4	104	8.4
Jewellery	42.3	2.6	-
Industrial	89	81	41.7
Investment	1.3	0.9	0.8
Total Gross + Other	257	188.5	50.9
Recycling	-36.9	-104.6	-9.2
Net Demand	220.1	83.9	41.7
Supply	180.1	211.3	18.5
Balance	-40	127.4	-23.2

Source: Platinum Investment Council, 2023

In contrast, Pd demand declined, as automakers increasingly replaced it with Pt in gasoline vehicle catalytic converters, while the shift towards electric vehicles reduced the need for Pd. Despite Pd's stable demand in the industrial sectors, investment outflows and decreased automotive usage resulted in a significant drop in its overall demand. Pd exceeded supply by 127.4 tons and Rh fell short by 23.2 tons, highlighting tighter market conditions compared to 2022, when there was a surplus (Table 21). This shift in balance was driven by stronger automotive and industrial demand for both metals. Meanwhile, heavy-duty vehicle production was more resilient and less affected by these issues. After several years of net outflows, platinum ETFs saw a mixed performance in 2023.

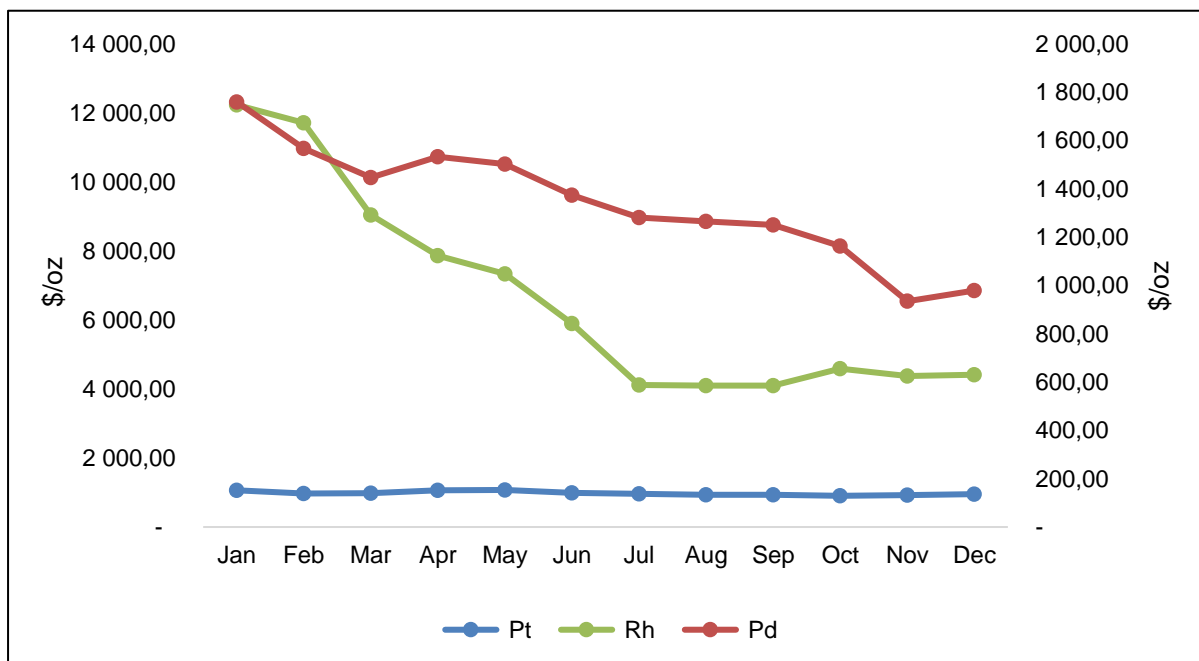
Some inflows were recorded, as market sentiment improved, driven by the widening market deficit and increasing industrial demand. However, investor appetite remained cautious, and overall holdings did not recover to pre Covid-19 pandemic levels. This contrasted with the heavy liquidations seen in earlier years, which contributed to surplus conditions in the market. The continuous liquidation of palladium ETFs, which began in 2015, persisted in 2023 but at a slower rate. By the start of 2022 Pd ETFs had already seen a cumulative decline of 600 000 ounces, and this trend continued as palladium prices remained high. Investors saw limited growth potential in palladium, due to increasing substitution by Pt. Locally refined PGMs were sold to a diverse range of global customers, mostly in Asia and Europe, with the largest markets being catalytic converters and the jewellery industry. Smaller portions were consumed locally, primarily by the catalytic converter industry, and in North America by industrial applications.

PRICES AND REVENUE

PGMs sales revenue was estimated at over R 196.1 billion in 2023, contributing approximately 22.9 percent to total mining revenue. The PGMs sector in South Africa faced a more challenging market environment as evidenced by a 29.8 percent y-o-y drop in revenue, driven by a 2.1 percent and 40.2 percent drop in sales mass and average PGM prices, coupled with a 10.6 percent weaker rand (Figure 12). Pt prices exhibited a slight increase, growing by 0.80 percent from an average of \$971.68 per ounce

(oz) in 2022 to \$979.42/oz in 2023. In South African rand terms, the price in kg rose by 12.8 percent, reflecting the currency's devaluation. This mild price growth was primarily driven by steady demand from the industrial and automotive sectors, despite headwinds from semiconductor shortages. However, Pt prices remained below \$1 000/oz for much of the year, a stark contrast to the earlier projection of stronger price increases.

FIGURE 12: PGMS PRICE AVERAGES 2023.



Source: Source: Johnson Matthey, 2023 May Report

Pd saw a significant drop in prices, declining by 37.31 percent, falling from \$2 135.35/oz in 2022 to \$1 338.88/oz in 2023. The reduction in price reflected waning demand from the automotive sector, which is increasingly shifting toward electric vehicles (EVs) that require fewer PGMs in their production. In South Africa, the Pd price/kg also fell by 31.9 percent, reflecting weaker global demand and a more competitive pricing environment. Rh prices experienced a drastic decline, dropping by 57.09 percent from \$15 492.33/oz in 2022 to \$6 651.65/oz in 2023.

Demand for Rh, primarily driven by the automotive industry's recovery, failed to meet earlier expectations. The restricted supply in 2022 that had driven prices higher eased in 2023, contributing to the price collapse. In rand terms, the price per kilogram for the metal fell by 59 percent, significantly affecting the revenue outlook for this high-value metal. Ir saw a more moderate increase in prices, rising by 5.08 percent from \$4 455.17/oz in 2022 to \$4 681.58/oz in 2023. In South African rand, the price per kilogram jumped by 22.1 percent, due to the weaker rand, suggesting strong industrial demand and tight supply conditions that buoyed the market for this less prominent PGM.

Ru experienced a decline in price, dropping by 15.8 percent in US dollar terms from \$552.14/oz in 2022 to \$464.41/oz in 2023. However, the local market in South Africa saw an 8.8 percent increase in rand terms, again reflecting the depreciation of the currency. Ru price performance was driven by modest demand in the chemical and electronic industries. The weakening of the South African rand by just over 12.6 percent played a crucial role in shaping the performance of the PGMs sector in local currency terms. While dollar prices for several metals decreased significantly, the depreciation of the rand against the US dollar softened the blow on South African producers by boosting local currency revenue. This helped cushion the impact of lower global prices, particularly for metals like Pt and Ir, whose local prices saw double-digit growth in rand terms.

KEY DEVELOPMENTS

In 2023, South Africa's PGMs sector was navigating a complex landscape, marked by efforts to balance production with economic challenges, supply constraints, and market dynamics. Overall, South Africa's PGM sector entered a phase of restructuring, characterized by cost-cutting initiatives and deferred capital expenditures (CAPEX) to navigate the turbulent economic environment. These restructuring efforts, while limiting immediate production impacts, could have weakened long-term production capacity. Furthermore, the employment landscape has shifted, with job losses anticipated as part of broader cost-cutting measures. The industry's future hinged on a delicate balance between managing refinery throughput, maintaining stock levels, and navigating global supply and demand constraints. On the supply side, bottlenecks such as energy shortages and labour unrest, combined with declining ore grades, continued to present hurdles.

A major focal point was the redevelopment of the Eland Mine, owned by Northam Platinum, which's progress was hindered by persistently low PGMs prices, which further prompted a reconsideration for the redevelopment timeline and scope. Similarly, the Bokoni Mine, managed by African Rainbow Minerals (ARM), underwent its own redevelopment aimed at increasing production capacity. Like Eland, the Bokoni project was constrained by volatile PGMs prices, which threatened to delay expansions and limit the financial viability of the project. Meanwhile, the Two Rivers Mine, a joint venture between Impala Platinum and ARM, proceeded with a significant Merensky Reef expansion to boost production. However, low PGMs prices introduced uncertainty into the project's execution, raising concerns that scaling back or delaying the initiative could become necessary if market conditions did not improve. In contrast, the Pilanesberg Mine, operated by Sedibelo Platinum, was set for closure in the second half of 2023. This decision, while not directly tied to current PGMs price levels, had a notable impact on South Africa's PGMs production. Additionally, the Kroondal Mine, managed by Sibanye-Stillwater, faced a decline in production due to the depletion of ore reserves. Furthermore, Sibanye's pipeline of mined material was susceptible to disruptions, not just from depleted reserves but also from energy constraints and logistical issues. The challenge of maintaining continuous feed to the refinery was compounded by the need to ensure profitability amid fluctuating demand, particularly from automotive and electronics sectors, which heavily drove PGMs consumption.

EMPLOYMENT

Employment in the PGMs sector was estimated at 182 944, contributing 62.8 percent to total mining employment in 2023, positioning the sector as the largest employer (Table 22). Employment increased by 6.2 percent compared with 175 288 employees in 2022. Remuneration increased by 9.4 percent to approximately R76.8 billion and pushed the average remuneration per employee up by 4.7 percent to R419.8/employee.

TABLE 22: SOUTH AFRICA'S PGM'S INDUSTRY'S EMPLOYMENT, 2014 – 2023.

YEAR	EMPLOYEES	TOTAL	AVERAGE
		REMUNERATION R'000	REMUNERATION R/employee
2014	186 865	35 652	190.9
2015	186 465	44 955	241.1
2016	172 556	45 926	266.2
2017	172 760	49 484	286.4
2018	167 038	51 409	307.8
2019	164 674	55 548	337.3
2020	154 600	57 195	369.9
2021	165 587	64 163	387.5
2022	175 288	70 173	400.3
2023	182 944	76 813	419.8

Source: DMRE, *Mineral Economics and Statistics*, 2023

The remuneration increased on the back of the uptake in contractual employment and positive wage increases as NUMSA secured wage increases. This sharp contrast between workforce growth and the average per-employee remuneration highlights that, although the total payroll has grown substantially, the average pay per worker has stabilized or even slightly declined when adjusted for inflation. This can be attributed to the substantial increase in workforce size relative to the rate of wage growth, potentially influenced by cost containment measures amid low PGMs prices and restructuring efforts.

OUTLOOK

The 2023 performance of the PGM sector illustrates a year of significant challenges, with dramatic price reductions for high-value metals like palladium and rhodium, overshadowing the modest gains seen in Pt and Ir. While the weaker rand helped bolster revenues in local terms, the sector's reliance on volatile global demand, particularly from the automotive industry, suggests ongoing uncertainty for 2024. The shift towards electric vehicles and the need for semiconductor supply chain resilience will be key factors in determining the future trajectory of the PGMs sector in South Africa. Despite the headwinds, the sector remains a crucial component of South Africa's mining economy, contributing significantly to mineral sales and foreign exchange earnings.

Global PGMs supplies are expected to decrease, especially Pd and Rh produced by Russia, as supply constraints become more prevalent due to the Russia-Ukraine war. South Africa is also expected to experience lower throughput as operational challenges and planned maintenance are set to continue in 2024. The direction of the Pt market balance remains dependent upon investment return to buying in Japan and South Africa during the first quarter of 2023, but investor interest may prove difficult to sustain in a higher interest rate environment. South African Pt supplies are forecast to rise 5 percent to 4.15 million oz in 2023, with palladium and rhodium also expected to see mid-single-digit gains. In addition, the release of pipeline stocks is expected to squeeze supply over the same period. Despite strong industrial demand, Pt demand is expected to decrease, especially on the back of lower Pd and Rh prices. The Pt price will not increase markedly, due to lower prices of Rh and Pd and is expected to decrease to about \$950/oz in-line with lackluster international demand and oversupply. The weak demand will be driven by sustained weakness in the auto sector weighing on Pt auto-catalysts demand (and) jewellery demand. On the other hand, thriving of fuel cells (using Rh and Pd in the actual fuel cell) is gaining momentum and will increase in 2022. However, the forecast for the industry was rather overly optimistic as PGMs demand was hit by supply chain disruptions, especially in the auto industry. The industry had to revise production to compensate for semiconductor shortages and consumer preference in favor of electric vehicles (EV's). The PGMs industry contributed 38.2 percent to SA's total mineral sales revenue, positioning the sector as the second largest revenue earner in 2024.

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ENERGY MINERALS OVERVIEW

K L Revombo

INTRODUCTION

Natural gas, coal, uranium, and oil are the main sources of energy in South Africa. Currently, coal supplies more than 70 percent of the nation's basic energy demands. Coal is utilized in the production of energy, synthetic fuels, as well as for cooking and warming in homes. Coal powered plants provide a total 89.5 percent of the nation's electricity, 5.12 percent from uranium, and 2.13 percent from pumped storage, with just 1.60 percent of the nation's electricity produced by hydro stations, 1.58 percent from open-cycle gas turbines (CGTs), 0.11 percent from wind (Table 23). South Africa has the sixth-largest coal reserves in the world.

TABLE 23: ESKOM'S GENERATION FROM PRIMARY ENERGY SOURCES, 2022 – 2023.

Source, GWh	2023	2022	2021	2020	Percentage (2023)
Coal-fired stations	171 131	184 568	183553	194357	89,45
Nuclear power	9 803	12 355	9903	13252	5,12
Pumped storage stations	4 081	4 743	4795	5060	2,13
Hydro stations	3 060	1 943	1387	688	1,60
Open-cycle gas turbines (OCGTs)	3 018	1 826	1457	1328	1,58
Wind	214	253	305	283	0,11
Total	191 307	205 688	201400	214968	100

Source: Eskom Integrated report for the year ended 31 March 2023

With only a small portion coming from domestic sources, South Africa is largely dependent on imports, to meet its oil needs for production of petroleum products (liquid fuels, bitumen, lubricants, solvents, and other petrochemicals). About 27 percent of all domestic oil needs are met with local output by the Oil and Gas Corporation of South Africa's (PetroSA) Mossel Bay refinery, which converts gas to liquid, and Sasol Secunda's coal to liquid refinery.

About 5.12 percent of the nation's electricity in 2023 came from uranium, the second important element in the energy mix. The nation has the sixth-largest uranium deposits in the world. The only firm on the African continent certified to develop and manufacture nuclear components and equipment by the American Society of Mechanical Engineers III (ASME III) and ASME VIII is Necsa (South African Nuclear Energy Corporation SOC Limited). Based on research and innovation, Necsa is one of the top four global producers of medical isotopes, serving more than 50 countries through its radio-isotopes subsidiary, NTP Radioisotope SCO Limited. The only manufacturer and provider of fluorochemicals in the southern hemisphere is Pelchem (Pty) Limited, a Necsa subsidiary. Pelchem sustains Necsa's global presence by producing 14 items that are sold in more than 25 countries.

Uranium is produced in South Africa as a byproduct of processing gold ores from the gold mines in the country. The provinces of Mpumalanga, northern KwaZulu-Natal, and Limpopo contain most of the nation's coal reserves.

The depletion of South Africa's oil and gas resources led to the country's inability to produce oil for ten consecutive years. There are very little oil resources in the country. Nonetheless, the Karoo Basin may

contain significant amounts of shale gas, while helium gas is sourced and extracted in the Free State province.

PRODUCTION AND SALES

South Africa's production of energy commodities increased marginally by 0.99 percent to 257 219 kt, driven mainly by the increase in the coal output which accounted for 99.99 percent of the production in the energy sector (Table 24). Domestic sales volume increased by 4.77 percent to 199 744 kt, whereas export sales quantities decreased by 1.36 percent to 63 817 kt. Revenues generated by sales in this sector dropped by 24.61 percent to R246 billion, owing mainly to the declines in the coal industry's revenue. Revenues from this sector are driven by 41.94 percent of the sales revenue generated from the coal industry.

For the past 10 years, up to and including 2023, South Africa did not produce oil, due to the depleted reserves. Global oil production increased by 2.2 percent to 96.3 million barrels per day (bl/d) in 2023 compared to 94.3 million bl/d in 2022, fueled by output from South and Central America, North America, and Africa. The Middle East and Commonwealth of Independent States (CIS) were the only regions to register production decline, during the period under review. The Middle East contributed about 31.5 percent to total production, followed by North America at 28.1 percent, CIS at 14.4 percent, South and Central America at 7.6 percent, Asia Pacific at 7.5 percent, Africa at 7.5 percent, and Europe at 7.5 percent.

TABLE 24: SOUTH AFRICA'S PRODUCTION AND SALES OF ENERGY COMMODITIES, 2023.

COMMODITY	YEAR	PRODUCTION	LOCAL SALES		EXPORT SALES*		TOTAL SALES	
		kt	kt	R'000	kt	R'000	kt	R'000
Coal	2022	254695	190639	110 655 979	64695	215 420 981	255 334	326 076 960
	2023	257218	199739	121 988 116	63817	123 378 778	263 556	245 366 894
Uranium	2022	0,16	-	-	0,16	226980,08	0,16	226 980
	2023	0,23	-	-	0,23	646871,90	0,23	646 872
Subtotal	2022	254 695	190 639	110 655 979	64 695	215 647 961	255 334	326 303 940
	2023	257 219	199 739	121 988 116	63 817	124 025 650	263 556	246 013 766
Natural Gas	2022	3,66	3,66	19 563	-	-	4	19 563
	2023	4,01	4,01	37 927	-	-	4	37 927
Natural Gas Condensate	2022	4,95	4,95	88002,54	-	-	5	88 003
	2023	1,04	1,04	18279,97	-	-	1	18 280
Subtotal	2022	8,60	8,60	107565	-	-	9	107 565
	2023	5,05	5,05	56 207	-	-	5	56 207
Total	2022	254704	190648	110 763 544	64 695	215 647 961	255 343	326 411 506
	2023	257224	199744	122 044 323	63 817	124 025 650	263 561	246 069 973

Source: DMRE, Mineral Economics and Statistics Directorate

* South African Revenue Services (Coal export figures only)

Global oil consumption improved by 2.6 percent to 100.2 million bl/d in 2023, compared to 97.7 million bl/d in 2022. Regionally, Asia Pacific, North America, South and Central America, the Middle East, CIS, and Africa recorded increases, except for Europe. Asia Pacific accounted for 38.0 percent of total consumption followed by North America at 23.2 percent, South and Central America at 6.4 percent,

Middle East at 9.6 percent CIS at 4.6, and Africa at 4.2. Europe was responsible for 13.9 percent of total oil consumption.

South Africa's production of natural gas increased by 9.6 percent to 4.0 kt in 2023, from 3.7 kt in 2022, driven by improved output from Renegen's Tetra4 (Table 25). Natural gas condensate output recorded a 78.9 percent decline to 1.0 kt, during the same period, driven by diminishing reserves at PetroSA's offshore production facilities. Revenue earned from the sale of natural gas grew by 93.9 percent from R19.6 million in 2022 to R37.9 million in 2023, driven by high sales volume and unit price (Table 25). Natural gas condensate sales revenue recorded a 79.2 percent decline to R18.3 million in 2023 compared to the previous year, owing to low sales volume. All the produced natural gas and condensate were sold and consumed locally. The natural gas unit price grew by 76.8 percent to R9 462/t in 2023 compared to R5 350/t in 2022, attributed to the tight supply amid high demand. Natural gas condensate unit price declined by 1.6 percent to R17 509/t in 2023, as compared to the previous year. PetroSA's production comes from its offshore production facilities, while Renegen's output is from the onshore Virginia gas project, situated in the Free State Province.

South Africa's demand of natural gas was mainly met by local production from Tetra4 and PetroSA, and imports from Mozambique's Temane and Pande gas fields, via the 865-kilometer (km) pipeline. The pipeline has a capacity of 240 million gigajoules (57.3 Mt) per year. About 50 percent of the imported natural gas goes to Sasol's gas-to-liquid and chemicals plant in Secunda in Mpumalanga Province, and the balance is distributed to other industrial and commercial customers via a pipeline to Free State, Gauteng, Mpumalanga, and Kwa-Zulu Natal provinces. South Africa imported 3.0 Mt of natural gas in 2023 as compared to 2.8 Mt in 2022.

Global gas production increased slightly by 0.3 percent to 392.7 billion cubic feet per day (bcf/d) in 2023 from 391.7 bcf/d in 2022, attributable to improved output from North America, Asia Pacific, and the Middle East. The production increase of 6.22 bcf/d from North America, the Middle East, and Asia Pacific was more than enough to offset the decline from other regions such as CIS, Africa, Europe and South and Central America. North America contributed about 31.5 percent to total production followed by CIS at 19.1 percent, Middle East at 17.6 percent, Asia Pacific at 17.0 percent, Africa at 6.2 percent, Europe at five percent, and South and Central America at four percent.

Global gas consumption remained relatively constant, increasing marginally from 387.9 bcf in 2022 to 388.0 bcf in 2023. North America remained the largest consumer accounting for approximately 27.5 percent, followed by Asia Pacific at 23.3 percent, CIS at 14.9 percent, Middle East at 14.4 percent, Europe at 11.6 percent, Africa at 4.3 percent, and South and Central America at four percent.

South Africa's saleable coal production marginally increased by 0.99 percent to 257.22 Mt, in line with the growth of run-of-mine (ROM) production. The top five major producers in descending order were Seriti Resources accounting for 19.01 percent of total production, Exxaro Resources Ltd (17.93 percent), Sasol Mining (Pty) Ltd (13.32 percent), Thungela Resources (8.31 percent) and Glencore (5.88 percent). These top five producers accounted for 64.45 percent of South Africa's total saleable coal production in 2023. Junior coal producers accounted for the remaining 35.55 percent. With the exclusion of Sasol Mining and Glencore, all other mining companies fall in the category of Black Economic Empowerment (BEE) or junior producers. In 2023, BEE and junior producers accounted for 80.81 percent of the country's total saleable production. The top five BEE producers were, Exxaro Resources, Seriti Coal Pty Ltd, Thungela Resources, Mbuyelo Coal and ARM Coal. Together, these top five BEE companies accounted for 53.77 percent of South Africa's total saleable production.

South Africa produces uranium as a by-product of gold mining. The country's production of uranium increased by 46.5 percent from 159.3 tonnes of uranium (tU) (187.8 uranium oxide (UO₈₃)) in 2022 to 233.3 tU (275.2 UO₈₃) in 2023. The increase in uranium production can be attributed to higher gold production from Moab Operations. All the produced uranium is exported through Nuclear Fuels Corporation of South Africa (Nufcor). Sales quantity grew significantly by 106.4 percent to 236.6 tU (278.9 UO₈₃) in 2023 compared to the previous year.

World uranium production increased by 12 percent from 49 355 tU (58 202 tU₃O₈) in 2022 to 55 300 tU (65 184 tU₃O₈) in 2023, owing to an upsurge in output from Kazakhstan and Canada. Kazakhstan remained the top producer in 2023, contributing 41.8 percent of global production, followed by Canada's 15.0 percent and Namibia's 11.4 percent. South Africa contributed about 0.4 percent to global production.

EMPLOYMENT

The number of employees in the energy sector grew by 4.86 percent to 96 388 in 2023 from 91 920 in 2022, owing mainly to the increased number of employees in the coal and the natural gas industries (Table 25). Coal continued to dominate the energy sector employment accounting for about 99.70 percent of the total jobs, with natural gas accounting for the remainder. For ten consecutive years, the oil industry did not contribute to employment, as PetroSA stopped its operations due to reserves exhaustion.

TABLE 25: EMPLOYMENT AND GROSS REMUNERATION ON MINES AND PLANTS IN THE SOUTH AFRICAN ENERGY INDUSTRY, 2014 – 2023.

YEAR	EMPLOYEES	REMUNERATION	
	Number	R'000	R'000/Employee
2014	87 235	20 795 751	238,39
2015	78 631	20 098 719	255,61
2016	78 086	21 284 622	272,58
2017	83 086	22 618 996	272,24
2018	89 898	26 059 145	289,87
2019	95 382	29 282 847	307,01
2020	90 258	35 148 484	389,42
2021	91 086	30 790 659	338,04
2022	91 920	32 244 608	350,79
2023	96 388	35 148 484	364,66

Source: DMRE, Mineral Economics and Statistics Directorate

Total remuneration increased by 9.01 percent to R35.15 billion, owing to the higher number of employees in 2023 compared to 2022, as well as annual remuneration increments. The average annual per capita earnings in energy sector grew by 3.95 percent to R364 656, owing mainly to the increased earnings in the coal and gas industries.

OUTLOOK

From an energy perspective, the disruptions to Russian energy supplies and the resulting global energy shortages continues to have material and lasting impact on the global energy system. In the South African energy sector, this disruption affects mainly coal trade. Traditional South Africa's coal importer, India, splits its buying depending on the price of coal. Since India is price sensitive, as the South African export price increase, that country shifts towards the cheaper Russian coal and, this impacts negatively on South Africa's coal exports. South Africa's gas industry remains small in comparison to other jurisdictions. However, there are prospects for growth in helium gas production with projects such as D3's helium project in the Free State recording good exploration results.

In 2024, South African coal consumption is expected to increase, reflecting the country's recovery from loadshedding, due to the Eskom's improved performance in energy generation. The continued poor railway performance by operator Transnet Freight Rail (TFR) will however, continue to hamper export growth.

South Africa plans to reduce pollution from coal and increase efficiency in industries through clean coal technologies (CCT). CCT like carbon capture and storage (CCS), coalbed methane (CBM) and underground coal gasification can play a very important role in decreasing the country's carbon footprint. Other technologies include ultra-supercritical low-emission high efficiency (HELE) technology and super-critical fluidised beds (CFBs), as well as co-firing with alternative fuels.

South Africa's Council for Geoscience (CGS) announced that the country's first carbon capture, utilisation and storage (CCUS) research site had been officially inaugurated in August 2024. This marked the conclusion of Phase 1 of South Africa's pilot CCUS project at Leandra in Mpumalanga province. This step followed the completion of a successful geological characterisation study of the site, which included the drilling of a 1 800 m stratigraphic borehole and confirmed the site's suitability for the permanent and safe storage of CO₂. South Africa has been investigating the possibility of CCUS since 2004.

In the short to medium-term leading to 2030, coal will continue to dominate South Africa's energy mix. The gas industry, as well as the nuclear industry have a potential to play an important role in the country's energy mix. Council for Geoscience is undertaking a geoscientific research project in the Karoo Basin, which is believed to host shale gas and uranium resources. The research will assist quantify both the shale gas and uranium resources as well as their economic potential. These two resources will play an important role in decarbonizing the country's economy, as the dependency on coal for electricity generation will be reduced, while also reducing the country's reliance on imports.

The domestic coal prices are expected to increase, owing to inflation. South Africa's coal production is forecasted to increase by more than three percent in 2024. Export prices are expected to be under pressure due to reduced demand from the international market.

South Africa's natural gas and natural gas condensate production is expected to decline further in 2024, given the declining reserves from PetroSA's offshore production facilities and its large contribution to local production. There are no major changes expected in the country's uranium industry in 2024 as there are no new mines that are envisaged to be commissioned soon.

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COAL

KL Revombo

SUPPLY AND DEMAND

South Africa conducted a coal resources and reserves study in 2012 and estimated the nation's reserves at 66 699 million tons (Mt) of coal (Table 26). In the period between 2012 and 2023, approximately 3.9 billion tons of coal were mined; as a result, at the end of 2023, the reserves had dropped to an estimated 63 130.47 Mt. With 6.2 percent of the global coal reserves, South Africa is ranked sixth in the world. The nation will run out of coal in 199 years if current mining rates are maintained.

TABLE 26: WORLD COAL RESERVES, PRODUCTION AND EXPORTS, 2023.

COUNTRY	RESERVES ¹			PRODUCTION ¹			EXPORTS ²		
	Mt	%	Rank	Mt	%	Rank	Mt	%	Rank
South Africa*	66 699	6,2	6	257,2	2,8	7	63,8	4,4	6
Australia	150 227	14,0	3	455,8	5,0	5	348	23,7	2
Canada	6 582	0,6	12	48,6	0,5	13	37	2,5	8
China	143 197	13,3	4	4 710,0	51,8	1	-	-	-
Colombia	4 554	0,4	13	54,5	0,6	12	57	3,9	7
India	111 052	10,3	5	1010,9	11,1	2	-	-	-
Indonesia	34 869	3,2	8	775,2	8,5	3	500	34,1	1
Kazakhstan	25 605	2,4	11	116,4	1,3	8	-	-	-
Poland	28 395	2,6	10	88,7	1,0	10	-	-	-
Mongolia	2 520	0,2	14	83,2	0,9	11	66,7	4,5	5
Russia	162 166	15,1	2	432,5	4,8	6	221	15,1	3
Ukraine	34 375	3,2	9	23,3	0,3	14	-	-	-
Germany	35 900	3,3	7	102	1,1	9	-	-	-
USA	248 941	23,2	1	526,5	5,8	4	84	5,7	4
Other	19 026	1,8	-	410,5	4,5	-	88,5	6,0	-
Total	1 074 108	100,0	-	9 095,6	100	-	1 466,0	100	-

Source: ¹BP Statistical Review of World Energy, June 2024

*DMRE, Mineral Economics and Statistics Directorate – reserves, production

#SARS Customs

²Coal 2023, Analysis and forecast to 2026, International Energy Agency

At the end of 2023, global coal reserves were estimated at 1 074 108 Mt like the previous year because countries did not review their reserves. According to estimates, worldwide coal reserves could last for another two centuries at current consumption rates. The largest coal reserves can be found in countries like the United States, Russia, China, Australia, and India. These countries combined possess more than half of the total global coal reserves. The United States hosts the most coal reserves, accounting for 23.2 percent of global coal, followed by Russia with 15.1 percent, Australia with 14 percent and China with 13.3 percent.

South Africa's run-of-mine (ROM) production grew by 2.02 percent to reach 328.2 Mt in 2023 (Table 26). This growth was realised following an increase in the number of mines from 119 in 2022 to 132 in 2023. With 69.01 percent of all ROM produced, opencast mining continued to be the most popular way of producing coal in the nation. Board and pillar came in second with 22.85 percent, longwall with 0.27 percent, and stooing with 0.05 percent. South Africa's saleable coal production marginally increased by 0.99 percent to 257.22 Mt in line with the growth of ROM production (Table 27). The top five major producers in descending order were Seriti Resources (accounting for 19.01 percent of total production), Exxaro Resources Ltd (17.93 percent), Sasol Mining (Pty) Ltd (13.32 percent), Thungela Resources

(8.31 percent) and Glencore (5.88 percent), These top five producers accounted for 64.45 percent of South Africa's total saleable coal production in 2023. Junior coal producers accounted for the remaining 35.55 percent. With the exclusion of Sasol Mining and Glencore, all other mining companies fall in the category of Black Economic Empowerment (BEE) or junior producers. In 2023, BEE and junior producers accounted for 80.81 percent of the country's total saleable production. The top five BEE producers, Exxaro Resources, Seriti Coal Pty Ltd, Thungela Resources, Mbuyelo Coal and ARM Coal. Together, these top five BEE companies accounted for 53.77 percent of South Africa's total saleable production.

TABLE 27: SOUTH AFRICA'S PRODUCTION AND SALES OF SALEABLE COAL, 2014 – 2023.

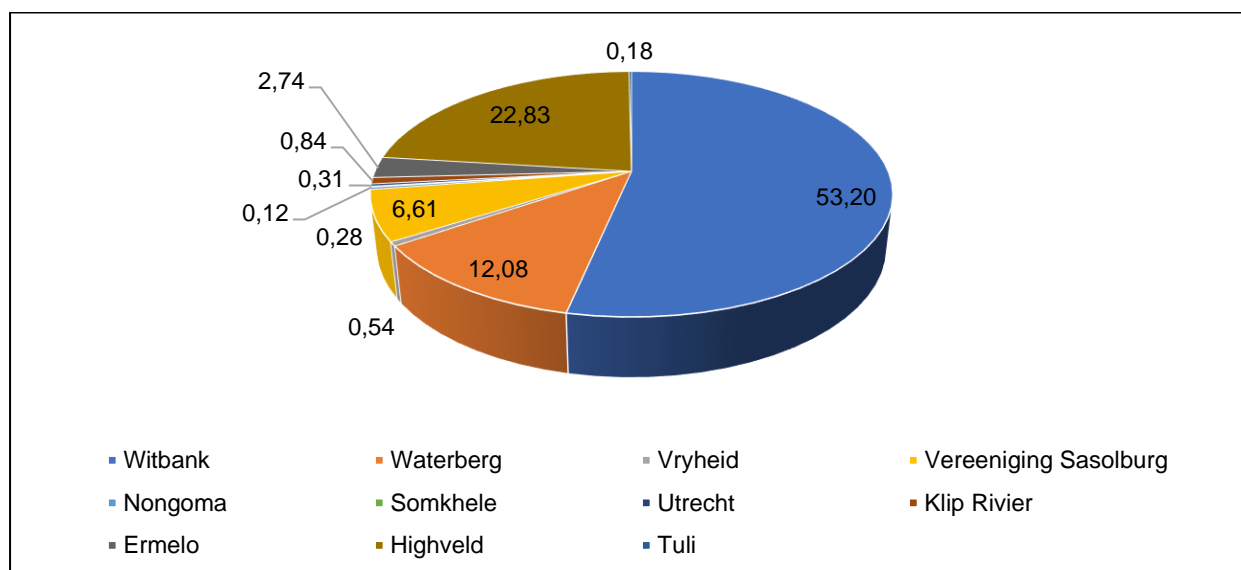
YEAR	PRODUCTION	LOCAL SALES			EXPORT SALES*		
		MASS	VALUE (FOR)		MASS	VALUE (FOB)	
	Mt	Mt	R'000	R/t	Mt	R'000	R/t
2014	261,40	183,00	54 924 215	300	75,40	50 881 592	675
2015	252,20	179,20	56 586 469	316	75,40	47 560 905	631
2016	250,57	183,30	61 445 037	339	73,60	53 905 148	732
2017	260,10	181,30	69 055 619	381	79,80	69 788 115	875
2018	253,55	171,78	68 727 949	400	79,57	77 043 285	968
2019	265,11	187,68	82 952 486	442	77,44	61 019 573	788
2020	264,50	190,20	85 020 498	452	74,30	59 936 853	807
2021	250,60	184,51	88 966 444	482	66,10	88 814 664	1 343
2022	254,70	190,00	110 655 979	582	64,70	215 420 981	3 330
2023	257,22	199,74	121 988 116	611	63,82	123 378 778	1 933

Source: Mineral Economics and Statistics Directorate, DMRE

* South African Revenue Services Customs

With almost 53.2 percent of the country's total saleable production in 2023 (Figure 13), the Witbank coalfield is still the biggest producer. It was distantly followed by the Highveld coalfield, accounting for 22.83 percent of saleable production, and Waterberg, (12.08 percent), and Sasol-Vereeniging (6.61 percent). The Witbank, Highveld, and Ermelo coalfields comprised the Mpumalanga Central basin, which constituted 78.77 percent of the nation's total production in 2023.

FIGURE 13: SOUTH AFRICA'S COAL PRODUCTION BY COALFIELD, 2023.



Source: Mineral Economics and Statistics Directorate, DMRE

South Africa's anthracite saleable production, decreased by 9.91 percent to 2.50 Mt (Table 28) as one of the major anthracite producers was put on care maintenance for a couple of months.

TABLE 28: SOUTH AFRICA'S PRODUCTION AND SALES OF ANTHRACITE, 2014 – 2023.

YEAR	LOCAL SALES				EXPORT SALES*		
	PRODUCTION	MASS	VALUE (FOR)		MASS	VALUE (FOB)	
	kt	kt	R'000	R/t	kt	R'000	R/t
2014	3 517	1 917,9	1 888 234	985	2 178	1 588 858	730
2015	3 396	1 800,0	1 851 799	1029	1 602	1 239 071	773
2016	2 628	1 663,0	1 676 092	1008	1 930	1 340 023	694
2017	2 886	1 867,0	2 026 923	1085	1 766	1 459 951	826
2018	3 317	2 163	2 281 611	1 055	1 551	1 620 376	1 045
2019	3 808	2 325	2 792 785	1 201	1 263	1 287 814	1 020
2020	3 349	2 090	2 085 232	998	1 259	1 180 612	938
2021	4 111	1 867	2 206 129	1 182	2 490	2 995 956	1 201
2022	2 777	1 664	2 934 719	1 764	1 113	2 605 600	2 340
2023	2 502	1 687	3 084 586	1 828	7 152	706 259	2 694

Source: Mineral Economics and Statistics Directorate, DMRE

* South African Revenue Services

Bituminous coal production, which accounted for more than 98 percent of South Africa's total saleable coal production, increased by 1.11 percent to 254.72 Mt (Table 29).

TABLE 29: SOUTH AFRICA'S BITUMINOUS COAL PRODUCTION AND SALES, 2014 – 2023.

YEAR	LOCAL SALES			EXPORT SALES*			
	PRODUCTION	MASS	VALUE (FOR)		MASS	VALUE (FOB)	
	Mt	Mt	R'000	R/t	Mt	R'000	R/t
2014	257,9	181,1	53 035 981	293	73,2	49 292 734	673
2015	248,8	177,4	54 734 670	309	73,8	46 321 834	628
2016	250,6	179,6	59 768 946	333	71,7	52 565 125	733
2017	260,1	179,5	67 078 699	374	78,0	68 328 163	876
2018	250,2	169,6	66 446 339	392	78,0	75 422 910	967
2019	261,5	185,3	80 159 701	432	76,2	59 731 759	784
2020	261,9	188,9	82 913 742	439	73,0	58 756 205	805
2021	246,2	182,6	86 760 315	475	63,6	85 818 708	1 350
2022	251,9	188,3	110653044	582	63,6	215418376	3 357
2023	254,72	198,05	118903530	600	56,66	122672519	2 165

Source: Mineral Economics and Statistics Directorate, DMRE

* South African Revenue Services

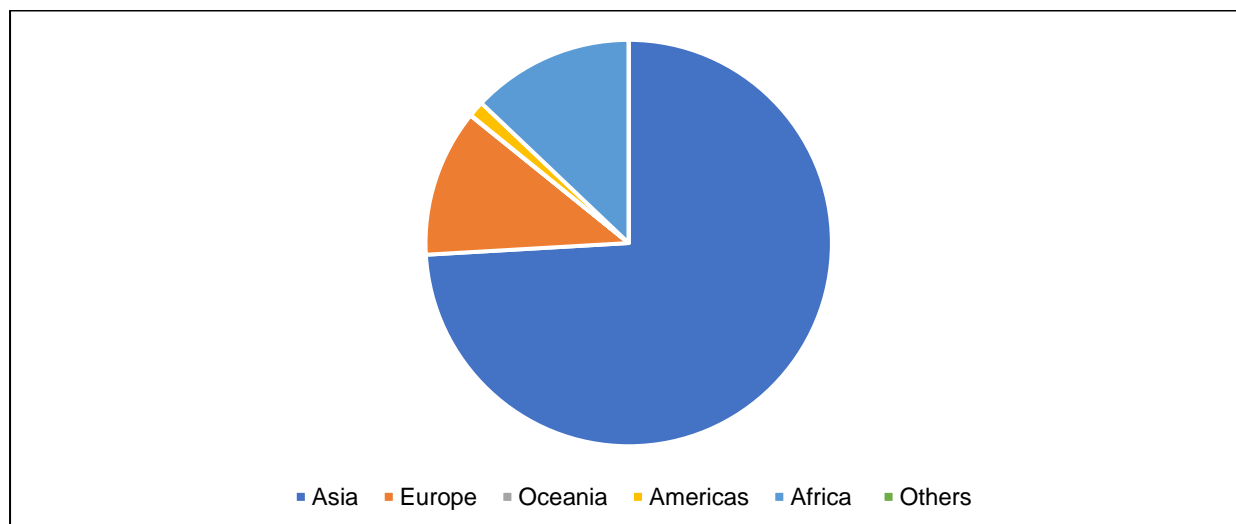
In 2023, global coal production reached its highest ever level (9 095.6 Mt), beating the previous high set in 2022. China continued to be the leading coal producer globally, accounting for about 51.8 percent of the total global coal production, followed distantly by India (11.1 percent) and Indonesia (8.5 percent). The Asia Pacific region accounted for nearly 80 percent of global output with activity concentrated in just four countries, Australia, China, India, and Indonesia.

South African coal exporters continued facing challenges in 2023; and these were compounded by declining global prices, which put pressure on some firms' breakeven costs. The myriads of challenges plaguing Transnet Freight Rail (TFR) continued into 2023 and led to reduced mineral exports. As a result, compared to 2022, South Africa's coal exports fell by 1.36 percent to 63.82 Mt in 2023, ranking 6th globally (Table 26).

Asia remained the top consumer of South Africa's coal for fifteen years running, making up 74.08 percent of the country's total exports in 2023. Africa and Europe were in second and third, respectively, with 12.91 and 11.71 percent (Figure 14).

India remained the country's top importer of coal in 2023, accounting for 39.92 percent of South Africa's total exports. South Korea followed second with 9.56 percent and Mozambique with 6.83 percent. Africa imported 6.83 percent of South Africa's exports, and the top three African buyers of South African coal were Mozambique, Mauritius (2.23 percent) and Morocco (1.04 percent) round out.

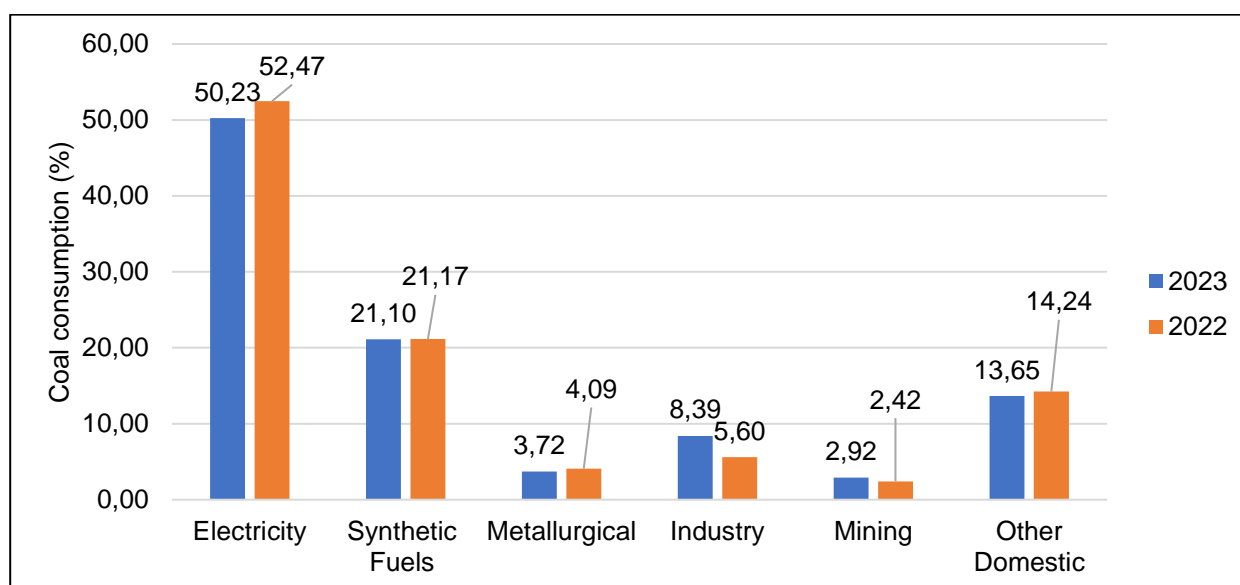
FIGURE 14: SOUTH AFRICA'S EXPORT BY REGIONAL DESTINATION, 2023.



Source: South African Revenue Services Customs

South Africa's coal consumption grew by 5.13 percent to 199.74 Mt in 2023 owing to increases in the industrial and mining sectors (Figure 15).

FIGURE 15: LOCAL COAL CONSUMPTION BY SECTOR (PERCENTAGE), 2023.



Source: DMRE, Mineral Economics and Statistics Directorate

Global coal consumption increased by 1.6 percent from the 2022 levels, seven times higher than the previous ten-year average growth rate. China remained the top consumer accounting for 56 percent of the total global coal consumption, followed by India (13.4 percent) and US (5 percent).

China leads the world in the number of coal fired power stations, with 1 161 operating coal power stations, followed by India (285), United States (204) and Indonesia (90) coal power stations (Table 30). South Africa ranked 17th with 18 coal fired power stations.

TABLE 30: NUMBER OF OPERATING COAL FIRED POWER STATIONS IN THE WORLD, 2023.

Country/Area	Operating [#]	CO ₂ Emissions (2022) ^{##}	
	No	Tons	Share of world (Percentage)
China	1 161	12 667 428 430	32.88
India	285	2 693 034 100	6.99
United States	204	4 853 780 240	12.6
Indonesia	90	692 236 110	1.8
Japan	89	1 082 645 430	2.81
Russia	65	1 909 039 310	4.96
Germany	48	673 595 260	1.75
Poland	41	321 954 000	0.84
Turkey	34	481 247 520	1.25
Philippines	27	155 380 930	0.4
South Africa	18	404 974 510	1.05
Rest of the World	360		32.67
Total	2422		100

Source: Global Energy Monitor, <https://globalenergymonitor.org/> [accessed 12 September 2024]

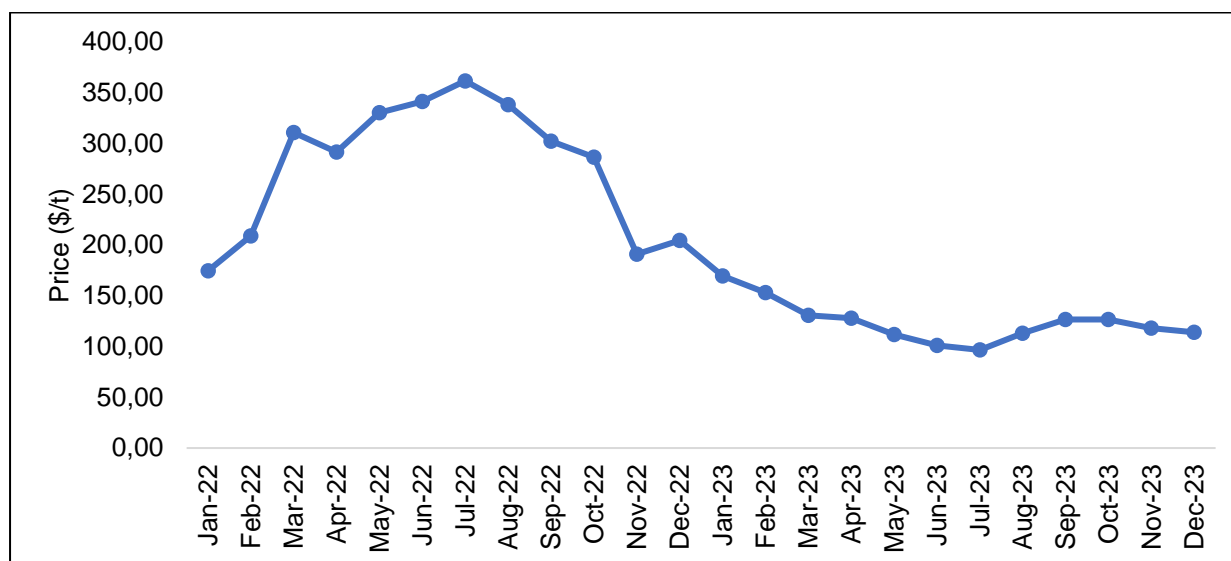
<https://www.worldometers.info/co2-emissions/co2-emissions-by-country/> (2022 emissions figures are the latest available)

Prices and revenue

The average price of coal exports from South Africa fell to \$124.07 per ton in 2023, a dramatic decrease of 55.43 percent from the \$278.36 per ton average the year before. This was the lowest price for the country's coal exports. Prices started the year at \$169.49 per ton and dropped until July, reaching a minimum of \$96.60 per ton in 2023 (Figure 16). The European supply glut, weak economic growth, and falling gas prices all contributed to the export prices' downward spiral. The weak European and Indian demand exacerbated the price situation. These factors also had adverse effect on the demand for coal in the electricity industry. This notable decline was further supported by a steady supply and a steadily rising penetration of renewable energy.

The following three months saw a brief recovery in prices, which increased to \$113.06 per ton in August and stabilized at \$126.63 and \$126.56 per ton in September and October, respectively, as worries about the world's energy supply stimulated the global markets due to tight supplies, improving demand from Europe and India, and rail problems. Prices fell as low as \$118.18 per ton in November 2023 and ended the year at \$114 per ton in December 2023 because of purchasers' resistance to the present price levels and sluggish demand from large customers because of good port stockpiles.

FIGURE 16: RBCT MONTHLY COAL PRICES, JANUARY 2022 – DECEMBER 2023.



Source: Global Coal website (www.globalcoal.com)

Revenue from all coal sales fell to R245 billion in 2023 from R326 billion in 2022, a 24.75 percent decrease. Lower export volumes and prices served as the foundation for this enormous decline in revenue. Because of rising domestic pricing and higher sales volumes, the domestic coal market helped to offset reduced export revenues, with revenue from local coal sales increasing by 10.24 percent. For the eleventh year running, coal continues to be the largest source of revenue, with gold coming in second at R104 billion and haematite (iron ore) third at R88.7 billion.

Projects / New mines

In 2023 seven mines came online (Table 31). These seven mines added about 808 employees into the coal industry.

TABLE 31: COAL PROJECTS THAT CAME ONLINE IN 2023

Nature Investment	Project /Mine Name	Controlling Group	Jobs
Greenfield	Ruitkuil Colliery	Smats Engineering & Projects (Pty) Ltd	97
Greenfield	Notre Coal	Notre Coal	15
Greenfield	Uitkyk Colliery	Tafelkop Mining House (Pty) Ltd	109
Greenfield	Weltevreden Colliery	Opsirex Pty Ltd	206
Greenfield	Izwelethu Colliery	Ericure (Pty) Ltd	33
Greenfield	Siphiwo Colliery	Siphiwo Investments (Pty) Ltd	83
Brownfield	Uitspan Colliery	Uitspan Colliery (Pty) Ltd	265

Source: DMRE, Mineral Economics and Statistics Directorate

Employment

In 2023, employment in the coal industry increased from 91 726 in 2022 to 96 096 in 2023, a 4.76 percent increase (Table 32). The new mines and operations ramping up production which lead to employment opportunities led to this growth. The coal industry employed 20 percent of the 480 427 mining workforce. Compared to the 3.84 percent growth in the number of male employees, the number of female employees increased by 9.45 percent. In the coal industry, men made up most workers accounting for 83 percent of all employed individuals, while women made up 17 percent.

TABLE 32: EMPLOYMENT IN THE COAL SECTOR, 2012 – 2023.

Year	Average number of employees			Earnings - R1 000		
	Total	Males	Females	Total	Males	Females
2012	78 579	71 542	7 037	16 039 447	14 469 109	1 570 338
2013	88 039	79 270	8 769	18 949 314	16 855 402	2 093 913
2014	86 242	77 109	9 133	20 581 868	18 156 465	2 425 403
2015	77 747	68 820	8 927	19 932 153	17 412 771	2 519 383
2016	77 259	67 944	9 315	21 111 665	18 370 819	2 740 845
2017	82 372	72 016	10 356	22 441 979	19 455 895	2 986 084
2018	89 790	78 052	11 738	25 948 907	22 333 840	3 615 068
2019	95 221	81 480	13 741	29 141 076	24 770 531	4 370 545
2020	90 086	76 250	13 836	30 374 024	25 630 533	4 743 491
2021	90 896	76 704	14 192	30 629 459	25 673 303	4 956 156
2022	91 726	76 605	15 121	32 091 798	26 626 492	5 465 306
2023	96 096	79 546	16 550	34 978 128	28 693 872	6 284 255

Source: DMRE, Mineral Economics and Statistics Directorate

The increase in employment drove an 8.99 percent growth in total earnings to R34.99 billion in the coal industry in 2023. Similarly, the per capita earnings rose by 4 percent to R363 992. Although the proportion of male employees remained high, female employees' incomes increased by 14.98 percent, while male employees' earnings increased by 7.76 percent. This essentially indicates that while the bulk of male workers are still mass contract workers, the new female employees are working in the high skill areas of the coal mining industry.

KEY DEVELOPMENTS

January

To assist in resolving an extraordinary power crisis, the government of South Africa eliminated all licensing procedures for private power plants. The action may result in a sharp increase in independent power projects as companies try to wean themselves off Eskom.

The Gugulethu Colliery in Mpumalanga being built by Canyon Coal was scheduled to begin producing in the latter part of 2023. Canyon coal invested R600 million in this greenfield project which will unfold

in two phases over its 20-year life of mine. The first phase comprising three open cast pits and processing plant and the second phase consisting of underground operations scheduled to take place in seven years' time. It was anticipated that the Gugulethu project's first phase, which should be finished in eight to ten months, will generate 1.2 Mt of 5,500 kc NAR material annually for sale to consumers in Asia and Europe from its 14.3Mt reserve run-of-mine (ROM) coal. This phase of the mine will create more than 200 jobs, with priority given to residents of the host community. When fully operational, the mine will create a total of 430 jobs.

February

Heavy rains and floods in South Africa disrupted coal mining operations, slowing regional exports, and forcing state utility Eskom to shut a key power station.

April

South Africa's president announced that the country will phase out coal generation at a pace that ensures energy security, while meeting its target of net zero emissions by 2050.

Canyon Coal, a subsidiary of private investment firm Menar Group, announced that it will invest ZAR1.4bn (\$60m) in developing its Gugulethu Colliery and Thuso mining project. Menar was among several miners, including Anglo American and Seriti Resources, to announce investment commitments at President Cyril Ramaphosa's South African Investment Conference. Production at Canyon's Gugulethu project was expected to start in the second half of 2023, with output of 1.2 Mt/y of 5,500 kc NAR material. Formerly known as De Wittekrans, Gugulethu is a greenfield project located southeast of Hendrina that Canyon bought out of business rescue. Phase 1 of the project holds an economically mineable reserve of 14.3 Mt of ROM coal. It comprises of three pits, one of which has been specifically designed to gain access to the underground reserve, as part of Phase 2. The coal will be trucked some 43 km to the Rietkuil siding for transportation to the Richards Bay Coal Terminal. All of Canyon Coal's export allocation at the terminal is in use but the capacity for Gugulethu's tonnages will free up when the company's 1.4 Mt/y Phalannawa Colliery in Delmas is closed later in 2023 when it reaches the end of its life.

After more than a decade trading on the Johannesburg Stock Exchange, Buffalo Coal Corporation delisted after obtaining shareholder approval for a transaction that will take the company private. The junior coal miner, which has been listed on the Johannesburg and Toronto stock exchanges since 2011, delisted from the Toronto exchange at the end of trading on 21 April and delisted on the JSE's Alternative Exchange on 28 April. With a market capitalisation of ZAR75m (\$4 m) on the JSE, the company announced it had obtained shareholder approval and completed a transaction that valued its shares at about ZAR103m (\$6m).

May

South Africa's hopes for a quick fix to its rail crisis looked more unlikely after a senior government delegation failed to secure a deal with Transnet's locomotive supplier in China. This is after President Cyril Ramaphosa sent a delegation led by Minister of Public Enterprises Pravin Gordhan to China in a bid to smooth over an impasse with the state-owned China Railway Rolling Stock Corporation (CRRC), which has refused to supply Transnet with critical spare parts for its locomotives. The CRRC locomotives directly impact three major corridors, North, Northeast, and Cape corridors, that account for approximately 50 percent of Transnet Freight Rail's revenue, and support three primary mining segments: export coal, chrome, and manganese,

July

A South African court gave Tendele Mining the go ahead to extend the life of the Somkhele anthracite and thermal coal mine, dismissing a legal challenge from activist groups that forced most operations to be halted for more than a year. The ruling by the Pietermaritzburg High Court effectively greenlights Tendele's plan to extend the life of its mine by 10 years. The mine, which for 15 years employed 1,200

workers and produced 1.3 Mt/y of anthracite coal for the domestic ferrochrome and ferromanganese industries, as well as for Brazilian sintering plants, shut down in July 2022 after its resources were depleted and its expansion plans were stalled by legal and administrative opposition launched by environmental justice groups. The mine also produced, and could continue to produce, 0.35 Mt/y of thermal coal

August

JSE-listed Salungano Group subsidiary Wescoal Mining entered into voluntary business rescue as a contractor seeks its liquidation.

Sasol, a producer of synthetic fuels and chemicals, is determined to reduce its post-2030 coal usage by 25 percent in a bid to meet its climate change commitments. The company, one of South Africa's biggest coal producers, said its coal usage will drop from 40 Mt/y currently to 30 Mt/y after 2030. The reduction in coal consumption at Sasol's Secunda operations – which is the largest single-point emitter of greenhouse gas in the world - is key if the group is to realise its commitment to cut its greenhouse gas emissions by 30 percent by 2030.

In another development, South Africa's Salungano Group placed its subsidiary, Wescoal Mining, into voluntary business rescue, after a mining contractor withdrew legal action requesting the unit's liquidation. The liquidation application was withdrawn and Wescoal Mining commenced with a voluntary business rescue process. The company the 0.8 Mt/y Khanyisa and 2.5 Mt/y Elandspruit mines. Earlier in the same month the Johannesburg Stock Exchange suspended the listing of Salungano's shares after the company failed to publish its annual financial results within the required four-month window.

September

A wave of retrenchments in South Africa's coal mining sector has underscored the increasingly troubled state of the industry as it grapples with continued railing constraints, which were also exacerbated by lower coal prices. Several coal mines owned by Glencore, Salungano, Seriti Resources and Thungela Resources kicked off a retrenchment processes largely because of logistics troubles, which have eroded the economics of the operations.

As the South African government develops its critical minerals strategy, Minister of Mineral Resources and Energy Gwede Mantashe said coal should be included in the list. The minister also urged resource-rich African nations to urgently develop their own critical minerals strategies.

Critical minerals strategies will have significant implications for strategic planning, prioritisation, and investment. The African approach to defining critical minerals "must be holistic, with consideration of our national and continental needs, and global trends.

October

The South African Revenue Service and other government agencies uncover a coal smuggling syndicate that operates across five provinces, Gauteng, Mpumalanga, KwaZulu-Natal, the Free State and Limpopo. The network of coal smugglers is suspected to consist of local and foreign nationals, including former Eskom employees who facilitated procurement fraud. According to Sars, coal trucks destined for power stations were diverted to designated coal yards where high-grade coal was replaced with low-grade or sub-standard product. It is estimated that the syndicate defrauds the tax collector of more than R500-million.

The South African government announced that it is delaying the decommissioning of Eskom's coal-fired power plants. This follows the closure of the Komati power station late in 2022. Cabinet agreed that the current generation fleet must be maximised based on a broader socio-economic benefit analysis and interest of securing energy security.

November

South Africa's Tshiamo Group acquired Thungela Resource's Umlalazi thermal coal mine, which has not been in operation for more than a year. Tshiamo acquired the Mpumalanga opencast mine through its partnership with the Golden Bush Baby Trust. Tshiamo did not disclose how much it paid for the mine. Umlalazi will be operated through Saldomate Proprietary Ltd, which is 50 percent owned by Tshiamo. The mine, which has reserves estimated at around 15 Mt of ROM coal, was placed under care and maintenance by Thungela in H1 of 2022 after reaching its end of life. The mine includes a dense medium separation (DMS) plant that can produce sized coal products (nuts, peas and duffs) for domestic and export markets

December

South Africa's energy minister pushed back against growing pressure from Western countries to accelerate its coal phase-out, saying it will transition into greener fuels at its own pace. Cabinet approved a new timeline for the decommissioning of Eskom's coal-fired power plants, as part of its revised long-term energy plan.

A Hong Kong-based takeover vehicle has reached a 64.3 percent stake in MC Mining, a South Africa-focused coal producer set to bring its Makhado metallurgical coal project into production in mid-2025. Goldway Capital Investment (GCI) was formed by some of MC Mining's largest shareholders and launched an off-market takeover for the Australian-listed company in early November. GCI aimed to acquire the remaining 35.7 percent of MC Mining shares not already in its hands. They include South African companies Senosi Group with 23.38 percent of MC Mining's shares and Dendocept with 6.93 percent, and Hong Kong companies Shining Capital (8.58 percent) and Pacific Goal Investment (6.11 percent), according to an 18 December notice to the Australian Securities Exchange. Senosi Group has the largest shareholding in GCI at 41.23 percent, followed by Eagle Canyon International Group based in Hong Kong on 17.85 percent, while Dendocept, Pacific Goal and Golden Eagle Trust have 6.93 percent, 6.11 percent and 6.50 percent shares, respectively. Other significant members of the GCI takeover group are MC Mining shareholders Jun Liu at 1.65 percent, Yi He with 2.12 percent, and Ying He Yuan Investment company with 5.25 percent. Jun Liu and Lu Zhang are listed as jointly holding 6.6 percent of MC Mining's shares in its 2023 annual report.

Outlook

In 2024, global coal demand is expected to stay broadly flat as a result of the diminishing role of coal in global energy. However, coal will continue to be widely used for electricity generation and industrial processes for decades. In the short and medium terms, coal will continue to dominate the South Africa's energy generation space. Logistics constraints continue to hamper growth in South Africa's coal industry. Coal production growth will be depended on the resolution of TRF's logistical challenges, demand from the domestic market, especially Eskom and coal prices.

It is forecasted that South Africa's coal production will remain stable at current levels in 2024. However, geopolitics, economic activity, natural gas prices and other factors could still sway production to slightly increase. Domestic coal prices will continue to increase due to the country's high inflation while export prices will be under pressure due the declining demand from the international markets as countries are moving to cleaner energy production sources.

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HYDROCARBON FUELS

KJ Tshetlhanyane

SUPPLY AND DEMAND

- **Oil**

World proven oil reserves were estimated at 1 732.4 billion barrels in 2023 (Table 33). By region, the Middle East holds the largest oil reserves globally, accounting for 48.3 percent, followed by South and Central America's 18.7 percent, North America's 14.0 percent, and the Commonwealth of Independent States (CIS) at 8.4 percent.

Africa holds the fifth largest reserves at 7.2 percent, followed by Asia Pacific's 2.6 percent and Europe's 0.8 percent. South Africa's oil and gas industry has had over 300 exploration wells drilled since 1965, which resulted in several discoveries of oil and gas fields situated in Bulpradda Basin, Bredasdorp Basin, and the Outeniqua Basin. Consequently, the Bredasdorp Basin and the Outeniqua Basin discoveries resulted in commercial production of crude oil, which ceased in 2013. Though South Africa is currently not producing crude oil, the country's nascent oil and gas industry has an estimated 15 billion barrels of oil resources.

TABLE 33: WORLD RESERVES AND PRODUCTION OF OIL AND NATURAL GAS, 2023

COUNTRY	Proved Reserves				Production			
	Oil		Gas		Oil		Gas	
	bbl x 10 ⁹	%	m ³ x 10 ¹²	%	1000 bb/d	%	m ³ x 10 ⁹	%
OPEC COUNTRIES								
Algeria	12,2	0,7	2,3	1,2	1 408	1,5	101,5	2,5
Angola	7,8	0,5	-	-	1 150	1,2	0	-
Congo	2,9	0,2	-	-	278	0,3	0	-
Equatorial Guinea	1,1	0,1	-	-	88	0,1	0	-
Gabon	2	0,1	-	-	223	0,2	0	-
Iran	157,8	9,1	32,1	17,1	4 662	4,8	251,7	6,2
Iraq	145	8,4	3,4	1,8	4 355	4,5	9,9	0,2
Kuwait	101,5	5,9	0,7	0,4	2 908	3,0	13,5	0,3
Libya	48,4	2,8	1,4	0,7	1 271	1,3	16,3	0,4
Nigeria	36,9	2,1	5,5	2,9	1 540	1,6	43,7	1,1
Qatar	25,2	1,5	24,7	13,1	1 772	1,8	181	4,5
Saudi Arabia	297,5	17,2	6	3,2	11 389	11,8	114,1	2,8
United Arab Emirates	97,8	5,6	5,9	3,1	3 992	4,1	55,6	1,4
Venezuela	303,8	17,5	6,3	3,3	853	0,9	29,7	0,7
Subtotal	1 241,2	71,6	88,3	46,9	35 889	37	817	18
OTHER SELECTED COUNTRIES								
Argentina	2,5	0,1	0,4	0,2	1074	1,1	41,6	1,0
Australia	2,4	0,1	2,4	1,3	383	0,4	151,7	3,7
Brazil	11,9	0,7	0,3	0,2	3 502	3,6	23,4	0,6
Brunei	1,1	0,1	0,2	0,1	93	0,1	10	0,2
Canada	168,1	9,7	2,4	1,3	5 653	5,9	190	4,7
China	26	1,5	8,4	4,5	4 198	4,4	234,3	5,8
Europe	13,6	0,8	3,2	1,7	3 225	3,3	204,3	5,0
CIS	146,2	8,4	56,6	30,1	13 868	14,4	773,6	19,1
India	4,5	0,3	1,3	0,7	728	0,8	31,6	0,8
Malaysia	2,7	0,2	0,9	0,5	565	0,6	81,1	2,0
Mexico	6,1	0,4	0,2	0,1	2 040	2,1	36	0,9
Oman	5,4	0,3	0,7	0,4	1 049	1,1	43,2	1,1
USA	68,8	4	12,6	6,7	19 358	20,1	1035	25,5
Other	31,9	1,9	10,2	5,4	4 751	4,9	386	9,5
Subtotal	491	28,4	99,8	53,1	60487	62,8	3241,9	79,9
Total	1 732,4	100	188,1	100	96376	100	4059,2	100

Source: Energy Institute Statistical Review of World Energy, 2024.

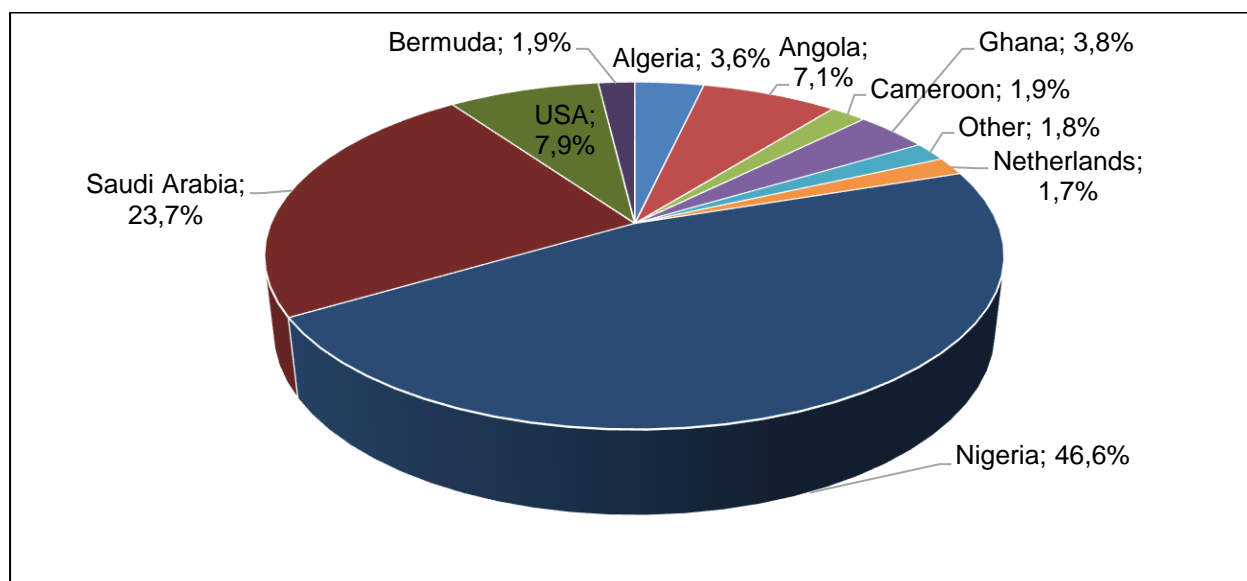
OPEC: Organization of the Petroleum Exporting Countries.

UAE: United Arab Emirates, USA: United States of America

Notes: + Includes crude oil, shale oil, oil sands and natural gas liquids and excludes liquid fuels derived from other sources such as coal.

South Africa relies heavily on imports, to meet the demand of its oil requirements used to produce petroleum products (liquid fuels, bitumen, lubricants, solvents, and other petrochemicals), with a small share sourced locally. Locally sourced oil requirements are from Sasol Secunda's coal to liquid refinery and Petroleum Oil and Gas Corporation of South Africa's (PetroSA) Mossel Bay refinery gas to liquid, contributing about 27 percent to total domestic oil requirements. The remaining share comes from other refineries (National Petroleum Refineries of South Africa (Natref), South African Petroleum Refineries (Sapref), Engen Refinery (Enref), and Astron Refinery) importing crude oil. In 2023, South Africa imported about 7.3 million tons (Mt) of crude oil, a 17.1 percent increase compared to 6.1 Mt in 2022. Unlike in the year 2022, no refineries were temporarily shut down during the year 2023. The primary sources of these imports were Nigeria, which accounted for 46.6 percent of total crude oil imports, followed by Saudi Arabia at 23.7 percent and the USA at 7.9 percent (Figure 17).

FIGURE 17: SOUTH AFRICA'S CRUDE OIL IMPORTS, 2023.



Source: South African Revenue Services, 2023.

Global oil production increased by 2.2 percent to 96.3 million barrels per day (bl/d) in 2023 compared to 94.3 million bl/d in 2022, fueled by output from South and Central America, North America, and Africa. Middle East and CIS were the only regions to register production decline, during the period under review. The Middle East contributed about 31.5 percent to total production, followed by North America at 28.1 percent, CIS at 14.4 percent, South and Central America at 7.6 percent, Asia Pacific at 7.5 percent, Africa at 7.5 percent, and Europe at 7.5 percent.

Global oil consumption improved by 2.6 percent to 100.2 million bl/d in 2023 compared to 97.7 million bl/d in 2022. This growth was primarily fueled by China's relaxation of Covid-19 policies to curb the virus. Regionally, Asia Pacific, North America, South and Central America, the Middle East, CIS, and Africa recorded an increase, except for Europe. Asia Pacific accounted for 38.0 percent of total consumption followed by North America at 23.2 percent, South and Central America at 6.4 percent, Middle East at 9.6 percent, CIS at 4.6, and Africa at 4.2. Europe was responsible for 13.9 percent of total oil consumption.

- **Gas**

The world-proven gas reserves amounted to 6,641.8 trillion cubic feet (Tcf) in 2023 (Table 34). Middle East held the largest reserves, accounting for 40.3 percent of the total global reserves, followed by CIS's 30.1 percent, Asia Pacific's 8.8 percent, and North America's 8.1 percent. Africa is ranked fifth with just 6.9 percent, followed by South and Central America's 4.2 percent, and Europe's 1.7 percent. The African continent has an estimated 445.2 Tcf of proven gas reserves. Nigeria (193.3 Tcf), Algeria (80.5 Tcf), and Egypt (75.5 Tcf) are the top three African countries with large gas reserves.

South Africa's gas resources were estimated at approximately 0.00096 Tcf, 20 to 30 Tcf of coalbed methane, and 30 Tcf of recoverable shale gas. However, with such estimated resources, there were only two natural gas producers, Petroleum Oil and Gas Corporation of South Africa (PetroSA) and Renegen in 2023.

TABLE 34: PRODUCTION, SALES, AND REVENUE OF NATURAL GAS AND CONDENSATE, 2014 TO 2023.

Year	Natural Gas		Natural Gas Condensate	
	Production (t)	Revenue (R')	Production (t)	Revenue (R')
2014	849 161	2 312 724 863	88 803	1 059 805 975
2015	1 049 537	1 966 303 015	70 978	528 037 562
2016	645,784	1 169 034 383	38 796	275 666 895
2017	589 702	1 200 018 469	31 145	256 532 594
2018	491 715	1 221 606 074	23 770	248 360 100
2019	526 222	1 360 123 140	29 774	309 307 621
2020	442 951	870 103 320	31 974	245 366 783
2021	34 891	44 656 444	15 633	188 323 981
2022	3 656	19 562 918	4 946	88 002 544
2023	4 008	37 927 182	1 044	18 279 969

Source: DMRE, Mineral Economics and Statistics Directorate.

PetroSA's production comes from its offshore production facilities, while Reenergy's output is from the onshore Virginia gas project, situated in the Free State Province. South Africa's production of natural gas increased by 9.6 percent to 4.0 kilotonnes (kt) in 2023, from 3.7 kt in 2022, driven by improved output from Reenergy's Tetra4 (Table 35). Natural gas condensate output recorded a 78.9 percent decline to 1.0 kt, during the period under review, driven by diminishing reserves at PetroSA's offshore production facilities. Revenue earned from the sale of natural gas grew by 93.9 percent from R19.6 million in 2022 to R37.9 million in 2023, driven by high sales volume and unit price (Table 35). Natural gas condensate sales revenue recorded a 79.2 percent decline to R18.3 million in 2023 compared to the previous year, owing to low sales volume. All the produced natural gas and condensate were sold and consumed locally. The natural gas unit price grew by 76.8 percent to R9 462/t in 2023 compared to R5 350/t in 2022, attributed to the tight supply amid high demand. Natural gas condensate unit price declined by 1.6 percent to R17 509/t in 2023, as compared with the previous year.

Natural gas consumption was mainly met by local production from Tetra4 and PetroSA, and imports from Mozambique's Temane and Pande gas fields, via the 865-kilometer (km) pipeline. The pipeline has a capacity of 240 million gigajoules (57.3 Mt) annually. About 50 percent of the imported natural gas goes to Sasol's gas-to-liquid and chemicals plant in Secunda in Mpumalanga Province, and the balance is distributed to other industrial and commercial customers via a pipeline to Free State, Gauteng, Mpumalanga, and Kwa-Zulu Natal provinces. South Africa imported 3.0 Mt of natural gas in 2023 compared to 2.8 Mt in 2022.

Global gas production increased slightly by 0.3 percent to 392.7 billion cubic feet per day (bcf/d) in 2023 from 391.7 bcf/d in 2022 attributable to improved output from North America, Asia Pacific, and the Middle East. The production increase of 6.22 bcf/d from North America, the Middle East, and Asia Pacific was more than enough to offset the decline from other regions such as CIS, Africa, Europe and South and Central America. North America contributed about 31.5 percent to total production followed by CIS at 19.1 percent, Middle East at 17.6 percent, Asia Pacific at 17.0 percent, Africa at 6.2 percent, Europe at five percent, and South and Central America at four percent.

Global gas consumption remained relatively constant, increasing marginally from 387.9 bcf in 2022 to 388.0 bcf in 2023. North America remained the largest consumer accounting for approximately 27.5 percent, followed by Asia Pacific at 23.3 percent, CIS at 14.9 percent, Middle East at 14.4 percent, Europe at 11.6 percent, Africa at 4.3 percent, and South and Central America at four percent.

EMPLOYMENT

The natural gas industry employed 292 employees in 2023, a 50.5 percent increase compared to 194 in 2022, driven by more employees from Renergen’s Tetra4 (Table 35). Total earnings rose by 9.3 percent to R170.3 million in 2023, up from R155.8 million in 2022. However, per capita earnings fell by 25.9 percent to R583 411, during the same period due to many low-income employees.

TABLE 35: SOUTH AFRICA’S HYDROCARBON EMPLOYMENT, 2014-2023.

YEAR	TOTAL EMPLOYMENT	TOTAL EARNINGS (R')	PER CAPITA EARNINGS (R')
2014	253	135 481 087	535 498
2015	261	108 365 808	415 195
2016	125	88 304 737	706 438
2017	129	99 065 753	767 952
2018	145	121 491 010	837 869
2019	161	141 037 812	876 011
2020	172	161 362 943	938 157
2021	190	161 199 906	846 935
2022	194	152 810 010	787 680
2023	292	170 356 018	583 411

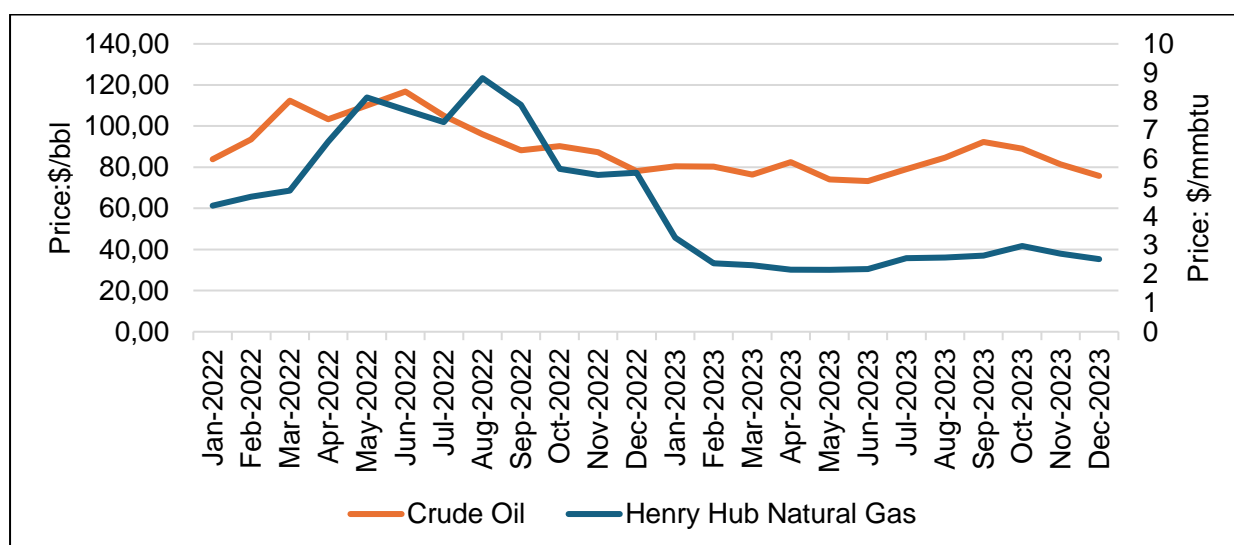
Source: DMRE, Mineral Economics and Statistics Directorate.

PRICES

- Crude oil

Due to weak demand, the annual average crude oil price declined by 16.8 percent from \$97.1/bbl in 2022 to \$80.8/bbl in 2023 (Figure 18). Crude oil prices remained moderate in the first half of 2023, hovering around \$73.4/bbl and \$80.4/bbl. However, there was a slight increase in the second half of 2023, which saw prices increase from \$78.9/bbl in July 2023 to \$92.2/bbl in September 2023, before falling and closing the year at \$75.7/bbl in December 2023. The increase was driven by production cuts by OPEC member producers, which was later countered by improved output from non-OPEC suppliers.

FIGURE 18: MONTHLY AVERAGE BRENT CRUDE OIL AND HENRY HUB NATURAL GAS PRICES, JANUARY 2022 – DECEMBER 2023.



Source: World Bank & US Energy Information Administration.

- Natural gas

In 2023, record-high natural gas production, stable consumption, and increasing inventories led to a decrease in prices compared to 2022 (Table 36). The monthly Henry Hub price was below \$3.00/ million British Thermal Units (MMBtu) throughout the year, except in January, with the lowest average recorded in May at \$2.19/MMBtu (Figure 19). The price declined by 60.5 percent from an annual average of \$6.4/MMBtu in 2022 to \$2.5/MMBtu in 2023.

South Africa has limited domestic natural gas reserves and production, leading to a reliance on imports, primarily through pipelines from Mozambique. The price of natural gas in the country is regulated to prevent market exploitation, given the limited number of producers and suppliers. However, the country's gas prices are linked to international oil and gas prices, with maximum price levels determined using a competitive benchmark approach based on the weighted average price of global pricing hubs. For instance, Sasol Gas adjust its natural gas costs quarterly, considering factors like oil, diesel, high-sulphur fuel oil prices, and the Producer Price Index (PPI) for both South Africa and the USA, to calculate the price in US\$/GJ(Gigajoule). Local producers such as PetroSA and Renergen also follow price calculation methods tied to international oil and gas prices. Once the maximum price is determined, producers are permitted to negotiate contracts with buyers based on an agreement reached between the two parties (supplier and buyer). For example, Sasol the largest supplier of gas prices was as follows in 2023:

TABLE 36: 2023 MONTHLY NATURAL GAS PRICES IN RAND PER GIGAJOULE.

	Maximum price	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6
		33 GJ	333 GJ	3 333 GJ	33 333 GJ	333 333 GJ	1 054 093 GJ
Jan	63,94	63,94	63,94	63,94	63,94	63,94	63,94
Feb	63,94	63,94	63,94	63,94	63,94	63,94	63,94
Mar	63,94	63,94	63,94	63,94	63,94	63,94	63,94
Apr	63,94	63,94	63,94	63,94	63,94	63,94	63,94
May	63,94	63,94	63,94	63,94	63,94	63,94	63,94
Jun	63,94	63,94	63,94	63,94	63,94	63,94	63,94
Jul	63,94	63,94	63,94	63,94	63,94	63,94	63,94
Aug	63,94	63,94	63,94	63,94	63,94	63,94	63,94
Sep	63,94	63,94	63,94	63,94	63,94	63,94	63,94
Oct	63,94	63,94	63,94	63,94	63,94	63,94	63,94
Nov	63,94	63,94	63,94	63,94	63,94	63,94	63,94
Dec	63,94	63,94	63,94	63,94	63,94	63,94	63,94

Source: SASOL (2023)

In 2023, the average unit price for natural gas increased by 76.9% to R9,462.9/t, compared to R5,350.9/t in 2022. However, the price of natural gas condensate slightly declined by 1.6%, dropping to R17,509.5/t in 2023 from R17,783.1/t the previous year. This price movement is influenced by several factors, including the methodologies used for price calculation and the depreciation of the Rand against the US Dollar, which traded at an average R18.45 in 2023, compared to R16.37 in 2022.

DEVELOPMENTS

The much-anticipated Renergen's Tetra4 Helium and Liquid Natural Gas Plant (LNG) construction was commissioned in May 2022, however, production commenced in September of the same year, following

delays. The project makes Renergen the first and only onshore gas producer in South Africa. The company had planned to produce the associated helium in 2023; however, progress was hampered by a leak discovered in the liquid helium cooling box in June 2023. The repairs to the cold box had to be done off-site, hence the project delay was stretched. The plant is expected to produce approximately 350 kg of helium and 50 tons of LNG daily, which falls under Phase 1 as designed by the Tetra4. Phase 2 of the project is anticipated to enlarge the gas plant's production capacity for both LNG and Helium. Full commercial production of helium is planned to commence in 2024. The LNG will be sold to domestic customers, while helium will be sold locally and exported.

D3 Energy, a natural gas and helium exploration company, drilled the RBD12 appraisal well within the ER315 permit in South Africa's Free State province. The company is leading an exploration program to fully assess the region's helium and gas resources, following successful tests at the RBD03 and RBD10 wells, which showed sustained flow rates and strong helium concentrations. South Africa is set to become a key global helium producer, through Renergen's Virginia gas project, positioning the country as a critical player in the global market, essential for industries such as scientific research, medical technology, defense, and space exploration.

OUTLOOK

World oil supply is expected to grow slowly in 2024, driven by output from non-OPEC countries such as the United States of America, and Guayana. Projects in the pipeline from Guyana are expected to continue bringing additional capacity online during the projected period. Production from non-OPEC member countries is expected to offset the decline from OPEC countries. OPEC member countries' production is expected to decline in 2024, due to the organization's agreement on continued output cuts of about 2.2 mb/d. The International Energy Agency projects supply of oil to increase by 6 mb/d to approximately 113.8 mb/d by 2030, while demand is expected to reach 105.4 mb/d during the same period. The demand will be driven by jet fuel and the industrial sector, mainly from China and India. However, the market performance would also be guided by developments surrounding global economic growth momentum and the ongoing geopolitical tensions in Russia, Ukraine, and in the Middle East.

Crude oil prices are expected to average below \$90/bbl again in 2024. Growth in production from non-OPEC member countries is expected to outweigh output cuts from OPEC members and thus weigh down oil prices. The continued geopolitical tensions between Europe and the Middle East would continue to put pressure on the oil price.

The gas market has stabilized as importers have found alternative suppliers following sanctions that were imposed on Russia's supply. However, the escalation of the geopolitical tensions in the Middle East and Russia and Ukraine remains a threat to the market value chain. Gas production is expected to remain at current levels in 2024, but is anticipated to grow rapidly beyond 2029, as from 2025, new supply is expected from the USA and Qatar. Growth in gas demand is also expected to improve, driven by the petrochemical industries from countries such as the Middle East, Europe, and South Asia. With such, natural gas prices are expected to remain below US\$3 in 2024 and in the medium term.

South Africa's Natural gas is expected to decrease in 2024, due to low productivity expected from Renergen's Tetra4 and depleted reserves from PetroSA. Production from Tetra4 was disturbed by the work done in completing the final stages of phase one which entailed integrating the helium system into the plant. The company is currently the only gas-producing project in the country.

In the long term, discoveries made by Total Energies company on the Brulpadda prospects, located on Block 11B/12B in the Outeniqua Basin, are expected to boost South Africa's production of gas, provided the project appraisal leads to production. The project is expected to supply gas to Mossel Bay refinery, replacing depleted feedstock from PetroSA's offshore facilities. However, such would take up to 10 years before the commencement of production from the findings can prove to be economically viable. Given such, South Africa's production of gas will be at lower levels in the medium term, once PetroSA stops production completely. South Africa is expected to continue importing a large share oil

requirements for local refineries, since domestic production from Sasol and PetroSA is not enough to cater to the entire demand.

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URANIUM

KJ Tshetlhanyane

SUPPLY-DEMAND

World uranium resources recoverable at \$130/kilogram (kg), are estimated at 6 078 kilotons of uranium (ktU). South Africa (SA) hosts the sixth largest reserves in the world, accounting for approximately 5.2 percent (320.9 ktU) of world uranium resources. The country's reserves are sited in the Witwatersrand Basin, Surficial deposits, Marine Phosphates, Cape Granite Suite, Karoo Basin, Springbok Flats Coalfield, and Mozaan Group conglomerates. Australia hosts the world's largest known recoverable uranium resources accounting for 27.7 percent of the world's total, followed by Kazakhstan's 13.4 percent, Canada's 9.7 percent, and Russia at 7.9 percent (Table 37).

TABLE 37: WORLD URANIUM RESOURCES, 2023.

COUNTRY	URANIUM RESOURCES		
	RAR		
	(ktU)	%	Rank
South Africa	320.9	5.3	6
Australia	1,684.1	27.7	1
Canada	588.5	9.7	3
China	223.9	3.7	8
India	-	-	-
Kazakhstan	815.2	13.4	2
Namibia	470.1	7.7	5
Niger	311.1	5.1	7
Russia	480.9	7.9	4
Ukraine	107.2	1.8	10
Uzbekistan	131.3	2.2	9
Others	945	15.5	
World total	6,078.5	100	

Sources: OECD's NEA & IAEA, *Uranium 2022: Resources, Production and Demand*

+ World Nuclear Association, *Market Report data, 2023*

Notes: #Reasonably Assured Resources (RAR) plus Inferred Resources, to \$130/kg U

South Africa produces uranium as a by-product of gold mining. The country's production of uranium increased by 46.5 percent from 159.3 tonnes of uranium (tU) (187.8 uranium oxide (U₃O₈)) in 2022 to 233.3 tU (275.2 U₃O₈) in 2023 (Table 38). This increase can be attributed to higher gold production from Moab Operations. All the produced uranium is exported through Nuclear Fuels Corporation of South Africa (Nufcor). Sales quantity grew significantly by 106.4 percent to 236.6 tU (278.9 U₃O₈) in 2023 compared to the previous year.

World uranium production increased by 12 percent from 49 355 tU (58 202 tU₃O₈) in 2022 to 55 300 tU (65 184 tU₃O₈) in 2023, owing to an upsurge in output from Kazakhstan and Canada. Kazakhstan remained the top producer in 2023, contributing 41.8 percent of global production, followed by Canada's 15.0 percent and Namibia's 11.4 percent. South Africa contributed about 0.4 percent to global production.

Uranium consumption is mainly driven by nuclear power plants. The commodity is considered a better alternative to fossil fuels, which are harmful to the environment. Other uses of uranium are in medicine, agriculture, nuclear science, and technology.

TABLE 38: SOUTH AFRICA'S URANIUM PRODUCTION, SALES, AND REVENUE. 2014-2023.

Year	Production (tU)	Sales (tU)	Revenue (R')
2014	566.2	536.4	512 916 052
2015	447.6	385	483 698 131
2016	381.7	336.6	309 626 499
2017	257.5	237.3	170 094 099
2018	195.8	222.8	187 146 610
2019	138.3	152.8	146 132 788
2020	111.5	70.7	91 811 420
2021	129.4	159.2	210 548 678
2022	159.3	114.6	226 980 080
2023	233.3	236.6	646 871 903

Source: DMRE, Mineral Economics and Statistics Directorate.

South Africa's uranium consumption comes from Eskom's Koeberg nuclear power station and the South African Nuclear Energy Corporation Limited (Necsa) research reactor. Koeberg nuclear power station, situated in Western Cape Province with an installed capacity of 1 860 Megawatts (Mw) of electricity, is the only nuclear power plant on the entire African continent. Consumption from research is from Necsa's Multi-Purpose Reactor (MPR) located in Gauteng province. Necsa uses the reactor to undertake and promote research and development in nuclear energy, radiation sciences, and technology. The state-owned company also fabricates nuclear fuel used on the MPR. Spent fuel is disposed of at the Vaalputs Radioactive Waste Disposal Facility in the Northern Cape province, which Necsa manages on behalf of the National Radioactive Waste Disposal Institute (NRWDI).

Globally, 439 operable nuclear power reactors consumed uranium by the end of 2023, two more than in 2022 (Table 39). Electricity generated from nuclear power reactors increased by 2.3 percent to 2 602 Terawatt-hour (TWh) in 2023, compared to 2 544 TWh in 2022. The major contributor to the increase was a 42 TWh improvement from France, with the rest coming from Pakistan and the United Arab Emirates.

Uranium is also consumed as fuel by nuclear research reactors around the world. According to the World Nuclear Association, approximately 220 research reactors are operational worldwide. They offer a wide range of applications like neutron beam research for material studies, neutron activation analysis, radioisotopes production for medical and industrial (Agriculture, mining, transport, and manufacturing) usage, neutron irradiation for materials testing for fission and fusion reactors, and neutron transmutation doping of silicon and gemstone coloration. One of the most important services they offer is research and training in nuclear technology areas for operators.

TABLE 39: WORLD NUCLEAR ELECTRICITY GENERATION AND REACTORS OPERABLE, 2023.

COUNTRY	NUCLEAR ELECTRICITY GENERATION	
	2023	
	TWh	% of electricity
South Africa	8.2	4.4
Belgium	31.3	41.2
Canada	83.5	13.7
China	406.5	4.9
France	323.8	64.8
Germany	6.7	1.4
Japan	77.5	5.6
Korea (South)	171.6	31.5
Russia	204.0	18.4
USA	779.2	18.6
UK	37.3	12.5
Sweden	46.6	28.6
Spain	54.4	20.3
SUBTOTAL	2 231	
Others	371.4	
World	2 602	9

Notes:

Percentage of electricity: percent contribution to national electricity production

MWe: Megawatt net (electrical as distinct from thermal)

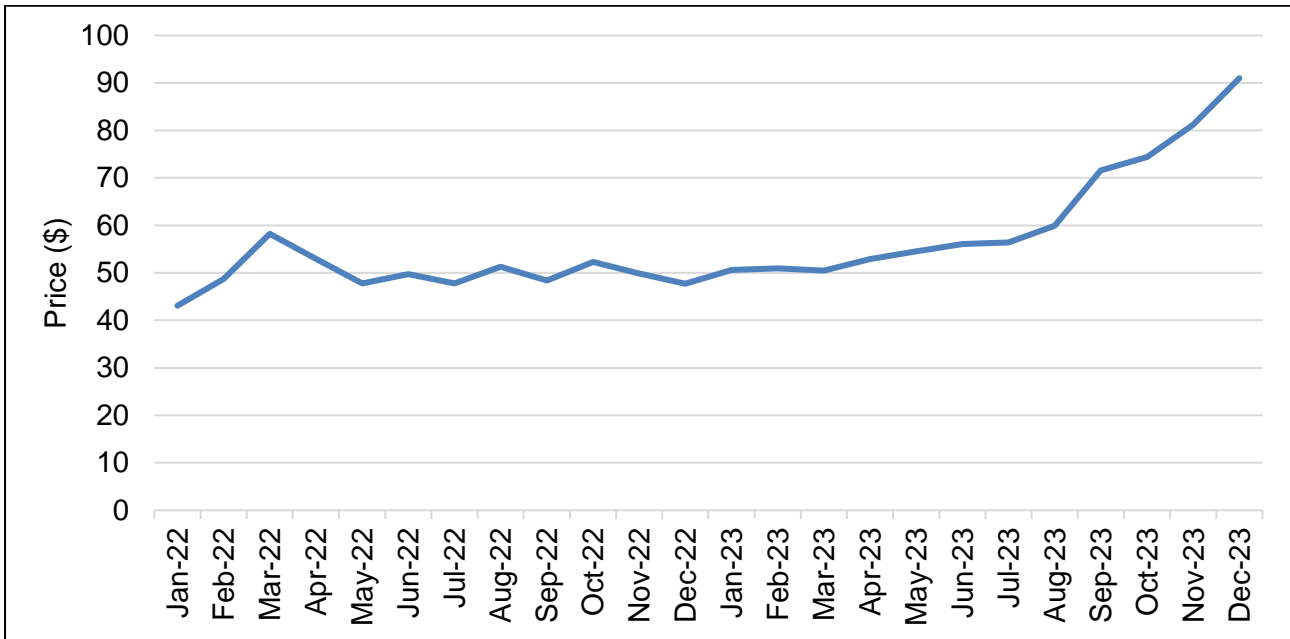
TWh: terawatt-hour

Sources: World Nuclear Association, 2023.

PRICES AND REVENUES

The average uranium spot price surged by 25.5 percent from \$49.8 per pound (lb) in 2022 to \$62.5/lb in 2023, driven by supply constraints and revived interest in the commodity. The uranium market is experiencing supply disruption due to declining inventory and low prices, prompting increased interest in greener energy sources. Uranium spot prices were on an upward trend for most of 2023, opening at \$50.6 in January 2023 and ending at \$91.0 in December 2023.

FIGURE 19: AVERAGE MONTHLY SPOT URANIUM PRICES, 2022 - 2023.



Source: www.cameco.com

SA’s uranium export sales unit price was no exception, as it recorded a 38.1 percent increase to R2 318/t in 2023 from R1 679/t in 2022. Revenue earned from uranium sales increased by 185.0 percent to R646.8 million in 2023 compared to R227.0 million in 2022, driven by sales quantity and the unit price.

OUTLOOK

Global uranium production is expected to reach 60.0ktU in 2024, driven by output from Kazakhstan. Kazakhstan, Kazatomprom, which accounts for about 38.3 percent of total global production, is expected to increase its output in 2024 and 2025. However, the 2025 output would be guided by the availability of the sulphuric acid which is currently in shortage on the market. However, the reduced output could be offset by production from Canada and Australia should high prices persist over the projected period. Global output is expected to improve beyond the projected period, as new mines are expected to come online from Namibia and Niger, driven by demand from new reactor deployments.

Uranium prices are expected to improve to an annual average between \$90/lb and \$100/lb in 2024, driven by the current market shortfall. The uranium market’s underperformance in the previous years, characterized by low prices, had led to underinvestment in new mining projects, which are now reflected in recent high prices. With inventories declining and few projects expected to come online, demand is projected to outstrip supply. According to the World Nuclear Association, global uranium demand is expected to reach 83,8 ktU in 2030, fueled by the shift to green energy sources, which include uranium. About 64 reactors are currently under construction, 88 are planned and 344 are proposed, globally.

Production of uranium in South Africa will be guided by the amount of gold produced from operations involved in the market, in 2024. In the long term, South Africa’s uranium production is likely to improve, as presently unexplored reserves could be tapped into, due to demand that may arise from new nuclear reactors planned locally and internationally. Projects on hold, such as Dominion Reef, Randfontein, Henkries, Beisa North and South could also be resurrected to take advantage of the favorable uranium demand and market prices. Significant uranium quantities alleged to be contained in gold mine tailings could also be extracted, given high prices above the cost of production, and can render profit for mines.

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FERROUS METALS AND MINERALS OVERVIEW

RC Ravhugoni

SUPPLY – DEMAND

South Africa remains the leading global producer and exporter of ferrous minerals, accounting for 75 percent and 37.6 percent of chrome and manganese ore reserves, respectively, and was ranked the ninth country in iron ore global reserves, in 2023. With more than 85 percent of ferrous minerals and their alloys consumed around the globe, steel production remains by far the biggest demand driver. Global crude steel production reached 1 888.2 million tons (Mt) in 2023, a marginal downtick of 0.02 percent, compared with 2022. Asian countries at 70 percent, were the largest contributors to global crude steel production, followed by European Union (EU) and North America at 6.7 percent and 4.6 percent, respectively. China at 1,019.0Mt remained the largest crude steel producer contributing 53.9 percent to global crude steel production, followed by India and EU at 7.4 percent and 6.6 percent, respectively.

TABLE 40: SOUTH AFRICA'S PRODUCTION AND SALES OF FERROUS MINERALS, 2023.

COMMODITY	PRODUCTION	LOCAL SALES		EXPORT SALES		TOTAL SALES	
	kt	Kt	R Mil	kt	R Mil	kt	R Mil
Chrome Ore	19 105	11 258	19 029	5 009	14 917	12 938	33 946
Iron ore	63 711	6 177	3 904	56 367	89 125	62 541	93 030
Manganese Ore	18 966	2 395	2 010	17 183	46 265	19 578	48 276
2023	101 782	19 826	24 944	75 230	150 308	95 057	175 253

Source: DMRE, Mineral Economics and Statistics Directorate, 2023

South Africa's total ferrous production was estimated at 101,927 kt (Table 41), with iron ore contributing the largest share at 61.9 percent, followed by chrome ore at 19.2 percent and manganese ore at 18.7 percent. Total ferrous production increased slightly by 0.14 percent compared to 2022, despite challenges such as electricity and logistical constraints, inflationary cost pressures, and commodity price fluctuations. Chrome ore and manganese ore production grew by 2.9 percent and 0.5 percent, respectively, while iron ore production declined by 0.8 percent. Total sales mass and revenue for ferrous minerals rose by 5.4 percent and 17.7 percent, respectively, driven by higher local and export sales, increased unit prices, and a weaker ZAR/US\$ exchange rate.

TABLE 41: SOUTH AFRICA'S PRODUCTION AND SALES OF FERROALLOYS, 2023

COMMODITY	PRODUCTION	LOCAL SALES		EXPORT SALES		TOTAL SALES	
	kt	Kt	R Mil	kt	R Mil	kt	R Mil
Chromium Alloys	3 158	883	14 652	2 209	39	3 092	54
Manganese Alloys	247	23	622	149	3 045	173	3 626
Silicon Alloys	86	29	1 054	32	644	61	1 699
Vanadium	6		124	5	2 881	5	3 006
2023	3 497	935	1 816	2 395	6 570	3 331	8 387

Source: DMRE, Mineral Economics and Statistics Directorate, 2023

South Africa's total ferroalloy production was estimated at 3 186 kt (Table 42), with chromium alloys making up 90.9 percent of the production, followed by manganese alloys (6.4 percent) and silicon alloys (2.4 percent). Ferroalloy production decreased by 8.8 percent, primarily due to infrastructure challenges, high electricity costs, and ongoing load shedding, despite a rise in global demand driven by increased crude and stainless-steel production. While the total sales mass of ferroalloys dropped by 1.9 percent, sales revenue rose by 3.7 percent, supported by higher unit prices in both local and export markets for chromium alloys, as well as a weaker ZAR/US\$ exchange rate.

EMPLOYMENT

South Africa's ferrous sector employed an average of 57 094 people (Table 42), reflecting a 3.5 percent increase compared to 2022. The iron ore sector was the largest employer, making up 41.6 percent of the workforce, followed by the chrome (38.2 percent) and manganese ore (20.1 percent) sectors. The rise in employment was driven by an increase in contractors for maintenance work, fewer retrenchments, and labor from new mines. As a result, total remuneration grew by 7.6 percent, and the average remuneration per employee increased by 3.9 percent.

TABLE 42: SOUTH AFRICA'S FERROUS MINE EMPLOYMENT AND REMUNERATION, 2023.

YEAR	EMPLOYEES	TOTAL REMUNERATION	AVERAGE REMUNERATION
		R'000	R/employee
2014	50 387	12 001 080	238 178
2015	47 701	12 841 231	269 202
2016	39 179	12 131 485	309 642
2017	42 634	13 066 606	306 483
2018	46 886	15 143 660	322 988
2019	51 796	17 285 318	333 721
2020	52 038	17 448 353	335 302
2021	53 008	19 760 259	372 779
2022	55 123	21 210 094	384 777
2023	57 094	22 832 352	399 908

Source: DMRE, *Mineral Economics and Statistics Directorate, 2023*

OUTLOOK

The World Steel Association (WSA) forecasts a 1.7 percent growth in global steel demand in 2024, down from a 2.3 percent rise in 2023. Chinese steel demand is expected to remain stable, with declines in real estate investments balanced by growth in infrastructure and manufacturing sectors. India's steel demand is projected to grow by 8 percent, driven by strong infrastructure investments. The EU, including the UK, faces significant challenges due to geopolitical uncertainties, high inflation, energy costs, and other economic pressures.

In South Africa, ferrous production is expected to rise in 2024, aided by reduced power outages and improved rail and port efficiencies. However, this growth may be limited by reduced output from some producers, particularly in the iron ore and manganese sectors, due to port and rail constraints and weaker market conditions. Rising labor and utility costs could also hinder production. Despite this, increased demand from sectors like electric vehicles is expected to boost manganese production. The chrome ore and ferrochrome sectors are expected to grow by about 4 percent, driven by strong global steel demand, especially from China, with a projected growth rate of 3-5 percent through 2025.

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CHROMIUM

Y Tawo

SUPPLY AND DEMAND

Global chrome reserves amounted to an estimated 560 Mt in 2023, with South Africa at 37 percent or 200 Mt the second largest holder of chrome reserves globally, after Kazakhstan at 42 percent or 230 million tons (Mt) (Figure 21). Global chrome ore production totaled 41 Mt, a 1.2 percent decrease compared with 2022, with South Africa contributing 43.5 percent, followed by Turkey and Kazakhstan both at 14.5 percent. South Africa's chrome ore production was estimated at 19.7 Mt in 2023 (Table 43) and was dominated by 40 – 44 percent grade at 60 percent of total production, which is primarily produced from 33 mines, followed by less than 40 percent grade at 40 percent of total production. Chrome ore output rose by 2.9 percent, from 19.1 Mt in 2022 despite mines facing ongoing operational challenges and energy constraints.

TABLE 43: WORLD CHROME RESERVES, AND PRODUCTION: 2023

COUNTRY	RESERVES			PRODUCTION#		
	kt	%	Rank	kt	%	Rank
United States	630	0.1	6	*	*	*
Finland	8300	1.5%	5	2000	4.8	5
India	79000	14.5%	3	4200	10.1	4
Kazakhstan	230000	42.2	1	6000	14.5	2
South Africa	200000	36.7	2	18000	43.5	1
Turkey	27000	5.0	4	6000	14.5	2
Other countries	*	*	*	5200	12.6	3

Source: USGS, 2023.

DMRE, Mineral Economics and Statistics Directorate, 2023

TABLE 44: SOUTH AFRICA'S CHROME ORE PRODUCTION AND SALES, 2014 – 2022.

YEAR	SA Production	LOCAL SALES			EXPORT SALES		
		Mass kt	Mass kt	Value R' 000	Unit Value R/t	Mass kt	Value R' 000
2014	14 038	10 048	7 771 424	773	3 698	5 834 876	1 579
2015	15 656	9 833	8 093 409	823	4 827	8 104 128	1 681
2016	14 708	8 728	8 164 638	936	4 684	9 541 381	2 037
2017	16 651	9 038	11 002 167	1 221	4 478	12 139 339	2 668
2018	17 610	9 650	11 410 226	1 181	4 068	10 045 204	2 471
2019	17 661	10 071	11 514 916	1 151	5 177	10 301 595	1 993
2020	13 197	8 328	9 869 904	1 138	4 647	8 731 865	1 879
2021	18 381	9 889	11 218 961	1 134	5 238	10 743 835	2 052
2022	19 105	11 258	19 029 382	1 680	5 008	14 917 335	3 026
2023	19 669	13 156	29 995 238	2 280	6 250	27 142 447	4 343

Source: DMRE, Directorate Mineral Economics and Statistics

Chrome ore total sales mass amounted 19 406 kilo tons (kt), a 19.3 percent increase in 2023 compared with 16 267 kt from the previous year. The increase in sales was due to high export sales which recorded a 24.8 increment, driven by increased demand from the Chinese stainless-steel sector and ferrochrome smelting industry. Local sales also recorded a 16.9 percent increment, from 11 258 kt in 2022 to 13 156 kt in 2023, despite a notable drop of 8.2 percent in domestic ferrochrome production from 3 158 kt in 2022 to 2 897 kt in 2023 (Table 45), mainly due to rising electricity costs and logistical issues.

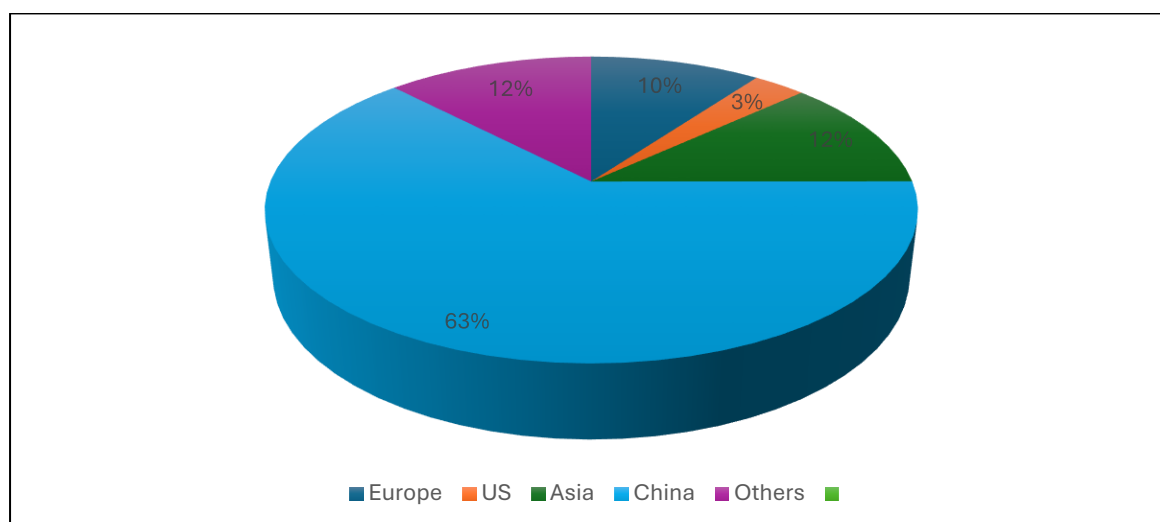
TABLE 45: SOUTH AFRICAN FERROCHROME PRODUCTION AND SALES, 2014- 2023

YEAR	PRODUCTION		LOCAL SALES			EXPORT SALES		
	t	Mass kt	Value R' 000	Unit Value R/t	Mass kt	Value R' 000	Unit Value R/t	
2014	3 719 010	571 314	5 105 685	8 937	3 192 039	31 079 849	9 737	
2015	3 650 488	610 515	5 658 315	9 268	3 071 764	30 002 172	9 767	
2016	3 490 654	530 120	5 154 520	9 723	3 184 572	32 678 776	10 262	
2017	3 268 906	498 878	5 944 020	11 915	2 646 365	35 611 515	13 457	
2018	3 515 945	537 653	6 141 369	11 423	2 697 054	33 038 655	12 250	
2019	3 187 542	598 872	6 547 716	10 933	2 516 371	29 492 913	11 720	
2020	2 404 088	707 751	7 794 352	11 013	2 022 192	24 162 981	11 949	
2021	3 109 659	1 005 824	15 804 520	15 713	2 165 358	35 605 845	16 443	
2022	3 157 560	883 064	14 652 913	16 593	2 209 227	39 991 057	18 102	
2023	2 897 423	738 649	12 961 549	17 548	2 342 372	45 314 316	19 345	

Source: DMRE, Mineral Economics and Statistics Directorate

Stainless steel remains the leading demand driver for chrome and ferrochrome, with around 75 to 85 percent of chrome demand. Global stainless-steel production increased by 4.6 percent to 58.4 Mt in 2023 compared with 2022, mainly due to a 12.6 percent surge in China's output to 36.7 Mt. Europe, United States and Asian market excluding China, all experienced a production decline of 6.2 percent, 9.6 percent and 7.2 percent, in that order (Figure 20). China at 63 percent, produced more than half of the worlds stainless steel in 2023, followed by Europe and other Asian markets at 10 percent and 12 percent, respectively. South Africa only produced 4.5 Mt of stainless steel and contributed 3 percent to global steel output.

FIGURE 20: WORLD STAINLESS STEEL PRODUCERS: 2023



Source: juyemetal, 2024

REVENUE AND PRICES

Sales revenue generated from the chrome ore sector amounted to R 57.1 billion in 2023, rising by a massive 68.3 percent compared with R 33.95 billion in 2022. This growth was driven by substantial 19.3 percent rise in total sales mass alongside higher unit prices, despite a weakened Rand to Dollar exchange rate (ZAR/US\$). The domestic market accounted for most of the demand, consuming 67.8 percent of chrome production, while 32.2 percent was accounted for by exports. Unit prices for local and export sales rose by 34.9 percent and 45.8 percent, respectively, contributing to revenue gains as the ZAR/US\$ exchange rate climbed by 13.2 percent, from R16.2/\$ to R18.4/\$.

EMPLOYMENT

South Africa's chrome ore sector employed on average 21 827 employees in 2023, representing 13.3 percent increase from 19 267 employees of 2022. Of that total, permanent employment contributed 55 percent, while contract employment contributed 45 percent (Table 47). Employment increased due to a notable growth of 8.2 percent and 17.7 percent in the number of permanent employees and contractors, respectively during this period, in line with mines ramping up production to meet demand (Table 46). Remuneration in the sector was estimated at R 7.5 billion, rising by 12.8 percent in line with employment figures. Per capita earnings dropped by 0.4 percent from 347 606 in 2022 to 346 158 in 2023 on the back of 10.9 percent drop in bonus payments.

TABLE 46: EMPLOYMENT IN SOUTH AFRICA'S CHROME INDUSTRY, 2013- 2023

YEAR	TOTAL EMPLOYEES	TOTAL REMUNERATION	AVERAGE REMUNERATION
		R' 000	R/employee
2013	18 359	3 840 559	209 192
2014	18 658	4 046 774	216 892
2015	18 449	4 416 943	239 414
2016	15 449	4 213 906	272 762
2017	16 968	4 733 924	278 991
2018	18 922	5 517 399	291 586
2019	20 847	6 388 714	306 457
2020	18 739	6 164 089	328 944
2021	18 316	6 035 862	329 549
2022	19 267	6 697 338	347 607
2023	21 827	7 555 599	346 158

Source: DMRE, Mineral Economics and Statistics Directorate

KEY DEVELOPMENTS

Merafe Resources reduced chrome production by 21 percent in the first nine months of 2023, due to power outages and high energy costs. Chrome producers are increasingly shifting towards exporting raw chrome ore instead of producing ferrochrome, due to the higher profitability of chrome ore exports and lower energy requirements. On the upside, Tharisa Minerals and Jubilee Metals embarked on expansion projects to increase chrome production capacity, aiming to supply the growing demand from China and other Asian markets.

OUTLOOK

The outlook for South Africa's chrome ore and ferrochrome sectors appears cautiously optimistic, driven by strong global demand, particularly from China which is directly influenced by stainless steel. Global stainless-steel market is projected to grow at a compound annual growth rate (CAGR) of 3 to 5 percent

until 2025. This expansion will directly influence the demand for ferrochrome and chrome ore, which is expected to see a CAGR of approximately 4 percent. Additionally, chrome ore prices are forecasted to rise gradually by approximately 3 percent annually, while ferrochrome price could increase by 3 percent to 5 percent each year. This sustained demand for chrome and ferrochrome will continue to shape South Africa's production growth. However, challenges persist, particularly concerning rail infrastructure, despite some progress in addressing these issues. On the energy front, it is hoped that the improved electricity availability observed since March 2024 will be maintained, supporting the ferrochrome sector's efforts toward sustainable growth and long-term competitiveness.

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IRON ORE

RC. Ravhugoni

SUPPLY – DEMAND

South Africa, at 670 million tons (Mt) of known iron ore reserves, accounted for only 0.8 percent to total global iron ore reserves which were estimated at 87 billion tons (Bt), in 2023 (Table 47). Australia continued to lead the pack at 31 percent of global iron ore reserves, followed by Brazil and Russia at 17.2 percent and 16.0 percent, respectively. World iron ore resources are estimated to be greater than 800 Bt of crude ore containing more than 230 Bt of iron. According to the United States Geological Survey (USGS, 2023), reserves for Australia, Iran, South Africa, Turkey and the United States were revised based on Government institutions and Industry sources.

South Africa, at 63.1 million tons (Mt) of production, contributed 2.5 percent to global iron ore production in 2023, positioning it amongst the top 10 global iron ore producers. Australia contributed 31.0 percent to global iron production, followed by Brazil and China at 17.6 percent and 11.2 percent, respectively. Slight increases in production and trade in 2023 were supported by restocking and increased consumption for intermediate products, as well as global end-use consumption of steel products increasing slightly, during the same period. This was on the back of government measures to address inflation and infrastructure concerns, despite concurrent events affecting consumer demand, including the Russia/Ukraine conflict, global inflation, and rising energy costs and interest rates. Despite a rise in global iron ore production, South Africa's iron ore production dropped by a marginal 0.8 percent to 63.1 Mt in 2023 compared with 63.7 Mt in 2022, as producers curtailed production, on the back of rail infrastructure and electricity (Table 47). South Africa exported 88.7 percent of its total production mainly to China and Japan. Iron ore prices improved during 2023, despite the rise in global iron ore supply and steel mill margins. Steel production in China rose by 3 percent per year to date, on the back of a strong increase in exports.

TABLE 47: WORLD IRON ORE RESERVES, PRODUCTION AND EXPORTS, 2023

COUNTRY	RESERVE#			PRODUCTION+			EXPORTS*		
	Mt	%	Rank	Mt	%	Rank	Mt	%	Rank
South Africa*	670	0.77	9	63.1	2.5	7	56	N/A	N/A
Australia	27000	31.03	1	960	38.4	1	N/A	N/A	N/A
Brazil	15000	17.24	2	440	17.6	2	N/A	N/A	N/A
Canada	2300	2.64	6	70	2.8	7	N/A	N/A	N/A
China	6900	7.93	4	280	11.2	3	N/A	N/A	N/A
India	3400	3.91	5	270	10.8	4	N/A	N/A	N/A
Iran	1500	1.72	7	77	3.08	6	N/A	N/A	N/A
Russia	14000	16.09	3	88	3.52	5	N/A	N/A	N/A
Sweden	600	0.69	10	38	1.52	9	N/A	N/A	N/A
Ukraine	2300	2.64	6	36	1.44	10	N/A	N/A	N/A
United States	1300	1.49	8	44	1.76	8	N/A	N/A	N/A
Other	12030			134			N/A	N/A	N/A
2023	87000			2500					
2022	85000			2600					

Sources: * DMRE Directorate Mineral Economics and Statistics, # USGS, 2024(Reserve – Iron content)

Lower domestic iron ore output, coupled with reduced steel scrap consumption and low iron ore inventories at Chinese ports provided further price support. The iron ore market improved on the back the Chinese economy stabilizing due to government stimulus. Despite a rise in global demand, in line with production, South Africa's exports dropped marginally by 0.54 percent to 56 Mt in 2023 compared with 2022, while domestic sales volumes and its corresponding alloy, pig iron, grew by 13.4 percent and 6.4 percent respectively, during this period.

TABLE 48: PRODUCTION AND SALES OF IRON ORE : 2014-2023

Year	Production		Local sales			Export sales		Export		Total Sales	
	Mass	Mass	Value	Unit Val	Mass	Value	Unit val	Mass	Value	Mass	Value
	kt	kt	R1 000	R/t	kt	R1 000	R/t	Kt	R1 000	Kt	R1 000
2014	80 759	9 571	5 741 815	600	61 963	52 957 448	855	71 534	58 699 263		
2015	72 806	7 513	5 071 073	675	64 176	34 394 014	536	71 689	39 465 086		
2016	66 456	6 161	3 855 830	626	58 398	39 242 899	672	64 559	43 098 728		
2017	75 091	7 256	5 226 565	720	60 869	44 333 905	728	68 125	49 560 471		
2018	74 273	8 025	5 732 580	714	61 715	45 529 223	738	69 740	51 261 803		
2019	72 407	7 571	5 633 418	744	60 570	65 038 020	1074	68 141	70 671 438		
2020	55 635	5 884	3 268 400	555	60 178	83 304 860	1384	66 062	86 573 260		
2021	73 127	8 144	5 426 490	666	60 839	115 707 741	1902	68 983	121 134 231		
2022	63 711	6 173	3 904 724	632	56 367	89 125 852	1 581	62 541	93 030 576		
2023	63 182	7 006	4 846 682	692	56 059	97 424 644	1 738	63 065	102 271 326		

Source: DMRE, Mineral Economics and Statistics Directorate

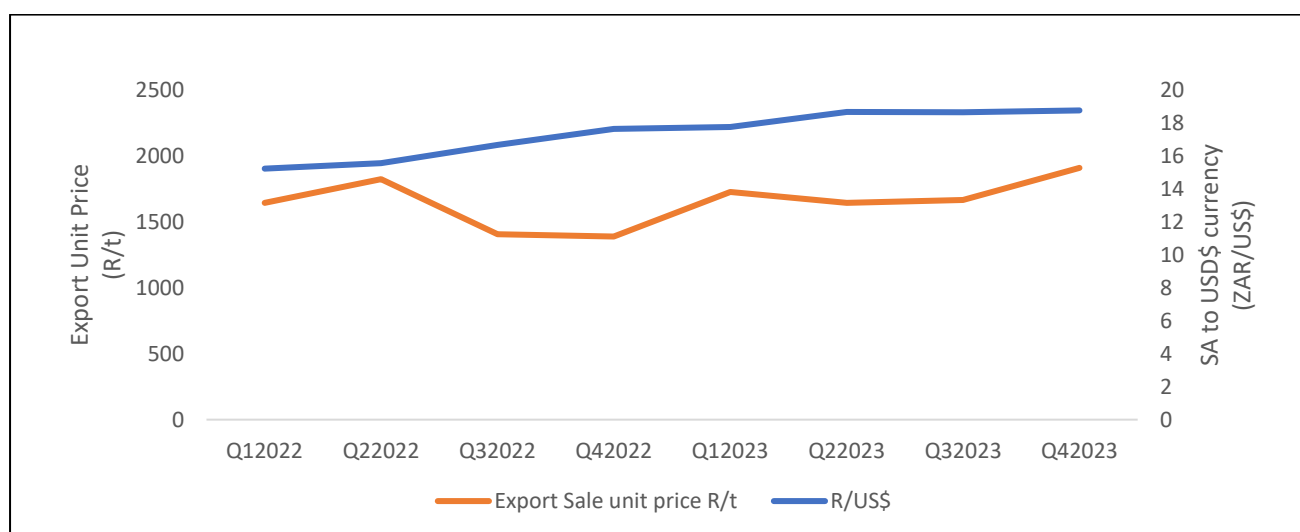
PRICES AND REVENUE

Revenue generated from the iron ore sector was estimated at R102.2 billion, an uptick of 9.9 percent, compared with the previous year. The increase in revenue was supported by increased domestic sales and stronger unit prices, following iron ore demand rebound in Asia. Iron ore prices experienced a strong growth trading at above US\$100 per ton during the 12 months of the year of 2023. The first three months of the year recorded an average price of over US\$120 per ton, and reached its lowest monthly average in May, when it hit US\$105.1 per ton, and moved up and down in the following months. The

gain in traction that pushed up the annual average price came in September, when it returned to an average value of over US\$120 per ton, exceeding \$130 in the last two months of 2023. The average price per ton of 62 percent iron content picked at US\$140.5 in December 2023, an increase of 19.73 percent compared to \$117.3 per ton in December 2022

South Africa’s export sales revenue averaged R24.8 billion (Bn) in the first quarter of 2023 (Q1 2023) due to a notable rise in both domestic and export sales volumes, in line with the rise in unit prices. In line with iron ore global trends, export unit prices averaged at R1 727 per ton (R1727/t) in Q1 2023, a 24.4 percent increase from R 1 389/t the previous quarter despite a slightly weaker rand to dollar exchange rate, which averaged at R17.74. In line with a drop in sales volumes in Q2 2023, revenue decreased to R24.3 Bn, affected by a down tick in export unit prices to R 1 644/t on the back of weaker rand which averaged at R18.67 compared with R17.74 the previous quarter. In Q3 2023, demand for iron ore declined, with sales volumes dropping to 15 252 kt compared with Q2 2023, due to improved rail and port efficiency which affected export volumes previously. Its corresponding revenue also dropped by 3.0 percent during this period, despite unit prices increasing to R1 665/t, and a weaker rand. Export sales volumes and its corresponding revenue rose by 7.0 percent and 23.0 percent each, in Q4 2023, largely affected by a rise dip in its unit price by 15 percent, and a weaker rand to dollar exchange rate during this period. South Africa’s freight rail capacity has plummeted due to years of underinvestment, with a lack of locomotives, vandalism accompanying theft of hundreds of kilometers of copper cable from rail lines, as well as the actual rail and fastening brackets, costing coal and iron ore exporters billions of rand in revenue.

FIGURE 21: IRON ORE EXPORT UNIT PRICES IN RANDS PER TON(R/T) AND UNITED STATES OF AMERICA CURRENCY(ZAR/USD\$), 2022 - 2023



Source: DMRE Mineral Economics and Statistics

EMPLOYMENT

Average employment in South Africa’s iron ore industry increased by 2.0 percent from 23 290 employees in 2022 to 23 762 in 2023, contributing 4.9 percent to total mining employment (Table 49). The number of contractors increased by 1.8 percent in 2023, as some of the iron ore producers conducted scheduled maintenance at the mines. Total remuneration and average remuneration per employee followed suit, increasing by 8.5 percent and 6.4 percent each, on the back of increased bonus payments coupled with increased established and contractor’s earnings by 27.7 percent and 14.7 percent respectively.

TABLE 49: IRON ORE INDUSTRY'S EMPLOYMENT AND REMUNERATION: 2014-2023

YEAR	EMPLOYEES	TOTAL REMUNERATION	AVERAGE REMUNERATION
		R'000	R/employee
2014	21 798	5 659 707	261 063
2015	20 613	6 224 916	301 990
2016	16 491	5 878 117	356 443
2017	17 510	5 825 750	332 710
2018	18 614	6 641 462	356 799
2019	19 769	7 025 066	355 362
2020	20 490	7 537 049	367 839
2021	21 427	8 557 329	399 378
2022	23 290	9 323 567	400 334
2023	23 762	10 123 628	426 037

Source: DMRE Directorate Mineral Economics and Statistics, 2014-2023

KEY DEVELOPMENTS

South Africa's Kumba Iron Ore mine, one of the major producers in the iron ore sector, announced that it will be cutting production over the next three years. This will be done to align output to constrained capacity to transport minerals via rail to port. This is on the back of the challenges that Transnet, South Africa's state-owned freight rail and port operator, is facing, as it is struggling to haul minerals and other commodities to export markets. The major factors are locomotive shortages, cable theft and vandalism of its infrastructure. This unfortunately cost exporters billions of rands in potential revenue. Kumba, whose iron ore stockpiles had grown to 9 Mt by September due to the rail bottlenecks, indicated that it expects to end 2023 with production of between 35Mt to 36Mt, from the previous forecast between 35Mt to 37Mt. Kumba has also lowered its production outlook for the next three years to 35Mt to 37Mt million tons per year, from the previous targets of 37Mt to 39Mt in 2024 and 39Mt to 41Mt in 2025.

OUTLOOK

The global steel market in 2024 is expected to experience more modest growth compared to 2023, with the World Steel Association (WSA) forecasting a 1.7 percent increase in global steel demand, down from the 2.3 percent growth seen in 2023. Several key factors are likely to shape this trend, particularly regional dynamics and sectoral growth. China's steel demand is expected to stabilize around 2023 levels, primarily due to the ongoing decline in real estate investments. However, this loss in steel demand will be offset by growth in other sectors, notably infrastructure and manufacturing. China's large-scale infrastructure projects, such as those related to transportation and urbanization, should continue to provide a solid foundation for steel consumption, even as the real estate sector remains subdued.

In contrast, India stands out as a key driver of global steel demand growth. Having been the strongest driver since 2021, India's steel demand is projected to grow by 8 percent in 2024. This growth will be supported by robust expansion across all steel-using sectors, especially infrastructure, which remains a critical focus for the government and private sector. India's ongoing infrastructure boom, including investments in roads, rail, energy, and urban development, will keep steel demand elevated. The European Union (including the UK) faces a more challenging environment. The region is grappling with a range of economic pressures, including geopolitical uncertainty, high inflation, tightening monetary policy, and rising energy and commodity prices. These factors are likely to dampen growth in steel demand, as steel-using sectors struggle with increased costs and reduced financial support from governments. The ongoing energy crisis in Europe, coupled with inflationary pressures, is expected to weigh heavily on industrial output and demand for steel in the region.

South Africa's ferrous production outlook for 2024 is cautiously optimistic. The reduction in power outages, along with improvements in rail and port efficiencies, is expected to bolster steel and iron ore production. However, the potential for reduced output from certain producers, particularly in the iron ore sector, could limit overall production growth. One of the major iron ore producers has already indicated plans to scale back output to address third-party port and rail infrastructure constraints. This could dampen iron ore supply and negatively impact production in 2024. Additionally, rising labor and utility costs in South Africa pose another risk to production. Increased wages, as well as higher energy and water prices, could squeeze margins and force some producers to adjust their output, particularly if costs continue to rise at a faster pace than productivity gains.

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MANGANESE ORE

RC Ravhugoni

SUPPLY AND DEMAND

South Africa, at 600 million tons (Mt) of reserves and 19.0 Mt of production remained the country with the largest world's manganese ore reserves and leading producer, in 2023 (Table 50). Global manganese reserves stood at 1900 Mt, with South Africa leading at 31.5 percent, followed by Australia at 26.3 percent, while China and Brazil were at third and fourth place at 14.7 percent and 14.2 percent respectively. Global manganese ore production totaled 32.5 Mt, a 24.3percent increase compared with 2022, with South Africa contributing 58.35 percent, followed by Australia and Ghana at 9.21 percent and 2.89 percent, respectively. South Africa's production rose by a marginal 0.57 percent, while that from Australia and Gabon dropped by 9 percent and 81.7 percent, respectively.

Global crude steel production reached 1,888.2 (Mt) in 2023, a marginal downtick of 0.02 percent, compared to 2022. China at 1, 019.1 Mt continues to be the largest crude steel producer contributing 54 percent to global crude steel production, followed by India and EU at 7.4 percent and 6.6 percent, respectively. South Africa exported approximately 95.3 percent of manganese produced, in 2023, increasing by 5.8 percent year on year (y-o-y).

TABLE 50: GLOBAL MANGANESE RESERVES, PRODUCTION AND EXPORTS :2022-2023

COUNTRY	RESERVES#			PRODUCTION*			EXPORTS#		
	MT	%	Rank	Mt	%	Rank	Mt	%	Rank
South Africa	600	31.58	1	19.00	58.35	1	18.1	N/A	N/A
Australia	500	26.32	2	3.00	9.21	2	N/A	N/A	N/A
Brazil	270	14.21	4	0.62	1.90	7	N/A	N/A	N/A
China	280	14.74	3	0.74	2.27	5	N/A	N/A	N/A
Gabon	61	3.21	6	0.84	2.58	4	N/A	N/A	N/A
Ghana	13	0.68	8	0.94	2.89	3	N/A	N/A	N/A
India	34	1.79	7	0.72	2.21	6	N/A	N/A	N/A
Ukraine	140	7.37	5	0.32	0.98	7	N/A	N/A	N/A
Other	2	0.11		6.38			N/A	N/A	N/A
2023	1,900	100		32.56	100		N/A	N/A	N/A
2022	1,700			26.18			N/A		

Source: USGS 2023

DMRE, Mineral Economics and Statistics Directorate*, 2022 - 2023

China's demand for lower grade ore, continues to support manganese export sales volumes, with some of the smaller producers, opting to sell almost all their output.

TABLE 51: MANGANESE ORE PRODUCTION AND SALES, 2014-2023

Year	Production	Local sales			Export sales			Total sales	
	Mass Kt	Mass Kt	Value R'000	Unit Value	Mass kt	Value R'000	Unit Value	Mass kt	Value R'000
2014	14 051	1 966	1 644	845	9 644	14 734	1640	11 610	16 378
2015	15 952	1 224	703	712	10 026	12 657	1257	11 250	13 518
2016	13 735	917	827	1008	11 245	18 861	1677	12 162	19 757
2017	14 140	1 375	1 671	1122	13 403	30 403	2277	14 778	32 361
2018	14 919	699	1 068	1519	15 277	43 746	2863	15 976	44 811
2019	16 994	1 099	1 750	1590	16 209	43 241	2669	17 308	44 992
2020	16 020	2 138	2 842	1330	15 339	34 856	2272	17 477	37 699
2021	19 156	2 450	2 757	1125	16 021	34 341	2144	18 471	37098
2022	18 966	2 395	2 010	839	17 183	46 265	2693	19 578	48 276
2023	19 076	3 130	1 837	587	18 185	45 052	2477	21 316	46 889

Source: DMRE, Mineral Economics and Statistics Directorate

In addition, to improved demand, higher unit prices, a weaker rand, as well as the full capacity operation of the 375-wagon manganese train, had a direct impact on higher manganese export sales. Local manganese sales volumes saw double digit increases by 30.6 percent to 3 130 Kt in 2023 from 2 395 Kt in 2022, due to a rise in domestic consumption of manganese ore. Ferromanganese production was about 205 kt, a 17 percent drop compared with the previous year, indicative of the impact of the challenges, which continue to cripple the sector. The manganese alloy sector was dominated by ferrosilicon manganese (FeSiMn) and high carbon ferromanganese (HCFeMn) in 2023, which accounts for about 53.6 percent and 46.3 percent respectively, to total alloy production, while medium carbon ferromanganese (MCFeMn) recorded zero production. (Table 52).

TABLE 52: MANGANESE ALLOYS PRODUCTION AND SALES, 2014-2023

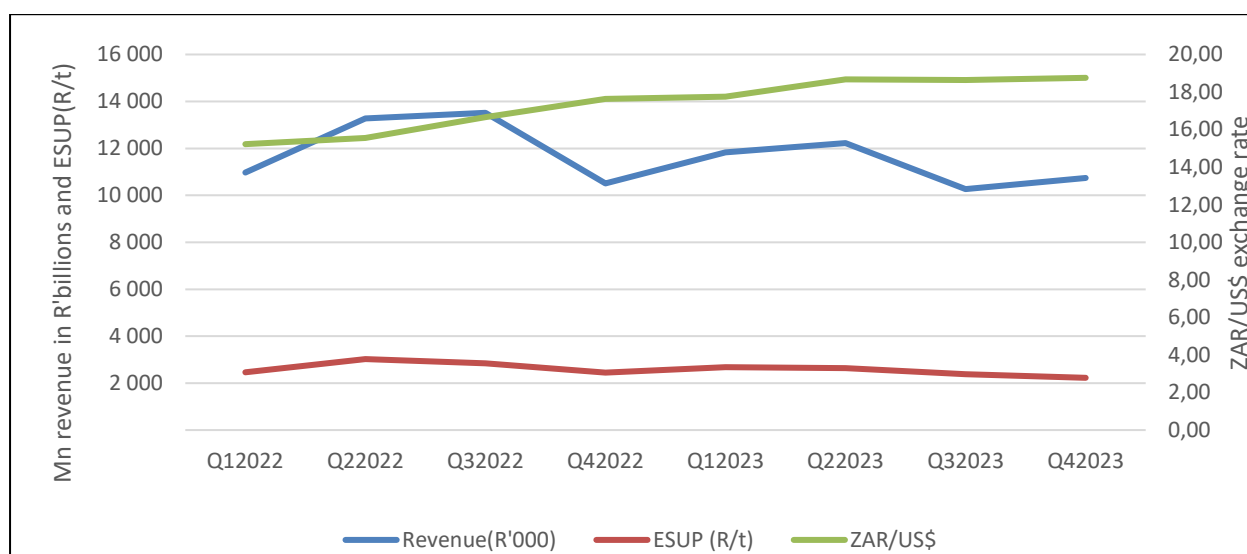
Year	Production		Local sales		Export sales			Total Sales	
	Mass	Mass	Value	Unit Value	Mass	Value	Unit value	Mass	Value
	1 000t	1 000t	R1 000	R/t	1 000t	R1 000	R/t	1 000t	R1 000
2014	970	104	1 020 762	9 780	659	6 334 636	9 619	763	7 355 398
2015	615	346	365 756	10 557	497	4 756 871	9 572	532	5 122 628
2016	371	260	249 298	9 597	342	3 095 977	9 056	368	3 345 275
2017	459	383	592 227	15 465	272	4 068 387	14 968	310	4 660 614
2018	432	410	623 161	15 207	276	3 986 430	14 459	317	4 609 591
2019	411	400	528 147	13 211	238	3 451 095	14 521	278	3 979 242
2020	227	325	446 354	13 726	189	2 706 509	14 316	222	3 152 863
2021	257	282	610 336	21 647	151	2 524 521	16 673	180	3 134 857
2022	247	239	622 527	25 960	149	3 004 209	20 153	173	3 626 737
2023	205	214	431 980	20 122	98	1 977 186	20 058	120	2 409 166

Source: DMRE, Mineral Economics and Statistics Directorate

PRICES AND REVENUE

Revenue generated from the manganese ore sector was about at R48 billion, rising by a notable 30.1 percent compared with the previous year. This was supported by a weaker rand to dollar (ZAR/US\$) exchange rate coupled with an increase in total sales mass, despite a drop in its corresponding unit prices.

FIGURE 22: MANGANESE ORE REVENUE, EXPORT SALES UNIT PRICE AND R/US\$.



Source: DMRE, Mineral Economics and Statistics Directorate, Prices and exchange rate, 2022, 2023

Manganese ore unit prices reached peaked higher than previously anticipated and remained higher for longer periods in 2023 on the back of strengthened demand, particularly from China steel mills and supply chain costs and constrictions. Power supply challenges, coupled with coordinated maintenance outages from some of the major producers affected supply, thus driving prices higher. South Africa's manganese ore export unit prices averaged at 2 676 rands per ton (R 2 676/t) in quarter 1 of 2023 (Q1 2023), a 9.2 percent rise compared with the previous quarter, on the back of higher export volumes coupled with a slightly weaker rand to dollar exchange rate (ZAR/US\$). Manganese ore unit prices dropped by a further 1.56 percent in Q2 of 2023 averaging at R2 634/t, supported by a slightly weaker

ZAR/US \$ exchange rate during this period. Manganese ore unit prices dropped by 9.47 percent in Q3 of 2023 and a further 6.63 percent in Q4 of 2023, averaging at R2385/t and R2227/t, in Q3 and Q4 of 2023, respectively.

EMPLOYMENT

South Africa's manganese ore sector employed on average 11 502 employees, with permanent employees and contractors contributing 49.3 percent and 50.7 percent of total employment, respectively. Employment declined by 8.7 percent from 12 603 employees in 2022 to 11 502 employees in 2023, due to a drop in the number of established and contract employees, by 5.05 percent and 12.0 percent each during this period. (Table 53). The corresponding total remuneration declined by a margin of 7.7 percent in line with the decrease in employment.

TABLE 53: SOUTH AFRICA'S MANGANESE ORE INDUSTRY'S EMPLOYMENT, 2014-2023

YEAR	EMPLOYEES	TOTAL	AVERAGE
		REMUNERATION	REMUNERATION
		R'000	R/employee
2014	9 966	2 302 514	231 036
2015	8 639	2 199 372	254 586
2016	7 239	2 038 555	281 581
2017	7 981	2 437 046	305 340
2018	9 350	3 001 535	321 020
2019	11 143	3 860 604	346 465
2020	12 274	4 430 034	360 941
2021	13 290	5 196 559	391003
2022	12 603	5 210 451	413 427
2023	11 502	5 169 963	449 461

Source: DMRE, Mineral Economics and Statistics Directorate

KEY DEVELOPMENTS IN SOUTH AFRICA

In September 2023, Manganese Metal Company (MMC) indicated that it is in the early phase of constructing a small scale 5 000 t/y commercial High Purity Manganese Sulphate Monohydrate (HPMSM) plant in Mbombela (Nelspruit), Mpumalanga Province. The plant is expected to be in production by 2026 and will be a brownfield addition to MMC's high purity electrolytic manganese metal (EMM) refinery. The manganese product is described as of battery-grade quality, in conformity with specifications provided by the International Manganese Institute. This follows the trend which MMC's customers have been using, by purchasing their high purity manganese metal to dissolve it into HPMSM, which prompted MMC to enter the HPMSM production space. MMC's forward movement into HPMSM is taking place amid key battery electric vehicle (BEV) manufacturers pursuing this more affordable and greener cathode active material with higher manganese content, as the material of choice. Manganese is going into BEVs and battery energy storage for good technical and cost reasons. Formulations are increasingly including manganese in batteries, which is drawing MMC more deeply into the battery minerals market, with its special South African skills ready to be leveraged. MMC, which has 400 direct employees and 200 indirect contractor employees, earned R2.28-billion in export revenue, exporting mainly through the ports of Maputo and Durban, and paid R179-million in taxes last year.

In November 2023, Jupiter mines announced that it had produced a 99.9 percent pure sample of high purity manganese sulphate monohydrate (HPMSM) using the Northern Cape's manganese ore, bringing into service an internally developed hydrometallurgical production process. Jupiter's advance towards producing HPMSM follows that of Manganese Metal Company (MMC). The sample of HPMSM was produced using 28 to 32 percent manganese content. Tshipi Mine was reportedly within required

tolerance limits for all specified impurity levels. Location studies to determine the ideal location of its first plant are being performed. The base case for this work is that refining facility will be in US or Canada, with Europe an alternative. The merits of producing a manganese concentrate in South Africa is being considered, prior to transportation and refinement in North America or elsewhere. Jupiter is on track to complete a scoping level market entry business case, which will recommend, if appropriate, the commencement of more detailed work in early 2024. This may include the construction of a pilot demonstration plant, prior to a final investment decision (FID) and proceeding with commercial plant construction.

OUTLOOK

World Steel Association (WSA) estimates a 1.7 percent growth in global steel demand in 2024, compared with a 2.3 percent rise in 2023. Steel demand in China in 2024 is expected to remain around 2023 levels, as real estate investments continue to decline, but the corresponding steel demand loss will be offset by growth in steel demand, coming from infrastructure investments and manufacturing sectors. India has emerged as the strongest driver of steel demand growth since the year 2021 and, this might indicate that Indian steel demand will continue to charge ahead with 8 percent growth in its steel demand over 2024. It will be driven by continued growth in all steel-using sectors, especially by continued strong growth in infrastructure investments. The EU, including the UK, remains the region currently facing the biggest challenges. The region and its steel-using sectors will be tested on a multitude of fronts, geopolitical shifts and uncertainty, high inflation, monetary tightening and partial withdrawal of fiscal support, as well as still high energy and commodity prices. Despite reduced power outages, coupled with slight improved operational and rail and port efficiencies, manganese ore production is expected to drop in 2024. This will be due to some major producers announcing a cut in output, on the back of weakened market conditions, coupled with structurally oversupplied port stocks. However, increased demand for manganese ore, mainly from the electric vehicle sector, will continue to drive production in the near future.

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NON-FERROUS METALS AND MINERALS OVERVIEW

L Ramane

INTRODUCTION

South Africa is well endowed with non-ferrous minerals, particularly titanium and zirconium resources, which are found in heavy mineral sands along the coastal provinces of this country. Cobalt, copper, and nickel are produced as by-products of platinum mining in the Bushveld Complex. Copper is mainly found in the Palabora Igneous Complex in the Limpopo Province, with zirconium and nickel being produced as by-products. Lead and zinc deposits associated with copper are mined near Aggeneys, Northern Cape. Nickel deposits are mined in the Uitkomst Complex near Badplaas in the Mpumalanga Province.

PRODUCTION AND SALES

In 2023, South Africa's production of primary non-ferrous metals and minerals, excluding titanium and zircon, increased by 114 percent to 734.1 kt, compared with 342.8 kt the previous year, largely because of the inclusion of lithium to the overall production. Domestic production of lithium came on stream in June of 2023. Additionally, most primary non-ferrous minerals improved their output, with cobalt showing the most improvement at 51 percent, followed by nickel and copper at 2.5 and 1.7 percent, respectively (Table 55). Despite improved production, local sales volume decreased by 11 percent to 9.3 kt in 2023, compared with 10.5 kt in 2022, because of an 18 percent drop in local sales volumes for nickel. Local sales revenue also declined by 24 percent from R3.5 billion to R2.4 billion, owing to lower volumes sold. Export sales volume improved by 61 percent to 894.5kt from 555.9kt the previous year because of the inclusion of lithium export sales. However, export revenue fell by 1.2 percent to R25.2 from R25.5 billion, due to lower commodity prices in 2023.

South Africa's total production of non-ferrous metals and minerals (primary and processed), rose by 6 percent to 4 687 kt in 2023, compared with 4 432 kt in 2022, resulting from a 114 percent increase in the production of primary minerals (Table 54). Total sales volumes and revenue also improved by 6 and 2 percent to 4 346 kt and R79.9 billion, respectively (Table 54). The sales volume and revenue were boosted by higher export sales including that of processed minerals.

TABLE 54: SOUTH AFRICAN PRODUCTION AND SALES OF NON-FERROUS METALS AND MINERALS, 2022 AND 2023

COMMODITY	PRODUCTION		LOCAL SALES		EXPORT SALES		TOTAL SALES	
	YEAR	Quantity (t)	Quantity	Value (R'000)	Quantity (t)	Value (R'000)	Quantity (t)	Value (R'000)
Cobalt	2022	250	52	55 743	35	33 659	87	89 402
	2023	378	79	34 100	119	69 113	198	103 213
Copper	2022	49 194	3 363	448 843	38 580	4 611 831	41 943	5 060 675
	2023	50 023	3 410	505 617	43 256	5 781 407	46 666	6 287 023
Lead	2022	39 974	125	4 222	38 988	1 241 779	39 113	1 246 001
	2023	40 271	131	4 876	40 893	1 494 423	41 024	1 499 299
Lithium	2022	0	0	0	0	0	0	0
	2023	416 131	0	0	409 643	994 384	409 643	994 384
Nickel	2022	29 033	6 999	2 642 131	25 572	10 203 058	32 571	12 845 190
	2023	29 750	5 713	1 845 601	24 106	9 288 652	29 819	11 134 253
Titanium	2022	2 190 746	1 628 594	2 136 869	165 566	1 736 069	1 794 160	3 872 938
	2023	2 114 131	1 613 428	2 560 003	113 823	1 726 365	1 727 251	4 286 368
Zinc	2022	224 356	0	0	452 749	9 390 241	452 749	9 390 241
	2023	197 630	0	0	376 448	7 534 737	376 448	7 534 737
Zircon	2022	307 285	9 991	327 844	311 568	10 061 426	321 559	10 389 270
	2023	289 479	6 357	245 416	236 375	8 525 904	242 732	8 771 320
*PRIMARY SUBTOTALS	2022	342 807	10 539	3 150 939	555 924	25 480 568	566 463	28 631 509
	2023	734 183	9 333	2 390 194	894 465	25 162 716	903 798	27 552 909
Aluminum	2022	717 855	193 075	9 141 504	347 412	16 042 796	540 487	25 184 300
	2023	706 644	170 407	7 432 474	441 783	19 047 579	612 190	26 480 054
Titanium Slag	2022	873 717	0	0	881 405	10 535 911	881 405	10 535 911
	2023	842 723	0	0	860 448	12 837 750	860 448	12 837 750
PROCESSED SUBTOTALS	2022	1 591 572	193 075	9 141 504	1 228 817	26 578 707	1 421 892	35 720 211
	2023	1 549 367	170 407	7 432 474	1 302 231	31 885 329	1 472 638	39 317 804
NONFERROUS TOTALS	2022	4 432 410	1 842 199	14 757 156	2 261 875	63 856 770	4 104 074	78 613 928
	2023	4 687 160	1 799 525	12 628 087	2 546 894	67 300 314	4 346 419	79 928 401

Source: DMRE, Mineral Economics and Statistics Directorate, 2022-2023

EMPLOYMENT

Employment and total remuneration of the South African non-ferrous metals and minerals sector increased by 1.7 and 15.7 percent to 16 526 employees and R8.99 billion, respectively in 2023 compared with the previous year, because of additional employees from lithium and copper mines (Table 55). Earnings also improved by 13.8 percent in 2023 indicative of improving salary earnings and additional employees from the lithium mine.

TABLE 55: SOUTH AFRICA'S NON-FERROUS METALS AND MINERALS: EMPLOYMENT AND GROSS REMUNERATION, 2019-2023

YEAR	EMPLOYEES	REMUNERATION	
	Number	R'000	Per Capita Payments
2019	19 723	6 505 081	329 822
2020	16 555	6 246 758	418 342
2021	15 651	7 483 216	478 130
2022	16 254	7 765 375	477 752
2023	16 526	8 987 663	543 850

Source: DMRE, Mineral Economics and Statistics Directorate

OUTLOOK

The general outlook for non-ferrous minerals is good in the short term, as it comprises some of the best performing commodities. The battery sector is also anticipated to create demand for these minerals, as the world transitions to greener energy sources. Additionally, global macroeconomic sentiments including interest rates cuts by major economies as well as China's stimulus packages will also boost demand. Copper is expected to be in deficit, going into 2025 resulting from China's growth in the manufacturing sector, driving prices on an upward trajectory.

South Africa's production of non-ferrous minerals is anticipated to rise, as additional capacity come on stream from both new and upgraded projects. These include Orions' projects, Copper 360's Rietberg copper project and the Gamsberg mine ramp up. Lithium production will also add additional capacity, as new projects come on stream to augment the already existing projects owned by SA Lithium. The country's commitment to energy transition, increased infrastructure spent as well as growth in the Chinese economy will drive demand for these minerals.

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COBALT

Lerato Ramane

SUPPLY AND DEMAND

South Africa's cobalt production rose by about 51.2 percent to 378t in 2023, compared with 250 t the previous year. This results from improved ore grades from both copper and PGMs mining, where cobalt is produced as a by-product (Table 56). Global cobalt mine and refinery production increased by 17 percent to 232 kt in 2023, with the largest increase in mine production (+26 kt) coming from the DRC. According to the Cobalt Institute, the DRC remained the largest producer of cobalt, accounting for 76

percent of global mine output, followed by Indonesia (17 percent), Australia (2.2 percent), Cuba (1.9 percent) and the Philippines (1.6 percent).

Global refined cobalt production grew by 9 percent in 2023, reaching 179 kt, compared to 165 kt in 2022. China was the world's leading producer of refined cobalt, accounting for 78.5 percent, followed by Finland at a distant 8.8 percent, Canada (3.1 percent) and Japan (1.9 percent)

Local sales volumes increased by 51.9 percent to 79 t in 2023 from 52 t in 2022, resulting from higher demand from domestic markets. South Africa consumed about 40 percent of locally produced cobalt, which was used in the manufacturing of alloys, batteries, ceramics, glass, plastics as well as catalysts in the gas-to-liquid process. Export sales volumes stabilised in 2023, rising by 240 percent to 119 t, compared with 35 t the previous year, as the Durban port halted operation after being severely impacted by floods in April of 2022, returns to normal.

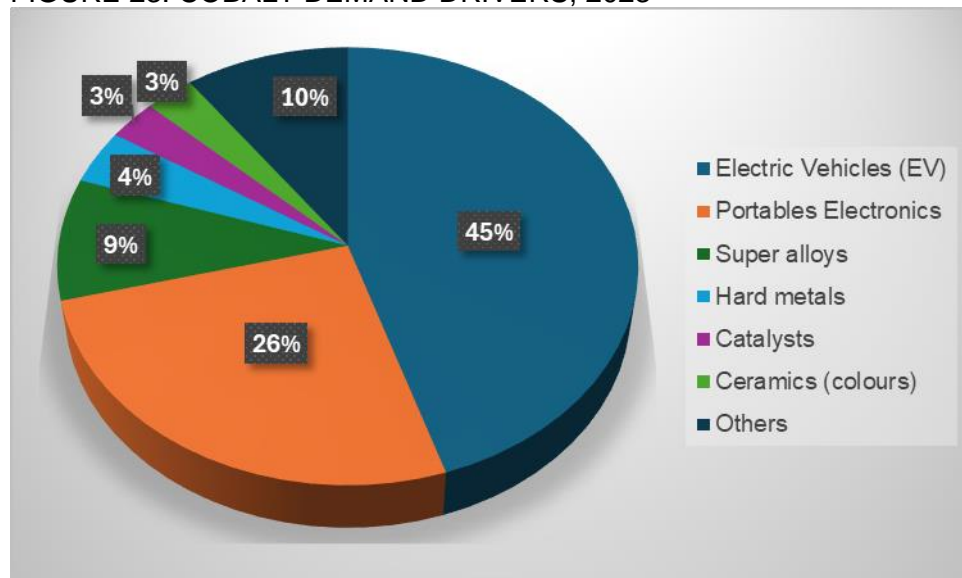
TABLE 56: SOUTH AFRICA'S LOCAL AND EXPORT SALES OF COBALT, 2014-2023

YEAR	PRODUCTION	LOCAL SALES			EXPORT SALES		
	Mass	Mass	Value (FOR)		Mass	Value (FOR)	
	t	t	R' 000	R/t	T	R' 000	R/t
2014	1 332	50	16 754	335	753	243 954	324
2015	1,362	64	21 970	343	703	253 885	361
2016	1,101	60	20 381	340	609	211 743	348
2017	1,062	46	21,550	468	593	374 440	631
2018	1,007	46	47 208	1 026	351	363 976	1,037
2019	1,027	60	28 650	477	473	256 572	542
2020	897	39	18 067	463	410	221 382	540
2021	355	43	33 352	775	233	137 175	589
2022	250	52	55 743	1 072	35	33 659	962
2023	378	79	34 100	431	119	69 113	581

Source: DMRE, Mineral Economics and Statistics Directorate

According to the Cobalt Institute Market Report 2023, cobalt market dynamics continued to be shaped by the global shift to electric vehicles (EVs). Battery applications account for 73 percent of cobalt demand and is the dominant driver of market growth. Electric vehicles (EVs) alone accounted for 96 percent of 2023 demand growth despite perceived weakness in the sector. Cobalt demand is also supported by super alloys (9 percent), hard metals (4 percent), catalysts (3 percent) and ceramics (3 percent).

FIGURE 23: COBALT DEMAND DRIVERS, 2023



Benchmark Mineral Intelligence – Cobalt Forecast via Cobalt Institute

Cobalt demand reached approximately 200 kt in 2023, with EVs alone constituting 45 percent of the market. Overall, the global cobalt market surplus in 2023 increased to 14.2 kt, up substantially from 6.7 kt in 2022. China was the world’s leading consumer of cobalt, with an estimated 87 percent of its consumption used by the lithium-ion battery industry.

UNIT PRICES AND REVENUE

Despite higher volumes of cobalt sold, revenue was negatively impacted by lower prices. The cobalt market was in surplus due to increased output from the DRC and Indonesia, as well as the lack of anticipated demand from Electric Vehicles (EVs). As a result, both the local and export unit sales fell by 59.7 and 39.6 percent, respectively. Consequently, local sales revenues decreased by 38.8 percent to R34.1 million in 2023, compared with R55.7 million in 2022. Due to much higher export volumes in 2023, export revenue rose by 105 percent to R69.1 million compared with R33.7 million the previous year.

Global cobalt prices continued to decline through 2023 across all grades, but this decline slowed in 2023 compared to 2022, when prices fell from a high point in the price cycle. Market surplus kept cobalt prices subdued.

DEVELOPMENTS

Marula Mining has signed an agreement with South African mining company Mansena Cobalt to acquire a 51 percent shareholding in Mansena Kruisrivier Cobalt (MKC). MKC is a registered holder of Prospecting Right which extends over 2,340.90 hectares of the Kruisrivier Farm located in the Elias Motsoaledi District of Limpopo Province in South Africa. Kruisrivier Cobalt is a former cobalt producing mine that operated intermittently for over 55 years up to the 1930s. Historical records confirm the presence of high-grade cobalt, gold, nickel, copper, chromium, zinc, lead, platinum, and silver mineralization.

Due diligence work completed by Marula Mining confirmed the presence of visible high grade cobalt mineralization, which occurs as a cobalt arsenate deposit with both safflorite, and erythrite. Independent assay results on samples taken in Q4 of 2023 reported 8.31% cobalt, 0.81% nickel, 323 g/t molybdenum, 2.73 g/t palladium, 0.16 g/t platinum, 1.91 g/t rhodium and 86 g/t gold. The company plans to complete all the necessary technical studies to complete a bankable feasibility study over the next 12 months.

The US signed an MoU with the DRC and Zambia to support both countries' joint ambition to develop local EV battery supply chain. This aims to start with regional processing, refining, and ultimately producing NMC battery precursors. However, aside from a pre-feasibility study for a precursor cathode active material (pCAM) facility that was published in December 2023, progress has been relatively slow.

The International Seabed Authority (ISA) missed the 2023 deadline to adopt a deep-sea extraction code, due to insufficient knowledge on biodiversity impacts and outstanding financial considerations and has set 2025 as the year to adopt the final code. Research continues to identify living species in the deep sea and more clarity is needed on the overall potential environmental impact of deep-sea extraction. ISA has been developing rules, regulations, and procedures to govern the prospecting, exploration and exploitation of marine minerals including the cobalt-rich ferromanganese crusts.

OUTLOOK

Globally, the cobalt market will remain in surplus in the short-term, as supply growth continues from the DRC and Indonesia, outpacing demand growth. As a result, prices will remain subdued in 2024 as production continues to increase. The low prices will support cobalt's application in cost competitive sectors such as the battery market at the risk of disincentivizing new investment in additional mined and refined capacity to support growing cobalt demand. However, cobalt will maintain a key role in the battery industry, and this will underpin cobalt's continued growth. The outlook for EVs remains positive and cobalt forms a critical part of the global energy transition.

In South Africa cobalt's production is very reliant on PGMs production, where it is mined as a by-product. The local consumption of cobalt is anticipated to continue to be driven by the local manufacturing of alloys as well as the gas-to-liquid process, where it is a catalyst.

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COPPER

Silungiselelo Mnyameni

SUPPLY AND DEMAND

In 2023, global copper reserves were estimated at 1 Bt, with Chile hosting the largest reserves at 190 million tonnes (Mt) followed by Peru at 120 Mt and Australia at 100 Mt, while South Africa's copper reserves were estimated at 10 Mt.

Global copper production was up by 1.8 percent to 22.4 Mt in 2023 from 22 Mt in 2022. Additional output was from expansion projects around the world as well as improved output from major mines. Locally, copper production improved slightly by 2 percent to 50 kt (Table 57), driven by improved ore grades from primary producers, PGMs as well as lead and zinc mines, where it is produced as a by-product. The country's primary copper mines contributed 48.1 percent to the total output, followed by production from PGMs mines at 39.5 percent and lead and zinc mines at 12.4 percent.

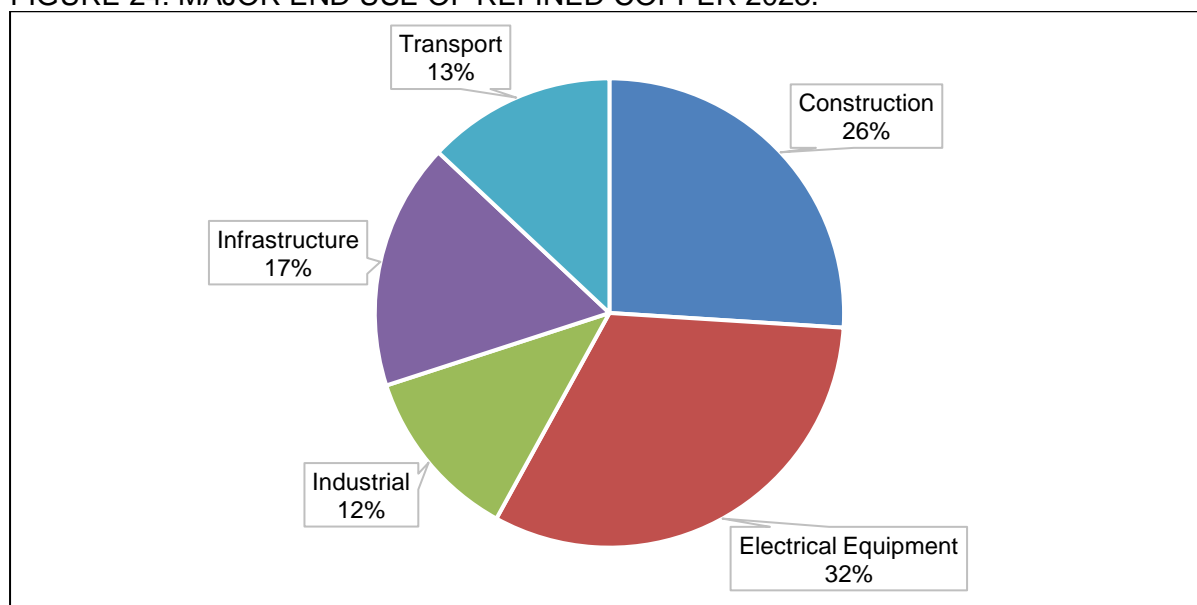
TABLE 57: SOUTH AFRICA'S PRODUCTION AND SALES OF COPPER 2014 - 2023

YEAR	PRODUCTION	LOCAL SALES			EXPORT SALES		
	Mass	Mass	Value (FOR)		Mass	Value (FOR)	
	kt	kt	R'000	R/t	kt	R'000	R/t
2014	79	45	3 483 784	77 411	37	2 466 769	67 242
2015	77	37	2 703 423	73 044	38	2 497 528	66 482
2016	65	27	1 923 681	72 102	27	1 821 207	66 426
2017	66	26	2 120 088	82 394	30	2 207 458	73 892
2018	47	23	2 027 485	87 945	27	2 050 357	76 010
2019	53	15	1 341 935	88 355	25	1 886 540	76 773
2020	38	22	2 030 196	91 541	16	1 517 314	92 092
2021	51	5	613 880	128 994	37	4 427 839	119 581
2022	49	3	448 843	133 465	39	4 611 831	119 543
2023	50	3	505 617	148 275	43	5 781 407	133 656

Source: DMRE, Directorate Mineral Economics and Statistics

Global consumption of refined copper increased by 1.5 percent to 26.5 Mt in 2023 from 26.1 Mt that was achieved in 2022, because of higher demand from Asia with China, the largest consumer of copper, accounting for 15.5 percent share in 2023. Local copper consumption remained stagnant at 3 kt as the construction sector, the largest consumer of copper metal, has been muted because of the slow rollout of government infrastructure programmes and weaker commercial building projects (Table 57). Export sales increased by 10.3 percent to 43 kt, owing to stronger demand in the international markets where energy transition to renewables was a major driver of copper consumption.

FIGURE 24: MAJOR END USE OF REFINED COPPER 2023.



Source: ICSG, World Copper Factbook 2024

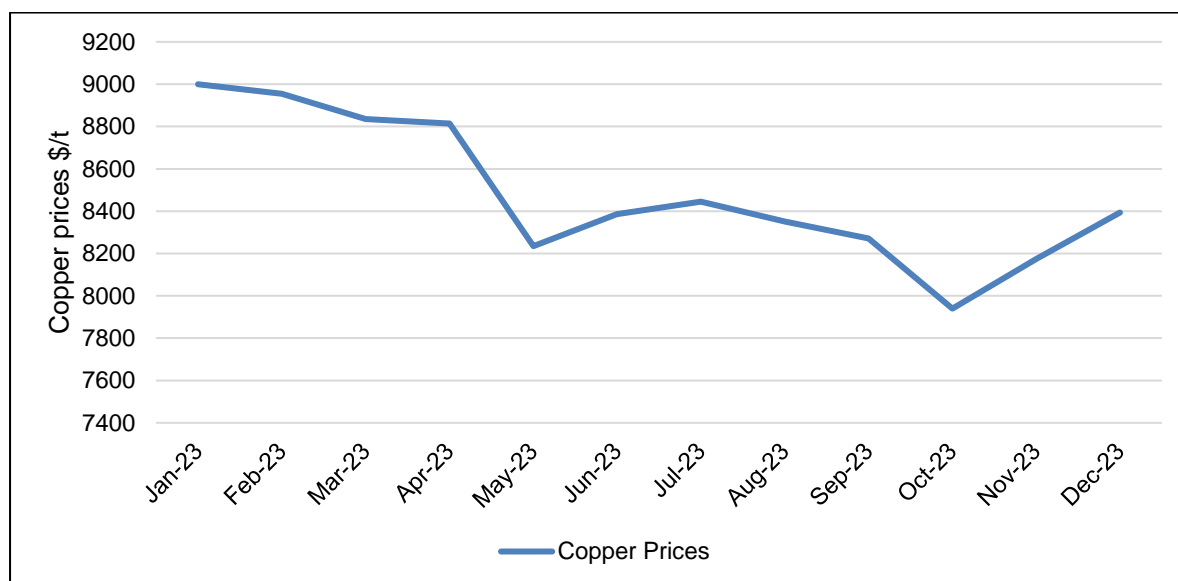
Copper is consumed as semi-finished copper products in the downstream industries for end use products such as automobiles, appliances, electronics, and a whole range of other copper dependent products to meet society’s needs. The manufacture of electrical equipment accounted for 32 percent to the world’s total usage of copper in 2023, because of its excellent conductivity. Construction accounted for 26 percent followed by infrastructure at 17 percent, transport and industrial sector at 13 percent and 12 percent, respectively (Figure 24).

PRICES AND REVENUES

In 2023, London Metal Exchange (LME) annual average cash settlement price fell by 3.8 percent to US\$8 483.40 /t from \$8 814.82 /t recorded in 2022. Among other factors, interest rates hike in major economies, overall slower global economic growth and weaker demand outlook, particularly from China, weighed on the red metal prices. Copper price started the year at an average of \$8 999.79 /t in January, however, prices plunged in the first half of the year reaching a low of \$8 234.28 /t in May (Figure 25). Despite retreating slightly in the third quarter, prices further tumbled to \$7 939.66 /t in October, as China continued to experience real estate sector issues. However, prices rebounded closing the year at \$8 394.11 /t, driven by supply concerns amid growing copper’s application in energy transition as well as rising demand for EVs putting strain on copper supply.

Domestically, both local and export unit prices rose by 11.1 and 11.8 percent to R148 275 /t and R133 656 /t in 2023, correspondingly (Table 57). The higher prices were driven by the depreciation of the South African rand against the US dollar from an annual average of R16.27 /\$ in 2022 to R18.42 /\$ in 2023, rather than supply and demand dynamics. As a result, revenues generated increased by 12.6 percent to R506 million for local sales, and for exports by 25.4 percent to R5.8 billion. Most of the copper produced locally was sold to Asian markets, Switzerland and Argentina.

FIGURE 25: LME MONTHLY COPPER SETTLEMENT PRICES 2023.



Source: London Metal Exchange, 2024

EMPLOYMENT

In 2023, the employment in South Africa’s primary copper mines increased by 6.7 percent to 7 566 employees compared with the previous year (Table 58). This rise follows the additional employees from Nama Copper processing plant in Springbok in the Northern Cape Province.

TABLE 58: EMPLOYMENT AND REMUNERATION IN SOUTH AFRICA'S COPPER MINES IN 2014 – 2023.

YEAR	EMPLOYEE	REMUNERATION	
	Number	R'000	Per Capita Earning (R)
2014	3 536	1 294 225	366 014
2015	3 516	1 367 945	389 063
2016	3 463	1 530 537	441 990
2017	3 476	1 634 437	470 206
2018	4 202	1 902 136	452 674
2019	6 353	2 452 248	385 998
2020	5 993	2 559 505	427 082
2021	6 059	3 700 785	610 791
2022	7 094	4 401 819	620 499
2023	7 566	5 638 442	745 234

Sources: DMRE, Directorate Mineral Economics and Statistics

Correspondingly, total remuneration increased by 28.1 percent to R5.6 billion (Table 58). As such, average earnings per employee also increased by 20.1 percent to R745 234 per year. This emanates additional employees in the copper sector as well as improving salary levels at the mines.

DEVELOPMENTS

Orion Minerals NL, an Australian company that has dual listing in the Australian Stock Exchange and Johannesburg Stock Exchange, is currently developing Prieska Copper Zinc Mine (PCZM) in Prieska Northern Cape Province. The Prieska project, located 270 kilometres south-west of Kimberly, is recorded as one of the world's 30 largest volcanogenic massive sulphide (VMS) base metal deposits. The project covers the PCZM, which was prematurely closed by previous owners as well as the nearby acquired Marydale and Vardocube prospective rights.

Development is at an advance stage with an updated bankable feasibility study currently underway for an accelerated development strategy. Bulk sampling commenced, followed by the mandatory dewatering. Early production is focused on the deep sulphide resource which comprises 28.73 Mt at 1.2 percent copper and 3.8 percent zinc. Prieska project is based on a proposed modern 2.4 Mtpa underground and open pit mining operations with a 12-year life of mine, delivering payable metal production of 226 kt of copper and 680 kt of zinc in concentrates. Total investment for the project is estimated at A\$1.6 billion, with a capital payback period of 2.5 years. Prieska project is estimated to come on stream late in 2025. The mine is estimated to create 1200 jobs during its construction phase and 879 jobs when in full operation.

Orion Minerals is concurrently also conducting exploration on its acquired prospecting rights areas. These include the Ayoba VMS discovery, located 5.3km south-west of Prieska, where the discovery drill hole intersected 9.5 metre of massive sulphides grading 0.63 percent copper and 0.93 percent zinc, including 1.50 metre at 0.89 percent copper and 4.98 percent zinc.

New Okiep Mining, a partnership between Orion Minerals (56.25%) and the Industrial Development Corporation of South Africa (IDC) (43.75%) located in Springbok in the Northern Cape Province of

South Africa, is approximately 450 km west of the Orion's flagship Prieska Copper Zinc Project. The Okiep copper project (OCP) comprises the historical copper district that produced over 2 Mt of copper over a 150-year period that ended in 2003. Historical mineral resource estimates have been reviewed together with the scoping study which confirmed the economic merits of developing a foundation-phase mining operation based on an initial six deposits. The foundation phase consists of mineral resources from Flat Mines area of the greater Okiep Copper Complex, leaving significant potential for future expansion to be considered. Total joint ore reserves committee (JORC) mineral resources at the OCP currently stand at 12 Mt grading 1.4 percent copper for 159 kt of contained copper. New Okiep Mining Invested A\$66.7 million for the development of Okiep deposits that have a potential to be mined at a low-cost method both the open pit and underground operations. At peak, the project is estimated to produce 9 kt of copper in concentrate per annum with a modelled 12-year life of mine for the foundation face. The company is also looking at concurrent explorations and mine expansion scenarios to be planned and potentially implemented.

Copper 360 Ltd, listed on the Alternative Exchange of the Johannesburg Stock Exchange, is an exploration and mining company that focuses on the copper sector in the Northern Cape copper belt. The company was established in November 2022, after the take-over of Shirley Hayes IPK (Pty) Ltd (SHIP), a mining rights owner, as well as Cape Copper Oxide that owns a processing plant. Copper 360 is based in Nababeep, 17 km northeast of Springbok town, in the Northern Cape Province. Currently, the company is focused on processing historical mined copper rock dumps and mining shallow copper resources at the former Okiep Copper Company (OCC), since acquiring mining right in October 2023.

Over the 19 000 hectares of the mining right area that holds 12 copper mines, the company has prioritised re-opening of the Reitberg copper mine. Following the confirmation of the historic drill database at the beginning of 2023, the company reported upgraded mineral resources of contained copper from 25 275t in 2022 to 81 200t. The company has invested R140 million for the re-opening of the Reitberg underground mine, that is estimated to produce 380ktpa of copper in concentrate over a seven-year life of mine. At the peak of operation, the mine is estimated to employ a total of 376 employees.

Palabora Copper, a subsidiary of Palabora Mining Company (PMC) Ltd., is a copper mine that operates a smelter and refinery in the Phalaborwa town in the Limpopo Province's Palabora Ingenious Complex. Following the approval of the Lift II bankable feasibility study (BFS) in 2014, the mine commenced with the project in 2019, by developing a twin decline roadway to provide access to the Lift II orebody that is 450 metres beneath the depleted Lift I ore body. Developments achievements so far include the construction and completion of draw-bells, Crusher Silo support and Crusher workshop, ventilation shaft also completed, among others. With an investment of R9.3 billion, PMC has through the application of new sciences and technologies, successfully managed to expand its life of mine to 2040.

OUTLOOK

Global copper supply is expected to grow by 1.7 percent to 22.7 Mt in 2024 and by a further 3.5 percent to 23.5 Mt in 2025, according to International Copper Study Group (ICSG). This growth will come from new projects and/or expansions as well as improved output from some of the major mines. However, the shutdown of the First Quantum's Cobre Panama mine, one of the world's largest copper producers will offset some of the new capacity. On the demand side, it is anticipated that copper consumption will grow by 2.2 percent to 27.2 Mt in 2024 and continue going up to 27.9 Mt in 2025. Key drivers for copper consumption are global energy transition, rising demand for EVs as well as urbanisation particularly from China, following the abolishment of the zero-Covid policy, early in 2023. Copper prices are expected to experience an upward pressure, driven by a more favourable global macroeconomic sentiment led by interest rates cuts by major economies as well as China's stimulus packages to boost economic growth. These positive market fundamentals are expected to drive prices to levels above the annual average of \$9 000 /t mark in 2024 and rise even further to reach a \$10 000

/t mark in 2025. The copper market is poised to be in a sustained deficit, driven by escalating demand from green energy transition that is likely to outpace market supply.

South Africa's copper production is expected to increase, as Orions' projects come on stream and Copper 360's Rietberg copper project ramps up production. These projects are expected to pave the way for South Africa to be a larger supplier of copper, to support the global energy transformation. Domestic consumption is also expected to improve, as Transnet and Passenger Rail Agency of South Africa (PRASA) embarks on refurbishing its railway infrastructure. The construction sector is also expected to improve public infrastructure projects in the fields of energy, transport, housing and digital infrastructure.

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LEAD

S Mnyameni

DEMAND AND SUPPLY

Global lead reserves were estimated at 95 million tonnes (Mt), mainly distributed in, among the largest, Australia, China, Russia, Mexico, Peru and the United States. South Africa's lead reserves were estimated at 0.3 Mt.

World lead mine supply was 4.5Mt in 2023, 1.1 percent more than in 2022 supported by increases in Bolivia, Kazakhstan, Peru and Australia balancing reductions in Europe, Mexico and the United States. Domestic lead mine production remained unchanged at 40 kilo tonnes (kt) in 2023, ranking 11th, according to the global data. South Africa accounts for one percent of global production, with the largest producers being China, Australia, Mexico and the US.

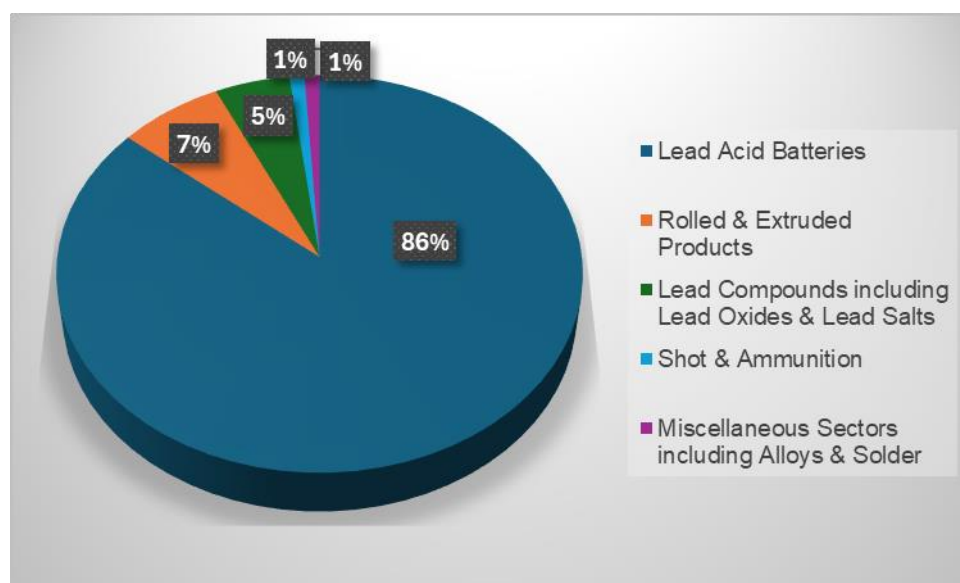
TABLE 59: SOUTH AFRICA'S PRODUCTION, LOCAL SALES, AND EXPORTS OF LEAD 2014 - 2023

YEAR	PRODUCTION	LOCAL SALES			EXPORT SALES		
	Mass	Mass	Value (FOR)		Mass	Value (FOR)	
	kt	t	R'000	R/t	kt	R'000	R/t
2014	29	-	-	-	33	659 777	19 765
2015	35	-	-	-	27	511 477	18 732
2016	39	-	-	-	39	884 986	22 457
2017	48	-	-	-	55	1 419 829	25 965
2018	35	-	-	-	36	1 008 096	28 320
2019	43	37	1 102	29 782	36	966 655	26 614
2020	28	114	3 190	27 980	30	690 904	22 727
2021	31	112	3 664	32 712	29	842 619	28 856
2022	40	125	4 222	33 775	39	1 241 779	31 851
2023	40	131	4 876	37 219	41	1 494 423	36 545

Sources: Department of Mineral Resources and Energy, Directorate Mineral Economics and Statistics, 2024

World lead consumption grew by 1.0 percent to 12.8 Mt in 2023 due to increased refined lead metal usage in Europe, China, India, Mexico and Taiwan offset declines in Korea, Türkiye and the United States. Local sales for lead concentrate increased by 4.8 percent to 131 tonnes (t) from 125 t recorded in 2022, because of improved demand from the manufacturing sector.

FIGURE 26: LEAD END USER, 2023.



Source: International Lead and Zinc Study Group (ILZSG)

Export sales also increased by 5.1 percent to 41 kt due to sustained demand from automotive lead-acid battery market (Table 60). South Africa exports over 90 percent of its lead concentrates to China, France, and Switzerland and is used in lead acid batteries, pigments, ammunition and cable sheathing.

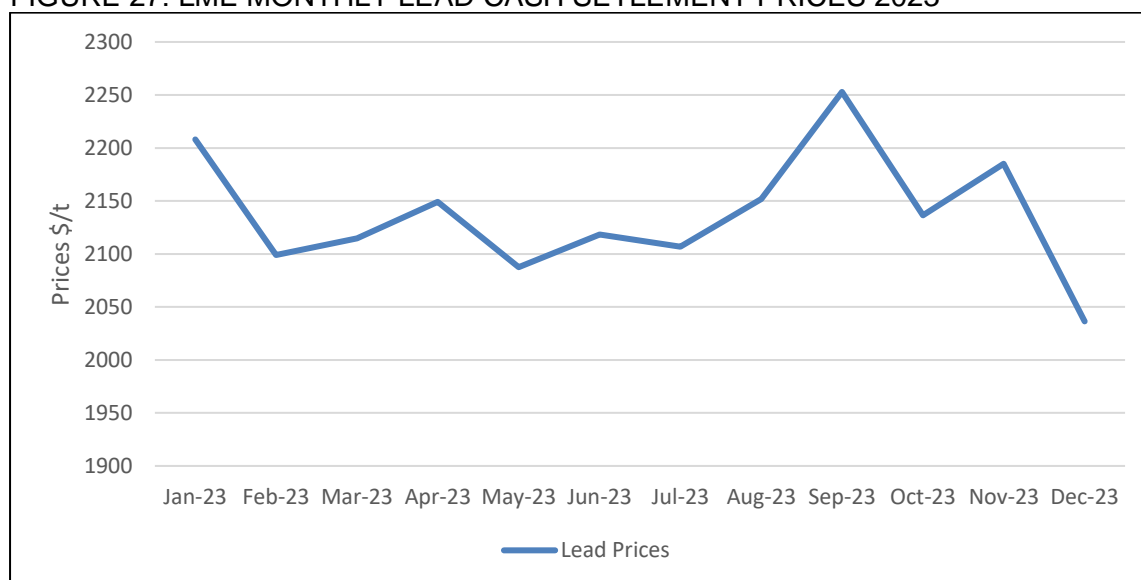
Lead is widely used to make products such as batteries, ammunitions, cable sheathing and is also used to store corrosive liquids. In 2023, the largest use of lead was in lead-acid batteries at 86 percent followed by rolled and extruded products at seven percent, lead oxides and salts at five percent. Ammunitions as well as alloys and solder accounted for one percent each (Figure 27).

The rise of electric vehicles (EVs) is expected to weigh on demand for lead acid batteries; however, EV manufacturers still use lead-acid batteries to power electrical systems. Lead-acid batteries also have a role to play in renewable energy storage systems.

PRICES AND REVENUES

In 2023, the average LME cash settlement price for lead was US\$2 137/t, 0.7 percent lower than in 2022. Lead prices began the year at \$2 208 /t and were rangebound, recording slight increases, with a peak at \$2 253 /t in September, and declines with the highest fall recorded in December at \$2 036 /t (Figure 27). Though the automotive industry was supportive of the demand side of lead's market fundamentals, but wider macroeconomic picture was less robust. Also, the lead market exceeded demand by 92kt, leading to the weakening of prices.

FIGURE 27: LME MONTHLY LEAD CASH SETTLEMENT PRICES 2023



Sources: London Metal Exchange, January 2024

Local lead concentrate unit price increased by 10.2 percent to R37 219 /t from R33 775 /t recorded in 2022, driven by an increase in local and international demand, particularly from China and India. As a result, revenues generated from local sales increased by 15.5 percent to R4.9 million from R4.2 million in 2022 (Table 60). Export unit price also increased by 14.7 percent to R36 545 /t from R31 851 /t in 2022 due to the rising demand for the lead-acid battery metal on the international market. This led to higher revenues from export sales increasing by 20.3 percent to R1.5 billion (Table 60).

EMPLOYMENT

In 2023, total employment in South Africa's lead and zinc mines decreased by 2.5 percent to 3 142 from 3 223 employees that were employed in 2022 (Table 60). This was due to the downsizing of the labour force at Black Mountain mine, particularly contractor employment. Total earnings increased by

15.1 percent to R1.2 billion due to payout of long service bonuses. Per capita earnings also increased by 18.1 percent to R371 037, indicating improving salary levels at the mines.

TABLE 60: EMPLOYMENT AND REMUNERATION IN SOUTH AFRICA'S LEAD MINES IN 2014 - 2023

YEAR	EMPLOYEE	REMUNERATION	
	Number	R'000	Per Capita Earnings R
2014	1 424	219 004	153 795
2015	1 311	241 156	183 995
2016	1 649	312 856	189 725
2017	3 000	434 635	144 878
2018	2 512	494 282	196 768
2019	2 542	751 960	295 814
2020	2 346	1 049 193	298 834
2021	2 808	833 928	296 983
2022	3 223	1 012 803	314 242
2023	3 142	1 165 800	371 037

Sources: Department of Mineral Resources and Energy, Directorate Mineral Economics and Statistics, 2024

DEVELOPMENT

Black Mountain Mine, a subsidiary of Vedanta Zinc International, is currently working on the Swartberg expansion project by adding reserves and providing opportunities to mine the tailings of the Deep underground operation. This project is aimed at replacing the Deep operation as it approaches the end of mining life in 2025. BBM is planning a phased execution approach that entails developing an open pit operation to deliver 1.5 Mt per annum of ore with an expected 13-year life of mine. The mine is planning to retain the workforce from the Deep underground operation for the current project.

OUTLOOK

The demand for lead will be driven by the strength in the automotive sector, manufacturing, as well as the uptick in the global industrial sector. The lead-acid battery market will remain the largest consumer of lead, the demand for motor vehicles and renewable energy storage batteries is directly proportional to the demand for lead-acid batteries. With economic uncertainty still weighing on global markets, demand is expected to weaken in 2024. The rising cost of living in many countries due to growing inflation and higher interest rates is also expected to hamper consumer demand for vehicles. On the supply side, ILZSG predicts world lead mine supply to grow by 1.7 percent to 4.54 Mt in 2024 and 2.1 percent to 4.64 Mt in 2025 mainly driven by supply from China, Mexico and Australia. Prospects of mine expansions particularly in Australia, the second largest producer of lead, and the potential restart of operations in European smelters are expected in 2024. It is forecast that production from Ireland, Portugal and South Africa will be low. South Africa's lead mine production is expected to remain constrained in 2024 as a result of the depletion of ore at the Deep mine, one of BMM operations in the Northern Cape. World refined lead output is forecast to fall by 0.2 percent to 13.2 Mt in 2024, however, supply is anticipated to rise by 2.4 percent to 13.5 Mt in 2025. Global supply of refined lead metal will

exceed demand by 63 kt in 2024 and 121 kt in 2025. This is anticipated to put downward pressure on market prices for the lead-acid battery metal.

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NICKEL

SL Ramane

SUPPLY-DEMAND

South Africa's production rose by 2 percent to 30 kt in 2023, compared with 29 kt in 2022, this was due to the slight increase in PGMs and copper production where nickel is a by-product (Table 61).

Global primary nickel production reached 3,36Mt in 2023, representing an annual increase of 10 percent from 2022 production levels, according to the International Nickel Study Group (INSG). Indonesia, accounted for 51 percent of global production, followed by the Philippines (10.8 percent), Russia (6.5 percent), New Caledonia (5.8 percent) and Australia (4.7 percent).

TABLE 61: SOUTH AFRICA'S PRODUCTION AND SALES OF NICKEL, 2014-2023

YEAR	PRODUCTION		LOCAL SALES		EXPORT SALES		
	Mass	Mass	Value	Unit value	Mass	Value	Unit Value
	Kt	kt	R'000		kt	R'000	R'000
2014	55.0	8.1	1 429 476	176 435	48.1	7 705 911	160 139
2015	56.7	9.1	1 278 526	140 931	47.7	7 033 115	147 510
2016	48.9	9.8	1 300 550	131 821	42.8	5 799 815	135 317
2017	48.4	10.4	1 344 463	129 362	36.8	4 923 158	133785
2018	43.2	7.2	1 183 189	163 356	32.7	5 529 651	168,860
2019	43.4	6.1	1 098 401	179 448	34.0	6,121,685	179 817
2020	34.9	4.6	1 011 728	219 226	30.1	6 395 819	212 479
2021	31.8	7.1	1 872 248	261 305	28.1	7 290 721	259 346
2022	29.0	7.0	2 642 131	377 501	25.6	10 203 058	398 993
2023	30.0	6.0	1 845 601	323 053	24.0	9 288 652	385 325

DMRE, Mineral Economics and Statistics Directorate

Exports and local sales declined by about 6 and 18 percent to 24 kt and 6 kt compared to 25.6 kt and 7 kt in 2022 respectively, due to lack of demand. Nickel surplus persisted in 2023 created by Indonesia's increased output as well as mild demand from stainless steel. World primary nickel consumption was 3.19Mt in 2023.

UNIT PRICES AND REVENUE

The nickel prices declined in 2022 and continued into 2023 resulting from the increasing surplus of nickel from Indonesia, combined with falling demand from the stainless-steel sector. In line with international trends both local and export unit sales fell by 14 and 3 percent to R323 053/t and R385 325/t, respectively (Table 61). As a result of the drop in volume sales and prices for nickel, revenue also declined by 9 and 30 percent for both export and local sales, reaching R9 288 and R1 845 million, respectively.

The average nickel LME price in 2023 was USD 21 474/t, 16 percent below the 2022 average of \$25 605/t. Nickel LME prices began the year at \$ 31 239/t before dropping to \$22 499/t in March, triggered by weak demand in China amid prospects of monetary policy tightening in the US and Europe. Prices rebounded to peak at \$24 472/t in April driven by speculative buying and a weaker US dollar. The growth was curbed by weak market fundamentals, and as a result the price slipped and bottomed at \$20 829/t in May. Nickel prices fell below \$20 000/t due to a surge in supply, weak demand from the European and US stainless steel sectors, and a record-high number of LME short positions of investment funds amid inflationary pressure and high interest rates around the world. Despite news that Indonesia wouldn't approve any new nickel mining quotas for 2023, and the country's high-grade nickel resources could face depletion in six years, the LME nickel plunged to \$16 375/t in December 2023. Long-term predictions estimate nickel prices at the \$17 000 range for 2024.

EMPLOYMENT

Employment in the nickel sector has been on the decline since 2021 after Nkomati mine was placed on care and maintenance, the workforce reduced by a further 5.5 percent in 2023 to 152 employees from 160 (Table 62). However, remuneration increased by 7.9 percent in the same period due to annual pay increases.

TABLE 62: EMPLOYMENT IN THE PRIMARY NICKEL SECTOR

YEAR	TOTAL EMPLOYEES	TOTAL REMUNERATION (R)	PERCAPITA PAYMENTS (R)
2019	2 586	721 958 804	279 180
2020	2 125	57 485 484	27 059
2021	603	19 115 904	31 684
2022	160	51 774 765	323 592
2023	152	54 430 934	394 667

Source: DMRE, Mineral Economics and Statistics Directorate

DEVELOPMENTS

Canada-based Zeb Nickel Corp is exploring and developing the Zeb project, strategically located in the Bushveld in Limpopo, South Africa. The Zeb Project Contains a historical indicated resource of 485.4 Mt averaging 0.245 percent Ni, with an additional Inferred Resource of 1 115.1 Mt at 0.248 percent Ni using a cut-off grade of 0.1 percent TNi (Total Nickel). Additional drilling is required to further investigate the morphology of the mineralized envelope and to in-fill sparsely drilled areas. In 2023, the company will proceed with a drilling program, that intendeds to determine the current estimate of mineral resources on the Project and the extent to which the Historical Resource Estimate may be considered current.

OUTLOOK

The global supply for nickel is expected to continue rising ahead of demand, leaving the market in surplus therefore pushing the nickel price to drop further in 2023. World primary nickel production is expected to reach 3.516Mt in 2024 and 3.649Mt in 2025, according to the INSG leading to market surplus of 170kt in 2024 and 135kt in 2025.

Stainless steel is set to remain the main demand driver for nickel for some time, especially in China and in Indonesia. However, interest in nickel's use in batteries is on the rise, though the rate of growth of nickel use in batteries for electric vehicles (EV) has been less than anticipated. This is because of the negative impact of the removal of subsidies in China, competition from non-nickel batteries (mainly lithium iron phosphate) and a recent relative preference in demand for plug-in hybrid EVs over battery EVs. Hence it is very important that the country considers the local manufacture of batteries and not just assemble to create the much-needed jobs and grow the country's economy. The INSG expects an increase of approximately 6 percent in nickel demand to 3.346Mt in 2024 to 3.514Mt in 2025.

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TITANIUM

M Ikaneng

SUPPLY AND DEMAND

In 2023, world titanium minerals (ilmenite and rutile) reserves were estimated at 755Mt. South Africa with an estimated 34.1Mt, accounted for approximately 4.5 percent of global reserves, according to the USGS. The titanium dioxide market experienced a downturn in demand leading to high stock levels which prompted production cuts by major producers.

TABLE 63: SOUTH AFRICA'S TITANIUM PRODUCTION AND SALES, 2014-2023.

YEAR	PRODUCTION		LOCAL SALES		EXPORT SALES		
	Mass	Mass	Value (FOR)		Mass	Value (FOB)	
	kt	kt	R'M	R/t	kt	R'M	R/t
2014	2 511	2 757	2 934	1 064	123	1 025	8 329
2015	1 982	1 937	2 303	1 189	108	992	9 151
2016	1 895	1 329	998	751	203	1 743	8 599
2017	2 285	1 908	1 368	717	419	1 432	5 788
2018	1 873	1 800	1 647	915	253	1 620	6 403
2019	2 250	1 476	1 486	1 007	233	1 508	6 471
2020	2 114	1 356	1 498	1 105	233	1 472	6 316
2021	1 769	1 372	1 580	1 151	209	1 189	5 682
2022	2 191	1 629	2 137	1 312	166	1 736	10 486
2023	2 114	1 613	2 560	1 587	114	1 726	15 167

Source: DMRE, *Mineral Economics and Statistics Directorate*

Note: SA production consists of rutile, ilmenite and tiokwa

As such, South Africa’s production of titanium concentrates fell by 3.5 percent to 2 114 kt in 2023 (Table 63). Though production fell in China, it remained the largest producer of titanium minerals, followed by Mozambique, Australia and South Africa. Ilmenite accounted for over 90 percent of the overall titanium production from the mines. Local sale volumes declined by 0.98 percent to 1 613 kt, due low output prompted by high stock levels (Table 64). Export sales volume continued to fall for the third consecutive year driven by slower post Covid 19 recovery in China. As such, export sales tonnages fell by 31.3 percent to 114 kt in 2022, compared with 166kt the previous year.

Titanium pigment demand is driven by paints and coatings, plastics and paper. Other applications include catalysts, ceramics, coated fabrics and textiles, floor coverings, printing ink, and roofing granules. Titanium metal and metal alloys are mainly used in aircraft construction.

PRICES AND REVENUE

The average FOB price for rutile (minimum 95 percent TiO₂), was quoted at US\$ 1 490/t in 2023, up 1.4 percent from an average of US\$1 470/t in 2022, driven by global demand. However, ilmenite prices plunged by 37.3 percent driven by soft global demand and high stock levels.

South Africa’s titanium concentrates local unit price increased by 21 percent to R1 587/t in 2022, (Table 63.). Accordingly, local sales revenue also rose by 17.8 percent to R2.6 billion. Export unit sales soared by 44.7 percent to R15 167/t, compared with R10 468/t .in 2022. As a result of low sales volume, export revenue fell slightly by 0.58 percent to R1.73 billion.

EMPLOYMENT

Employment in the South African titanium industry fell by 2.8 percent to 5 281 employees in 2023 from 5 431 employees in 2022, due to reduction in employment at Fairbreeze mine (Table 64). As a result, total employee earnings fell by 7.9 percent to under R2.0 billion. Accordingly, per capita earnings fell by 11 percent to R373.

TABLE 64: EMPLOYMENT IN THE TITANIUM MINES, 2019-2023

YEAR	EMPLOYEE		REMUNERATION	
	Number	R'000	Per Capita Earnings	
2019	7 467	2 139 561	287	
2020	7 762	2 336 292	301	
2021	4 149	1 727 485	355	
2022	5 431	2 142 585	394	
2023	5 281	1 973 275	373	

Source: DMRE, Mineral Economics and Statistics Directorate

DEVELOPMENTS

The construction of US\$463 million Zulti South project at Richards Bay Minerals (RBM), remains fully suspended since the approval in April 2019. When this project is complete, it will sustain RBM’s current capacity and extend the life of mine.

Bulk earthworks on the 69 hectars Nyanza Light Metal’s main (TiO₂) plant site commenced in August 2024 at the Richards Bay Industrial Development Zone (RBIDZ) in South Africa’s KwaZulu-Natal province. Site clearing, levelling and geotechnical studies is expected to continue into 2025. Plant erection is scheduled to commence later in 2025, with first production from 2027.

Nyanza signed an engineering, procurement, construction (EPC) and operations management contract with East China Engineering Science and Technology Company, a subsidiary of China National Chemical Engineering Group Company.

Nyanza will process ilmenite produced from the mining of heavy mineral sands, to produce the ten times higher priced TiO₂ pigment on 28 hectares of the site, used for industrial coatings, architectural paints, paper and plastics. The remaining part of the site is earmarked for lithium iron phosphate, zirconium oxychloride, fumed silica, iron sulphate and sulphuric acid plant. The project is expected to have a production capacity of 80 000 tons of TiO₂ pigment per annum and, will require capital expenditure (capex) of \$550 million and peak funding of \$860 million. It is expected that 3 000 jobs will be created during the construction phase and 850 permanent jobs during operation.

The US government had previously imposed a 25 percent duty on TiO₂ products imported into that country from China, giving producers from other mining jurisdiction such as South Africa advantage to exports their titanium minerals into the US. Following the review of Section 301, imports from China on certain critical minerals have increased tariff rates ranging between 25 percent and 100 percent, beginning from September 2024. Further increases are anticipated in 2025 and 2026.

OUTLOOK

In the short term, titanium market is expected to be primarily driven by the growing usage of titanium alloys in the aerospace sector and increasing demand for titanium alloys for combat vehicles to replace steel and aluminium. China will continue to dominate the market, attributed to the increasing demand from the chemical, high-end aerospace, automotive, medical, and environmental protection sectors. Global demand for titanium minerals continues to outpace supply and this has resulted in a favourable environment for rutile and ilmenite prices. However, in the long term a few quality projects will boost supply and stabilize the market.

South Africa's supply changes will be influenced by the market's state of equilibrium and demand. Following a period of challenges at RBM, the mine has since become stable and accordingly titanium production has been on the rise. As soon as testing and development centre at Nyanza light metals is constructed, it will be able to handle 700t a year of titanium dioxide pigment and will operate for a year to allow for the completion of the preconstruction for the main commercial plant.

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ZINC

Silungiselelo Mnyameni

SUPPLY AND DEMAND

World zinc ore resources are estimated at 1.9 billion tonnes (Bt) with recognized reserves at about 224 million tonnes (Mt) distributed in Australia (64Mt), China (44Mt), Russia (25Mt), Peru (21Mt) and Mexico (14Mt), according to the United States Geological Survey (USGS). South Africa hosts an estimated 6.2Mt of zinc reserves, constituting 2.8 percent of global total.

The country's zinc production decreased by 11.6 percent to 198 kilo tonnes (kt) in 2023, from 224 kt achieved in 2022 (Table 65) due to persistent lower ore grades from Black Mountain and Gamsberg mines. World zinc mine production fell by 2 percent from 12.5 Mt in 2022 to 12.2Mt in 2023 constrained by operational disruptions particularly in Europe as well as lower output from Canada, China and Peru spurred by low zinc prices.

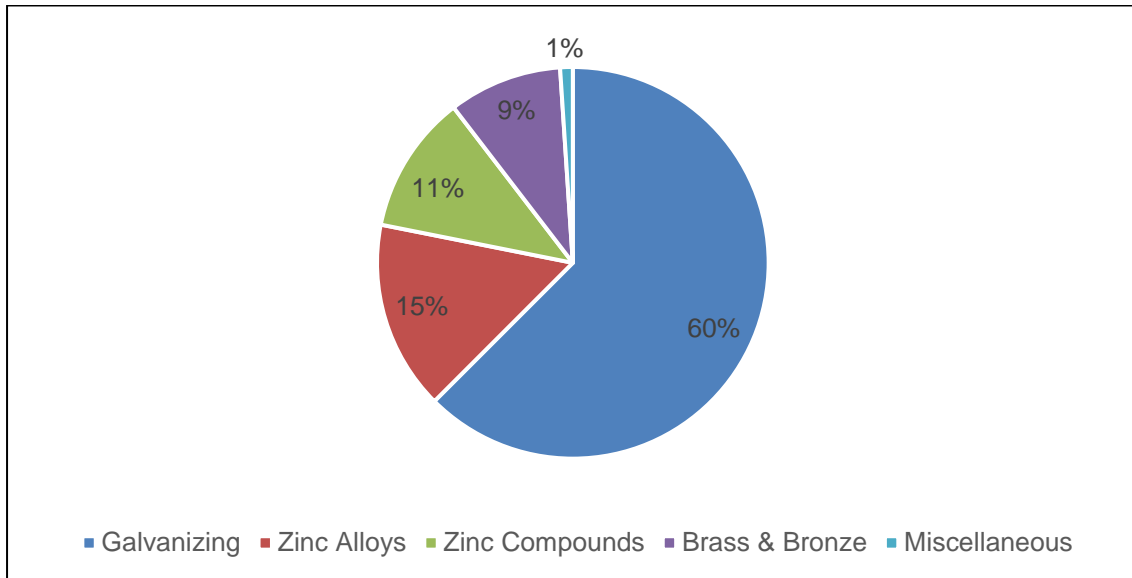
TABLE 65: SOUTH AFRICA'S PRODUCTION AND SALE OF ZINC METAL IN CONCENTRATE 2014 - 2023

YEAR	PRODUCTION	LOCAL SALES			EXPORT SALES		
	Mass	Mass	Value (FOR)		Mass	Value (FOR)	
	kt	kt	R'000	R/t	kt	R'000	R/t
2014	26	0	0	0	28	455 631	16 536
2015	29	0	0	0	30	447 493	15 164
2016	27	0	0	0	26	538 325	20 633
2017	31	0	0	0	32	990 268	30 596
2018	28	0	0	0	28	802 282	28 551
2019	125	0	0	0	174	3 519 916	20 180
2020	161	0	0	0	331	5 017 549	15 151
2021	194	0	0	0	380	7 084 935	18 656
2022	224	0	0	0	453	9 390 241	20 741
2023	198	0	0	0	376	7 534 737	20 015

Sources: DMRE, Mineral Economics and Statistics Directorate

South African zinc export sales fell by 17 percent to 376 kt in 2023 because of reduced output. All the zinc concentrate produced in the country was exported to China, Switzerland, and Germany. World refined zinc usage increased by 1.2 percent in 2023 driven by demand from Brazil, China, India, the Republic of Korea, Taiwan, Thailand and Vietnam which partially offset by reductions in Europe and the United States.

FIGURE 28: ZINC END USER BY SECTORS.



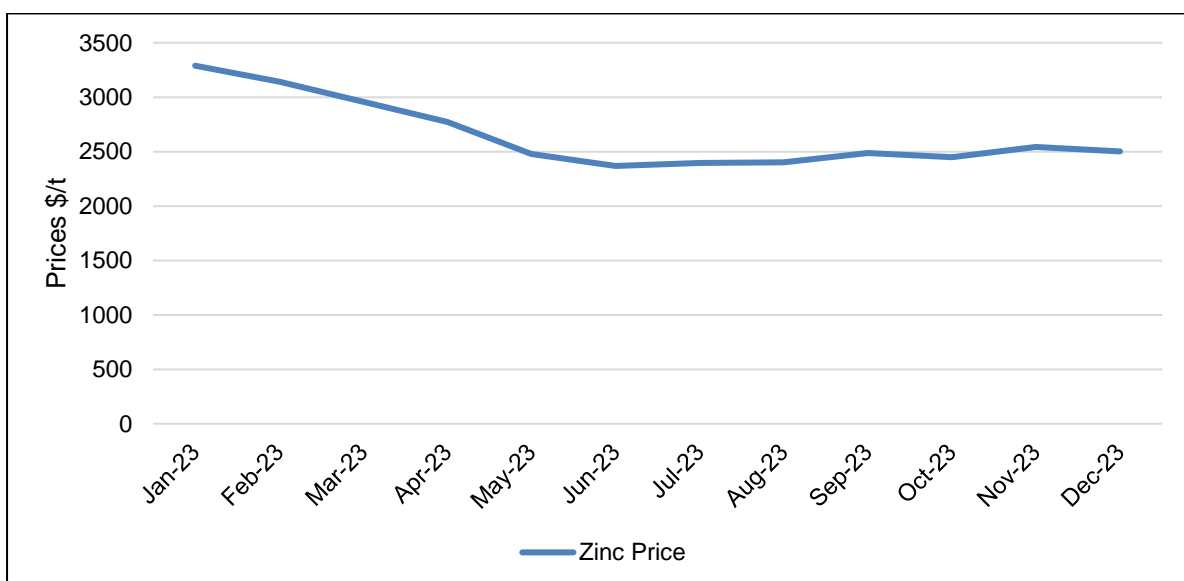
Source: International Lead and Zinc Study Group (ILZSG)

Galvanized steel is the largest first use application for zinc, accounting for 60 percent of all demand and is widely used in construction, building, energy (power), agriculture and transportation. Other uses of zinc include brass (9 percent), alloys (15 percent), compounds (11 percent) and miscellaneous (1percent), (Figure 28).

PRICES AND REVENUES

In 2023, zinc LME cash settlement price fell more than 23 percent to an annual average of \$2 649.04/t driven by high interest rates, the relative strength of the US dollar, high energy prices, and concerns over a downturn in China’s real estate sector (Figure 29). In January 2023, zinc prices averaged \$3 289.38/t and immediately started trending downward until bottoming at \$2 368.11/t in June 2023. In the second half of the year, prices rebounded slightly in July and were rangebound until settling at \$2 501.71/t in December.

FIGURE 29: ZINC LME CASH SETTLEMENT PRICE, 2023



Source: London Metal Exchange (LME), 2024

Zinc unit price decreased by 3.5 percent to R20 015 /t in 2023 from R20 741 /t the previous year (Table 65), driven by a slump in China's real estate sector, the largest consumer of galvanised steel. The resumption of smelting operations in Europe that were previously on care and maintenance on the back of higher energy prices were brought back online leading to an oversupply in the market exerting a downward pressure on market prices. As such, revenues from zinc sales were reflective of the falling export prices, recording a 19.8 percent decline of 19.8 percent to R7.5 billion in 2023 compared with R9.4 billion in 2022.

DEVELOPMENTS

The Vedanta Zinc International's Gamsberg Phase II expansion project will more than double Gamsberg's annual capacity from 4 Mt to 8.5 Mt of run of mine ore. Additionally, the project is set to expand Gamsberg's processing plant capacity to 500 kt per annum of metal in concentrate, bringing South Africa onto the global zinc map.

The construction partner for engineering processes has been appointed with a full ramp up of the project targeted for 2026 and 2027. The expansion will be carried out with an estimated investment of \$466 million. During the construction phase, the project is expected to create 2 000 – 2 500 jobs and a further 800 – 1 000 permanent jobs at the peak operations phase. The mineral reserves and resources of this project show a potential life of mine of 50 years.

OUTLOOK

Following two consecutive years (2022 and 2023) of world zinc mine production declines, it is anticipated that mine production will decline further in 2024, according to the International Lead and Zinc Study Group (ILZSG). However, a recovery is anticipated in 2025, mainly influenced by a robust growth in various jurisdictions. European output is forecast to record the highest decline followed by reductions in China, Canada, the United States and Peru. However, these anticipated declines will be partially set off by increases in Australia, Mexico and Congo DRC. Falling zinc prices have discouraged investment in existing and planned projects. Global demand for refined zinc is forecast to rise in 2024 and 2025 driven by demand by Chinese galvanising, passenger cars and home appliances industries.

The Group anticipates that world refined zinc metal production will be limited by the availability of concentrates and expects a decrease in 2024. However, in 2025, global refined metal output is forecast to recover. The global zinc market is expected to be in deficit in 2024 as mine production slump forces smelters to reduce production of refined metal. Weaker global industrial activity led by China's weaker construction sector and other major economies is anticipated to weigh on the consumption of zinc mostly used to galvanize steel for construction, manufacturing and infrastructure. Subdued demand for zinc is forecast to put downward pressure on market prices.

South Africa's zinc production is expected to rise as Gamsberg mine gradually ramps up production towards full capacity at 250 kt per annum. The project is anticipated to put South Africa in the map among the largest zinc producers in the world.

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ZIRCON

Mathabo Ikaneng

SUPPLY DEMAND

In 2023, the world reserves base for zircon concentrates was estimated at 74 Mt, with Australia hosting the largest reserves at 55 Mt, followed in distant second place by South Africa with 0.56 Mt, according to United States Geological Survey (USGS)

Global mine production of zirconium mineral concentrates increased by 11.1 percent to 1.6Mt in 2023 from 1.4Mt in 2022. Major producers were Australia (500 kt), South Africa (289 kt) and China (140kt). South Africa's zircon production fell by 5.9 percent to 289 kt in 2022 (Table 66), attributed to challenging macroeconomic environment, particularly sluggish demand as well as inflation and geopolitical unrest.

TABLE 66: SOUTH AFRICA'S ZIRCON PRODUCTION AND SALES, 2014 - 2023

YEAR	PRODUCTION	LOCAL SALES			EXPORT SALES		
	Mass	Mass	Value (FOR)		Mass	Value (FOR)	
	kt	t	R'000	R/t	kt	R'000	R/t
2014	398	12	138 836	11 768	431	4 601 410	10 679
2015	380	8	116 784	13 286	404	4 818 346	11 931
2016	377	5	62 386	13 621	349	4 069 143	11 675
2017	362	10	126 944	12 915	367	4 505 860	12 259
2018	340	10	192 741	18 360	364	6 555 576	17 974
2019	368	8	180 752	21 513	414	8 594 875	20 784
2020	307	9	208 943	22 716	390	8 270 821	21 295
2021	278	11	244 286	22 052	327	6 561 498	20 093
2022	307	10	327 844	32 814	312	10 061 426	32 293
2023	289	6	245 416	38 606	263	8 525 903	36 069

Sources: DMRE, Mineral Economics and Statistics Directorate

Over 95 percent of South Africa's zircon production is sold in the international market. Local sale volumes decreased by 40 percent to 6 kt, while export sales volume fell by 15.7 percent to 263k from 312 kt in 2022, as the construction sector remained subdued (Table 66). Global demand for zircon concentrates was soft in 2023, mainly affected by the decline in the Chinese construction industry, which accounts for more than half of global zircon demand.

Major applications of zircon and its derivatives include ceramics manufacturing, refractories and casting in foundry industry, catalysis and pigments in paints. Zircon also forms an integral part of high-tech equipment such as military, aerospace and medical

PRICES AND REVENUES

Global zircon prices started the year on a positive trajectory at US\$ 2000/t and continued in Q2 of 2023 to reach US\$ 2100/t. Zircon prices settled at US\$ 2300/ by the end of the year, defying the volatility of the market that underscored the imbalanced supply and demand dynamics. South African zircon unit sales price performed better than expected, rising by 17.7 percent to R38 606/t in 2023, while export unit prices increased by 11.7 percent to R36 069/t driven by rising prices in the international market (Table 66). However, the lower local and export sales volumes had a negative impact on sales revenue resulting in a 25.1 percent decline in local sales revenue to R245 million and an 18 percent decline in export sales revenue to R8.5 billion.

EMPLOYMENT

In 2023, total employment in zircon mines fell by a marginal 0.6 percent 314 from 316 employees in 2022 (Table 67). Total earnings increased by 5.6 percent to approximately R130 million due to higher employee remuneration. Per capita earnings increased by 6.2 percent to R389 thousand, indicative of improving salary levels at the mines.

TABLE 67: EMPLOYMENT AND REMUNERATION IN SOUTH AFRICA'S ZIRCON MINES IN 2014-2023.

YEAR	EMPLOYEE	REMUNERATION	
	Number	R'000	Per Capita Earnings (R)
2014	184	38 437	208 897
2015	373	100 309	268 925
2016	345	102 616	297 438
2017	310	104 394	336 755
2018	355	118 429	333 603
2019	368	119 241	324 024
2020	352	106 821	303 469
2021	313	105 446	336 888
2022	316	122 910	388 956
2023	314	129 744	413 199

Sources: DMRE, Mineral Economics and Statistics Directorate

DEVELOPMENTS

The construction of US\$463 million Zulti South project at RBM remains fully suspended since its approval in April 2019. When this project is complete it will sustain RBM's current capacity and extend the life of mine.

OUTLOOK

New entrants from Australia led to a market excess and the market is expected to remain the same in 2024. This trend is expected to continue into 2025, as such zircon pricing is expected to remain tight. The market excess will start improving from 2026 and beyond, as new mine supply is expected to offset declining output from aging mines and mine closures over the coming years.

Demand for zircon sand is driven by growth in the construction sector, particularly in India, China and Europe. Demand for zircon was soft in 2023 due to sluggish demand from the Chinese construction industry. However global zircon demand is expected to improve from 2024, as many economies undertake activities that will stimulate economic growth, including interest rate cuts on the back of improving inflation – zircon demand has been observed to be linked to GDP growth due to its broad spectrum of applications. In recent years, efforts to explore new end markets with higher value add for zircon and its derivatives were made. New areas such as nanomaterials, 3D printing, advanced coating and biomedical implants should expand the zircon market and increase its resilience in tough economic times.

South Africa, supply growth is limited even with Richards Bay Minerals returning to normal production. The demand for South African produced zircon is dominated by the export market with more than 96 percent of the total production sold in the international market.

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INDUSTRIAL MINERALS OVERVIEW

Ray Masetlana

INTRODUCTION

Industrial minerals comprise of a highly diverse group of vitally important minerals and rocks that are exploited for their non-metallurgical value. These are used in various applications, lime and limestone as well as phosphates in agriculture and fertiliser industries, sands, limestone and dimension stone in construction, fluorspar, and kaolin in pharmaceuticals and chemicals, andalusite, lime and silica sands in the metallurgical sector, kaolin and feldspar in the paint and pigment sectors.

Industrial minerals are generally high volume, low value commodities compared with other minerals, making their economic exploitation highly dependent on transport costs and distance to the market. Because of their low value, some companies mining these minerals have a high degree of vertical integration, in that they mine raw materials and beneficiate them to the stage of final product. Many industrial minerals have a large value-added potential because the same mineral can often be used in different applications. Key to this sector, is the performance of the mineral consuming market which drives the demand for industrial minerals. This is often led by the economic performance, population growth and development.

PRODUCTION

Production of industrial minerals decreased by 3.7 percent to about 89 Mt in 2023 compared with 2022. The decrease is attributed to various factors such as higher construction costs including a rapid rise in interest rates, an unstable global economy, as well as heightened operational challenges, all of which led to a subservient performance.

SALES TRENDS

Industrial minerals total sales mass decreased by 5 percent, driven mainly by the decline in aggregate and sand, owing to waning economic activities in construction sector, while fluorspar downswing can be attributed to a reduction from the local downstream market. Total revenue generated from industrial minerals sales in 2023 was R25.7 billion, an increase of 13 percent compared with the previous year. The increase in mineral sales is attributed to strong market prices for commodities such as aggregate and sand, andalusite, fluorspar, limestone and phosphate rock.

EMPLOYMENT

Industrial minerals workforce is estimated to have increased by 0.2 percent in 2023 to 17 884 employees due to slight improvement in the marketplace activity. Total remuneration increased by 24.3 percent to R5.3 billion, with average annual earnings of R297 453 per employee, a 24.1 percent increase from 2022. The corresponding revenue generated per employee increased by 12.8 percent compared with the same period. Industrial minerals employment accounted for 3.7 percent of the total mining workforce in 2023.

OUTLOOK

Industrial minerals are generally low-priced and heavily reliant on domestic market for bulk consumption. South Africa's industrial minerals sector is primarily driven by economic growth, particularly construction and manufacturing. However, construction minerals make up most of the local industrial minerals' consumption. The South African construction market is valued at R464.8 billion

(\$25.5 billion) in 2023, and the industry's output is expected to grow by an annual average rate of 3.6 percent between 2025 and 2027, supported by the development of transport, energy, industrial and housing projects. South African government has long identified infrastructure development as a potential driver of economic development and growth. To this end, the government has resolved to pursue a massive investment in infrastructure, ultimately causing construction minerals like aggregate and sand supply and demand growth and boosting job creation as well as economic growth. It is thus anticipated that their production, sales volume, and sales revenue experience an upswing because of the construction industry's growing indicators.

The construction aggregates market size is expected to continue growing in the coming years, driven by increased infrastructure development and construction activities in emerging economies, as well as the trend towards sustainable construction practices that prioritize the use of recycled and eco-friendly materials. The South African government has outlined plans to fast track infrastructure projects that are under construction and those already pre-approved, which are expected to result in an increase in demand for industrial minerals such as limestone, dimension stone and aggregates. The expected improvement is underpinned by easing structural constraints (loadshedding and logistics).

It is expected that imports of fluorspar will increase, to make up for the expected shortfall, following the announcement by the Chinese Ministry that it will reduce import tariffs on fluorspar and fluorspar-related products in that country, with effect from January 2024. In addition, the demand for the commodity will further benefit from the demand for its application in the growing application in the production of batteries, driven by demand for electric vehicles (EVs). Furthermore, its refrigeration applications, fluorspar is also essential in the new energy and new materials sector, including in the manufacture of lithium hexafluorophosphate, polyvinylidene fluoride (PVDF), graphite anodes, and photovoltaic modules. The European Union is also another emerging battery market with battery capacity expected to exceed 1,000 GWh/year by 2030, further driving demand for fluorspar to approximately 375,000 tonnes per year, representing 65 percent in demand increase in fluorspar in Europe. The global limestone market was valued at USD 75.79 billion in 2023 and is expected to grow at a compound annual growth rate (CAGR) of 7.4 percent during the forecast period. The market is poised for sustained growth, driven by the expansion of industries such as construction, agriculture, and chemicals.

Construction sector significantly relies on limestone, primarily for its essential role in cement and concrete production. The South African cement market is projected to grow at a CAGR of 2.5 percent, between 2024 and 2032, reaching a total of around 17.1 Mt by 2032. Furthermore, the increasing global population necessitates higher agricultural productivity. As a result, the demand for limestone in agriculture is expected to rise, especially in regions aiming to enhance food security. In addition, rapid urbanization and the need for modern infrastructure are also drivers of the limestone market. Simultaneously, the growth of diverse industries, including manufacturing, steel production, and chemicals, hinges significantly on the abundant supply of limestone

Phosphate has a diverse application across agriculture, industry as well in human body, as a vital nutrient. Its primary application in agriculture is fertilizers, to enhance productivity in crops. The global phosphate market is projected to experience an annual growth rate of 8.1 percent from 2024 to 2031, amid the projected growth rate in the agricultural industry from 1.2 percent to over 4 percent, which is driven by the growing global population (estimated to grow by 10 billion by 2050) and the food industry. During this time, food demand is expected to rise by 59 percent to 98 percent, over the forecast period, while farmers are expected to increase agricultural productivity through fertilizers and advanced farming technologies. Increased population will be met by increased crop production, farming activities, and trade volumes. Hence, it is anticipated that the phosphate market will see a recovery in demand, due

to improvements in the economy and the resolution of supply chain issues. South Africa's phosphate production is expected to increase on the back of a few projects coming online.

The growth of the kaolin industry is expected to be positively impacted by the increasing demand for ceramic products, such as tiles and sanitaryware, as well as by its expanding use as a supplemental material in the cement sector. The market for kaolin is expected to grow at a compound annual growth rate (CAGR) of 9.3 percent to reach \$14.67 billion in 2028. Its increased use in agriculture, the rise of environmentally friendly substitutes, rising applications in cosmetics, and changes in consumer tastes toward natural products are the main drivers of the industry's anticipated growth in the years to come, as it finds new application in other areas. In addition, more research and development are being done on medicinal and cosmetic grades of the substance.

The growth in construction and industrial projects will lead to increased demand for various materials and chemicals, including bentonite, for applications such as drilling fluids, construction materials, and environmental containment liners. Additionally, the burgeoning oil and gas exploration activities in certain regions, particularly in offshore areas, are expected to contribute further to the demand of bentonite in drilling fluids. Global bentonite market is estimated to grow at a compound annual growth rate (CAGR) of 4.2 percent from the year 2025 to 2034 and is likely to reach approximately 19 million tonnes in 2034. As South Africa continues to enhance its environmental regulations and waste disposal standards, the demand for bentonite in this sector is expected to rise. This trend is likely to spur local production, offering new opportunities for bentonite suppliers to meet the growing needs of both public and private waste disposal projects. Additionally, government initiatives focused on sustainable environmental practices and infrastructure development could further boost demand for bentonite in the short-term.

The future of the industrial attapulgite clay market looks promising, with continued advancements in technology and growing demand across various industries. As manufacturing processes become more sophisticated, the need for versatile materials like attapulgite clay will continue to rise, offering significant opportunities for growth and investment. The country's strategic goal to diversify its energy mix is another factor expected to stimulate the attapulgite market. Attapulgite's application in drilling fluids for gas exploration could lead to increased demand, particularly as the country advances its efforts towards cleaner energy solutions. Hence, the market for attapulgite clay is expected to rise steadily in the future due to rising demand across a range of applications, such as paint, plastics, and medications.

Growing infrastructure, expanding markets, environmental applications, and technological advancements have all contributed to the increase seen throughout the anticipated time. Demand for vermiculite continues to rise on the back of the following main drivers, population growth, change in lifestyle, and increasing consumer preferences towards healthy food products. The vermiculite market is anticipated to grow at a robust CAGR of 7.6 percent to reach a projected market value of \$0.37 billion by 2028. The market for vermiculite will probably see rapid expansion in the upcoming years. Therefore, South Africa's supply of vermiculite is expected to continue an increasing trend to meet the demand fuelled by the healthy appetite from the agricultural sector and the growing population.

AGGREGATE AND SAND

M Modiselle

SUPPLY AND DEMAND

Aggregate and sand are mainly used in the construction sector as raw materials for concrete, masonry and as base materials for roads, landfills, and buildings. Total sales volume of aggregate and sand decreased by 0.4 percent to 53.9 Mt in 2023, owing to higher construction costs including a rapid rise in interest rates, an unstable global economy from the construction sector, likely impacting on aggregate and sand industry (Table 68). The effects for construction sector have been substantial, whereby the overall, stability and strength of the industry has gradually continued to improve. However, growth is slow and construction businesses (big and small) continue to face some unique challenges. Nonetheless, total sales value of aggregate, and sand increased by 7.7 percent from R6.75 billion in 2022 to R7.27 billion in 2023, on the back of improved demand for infrastructure development. After years of under-investment in infrastructure and grappling with the impact of a high-interest rate environment, the construction industry in the country witnessed a notable surge in activity throughout 2023.

TABLE 68 SOUTH AFRICA'S SALES OF AGGREGATE AND SAND BY MASS, 2014-2023

YEAR	+COARSE			xFINE			TOTAL		
	Mass	Value (FOR)		Mass	Value (FOR)		Mass	Value (FOR)	
	Kt	R'000	R/t	Kt	R'000	R/t	Kt	R'000	R/t
2014	47 972	5 310 874	111	14 220	605 774	43	62 192	5 916 648	95
2015	48 991	5 808 230	119	14 788	693 854	47	63 779	6 502 084	102
2016	51 035	6 435 356	126	14 594	659 796	45	65 630	7 095 152	108
2017	52 102	6 621 184	127	14 306	683 208	48	66 408	7 304 392	110
2018	48 223	6 194 005	128	13 707	765 548	56	61 930	6 959 553	112
2019	47 642	6 149 151	129	11 890	732 045	62	59 532	6 881 197	116
2020	38 972	5 321 729	137	10 071	628 919	62	49 042	5 950 648	121
2021	42 850	5 746 948	134	12 139	797 332	66	54 990	6 554 280	119
2022	43 354	6 020 793	139	10 792	730 456	68	54 147	6 751 248	125
2023	44 193	6 595 891	149	9 743	675 073	69	53 936	7 270 964	135

Source: DMRE, Mineral Economics and Statistics Directorate

Notes: + Includes Crusher Sand

x Includes Natural Sand

Construction minerals make up the bulk of local industrial minerals sales, therefore aggregate and sand as well as the other construction minerals contribute the most to the sector growth. South African aggregate and sand market is driven by the growth of the construction industry, urbanization, and infrastructure development projects. The increasing investment in residential, commercial, and public infrastructure projects is driving the demand for construction aggregates in South Africa, along with the growing emphasis on sustainable construction practices and the use of recycled aggregates.

South Africa's construction industry expanded by 0.6 percent year-on-year in 2023, impacted by low activity in the residential and non-residential building sectors and high policy uncertainty ahead of the 2024 elections, discouraging private infrastructure investment. Companies in this market are encountering heightened competition and a challenging trading environment due to persistent low levels

of economic growth and a downturn in the construction sector. Construction will be one of very few economic sectors that will hit 2024 running in South Africa as activity reached seven-year highs in 2023 off a low base, following years of under investment on infrastructure, and the impact of the high-interest rate environment.

South Africa's construction sector has shown great resilience in rebuilding and rebounding after the Covid-19 pandemic. Construction investment dropped significantly, with residential and non-residential investments contracting sharply. Despite challenges, the civil industry showed positive signs with increased project awards and tender values. The building industry remains pressured, due to high interest rates and weak investor sentiment. The value of recorded building plans passed (at current prices) decreased by 13.8 percent or -R16 319.7 million in 2023 compared with the year 2022. Building plans for residential buildings decreased by 19.1 percent or -R11 908.9 million, non-residential buildings decreased by 4.2 percent or -R941.3 million and additions and alterations decreased by 10.5 percent or -R3 469.5 million. The value of buildings reported as completed (at current prices) decreased by 14.8 percent or -R10 026.9 million in 2023 compared with 2022. Residential buildings decreased by 6.5 percent or -R2 430.2 million, additions and alterations decreased by 39.6 percent or -R6 289.8 million and non-residential buildings decreased by 8.9 percent or -R1 306.9 million.

PRICES

The average unit value of aggregates continued a moderate growth trajectory until it dropped in 2021 and afterwards continued to swivel again from 2022 until 2023. The unit value of aggregates increased by 7.2 percent from R139/t in 2022 to R149/t in 2023, rising price of fuel which was contributed by the Russia-Ukraine conflict. Costs for fuelling machinery, lighting sites, heating and transportation have ballooned and contributed to higher construction costs. While sand unit value followed suit, increasing by 1.5 percent from R68/t to R69/t in 2023. The total unit value of aggregates and sand increased by 8 percent from R125/t in 2022 to R135/t in 2023 (Table 68). The construction price index (Stats SA) showed that the price index of aggregate stone increased by 7.8 percent and price index of sand increased by 7.1 percent year-on-year. There is always a spike in the index in the fourth quarter of each year, as contractors rush to complete projects before the builders' year-end shutdown in mid-December.

EMPLOYMENT

Employment in the sector decreased by 1.9 percent to 6 097 personnel in 2023 compared to 6 213 personnel in 2022 (Table 69), which can be attributed to decreased labour capacity from male personnel. Higher construction costs also saw a reduction in job opportunities in the construction sector. Labour productivity increased by 1.5 percent from 8.72 kt/employee to 8.85 kt/employee in 2023. The increase in productivity was because while production in 2023 declined by 0.4 percent as compared to 2022, the number of employees also declined by 1.9 percent and the percentage declines of the two parameters are not commensurate. Revenue generated per employee increased by 9.7 percent from R1 086 633/employee in 2022 to R1 192 548/employee in 2023. Despite employment decline by 1.9 percent in 2023, the percentage of total revenue increased by 7.7 percent in 2023 as compared to 2022. Average annual earnings slightly increased by 0.1 percent from R207 262/employee in 2022 to R207 404/employee in 2023. The increase in average annual earnings was due to increased labour productivity rates in 2023.

TABLE 69: SOUTH AFRICA'S AGGREGATE AND SAND QUARRIES EMPLOYMENT AND REMUNERATIONS, 2014 – 2023

YEAR	EMPLOYEES	TOTAL REMUNERATION
		R'000
2014	7 421	1 037 945
2015	7 452	1 115 964
2016	7 553	1 167 306
2017	7 425	1 176 061
2018	7 337	1 252 988
2019	7 112	1 253 124
2020	6 075	1 013 209
2021	6 465	1 250 590
2022	6 213	1 287 718
2023	6 097	1 264 545

Source: DMRE, Mineral Economics and Statistics Directorate

RECENT DEVELOPMENTS

Government is introducing fundamental and far-reaching reforms to infrastructure financing and delivery, to optimise the infrastructure value chain to be effective and efficient. According to the 2024 Budget Review, over the next three years, government plans to invest R943.8 billion in infrastructure. This includes investments of R486.1 billion by state-owned companies and public entities, R213.8 billion from municipalities and R224.8 billion from provincial and national government.

The South African government has launched 12 major infrastructure projects to promote public and private sector-led development. The launch happened at the Sustainable Infrastructure Development Symposium in Cape Town on 19th March 2024. The projects cover transport, social services, electricity, gas and water and are part of the 2024/2025 infrastructure pipeline. President Cyril Ramaphosa, who delivered the keynote address, described infrastructure development as the flywheel that will accelerate economic development. According to Infrastructure South Africa (ISA), these priority projects, all face one or more obstacles in becoming a bankable project that would be able to secure funding from the fiscus, and/or the private sector and development finance institutions, such as bulk service provision or securing environmental approval. ISA will now focus on unblocking these projects to ensure that they can proceed. The projects are as follows:

- *the liquid natural gas import terminal in KwaZulu-Natal.*
- *the Durban Container Terminal (DCT Pier 1) project in KwaZulu-Natal.*
- *the Berth A100 liquid bulk project in the Eastern Cape.*
- *the Ukuvuselela rail project between Gauteng and the Eastern Cape, aimed at assisting car and component manufacturers and exporters.*
- *a project to refurbish health facilities.*
- *schools project in Limpopo and KwaZulu-Natal.*
- *the Eskom Mossel Bay gas project.*
- *the Eskom Tubatse pumped hydro storage project.*
- *the Rooiwal Phase 2 wastewater project in Tshwane.*
- *the Amathole water bulk supply augmentation project in the Eastern Cape.*
- *the Nkhomazi Special Economic Zone (SEZ) in Mpumalanga; and*
- *the Namakwa SEZ in the Northern Cape.*

The "construction mafia," which poses a threat to South Africa's construction industry's survival, is another concerning factor for the construction industry. By intimidating construction companies, these criminal syndicates forcing them to pay protection payments causes disruptions, leading to delayed

projects, violence and financial losses through extortion at construction sites. President Cyril Ramaphosa's commitment to address this issue with a dedicated police unit signalled the government's effort to tackle the problem. President requested the establishment of South African Police Service (SAPS) Task Force that focuses on investigating and prosecuting construction mafia incidents across South Africa.

OUTLOOK

Since construction minerals make up most of local industrial minerals, it is anticipated that production, sales volume, and sales revenue of industrial minerals will eventually experience a boost, because of the construction industry's growing indicators. The construction aggregates market size is expected to continue growing in the coming years, driven by increased infrastructure development and construction activities in emerging economies, as well as the trend towards sustainable construction practices that prioritize the use of recycled and eco-friendly materials. The South African government has outlined plans to fast track infrastructure projects that are under construction and those already pre-approved, which are expected to lead to an increase in demand for minerals such as limestone, dimension stone and aggregates. The expected improvement is underpinned by easing structural constraints (loadshedding and logistics).

Generally, in 2023, the construction industry's strength and stability have been better throughout time. Following lockdowns in 2020, the last few years of the 2010s were an incredibly turbulent rollercoaster. Still, there is a modest rate of expansion, and both large and small construction companies are confronted with some difficulties. Forecasts are largely optimistic despite challenging years in the building sector. Despite the obvious challenges, the future of the construction industry remains positive. Small to large construction businesses in South Africa are versatile and adaptable, and they continue to find a way forward. The South African construction market is valued at R464.8 billion (\$25.5 billion) in 2023, and the industry's output is expected to grow by an annual average rate of 3.6 percent between 2025 and 2027, supported by the development of transport, energy, industrial and housing projects.

South Africa's construction industry ranks among the top GDP and employment contributors in the country, making it as crucial to the economy as it is to the country's physical expansion and advancement. Despite these positive predictions, there are challenges ahead in 2024 for the construction industry, including increases in material and labour costs, logistics disruptions, labour shortages, lack of access to funding and slow technology uptake. Investment in infrastructure is gaining momentum. New and innovative funding mechanisms will be utilized to increase construction of infrastructure.

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ALUMINO-SILICATES

M Maredi

SUPPLY AND DEMAND

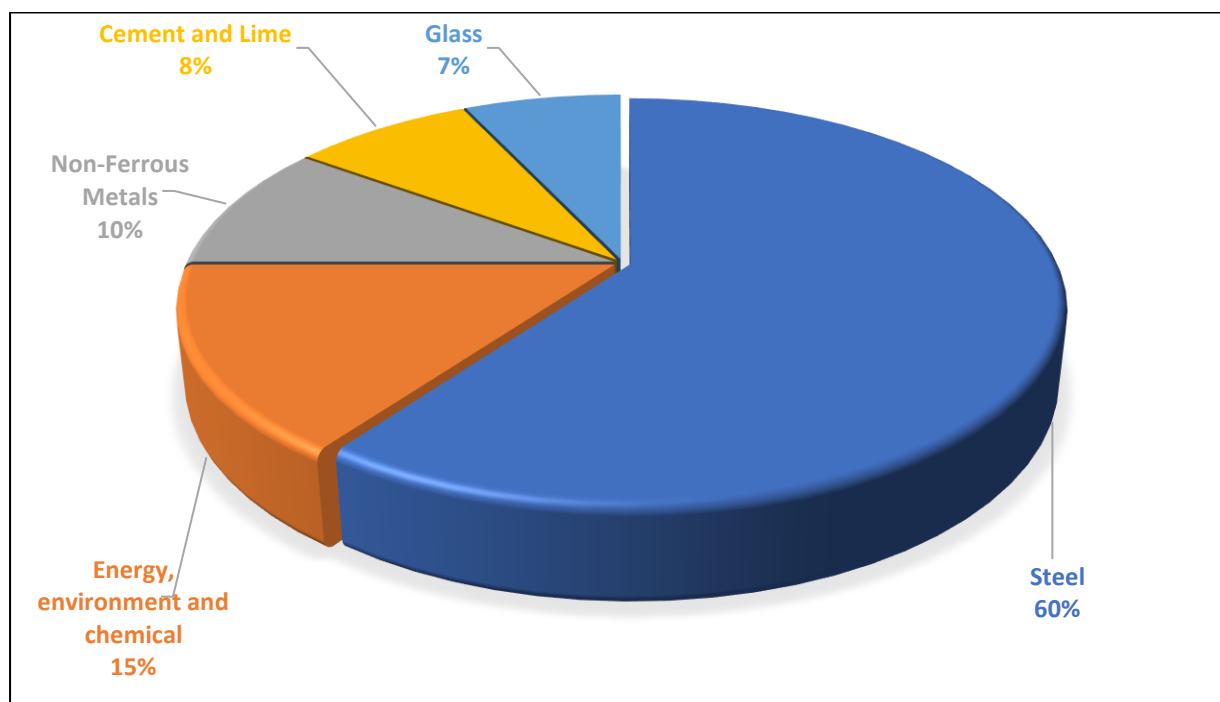
SOUTH AFRICA

Domestic supply of alumino-silicates comprises only andalusite, with one sillimanite producer closing shop during heights of the Covid-19 pandemic. South Africa possesses by far, the largest portion of the world's known andalusite deposits, with production mainly sourced from ARM Andalusite and Imerys, which operates two mines, viz., Rhino and Annesley. The production of andalusite declined year-on-year by over 9 percent in 2023, owing to a decline in demand for the material. The supply of andalusite is highly reliant on the demand for the material, as year-long contract negotiations are made around February. Local sales mass went slightly up by a little under 1 percent with local sales value increasing by over 20 percent. This was due to increased demand from the domestic steel sector. The upswing in domestic demand coincided with the upswing in local steel production, which went up by 10.6 percent in 2023. South African steel output went from being ranked 34th in global output in 2022 to the 32nd spot in 2023, overtaking Sweden, amongst other countries. International demand for andalusite took a knock in 2023, which saw export sales volume decline by over 20 percent, but export sales revenue increased by over 4 percent. The contrasting effect on export sales volume and revenue was a result of a price hike, which had a negative impact on the quantities sold but a positive one on revenue generated from the sale.

WORLD

Demand and growth of alumino-silicates is largely dependent on the refractory production and the industry's end-user markets at large. The iron and steel sector is by far the largest consumer of refractories, accounting for about 60 percent of global refractory demand. This is followed by the energy, environment, and chemicals sectors which account for about 15 percent of consumption for refractory materials, the non-ferrous metals sector at about 10 percent, cement sector at around 8 percent and the remainder being the glass industry at approximately 7 percent refractory consumption (Figure 30).

FIGURE 30: WORLD REFRACTORIES MARKET BY END-USERS



Source: Maximize market research, 2022

South Africa remains the largest producer and exporter of andalusite, China tailing behind at an estimated 100 kt in 2023. Peruvian andalusite production declined from 2022 output levels, owing to the expectation of low demand for the material. French exports surpassed Peruvian exports despite the 4 percent export volume decline from France. India, the United Kingdom, United Arab Emirates (UAE) and Italy were among the few countries that reported increases in alumino-silicates exports, but the top 8 exporters reported declines in export volumes. Total world imports of alumino-silicates also declined in 2023 by about 23 percent, signifying a decline in appetite. Steel production, the biggest end-user market, also reported a marginal decline in output for the 2023 period compared to 2022. World steel production declined from 1888.7 Mt produced in 2022 to 1888.2 Mt in 2023, with notable declines from Japan, Germany, Türkiye and Brazil, amongst other countries. India is experiencing unprecedented steel demand growth across numerous industries and sectors. Infrastructure is one of the most crucial sectors for the country's economy and thanks to policy approaches, the sector has witnessed tremendous growth.

PRICES AND REVENUES

The price of andalusite f.o.b Durban was estimated at around \$454/t in April 2023, the price however declined in May 2023 to about \$386/t. With new contract price negotiations in June 2023, prices edged upward by about 17 percent to about \$452/t. The upswing was nevertheless short-lived as prices declined in July 2023 to \$427/t, denoting a 5.5 percent decline from the previous month. The average unit value of andalusite increased to R7018/t from R5459/t, increasing by 37.5 percent. This is due to high energy and shipping costs.

EMPLOYMENT

Total employment in the andalusite sector went up to 567 personnel in 2023 from the 522 employed in the sector in 2022 (Table 70). This signifies an 8.6 percent year-on-year increase in the total labour force. Total remuneration increased by over 13 percent in 2023, in line with the increase in personnel. Labour productivity declined in 2023 by 16.9 percent, as output levels declined during the reporting period, despite the increase in the labour force.

TABLE 70: SOUTH AFRICA'S ALUMINO-SILICATE MINES: EMPLOYMENT, 2014–2023

YEAR	EMPLOYEES	TOTAL REMUNERATION
		R'000
2014	349	*
2015	337	*
2016	339	*
2017	362	*
2018	398	*
2019	446	*
2020	442	*
2021	486	*
2022	522	*
2023	567	*

Source: DMRE, Mineral Economics and Statistics Directorate

*Total Remuneration figures withheld for confidentiality reasons

OUTLOOK

Despite ongoing challenges arising from the aftermath of monetary tightening, rising costs, limited affordability, and geopolitical uncertainties, there is a cautious optimism that global steel demand will enter a period of broad-based moderate growth in 2025, expected to reach around 2.5 billion tons per annum (btpa) by 2050. China's national plan has highlighted reducing carbon emissions from the iron and steel industry from 2024 to 2025 and is expected to reduce steel capacity, due to the current oversupply and the imposition of high tariffs from export destinations as an anti-dumping initiative. Growth in the Indian steel market is expected to be driven by growth in all steel-consuming sectors, particularly continued robust growth in infrastructure investments, which is expected to drive steel demand growth by 8 percent from 2024 to 2025. The expected growth in steel demand and production will ultimately lead to increase in appetite for refractory materials like andalusite. The global andalusite market size is anticipated to reach around \$496.2 million by 2034, growing at a Capital Annual Growth Rate (CAGR) of about 4.5 percent over the forecast period 2024 to 2034. Such a growth rate will be on the back of growing solar energy industrial sector, expanding automotive, industrial sector, and energy-efficient buildings raising demand.

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DIMENSION STONE

M Modiselle

SUPPLY AND DEMAND

Dimension stone is a natural rock used mainly in the construction industry, monument applications and for decorative purposes. South Africa's local sales quantity of dimension stone decreased by 23.4 percent to 210.5 kt in 2023, as compared to 274.7 kt in 2022. Local sales decrease was due to lack of demand of sales for granite blocks and sawn slabs, slate for tile roof as well as slate for other uses. The decrease in dimension stone demand came mainly from granite blocks and granite sawn slabs which decreased by 24.7 percent and 11.2 percent respectively, owing to waning domestic demand of granite applications. Domestic demand for slate saw a 7.9 percent increase for the period under review. The local slate industry displayed signs of improvement, particularly slate for paving and slate for tile roof, which increased by 16.1 percent and 17.5 percent respectively. Local sales value decreased by 24.8 percent to R364.8 million in 2023 as compared to R485.3 million in 2022 (Table 71). While slate for tile floor and slate for any other uses decreased by 63.3 percent and 27.6 percent respectively. Local sales value decreased, following downswing of markets owing to decreased demand for granite blocks and sawn slabs used for memorial art, building facades and countertops for kitchens, bathrooms, or workrooms, slate for tiles for roof and slate for other uses. Export sales volume decreased by 20.2 percent to 97.3 kt in 2023, as compared to 121.9 kt in 2022. The corresponding export sales value decreased by 10.3 percent to R276.2 million in 2023, as compared to R309.4 million in 2022. The export sales value decreased on the back of waning export demand capacity for granite sales traded during the period under review.

TABLE 71: SOUTH AFRICA'S LOCAL SALES AND EXPORTS OF DIMENSION STONE 2014 – 2023

YEAR	LOCAL SALES			EXPORTS SALES		
	Mass	Value (FOR)		Mass	Value (FOB)	
	Kt	R'000	R/t	kt	R'000	R/t
2014	159.0	363 770	2 288	93.8	209 394	2 231
2015	169.8	372 814	2 195	101.1	242 231	2 396
2016	195.1	383 124	1 964	113.7	244 722	2 152
2017	169.1	353 355	2 090	107.5	208 613	1 941
2018	167.7	369 507	2 204	221.9	239 455	1 079
2019	172.2	369 720	2 147	213.8	233 181	1 090
2020	185.6	349 866	1 885	188.6	266 160	1 411
2021	256.5	463 433	1 807	235.2	294 311	1 251
2022	274.7	485 341	1 766	121.9	309 399	2 537
2023	210.5	364 833	1 733	97.3	276 183	2 838

Source: DMRE, Mineral Economics and Statistics Directorate

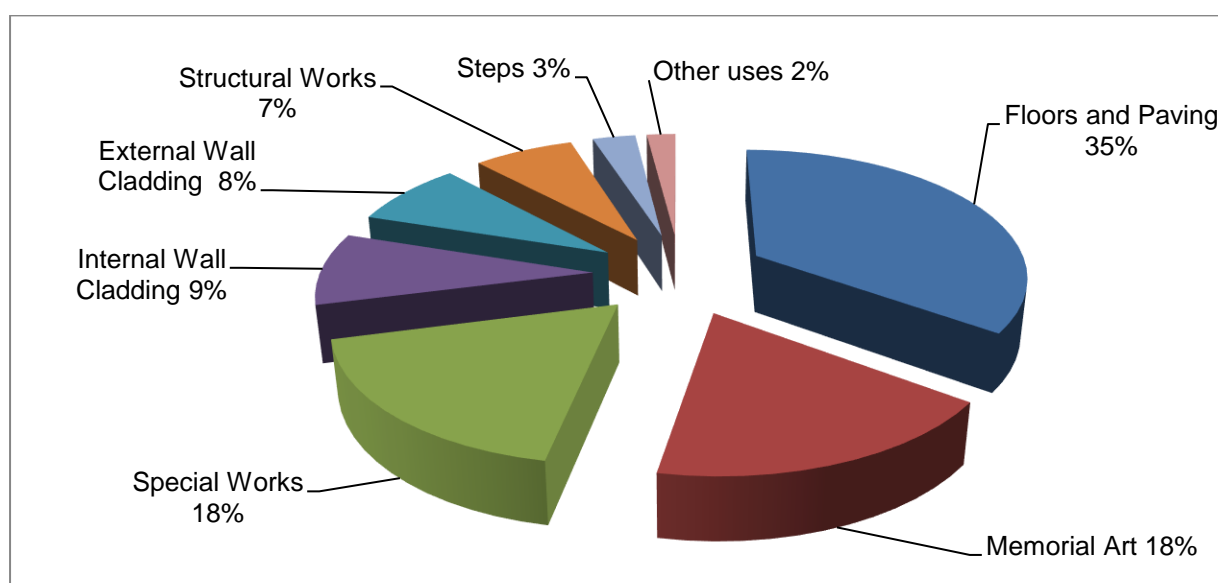
DEMAND

Dimension stone materials offer distinct qualitative features, compared to other materials derived from other natural rock. Demand for dimension stone as one of the most sustainable materials, is presented in its use in construction, cladding, paving and other applications, for the purpose of building and adding permanent additions, such as paths, bridges and sculptures that exist on land outside of core

architecture. Dimension stone is largely consumed in the construction sector, accounting for over 60 percent of consumption. Making up the balance are other uses and applications such as memorial art and special works (Figure 31).

The dimension stone market is fuelled by expansion of the global construction sector, particularly in emerging economies. The increasing emphasis on sustainable building practices is driving interest in dimension stone, as it is a natural and long-lasting material, aligning with the industry's focus on environmentally friendly construction. As urbanization and infrastructure development projects escalate, the demand for dimension stone as a primary construction material is witnessing a notable upswing, and this upswing is particularly pronounced in residential, commercial and public infrastructure projects.

FIGURE 31: WORLD CONSUMPTION OF DIMENSION STONE BY SECTOR



Source: Ashmole, 2014

PRICES

Prices for dimension stones are dependent on the stone's quality, type, and customer specification. The average local sales unit value decreased by 1.9 percent to R1 733/t in 2023 as compared with R1 766/t in 2022. Average local sales unit decreased on the back of weakness in oil prices. On the contrary, average export prices increased by 11.9 percent from R2 537/t in 2022 to R2 838/t in 2023. Supply chain disruptions can lead to price volatility in the dimension stone market, as demand fluctuates, and availability varies. There is no straight correlation between prices and volumes of dimension stone, because there is no single price for dimension stone. It varies a lot depending on which dimension stone is being bought and for what purposes. Prices tend to rise more quickly than they fall, hence South African prices also followed suit with the rise and fall of prices.

EMPLOYMENT

South Africa's dimension stone sector had a labour force of about 1 309 in 2023, representing a slight increase of 0.6 percent from the 1 301 employees in 2022 (Table 72). The increase in labour force comes from increment of labour capacity from female permanent and contractor employments. However, the corresponding labour productivity decreased by 23 percent, while revenue generated decreased by 24.7 percent in 2023. Remuneration of workers decreased by 4.1 percent to R205 million in 2023 as compared to R214 million in 2022 because of a downswing in the Severance, Termination and Retrenchment (STR) and bonuses in 2023 as compared to 2022.

TABLE 72: SOUTH AFRICA'S DIMENSION STONE EMPLOYMENT, 2014 – 2023

YEAR	EMPLOYEES	TOTAL REMUNERATION
		R`000
2014	1 584	151 974
2015	1 340	146 532
2016	1 553	162 793
2017	1 512	183 604
2018	1 325	176 080
2019	1 368	198 840
2020	1 147	161 555
2021	1 215	194 346
2022	1 301	213 882
2023	1 309	205 125

Source: DMRE, Mineral Economics and Statistics Directorate

RECENT DEVELOPMENTS

The dimension stone sector saw two quarries which were operational in 2023, while they were not in 2022, namely Kelgran Africa - Bafokeng and LM Moloi Engineering then, there was a new mine New Venture Mining Granite which came online in 2023. Kelgran Africa - Bafokeng in Rustenburg, North-West Province is an on and off quarry with operations dating back to 2011. However, it was operated fully from 2011, until it operated for only two months in 2017, one month in 2018, and then ceased production from 2019 and restarted production in 2023 for only five months for local sales. Kelgran Africa – Bafokeng, LM Moloi Engineering and New Venture Mining Granite didn't have export sales.

LM Moloi Engineering quarry located in Brits, North-West, started operating in 2014 with a few local sales production capacities of 0.1kt/annum and production capacity of 6.5 kt/annum in 2023. New Venture Mining Granite is a new mine located in Brits, North-West Province, which started operations in 2023, with local sales volume capacity of 2kt/annum. Honey Badger Granite Mining in Groblersdal, Mpumalanga Province, became dormant in April 2024.

OUTLOOK

The dimension stone market is poised for steady growth in the foreseeable future. It will grow from \$9.19 billion in 2024 to \$11.68 billion in 2033 at a compound annual growth rate (CAGR) of 6.2 percent. The dimension stone mining market is expected to witness growth, propelled by increasing construction activities. The historical growth can be attributed to several factors, including an upsurge in the demand for natural stones, robust economic expansion in emerging markets, an increase in production capacities, and a low-interest-rate environment, as well as population growth, rapid urbanization, and the migration of people toward urban areas. The outlook also indicates that global infrastructure investments need to reach \$94 trillion by the end of 2040, to keep pace with worldwide demographic and economic changes.

The increasing global activity in infrastructure development and construction, is likely to generate a higher demand for dimension stone materials in the building and construction industry. Demand for long-lasting and aesthetically pleasing building materials is being driven by increased urbanization and modernity. By virtue of their strength and attractiveness, dimension stones are widely utilised in both commercial and residential building projects. Technological developments in dimension stone mining and processing methods are improving the range and grade of stones accessible, which are driving

market expansion even more. Furthermore, the growing popularity of environmentally friendly and sustainable building materials is encouraging the use of natural dimension stones, which is fuelling the market's growth. Construction activities play a pivotal role in driving the demand for dimension stone, providing economic benefits, job opportunities, contributing to growth of the mining sector.

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FLUORSPAR

M Maredi

SUPPLY AND DEMAND

SOUTH AFRICA

Domestic fluorspar is sourced from two operations, Vergenoeg Mining Company (VMC) and Nokeng fluorspar mine. Local production went up in 2023 by 12.5 percent to 451 kt from the 401 kt produced in 2022 (Table 73). The upswing may have been incited by an increase in the price of acidspar. Local sales volume declined significantly by over 60 percent year-on-year from 32kt in 2022 to 11 kt in 2023, owing to a decline in local appetite for metspar, as the average unit value of the material increased from the 2022 level. Export sales mass was also down in 2023, compared to 2022 by 19.3 percent to 322 kt from the 399 kt exported in 2022, largely due to an acidspar price upswing during the third quarter of 2023. Decreased export volumes were also the result of shipment disruptions during the fourth quarter, which saw producers having delayed shipments in 2023.

TABLE 73: SOUTH AFRICA'S PRODUCTION AND SALES OF FLUORSPAR, 2014 – 2023

YEAR	PRODUCTION	LOCAL SALES	EXPORTS
	Kt	Mass Kt	Mass Kt
2014	164	14	131
2015	121	11	124
2016	177	11	163
2017	218	9	233
2018	212	9	236
2019	253	6	170
2020	301	5	268
2021	367	9	332
2022	401	32	399
2023	451	11	322

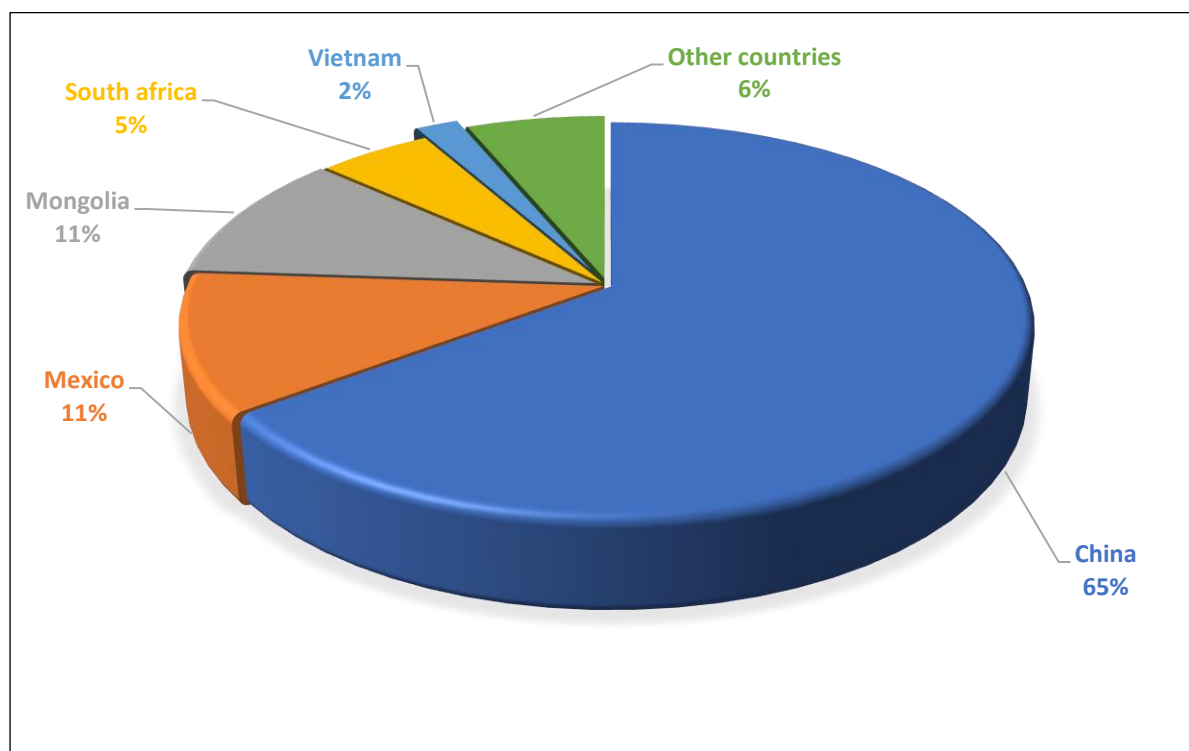
Source : DMRE, Directorate Mineral Economics and Statistics

Note: Sales turnover figures withheld for confidentiality purposes

WORLD SUPPLY AND DEMAND

Total world production of fluorspar increased in 2023 by about 5.8 percent to an estimated production capacity of about 8.8 Mt in 2023 from the 8.3 Mt estimated production in 2022. The improvement in world production was a result of a surge in Mongolian fluorspar production. World production is dominated by China accounting for about 65 percent (Figure 32).

FIGURE 32: WORLD FLUORSPAR PRODUCTION, 2023



Source: DMRE, Mineral Economics and Statistics Directorate
USGS, 2024

China is followed by Mexico and Mongolia at about 11 percent each, South Africa's 5 percent, Vietnam at 2 percent and the rest of the world making up the balance. Fluorspar supply is extensively reliant on demand, that is, production is determined by orders. Mongolian supply was down in 2022 due to diminished demand from China, however, with increased import reliance from China, demand increased, which led to a 119 percent increase in Mongolian production of fluorspar. South Africa also experienced an increase in fluorspar production, despite electricity disruptions.

According to trade statistics, United States imported more acidspar in 2023 than any other region in the world. The United States, however, imported less fluorspar in 2023 than in 2022, with imports mainly sourced from Mexico, Vietnam, South African and China, amongst other regions. During the year 2023, China reported safety accidents in the fluorspar that resulted in the death of four people. The country's mine safety authorities announced that it will conduct nationwide safety inspections of fluorspar mining, following the fatal incident. While previous inspections were only conducted in individual provinces, this will be China's first nationwide safety inspection of fluorspar mining and, it aims to improve operational safety and eradicate illegal mining. Furthermore, as China's fluorspar reserves have been affected by over-mining in recent years, the government of that country has been moving to close small fluorspar mines to consolidate them into a smaller number of larger operations. The move, aimed at improving production efficiency and reducing environmental impact, was prompted by provisions in the Mineral Resources Master Plan released by that country's Ministry of Natural Resources in late 2022. Chinese metspar imports tripled in 2023, increasing by over 200 percent compared to the previous period.

PRICES

The closing price of fluorspar fob Durban was estimated at \$420/t, during the fourth quarter of 2022, which denoted a decline from third quarter price level. The price of acidspar went up during the first quarter of 2023 to \$425/t, as orders were picking up during new contract negotiations. The price of acidspar fob Durban remained fixed at \$425/t for the second quarter of 2023. With increased appetite from the international buyers and soaring energy and freight costs, prices increased by 11.8 percent to \$475/t, during the third quarter of 2023. The price hike was short-lived, as unavailability of vessels and festive closures saw prices decline to 455/t during the fourth quarter of 2023.

EMPLOYMENT

The fluorspar labour force increased year-on-year by 2.8 percent from 782 personnel in 2022 to 804 personnel in 2023 (Table 74). The increase in the number of personnel coincided with improved productivity in 2023 compared to 2022 production levels. An increase in labour led to an increase in remuneration, with total employee earnings going up in 2023 by 7.4 percent. Labour productivity also improved in 2023 going up by 9.5 percent year-on-year.

TABLE 74: SOUTH AFRICA'S FLUORSPAR QUARRIES: EMPLOYMENT AND REMUNERATION, 2014-2023

YEAR	EMPLOYEES	TOTAL REMUNERATION
		R'000
2014	233	68 900
2015	228	66 282
2016	232	74 306
2017	264	89 146
2018	945	295 299
2019	988	349 941
2020	681	265 450
2021	757	375 756
2022	782	413 275
2023	804	443 796

Source: DMRE, Mineral Economics and Statistics Directorate

DEVELOPMENTS

Fluorchemicals South Africa Pty Ltd was established in 2021 as a special purpose vehicle (SPV) with a vision to help build a large-scale fluorochemical industry in South Africa. One such project is a 100 kt per annum fluorochemical plant in South Africa (Coega, Gqeberha) called the project Cape, in the Eastern Cape Province. The project is currently at the end of the pre-feasibility (PFS) phase and will begin the Bankable Feasibility (BFS) phase from February 2025. A final investment decision (FID) is expected to be made in November 2025, and construction will commence during the third quarter of 2026. The Anhydrous Hydrogen Fluoride (AHF) plant with a capacity of 60 kt per annum is anticipated to supply Asia, the European Union (EU), South America and North America markets. The project consists of two phases; that is, Phase 1 is a 60 kt per annum AHF plant, due for completion by 2028, while Phase 2 will add a further 40 kt per annum capacity by 2030/31. The project objective is to produce AHF, with high purity acidspar feedstock purchased from local companies. Investment in the project is estimated at R5 billion (\$266 million), potentially creating more than 300 direct jobs, more than 2,100 indirect jobs during operations, and more than 3,000 jobs during construction. Malawi's off-take market will be 11 kt of AHF per year when the project is completed by 2028, making Malawi the largest customer for CAPE project in Africa. While fluorochemicals market in South Africa is still relatively small, the project will make South Africa one of 15 countries producing fluorochemicals on a commercial scale.

OUTLOOK

Limited supplies from China, will be an opportunity for other regions, such as South Africa, to make up for the supply shortfall. The Chinese Ministry also announced that it will reduce import tariffs on fluorspar and fluorspar-related products from January 2024. This is expected to lead to increased imports of fluorspar, to make up for the expected shortfall. Another demand driver for this material is its essentiality in the production of batteries, driven by demand for electric vehicles (EVs). In addition to its refrigeration applications, fluorspar is also essential in the new energy and new materials sector, including in the manufacture of lithium hexafluorophosphate, polyvinylidene fluoride (PVDF), graphite anodes, and photovoltaic modules. The Asian battery market has seen some positive sentiment regarding the use of fluorspar in battery manufacturing. Sources estimate that the production of new energy vehicles requires 45kg of acidspar.

The EU is an emerging battery market with battery capacity expected to exceed 1,000 GWh/year by 2030. This increase in battery production is predicted to drive demand for fluorspar to approximately 375,000 tonnes per year, signifying a 65 percent demand increase in fluorspar in Europe. Without additional domestic fluorspar sources, it is estimated that the EU will be extensively reliant on imports to meet about 87 percent of its demand. Global demand for fluorspar from the new energy sector is expected to exceed 5 million tons in 2030. Demand from the photovoltaic industry is also strong, as the manufacturing process requires substantial amounts of hydrofluoric acid (HF), indicating that the demand for fluorspar from new energy sector is increasing year by year. The rapid development of the new energy and semiconductor sectors is likely to support the long-term demand for fluorspar and its price. These developments may lead to a turnaround in the fluorspar market and strong demand for this material.

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LIMESTONE AND DOLOMITE

Mphonyana Modiselle

SUPPLY AND DEMAND

Limestone is widely used for various construction purposes due to its unique properties and abundance. The demand for limestone is consistently growing, mainly driven by the construction industry and infrastructure development across the globe. Local production of limestone and dolomite contracted by 4.8 percent to 20.8 Mt in 2023 as compared to 21.9 Mt in 2022 owing to operational challenges resulting in decreased capacity utilisation (Table 75). Interruptions halt critical operations, including machinery operation, equipment maintenance and site facility upkeep, and energy shortage and intermittent power supply also disrupt construction activities. Local sales volume of limestone and dolomite also dipped year-on-year by 8 percent, which can be attributed to decreasing domestic demand for cement in the construction sector, conversely, local sales revenue increased by 3.6 percent because of gradual improvement of sales.

TABLE 75: SOUTH AFRICA'S PRODUCTION AND LOCAL SALES OF LIMESTONE AND DOLOMITE FOR NON - AGGREGATE USE, 2014 – 2023

YEAR	PRODUCTION		LOCAL SALES	
	Mass	Mass	Value (FOR)	
	Kt	Kt	R`000	R/t
2014	21 776	19 340	2 785 855	144
2015	22 905	20 406	2 902 761	142
2016	23 355	21 130	3 011 744	143
2017	23 752	21 037	3 247 959	154
2018	22 746	21 069	3 490 117	166
2019	22 274	20 591	3 619 819	176
2020	20 288	19 380	3 496 438	180
2021	23 962	22 192	4 115 501	187
2022	21 895	21 077	4 122 548	196
2023	20 846	19 399	4 269 033	220

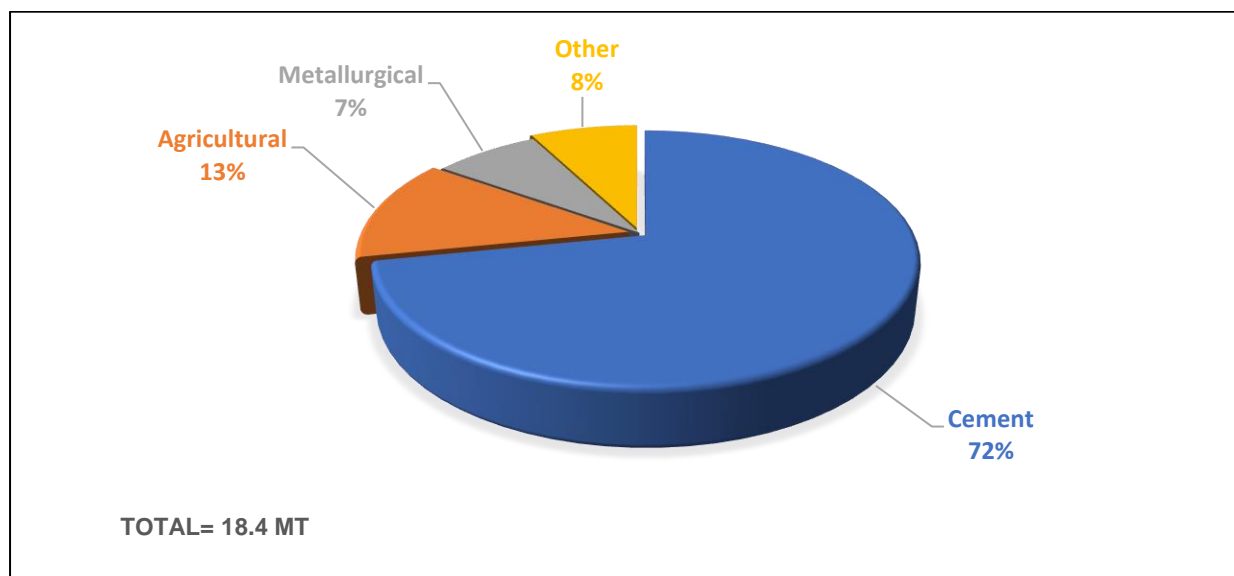
Source: DMRE, Mineral Economics and Statistics Directorate

Amidst many global challenges such as rising interest rates and heightened geopolitical tensions, the South African economy and construction sector came under some pressure. However, it's important to note that despite a difficult macroeconomic environment, the industry fared relatively well in 2023 compared to 2022 as South Africa gradually recovered from the impacts of the pandemic.

The cement industry remains the largest consumer of limestone. Cement accounted for about 72 percent of limestone demand in 2023 (Figure 33 and Table 76). This was followed by limestone's application in the agricultural sector (fertilisers, fungicides, animal feed) accounting for about 13 percent of total demand, then the metallurgical sector (steel refining) at 7 percent, and other applications (glass, food processing, papermaking, leather, water purification, waste water treatment, explosives, flue gas

desulphurization, adhesives, insulation and pH control) making up the balance with 8 percent. Limestone is the main material in cement production and is also used as a flux in the steel/metallurgical sector, which makes the construction industry the main demand driver in the limestone industry. The sector has experienced its 7th consecutive contraction in 2023. The cement industry growth continued to be constrained by increased costs for energy, material and service inputs, labour and production shortages and supply chain disruptions.

FIGURE 33: DEMAND FOR LIMESTONE BY SECTORS, 2023



Source: DMRE, Mineral Economics and Statistics Directorate

Local sales mass of limestone for cement decreased in 2023 by 9.6 percent and local sales value increased 1.6 percent. The decline in cement sales volume was attributed to intense competition and a stagnant construction market. The distressed state of the construction sector, the poor economy and reduced spending on infrastructure resulted in declining sales volumes of cement. The competitive environment was exacerbated by imports and blender activity.

Local sales mass of limestone for metallurgical purposes declined in 2023 by 6.3 percent and local sales revenue increased by 1 percent. This is owing to decreased demand from the steel industry, of which decreased year-on-year by 0.03 percent in 2023. Local sales mass of limestone for agricultural use increased by 1.2 percent and local sales value rose by 8.2 percent, which coincides with the downswing experienced in the agricultural sector. Local sales mass of limestone for other uses dipped by 10 percent, inversely local sales value increased by 4.2 percent, on the back of higher volume consumed locally. Companies in this market are encountering heightened competition and a challenging trading environment due to persistent low levels of economic growth and a downturn in the construction sector.

TABLE 76: SOUTH AFRICA'S LOCAL SALES OF LIMESTONE AND DOLOMITE BY APPLICATION, 2014 – 2023

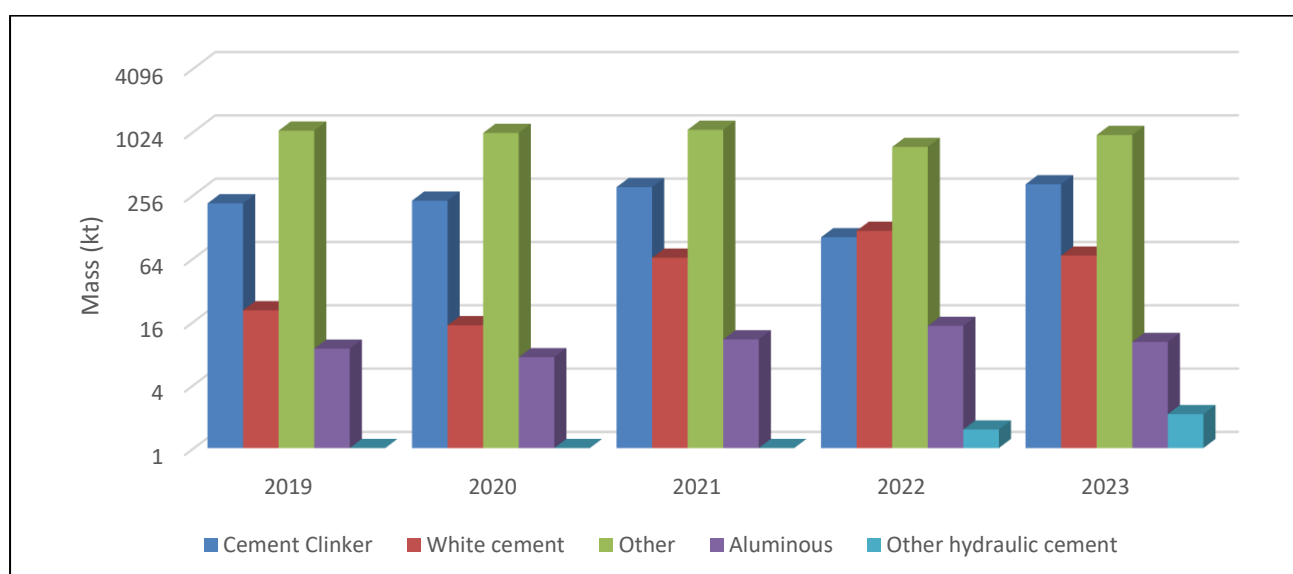
YEAR	CEMENT			METALLURGICAL			AGRICULTURAL			OTHER		
	Mass	Value (FOR)		Mass	Value (FOR)		Mass	Value (FOR)		Mass	Value (FOR)	
	Kt	R`000	R/t	Kt	R`000	R/t	Kt	R`000	R/t	Kt	R`000	R/t
2014	13 099	521 370	40	1 826	258 363	141	987	147 994	150	2 174	617 952	284
2015	14 456	649 452	45	1 818	257 905	142	999	164 124	164	2 018	651 824	323
2016	15 182	675 776	45	1 970	295 359	150	1 343	197 597	147	1 507	614 333	408
2017	14 622	696 047	48	2 082	319 417	153	1 732	267 200	154	1 393	594 583	427
2018	14 581	750 542	51	2 147	333 542	155	1 639	271 509	166	1 391	586 462	422
2019	14 546	864 600	59	1 787	292 859	164	1 730	316 521	183	1 312	551 997	421
2020	13 527	868 628	64	1 274	208 368	164	2 274	399 173	176	1 311	606 855	463
2021	15 157	1 006 614	66	1 614	273 878	170	2 760	489 010	177	1 522	769 240	505
2022	14 604	1 069 034	73	1 475	277 024	188	2 369	476 733	201	1 563	732 553	469
2023	13 208	1 086 136	82	1 382	279 886	202	2 397	515 633	215	1 407	763 117	542

Source: DMRE, Mineral Economics and Statistics Directorate

CEMENT IMPORTS

South Africa's cement import mass increased from 0.96 Mt in 2022 to 1.35 Mt in 2023 denoting a 40.2 percent year-on-year increase, despite logistical challenges at ports. Cement imports continue to be able to navigate the port and supply chain issues in South Africa with minimal impact. Imported cement clinker has been on an upward trajectory from 2019 until 2021, with imports crashing eventually dwindling year-on-year to 100kt in 2022. Then by 2023 there was a turnaround whereby the imports rose by 218.9 percent year-on-year to 321.8 kt. White cement imports have been fluctuating over time. South African imports of white cements tumbled by 41.9 percent to 67.5 kt imported in 2023 as compared to 116.2 kt in 2022. Imports of other cement products rose about 70.2 percent of total cement imports. Other cement imports increased by 29.9 percent in 2023. Imported volumes of aluminous cement went down year-on-year by 29.7 percent in 2023, while imports of other hydraulic cement rose by 40 percent year-on-year.

FIGURE 34: SOUTH AFRICA'S IMPORTS OF CEMENT PRODUCTS, 2018 – 2023



Source: South African Revenue Services (SARS), 2023

LIME

Lime is a multipurpose mineral with many different forms used in environmental, metallurgical, construction, chemical or industrial applications. Not only does it help the construction and manufacturing industries optimise their products, but it is also used in drinking water treatment and agriculture to treat acidic soils. The largest single use of lime is removing impurities used for remains in steel production. In construction, lime is mainly used for soil stabilisation of roads, earthworks, airfields and building foundations.

South Africa's sales quantity of lime decreased by 5.7 percent to 1.01 Mt in 2023 as compared to 1.07 Mt in 2022, amidst weak economic conditions, elevated input costs and other constraints of doing business in South Africa. Sales quantity of quicklime for pyrometallurgical and chemical applications decreased year-on-year by 7.3 percent to 0.90 Mt in 2023, compared to 0.97 Mt sold in 2022. Hydrated lime consumption increased by 10.2 percent, attributed to recorded increases for lime for water purification at 20 percent and for other uses at 7.7 percent (Table 77). Inversely, local sales revenue of lime increased by 3.6 percent from R1.57 billion in 2022 to R1.62 billion in 2023. Local sales revenue of quicklime for pyrometallurgical and chemical applications increased by 1.4 percent from R1.36 billion in 2022 to R1.38 billion in 2023. Local sales revenue of hydrated lime for water purification, hydrated lime for chemical and other application increased 30.1 percent, 1.7 percent, and 14.1 percent, respectively.

TABLE 77: SOUTH AFRICA'S LOCAL SALES OF LIME, 2022 – 2023

LIME PRODUCT BY SECTOR USE	2022			2023		
	Mass Kt	Value (FOR)		Mass kt	Value (FOR)	
		R'000	R/t		R'000	R/t
Quicklime						
Pyrometallurgical	307	445 632	1 453	330	498 900	1 510
Chemical	661	914 680	1 383	567	879 918	1 551
SUB-TOTAL	968	1 360 312	1 405	897	1 378 818	1 536
Hydrated lime						
Water purification	50	102 420	2 049	60	133 294	2 222
Chemical	25	56 800	2 244	24	57 753	2 451
Other	22	47 682	2 130	24	54 394	2 255
SUB-TOTAL	98	206 902	2 118	108	245 442	2 280
TOTAL	1 066	1 567 214	1 470	1 005	1 624 260	1 616

Source: DMRE, Mineral Economics and Statistics Directorate

PRICES

Local sales unit value for limestone increased by 12.2 percent from R196/t in 2022 to R220/t in 2023 leading to an increase in local sales revenue of about 3.6 percent from R4.12 billion in 2022 to R4.27 billion in 2023. Limestone for cement manufacturing unit price increased by 12.3 percent from R73/t in 2022 to R82/t in 2023. Furthermore, the price for limestone used in metallurgical applications increased by 7.4 percent from R188/t in 2022 to R202/t in 2023. The strengthening of the unit values was owing to price stability in the economy, which may lead to lower interest rates. The price of limestone for agricultural application increased by 7 percent from R201/t in 2022 to R215/t in 2023, while limestone for other uses increased by 15.6 percent from R469/t in 2022 as compared with R542/t in 2023.

EMPLOYMENT

The labour force in the limestone and dolomite increased by 1.1 percent from 2 781 personnel in 2022 to 2 811 personnel in 2023 (Table 78). This trend of some growth in the sector employment will continue

as construction companies rehire workers that the industry lost following the pandemic lockdowns. Total employee earnings also rose by 5.6 percent, which coincides with the increase in the total number of employees. The increases are largely due to investors becoming more cautious to take on new construction projects leading to recommencement of construction activities. Labour productivity dropped by 5.7 percent and revenue productivity increased by 2.4 percent owing to working hours and shifts improving in 2023 as compared to 2022.

TABLE 78: SOUTH AFRICA'S LIMESTONE AND DOLOMITE QUARRIES: EMPLOYMENT AND REMUNERATION, 2014 – 2023

YEAR	EMPLOYEES	TOTAL REMUNERATION
		R`000
2014	2 673	509 250
2015	2 774	537 967
2016	2 856	610 253
2017	2 774	620 638
2018	2 715	631 629
2019	2 746	670 242
2020	2 611	668 146
2021	2 689	775 478
2022	2 781	808 111
2023	2 811	853 079

Source: DMRE, Mineral Economics and Statistics Directorate

RECENT DEVELOPMENTS

Afrimat has received approval to acquire all of Lafarge South Africa and its subsidiaries. The acquisition has been structured as a locked box transaction, effective 31 December 2022, and the purchase is valued at US\$6m. Afrimat also agreed to repay its loan amounts owed equating to US\$47.8m. Afrimat confirmed the acquisition of the LSA Group, part of the Holcim Group, on 10 April 2024. The deal will bring 800 Lafarge employees to Afrimat. The acquisition also includes Lafarge's fly ash operations and a grinding plant. Funded primarily in cash, Afrimat's move comes at a time when the construction materials sector is experiencing increased demand, driven partly by state initiatives and a 'robust' residential building market in coastal regions.

China-based Huaxin Cement completed its acquisition of Brazil-based InterCement's South African business on 27 December 2023. It was reported that financial services firm JPMorgan Chase acted as advisor to InterCement. The deal concludes the Brazilian company's exit from Africa, after it sold its Egyptian and Mozambique businesses earlier in 2023. The South African cement industry faces plant closures and job losses due to an influx of 'cheap' cement imports, according to a recent study. Chronux Research found that cement imports to South Africa rose by nearly 20 percent in 2023, despite logistical challenges at ports.

The European Union (EU) Carbon Border Adjustment Mechanism (CBAM) is a key policy tool implemented by the EU within the context of the EU Green Deal, which aims to achieve the EU's climate targets. According to the EU Commission, the EU CBAM aims "to put a fair price on the carbon emitted during the production of carbon-intensive goods that are entering the EU, and to encourage cleaner industrial production in non-EU countries. The transitional, or pilot, phase of the EU CBAM commenced on 1 October 2023, initially only enforcing a reporting requirement. Once the definitive phase commences on 1 January 2026, the EU CBAM will include a charge levied on the carbon emissions embedded in designated imported products. Conversely, the risk profile for the cement and fertiliser sectors is marginal. South Africa's cement exports to the global market reached R1.65 billion in 2023, with only a nominal R3.98 million worth of cement exported to the EU falling under the EU CBAM.

Consequently, exports in these two sectors face marginal potential risks, estimated at 0.24 percent for cement and 0.30 percent for fertilisers. It is evident that even with the marginal risk, vigilance and strategic considerations will be crucial for these sectors in the face of evolving international trade dynamics.

In November 2023, South Africa, together other members of the BASIC bloc (Brazil, China, India and South Africa), submitted an official request at the Conference of the Parties of the UNFCCC (COP28). They appealed for their concerns regarding unilateral trade measures related to climate change to be included as an agenda item for discussion at the Conference of the Parties of the UNFCCC (COP28). The letter called for collective opposition to measures to restrict trade and investment through setting up new green trade barriers, such as unilateral carbon border taxes with the pretext of addressing climate change, which are incompatible with multilateral rules under the WTO and the Paris Agreement. While not officially adopted, the issue was taken up as part of other agenda items. In its final assessment of the outcomes of COP28, South Africa welcomed the fact that the final text included recognition that unilateral measures to combat climate change should not constitute a means of arbitrary or unjustifiable discrimination, or a disguised restriction on international trade.

OUTLOOK

The economic outlook for South Africa will remain a tough and challenging environment. The economy will continue to grapple with domestic and global headwinds as it moves forward. In 2023, the construction industry dappled with lingering effects of supply chain disruptions, inflation and ever-present labour shortages-a narrative that has become all too familiar. However, despite these difficulties, experts in the building industry remained resilient and creative as ever. The global limestone market was valued at USD 75.79 billion in 2023 and is expected to grow at a compound annual growth rate (CAGR) of 7.4 percent during the forecast period. The limestone market is poised for sustained growth, driven by the expansion of industries such as construction, agriculture, and chemicals. Limestone plays a pivotal role in enhancing the strength, durability, and workability of these construction materials. With the global construction industry's continuous expansion, the demand for limestone is anticipated to grow in tandem.

The South Africa cement market size reached approximately 13.8 Mt in 2023. The market is projected to grow at a CAGR of 2.5 percent between 2024 and 2032, reaching a value of around 17.1 Mt by 2032. Due to cement's importance in building, the infrastructure projects are driving the market for the material as it is vital component in construction activities. Cement manufacturers are actively embracing eco-friendly manufacturing processes, which involve the use of alternative fuels and the incorporation of supplementary cementitious materials, to reduce carbon emissions. The construction sector significantly relies on limestone, primarily for its essential role in cement and concrete production. The increasing global population necessitates higher agricultural productivity. As a result, the demand for limestone in agriculture is expected to rise, especially in regions aiming to enhance food security. Moreover, rapid urbanization and the need for modern infrastructure are primary drivers of the limestone market. Simultaneously, the growth of diverse industries, including manufacturing, steel production, and chemicals, hinges significantly on the abundant supply of limestone. As these sectors continue to expand, so does the need for this indispensable raw material. The construction sector is set to bounce back, but this was off a low base and the expectation is that growth expectations in the next three to five years will be broadly in line with the country's economic growth projections.

The South African government has long identified infrastructure development as a potential driver of economic development and growth. The Government of National Unity wants to turn the country into a construction site through pursuing a massive investment in infrastructure, ultimately causing construction minerals like aggregate and sand supply and demand growth and boosting job creation as well as economic growth.

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PHOSPHATE ROCK

M Muravha

SUPPLY AND DEMAND

South Africa's phosphate rock production decreased by 12 percent to 1 744 kt in 2023 compared with the previous year (Table 79). The decrease in phosphate rock is attributed to operational issues at the leading phosphate producer, coupled with a decreased demand for high-priced fertilizers. Local sales volumes increased by 59.4 percent to 1319 kt in 2023, compared with 827 kt in 2022, while export volumes increased by 11.1 percent to 790 kt in the same period. Export sales volumes increased due to a positive outlook of a global continued demand recovery with decent supply after various supply issues in recent years.

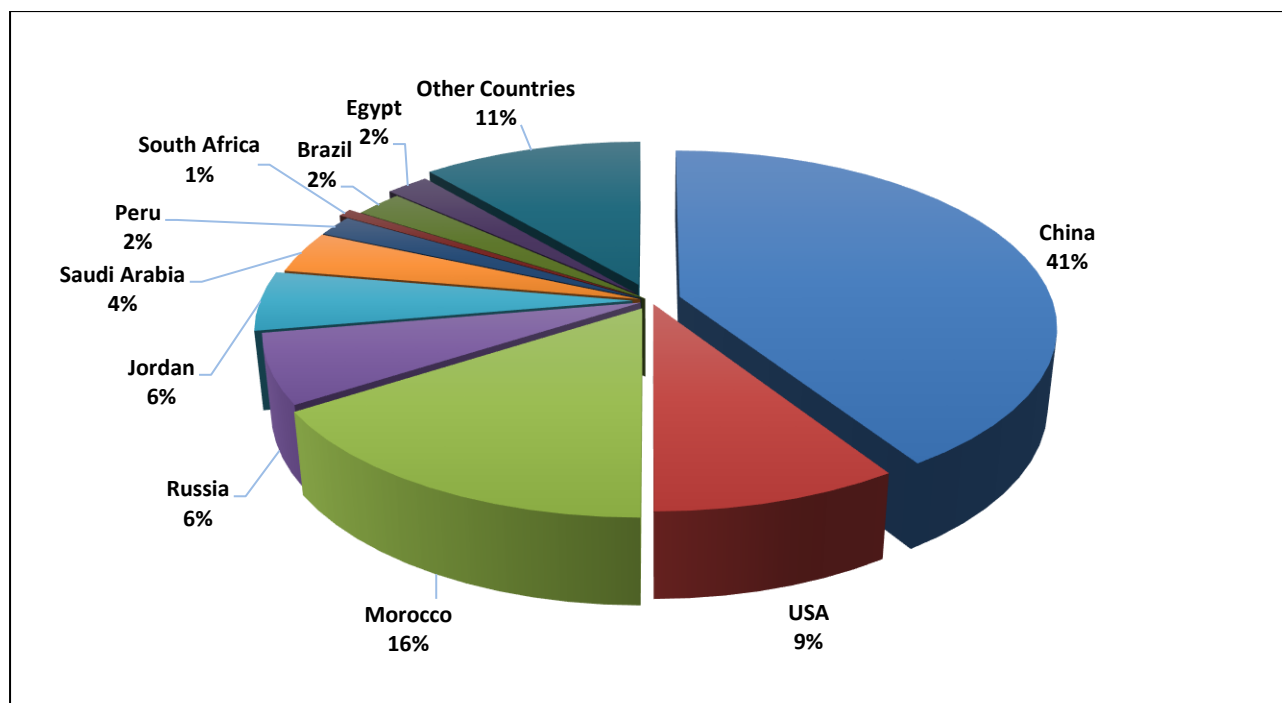
TABLE 79: SOUTH AFRICA'S PRODUCTION AND SALES OF PHOSPHATE ROCK, 2014-2023

YEAR	PRODUCTION	LOCAL SALES	EXPORTS
	Mass kt	Mass kt	Mass Kt
2014	2 011	1 640	227
2015	1 852	1 190	828
2016	1 696	1 555	476
2017	2 078	1 689	683
2018	2 057	1 385	692
2019	1 825	1 205	569
2020	1 543	980	669
2021	1 725	1 174	433
2022	1 985	827	711
2023	1 744	1 319	790

Source: DMRE, Mineral Economics and Statistics Directorate

World production of phosphate rock decreased by 3.5 percent to 220 Mt in 2023, compared with 228 Mt in 2022, owing to decreased phosphoric acid and fertilizer production. Different weather conditions during planting seasons also affect fertilizer consumption. China was the world's largest phosphate producer accounting for 41 percent of global production in 2023, followed by Morocco at 16 percent, United States at 9 percent, Russia at 6 percent and Jordan at 6 percent. South Africa contributed 1 percent to the global phosphate production (Figure 35).

FIGURE 35: PHOSPHATE ROCK PRODUCTION BY COUNTRY, 2023



Source: USGS 2024

The bulk of the phosphate rock mined is applied in the production of phosphoric acid and is further used in fertilizer and animal feed supplements industries. Production and demand of phosphate rock continue

to be on the rise, with Morocco and Western Sahara boasting the largest phosphate rock reserves at roughly 75 percent of the world's total. Globally, consumption and production of phosphate from the United States were estimated to have increased, owing to increased phosphoric acid and fertilizer production. The consumption of fertilizers was boosted by favourable weather conditions during the planting season.

The Russia-Ukraine war temporarily disrupted global economic recovery from Covid-19 pandemic. The war has led to economic sanctions on multiple countries, a surge in commodity prices, and supply chain disruptions, causing inflation across goods and services, affecting many markets across the globe. Disruptive product launches, such as environmentally friendly fertilizers or novel phosphate-based products, are expected to help companies differentiate themselves in a competitive market and appeal to eco-conscious consumers. These innovative tactics are expected to drive market growth in the coming years, as demand for phosphates continues to rise in agriculture, food production, and other industries.

The notable volatility of raw material prices because of geopolitical conflicts, and the anticipated slowdown of economic growth are some of the challenges that hamper supply. Good cooperation between the chemical sector and other value chain participants is essential to building a strong regulatory environment and reaching an agreement on projects that promote a balanced strategy that takes demand, supply, and cost into account. Among many other uses, phosphoric acid and phosphate compounds can be employed directly in the chemical industry or as vital components in the creation of numerous other chemicals needed for surface treatment (cleaning and coating metal), water treatment, dentistry, toothpastes, fire extinguishers, and animal feed.

By putting resilience and innovation first, the phosphate industry can take advantage of significant potential, even in the face of projected obstacles in the coming years. This highlights the crucial role the chemicals sector plays in advancing sustainable solutions by requiring investors to exercise discipline in their investments, participate actively in company ecosystems, and exhibit a strong commitment to sustainability.

Demand for phosphate rock is driven by fertilizer consumption, which accounts for the largest market share at roughly 87 percent, followed by animal feed at 7 percent, while food and industrial uses comprise a further 6 percent. Phosphates are used in fertilizers to enhance crop yields, increase the water-holding capacity of the plants, and increase root depth. Approximately 25 percent of the wet-process phosphoric acid produced is sold, in the form of upgraded granular Diammonium Phosphates (DAP), Monoammonium Phosphates (MAP) fertilizers, and merchant-grade phosphoric acid. The balance of the phosphate rock is used for the manufacture of elemental phosphorus, which is then used to produce phosphorus compounds for industrial applications, primarily glyphosate herbicide.

The International Fertilizer Association estimated that 85 percent of the world's soils are deficient in nitrogen, while 73 percent are deficient in phosphorus (phosphates) and 55 percent are deficient in potassium (potash). The deficiencies make fertilizers essential to crop growth, but because of the exorbitant cost of fertilizers, many farmers are opting to limit the amount of fertilizer they purchase and use. This is expected to impact soil health and crop yields. Sanctions continue to impact individual fertilizer product markets across the board in various ways, however, potash remains by far the most exposed product.

The fertilizer supply/price crisis is more concerning than direct food inflation because it could inhibit food production in the rest of the world which could eventually help ease up the supply tension from stalled Russian and Ukrainian grain deliveries. Fertilizer prices have since dropped two-thirds and are now only 20 percent above pre-pandemic levels since the Russia-Ukraine war in February 2022. The global economy has remarkably adjusted to the war's dislocations, by finding new input sources and building new production facilities. Russia and Belarus pushed so hard to lift sanctions affecting their ability to export fertilizer products, and if successful, that would cut fertilizer prices further.

Furthermore, the market is expected to be driven by the increased usage of phosphate in the medicinal and pharmaceutical sector, in the form of treatment to prevent kidney stones and other related applications. Additionally, the use of lithium iron phosphate (LFP) batteries in EVs, has been slowly picking up as the preferred battery, since it possesses lower energy density than nickel-based chemistries. The lack of exposure to elevated pricing of battery materials such as nickel and cobalt, currently makes LFP batteries, an attractive choice for entry-level car models, with some big electronic vehicle producers, opting for the technology. The exponential growth of the EV sector has led to the rapid development of battery technology. Phosphate demand for LFP batteries could reach 6.9 Mt P₂O₅ by 2050.

PRICES

Phosphate prices ranged between US\$347.5 s/t and US\$152 by December 2023 s/t. The price was at an average of US\$ 316.2 s/t for the year 2023. The average price of phosphates increased by 18.6 percent in 2023 when compared to the same period in 2022. The gap in phosphate rock supply created by Morocco's reduced exports was filled by additional exports from the Middle East, leading to an ease on the prices.

Fertilizer prices have seen significant improvement from the record-high levels recorded, stemming from market disruptions due to Covid-19 outbreak, supply chain bottlenecks, and the Russia-Ukraine war. This positive trend in international prices started to reflect in domestic fertilizer prices, a pattern that might persist, if global market conditions continue to improve. However, the substantial depreciation of the Rand against US dollar over time undermines, the local price improvements at the same rate as worldwide prices.

EMPLOYMENT

South Africa's phosphate employment increased by 33.1 percent from 2 854 employees in the previous year to 3 903 employees in 2023, resulting from the additional seasonal contractors for the Kropz Phosphate Elandsfontein Mine and Foskor (Table 80). Consequently, remuneration increased by 121.9 percent. Productivity was at 0,4 kt per employee in 2023.

TABLE 80: SOUTH AFRICA'S PHOSPHATE SECTOR EMPLOYMENT, 2013 – 2022

Year	Employees	Remuneration R'mil
2013	3654	*
2014	2242	*
2015	2809	*
2016	3898	*
2017	3516	*
2018	3246	*
2019	3044	*
2020	2882	*
2021	2469	*
2022	2854	*
2023	3903	*

Source: DMRE, Mineral Economics and Statistics Directorate
 *Figures withheld to protect confidential information

DEVELOPMENTS

The Elandsfontein Phosphate Mine in the Western Cape owned by Kropz, has commenced operations after once again halting operations towards the end of the year 2022. The mine reported a loss for the year 2023, after it experienced operational challenges leading to operation below planned production levels in 2023, however, the operational cost per tonne remained elevated. The mine has since put measures in place to curb the challenges. Kropz reported that sales from the trial production phase generated a revenue of \$30.2 million for the year 2023. The Elandsfontein mine is still in its trial production phase and thus, further challenges can be expected, as it progresses towards full production.

The mine has an initial mine life of about 14 years and can deliver one million tonnes a year of phosphate rock concentrate at a steady state. The processing plant will produce a final saleable concentrate to the expected specification of 68 percent bone phosphate of lime and about 31 percent phosphorus oxide, using a flotation configuration of direct flotation, followed by a reverse flotation circuit.

Recently the phosphate industry welcomed good news of a secured mining right for the Zandheuveld phosphate mining project owned by Adelaide Ruiters Mining and Exploration (ARME). ARME is a 51 percent South African women-owned mining and exploration company, focusing on exploring sedimentary phosphates and limestone in the Saldanha Bay area of the Western Cape. The company secured backing and support from the Anglo Sefa Mining Fund and the Industrial Development Corporation, to conduct its initial stages of exploration. It aims to bring into the industry a re-establishment of phosphate expertise and competence to safeguard food security. The preparation stages are coming to completion, and just a few regulatory activities are needed to open the way for site preparation. The mine is considered a *game changer*, introducing all the new aspects of mining phosphate and finally creating the much-needed jobs for roughly 400 employees. The commencement date for Adelaide Ruiters Mining and Exploration (ARME) is expected within the year 2024 and an initial public offering (IPO) by the end of that year.

OUTLOOK

Phosphate market is expected to display erratic growth patterns shortly, mostly due to enduring factors that will continue to contribute to the slow growth going forward. It is anticipated that the phosphate market will see a recovery in demand, due to improvements in the economy and the resolution of supply chain issues. The sector has several significant issues that need to be resolved in the short to medium-term., including changing consumer preferences and the requirement to modify industrial policies to address escalating environmental concerns.

The global phosphate market is projected to experience an annual growth rate of 8.1 percent from 2024 to 2031, amid the projected growth rate in the agricultural industry from 1.2 percent to over 4 percent, which is driven by the growing global population (estimated to grow by 10 billion by 2050) and the food industry. During this time, food demand is expected to rise by 59 percent to 98 percent, over the forecast period, while farmers are expected to increase agricultural productivity through fertilizers and advanced farming technologies. Increased population will be met by increased crop production, farming activities, and trade volumes.

Global phosphate rock production is projected to increase to at least 69.9 Mt; however, climate change is expected to impact future demand and supply fundamentals. European countries, the Asia-Pacific region, and Latin America are expected to show steady growth in the phosphate market. Among these regions, Asia-Pacific is expected to dominate the market with a market share of around 40 percent of the total valuation. The region is expected to fuel the demand for fertilizers to increase crop production efficiency for its growing demand for food. North America, particularly the United States and Canada, is also expected to increase its production notably, due to increasing agricultural activities and demand for fertilizers. Overall, the phosphate market is forecasted to experience steady growth as companies leverage these strategies to expand their market reach and capitalize on emerging industry trends. By

embracing innovation and collaboration, phosphate companies can position themselves for success in a rapidly evolving market landscape.

The price of phosphate rock, stood at an average of US\$ 316 s/t in 2023, denoting a considerable increase in recent years. The price of phosphate is forecast to decrease moderately in the coming years, reaching US\$240 s/t by the end of 2024. Despite weakened demand for the mineral, prices remained at elevated levels following the reduction of Chinese exports. Now that Chinese domestic consumption is coming out of peak season, downward price movement is expected with the return of Chinese volumes to the global market.

The global phosphate fertilizer market is expected to grow to USD 110.2 billion by the end of 2033 at a compound annual growth rate (CAGR) of 5.4 percent. Extreme market volatility and record-high prices severely impacted fertilizer demand during the year 2023. However, affordability is expected to continue improving going forward, and in addition, a rapid recovery in consumption is possible in some regions going into 2024. Demand is, however, expected to take a while to return to pre-Covid-19 pandemic levels. The phosphate market is expected to witness significant growth in the coming years across various regions.

South Africa's phosphate industry is also expected to increase in the long term, following planned projects that are currently in the preparation phase. The Elandsfontein Phosphate Mine Kropz and Zandheuvél phosphate mining projects are already making significant contribution to the industry through their production. The Elandsfontein operation is expected to increase its production throughput by more than 40 percent following the commissioning of the new equipment. The project is expected to be fully operational by the end of the year 2024. Hence, South Africa's phosphate production is expected to increase on the back of these projects coming online, promising a steady-state production of more than one million tons in the short term.

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SPECIAL CLAYS

M. Muravha

SUPPLY AND DEMAND

SOUTH AFRICA

The special clays industry in South Africa, which includes amongst others kaolin, bentonite, and attapulgite, is crucial to both the local and international markets. These clays are used in a wide range of industries, including ceramics, construction, agriculture, and cosmetics. The minerals are prized because of their special qualities and adaptability. Kaolin, also known as "white gold," is well-known for its use in the paint, paper, and ceramics industries. Bentonite's remarkable binding and absorbent properties is useful in foundries, drilling fluids, and environmental cleanup while, Attapulgite, with its exceptional colloidal and absorbent characteristics, is widely used in pharmaceuticals, animal feed additives, and as a thickening agent in paints and drilling fluids. South Africa's unique clays are an essential resource in the country's industrial landscape since they not only provide the basis for several industrial sectors, but also greatly enhance the economic growth and export potential of the country. Local communities benefit from increased employment and income levels because of the clays' mining and processing.

South Africa's production of kaolin decreased by 17.7 percent from 10.6 kt in 2022 to 8.6 kt in 2023, due to decreased demand from the ceramics industry (Table 81). However, volumes sold locally increased by 27.3 percent to 18.4 kt, while the corresponding sales value increased by 12.9 percent to R4.9 million in 2023.

TABLE 81: SOUTH AFRICA'S PRODUCTION AND LOCAL SALES OF KAOLIN, 2014-2023

YEAR	PRODUCTION		LOCAL SALES	
	Mass	Mass	Value (FOR)	
	Kt	Kt	R'000	R/t
2014	26.0	20.7	11 805	570
2015	12.1	19.9	5 444	273
2016	21.2	24.1	8 757	364
2017	31.1	23.7	11 347	478
2018	23.5	21.1	11 324	536
2019	27.8	19.4	9 636	513
2020	20.6	12.9	4 174	314
2021	29.2	13.4	4 442	332
2022	10.6	14.4	4 418	307
2023	8.6	18.3	4 989	272

Source: DMRE, Mineral Economics and Statistics Directorate

South Africa's bentonite production declined significantly by 19.6 percent, dropping from 96.5 kt to 77.6 kt in 2023. This decrease was largely driven by reduced demand from the foundry sector, which remains a key end market for bentonite. Despite the decline in production, local sales volume showed resilience, decreasing by only 7.7 percent to 52.4 kt, while the corresponding sales value experienced a marginal decline of 0.5 percent, reaching R48.2 million. Although the foundry market's weakening demand has

impacted overall performance, bentonite remains an essential material in multiple industrial applications, which may help stabilize the market in the short term (Table 82).

TABLE 82: SOUTH AFRICA'S PRODUCTION AND LOCAL SALES OF BENTONITE, 2014 -2023

YEAR	PRODUCTION		LOCAL SALES	
	Mass	Mass	Value (FOR)	
	Kt	kt	R'000	R/t
2013	177.2	169.6	123 077	726
2014	156.8	113.6	57 914	510
2015	165.5	138.2	62 927	455
2016	134.1	102.5	62 081	455
2017	157.9	106.9	88 175	824
2018	173.5	124.2	79 335	639
2019	105.1	60.9	58 655	963
2020	85.6	56.4	39 192	817
2021	98.6	58.1	42 796	737
2022	96.5	56.7	48 397	853
2023	77.6	52.4	48 148	919

Source: DMRE, Mineral Economics and Statistics Directorate

South Africa's production of attapulgite decreased by 12.1 percent from 9.1 kt in 2022 to 7.9 kt in 2023, reflecting a downturn in market performance. This decline can be attributed to a reduction in demand for key products such as cat litter and liquid fertilizers, both of which had supported the demand of the mineral growth in previous years. Volumes sold locally also decreased by 12.1 percent to 7.9 kt in 2023, whilst the corresponding sales values consequently decreased by 12.1 percent to R752.2 thousands (Table 83). Despite this contraction, the steady rise in demand for environmentally friendly products and sustainable cat litter absorbents continues to provide hope for a market rebound. If demand continues to grow, particularly with increasing consumer awareness, the attapulgite market may eventually return to the peak production levels seen in 2017 at 17 kt.

TABLE 83: SOUTH AFRICA'S PRODUCTION AND LOCAL SALES OF ATTAPULGITE, 2014 -2023

YEAR	PRODUCTION		LOCAL SALES	
	Mass	Mass	Value (FOR)	
	kt	Kt	R'000	R/t
2014	16.7	16.7	7 549	451
2015	18.3	17.7	9 386	530
2016	14.5	11.1	4 567	411
2017	17.0	14.6	7 745	532
2018	17.2	17.2	9 084	527
2019	11.6	11.6	2 411	208
2020	12.5	12.5	2 511	201
2021	13.2	13.2	2 702	205
2022	9.1	9.1	855	95
2023	7.9	7.9	752	95

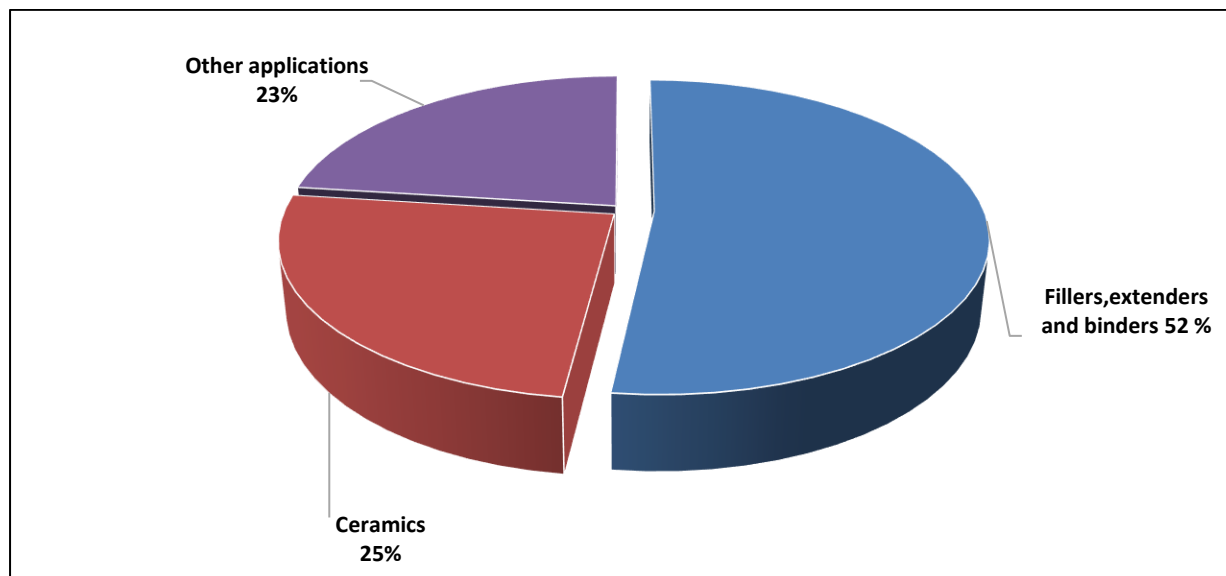
Source: DMRE, Mineral Economics and Statistics Directorate

WORLD

In 2023, the fillers, extenders, and binders sector remained the largest end-user of kaolin, accounting for 52 percent of total consumption, followed by the ceramics industry at 25 percent and other end markets at 23 percent. The ceramics segment, which includes sanitaryware, tableware, and tiles, has shown consistent growth in recent years, driven by increased construction activities and rising consumer demand. The growth of the kaolin mining market can be attributed to the continued rise in

demand, advancements in mining technologies, and the expansion of emerging markets. Kaolin remains a crucial additive in rubber production due to its anisometric booklet element form, which enhances the stiffness and strength of rubber by improving stress transfer. Additionally, it plays a vital role in maintaining the mechanical integrity of moulds by preserving an impermeable surface.

FIGURE 36: GLOBAL KAOLIN DEMAND BY SECTOR, 2023

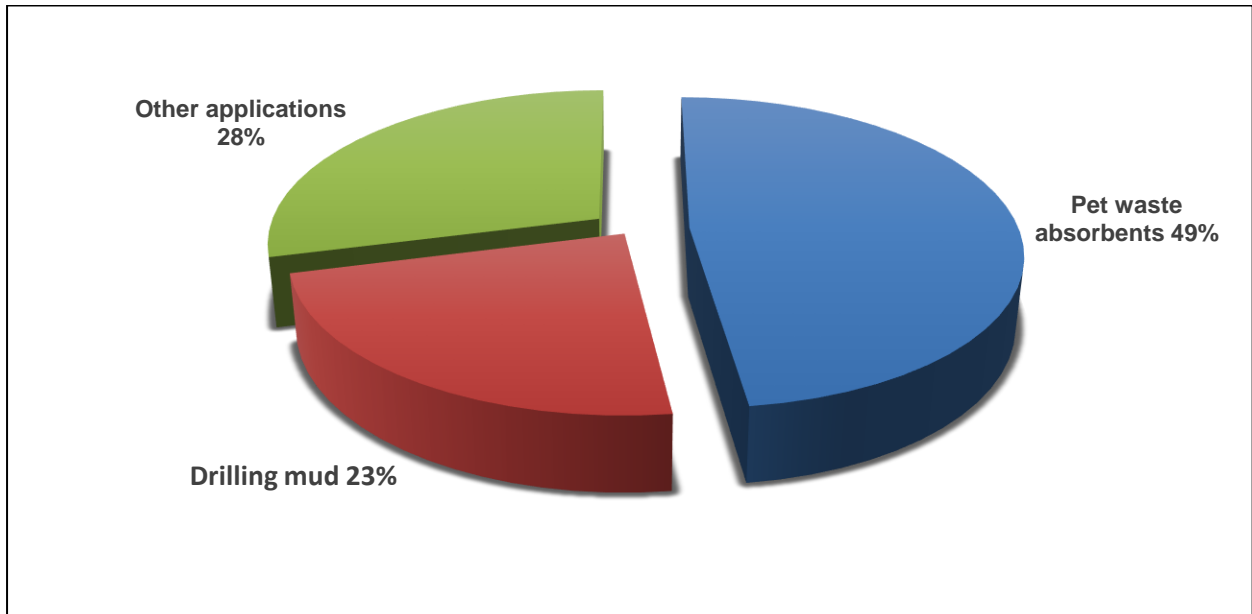


Source: USGS, 2024

Bentonite's unique properties swelling, water absorption, hydration, thixotropy, and viscosity make it an essential material for various applications. The global bentonite market is segmented into foundry sands, cat litter, iron ore pelletizing, refining, drilling muds, and civil engineering. In 2023, the pet waste absorbents market accounted for 49 percent of bentonite consumption, followed by drilling mud applications at 23 percent, and other uses at 28 percent (Figure 36). The demand for bentonite continues to rise, particularly in metal casting applications such as brake drums, engine blocks, manhole covers, brass water fittings, transmission housing, and cast-iron pans. These end uses are expected to have a favourable impact on the market in the coming years. Additionally, key factors driving demand for sodium bentonite in the foundry and construction industries include expanding infrastructure projects and the growing need for steel and iron ore in various sectors. The rising demand for crude oil and natural gas has also positively influenced the demand for bentonite, especially in drilling applications.

Attapulgite demand was driven by the robust global oil and gas, construction, and pet litter markets. The mineral's versatility in various applications, including its use in salt-polluted mud for offshore drilling, as a thickening and gelling agent, and as an adhesive viscosity controller in adhesives, paints, and coatings, has supported the growth of the global attapulgite market. Advancements in drilling technologies, particularly in the oil and gas sector, further fuelled demand for attapulgite, contributing to the market expansion. In addition, innovations in attapulgite-based pet litter absorbents, which offer benefits such as coagulating soil and dispersing odours while being environmentally friendly, continue to strengthen the market growth. However, the global attapulgite market still faces challenges from stringent mining regulations, including land policies, environmental standards, and substance toxicity controls, as well as waste disposal concerns in certain regions, which may limit growth in some areas.

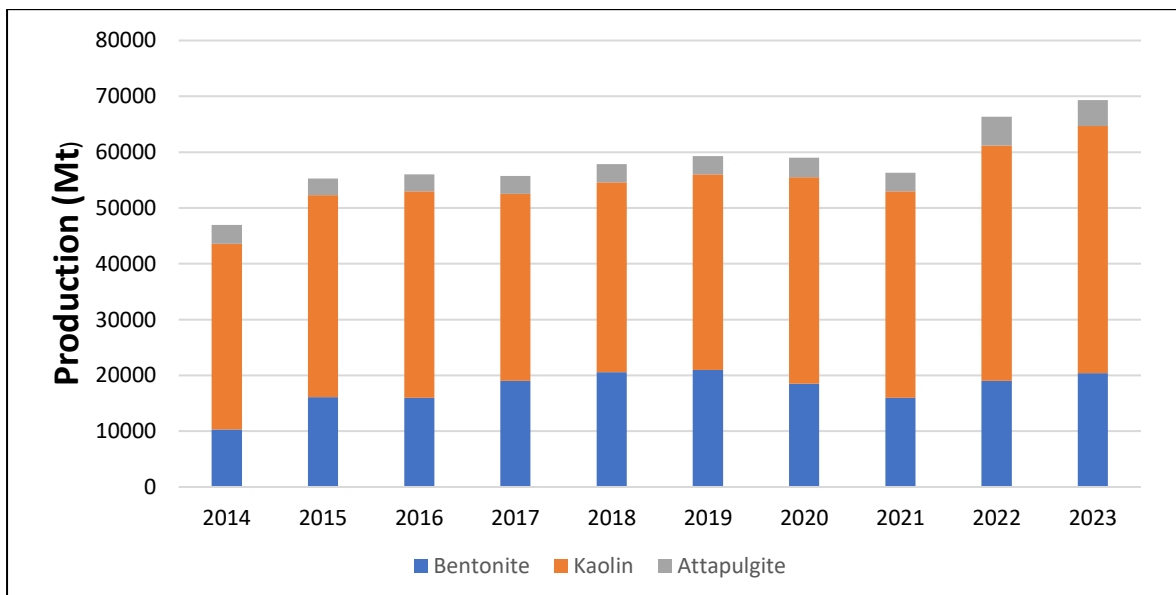
FIGURE 37: GLOBAL BENTONITE DEMAND BY SECTOR, 2023



Source: USGS, 2024

In 2023, total world production of kaolin decreased by 1.7 percent to 51 Mt (Figure 38), owing to dwindling demand from paper coating and fillers, as well as extenders in paint and plastic. The main producing countries of kaolin in 2023 were Uzbekistan accounting for 16.7 percent, followed by India and China, both with 16.5 percent, United States accounted for 8.6 percent, Czechia accounting for 6.1 percent, while other countries accounted for 35.5 percent of the total kaolin production. About 1.8 Mt was exported from the US as a paper coating filler, a component in ceramic bodies, and fillers and extenders in paint, plastic, and rubber products. Mexico, China and Japan, in descending order, were the leading destinations.

FIGURE 38: GLOBAL SPECIAL CLAYS PRODUCTION: 2014-2023.



Source: USGS, 2024

Total global production of bentonite decreased by 2 percent to 20 Mt (Figure 39). The slight decrease in demand came from the foundry sector. Additionally, the bentonite market continued to see substantial consumption in oil and gas drilling operations due to increasing global energy requirements. The United

States remained the largest producer, accounting for 23.5 percent of total world production, followed by India with 18.5 percent, China with 10.5 percent, and other countries contributing 35.5 percent.

Total world production of attapulgite decreased by 7.9 percent to 4.3 Mt in 2023 (Figure 37), owing to slight demand increase from the chemicals and pet waste absorbents industries. United States accounted for 53.5 percent of the total world production of attapulgite, followed by India with 17 percent, Spain with 13.3 percent, and Mexico at 13.3 percent and other countries at 13.5 percent.

PRICES

In 2023, prices of special clays increased by 4.1 percent because of normal inflation price increases for all different types of clay.

EMPLOYMENT

South Africa's special clays industry employed a total of 211 employees in 2023, up by 10.5 percent when compared with 2022 (Table 84). Remuneration increased by 33 percent from R32.2million in 2022 to R42.8 million in 2023, in line with increased employment. Productivity increased to 12.2 kt per employee in 2023 from 1.8 kt per employee in 2022, as the production was increased during the period under review.

TABLE 84: SOUTH AFRICA'S SPECIAL CLAYS EMPLOYMENT, 2014 – 2022

Year	Employees	Remuneration
2014	323	36 246 841
2015	359	42 361 584
2016	300	38 441 871
2017	322	42 377 525
2018	289	41 577 211
2019	255	42 202 834
2020	192	34 232 701
2021	202	40 464 996
2022	191	32 197 929
2023	211	42 834 867

Source: DMRE, Mineral Economics and Statistics Directorate

OUTLOOK

The growth of the kaolin industry is expected to be positively impacted by the increasing demand for ceramic products, such as tiles and sanitaryware, as well as by its expanding use as a supplemental material in the cement sector. The market for kaolin is expected to grow at a compound annual growth rate (CAGR) of 9.3 percent to reach \$14.67 billion in 2028. Its increased use in agriculture, the rise of environmentally friendly substitutes, rising applications in cosmetics, and changes in consumer tastes toward natural products are the main drivers of the industry's anticipated growth in the years to come. Some of the major trends expected to accelerate the growth rate throughout the forecast period include, the usage of nanotechnology, continuous research & development for novel applications, kaolin's use in bio-ceramics and medical domains, the adoption of kaolin-based filtering systems, and its incorporation into polymers and composites.

To expand the range of applications for kaolin, more research and development is being done on medicinal and cosmetic grades of the substance. This is expected to provide kaolin producers with substantial growth prospects in the short-term.

Global bentonite market is estimated to grow at a compound annual growth rate (CAGR) of 4.2 percent from the year 2025 to 2034 and is likely to reach approximately 19 million tonnes in 2034. The Asia Pacific is forecasted to experience the highest CAGR over the forecast period due to several key factors - rapid urbanization and industrialization in countries across the Pacific, including China, India and the southeast Asian nations, are driving significant infrastructure development, construction activities, and industrial expansion. This surge in construction and industrial projects will lead to increased demand for various materials and chemicals, including bentonite, for applications such as drilling fluids, construction materials, and environmental containment liners. Additionally, the burgeoning oil and gas exploration activities in certain regions, particularly in offshore areas, is expected to contribute further to the demand of bentonite in drilling fluids.

As South Africa continues to enhance its environmental regulations and waste disposal standards, the demand for bentonite in this sector is expected to rise. This trend is likely to spur local production, offering new opportunities for bentonite suppliers to meet the growing needs of both public and private waste disposal projects. Additionally, government initiatives focused on sustainable environmental practices and infrastructure development could further boost demand for bentonite in the short-term.

Market for attapulgite clay is expected to rise steadily in the future due to rising demand across a range of applications, such as paint, plastics, and medications. Potential disruptors, such the emergence of environmentally friendly substitutes and improvements in synthetic materials, is expected to change the dynamics of the market. Traditional clay extraction techniques may also face difficulties, because of regulatory changes pertaining to environmental sustainability which will also affect production. However, in the coming years, product innovation and research into sustainable mining methods will be given priority. The future of the industrial attapulgite clay market looks promising, with continued advancements in technology and growing demand across various industries. As manufacturing processes become more sophisticated, the need for versatile materials like attapulgite clay will continue to rise, offering significant opportunities for growth and investment.

South Africa's ongoing shift from reliance on ageing coal-fired power plants has opened avenues for the exploration and development of natural gas reserves. The country's strategic goal to diversify its energy mix is another factor expected to stimulate the attapulgite market. Attapulgite's application in drilling fluids for gas exploration could lead to increased demand, particularly as the country advances its efforts towards cleaner energy solutions. This diversification of energy sources is likely to generate significant demand for attapulgite, particularly once gas exploration projects commence, thereby contributing to the overall growth of the industry in the long term.

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VERMICULITE

Munyadziwa Muravha

SUPPLY AND DEMAND

South Africa's production of vermiculite decreased by 1.2 percent to 169.8 kt in 2023, compared with 171.9 kt in 2022 (Table 85). The decline in production resulted from a slight decrease in demand from the agriculture and horticulture sectors, particularly the animal feed industry. Volumes sold locally increased by 13.4 percent to 11.9 kt in 2023 compared with 10.5 kt in 2022, while local sales values increased by 31.4 percent to R46.7 million in the same period. Local sales volumes and values increased when compared with 2022, where demand had been low for high-priced fertilizers. Export volumes decreased by 15.8 percent from 145.4 kt to 122.5 kt in 2023. Export value decreased by 9.1 percent to R672.2 million. Decreased export sales figures can be attributed to global supply disruptions which resulted in lower demand. Furthermore, export sales volumes are usually higher when coarser grades (greater than 5-millimeter particle size) are produced.

TABLE 85: SOUTH AFRICA'S PRODUCTION, LOCAL SALES, AND EXPORTS OF VERMICULITE, 2014 – 2023

YEAR	PRODUCTION		LOCAL SALES		EXPORTS SALES		
	Mass	Mass			Mass	Value (FOB)	
	Kt	Kt	R'000	R/t	kt	R'000	R/t
2014	143.1	9.2	19 027	2 055	144.4	461 928	3 200
2015	138.3	9.3	20 212	2 164	115.1	399 547	3 470
2016	166.5	10.5	24 847	2 363	56.8	272 705	4 805
2017	166.1	10.0	25 053	2 515	68.7	272 920	4 002
2018	141.3	9.7	25 113	2 583	94.2	378 899	4 029
2019	158.0	9.3	26 567	2 862	153.1	618 057	4 036
2020	118.2	8.3	24 803	2 982	118.1	566 405	4 795
2021	150.1	10.9	34 208	3 137	122.8	548 822	4 571
2022	171.9	10.5	35 522	3 440	145.5	739 696	5 125
2023	169.8	11.9	46 679	3 935	122 .4	672 148	5 489

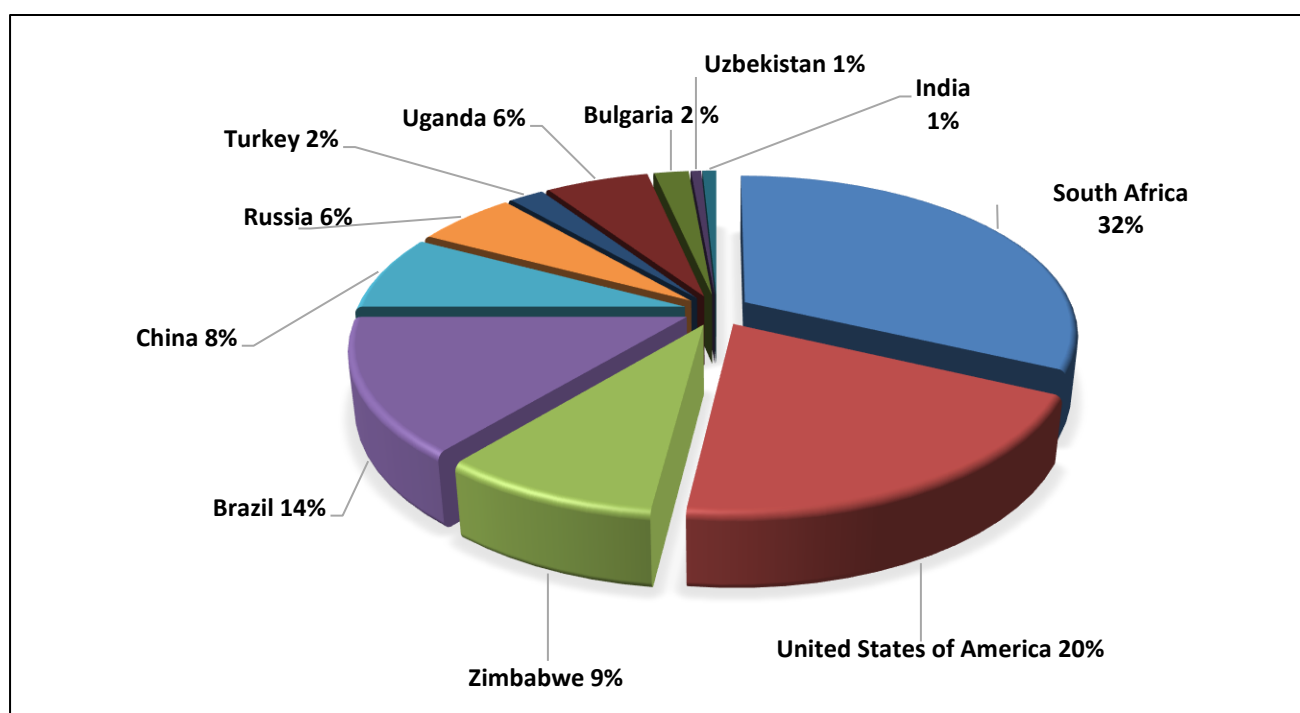
Source: DMRE, Mineral Economics and Statistics Directorate

South Africa remained the world's largest producer of vermiculite in 2023 at 160 kt, followed by the United States (US), which remained constant at 100 kt. South Africa's output came only from PMC, while the US's output came from two operations with mining and processing facilities in South Carolina and Virginia. World production of vermiculite is estimated to have decreased by 3.1 percent from 516 kt to 500 kt in 2023. South Africa contributed about 32 percent to total world production, followed by the

US at 20 percent and Brazil at 14 percent (Figure 39). South Africa and the US have held leading rankings for almost a decade. The vermiculite market experienced robust growth in recent years, with a promise for continuous growth in the future. The global market grew from \$0.26 billion with a Compound Annual Growth Rate (CAGR) of 7.9 percent in 2023. This notable growth was driven by the construction industry, horticulture, agriculture, industrial applications, fireproofing, and insulation, which are the sectors that lay the foundation for a flourishing market.

With less domestic production, as well as global supply issues, vermiculite exfoliation operations in the U.S. are experiencing difficulties obtaining crude vermiculite (especially medium and coarse grade), which is increasing waiting times and could result in consumers using substitute materials. Producers will continue to investigate ways to increase the use of the finer grades in existing application and as a substitute for coarser vermiculite, while continuing to develop new and innovative applications.

FIGURE 39: WORLD PRODUCTION OF VERMICULITE BY COUNTRY, 2023.



Source: USGS Commodity Summaries, 2024

Vermiculite is a hydrous magnesium aluminium silicate mineral of the mica group of phyllosilicates and is widely distributed around the world. It is widely utilized in the production of molded shapes for high-temperature insulations, open fire areas, and structural steel and pipe fireproofing. Due to its exceptional thermal resistance, vermiculite is also utilized in the automotive sector for the manufacturing of brake linings. Vermiculite has a wide range of applications, such as floor and roof screeds concretes, as soil-less media in hydroponics, and as a soil enhancer.

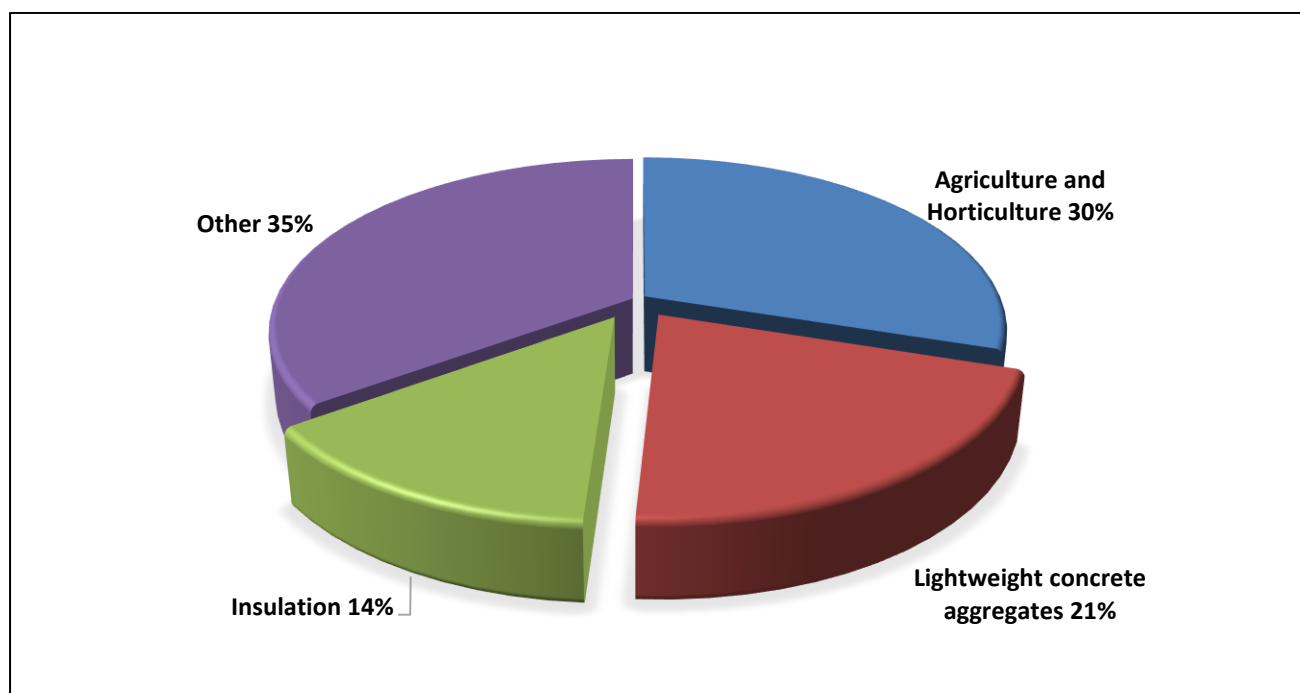
The vermiculite market consists of sales of vermiculite by entities (organizations, sole traders, and partnerships) that mine the mineral. The current driving forces for the growth of the vermiculite industry globally, are undoubtedly infrastructure expansion, environmental applications, emerging markets, and technological advancements. Other factors driving demand include, increasing demand for vermiculite products and services across various industries. The global surge in construction activity emerges as a pivotal driver propelling the vermiculite market's growth. Construction activities globally have been stimulating demand for materials and services, contributing to the market's expansion.

Technological advancements and digitalization are also on the rise, contributing directly to the mining of the mineral, thereby transforming mining operations through rise of 3D printing, which enables on-site manufacturing of critical parts and reduces delays. Advanced technology also includes remote manufacturing which has introduced improved heavy-lift transport and facilitates, the movement of modular equipment to remote sites, reducing the need for expensive onsite construction. As a result, the industry continues to grow rapidly. Furthermore, customers are shifting to more environmentally friendly products, which is growing emerging markets such as green roofing. Hence, the growing emphasis on sustainability and energy efficiency has propelled the demand for environmentally friendly vermiculite alternatives. This has created lucrative opportunities for market players to develop innovative and sustainable vermiculite solutions. New innovative applications include the use of vermiculite to combat air pollution and absorption of water in mines, replacing zeolites in ion-exchange columns, and purification of wastewater. These sectors are expected to keep the industry growing.

Additionally, the vermiculite industry is anticipated to grow at a faster rate because of the rising demand for gas and oil. In hydraulic fracturing operations, vermiculite is employed as a proppant to retain open fractures in rock formations, maximizing the extraction of gas and oil.

Agriculture and horticulture accounted for 30 percent of vermiculite consumption, followed by lightweight concrete aggregates (including cement premixes, concrete and plaster) at 21 percent and insulation applications at 14 percent, and other applications at 35 percent (Figure 40).

FIGURE 40: VERMICULITE CONSUMPTION BY SECTOR, 2023.



Source: USGS Commodity Summaries, 2024

Vermiculite is found in various regions across the globe such as Brazil, Australia, South Africa and Russia. Vermiculite market is segmented into 7 key regions: North America, Latin America, Western Europe, Eastern Europe, Asia Pacific excluding Japan, Middle East, Africa, and Japan. The vermiculite market is predicted to increase in these regions in the long term. In terms of production, the vermiculite market is dominated by the Middle East, Africa, and Asia-Pacific regions. China and South Africa are the two major exporters of vermiculite. Major businesses in the vermiculite market include Palabora Mining Company in South Africa, Samrec Vermiculite in Zimbabwe, Virginia Vermiculite LLC in the USA, UBM Uniao Brasileira de Mineracao S.A. in Brazil, and JSC Kovdorsluda in Russia.

PRICES

There were noticeable price fluctuations in the first half of 2023. Demand increased gradually at first but became steady into the second half (H2) of 2023. Occasionally, overstocking challenges in some key regions caused the price of vermiculite to drop. In the second half of 2023, there was a significant worldwide decrease in vermiculite output compared to the same time the previous year. Prices rose despite this decline in volumes. The mineral's diverse application in industries such as construction and agriculture continued to drive demand and resulting in the growth of vermiculite prices from approximately 424 \$/Mt to 450 \$/Mt in H2 of 2023. However, towards the end of the year, prices averaged around 615\$/Mt. Vermiculite's insulating qualities are used by the construction industry to improve building energy efficiency, and its soil conditioning qualities are advantageous to the agricultural sector. The combination of these ongoing demands and decreased supply made the conditions conducive for price hikes. Disruptions to the global supply chain and rising energy prices added to the cost of manufacturing, which was reflected in the pricing trajectory. A decrease in vermiculite is anticipated, considering the challenges facing the mining industry worldwide.

OUTLOOK

The vermiculite market is anticipated to grow at a robust CAGR of 7.6 percent to reach a projected market value of \$0.37 billion by 2028. The market for vermiculite will probably see rapid expansion in the upcoming years. Growing infrastructure, expanding markets, environmental applications, and technological advancements have all contributed to the increase seen throughout the anticipated time. The main trends for the forecast period are expected to be electrification and lightweight concrete aggregates, manufacturing, digitalization and connectivity. Future growth in the vermiculite market is predicted due to the notable increase in global construction activities. The market for vermiculite is expected to expand more quickly in the coming few years because of the growing demand, however, market fluctuations are still expected.

Numerous businesses worldwide are still increasing their output of materials using vermiculite, which is anticipated to eventually lead to a growth of the vermiculite market worldwide. In addition, the increased demand for coarse to medium grades has led to a rise in vermiculite exploration efforts. Demand for vermiculite continues to rise on the back of the following main drivers, population growth, change in lifestyle, and increasing consumer preferences towards healthy food products. Therefore, South Africa's supply of vermiculite is expected to continue an increasing trend to meet the demand fuelled by the healthy appetite from the agricultural sector and the growing population.

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STATISTICS FOR OTHER INDUSTRIAL MINERALS

M Maredi

NOTE: The following applies to all tables.

** Withheld for reasons of company confidentiality

* Nil

1. NATURAL ABRASIVES

TABLE 86: SOUTH AFRICA'S IMPORTS OF NATURAL ABRASIVES, 2014–2023

YEAR	Mass	Value (FOB)	
	t	R'000	R/t
2014	996	5 398	5 421
2015	1 645	8 177	4 971
2016	1 902	8 618	4 530
2017	900	8 918	9 906
2018	1 319	9 011	6 829
2019	1 102	10 990	9 972
2020	213	1 916	8 995
2021	326	2 873	8 812
2022	1 463	6 915	4 728
2023	86	1 678	19 414

Source: RSA, Commissioner for South African Revenue Service, 2014–2023

2. BARYTES

TABLE 87: SOUTH AFRICA'S IMPORTS OF BARYTES, 2014–2023

YEAR	Mass	Value (FOB)	
	t	R'000	R/t
2014	5 699	18 804	3 299
2015	2 801	15 029	5 365
2016	2 101	11 030	5 250
2017	2 446	10 586	4 327
2018	5 661	18 433	3 256
2019	3 378	14 473	4 284
2020	7 896	22 199	2 811
2021	3 432	15 388	4 484
2022	14 533	28 404	1 954
2023	1 850	15 518	8 388

Source: RSA, Commissioner for South African Revenue Service, 2014–2023

3. DIATOMACEOUS EARTH (KIESELGUHR)

TABLE 88: SOUTH AFRICA'S IMPORTS OF DIATOMACEOUS EARTH, 2014–2023

YEAR	Mass	Value (FOB)	
	t	R'000	R/t
2014	4 541	26 419	5 818
2015	5 554	37 889	6 822
2016	4 300	34 318	7 981
2017	5 853	46 044	7 867
2018	8 485	69 301	8 168
2019	4 968	41 174	8 288
2020	7 750	65 796	8 490
2021	4 118	30 937	7 512
2022	7 122	72 501	10 180
2023	4 440	52 444	11 812

Source: RSA, Commissioner for South African Revenue Service, 2014–2023

Note: Production statistics are not published due to confidentiality

4. FELDSPAR

TABLE 89: SOUTH AFRICA'S PRODUCTION, LOCAL SALES AND EXPORTS OF FELDSPAR, 2014–2023

YEAR	PRODUCTION	LOCAL SAL		EXPORT SALES+			
	kt	Mass	Value (FOR)	Mass	Value (FOB)		
		kt	R'000		R/t	R'000	R/t
2014	102.5	99.9	52 134	522	*	*	*
2015	130.2	119.8	63 450	530	*	*	*
2016	127.9	114.2	56 181	492	*	*	*
2017	116.7	129.7	66 730	515	*	*	*
2018	76.8	104.0	50 530	486	*	*	*
2019	76.3	91.9	45 957	500	*	*	*
2020	48.4	63.4	56 703	894	*	*	*
2021	67,1	119,5	91 567	767	*	*	*
2022	75,4	80,3	55 018	685	*	*	*
2023	142,8	86,3	49 573	574	*	*	*

Source: DMRE, Mineral Economics and Statistics Directorate, 2014–2023

5. GRAPHITE

TABLE 90: SOUTH AFRICA'S IMPORTS OF NATURAL GRAPHITE, 2014–2023

YEAR	Mass	Value (FOB)	
	t	R'000	R/t
2014	603	9 208	15 270
2015	486	11 347	23 347
2016	698	12 341	17 691
2017	947	12 636	13 341
2018	747	11 161	14 934
2019	769	11 511	14 961
2020	719	12 099	16 826
2021	826	11 252	13 622
2022	1042	22 282	21 391
2023	776	16 088	20 734

Source: RSA, Commissioner for South African Revenue Service, 2014–2023

6. GYPSUM

TABLE 91.1: SOUTH AFRICA'S PRODUCTION, LOCAL SALES, AND CONSUMPTION OF NATURAL GYPSUM, 2014–2023

YEAR	PRODUCTION	LOCAL SALES			CONSUMPTION
	kt	Mass	Value (FOR)		FOR CEMENT+#
		kt	R'000	R/t	kt
2014	376	290	52 580	181	***
2015	232	213	40 367	190	***
2016	262	218	42 484	195	***
2017	321	237	50 195	212	***
2018	322	243	51 981	214	***
2019	277	208	50 508	243	***
2020	206	208	48 924	236	***
2021	277	257	64 465	251	***
2022	243	244	64 816	265	***
2023	227	206	62 166	301	***

Sources: DMRE, Directorate Mineral Economics and Statistics, 2014–2023

Notes: + Based on cement sales and assuming 38,5t gypsum/1 000t cement.

Includes synthetic gypsum

*** Not available

91.2: SOUTH AFRICA'S IMPORTS OF NATURAL GYPSUM, 2014–2023

YEAR	GYPSUM			GYPSUM PLASTERS		
	Mass t	Value (FOB)		Mass t	Value (FOB)	
		R'000	R/t		R'000	R/t
2014	66 261	28 971	437	7 597	18 219	2 398
2015	143 945	30 984	215	8 385	25 348	3 023
2016	142 529	30 774	216	9 096	31 574	3 471
2017	139 754	28 336	203	9 662	27 348	2 831
2018	239 943	49 171	205	8 825	24 485	2 775
2019	223 108	50 308	225	9 931	27 022	2 721
2020	179 925	74 193	412	5 132	19 556	3 810
2021	239 746	59 903	250	5 267	17 119	3 250
2022	425 192	245 230	577	4 035	13 568	3 363
2023	222 975	69 554	312	2 875	14 695	5 112

Source: RSA, Commissioner for South African Revenue Service, 2014–2023

7. MAGNESITE

TABLE 92.1: SOUTH AFRICA'S PRODUCTION AND LOCAL SALES OF MAGNESITE AND DERIVED PRODUCTS, 2014–2023

YEAR	PRODUCTION kt	Mass kt	LOCAL SALES	
			Value (FOR)	
			R'000	R/t
2014	**	**	**	**
2015	10.2	10.6	17 666	1 666
2016	8.8	9.0	15 015	1 673
2017	8.7	8.9	17 389	1 962
2018	9.4	9.5	20 903	2 209
2019	8.1	7.9	13 918	1 755
2020	6.8	7.1	8 556	1 214
2021	5.8	5.8	7 181	1 249
2022	7,8	7,9	11 884	1 498
2023	4,2	4,2	7 817	1864

Source: DMRE, Mineral Economics and Statistics Directorate, 2014–2023

TABLE 92.2: SOUTH AFRICA'S IMPORTS OF MAGNESITE AND MAGNESIA, 2014–2023

YEAR	MAGNESITE			MAGNESIA		
	Mass kt	Value (FOB)		Mass kt	Value (FOB)	
		R'000	R/t		R'000	R/t
2014	11.2	34 527	3 094	44.8	229 975	5 124
2015	9.8	36 785	3 754	51.3	302 871	5 904
2016	8.6	26 201	3 055	70.6	542 286	7 683
2017	12.3	32 904	2 673	52.4	342 841	6 544
2018	9.8	26 506	2 692	38.8	211 354	5 451
2019	8.1	30 124	3 729	56.5	245 239	4 341
2020	10.9	42 195	3 871	34.2	178 234	5 205
2021	7.0	28 254	4 036	41.2	213 031	5 170
2022	5	24 343	4 994	56 011	346 496	6 186
2023	5	24 438	4 501	45	317 503	7 062

Source: RSA, Commissioner for Service, South African Revenue, 2014–2023

8. MICA

TABLE 93.1: SOUTH AFRICA'S PRODUCTION, LOCAL SALES AND EXPORTS OF SCRAP AND FLAKE MICA; 2014–2023

YEAR	PRODUCTION	LOCAL SALES			EXPORT SALES			
		t	Mass	Value (FOR)		t	Value (FOB)	
			t	R'000	R/t		R'000	R/t
2014	83	*	**	**	*	**	**	
2015	29	*	**	**	*	**	**	
2016	8	*	**	**	*	**	**	
2017	21	8	**	**	*	**	**	
2018	32	14	**	**	18	**	**	
2019	9	*	**	**	**	**	**	
2020	194	239	**	**	**	**	**	
2021	630	631	**	**	**	**	**	
2022	392	413	**	**	**	**	**	
2023	425	485	**	**	**	**	**	

Source: DMRE, Mineral Economics and Statistics Directorate, 2014–2023

TABLE 93.2: SOUTH AFRICA'S IMPORTS OF MICA, 2014–2023

YEAR	Mass		Value (FOB)	
	t	R'000	R'000	R/t
2014	862	3 853	4 471	
2015	955	5 580	5 842	
2016	721	4 271	5 920	
2017	818	4 685	5 728	
2018	626	4 690	7 498	
2019	1 090	8 103	7 436	
2020	213	1 652	7 744	
2021	360	3 277	9 102	
2022	2	0,686	457	
2023	140	3 513	25 123	

Source: RSA, Commissioner for Service, South African Revenue, 2014–2023

9. POTASH

TABLE 94: SOUTH AFRICA'S IMPORTS OF POTASH, 2014–2023

YEAR	POTASSIUM CHLORIDE		POTASSIUM SULPHATE		POTASSIUM NITRATE		TOTAL	
	kt	R'000	kt	R'000	kt	R'000	kt	R'000
2014	381.5	1 333 954	65.3	470 162	57	491 961	503.8	2 295 277
2015	377.4	1 434 884	39.6	323 091	29.6	254 351	446.6	2 012 326
2016	335.4	1 026 860	60.5	363 124	28.3	360 341	424.2	1 750 325
2017	305.8	899 436	376.4	325 074	9.0	93 089	691.2	1 317 599
2018	403.4	1 438 691	47	304 681	32.8	314 181	483.2	2 057 563
2019	349.6	1 357 811	75.6	513 943	37.2	357 201	462.5	2 228 965
2020	404.5	1 480 001	61.8	434 366	35.9	376 531	502.3	2 290 913
2021	405.7	1 984 641	99.5	574 257	30.5	380 141	535.7	2 939 041
2022	749,7	6 327 041	147,9	1 300 931	28,9	650 531	926,5	8 278 513
2023	333,8	2 699 931	39,4	441 772	22,5	841 291	395,7	3 983 001

Source: RSA, Commissioner for South African Revenue Service, 2014–2023

Note: Up to 10 percent of the imports were most likely for non-fertiliser uses

10. PYROPHYLLITE

TABLE 95: SOUTH AFRICA'S PRODUCTION, LOCAL SALES AND EXPORTS OF PYROPHYLLITE, 2014–2023

YEAR	PRODUCTION	LOCAL SALES			EXPORT SALES		
		Mass t	Value (FOR)		Mass t	Value (FOB)	
			R'000	R/t		R'000	R/t
2014	22 500	16 373	4 910	300	6 754	18 448	2 731
2015	17 352	12 579	4 901	390	3 315	11 436	3 450
2016	19 114	14 952	7 923	530	5 294	16 631	3 141
2017	55 048	13 793	10 508	762	4 213	14 654	3 478
2018	98 245	15 232	7 667	504	9 653	25 021	2 592
2019	134 451	13 818	16 881	1 222	10 767	41 436	3 848
2020	92 318	13 395	13 601	1 016	51 951	58 041	1 117
2021	270 944	18 340	27 461	1 497	30 362	142 191	4 683
2022	438 698	19 930	22 031	1 106	55 472	235 441	4 244
2023	319 775	17 568	21 190	1 206	33 491	191 371	5 713

Source: DMRE, Mineral Economics and Statistics Directorate, 2014–2023

11. SALT

TABLE 96: SOUTH AFRICA'S PRODUCTION, LOCAL SALES AND EXPORTS OF SALT, 2014–2023

YEAR	PRODUCTION	LOCAL SALES		EXPORTS				
		kt	Mass	Value (FOR)		Mass	Value (FOB)	
			kt	R'000	R/t		kt	R'000
2014	494	492	160 818	327	*	*	*	
2015	517	512	160 267	313	*	*	*	
2016	473	460	169 762	369	*	*	*	
2017	493	480	190 178	397	0.10	93.21	914	
2018	478	496	230 172	464	102	90	879	
2019	510	523	257 310	492	*	*	*	
2020	538	536	251 928	470	226	230	1 017	
2021	546	555	268 549	484	0	322	947	
2022	570	547	307 522	562	0	94	999	
2023	616	579	348 722	603	0	47	1392	

Source: DMRE, Mineral Economics and Statistics Directorate, 2014–2023

12. SILICA

TABLE 97: SOUTH AFRICA'S PRODUCTION, LOCAL SALES AND EXPORTS OF SILICA, 2014–2023

YEAR	PRODUCTION	LOCAL SALES			EXPORT SALES			
		kt	Mass	Value (FOR)		Mass	Value (FOB)	
			kt	R'000	R/t		t	R'000
2014	2 604	2 622	548 129	209	15 959	46 794	2 932	
2015	2 278	2 318	530 917	229	19 428	51 962	2 675	
2016	1 886	1 911	512 220	268	11 461	34 068	2 972	
2017	2 401	2 242	540 345	241	3 219	6 051	1 880	
2018	2 287	2 039	584 142	286	780	1 549	1 987	
2019	2 269	2 160	587 351	272	1 142	2 041	1 787	
2020	2 130	2 101	537 415	256	632	945	1 496	
2021	2 074	2 030	623 733	307	429	648	1 511	
2022	1 860	1 718	636 630	370	0	0	0	
2023	1 900	1 658	669 975	404	0	0	0	

Source: DMRE, Mineral Economics and Statistics Directorate, 2014–2023

13. TALC

TABLE 98.1: SOUTH AFRICA'S PRODUCTION AND SALES OF TALC, 2014–2023

YEAR	PRODUCTION	LOCAL SALES				EXPORT SALES		
		Mass		Value (FOR)		Value (FOB)		R/t
		t	t	R'00	R/t	t	R'00	
2014	4 827	5 606	8 297	1 480	*	*	*	
2015	4 497	5 032	8 298	1 649	*	*	*	
2016	4 462	4 462	9 469	2 122	*	*	*	
2017	3 728	3 727	8 665	2 325	*	*	*	
2018	3 897	3 897	9 069	2 327	*	*	*	
2019	979	979	2 365	2 416	*	*	*	
2020	*	*	*	*	*	*	*	
2021	*	*	*	*	*	*	*	
2022	*	*	*	*	*	*	*	
2023	*	*	*	*	*	*	*	

Source: DMRE, Mineral Economics and Statistics Directorate, 2014–2023

TABLE 98.2: SOUTH AFRICA'S IMPORTS OF TALC, 2014–2023

YEAR	Mass	Value (FOB)	
	t	R'000	R/t
2014	9 096	43 500	4 782
2015	9 161	45 815	5 001
2016	8 854	43 692	3 156
2017	12 606	63 335	5 024
2018	12 057	53 289	4 419
2019	14 666	62 340	4 251
2020	10 550	51 851	4 915
2021	15 982	70 895	4 436
2022	17 696	83 443	4 715
2023	13 311	68 823	5 170

Source: RSA, Commissioner for South African Revenue Service, 2014–2023

PART THREE: GENERAL INFORMATION

USEFUL ADDRESSES

DEPARTMENT OF MINERAL RESOURCES AND ENERGY HEAD OFFICE

The Director-General		Trevenna Office Campus
Department: Mineral Resources		Buildings 2B and 2C
Private Bag X 59	www.dmre.gov.za	Corner of Francis Baard and Meintjies Street
0007 Arcadia		Pretoria

Tel: (012) 444 3000

Telefax:(012) 341 4134 / 5886

Private Bag X96, Pretoria, 0001	Land Bank Building
Pretoria	192 Visagie corner Paul Kruger Streets, Tel: (012) 406 8000

SAMRAD Online Helpdesk: (012) 444 3119

SAMRAD Online e-mail: samradonline@dmr.gov.za

Enquiries: enquiries@dmre.gov.za

DMR 128 mStatistical data submission: mineralstats@dmre.gov.za

DEPARTMENT OF MINERAL RESOURCES AND ENERGY REGIONAL OFFICES

EASTERN CAPE PROVINCE

Regional Manager: Mineral Regulation - Eastern Cape
Private Bag X6076
6000 Port Elizabeth

Pier 14 Building, 444 Govan Mbeki Avenue
North end
Port Elizabeth

Tel: +27 (0) 41 396 3900

Telefax: +27 (0) 41 375 8171

Regional Manager: Mineral Regulation - Eastern Cape
Private Bag X6076
Port Elizabeth
6000

33 Philip Frame Road
Wavely Office Park
East London
+27 (0) 43 703 6000

Tel: +27 (0) 43 396 3900

Private Bag X5252
5099 Umthata

PRD Building 2nd floor
96 Sutherland Road
Umthata

Tel: +27 (0) 47 532 4488

Telefax: +27 (0) 47 532 4547

FREE STATE PROVINCE

Regional Manager: Mineral Regulation - Free State
Private Bag X33
9459 Welkom

The Strip
314 c/o Stateway and Bok Streets
Welkom

Tel: +27 (0) 57 391 1300

GAUTENG PROVINCE

Regional Manager: Mineral Regulation – Gauteng
Private Bag X5
2017 Braamfontein

Mineralia Building
Smit Building
222 Smit Street
Braamfontein

Tel: +27 (0)11 358 9700
: +27 (0) 63 501 0290
Telefax: +27 (0)11 339 1858 / 2423

KWA-ZULU NATAL PROVINCE

Regional Manager: Mineral Regulation – Kwa-Zulu Natal
Private Bag X 54307
4000 Durban

Izimbiwa' naMandla House
12 Joe Slovo Street
Durban

Tel: +27 (0) 31 335 9600/9758

LIMPOPO PROVINCE

Regional Manager: Mineral Regulation – Limpopo
Private Bag X9467
0700 Polokwane

Broll Building
101 Dorp Street
Polokwane

Tel: +27 (0)15 287 4736
Telefax: +27 (0)15 287 4729

Landros Maree Building
20 Landoros Maree Street
Polokwane

MPUMALANGA PROVINCE

Regional Manager: Mineral Regulation – Mpumalanga
Private Bag X7279
1035 Emalaheni

Saveways Crescent Centre
c/o OR Tambo and Mandela Drive
Emalaheni

Tel: +27 (0)13 653 5000
Telefax: +27 (0)13 690 3288

NORTHERN CAPE PROVINCE

Regional Manager: Mineral Regulation – Northern Cape
Private Bag X6093
8300 Kimberley

Telkom Building
41 Schmidtdrift Street
Kimberley

Tel: +27 (0) 53 830 1700 / 02
Telefax: +27 (0) 53 832 5631/ 830 0827

Regional Manager: Mineral Regulation – Springbok
Private Bag x14
Street
8240 Springbok

Hopley Centre
1st Floor
c/o Van Der Stel and Van Riebeeck Streets
Springbok

Tel: +27 (0) 27 712 8160
Telefax: +27 (0) 27 712 1959

NORTH WEST PROVINCE

Regional Manager: Mineral Regulation - North-West
Private Bag A1
2570 Klerksdorp

Vaal University of Technology building
Cnr Margaretha Prinsloo & Voortrekker Streets
Klerksdorp

Tel: +27 (0) 18 487 9830
Telefax: +27 (0) 18 487 9831 / 9836/
+27 (0) 18 462 9039

Regional Manager: Mineral Regulation – Mafikeng
PO Box 150
0309 Tlhabane

Katlego House
21 Connaught Street
Mafikeng

Tel: +27 (0) 18 487 9830
Telefax: +27 (0) 18 487 9831 / 9836/
+27 (0) 18 462 9039

Regional Manager: Mineral Regulation – Rustenburg
PO Box 150
0309 Tlhabane

Propcor Building
cnr Beyers Naude & Unie Street
Tlhabane

Tel: +27 (0)14 565 6417

Telefax: +27 (0)14 565 6424

WESTERN CAPE PROVINCE

Regional Manager: Mineral Regulation - Western Cape
Private Bag X9
8012 Roggebaai
Cape Town

44 Strand Street
MAP House
Cape Town

Tel: +27 (0)21 427 1000

Telefax: +27 (0)21 427 1046 / 1047

ASSOCIATED GOVERNMENT DEPARTMENTS

Department of Forestry, Fisheries & the Environment

Private Bag X447
0001, Pretoria
Website: www.dffe.gov.za

www.dffe.gov.za

473 Steve Biko
Acardia
Pretoria

Email address: callcentre@dffe.gov.za

Tel: +27 (0)12 339 9000

086 002 5005

Fax: +27 (0)12 359 3625

Department of Agriculture, Rural Development and Land Reform

Private Bag X 833

Pretoria

0001, Pretoria

Website: www.dalrrd.gov.za

Cnr Jeff Masemola & Paul Kruger Street

Email address: quiries@dalrrd.gov.za

Tel: +27 (0) 12 312 8911

(0) 12 319 6000

Fax: +27 (0) 12 312 8066

Department of Science, Technology and Innovation

Private Bag X894

0001, Pretoria

Website: www.dsti.gov.za

Building 53

Meiring Naude Road, Brummeria

Pretoria

Email address: webmaster@dsti.gov.za

Tel: +27 (0) 12 843 6300 / 6671

Fax: +27 (0) 12 349 1030

Department of Trade, Industry and Innovation

Private Bag X84

0001 Pretoria

Website www.thedti.gov.za

DTI Campus – Block E

Cnr Robert Sobukwe & Meintjies Streets

Sunnyside, Pretoria

Tel: +27 (0) 86 184 3384

Telefax: +27 (0) 12 394 4612 / 0517

+27 (0) 86 184 3888

Department of Water and Sanitation

Private Bag X313

0001, Pretoria

Website: www.dws.gov.za

Sedibeng Building

185 Francis Baard Street

Pretoria

Email address: customercare@dws.gov.za

Tel: +27 (0)12 336 7500

Tol free: 0800 200 200

Fax: +27 (0)12 324 6592

Statistics South Africa

Private Bag X44

0001, Pretoria

www.statssa.gov.za

Isibalo House

Koch Street, Salvokop

Pretoria

Tel: +27 (0) 12 310 8600

Fax: +27 (0) 12 310 8944

STATE OWNED ENTERPRISES

The Industrial Development Corporation of SA Ltd

(IDC)

P O Box 784055

2146 Sandton

Website: www.idc.co.za

19 Fredman Drive

Sandton

Tel: +27 (0)11 269 3000

Telefax: +27 (0)11 269 3116

DMRE RELATED STATE-OWNED ENTERPRISES

DEPARTMENT OF MINERAL AND PETROLEUM RESOURCES (DMPR)

Name	Address	Contact details
Council for Geoscience (CGS)	280 Pretoria Road Silverton Pretoria	www.geoscience.org.za Tel: +27 (0)12 841 1911 Telefax: +27 (0)12 841 1221
Mine Health and Safety Council (MHSC)	Building B7 Business Park Western service Road Woodmead, Johannesburg	www.mhsc.org.za Tel : +27 (0)11 656 1797 Fax : +27 (0)11 656 1578
Council for Mineral Technology (Mintek)	200 Malibongwe Drive Randburg	www.mintek.co.za Tel: +27 (0)11 709 4111 Telefax: +27 (0)11 793 2413
State Diamond Trader (SDT)	Suite 510, 5 th Floor 225 Main street SA Diamond Centre Johannesburg	www.statediamondtrader.gov.za Tel : +27 (0)11 334 2691 Telefax : +27 (0)11 334 1540
South African Diamonds & Precious Metals Regulator (SADPMR)	251 Fox street Doornfontein Johannesburg	www.sadpmr.co.za Tel: +27 (0)11 223 7000 Telefax: +27 (0)11 334 8898
Alexkor SOC Ltd	Office Block 15, 2nd Floor, The Woodlands Office Park 20 Woodlands Drive, Woodmead Johannesburg , 2191	Telephone: +27 11 ALEXKOR (253 9567) Fax: +27 11 788 8869
CEF Group CEF SOC	Orange Road, Alexander Bay, 8290, South Africa Block C, Upper Grayston Office Park, 152 Ann Crescent Strathavon, Sandton 2031 Johannesburg	cefcomms@cefgroup.co.za +27 10 201 4700 www.petroleumagency.co.za
Petroleum Agency SA (PASA)	7 Mispel street Petroleum House Bellville, Cape Town	Tel: +27 (0)21 938 3500 Telefax: +27 (0)21 938 3520 www.petrosa.co.za

Petro SA	Heron Place, 1 st Floor Heron Close, Century City	Tel: +27 (0)21 929 – 3000 Telefax: +27 (0)21 929 - 3144
	151 Frans Conradie Drive Cape Town 7500	
Strategic Fuel Fund (SFF)	151 Frans Conradie Drive, Parow, 7500, Cape Town, South Africa	021 524 2700
	Saldanha Terminal - Skurwerug, MR559 Road	
	Milnerton – c/o Platteklouf and Tygerberg Valley Roads, Milnerton	
	Ogies – Wakefield Road, Ogies	
iGas	CEF House Block C, Upper Grayston Office Park 152 Ann Crescent Strathavon, Sandton 2031 Johannesburg	cefcomms@cefgroup.co.za +27 10 201 4700 +27 10 201 482
African Exploration Mining and Finance Corporation (SOC) (AEMFC)	LTD 1st Floor, Building 1 – Waterfall Corporate Campus 74 Waterfall Drive Waterfall City, 2090	Tel +27 10 010 6100 Tel +27 10 010 6117 Fax +27 87 236 5061 Fax +27 87 236 5052
National Radioactive Disposal (NRWDI)	Waste Elias Motsoaledi Street Extension R104 Pelindaba Pretoria	www.nrwdi.org.za Tel: (0)12) 305 3222 Telefax: (012) 305 3200
National Energy Regulator (NNR)	Eco Glades 2 Block G. Witch Hazel Avenue Eco Park Centurion	www.nnr.co.za Tel: +27 (0)12 674 7100 Telefax: +27 (0)12 663 5513
National Energy Regulator of South Africa (NERSA)	526 Madiba St Arcadia 0007	www.nersa.org.za Tel: (012) 401-4600
South African Nuclear Energy Corporation (NECSA)	Church Street West, Extension Pelindaba, Brits District Pretoria	www.necsa.co.za Tel: +27 (0)12 305 4911 Telefax: +27 (0)12 305 3111
		www.sanedi.org.za

South African National Energy Development Institute (SANEDI)	Block C, Upper Greyston office park 152 Ann Crescent Sandton	Tel: +27 (0)11 038 4300
		www.eskom.co.za
ESKOM	1 Maxwell-Drive Megawatt Park Sunninghill Ext 3 Sandton	Tel: +27 (0)11 800 8111 Telefax: +27 (0)11 800 4299
		www.mqa.org.za
Mining Qualifications Authority (MQA)	7 Anerly Road Parktown Johannesburg	Tel: +27 (0)11 832 2600 Telefax: +27 (0)11 832 1027
		www.csir.co.za
Council for Scientific and Industrial Research (CSIR)	Meiring Naude Road Brummeria Pretoria	Tel: +27 (0)12 841 2911 Telefax: +27 (0)12 349 1153

OTHER RELATED ORGANISATIONS

Aggregate and Sand Producers Association of South Africa (ASPASA) PO Box 61809 Marshalltown	www.aspasa.co.za	89 FereroAve, Randpark Ridge, Randburg	2107
		Tel: +27 (0)11 791 3327 Telefax: +27 (0)11 498 7269	
Minerals Council South Africa PO Box 61809 2107 Marshalltown	www.mineralscouncil.org.za	5 Marshall Street Marshalltown, Johannesburg	
		Tel: +27 (0)11 498 7100 Telefax: +27 (0)11 834 1884	
Copper Development Association (Pty) Ltd P O Box 14785 1422 Wadeville	www.copper.co.za	53 Rendell Road Wadeville, Germiston	

Tel: +27 (0)11 824 3916
Telefax: +27 (0)11 824 3120

Federation of SA Gem & Mineralogical Societies
P O Box 36888 www.fosagams.co.za 29 26th Street
0102 Menlopark Menlopark

Tel: +27 (0)12 460 1494

Ferro Alloy Producers Association (FAPA) Metal Industries House
P O Box 1338 www.seissa.co.za 42 Anderson Street
2000 Johannesburg Johannesburg

Tel: +27 (0)11 833 6033
Telefax: +27 (0)11 298 9500

South African Mining Development Association (SAMDA) The Riviera Road
PO Box 2057 www.samda.co.za 606 Oxford corner North Avenue
2121, Parklands Ground Floor, Block 3, Office 2
2196, Rosebank

Tel: +27 (0)11 486 0510
Telefax: +27 (0)11 486 3194

Steel and Engineering Industries Federation of SA (Seifsa) Metal Industries House
P O Box 1338 www.seifsa.co.za 42 Anderson Street
2000 Johannesburg Johannesburg

Tel: +27 (0)11 298 9400
Telefax: +27 (0)11 838 9500

The Institute of Mine Surveyors of SA Minerals council South Africa, Room 509
P O Box 62339 www.ims.org.za 5 Hollard street
2107 Marshalltown Marshalltown

Tel: +27 (0)11 498 7682
Telefax: +27 (0)11 498 7681

The South African Institute of Mining and Metallurgy Minerals council South Africa, 5th floor
P O Box 61127 www.saimm.co.za 5 Hollard Street
2107 Marshalltown Marshalltown

Tel: +27 (0)11 834 1273

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| <input type="checkbox"/> R40/2006 | <input type="checkbox"/> R64/2007 | <input type="checkbox"/> R92/2012 | <input type="checkbox"/> R118/2016 | |
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