#MiningMatters

2023

MINERALS COUNCIL
SOUTH AFRICA

COMPREHENSIVE FACTS AND FIGURES

Foreword

Mining continues to play a significant role in South Africa's economy, and it remains a catalyst for change. Credible, relevant and accessible industry data is vital for stakeholders to better understand the industry, its performance and its value creation.

Data and statistics not only improve the understanding of the role of mining in the national economy, but also illustrate the importance of good mineral resource governance in ensuring that mineral wealth translates into economic and social progress.

Minerals Council South Africa's (Minerals Council's) economics team has compiled this document to provide insight into what the numbers mean and demonstrate the depth and nuances of the industry's contribution to the country today.

An Excel spreadsheet containing the commodity data featured in this publication is available for download online.

The availability of credible statistics helps paint an accurate picture of the country's mining sector and allows the Minerals Council to fulfil its mandate as the voice of the mining industry in South Africa.

The Minerals Council's economics discipline plays a key role in gathering the data necessary for its internal teams and its members to properly understand the state of the sector and to improve its growth.

This *Facts and Figures 2023* book is a comprehensive statistical reference guide to the South African mining sector.

In compiling this Facts and Figures publication, the Minerals Council relies on various primary data sources such as Statistics South Africa (Stats SA), the Department of Mineral Resources and Energy (DMRE), the South African Reserve Bank (SARB), the South African Revenue Services (SARS), the World Bank, the International Monetary Fund (IMF) and the United States Geological Survey.

The Minerals Council has 70 members, representing 90% of South Africa's mineral production with industry turnover valued at R1.1 trillion in 2023. Members have interests in a wide range of minerals with many companies mining several minerals.

14	Platinum
13	Coal
12	Chrome
10	Other commodities
8	Manganese
8	Gold
4	Iron ore
5	Mining contractors
5	Diamond
3	Copper
3	Associations
1	Vanadium
2	Exploration
2	Corporate
2	Zinc
1	Investment companies

The mining sector in 2023

479,228
people employed

R444.2 billion
contributed to GDP

R85.5 billion
contributed in taxes to South Africa

Contents

Vision

To ensure mining matters for South Africa.

Mission

Our mission is to lead in enabling the South African mining sector to shift from potential to performance through investment, growth, transformation and development in a socially and environmentally responsible manner: we put South Africa first.

Our values

Members are obliged to conduct their business according to the Minerals Council Membership Compact, which dictates that we:

Responsible citizenship
Demonstrate responsible citizenship

Trust
Strive to earn the trust of society

Accountability
Be accountable to our stakeholders

Respect
Conduct ourselves towards others with respect

Honesty
Engage stakeholders with honesty and transparency

Message from the CEO

"This Comprehensive Facts and Figures illustrates the crucial contribution of the mining sector to the economy and the society."

Mzila Mthenjane
CEO

#MiningMatters

The South African mining sector went through several trials and tribulations in 2023.

These include unprecedented electricity load-curtailment that was a particular constraint on deep-level mining in the precious metals industry, debilitating rail and port failures that adversely impacted the bulk commodities sub-sector, pervasive criminal activity, and the devastating loss of life late in the year that set back the progress to improve the industry's safety performance.

In addition, the commodity price cycle turned against PGM and coal miners. Against this backdrop, overall seasonally adjusted real mining output declined by 0.2% in 2023.

Despite these headwinds, it is gratifying that the Comprehensive Facts and Figures 2023, our flagship annual overview of the sector, again illustrates the crucial contribution of the mining sector to the South African economy and the broader society. Just as one example of this, provincial data released by Stats SA in 2023 showed that mining was the largest sector in four of the nine provinces during 2022. These provinces are North West, Limpopo, Mpumalanga and the Northern Cape, with mining contributing between 20% and 30% to the GDP of these provinces.

In addition, formal sector employment trends are a particular highlight that showcase the significance of the sector. The mining sector did not experience nearly the magnitude of job losses suffered in many other parts of the economy during 2020. This explains why the level

of mining employment was 6.5% higher in Q4 2023 than the pre-COVID-19 level in Q4 2019, vastly outpacing the non-mining (excluding agriculture) sectors where employment was 'only' 3.4% above the pre-COVID-19 level in Q4 2023. Although this heartening performance is something to be proud of, it should not detract from the fact that parts of the industry are under severe strain and that the mining sector lost jobs in specific sub-sectors during the first quarter of 2024.

Amid a weak commodity price environment, elevated input costs and the other constraints on doing business in South Africa, the PGM sector is a case in point. The coal industry was also weighed down by a sharp (-55%) downward price correction from the highs in 2022, as well as Transnet rail woes that curtailed export volumes. Transnet logistical issues also adversely impacted the iron ore and chrome sectors.

Thankfully, in the case of iron ore, well-supported prices in the second half of the year shielded the sector. While input costs remained elevated, the gold industry benefited from record-high (nominal) prices of more than $2,000/oz.

Following the challenges of 2023, there has been encouraging progress in addressing some of the key constraints on the mining sector in the first half of 2024. Of most significance has been the improvement in electricity provision. By mid-July, South Africa had experienced an uninterrupted period of more than 100 days without load shedding. On the logistics front, Transnet's operational performance has stabilised, albeit that there is still a long "track" ahead to return to peak levels of rail transportation. The outcome of the May election, which resulted in the formation of a government of national unity, has been received well by the domestic business sector, as well as investors.

This was reflected in renewed foreign appetite for acquiring local assets. These include JSE-listed companies with a high exposure to the South African economy and South African government bonds. Among others, the purchases helped to lower the domestic cost of capital.

From a global perspective, central bank interest rate increases are nearing an end. Some major banks, including the European Central Bank, have already started to reduce their policy interest rates. Although several challenges persist, including sustained low PGM prices, we remain steadfast in our commitment to create an environment that facilitates higher mining sector growth and investment.

Mzila Mthenjane

CEO

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Mining at a glance:

snapshot 2023

Industry turnover
R1.1 trillion
(-8.3%) ↓
(2022: R1.2 trillion)

Direct GDP contribution[1]
R444.2 billion
(-8.1%) ↓
(2022: R483.3 billion)

% contribution to GDP
6.3% ↓
(2022: 7.3%)

Total primary sales
R794.3 billion
(-9.9%) ↓
(2022: R881.7 billion)

Mineral exports
R780.7 billion
(-11.4%) ↓
(2022: R880.2 billion)

Employment[2]
479,228
(+2.1%) ↑
(2022: 469,353)

Employee earnings
R189.6 billion
(+8.5%) ↑
(2022: R174.7 billion)

PAYE by mining employees
R34.4 billion
(+9.9%) ↑
(2022: R31.3 billion)

VAT (net outflows)
R45.4 billion
(+57.1%) ↑
(2022: R28.9 billion)

Company tax paid[3]
R85.5 billion
(-4.9%) ↓
(2022: R89.9 billion)

Royalties
R25.3 billion
(-11.2%) ↓
(2022: R28.5 billion)

[1] *Expressed in nominal terms.*
[2] *Full-year employment number based on the most recent data available for 2023.*
[3] *Tax data reported by SARS for the 2022/23 financial year.*

Overview: the state of mining 2023

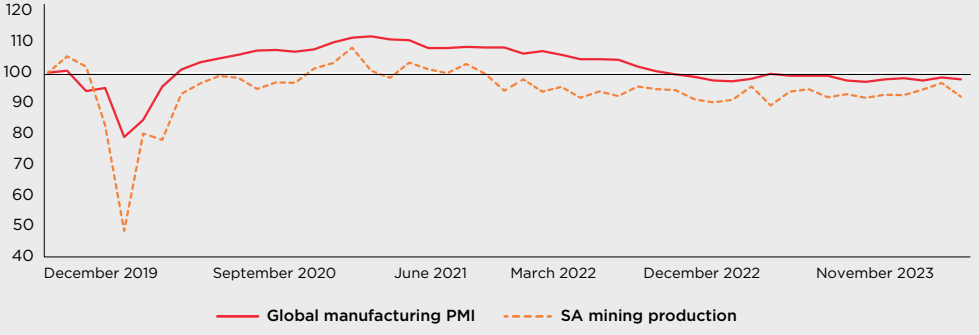
Global context

The global economic environment was not conducive to a productive South African mining sector performance in 2023. While real GDP growth in the United States (US) remained remarkably resilient, activity stalled in the Eurozone and the United Kingdom (UK) in the second half of the year. In China, the recovery from draconian COVID-19 lockdowns in 2022 proved to be weaker than initially anticipated. The divergent regional trends were reflected in the global manufacturing purchasing managers' index (PMI), an important gauge of factory sector activity, remaining under pressure during 2023. Manufacturing production in major economies (especially China) is an important driver of domestic mining sector performance.

Global manufacturing production is an important driver of domestic mining sector performance.

Easing in global manufacturing momentum a drag on South African mining production

December 2019 = 100



Source: S&P Global, Stats SA, Minerals Council

Overview: the state of mining 2023 continued

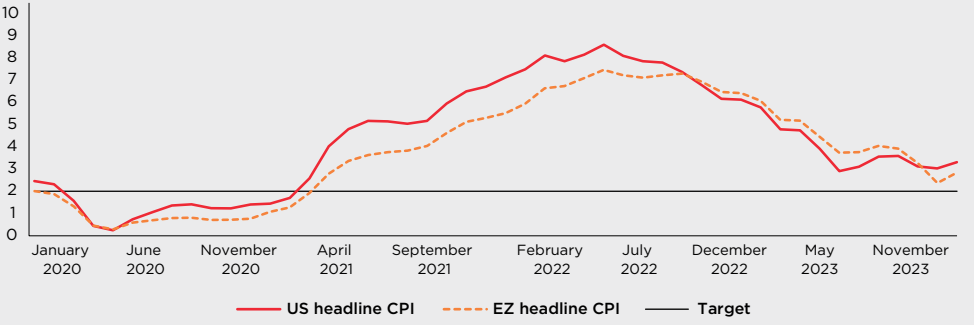
In addition, elevated global consumer inflation of almost 7%, as well as high international policy and long-term interest rates, lifted the cost of capital for South African mining companies. Along with other constraints, this weighed on mining sector fixed investment. Furthermore, the squeeze on household disposable income in developed countries amid higher borrowing costs dampened the demand for luxury goods, including diamonds.

Combined with geopolitical tensions, changing expectations about central bank interest rate actions led to volatile international currency markets. On average, the US Dollar weakened against the Euro in 2023, but traded stronger versus the Japanese Yen. Against this uncertain backdrop, the Rand weakened by almost 13% against the US Dollar to an average of R18.46/$ (2022: R16.37/$) in 2023.

On a positive note, there was a widespread moderation in the annual rate of increase for global consumer price index (CPI) inflation to 3% and below in the second half of 2023. This provided room for central banks in the US, the Eurozone and the UK to stop their aggressive interest rate hiking cycles.

Headline CPI in the US and Eurozone heading back to target

Year-on-year % change



Source: Organisation for Economic Co-operation and Development (OECD)

Mixed bag for South African export commodity prices in 2023

The uncertain global economic conditions pushed prices of the major minerals that South Africa produces and exports in opposing directions. Growing concerns about the future demand for PGMs as the electrical vehicle market takes off weighed on prices.

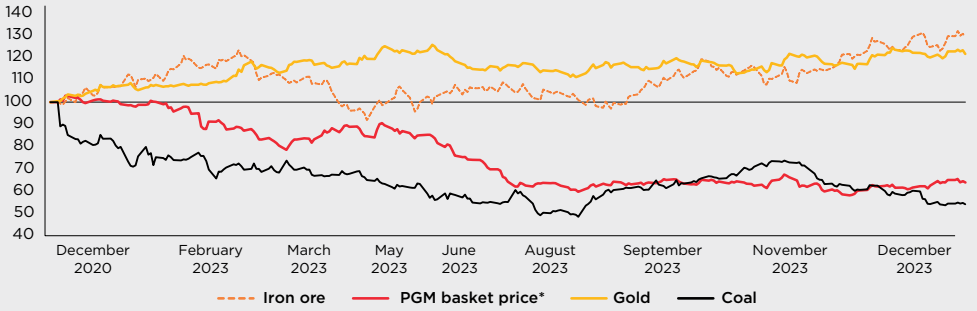
Rhodium was the hardest hit, while the price of palladium normalised from the sharp gains in 2022 after Russia, a major producer, invaded Ukraine. The coal price also corrected sharply lower after surging in 2022 amid renewed European demand as the continent was forced to reduce its reliance on gas imports from Russia.

The rand prices of gold and iron ore both increased by more than

20%

Key South African commodity prices (measured in Rand) diverged in 2023

December 2022 = 100



Source: Refinitiv, Minerals Council

** PGM basket consists of platinum, palladium and rhodium*

In stark contrast to the price declines for PGMs and coal, the dollar prices of gold and iron ore both ended 2023 more than 20% higher compared to December 2022. Gold was supported by a weaker US Dollar, investor demand amid geopolitical uncertainties that drove a flight to safe haven assets, and sustained robust central bank buying. A ramp-up of fiscal and monetary stimulus measures from Chinese authorities in the second half of 2023, including measures to stabilise a weak property market, helped to lift the iron ore price.

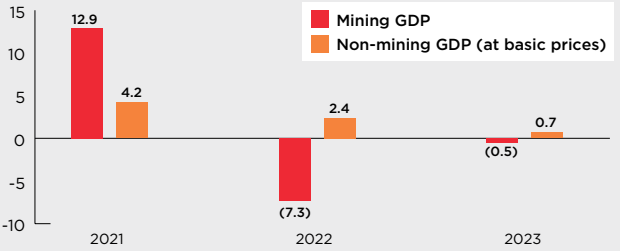
Despite improvement in Q4, mining GDP underperformed again in 2023

Stats SA's real GDP data for Q4 2023 showed that activity in the mining sector was notably better than in the rest of the economy during the final months of the year. Mining GDP increased by an upwardly revised 2.6% quarter-on-quarter in Q4, vastly outpacing non-mining GDP that increased by 0.2% quarter-on-quarter. The increase in mining GDP supported a modest rise of 0.3% quarter-on-quarter in overall real GDP. The quarterly gain for mining was driven by increased activity for PGMs, coal, chromium and diamonds.

Whereas mining sector GDP outperformed the rest of the economy in the fourth quarter, annual mining GDP contracted for a second consecutive year in 2023. On a less downbeat note, the rate of decline eased significantly when compared to 2022. Nevertheless, although the gap closed materially, for the entire 2023, mining GDP again performed worse than the non-mining part of the economy. This is very different from 2021 when on the back of rising commodity prices, real mining GDP expanded three times faster than the non-mining sectors. Since 2022, the mining sector has been particularly hard hit by record electricity load-curtailment and freight logistics problems.

Real mining GDP declined again in 2023

Year-on-year % change



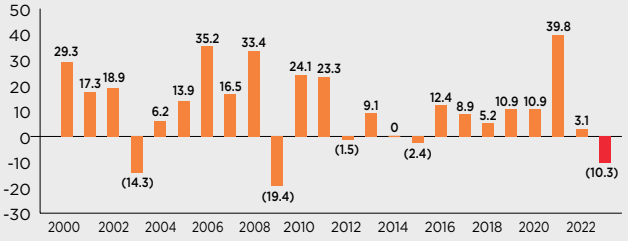
Source: Stats SA, Minerals Council

Overview: the state of mining 2023 continued

The combination of declining mining production and lower commodity prices in some key mining sub-sectors meant that South African mineral sales (in nominal terms) declined by a significant 10.3% year-on-year in 2023. This was the first calendar year decline since 2015 and the largest annual fall since the aftermath of the global financial crisis in 2009.

Mineral sales posted first calendar year decline since 2015

Year-on-year % change



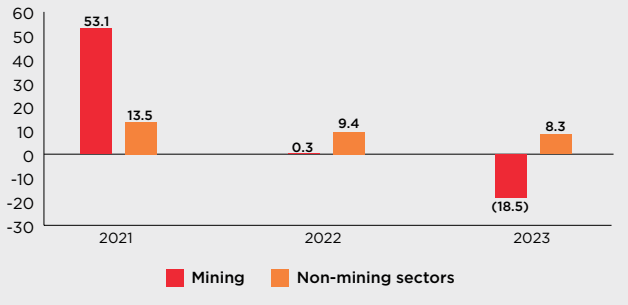
Source: Stats SA

Profitability taking strain

The relative underperformance from the mining sector is also evident in the gross operating surplus figures from Stats SA. These provide a broad measure of profitability in the economy and illustrates the cyclical nature of mining sector profitability. After gross operating surplus (profit) growth in mining vastly outpaced the non-mining part of the economy in 2021, it underperformed notably in 2022. The underperformance was even more pronounced during 2023.

Mining profitability worse than the rest of South Africa's economy

Year-on-year % change



Source: Stats SA, Minerals Council

The fiscal impact of lower mining sector profitability was starkly highlighted in the February 2024 National Budget. The Treasury reported that corporate tax receipts from the mining sector declined by more than R39 billion year-on-year in the first 10 months of the 2023/24 fiscal year. Combined, tax receipts from other key sectors of the economy were down by R1 billion.

In the context of falling profitability, the figures regarding compensation of employees are interesting. The mining sector paid out almost R182 billion to employees in 2023. This was 9.3% more than during 2022, outpacing the 5.4% year-on-year rise in compensation for the non-mining sectors.

Fixed investment focused on sustaining operations

Revised data from Stats SA indicates that the growth in real mining sector fixed investment (capex) ground to a halt during 2023. Even so, the mining sector contributed a sizeable 13% to overall real fixed investment in South Africa. The real growth in mining capex slowed to just 0.1% year-on-year during 2023, down from a downwardly revised 3.0% in 2022. As in 2022, the increase in mining sector capex was again well below the capex growth for the non-mining sectors (+4.4% in 2023). This is consistent with a sector taking strain from low profitability, which necessitated cost cutting. Although somewhat better at 2.1% year-on-year, the growth in spending on mineral exploration was also subdued in 2023. In real terms, only R1.2 billion was spent on mineral exploration.

Mining exploration activity remained depressed in 2023

Rand billion

Source: Stats SA

Mining export volumes curtailed by Transnet rail problems

As was the case in 2022, bulk commodity exporters (especially coal and iron ore) continued to be negatively impacted by Transnet's rail infrastructure constraints in 2023, with significant export tonnages and revenue lost. A notable example of this is that the tonnages of coal railed to the Richards Bay Coal Terminal (RBCT) dropped to less than 48 million tonnes in 2023, the lowest since 1992. Based on the tonnages exported and average commodity prices, we estimate that between 2021 and 2023, the freight logistics constraints saw South Africa lose out on an estimated R98 billion (1.4% of GDP) in export revenue from coal and iron ore exports. Because of the problems with key Transnet rail corridors, mining companies were again forced to look to alternative ports, including Maputo in Mozambique, and increased road transportation to sustain export volumes. Although it resulted in higher transportation costs, these alternative measures, which were made possible by higher chrome ore prices, were particularly successful in the chrome industry where annual export tonnages reached a record high of 17.7 million tonnes in 2023.

Iron ore and coal export losses versus 2019

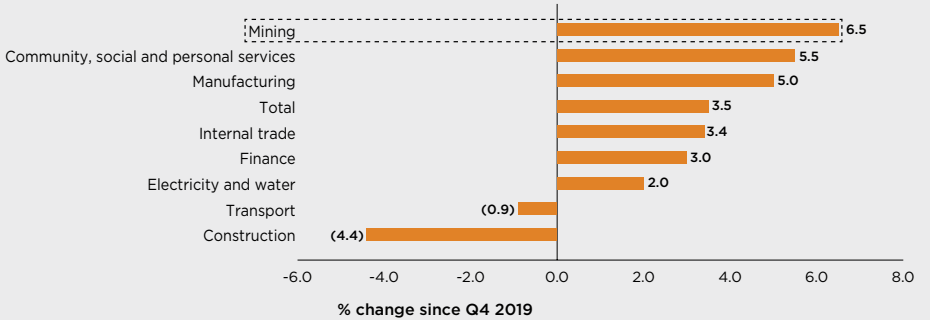
	Tonnes (million)			Rand (billion)		
	2021	2022	2023	2021	2022	2023
Iron ore	+1.0	-9.0	-7.6	+2.3	-17.6	-16.8
Coal	-12.8	-6.9	-4.7	-23.6	-31.3	-10.5
Total	**-11.8**	**-15.9**	**-12.3**	**-21.3**	**-49.0**	**-27.3**

Source: SARS, Minerals Council

Mining employment defies poor operating environment

According to Stats SA's quarterly employment statistics, 481,775 people were employed in the formal mining sector during Q4 2023. Although this was flat compared to Q3 2023, it was about 9,400, or 2%, more than in the corresponding period of 2022. The mining sector did not experience nearly the magnitude of job losses suffered in many other parts of the economy during 2020. This explains why the level of mining employment was 6.5% higher in Q4 2023 than the pre-COVID-19 level in Q4 2019, vastly outpacing the non-mining (excluding agriculture) sectors where employment was 'only' 3.4% above the pre-COVID-19 level in the final quarter of 2023.

Change in formal non-agricultural employment



Source: Stats SA, Minerals Council

Input cost pressures ease, but remain elevated

The Minerals Council's mining input cost index increased by 8.6% in 2023. Although still elevated and above the 6% increase for headline CPI and the 6.8% rise for manufacturing Producer Price Index (PPI), the rate of increase for mining input costs eased notably from 13.8% in 2022. In addition, mining input cost inflation returned to its long-term (2013-19) average of 8%. The gold sector had the highest average increase in input costs during 2023, averaging 9.7%. In contrast, coal experienced the lowest average increase of 8.1%. The main drivers of mining input cost inflation in 2023 were electricity and water (increased by an average of 15.4%), as well as machinery and equipment input prices (averaged 12.4% in 2023).

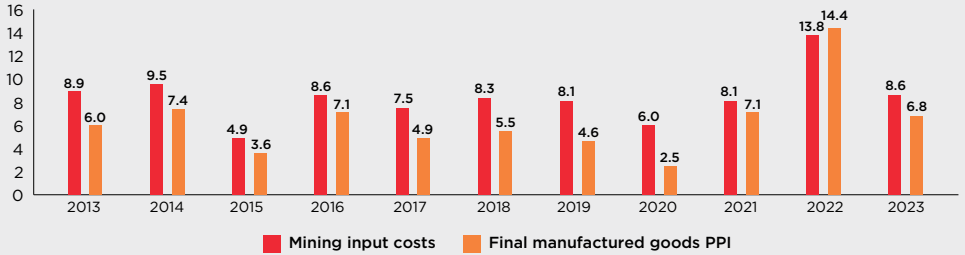
The Minerals Council's mining input cost index increased by

8.6%

in 2023

Mining input costs back at the long-term trend in 2023

Year-on-year % change



Source: Stats SA, Minerals Council

Our metals and minerals

PLATINUM GROUP METALS

PGMs consist of six noble metals, namely: platinum, palladium, rhodium, ruthenium, osmium and iridium. Platinum, palladium, rhodium and iridium are the primary metals of significant economic value.

PGMs are used in a wide range of applications. One of the most prominent uses is in the production of jewellery and in the automotive industry, where their catalytic properties are highly valued. PGMs are also used in fuel cells, where they help to convert chemical energy into electrical energy. In addition, they are commonly used for investment purposes in the form of coins, bars and Exchange Traded Funds (ETFs) due to their intrinsic value and scarcity.

Moreover, PGMs are widely utilised in various industrial applications for their unique properties such as high melting points, excellent conductivity and corrosion resistance. They are also frequently used in medical and electronic applications due to their biocompatibility and electrical properties. In medical applications, they are used for implants, diagnostic tools and radiation therapy. In the electronic industry, they are used for semiconductors, capacitors and transistors, among other things.

Industry developments:

- PGM industry sales continue to be the largest contributor to total mining sector sales having surpassed coal sales in 2020. South Africa continues to be the single biggest producer of PGMs in the world.
- However, data for 2023 shows a decline in PGM production of 6.1% at 253.0 tonnes compared to 269.5 tonnes in 2022. Load curtailment and operational difficulties impacted concentrators and smelters, which resulted in increased work-in-progress inventory. Production is around 5.6% below pre-COVID-19 levels and the sustained declines in physical output coupled with a significant decline in the PGM basket price continue to be a concern.
- Due to a rapid and precipitous decline in the PGM basket price, total PGM sales values for 2023 are 34.3% lower compared to the previous year. The drop in sales aligns with reduced production due to electricity constraints and other operational difficulties.
- Rhodium prices experienced a significant decline in 2023, falling from a high of $12,400 per troy ounce in January 2023 to around

Our metals and minerals

PLATINUM GROUP METALS continued

$4,400 by December. Similarly, the price of palladium also dropped sharply. Since these two metals accounted for 60% of the PGM basket income split in 2023, their price deterioration had a noticeable impact on PGM producers' revenues.

- International PGM prices in 2023 were markedly lower with the dollar price of palladium, rhodium and ruthenium falling by 36.1%, 56.5% and 15.8% respectively. However, the rand price decrease was softer due to a weakening in the rand/dollar exchange rate. The rand price of platinum increased by 14.3% in 2023 after accounting for the exchange rate effect. Platinum, however, only accounted for around 20% of the PGM basket in terms of value/income.
- Input costs continue to increase significantly with an average input cost escalation of 8.7% for the industry in 2023. This, coupled with lower prices, negatively impacted the profitability of the sector. Input cost escalation outstripped commodity price escalation since August 2023, essentially leading some PGM producers to go into cash-burning scenarios.

PGM average prices 2023 (year-on-year % change)

	R/troy ounce	US$/troy ounce
Platinum	14.3%	1.2%
Palladium	-27.9%	-36.1%
Rhodium	-51.1%	-56.5%
Iridium	18.8%	5.1%
Ruthenium	-4.6%	-15.8%

Our metals and minerals

PLATINUM GROUP METALS continued

Industry constraints:

- The unreliable nature of electricity supply coupled with steep increases in electricity prices is a binding constraint on the industry, which is a large electricity consumer because it mines, smelts and refines its metals.
- A weak PGM basket price environment amid concerns about future demand.
- Most PGM production takes place at underground operations. These operations are costly and labour-intensive. In addition, high investment costs limit the scope for mechanisation and modernisation of machinery, equipment and other capital goods.

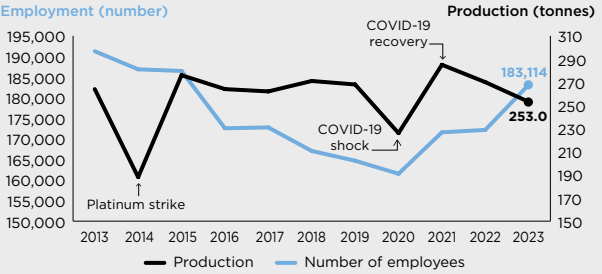
Industry outlook:

- South African PGM miners are increasingly discussing the need to restructure unprofitable production following the significant decline in the PGM basket price as well as high input costs. Electricity and labour costs account for most of PGM miners' total costs. We have seen this dynamic unfold so far in 2024.
- The continued economic slowdown seen in some of our major trading partners has decreased demand for PGMs. In particular, demand for platinum, palladium and rhodium, which are used in the automotive and industrial sectors, will remain suppressed if global economic activity, and internal combustion engine (ICE) vehicle sales in particular, do not pick up. Even if overall activity improves, there is notable uncertainty about future PGM demand.
- Platinum investment demand in the form of bars, coins and ETFs is forecast to be negatively impacted due to persistently high interest rates around the world. High interest rates reduce demand for non-yielding assets like platinum ETFs. However, there could be some relief within the next 6 months as global interest rates are expected to move lower.
- There is a great deal of uncertainty in the industry concerning technological advancements and research and development. This includes the extent of future demand for ICE vehicles, battery electric vehicles (BEVs) and the hydrogen economy.

Our metals and minerals

PLATINUM GROUP METALS continued

PGM industry – employment and production



Source: DMRE, Minerals Council

PGM	2023	% change on prior year	% change on 2019 (pre-COVID)
Direct employees	**183,114**	4.5%	11.2%
Employee earnings (rand billion)	**76.3**	8.7%	37.3%
Royalties (rand billion)*	**9.0**	-39.8%	695.6%
Production (tonnes)	**253.0**	-6.1%	-5.6%
Total sales (rand billion)	**196.1**	-34.3%	44.2%
Percentage of value exported	93.5%		

** Latest SARS data for the 2022/23 financial year.*

Source: DMRE, SARS and Minerals Council

Hydrogen economy

The hydrogen economy is expected to be a significant driver of PGM demand for the foreseeable future, particularly given the global drive to reduce carbon emissions. Hydrogen, as a clean and versatile energy carrier, is gaining attention for various applications, including fuel cells used in transportation and power generation. PGMs like platinum, palladium, ruthenium and iridium are essential catalysts in hydrogen fuel cells and this technology is anticipated to drive future demand for PGM metals. The role of research and development is also affecting the PGM industry. For example, the use of PGM metals such as palladium in fuel cells is waning due to the relatively high cost of the metal, which leads to research into substitution with other, cheaper metals such as platinum. Undoubtedly, the hydrogen economy and the drive towards clean and renewable energies will rebalance demand for the PGM commodity basket in the long run.

Our metals and minerals

COAL

At around 250 million tonnes per annum, the coal industry is the largest component of South African mining in terms of production volumes.

South Africa's economy relies on coal as the primary input source of energy for electricity production, with bituminous coal accounting for 99% of production and anthracite coal for the remaining 1%. Of all the coal exports leaving by sea port, more than than 90% of South African coal exports in terms of volume were transported through the port of Richards Bay (including Richards Bay Coal Terminal) while the remaining 10% were carried through the Port of Durban in 2023. Around seven million tonnes of coal also left through the land border of Komatipoort bound for Maputo. In terms of export destinations, Asia was the largest market, accounting for 71.7% of all exports. Among Asian countries, India was the biggest buyer of South African coal with a share of around 39.3%. Meanwhile, Europe accounted for 14.7% of coal exports in 2023.

In 2023, over 80% of total coal sale volumes were sold domestically, primarily to Eskom, while only about 20% of the volumes were exported.

Industry developments in 2023:

- In 2023 coal production was 0.7% higher than the previous year, registering 231.7 million tonnes. This represents a 1.7 million tonne increase from 2022 levels. Production was still 10.3% lower in 2023 compared to 2019, the year before the COVID-19 pandemic. Coal has therefore not yet recovered to pre-pandemic levels of production.
- Based on actual sales data for 2023, total coal sales fell sharply by 22.0% in 2023 compared to 2022. This is mostly due to a 55.7% decline in dollar-based coal prices from around $276/Mt in 2022 to $122/Mt in 2023.
- In 2023, coal companies took shared responsibility for safeguarding the 600km rail line to Richards Bay to counteract the effects of cable theft and vandalism. This initiative has had a positive impact, resulting in a significant decrease in the number of such incidents. However, due to the sudden decline in prices, the cost of continuing with this effort has become unsustainable.
- The Coal Leadership Forum of the Minerals Council is working with other bulk

96,050

Direct employees

commodity forums to engage Transnet and the DMRE to find a lasting solution to the problems in the rail and port sectors. Specifically, they are addressing the issues that are indirectly impacting the Richards Bay Coal Terminal, the Port of Richards Bay and the connecting rail network on the Northern Corridor.

- To address some of these issues, the Minerals Council helped establish and is involved in initiatives of the Presidency to halt and reverse the decline in rail performance and port logistics through the National Logistics Crisis Committee (NLCC).

In 2023, coal production was 0.7% higher than the previous year, registering 231.7 million tonnes.

Industry constraints:

- Inadequate supply of locomotives and inefficient rail and port challenges continue to harm coal exports. While prevailing coal prices no longer justify the additional cost of road transportation of export coal, road transportation leads to infrastructure damage, air pollution and various other negative externalities.
- Global sentiments against coal use have negatively affected long-term investment in the industry. The COP28 conference, held in December 2023, pledged to transition from fossil fuels like coal. As a result, longer-term demand growth (beyond 2030) for coal will be limited while near-term demand over the next several years should remain steady.

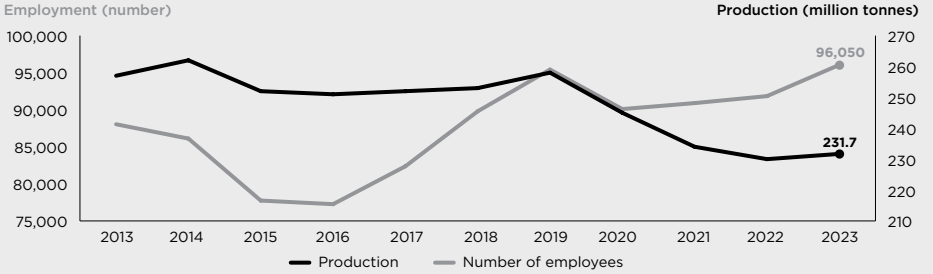
Industry outlook:

- Eskom planned to decommission approximately 24,100MW of coal-fired electricity generation capacity by 2030 according to the 2019 Integrated Resource Plan (IRP), which would significantly reduce coal demand from domestic power plants.
- However, the draft IRP 2023, which was released in January 2024, indicates that most of the planned coal power station decommissioning will be postponed in light of the current electricity crisis.
- In March 2024 the Eskom board sanctioned the extension of the Camden, Hendrina and Grootvlei power stations' operations until 2030. This was done to ensure energy security and short-term coal supply to these stations.

Our metals and minerals

COAL continued

Coal industry – employment and production



Source: DMRE, Minerals Council

Coal	2023	% change on prior year	% change on 2019 (pre-COVID)
Direct employees	**96,050**	4.6%	00.7%
Employee earnings (rand billion)	**35.0**	8.5%	19.8%
Royalties (rand billion)*	**8.5**	162.0%	314.4%
Production (million tonnes)	**231.7**	0.7%	-10.3%
Total sales (rand billion)	**192.5**	-22.0%	36.7%
Percentage of value exported	36.7%		

** Latest SARS data for the 2022/23 financial year.*

Source: DMRE, SARS and Minerals Council

Our metals and minerals

GOLD

Gold remains one of the world's most coveted metals as it is revered for its beauty and symbolism and is held as a store of value. This versatile metal is malleable, conductive and does not tarnish, making it ideal for use in jewellery and many industrial applications.

In recent years, the COVID-19 pandemic, ensuing economic uncertainty, double-digit inflation figures in most economies around the world and rising geopolitical tensions have re-emphasised the safe-haven characteristic of gold as a long-term store of value.

Against this backdrop, gold prices have hovered around $2,000 an ounce and gold remains a haven for investors. An added source of gold demand in recent years has been increased central bank buying.

Industry developments:

- The US dollar price of gold strengthened by around 8% to $1,943 an ounce in 2023 while rand prices increased by 22% year-on-year, mostly assisted by the weakening of the exchange rate. In late 2023, gold prices rose to above $2,000 an ounce.
- The rising gold prices have enabled South African gold producers to maintain production levels by sustaining marginal deposits for longer.
- Given this, South African gold production marginally increased by 0.2% to around 96.6 tonnes in 2023. Sporadic and unreliable electricity supply is a significant constraint on production, along with various other constraints such as illegal mining, crime, theft and heightened input costs.

93,909

Direct employees

- The effects of electricity supply constraints are seen in gold export and local sales volumes, which decreased by 1.9% and 17.1% respectively, as smelters were unable to keep up with the refining of gold ore for the local and export market.
- Despite the drop in volumes, and given the strong gold price, total gold sales increased by 18.8% year-on-year in 2023 with sales up 49.3% compared to pre-pandemic levels.

Our metals and minerals

GOLD continued

Industry constraints:

- South Africa's gold sector is characterised by deep-level underground mining. This brings with it risks and hazards that require constant adherence to high safety and health standards and procedures. High temperatures and humidity at deep levels also create difficult working conditions for labour, which decreases productivity.
- The industry experiences costly electricity and water supply shortages that are particularly problematic in deep-level underground mining of gold.
- Decreasing ore grades are also a significant challenge faced by the sector. This makes production less efficient.

Gold prices rose to above

$2,000

an ounce

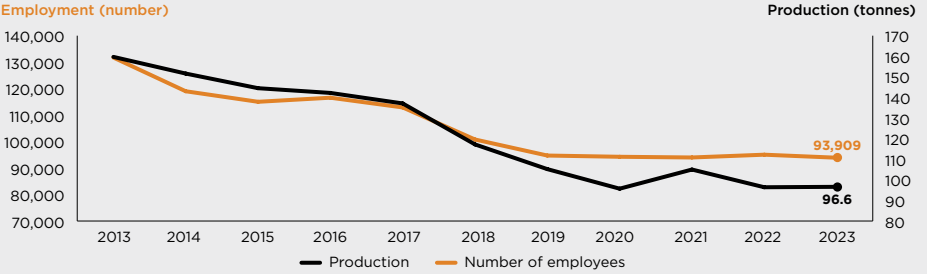
Industry outlook:

- Global uncertainty such as several key elections, the Russia-Ukraine war and conflict in the Middle East is expected to drive demand for gold as a safe store of value for investors.
- In the absence of urgent structural solutions to South Africa's electricity crisis, the investment prospects for the sector are expected to remain bleak. Electricity accounts for a significant portion of intermediate input costs, particularly in the deep-level operations that characterise the country's gold mines. The recent achievement of more than 100 days without load curtailment bodes well for deep-level mining, especially for gold. However, the intermittent nature of the electricity supply raises health and safety concerns, and the steep trajectory of electricity tariffs further exacerbates input cost challenges.

Our metals and minerals

GOLD continued

Gold industry – employment and production



Source: DMRE, Minerals Council

Gold	2023	% change on prior year	% change on 2019 (pre-COVID)
Direct employees	**93,909**	-1.2%	-0.9%
Employee earnings (rand billion)	**34.4**	6.7%	29.7%
Royalties (rand million)*	**415.0**	-18.8%	44.4%
Production (tonnes)	**96.6**	0.2%	-8.1%
Total sales (rand billion)	**114.4**	18.8%	49.3%
Percentage of value exported	95.3%		

** Latest SARS data for the 2022/23 financial year.*

Source: DMRE, SARS and Minerals Council

Our metals and minerals

IRON ORE

Iron is the most common element on earth, comprising most of the planet's inner and outer core. Around 95% of South Africa's iron ore production is high-quality hematite (Fe_2O_3) which is sought after for steelmaking.

Globally, around 98% of iron ore is used in the production of steel. Steel is an essential material in construction, infrastructure, transportation and various manufacturing industries.

In the construction industry, steel is used in buildings, bridges, roads and other infrastructure projects. In the manufacturing sector, steel derived from iron ore is essential for the manufacturing of vehicles, ships, trains and other transportation equipment as well as machinery, appliances, tools and various equipment.

Industry developments in 2023:

- Iron ore production marginally declined by 0.8% in 2023 to 63.2 million tonnes. Iron ore sales increased by 10.0%, reaching R102.3 billion.
- Iron ore prices were relatively robust in 2023, remaining unchanged on average relative to 2022 at $120/dmtu (dry metric tonne).
- Port and rail inefficiencies on the Sishen-Saldanha line have meant a build-up of iron ore stockpiles to unsustainable levels at mines. An overall estimated 9 million tonnes of iron ore was also reportedly stockpiled at mines and Saldanha Bay port awaiting export. As a result, a major iron ore company started to cut back production in Q4 2023 to manage stockpiles and profitability.

23,762

Direct employees

- The Minerals Council's Northern Cape Mines Leadership Forum continues to engage the Northern Cape provincial government and the Department of Water and Sanitation to structure a suitable collaboration arrangement to ensure a sustainable, cost-effective supply of water from the Vaal Gamagara Water Supply Scheme. This scheme is essential for mining operations in the Northern Cape, which includes iron ore and manganese.

Our metals and minerals

IRON ORE continued

Industry constraints:

- The continued deterioration of the rail network and inefficient ports, compounded by multiple equipment breakdowns at Saldanha Bay, including stacker reclaimers, ship loaders and blocked chutes along with adverse weather conditions, negatively impacted iron ore export volumes in 2023.
- Transnet cannot presently discharge its contractual commitments to its existing customers because of poor operational performance. The iron ore rail channel's nameplate capacity is 60 million tonnes per annum. Transnet underperformed in 2023, having transported only 56 million tonnes.
- Access to water and the maintenance of water infrastructure remains a challenge for communities and businesses in the Northern Cape. Without water, most mining operations will cease production.

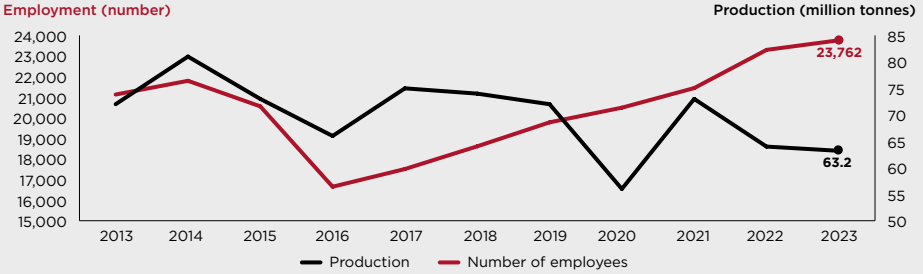
Industry outlook:

- The iron ore industry is actively engaging Transnet and the government through the NLCC to improve rail performance and allow for private sector participation on the corridors.
- The Freight Logistics Roadmap, which was formally adopted by Cabinet in December 2023, will hopefully facilitate private sector train operating companies to compete with Transnet Freight Rail (TFR) in the railing and shipping of commodities in an efficient and cost-effective manner.

Our metals and minerals

IRON ORE continued

Iron ore industry – employment and production



Source: DMRE, Minerals Council

Iron ore	2023	% change on prior year	% change on 2019 (pre-COVID)
Direct employees	**23,762**	2.0%	20.2%
Employee earnings (rand billion)	**R10.1**	8.6%	44.1%
Royalties (rand billion)*	**3.6**	-47.8%	73.5%
Production (million tonnes)	**63.2**	-0.8%	-12.7%
Total sales (rand billion)	**102.3**	10.0%	44.7%
Percentage of value exported	95.3%		

** Latest SARS data for the 2022/23 financial year.*

Source: DMRE, SARS and Minerals Council

Our metals and minerals

CHROME

South Africa is the world's largest producer of chromite ore, with over 19 million tonnes produced in 2023.

Some of this ore is further processed to extract chrome, which is then combined with other materials and smelted in an electric arc furnace. The end product of this process is ferrochrome, which is a type of alloy that contains high levels of chromium and is often mixed with iron. Ferrochrome has a wide range of applications, such as in the production of stainless steel used for anything from kitchenware to industrial machinery.

Chromium finds its applications in several other industries. One of its uses is in chrome plating, where it forms a protective layer on surfaces. It is also used in the manufacturing of catalytic converters for automobiles. Additionally, chrome compounds are used as pigments in paints, inks and plastics. Chromium compounds are also used as catalysts in certain chemical reactions, including those in the production of plastics and synthetic rubbers.

The chrome industry has maintained rising production performance. In 2023, production increased by 3.0% in year-on-year terms while production increased by 11.3% compared to 2019 levels.

Industry developments in 2023:

- In 2023, 19.7 million tonnes of chrome ore was produced, 47.8% of which was exported to China alone. Furthermore, SARS data shows that a further 41.8% of exports went to Africa followed by the EU at 1.2%. It is worth noting that the export figures to Africa can be misleading. This is because a significant portion of South Africa's chrome is exported through Mozambique's Maputo harbour, which acts as an intermediary before it reaches its final destination. The reason for this is Transnet's inability to meet industry demand for rail transport of chrome through Richards Bay.
- Based on the actual sales data, total sales for 2023 increased by 68.7% from 2022 to R57.2 billion, while physical production volumes were also higher year-on-year.

21,842

Direct employees

Our metals and minerals

CHROME continued

Industry constraints:

- Transnet is currently facing a major locomotive shortage, which is affecting the export of chrome from Richards Bay and Durban. Approximately 58% of all chrome exports pass through these two ports and, at present, the primary way to transport the goods to the ports is through trucks on the road.
- Inadequate port handling equipment at some of the ports, particularly Durban, is also negatively affecting export volumes.
- The remaining 42% of chrome exports are transported via trucks on the N4 route to reach Maputo harbour in Mozambique through Komatipoort. However, this has resulted in queues of trucks stretching for kilometres, waiting for customs clearance to enter Mozambique. This bottleneck has significantly affected the chrome export industry, and has caused South African ports to suffer revenue losses worth millions of rands due to their inability to handle the export traffic.
- Insufficient electricity supply has hindered the local chrome beneficiation industry, causing a decline in global competitiveness, particularly in ferrochrome production and export. Moreover, double-digit annual electricity tariff increases further exacerbate the situation.

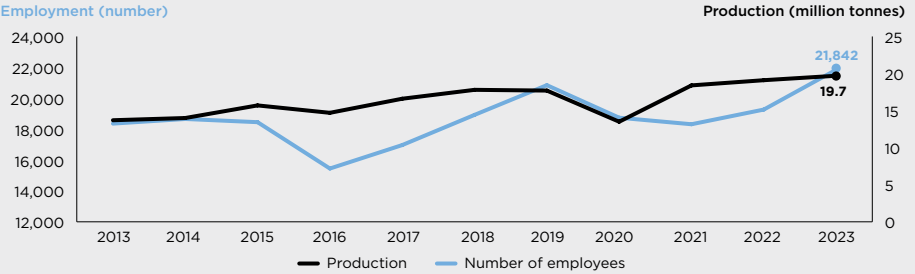
Industry outlook:

- Chrome export volumes continue to rise despite rail constraints and inefficiencies. This growth is largely due to the economic viability of exporting chrome by road through Maputo, given current chrome ore prices. Consequently, Transnet is not a major constraint on chromium ore exports. However, road transport remains more expensive than rail. Enhancements in rail infrastructure would significantly reduce costs for chrome producers, benefit the fiscus and indirectly make South African ports more profitable by increasing the volume of chrome ore exports handled.
- The bulk of demand for chrome from South Africa comes from China, which has seen slower growth in recent times. According to IMF predictions, China's growth rate is expected to drop to 5.0% in 2024, compared to the 5.2% it achieved in 2023. However, Chinese manufacturing output remains strong, with most local production destined for export. Despite China's subdued local economic environment, exports are thriving, ensuring robust demand for chrome from China.

Our metals and minerals

CHROME continued

Chrome industry – employment and production



Source: DMRE, Minerals Council

Chrome	2023	% change on prior year	% change on 2019 (pre-COVID)
Direct employees	**21,842**	13.4%	4.8%
Employee earnings (rand billion)	**7.5**	12.5%	18.0%
Royalties (rand million)*	**N/A**	–	–
Production (million tonnes)	**19.7**	3.1%	11.4%
Total sales (rand billion)	**57.2**	68.7%	157.7%
Percentage of value exported	52.5%		

** Latest SARS data for the 2022/23 financial year.*

Source: DMRE, SARS and Minerals Council

Our metals and minerals

MANGANESE

South Africa is estimated to host around 80% of the world's identified manganese resources. In those processes where manganese is used, there is no known satisfactory substitute.

Manganese is primarily used in the steelmaking process where its addition aids in reducing brittleness and imparts strength to steel products. Manganese also has powerful deoxidation capacity in steel, preventing corrosion, makes steel more resistant to abrasion and increases the hardenability rate, thereby reducing brittleness. Steelmaking alone accounts for around 90% of overall manganese demand.

Aluminium production is the second most important in terms of manganese demand. Small amounts of manganese are found in aluminium, which enhances its corrosion resistance. Aluminium-manganese alloys and aluminium-manganese-magnesium alloys have applications in areas such as kitchenware, roofing, car radiators, transportation and, most commonly, cans.

The main non-metallurgical application of manganese is in the batteries industry. Manganese dioxide is used as a depolariser in dry-cell battery fabrication.

The manganese industry has maintained stable sales and production performance. Compared to pre-COVID-19 2019 levels, production and sales have increased by 12.1% and 3.9% respectively in 2023.

Industry developments in 2023:

- In 2023, 21.2 million tonnes of manganese ore was sold, of which 85.7% was exported. In terms of export values, 91.6% went to Asia (59.4% to China, 15.5% to India, 4.4% to Singapore, 4.5% to Malaysia and 4% to Japan) followed by the European Union (EU) at 7.8%. This is mostly driven by the demand for steel in these countries.
- Based on the actual sales data for 2023, total sales for 2023 were down 3.1% relative to 2022 at R46.8 billion, while physical production volumes marginally decreased by 0.3% year-on-year.
- TFR finished upgrading the Mamathwane crossing loop in the Northern Cape in July 2023. The loop extension has increased capacity by 1.5 million tonnes per annum, which is expected to benefit exporters. This upgrade will help to reduce congestion on this section of rail and allow for an additional four rail slots per week.

Our metals and minerals

MANGANESE continued

Industry constraints:

- Due to constraints and limitations on the rail system along the Cape Corridor, a vast amount of manganese has been transported via road. The physical limitations of the rail infrastructure have resulted in negative externalities, such as road damage and air pollution, particularly around Gqeberha.
- Transnet's current network can only handle approximately 15 million tonnes of manganese ore per annum. However, the annual export of manganese ore amounts to around 18 million tonnes, which leaves an excess of over 3 million tonnes of manganese ore being transported via road.
- The locomotive fleet servicing manganese has reached the end of its life cycle and will need to be replaced by Transnet soon. This introduces operational inefficiencies. In the meantime, transportation of manganese ore by road carries a higher cost premium.
- Port disruptions and inefficiencies by Transnet Port Terminals at Gqeberha and Saldanha harbours, which in 2023 processed around 70.5% and 25.4% of all manganese exports respectively, hamper manganese export performance and potential.

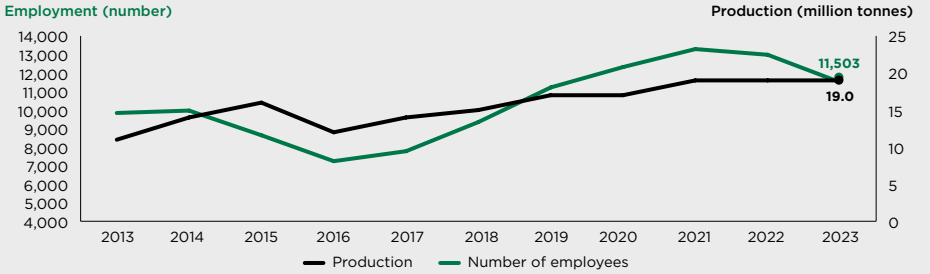
Industry outlook:

- The Chinese economy is experiencing tepid growth, mainly due to the struggling real estate and construction sectors. As a result, the demand for industrial minerals, such as manganese and steel, is expected to be muted. South African manganese exports are highly dependent on the demand for raw minerals from these two Chinese sectors. It remains to be seen how effective recent Chinese stimulus measures will be in lifting these sectors.
- Planned rail and port infrastructure upgrades at Gqeberha and Ngqura, as specified in the Port Development Framework Plans, are expected to increase overall port capacity for manganese.
- According to the IMF, economic growth in Asia is expected to be approximately 5.4% in 2024, which is a slight decrease from 5.7% in 2023. The growth rate for China is expected to be around 5.0%, and India's economy is expected to grow by 7.0%. On the other hand, Europe is expected to grow by only 0.9%. Since Asia is the largest market for South African manganese exports, it is expected that there will be an increase or at least stabilisation of the current demand for manganese, given the forecast GDP growth rate for 2024.

Our metals and minerals

MANGANESE continued

Manganese industry – employment and production



Source: DMRE, Minerals Council

Manganese	2023	% change on prior year	% change on 2019 (pre-COVID)
Direct employees	**11,503**	-8.7%	2.5%
Employee earnings (rand billion)	**5.17**	-0.8%	33.1%
Royalties (rand million)*	**770.0**	19.9%	-4.1%
Production (million tonnes)	**19.0**	-0.3%	12.1%
Total sales (rand billion)	**46.8**	-3.1%	3.9%
Percentage of value exported	96.3%		

** Latest SARS data for the 2022/23 financial year.*

Source: DMRE, SARS and Minerals Council

Our metals and minerals

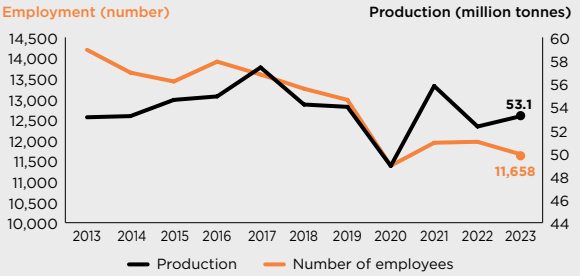
INDUSTRIAL MINERALS

South Africa is richly endowed with a vast and diverse array of minerals, making it a global leader in both the quantity and variety of minerals available.

Based on the actual sales data for 2023, total sales of industrial minerals amounted to R25.8 billion, reflecting a 14.7% increase compared to 2022.

Similarly, non-metallic sales have maintained substantial growth in 2023 with sales up by around 26.3% at R12.9 billion. This sector, which includes minerals such as silica, vermiculite and feldspar, contributed 49.9% to total sales. This was followed by the aggregate and sand sector and the limestone and lime sector each contributing 28.3% and 16.7% respectively.

Industrial minerals – employment and production



Source: DMRE, Minerals Council

Industrial minerals	2023	% change on prior year	% change on 2019 (pre-COVID)
Direct employees	**11,658**	-2.6%	-7.0%
Employee earnings (rand billion)	**2.5**	-2.3%	8.2%
Royalties (rand million)*	**490.0**	-63.8%	110.8%
Production (million tonnes)	**53.1**	-0.2%	-7.4%
Total sales (rand billion)	**25.8**	14.7%	44.3%
Percentage of value exported	31.1%		

** Latest SARS data for the 2022/23 financial year.*

Source: DMRE, SARS and Minerals Council

Our metals and minerals

INDUSTRIAL MINERALS continued

Industrial mineral category	Non-metallic other	Limestone and lime	Aggregate and sand	Special clays	Dimension stone	Brickmaking materials	Salt	Building material
Contribution to total sales (%)	**49.9%**	**16.7%**	**28.3%**	**0.6%**	**2.5%**	**0.5%**	**1.4%**	**0.1%**
COMMODITY	Feldspar	Limestone	Aggregate	Attapulgite	Granite	Clay brick making	Salt coarse	Shale for cement
	Feldspar: Lumpy	Limestone: ROM	Aggregate: Base (g1-g)	Bentonite	Granite: Blocks	Shale brickmaking	Salt processed	
	Feldspar: Ground	Limestone: Dolomitic ROM	Aggregate: Sub-base (g4-g)	Fireclay	Granite: Sawn slabs	Building materials other		
	Gypsum	Limestone: Cement	Aggregate: Over 26mm	Flint clay	Granite: Any	Shale for cement		
	Mica	Limestone: Agricultural	Aggregate: Between 13mm to 26mm	Plastic clay	Slate			
	Phosphate concentrate	Limestone: Fluxing	Aggregate: Between 4.75mm to 13mm	Kaolin				
	Pyrophyllite	Limestone: Any	Aggregate: Sand crusher					
	Silica	Lime	Aggregate: Crusher run					
	Silica: Crude	Lime: : Quicklime pyrometallurgical	Aggregate: Any					
	Silica: Processed	Lime: Quicklime chemical	Sand natural					
	Sodium sulphate	Lime: Hydrated lime water purification						
	Sulphur	Lime: Hydrated lime chemical						
	Talc	Lime: Hydrated lime any						
	Talc: Crude							
	Vermiculite							

The industry employed **11,658** people in 2023, who in turn earned R2.5 billion. The industry's employment has remained relatively flat over the last decade.

Our metals and minerals

DIAMONDS

Diamonds are the hardest natural substance on earth. Their hardness is measured on the Mohs scale, from 1 to 10, and diamonds score a perfect 10.

The primary use of diamonds is in jewellery. They are highly valued for their brilliance, durability and symbolism. Diamonds are commonly used in engagement rings, necklaces, earrings and other forms of high-end jewellery.

Diamonds are also used in medical equipment such as surgical blades and drills due to their sharpness and durability. They are also used in certain medical imaging devices.

The last time diamond production in South Africa exceeded 10 million carats was in 2008. After the Global Financial Crisis, this declined to single-digit numbers and only in 2022 did production reach in excess of 10 million carats again.

Industry developments:

- In 2023, diamond production fell back sharply by an estimated 43.9% year-on-year to around 5.9 million carats. When comparing 2023 to pre-COVID-19 levels of 2019, production is 17.8% lower.
- Based on the actual sales data for 2023, the value of total diamond sales fell by 37.6% in 2023 compared to the previous year, mainly on account of lower demand and lower international prices. Compared to 2019, the total value of sales is 26.4% higher in 2023.
- The Minerals Council continues to engage the National Treasury and SARS on the removal of:
  - The requirement for a provisional VAT on imported rough diamonds. The removal of this would aid the cash flow position of beneficiators.
  - VAT payment by tourists on the local sale of diamond jewellery purchases exceeding R10,000. This will mean that tourists will not have to go through the highly administrative process of claiming back VAT by submitting proof of where they obtained the cash - whether it be from an ATM, a bank or a Bureau de Change. The process limits the volume of diamond sales to tourists.

14,856

Direct employees

Our metals and minerals

DIAMONDS continued

- Provisional VAT payments on temporary imports to South Africa, which applies to shipments higher than R14,000. SARS requires jewellery firms from neighbouring countries to pay this amount upfront. The result is that neighbouring firms are dissuaded from acquiring domestic services for repairs, warranty claims, sending gemstones for grading and sending sweeps and filings.

Industry constraints:

The industry faces a number of challenges such as the Diamond Export Levy Act, the role of the State Diamond Trader (SDT) and the Diamond Exchange and Export Centre (DEEC), and the Section 74 Exemption in the Diamond Act), among others.

For example, regarding the Diamond Export Levy Act, the view of the Minerals Council is that it unfortunately does not take into account the economic circumstances of the downstream cutting and polishing industry. There have been instances where downstream players would buy diamonds on dealer licences and then export the diamonds without beneficiation.

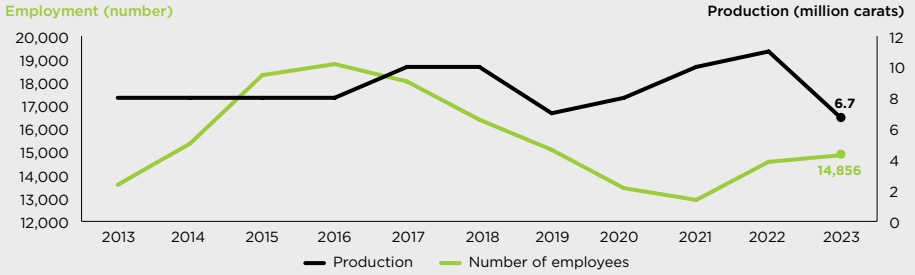
Industry outlook:

- In South Africa, production has decreased substantially due to the planned end of Venetia's open pit operation, which reached its end of life in December 2022. Venetia will continue to process lower-grade surface stockpiles as the underground operations ramp up production over the next few years. Venetia mine, owned by the De Beers Group, accounts for around 40% of all diamonds produced annually.

Our metals and minerals

DIAMONDS continued

Diamonds – employment and production



Source: DMRE, Minerals Council

Diamonds	2023	% change on prior year	% change on 2019 (pre-COVID)
Direct employees	**14,856**	2.0%	-1.5%
Employee earnings (rand billion)	**6.7**	13.1%	36.5%
Royalties (rand million)*	**227.0**	124.4%	-37.2%
Production (million carats)	**5.9**	-43.9%	-17.8%
Total sales (rand billion)	**16.6**	-37.6%	26.4%
Percentage of value exported	46.8%		

** Latest SARS data for the 2022/23 financial year.*

Source: DMRE, SARS and Minerals Council

Junior and emerging miners

While junior mining generally refers internationally to prospecting companies involved in the early stages of mining development, in South Africa the term is used more broadly to include exploration as well as small- to mid-tier producers.

The Minerals Council represents various such miners including in the form of member organisations such as the Aggregate and Sand Producers Association of Southern Africa (ASPASA), the Clay Brick Association of South Africa and the South African Diamond Producers Organisation(SADPO).

Emerging miners is also a South African term used to refer to smaller new entrants to the industry typically being black economic empowerment companies.

The latest estimates of the size of this sector indicate that the overall revenue and expenditure of the junior and emerging mining sector in South Africa is as follows:

Income	R million
Turnover	95,938
Interest received	608
Dividends received	890
Royalties received	67
Received rental on land and buildings	206
Received rental on plant and machinery	822
Profit on assets	918
Other income	1,604
Total income	**101,053**

Source: Minerals Council

Expenses	R million
Purchases	35,434
Employment costs	20,902
Interest paid	1,941
Royalties paid	1,290
Paid rental on land and buildings	1,748
Paid rental on plant and machinery	3,738
Depreciation	4,532
Losses on assets	1,184
Other expenditure	28,301
Total expenditure	**99,070**

Source: Minerals Council

Junior and emerging miners continued

In addition, the sector employs 48,000 people in direct jobs, which is about 10% of the total industry workforce. In terms of the commodities mined, the highest concentration is in industrial minerals followed by diamonds, coal, iron ore and manganese, gold, chrome and PGMs.

While in South Africa the junior sector comprises mainly smaller producers, there is a smaller exploration sector. This sector has become the target of the Minerals Council's thrust to attract more investment into exploration. Over the past 10 years, South Africa's share of global exploration dollars has dropped from 2% to below 1%. This contrasts with countries such as Canada and Australia, which attract anything between 5% and 7% of global exploration dollars annually.

This is also reflected in the various stock exchanges: the Johannesburg Stock Exchange (JSE) has less than 10 listed junior companies, whereas the Toronto Stock Exchange (TSX) has over 1,200 listed junior companies.

The Minerals Council is involved in active lobbying efforts with the DMRE, the Council for Geoscience, National Treasury and the JSE to improve the support of the financial services industry for exploration in South Africa. Part of this involves a tax incentive to promote exploration in the country.

Critical minerals

In today's rapidly evolving technological landscape, the term 'critical minerals' has emerged as a focal point in discussions about industrial and economic development.

These minerals, often scarce and possessing unique properties, play an indispensable role in powering modern technology and shaping various industries. Their significance extends far beyond their scarcity; critical minerals are the building blocks of innovation, acting as catalysts for advancements in renewable energy, electronics, aerospace and healthcare sectors.

South Africa, a nation rich in diverse mineral resources, stands at a pivotal juncture where it can harness the potential of critical minerals to drive profound economic transformation. With a treasure trove of valuable resources beneath its soil, ranging from rare earth elements and PGMs to phosphates and lithium, the country possesses a unique advantage in addressing global demands and securing its economic future. The need for increased exploration in South Africa cannot be underestimated to ensure the discovery of mineable deposits of critical minerals. Overall, critical minerals find use in and are important in three main thematic applications.

1. Critical battery and vehicle metals applications:

In the realm of battery and vehicle technologies, critical minerals take centre stage as they underpin the transition towards cleaner and more sustainable energy sources. These minerals are fundamental components of rechargeable batteries used in electric vehicles and renewable energy storage systems. As the growth of the electric vehicle market is projected to surge, it is deeply intertwined with the availability of supply and sustainability of these critical minerals.

2. Renewable energy technology (e.g. wind and solar):

Renewable energy sources, such as wind and solar, play a pivotal role in reducing greenhouse gas emissions and transitioning towards a more sustainable energy future. Critical minerals are essential components of renewable energy technologies, enabling the efficient generation, storage and distribution of clean energy. Neodymium, dysprosium, and praseodymium, which are rare earth elements, are crucial for the production of high-performance permanent magnets used in wind turbines. These magnets, along with copper – a vital material in electrical wiring and connections, facilitate the generation of electricity from wind power and its transmission to the grid.

Silicon is fundamental to manufacturing solar cells, converting sunlight into electricity in photovoltaic panels. Tellurium and indium play a role in enhancing the

efficiency of thin-film solar cells, contributing to effective solar energy conversion. Additionally, minerals like lithium, nickel, cobalt and graphite are instrumental in energy storage systems, particularly lithium-ion batteries. These batteries support the seamless integration of intermittent renewable energy sources like wind and solar into the grid. The role of rare earth elements, such as europium and terbium, extends to lighting as they are used in phosphors for energy-efficient lighting solutions like LEDs (light-emitting diodes).

The growth of renewable energy industries underscores the importance of securing a stable supply of these critical minerals, while also addressing environmental considerations related to their extraction and processing. Understanding and managing the intricate relationship between critical minerals, sustainable technology advancement and environmental responsibility is vital for shaping a greener and more resilient global future.

3. Critical hydrogen economy metals applications:

The emerging hydrogen economy is another transformative space where critical minerals find significance. Hydrogen, as a clean and versatile energy carrier, is gaining attention for various applications, including fuel cells used in transportation and power generation. PGMs like platinum, palladium, ruthenium and iridium are essential catalysts in hydrogen fuel cells. Moreover, rare earth elements are employed in manufacturing electrolysers for producing green hydrogen through water electrolysis. These minerals form the backbone of technologies that are pivotal to decarbonising industries and achieving carbon-neutral energy systems.

In addition, PGMs continued to be important in ICE where platinum, palladium and rhodium are used in catalytic converter systems to promote the conversion of harmful pollutants into less harmful compounds.

Again, a similar intricate interplay emerges when considering the hydrogen economy. For example, electrolyser technologies employ various materials, including rare earth elements, with evolving supply dynamics. As technological breakthroughs occur and markets mature, the demand for certain minerals might rise or wane unpredictably. Similarly, the use of palladium in fuel cells is waning due to the high cost of the metal and there is a slow substitution by other metals such as platinum and ruthenium – and all the while ICE and demand is still present.

Critical minerals continued

Critical mineral lists of South Africa's trading partners

	Critical mineral	US	UK	Australian	EU	Canadian	Japanese	Indian	China
1.	High-purity alumina	Yes	Yes	Yes	Yes	Yes	No	No	No
2.	Antimony	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
3.	Arsenic	Yes	Yes	No	Yes	No	Yes	Yes	No
4.	Barite	No	No	Yes	No	No	No	No	No
5.	Beryllium	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6.	Bismuth	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
7.	Boron	No	No	No	No	No	No	No	Yes
8.	Coking coal	Yes	No	No	No	Yes	No	No	No
9.	Cerium	Yes	No	No	Yes	No	Yes	Yes	Yes
10.	Ceasium	Yes	No	No	Yes	Yes	No	No	Yes
11.	Chromium	Yes	No	No	No	Yes	Yes	Yes	Yes
12.	Cobalt	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
13.	Dysprosium	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
14.	Erbium	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
15.	Europium	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
16.	Fluorspar	Yes	No	No	No	No	No	No	No
17.	Gadolinium	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
18.	Gallium	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
19.	Germanium	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Critical mineral lists of South Africa's trading partners continued

	Critical mineral	US	UK	Australian	EU	Canadian	Japanese	Indian	China
20.	Graphite	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
21.	Hafnium	Yes	Yes	No	Yes	No	Yes	No	No
22.	Holmium	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
23.	Indium	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
24.	Iridium	Yes	No	No	No	No	No	No	Yes
25.	Lanthanum	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
26.	Lithium	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
27.	Lutetium	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
28.	Magnesium	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
29.	Manganese	Yes	No	Yes	No	Yes	No	No	Yes
30.	Molybdenum	No	No	No	No	No	No	No	Yes
31.	Neodymium	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
32.	Nickel	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
33.	Niobium	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
34.	Palladium	Yes	Yes	No	No	No	No	No	Yes
35.	Platinum	Yes	Yes	No	No	No	No	No	Yes
36.	Praseodymium	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
37.	Promethium	No	No	No	No	No	No	No	Yes
38.	Rhenium	No	No	No	No	No	No	No	Yes

Critical mineral lists of South Africa's trading partners continued

	Critical mineral	US	UK	Australian	EU	Canadian	Japanese	Indian	China
39.	Rhodium	Yes	No	No	No	No	No	No	Yes
40.	Rubidium	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
41.	Ruthenium	Yes	No	No	No	No	No	No	Yes
42.	Osmium	No	No	No	No	No	No	No	Yes
43.	Samarium	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
44.	Scandium	Yes	Yes	No	Yes	Yes	No	No	Yes
45.	Selenium	No	No	No	No	No	No	No	Yes
46.	Tantalum	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
47.	Tellurium	No	No	No	No	Yes	No	No	No
48.	Terbium	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
49.	Thulium	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
50.	Tin	Yes	Yes	Yes	Yes	Yes	No	No	Yes
51.	Titanium	Yes	Yes	Yes	Yes	Yes	Yes	No	No
52.	Tungsten	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
53.	Vanadium	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
54.	Ytterbium	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
55.	Yttrium	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
56.	Zinc	No	Yes	No	No	Yes	No	No	No
57.	Zirconium	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Health

Occupational diseases, tuberculosis (TB) and HIV (human immunodeficiency virus) reported to the Minerals Council

Through the Minerals Council's flagship Masoyise Health Programme (Masoyise), performance against the industry occupational health milestones is monitored and it is reported on in this section.

In 2023, 114 companies representing 416,545 employees registered on the Minerals Council Occupational Health Information Management System. This accounted for 401 mines in South Africa, which represent about 87% of the estimated 479,000 employees in the mining industry.

Occupational disease, TB and HIV statistics

There has been a steady increase in the reporting of occupational diseases both to the DMRE and to the Minerals Council. Simultaneously, there has also been a sharp increase in the number of diseases as can be seen in the table below.

Occupational diseases reported to Minerals Council 2022 vs 2023 per commodity

Commodity	Silicosis		Pulmonary TB		Silicosis and TB		Noise-induced hearing loss (NIHL)		Total	
	2022	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**
Gold	156	160	519	449	–	–	6	2	681	611
Platinum	23	8	324	355	1	4	–	162	348	529
Coal	–	–	101	80	5	1	7	12	113	93
Diamonds	–	–	7	9	–	–	6	5	13	14
Chrome	1	–	19	34	2	–	6	1	28	35
Manganese	–	–	7	9	–	–	–	1	7	10
Iron ore	–	–	26	30	–	1	–	2	26	33
Others	–	–	4	15	–	–	1	1	5	16
Total	**180**	**168**	**1,007**	**981**	**8**	**6**	**26**	**186**	**1,221**	**1,341**

All mines report annually to the DMRE on occupational diseases, TB and HIV. The provisional statistics from the Minerals Council for 2023 are reported on.

Occupational diseases reported to the Minerals Council 2023

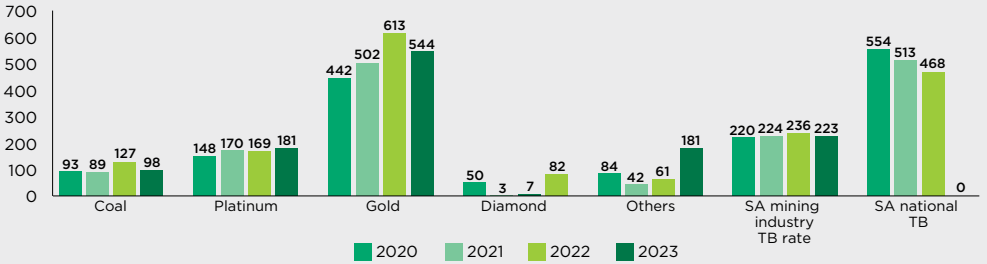
Reports from all mines showed an increase of 9% in the total number of occupational diseases reported by mines, from 1,221 cases in 2022 to 1,341 cases in 2023.

TB and HIV reported to Minerals Council for 2023

Mines are required to report on TB and HIV. In 2023, 396 mines representing approximately 446,256 employees had reported. This is compared to 390 mines representing approximately 427,048 employees that reported in 2021/2022.

In 2023, 90% of employees were provided with HIV counselling and 92% of employees were screened for TB. This is an improvement in comparison with 83% and 82% respectively noted at year end 2022. There has been an improvement of TB incidence rates year-on-year for most commodities compared to the national TB incidence.

TB incidence milestone performance 2023



Milestone performance

Performance against the industry and Masoyise occupational health milestones is monitored, and it is reported on below.

Health performance milestones 2022 vs 2023

Milestone	2022	2023
Employees screened for TB	82%	92%
Employees counselled for HIV	83%	90%
Hypertension screening	79%	91%
Diabetes screening	83%	91%
Obesity screening	0%	88%
Cholesterol screening	0%	32%
Mental health screening	0%	11%
Pneumoconiosis in novices	0%	2%
Standard threshold shift (NIHL)	19%	41%

Occupational hygiene milestones

During the 2014 Mine Health and Safety Council (MHSC) Summit, all stakeholders agreed that the industry should accelerate the reduction of exposure to respirable crystalline silica dust, respirable coal dust, respirable platinum mine dust and equipment noise as part of the journey toward the elimination of occupational diseases related to these hazards.

The Minerals Council's members further agreed to aspirational targets for each milestone per year in order to progress towards achieving the agreed milestones by December 2024.

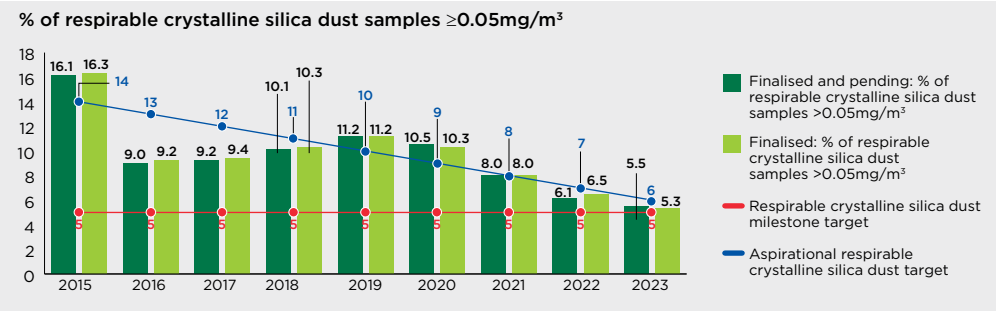
The data reported below is from the Occupational Health Reporting System of the Minerals Council.

Respirable crystalline silica dust milestone

By December 2024, 95% of all exposure measurement results will be below the milestone level for respirable crystalline silica of 0.05mg/m^3.

The data indicates that the industry has progressed well towards the achievement of the respirable crystalline silica dust milestone and achieved the aspirational target of 6% at the end of 2023.

The graph below depicts the industry performance from 2015 to 2023.

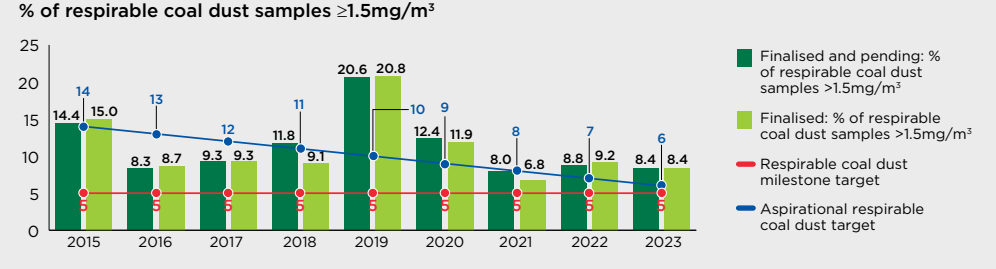


Coal dust milestone

By December 2024, 95% of all exposure measurement results will be below the milestone level for coal dust respirable particulate of 1.5mg/m³.

The data indicates that the industry progressed well towards the achievement of the respirable coal dust milestone up to 2021, when the aspirational target of 8% was met at the end of 2021.

The Industry performance for 2022 however regressed, resulting in the industry not achieving the agreed aspirational target of 7% for the end of 2022, nor the agreed aspirational target of 6% for the end of 2023. The graph below depicts the industry performance from 2015 to 2023.

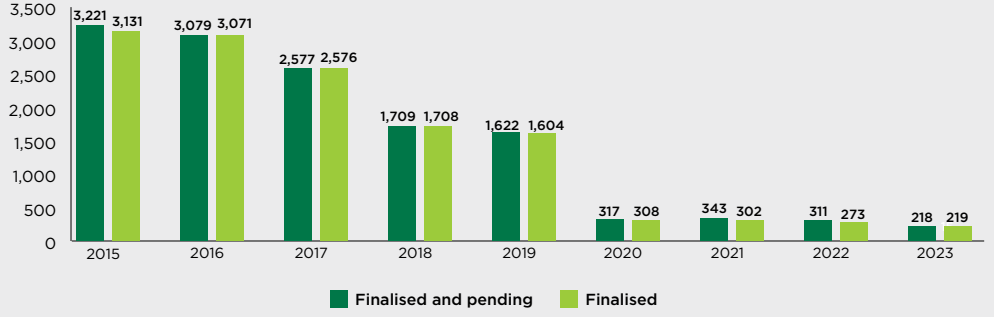


NIHL milestone

By December 2024, the total operational or process noise emitted by any equipment must not exceed a milestone sound pressure level of 107dB(A).

The data indicates that up to 2020, the industry progressed well towards achieving the equipment noise milestone, with the number of pieces of equipment emitting noise reduced from 3,221 in 2015 to 317 in 2020. The industry has made very little progress towards the achievement of the equipment noise milestone since 2021, with the number of pieces of equipment emitting noise only being reduced from 317 to 219 by the end of 2023.

Total number of individual pieces of equipment ≥ 107dB(A)



Safety

Following a vastly improved safety record in 2022, 2023 was a setback for the South African mining industry in respect of occupational safety.

On Monday, 27 November 2023, a winder incident at one of the platinum operations in the North West resulted in 13 mineworkers losing their lives while others were seriously injured. The Minerals Council extends its heartfelt condolences to all the families, friends and colleagues affected by the tragic accident.

This tragic incident serves as a stark reminder that there can never be any lapse in focus and vigilance regarding safety on mines. It is the most important aspect of mining and one that receives the industry's undivided leadership attention.

Nonetheless, safety lagging indicators throughout the year trended very positively in comparison to 2022, a year that saw the best performance on safety in the history of the industry. Throughout 2023 the industry maintained an average improvement of between 4% to 6% on lagging indicators with agencies such as transport and mining seeing an average improvement of around 60%.

The fall of ground performance was a concern early in the year as the trend showed a marked decrease compared to 2022. In 2023 the industry had recorded 15 fall of ground fatalities compared to 5 for the full year in 2022.

Statistics from the DMRE show an overall regression in safety performance. Industry statistics for the 2023 calendar year compared to 2022 showed a 12% regression in overall fatalities with 55 recorded in 2023 against 49 in 2022. The table below shows the number of fatalities per commodity for 2023.

The platinum and gold sectors were the highest contributors to fatalities, with 22 and 20 fatalities in 2023 respectively.

Fatalities 2023

	Gold	Coal	Platinum	Other
January	–	–	–	–
February	–	1	1	1
March	5	1	1	1
April	7	1	–	–
May	–	1	–	–
June	1	–	1	–
July	1	–	1	1
August	2	–	2	2
September	2	1	1	–
October	2	1	1	1
November	–	–	13	–
December	–	1	1	–
Total:	**20**	**7**	**22**	**6**
Industry total:		**55**		

Transportation and mining, general, fires, electricity and explosives were the agencies that experienced a reduction in the number of fatalities, while all the other agencies recorded regressions.

The Minerals Council Board and the CEO Zero Harm Forum continue to monitor the progress on the trackless mobile machinery project that will address transport-related incidents. The industry continued to implement several low-hanging fruit solutions with a focus on traffic flow and risk analysis. The marked improvement in this category can be attributed to the efforts on traffic management now bearing results as many companies have matured their approach to interactions between vehicles and personnel. Efforts have also increased in managing compliance with the regulations that came into effect in December 2022.

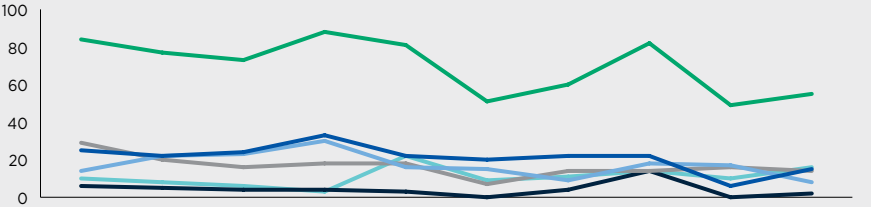
Number of fatalities per classification

Classification	2022	2023
Fall of ground/rockfall	6	15
Machinery	–	2
Transportation and mining	17	8
General	16	15
Conveyance accidents (shaft winder)	1	13
Electricity	1	–
Fires	1	–
Explosives	1	–
Subsidence or caving	–	–
Heat sickness	–	–
Diving sickness	–	–
Occupational diseases	–	–
Miscellaneous (specify)	6	2
Total	**49**	**55**

Reduction in injuries per classification

Serious injuries in the sector increased by 4.6% to 2,080 (2022: 1,988). Gold, coal and other commodities recorded serious injury increases of 7%, 10% and 4% respectively. On the other hand, the PGMs sector recorded a 9% reduction in serious injuries.

Fatalities – Performance by cause: 2014-2023



	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
FOG	25	22	24	33	22	20	22	22	6	15
T&M	14	22	23	30	16	15	9	18	17	8
General	29	20	16	18	18	7	14	14	16	15
Machinery	6	5	4	4	3	0	4	14	0	2
Other	10	8	6	3	22	9	11	14	10	15
All	84	77	73	88	81	51	60	82	49	55

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