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Mining plays a significant role in the economy of our nation. It is therefore important for data on our industry to be freely available so that stakeholders are able to understand how our industry is performing. The Minerals Council (formerly Chamber of Mines) chief economist, Henk Langenhoven, and his team, have compiled this document to showcase our industry using this data, and provide some insight into what the numbers mean for our country and the future of our mining industry. This year we have included a safety and health section. The Minerals Council and our members, in close co-operation with unions and government, continue to strive for best practice in all areas, in the industry’s quest for zero harm.

The availability of credible statistics, which paint an accurate picture of the South African mining sector, is crucial for the Minerals Council. Statistics allow us to fulfil our mandate as the voice of mining in South Africa.

They also help South Africans to develop a better, more nuanced understanding of the current state of the mining industry. This also allows the industry to accurately represent the wider impact of mining on the country as a whole.

The Minerals Council’s economics department plays a key role in gathering the data necessary for us and our members to properly understand the state of the sector and to work to improve growth across it.

A facts and figures pocketbook “Mine SA 2017” was published just before the Mining Indaba 2018 and has been distributed widely - it is also currently available on the Minerals Council website. The pocketbook provides a snapshot glimpse into the industry and the impact that South Africa’s mineral wealth has on our everyday lives.

This “Facts and Figures 2017” publication is both an updated version of the pocketbook and a more comprehensive statistical reference guide to the South African mining sector.
MESSAGE FROM THE CEO

South Africa’s modern economy is founded on the mining industry. The industry was the basis for the development of many other economic sectors, from the steel industry to construction, forestry, and financial services, including the Johannesburg Stock Exchange.

The Minerals Council led a national campaign of Safety & Health Days in Mining 2018, launched on 17 August 2018.

The international economic slowdown which began in 2008 had a dampening effect on the mining industry the world over. Locally, economic issues, such as rapid increases in mining input prices, particularly electricity and labour costs, exacerbated this trend. But as the global economy begins to show some signs of recovery, there are also some positive signs for the industry.

Despite South Africa’s economy having diversified over time, the mining industry remains a central part of the economy, with a contribution of over 17% through direct inputs and its supply chain. Yet the industry believes it could make a significantly greater contribution, even in these volatile international economic times, given a better and more certain national policy and operating environment.

In the existing environment, the mining industry made the following contributions in 2017:

- **R335 billion** to GDP
- **R81 billion** to fixed investment
- **R19 billion** paid in taxes
- **R7.5 billion** paid in royalties
- **R300 billion** spent on goods and services
- **R7 billion** spent on skills development
- **R2 billion** spent on community development
- **R10 billion** in employee tax collected by mining
- **464,667 employees** who in turn supported some **4.5 million dependents**

Roger Baxter
Chief Executive Officer

The new face of the Minerals Council South Africa
South Africa’s gross fixed investment in mining grew to R80.9 billion in 2017 (R67.6 billion in 2016) representing 18.2% of private and 10.8% of total fixed investment in the economy, hopefully a sign of better things to come.

The weighted dollar commodity price index (coal, iron ore, gold and platinum) for South Africa hardly moved between 2016 and 2017. In dollar terms, this is due to the lacklustre price trend for gold (+0.8%) and the decline in platinum prices (-4%), negating the increases in the prices of coal (+28%) and iron ore (+22%). The equivalent rand index also hardly moved (given differential price movements and weights). Total sales of commodities exported increased by nearly 7% (in real terms) in 2017 on 2016. Total production of commodities increased by 4.6% between 2016 and 2017.

On average, the rand strengthened against the dollar by 10% over the same period. The rand continued to strengthen from the beginning of 2018 due to a renewal of political confidence but weakened in August due to both local and international issues. The currency movements are a double-edged sword for the industry’s exports.

The Minerals Council believes that much more work is required on the draft Mining Charter III to create a Charter that promotes competitiveness, investment, growth and transformation in the mining industry, and that will support growth and prosperity for South Africa as a whole. Without competitiveness, investment in new exploration and mining will be limited, and the mining sector would continue to decline.

The Minerals Council is saddened and disappointed by the industry’s deterioration in safety performance measured by the increase in fatalities in 2017 and into 2018.

A critical element of the Minerals Council’s leadership role was the establishment in 2012 of the CEO Zero Harm Forum to acknowledge the value of leading by example. The Forum, comprising mining company CEOs, meets on a quarterly basis and directs and guides industry’s efforts in respect of safety and health. Among its priorities have been the development and management of critical controls for fatal risks, and instilling a culture in the industry that will change the behaviour of people at all levels to enhance their compliance and agility for change.

In addition to the active steps being taken by the Minerals Council and its members to address safety matters, and to get the industry’s quest for zero harm back on track, the Minerals Council led a national campaign of Safety & Health Days in Mining 2018, launched on 17 August 2018.

As the Minerals Council looks forward to a new dawn for our country and its mining industry, I hope that this Facts and Figures 2017 publication will prove useful to those monitoring trends and progress.

ROGER BAXTER
Chief Executive Officer
MINING’S 2017 CONTRIBUTION TO SOUTH AFRICA

Research worldwide shows that, due to better technologies used to explore for minerals and more efficient use of commodities, the importance of mining does not abate.

According to the national statistics compiled by the South African Reserve Bank, the inflation-adjusted monetary value of mining’s contribution to the South African economy has not fluctuated much since 1960, remaining at an average of R350 billion per annum in 2017 numbers. The mining sector provided the base for the South African economy to industrialise and become a middle income country, far ahead of its African peers. Cyclical expansion and contraction does occur, however.

Indications (on balance) are that 2017 was a lower turning point for the mining sector. Due to higher economic growth in the world, the dollar prices of commodities started to recover, and were it not for the stronger rand exchange rate (10% appreciation), rand prices would have been higher too. Higher production (+3.4%), however, led to higher export sales (+7%). Value added to the South African economy increased by 4.6%, but due to continuous and accelerating cost increases (from 5.5% in January to 7% in December), profitability remained elusive and unpredictable (decline in net profits before taxes is estimated at 10% for 2017). Employment in the sector is estimated to have grown by about 1.6% from 2016 to 2017. Gross fixed investment improved by 16% after an historic low in 2016. These signals give hope of recovery.

The sector contributed as follows to the South African economy in 2017:

- Exports of R307 billion (R295 billion in 2016) representing 27% of the country’s R1.1 trillion total
- Production rose to R630 billion (R574 billion in 2016) – 7.4% of R8.6 trillion South African production
- Value added rose to R334 billion (R307 billion in 2016) – 6.8% of R4.6 trillion South African value added
- Mining sector employment rose to 464,667 (457,290 in 2016) – 6.1% of private non-agricultural employment or 4.8% of total non-agricultural employment
- Gross fixed investment in mining grew to R80.9 billion (R67.6 billion in 2016) representing 18.2% of private and 10.8% of total fixed investment in the economy

This serves to illustrate that “mining really does matter for South Africa”.

Mining is a ‘SUNRISE INDUSTRY’ and it remains the “flywheel” of the South African economy.

6.8% contribution to South Africa’s gross domestic product by the mining sector in 2017
OVERVIEW

OF THE SOUTH AFRICAN MINING INDUSTRY

The year 2017 marked 10 years since the global financial crisis and the collapse of the commodity price cycle. Countries that responded with appropriate economic policies have recovered whereas others, like South Africa, failed to provide a policy environment conducive to growth.

As world economic growth has recovered with concomitant resumption of growth in international trade and higher demand (and prices) for commodities, the mining sector has responded positively.

International geopolitical tensions eased towards the end of 2017 with the US returning to a "Monroe doctrine"- like self-imposed isolation and, although brash, it was not cause for instability.

Renewed world economic growth, resulting in higher demand for commodities, seems to indicate that the commodity cycle has reached the lower turning point of the cyclical trough and will slowly recover from here on.

South Africa's dismal economic growth performance was fuelled by a crescendo (towards the end of 2017) of contradictory and inappropriate economic policies stifling growth with almost complete focus on redistribution as opposed to growth. In many cases, there was brazen looting of assets from private and public coffers. The mining sector was at the face of this onslaught, and suffered greatly from uncertain policies towards it, causing costs to rise dramatically and loss of competitiveness. The sector grew unattractive to investors.

The mining sector's share of the South African economy is estimated to have been 6.8%, marginally down from the 7% of overall gross domestic product (GDP) recorded in 2016. This despite the fact that growth resumed from the dismal decline (-4.3%) in 2016 to an expansion of about 4.6% in 2017, contributing R335 billion to GDP.

Due to higher mining production, employment is estimated to have increased by 1.6% to 464,667 during 2017. This has finally arrested the rate of job losses, which stood at 30,000 jobs between 2014 and 2017. Among the major commodities, estimates point to the gold sector having shed another 4,000 jobs between 2016 and 2017 while the PGMs, iron ore, diamonds, chrome and manganese sectors employed more people in 2017 than in 2016. Mining employment represents 6.1% of private non-agricultural employment and 4.8% of total non-agricultural employment.

The sector contributed R80.9 billion to fixed investment in 2017, which constituted 18.2% of private-sector fixed investment and 10.8% of the country’s total fixed investment for the year. In the decade between 2007 and 2017, the mining industry’s fixed investment has been on a downward trajectory. The recovery in fixed investment is a sign of better prospects for the sector, but it still hung in the balance at the end of 2017.

The industry exported R307 billion worth of produce, which is 27% of the country’s R1.1 trillion export book. The 10% strengthening of the rand against the US dollar in 2017 adversely affected the rand receipts for exports. On a US dollar-equivalent basis, exports increased by 16.1%, but only by 7% in rand terms.

In the 2016/2017 fiscal year, the industry paid R5.8 billion in royalties, representing a 56% increase on the previous year. The industry paid R16 billion in taxes over the same period.

The state of mining in 2017 was again influenced by a complex set of dynamics. The sales performance of the sector is largely determined by the dollar commodity price trends translated into “landed” rand prices.
The overall weighted dollar commodity price index (coal, iron ore, gold and platinum) for South Africa hardly moved between 2016 and 2017. In dollar terms, this was due to gold's lacklustre price trend (+0.8%) and the decline in the platinum price (-4%), negating increases in the price movements of coal (+28%) and iron ore (+22%). The equivalent rand commodity price index also hardly moved (given differential price movements and weights). Please see the graph on annualised production versus rand commodity price trends in this section for details. A rise during 2016 was negated by a decline during 2017, leaving the average prices virtually unchanged.

Each major commodity exhibited unique trends (in rand terms), which could, in general, be explained by the differential recovery in markets for South African commodities.
In rand terms, each major commodity exhibits unique trends, which in general can be explained by the differential recovery in markets for South African commodities:

- **Gold** price declined by more than 8% between 2016 and 2017, mainly driven by geopolitical uncertainties subsiding during 2017. Sales of gold were up by about 1%, but production declined by 3%.

- **Platinum** prices declined by over 12% over the same period, mainly due to environmental issues and the uncertainty regarding the pace and technological direction of electric vehicle development. Platinum sales grew by 0.5% (in real terms) but production declined by 4.1% over the period.

- **Coal** export prices improved by 17% between 2016 and 2017, and are more or less on par with the prices achieved during the 2008 commodities price peak. The volume of coal sold declined slightly (-1%) over the period, but production increased by 1.5%. India seems to have an insatiable demand for South African coal.

- **Iron ore** prices increased by over 12% between 2016 and 2017. The high-quality iron ore puts South Africa in the “higher tier” price range due to Chinese environmental concerns, which has forced lower-quality iron ore prices to decline. The volume of sales of iron ore increased by more than 5% and production by 12% over the period.

- The two star performing commodities were **chromium** and **manganese**. Sales of the former increased by over 6% and production by over 14% during the period. Chromium prices increased by 63% over the period. Manganese sales jumped by nearly 140% and production by nearly 40% between 2016 and 2017. Manganese prices accelerated by 20% over the same period. These movements are also related to the pace and technological direction of electric vehicle development. Overall sales of commodities exported increased by nearly 7% (in real terms) in 2017 on 2016.

Total production of commodities increased by 4.6% between 2016 and 2017. On average, the rand appreciated against the dollar by 10% over the same period. It is clear that production trends do not directly correlate with commodity price movements, as depicted in the graph above. A lag of one year to 18 months is evident between the two variables in recent years.
The sector as a whole struggled to remain profitable. This was mainly due to commodity prices not improving strongly and domestic costs continuously rising. Mining input costs increased by nearly 6% over the same period.
In 2017, the Economics Department developed a mining input cost index. Based on this research, the contribution of intermediate inputs was 69.5% and labour 30.5% during 2017. The split of intermediary input cost is depicted by the graph alongside, which was developed from the estimated input-output tables for mining, augmented by company data as reported in their published reports. More than 50% of these costs (petroleum, electricity, transport and storage) are administered prices.
Rapidly rising costs, a large proportion of which are completely out of mining companies’ control, keep eroding profitability in the sector. Apart from costs eroding profitability, they also have a direct impact on employment. As an example, the potential job losses related to the attempted 20% electricity tariff increase by Eskom would have cost 48,000 mining job opportunities. NERSA only awarded a 5.2% tariff increase after serious opposition from the Minerals Council and other private-sector organisations.

The uncertain, and sometimes openly hostile, domestic policy environment has had a direct and negative impact on the mining sector. The cabinet reshuffle, which included firing Finance Minister Pravin Gordhan in March and April 2017, and the subsequent downgrading of South Africa’s sovereign credit rating, had a negative impact on the sector’s cost of capital. Lingering uncertainty regarding the revised Mining Charter weighed heavily on investor confidence and mining share prices, which countered the optimism of commodity prices stabilising and, for some commodities, rising. These factors, if not rectified, will continue to have a negative impact on fixed investment in mining and may therefore result in the country’s mining sector losing out on the next commodity price cycle upturn.

The mining sector continued to provide significant employment in South Africa. Total employment for 2017 was 464,667 people, which is slightly higher than it was in 2016.

### Number of employees and earnings: 2017

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Employment</th>
<th>Total earnings R'000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold</td>
<td>112,200</td>
<td>29,027,067</td>
</tr>
<tr>
<td>PGMs</td>
<td>175,770</td>
<td>48,258,265</td>
</tr>
<tr>
<td>Iron ore</td>
<td>21,794</td>
<td>5,791,755</td>
</tr>
<tr>
<td>Chrome</td>
<td>17,535</td>
<td>4,775,778</td>
</tr>
<tr>
<td>Manganese</td>
<td>8,314</td>
<td>2,437,046</td>
</tr>
<tr>
<td>Diamonds</td>
<td>18,227</td>
<td>5,243,203</td>
</tr>
<tr>
<td>Coal</td>
<td>81,962</td>
<td>22,415,572</td>
</tr>
<tr>
<td>Aggregate and sand</td>
<td>7,390</td>
<td>1,244,248</td>
</tr>
<tr>
<td>Other mines and quarries</td>
<td>21,475</td>
<td>6,871,005</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>464,667</strong></td>
<td><strong>126,009,944</strong></td>
</tr>
</tbody>
</table>

Source: Department of Mineral Resources

The graph above shows the job losses in mining since 2008.
OVERVIEW OF THE SOUTH AFRICAN MINING INDUSTRY continued

Commodity summary: 2017

<table>
<thead>
<tr>
<th>Group</th>
<th>Commodity</th>
<th>Local sales R'000</th>
<th>Total sales R'000</th>
<th>Total exports R'000</th>
<th>Exports as a % of total sales</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GOLD, PGMS, DIAMONDS AND SILVER</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gold</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gold</td>
<td></td>
<td>17,681,881</td>
<td>82,784,283</td>
<td>65,102,402</td>
<td>78.6</td>
</tr>
<tr>
<td>PGMs</td>
<td></td>
<td>11,971,452</td>
<td>97,040,689</td>
<td>85,069,237</td>
<td>87.7</td>
</tr>
<tr>
<td>Diamonds</td>
<td></td>
<td>7,899,725</td>
<td>18,095,432</td>
<td>10,195,708</td>
<td>56.3</td>
</tr>
<tr>
<td>Silver</td>
<td></td>
<td>21,788</td>
<td>361,677</td>
<td>339,889</td>
<td>92.0</td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td></td>
<td>37,574,846</td>
<td>198,282,081</td>
<td>160,707,236</td>
<td></td>
</tr>
<tr>
<td><strong>BASE MINERALS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chrome</td>
<td></td>
<td>10,819,578</td>
<td>23,406,141</td>
<td>12,586,563</td>
<td>46.2</td>
</tr>
<tr>
<td>Copper</td>
<td></td>
<td>2,120,087.6</td>
<td>4,327,545</td>
<td>2,207,458</td>
<td>49.0</td>
</tr>
<tr>
<td>Iron ore</td>
<td></td>
<td>5,137,619</td>
<td>49,326,257</td>
<td>44,188,638</td>
<td>89.6</td>
</tr>
<tr>
<td>Lead concentrate</td>
<td></td>
<td>0</td>
<td>1,419,830</td>
<td>1,419,830</td>
<td>100</td>
</tr>
<tr>
<td>Manganese</td>
<td></td>
<td>1,724,512</td>
<td>32,361,939</td>
<td>30,637,427</td>
<td>94.7</td>
</tr>
<tr>
<td>Nickel</td>
<td></td>
<td>1,344,463</td>
<td>4,923,158</td>
<td>6,267,622</td>
<td>81.7</td>
</tr>
<tr>
<td>Zinc</td>
<td></td>
<td>0</td>
<td>1,088,563</td>
<td>1,088,563</td>
<td>100</td>
</tr>
<tr>
<td>Coal</td>
<td></td>
<td>69,083,470</td>
<td>130,361,457</td>
<td>61,277,987</td>
<td>47.0</td>
</tr>
<tr>
<td>Other non-metallic</td>
<td></td>
<td>3,581,072</td>
<td>6,120,903</td>
<td>2,538,831</td>
<td>41.5</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td></td>
<td>12,560,346</td>
<td>20,918,970</td>
<td>8,358,623</td>
<td>31.5</td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td></td>
<td>108,226,503</td>
<td>275,599,227</td>
<td>167,372,723</td>
<td></td>
</tr>
<tr>
<td><strong>Grand total</strong></td>
<td></td>
<td>145,801,349</td>
<td>473,881,308</td>
<td>328,079,959</td>
<td></td>
</tr>
</tbody>
</table>

Source: Department of Mineral Resources, 2017
OVERVIEW
OF THE SOUTH AFRICAN MINING INDUSTRY

Stock exchange comparison (as at 21 June 2018)

Compared to the resource indices in global stock exchange peers, the South African performance has been extremely poor as depicted in the table. It cannot be stressed enough that stock exchange performance is a function of investment into or out of a jurisdiction.

A negative performance is indicative of declining levels and confidence and investment in an industry.

The South African performance as depicted above is undoubtedly a cause for concern and indicates the view investors hold of the South African mining sector.

Stock Exchange resource indices

<table>
<thead>
<tr>
<th>Measured period</th>
<th>Johannesburg Stock Exchange (Resources index)</th>
<th>Australia Stock Exchange (Resources index)</th>
<th>Toronto Stock Exchange (Resources index)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Month-to-date</td>
<td>1.96</td>
<td>0.94</td>
<td>(0.93)</td>
</tr>
<tr>
<td>Quarter-to-date</td>
<td>16.32</td>
<td>13.68</td>
<td>5.59</td>
</tr>
<tr>
<td>Year-to-date</td>
<td>11.24</td>
<td>6.93</td>
<td>2.24</td>
</tr>
<tr>
<td>1 year</td>
<td>37.08</td>
<td>38.29</td>
<td>20.73</td>
</tr>
<tr>
<td>3 years</td>
<td>(2.98)</td>
<td>8.51</td>
<td>5.76</td>
</tr>
<tr>
<td>5 years</td>
<td>(8.78)</td>
<td>3.61</td>
<td>2.88</td>
</tr>
<tr>
<td>10 years</td>
<td>(44.20)</td>
<td>(4.04)</td>
<td>(2.19)</td>
</tr>
</tbody>
</table>

Source: ShareNet and S&P Global Market Intelligence

One way to measure the market’s reaction to policy changes is to observe stock market performance. This table shows the performance of the JSE resource index as compared with the resource indices of the Australian and Toronto Stock Exchanges over time.

Our interpretation of the performance of the South African resource index is that it shows lingering concerns relating to regulatory and policy uncertainty. The table indicates that the longer dated performance, as measured in three, five and 10 years, recorded decreases of -3%, -8.7% and -44% respectively.

This is indicative of declining levels in investment and confidence in the South African resource sector. Compared to its peers, the South African resource index has performed dismally. And this is on the back of the world economy having improved since the global financial crisis of 2007/8.

Gold Fields – Drilling and installing support at South Deep Gold Mine
### Key mineral industry statistics for South Africa

<table>
<thead>
<tr>
<th>Description</th>
<th>Units of measure</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>Year-on-year % change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GROSS DOMESTIC PRODUCT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct contribution of mining to GDP (value add)</td>
<td>R’millions nominal terms</td>
<td>157,672.0</td>
<td>197,643.0</td>
<td>200,824.0</td>
<td>230,349.7</td>
<td>261,575.4</td>
<td>267,343.9</td>
<td>288,300.4</td>
<td>287,487.5</td>
<td>282,888.5</td>
<td>307,302.1</td>
<td>334,667.5</td>
<td>8.9%</td>
</tr>
<tr>
<td>Direct contribution of mining to GDP</td>
<td>R’millions constant 2010 prices</td>
<td>243,662.5</td>
<td>230,662.8</td>
<td>218,830.4</td>
<td>230,350.1</td>
<td>228,645.5</td>
<td>221,989.8</td>
<td>230,771.8</td>
<td>226,790.6</td>
<td>233,744.6</td>
<td>224,016.0</td>
<td>234,305.2</td>
<td>4.6%</td>
</tr>
<tr>
<td>Mining GDP growth rate</td>
<td>% year-on-year</td>
<td>-0.6</td>
<td>-5.3%</td>
<td>-5.1%</td>
<td>5.3%</td>
<td>-0.7%</td>
<td>-2.9%</td>
<td>4.0%</td>
<td>-1.7%</td>
<td>3.1%</td>
<td>-4.2%</td>
<td>4.6%</td>
<td></td>
</tr>
<tr>
<td>South African GDP (market prices)</td>
<td>R’millions nominal terms</td>
<td>2,109,501.0</td>
<td>2,369,063.0</td>
<td>2,507,676.0</td>
<td>2,748,008.3</td>
<td>3,023,659.1</td>
<td>3,253,851.9</td>
<td>3,539,977.0</td>
<td>3,805,349.6</td>
<td>4,051,420.7</td>
<td>4,350,314.2</td>
<td>4,651,784.8</td>
<td>6.9%</td>
</tr>
<tr>
<td>South African GDP (market prices)</td>
<td>R’millions constant 2010 prices</td>
<td>2,624,840.0</td>
<td>2,708,600.0</td>
<td>2,666,939.0</td>
<td>2,748,008.0</td>
<td>2,838,257.1</td>
<td>2,901,077.8</td>
<td>2,973,175.0</td>
<td>3,028,089.8</td>
<td>3,066,835.3</td>
<td>3,084,174.1</td>
<td>3,124,887.1</td>
<td>1.3%</td>
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<tr>
<td>Mining’s contribution as % of total GDP nominal terms</td>
<td>%</td>
<td>7.5</td>
<td>8.3</td>
<td>8.0</td>
<td>8.4</td>
<td>8.7</td>
<td>8.2</td>
<td>8.1</td>
<td>7.5</td>
<td>7.0</td>
<td>7.1</td>
<td>7.2</td>
<td>-</td>
</tr>
<tr>
<td>Mining’s contribution as % of total GDP real terms</td>
<td>%</td>
<td>9.3</td>
<td>8.5</td>
<td>8.2</td>
<td>8.4</td>
<td>8.1</td>
<td>7.7</td>
<td>7.8</td>
<td>7.5</td>
<td>7.7</td>
<td>7.3</td>
<td>7.5</td>
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<td><strong>FIXED INVESTMENT</strong></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct contribution of mining to fixed investment (GFCF*)</td>
<td>R’millions nominal terms</td>
<td>40,628.0</td>
<td>59,084.0</td>
<td>64,574.0</td>
<td>63,555.0</td>
<td>68,420.4</td>
<td>72,106.0</td>
<td>80,608.7</td>
<td>85,615.3</td>
<td>75,096.1</td>
<td>67,654.5</td>
<td>80,877.4</td>
<td>0.03%</td>
</tr>
<tr>
<td>Direct contribution of mining to fixed investment (GFCF*)</td>
<td>R’millions constant 2010 prices</td>
<td>49,643.0</td>
<td>62,349.0</td>
<td>65,969.0</td>
<td>63,555.0</td>
<td>65,952.7</td>
<td>65,437.8</td>
<td>67,332.6</td>
<td>66,994.5</td>
<td>57,207.0</td>
<td>48,623.6</td>
<td>56,337.9</td>
<td>-1.35%</td>
</tr>
<tr>
<td>Total private sector fixed investment (private GFCF*)</td>
<td>R’millions nominal terms</td>
<td>307,189.0</td>
<td>376,918.0</td>
<td>342,142.0</td>
<td>341,517.0</td>
<td>380,411.0</td>
<td>406,000.0</td>
<td>470,078.0</td>
<td>511,839.4</td>
<td>528,005.6</td>
<td>537,180.6</td>
<td>548,856.7</td>
<td>-0.95%</td>
</tr>
<tr>
<td>Total SA fixed investment (GFCF*)</td>
<td>R’millions nominal terms</td>
<td>435,548.0</td>
<td>556,997.0</td>
<td>539,440.0</td>
<td>529,431.0</td>
<td>578,014.0</td>
<td>625,643.0</td>
<td>721,234.0</td>
<td>775,949.7</td>
<td>828,245.1</td>
<td>848,911.6</td>
<td>871,476.0</td>
<td>1.55%</td>
</tr>
</tbody>
</table>

* GFCF: Gross fixed capital formation
### Key Mineral Industry Statistics for South Africa

#### Description

<table>
<thead>
<tr>
<th>Description</th>
<th>Units of measure</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>Year-on-year % change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining fixed investment growth rate</td>
<td>% year-on-year</td>
<td>-</td>
<td>25.6</td>
<td>5.8</td>
<td>-3.7</td>
<td>3.8</td>
<td>-0.8</td>
<td>2.9</td>
<td>-0.5</td>
<td>-14.6</td>
<td>-15.0</td>
<td>15.9</td>
<td>-</td>
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<tr>
<td>Mining's contribution to private sector fixed investment (GFCF*)</td>
<td>%</td>
<td>13.2</td>
<td>15.7</td>
<td>18.9</td>
<td>18.6</td>
<td>18.0</td>
<td>17.8</td>
<td>16.9</td>
<td>16.73</td>
<td>14.22</td>
<td>12.59</td>
<td>14.74</td>
<td>0.99%</td>
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<td>Mining's contribution as % of total investment</td>
<td>%</td>
<td>9.3</td>
<td>10.6</td>
<td>12.0</td>
<td>12.0</td>
<td>11.8</td>
<td>11.5</td>
<td>11.0</td>
<td>9.1</td>
<td>8.0</td>
<td>9.3</td>
<td>-1.49%</td>
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### Sales and Exports

<table>
<thead>
<tr>
<th>Description</th>
<th>R'millions nominal terms</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>Year-on-year % change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total primary mineral sales</td>
<td>223,901.2</td>
<td>300,763.1</td>
<td>239,881.1</td>
<td>300,891.1</td>
<td>370,832.7</td>
<td>363,756.5</td>
<td>385,033.1</td>
<td>386,350.0</td>
<td>386,709.4</td>
<td>424,041.9</td>
<td>473,881.3</td>
<td>11.8%</td>
<td></td>
</tr>
<tr>
<td>Mining industry primary exports</td>
<td>160,685.4</td>
<td>220,077.1</td>
<td>175,772.1</td>
<td>224,968.8</td>
<td>282,296.6</td>
<td>269,119.8</td>
<td>279,673.1</td>
<td>269,263.6</td>
<td>266,604.0</td>
<td>294,896.8</td>
<td>328,080.0</td>
<td>11.3%</td>
<td></td>
</tr>
<tr>
<td>Total SA exports (goods and services)</td>
<td>470,275.7</td>
<td>638,035.6</td>
<td>503,945.2</td>
<td>652,274.8</td>
<td>771,622.7</td>
<td>797,334.0</td>
<td>900,381.2</td>
<td>969,876.4</td>
<td>1,004,468.2</td>
<td>1,080,809.6</td>
<td>1,147,193.6</td>
<td>6.1%</td>
<td></td>
</tr>
<tr>
<td>Primary mineral exports as % of total SA exports</td>
<td>%</td>
<td>34.2</td>
<td>34.5</td>
<td>34.9</td>
<td>34.5</td>
<td>36.6</td>
<td>33.8</td>
<td>31.1</td>
<td>27.8</td>
<td>26.5</td>
<td>27.3</td>
<td>28.6</td>
<td>-</td>
</tr>
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</table>

### Employment

<table>
<thead>
<tr>
<th>Description</th>
<th>Numbers</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>Year-on-year % change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining industry direct employment</td>
<td>495,150</td>
<td>518,725</td>
<td>491,793</td>
<td>498,906.8</td>
<td>512,874</td>
<td>524,868</td>
<td>509,909</td>
<td>492,931</td>
<td>480,204</td>
<td>457,661</td>
<td>464,667</td>
<td>1.1%</td>
<td></td>
</tr>
<tr>
<td>Total private non-agricultural employment</td>
<td>7,667,329</td>
<td>7,733,514</td>
<td>7,379,221</td>
<td>7,248,651.8</td>
<td>7,340,934</td>
<td>7,411,984</td>
<td>7,443,508</td>
<td>7,382,081</td>
<td>7,366,387</td>
<td>7,562,929</td>
<td>7,576,175</td>
<td>0.2%</td>
<td></td>
</tr>
<tr>
<td>Total SA formal non-agricultural employment</td>
<td>9,260,478.3</td>
<td>9,403,045.5</td>
<td>9,112,119.5</td>
<td>9,032,440.3</td>
<td>9,208,068.8</td>
<td>9,311,779.3</td>
<td>9,433,330.8</td>
<td>9,497,001.8</td>
<td>9,429,856.3</td>
<td>9,667,654.0</td>
<td>9,619,975.0</td>
<td>-0.5%</td>
<td></td>
</tr>
</tbody>
</table>

* GFCF: Gross fixed capital formation
# OVERVIEW OF THE SOUTH AFRICAN MINING INDUSTRY

## Key mineral industry statistics for South Africa continued

<table>
<thead>
<tr>
<th>Description</th>
<th>Units of measure</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>Year-on-year % change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining as % of total private non-agricultural employment</td>
<td>%</td>
<td>6.5</td>
<td>6.7</td>
<td>6.7</td>
<td>6.9</td>
<td>7.0</td>
<td>7.1</td>
<td>6.9</td>
<td>6.7</td>
<td>6.5</td>
<td>6.0</td>
<td>6.1</td>
<td></td>
</tr>
<tr>
<td>Mining as % of total non-agricultural formal employment</td>
<td>%</td>
<td>5.3</td>
<td>5.5</td>
<td>5.4</td>
<td>5.5</td>
<td>5.6</td>
<td>5.6</td>
<td>5.4</td>
<td>5.1</td>
<td>4.7</td>
<td>4.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remuneration paid to employees in mining</td>
<td>R'millions current</td>
<td>50,072.9</td>
<td>60,886.4</td>
<td>66,091.6</td>
<td>74,318.5</td>
<td>86,972.1</td>
<td>93,630.5</td>
<td>100,752.7</td>
<td>102,146.4</td>
<td>114,084.9</td>
<td>120,450.1</td>
<td>126,009.9</td>
<td>4.6%</td>
</tr>
<tr>
<td>Remuneration paid to employees in mining</td>
<td>R'millions 2010 prices</td>
<td>67,376.0</td>
<td>81,926.2</td>
<td>88,930.1</td>
<td>100,000.0</td>
<td>117,026.1</td>
<td>125,985.3</td>
<td>135,568.8</td>
<td>137,444.0</td>
<td>153,508.0</td>
<td>162,072.7</td>
<td>169,553.8</td>
<td>4.6%</td>
</tr>
<tr>
<td>Average annual remuneration per mineworker</td>
<td>Rand</td>
<td>101,126.7</td>
<td>117,376.9</td>
<td>134,388.8</td>
<td>148,962.8</td>
<td>169,577.8</td>
<td>178,388.4</td>
<td>197,589.7</td>
<td>207,222.5</td>
<td>237,575.5</td>
<td>263,186.0</td>
<td>272,235.7</td>
<td>3.4%</td>
</tr>
</tbody>
</table>

## EXCHANGE RATES

- **Rand per US$ exchange rate**: R/US$ 7.1, 8.3, 8.4, 7.3, 7.3, 8.2, 9.7, 10.8, 12.8, 14.7, 13.3, -9.5%
- **Rand per Euro**: R/Euro 9.7, 12.1, 11.7, 9.7, 10.1, 10.6, 12.8, 14.4, 14.1, 16.3, 15.0, -7.6%

## COMMODITY PRICES

- **Gold price**: Rand per ounce 4,915.2, 7,198.1, 8,192.0, 8,969.7, 11,381.3, 13,697.7, 13,615.2, 13,730.8, 14,796.4, 18,355.0, 16,764.8, -8.7%
- **Gold price**: US$/oz 696.8, 872.3, 970.9, 1,225.0, 1,569.2, 1,668.4, 1,410.9, 1,266.2, 1,604.0, 1,247.9, 1,259.3, 0.9%
- **Platinum price**: Rand per kg 9,184.1, 12,582.1, 10,056.6, 11,777.2, 12,397.5, 12,721.0, 14,282.8, 14,952.9, 13,309.6, 14,463.7, 12,618.6, -12.8%
- **Platinum price**: US$/oz 1,301.9, 1,524.8, 1,191.9, 1,608.4, 1,709.3, 1,549.5, 1,480.0, 1,378.9, 1,043.8, 983.3, 947.8, -3.6%

*Source: Minerals Council, South African Reserve Bank, Statistics South Africa and Department of Mineral Resources*
**Impact of the CO\(_2\) tax on output, jobs and investment in the mining sector**

<table>
<thead>
<tr>
<th>Year</th>
<th>Gold**</th>
<th>Coal</th>
<th>Other*</th>
<th>Total mining</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>0.5</td>
<td>1.1</td>
<td>2.4</td>
<td>3.9</td>
</tr>
<tr>
<td>2001</td>
<td>0.5</td>
<td>1.1</td>
<td>2.3</td>
<td>3.9</td>
</tr>
<tr>
<td>2002</td>
<td>0.6</td>
<td>1.1</td>
<td>2.4</td>
<td>4.0</td>
</tr>
<tr>
<td>2003</td>
<td>0.6</td>
<td>1.1</td>
<td>2.4</td>
<td>4.1</td>
</tr>
<tr>
<td>2004</td>
<td>0.5</td>
<td>1.2</td>
<td>2.6</td>
<td>4.3</td>
</tr>
<tr>
<td>2005</td>
<td>0.5</td>
<td>1.2</td>
<td>2.7</td>
<td>4.3</td>
</tr>
<tr>
<td>2006</td>
<td>0.6</td>
<td>1.2</td>
<td>2.5</td>
<td>4.3</td>
</tr>
<tr>
<td>2007</td>
<td>0.7</td>
<td>1.2</td>
<td>2.4</td>
<td>4.3</td>
</tr>
<tr>
<td>2008</td>
<td>0.9</td>
<td>1.2</td>
<td>2.0</td>
<td>4.1</td>
</tr>
<tr>
<td>2009</td>
<td>0.9</td>
<td>1.2</td>
<td>1.7</td>
<td>3.8</td>
</tr>
<tr>
<td>2010</td>
<td>1.0</td>
<td>1.2</td>
<td>1.9</td>
<td>4.0</td>
</tr>
<tr>
<td>2011</td>
<td>1.2</td>
<td>1.2</td>
<td>1.6</td>
<td>4.0</td>
</tr>
<tr>
<td>2012</td>
<td>1.2</td>
<td>1.2</td>
<td>1.4</td>
<td>3.9</td>
</tr>
<tr>
<td>2013</td>
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<td>4.1</td>
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<td>2014</td>
<td>1.2</td>
<td>1.3</td>
<td>1.5</td>
<td>4.0</td>
</tr>
<tr>
<td>2015</td>
<td>1.2</td>
<td>1.2</td>
<td>1.7</td>
<td>4.2</td>
</tr>
<tr>
<td>2016</td>
<td>1.5</td>
<td>1.2</td>
<td>1.3</td>
<td>4.0</td>
</tr>
</tbody>
</table>

* Other includes PGMs, iron ore, manganese, chrome etc.

**Gold long-run equation was run on production volumes. It was later converted to monetary values.

**Source:** Minerals Council

Supposing that the CO\(_2\) tax had been introduced in 2000 and that it was not electricity neutral, these tables show the impact on output, jobs and investment.

This assumes an annual electricity price increase of 5%. The CO\(_2\) tax is electricity neutral until 2020.

In deciphering the tables, in 2016 for example, there would have been an output reduction of R4 billion; 5,292 jobs lost and investment reduced by R2.2 billion.
Key points

1. Mining in South Africa is a marginal industry. A slight increase in some of the cost items (electricity, liquid fuels, transport, etc.) impacts on the profitability and sustainability of especially marginal operations, even driving some operations out of business. This results in a number of job losses. Of the three mining real variables modelled in this book – output, employment and investment – electricity prices significantly and negatively affect mining employment. This is not good news for two reasons:

   • Among the major macro-economic objectives of government is increasing employment. The mining sector is one of the country’s major employers, with the second highest median wage earnings, after the utilities sector. Any policy that reduces mining employment should be discouraged. The mining sector, working along with national and provincial governments, is at the centre of driving a number of national government imperatives including job creation and social upliftment through provision of housing, medical and education facilities and local economic development (LED) initiatives in the communities where the mines are located.

   • South African miners are predominantly marginal players; thus, even the smallest increase in costs often results in the shutting down of entire operations or the retrenchment of employees.

2. The Minerals Council’s view is that since mining is a marginal sector, mining companies should be exempted from the CO$_2$ tax, based on the aforementioned rationale.

3. An increase in costs will reduce overall mining output, investment and employment. In our analysis which looked at two industries (gold and coal mining), gold mining will be the most affected by the introduction of the CO$_2$ tax. The impact will be through indirect taxation via the price of electricity (especially after 2020).

4. Mining is a price taker and cannot pass on the effect of the tax to the final price without losing competitiveness, thus negatively impacting on its overall profitability and sustainability of mines. South Africa as an investment destination would not be attractive.
OVERVIEW OF THE SOUTH AFRICAN MINING INDUSTRY  

Mining industry royalties paid (R million)

<table>
<thead>
<tr>
<th></th>
<th>2014/15</th>
<th>% of total</th>
<th>2015/16</th>
<th>% of total</th>
<th>2016/17</th>
<th>% of total</th>
<th>Year-on-year growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>713</td>
<td>13.2%</td>
<td>02</td>
<td>18.9%</td>
<td>1,097</td>
<td>18.9%</td>
<td>56.4%</td>
</tr>
<tr>
<td>Copper</td>
<td>-</td>
<td>0.0%</td>
<td>-</td>
<td>0.0%</td>
<td>-</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Diamond</td>
<td>185</td>
<td>3.4%</td>
<td>93</td>
<td>2.5%</td>
<td>50</td>
<td>4.3%</td>
<td>169.0%</td>
</tr>
<tr>
<td>Gold and uranium</td>
<td>787</td>
<td>14.5%</td>
<td>608</td>
<td>16.4%</td>
<td>930</td>
<td>16.0%</td>
<td>53.0%</td>
</tr>
<tr>
<td>Industrial minerals(^1)</td>
<td>324</td>
<td>6.0%</td>
<td>155</td>
<td>4.2%</td>
<td>70</td>
<td>1.2%</td>
<td>-54.6%</td>
</tr>
<tr>
<td>Iron Ore</td>
<td>2,102</td>
<td>38.8%</td>
<td>643</td>
<td>17.3%</td>
<td>1,629</td>
<td>28.1%</td>
<td>153.2%</td>
</tr>
<tr>
<td>Manganese</td>
<td>115</td>
<td>2.1%</td>
<td>185</td>
<td>5.0%</td>
<td>105</td>
<td>1.8%</td>
<td>-43.4%</td>
</tr>
<tr>
<td>Platinum</td>
<td>548</td>
<td>10.1%</td>
<td>720</td>
<td>19.4%</td>
<td>804</td>
<td>13.9%</td>
<td>11.6%</td>
</tr>
<tr>
<td>Zinc</td>
<td>13</td>
<td>0.2%</td>
<td>5</td>
<td>0.1%</td>
<td>8</td>
<td>0.1%</td>
<td>52.2%</td>
</tr>
<tr>
<td>Other(^2)</td>
<td>34</td>
<td>11.7%</td>
<td>597</td>
<td>16.1%</td>
<td>909</td>
<td>15.7%</td>
<td>52.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>5,422</td>
<td>100.0%</td>
<td>3,708</td>
<td>100.0%</td>
<td>5,802</td>
<td>100.0%</td>
<td>56.5%</td>
</tr>
</tbody>
</table>

\(^1\) Industrial minerals are geological materials mined for their commercial value, not mineral fuels and not sources of metallic minerals. They are used in their natural state or after beneficiation either as raw materials or as additives in a wide range of applications (industrial minerals are all those minerals other than gold, PGMs, coal, iron ore, chrome, manganese, diamonds, etc.).

\(^2\) The commodities grouped under Other are: chrome, fluor spar, nickel, oil and gas, phosphates, vanadium and unspecified.

Movement in commodity prices has been mixed, with some commodities having recovered from the financial crisis of 2007/08, which boosted exploration budgets.

Globally, in 2017, mining firms spent R111.7 billion in exploration up from R97.1 billion the previous year. As has been the trend in recent years, Latin America remained the most popular attraction in gold mining exploration. Africa attracted 14% of the global exploration budget. In Africa the top four attractive destinations were the Democratic Republic of the Congo, Burkina Faso, Tanzania and South Africa. In 2017, South African companies spent over R11 billion in exploration compared to R14.1 billion the previous year.
OVERVIEW
OF THE SOUTH AFRICAN MINING INDUSTRY
continued

South Africa’s share of African exploration budgets: 2000-2017 (%)

![Graph showing South Africa's share of African exploration budgets from 2000 to 2017.]

Source: S&P Global Market Intelligence

South Africa’s exploration budgets: 2000-2017 (US$)

![Graph showing South Africa’s exploration budgets from 2000 to 2017.]

Source: S&P Global Market Intelligence

Kumba Iron Ore – Klipbankfontein Leeuwfontein pit phase 5 and 6, East viewpoint
South Africa’s role in world mineral reserves, production and exports 2017 (latest available data)

<table>
<thead>
<tr>
<th>Commodity</th>
<th>unit</th>
<th>South Africa</th>
<th>World</th>
<th>Location of major reserves</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Reserves</td>
<td>Reserves</td>
<td>%</td>
</tr>
<tr>
<td>Aluminium</td>
<td>kt</td>
<td>715</td>
<td>72,500</td>
<td>0.9</td>
</tr>
<tr>
<td>Antimony (metal)</td>
<td>kt</td>
<td>27</td>
<td>1,500,000</td>
<td>1.8</td>
</tr>
<tr>
<td>Chromium</td>
<td>Mt</td>
<td>200,000</td>
<td>500,000</td>
<td>40.0</td>
</tr>
<tr>
<td>Coal</td>
<td>Mt</td>
<td>16,044</td>
<td>1,100,000,000</td>
<td>*</td>
</tr>
<tr>
<td>Copper</td>
<td>kt</td>
<td>*</td>
<td>720,000</td>
<td>*</td>
</tr>
<tr>
<td>Diamond</td>
<td></td>
<td>70</td>
<td>750</td>
<td>9.3</td>
</tr>
<tr>
<td>Gold (metal)</td>
<td>t</td>
<td>6,000</td>
<td>57,000</td>
<td>10.5</td>
</tr>
<tr>
<td>Iron ore</td>
<td>Mt</td>
<td>770</td>
<td>82,000</td>
<td>0.9</td>
</tr>
<tr>
<td>Lead (metal)</td>
<td>Mt</td>
<td>300</td>
<td>88,000</td>
<td>0.3</td>
</tr>
<tr>
<td>Manganese (metal)</td>
<td>kt</td>
<td>200,000</td>
<td>690,000</td>
<td>28.9</td>
</tr>
<tr>
<td>Nickel</td>
<td>Mt</td>
<td>3,700</td>
<td>78,000</td>
<td>4.7</td>
</tr>
<tr>
<td>Platinum group metals</td>
<td>t</td>
<td>63,000</td>
<td>67,000</td>
<td>94.0</td>
</tr>
<tr>
<td>Silicon (metal)</td>
<td>Mt</td>
<td>84</td>
<td>7,200</td>
<td>0.1</td>
</tr>
<tr>
<td>Silver (metal)</td>
<td>t</td>
<td>*</td>
<td>570,000</td>
<td>*</td>
</tr>
<tr>
<td>Uranium (metal, up to $US80/kg)</td>
<td>t</td>
<td>279,100</td>
<td>570,000</td>
<td>5.2</td>
</tr>
<tr>
<td>Zirconium minerals (metals)</td>
<td>kt</td>
<td>14,000</td>
<td>75,000</td>
<td>18.6</td>
</tr>
</tbody>
</table>

Source: Department of Mineral Resources and US Geological Survey, Reston, Virginia
* Not available
MINING PLAYS A BIG ROLE IN SOUTH AFRICA

Mining offers not only employment but also supports the respective provincial economies. In the communities where mining firms operate, they have built schools, clinics, and other social infrastructure such as roads and housing for employees, thus improving the quality of life of community members. They have also directly and indirectly supported recreational activities.

Provincial overview (latest available data)

<table>
<thead>
<tr>
<th>Provinicial overview (2017)</th>
<th>Eastern Cape</th>
<th>Free State</th>
<th>Gauteng</th>
<th>KwaZulu-Natal and Pietermaritzburg</th>
<th>Limpopo</th>
<th>Mpumalanga</th>
<th>North West</th>
<th>Northern Cape</th>
<th>Western Cape</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital</td>
<td>Bhisho</td>
<td>Bloemfontein</td>
<td>Johannesburg</td>
<td>Pietermaritzburg</td>
<td>Polokwane</td>
<td>Nelspruit</td>
<td>Mafikeng</td>
<td>Kimberley</td>
<td>Cape Town</td>
</tr>
<tr>
<td>Total area (000km²)</td>
<td>168,965</td>
<td>129,825</td>
<td>18178</td>
<td>94,361</td>
<td>125,753</td>
<td>76,494</td>
<td>104,881</td>
<td>372,889</td>
<td>129,462</td>
</tr>
<tr>
<td>% of SA area (province)</td>
<td>13.8</td>
<td>10.6</td>
<td>1.4</td>
<td>7.7</td>
<td>10.3</td>
<td>6.3</td>
<td>8.6</td>
<td>10.3</td>
<td>10.6</td>
</tr>
<tr>
<td>Total population (2016 census)</td>
<td>6,996,976</td>
<td>2,834,714</td>
<td>13,399,724</td>
<td>11,065,240</td>
<td>5,799,090</td>
<td>4,335,964</td>
<td>3,748,435</td>
<td>1,193,780</td>
<td>6,279,730</td>
</tr>
<tr>
<td>% of total SA population</td>
<td>12.6%</td>
<td>5.1%</td>
<td>24.1%</td>
<td>19.9%</td>
<td>10.4%</td>
<td>7.8%</td>
<td>6.7%</td>
<td>2.1%</td>
<td>11.3%</td>
</tr>
<tr>
<td>Real gross value added at basic prices, R millions constant 2010 prices</td>
<td>210.8</td>
<td>143.7</td>
<td>975.4</td>
<td>446.8</td>
<td>199.1</td>
<td>201.0</td>
<td>60.7</td>
<td>168.3</td>
<td>387.7</td>
</tr>
<tr>
<td>Mining GDP 2010 (R’ billions - nominal terms 2016)</td>
<td>0.60</td>
<td>18.06</td>
<td>22.34</td>
<td>8.30</td>
<td>55.51</td>
<td>49.93</td>
<td>17.27</td>
<td>52.34</td>
<td>0.95</td>
</tr>
<tr>
<td>Mining (% contribution to provincial GDP 2016)</td>
<td>0.3</td>
<td>12.6</td>
<td>2.3</td>
<td>1.9</td>
<td>27.9</td>
<td>24.8</td>
<td>28.4</td>
<td>31.1</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Source: Statistics South Africa, Department of Trade and Industry, Department of Mineral Resources and Minerals Council
### Employment by commodity: 2005-2017

<table>
<thead>
<tr>
<th>Year</th>
<th>Gold</th>
<th>PGM</th>
<th>Diamonds</th>
<th>Chrome</th>
<th>Iron ore</th>
<th>Manganese</th>
<th>Coal</th>
<th>Aggregate and sand</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>160,635</td>
<td>155,034</td>
<td>22,033</td>
<td>7,894</td>
<td>7,492</td>
<td>3,335</td>
<td>56,971</td>
<td>4,080</td>
</tr>
<tr>
<td>2006</td>
<td>159,782</td>
<td>168,530</td>
<td>19,686</td>
<td>7,899</td>
<td>8,859</td>
<td>3,333</td>
<td>57,777</td>
<td>5,210</td>
</tr>
<tr>
<td>2007</td>
<td>166,064</td>
<td>186,410</td>
<td>19,471</td>
<td>9,796</td>
<td>13,857</td>
<td>3,239</td>
<td>60,439</td>
<td>5,133</td>
</tr>
<tr>
<td>2008</td>
<td>166,423</td>
<td>199,948</td>
<td>18,474</td>
<td>12,279</td>
<td>13,257</td>
<td>3,976</td>
<td>65,484</td>
<td>5,834</td>
</tr>
<tr>
<td>2009</td>
<td>159,926</td>
<td>184,162</td>
<td>11,601</td>
<td>10,966</td>
<td>13,728</td>
<td>5,003</td>
<td>70,791</td>
<td>6,427</td>
</tr>
<tr>
<td>2010</td>
<td>157,019</td>
<td>181,969</td>
<td>11,467</td>
<td>13,982</td>
<td>18,216</td>
<td>5,879</td>
<td>74,025</td>
<td>6,852</td>
</tr>
<tr>
<td>2011</td>
<td>144,799</td>
<td>194,745</td>
<td>12,047</td>
<td>16,911</td>
<td>22,360</td>
<td>7,460</td>
<td>78,580</td>
<td>7,009</td>
</tr>
<tr>
<td>2012</td>
<td>142,200</td>
<td>197,752</td>
<td>12,332</td>
<td>19,762</td>
<td>23,380</td>
<td>8,685</td>
<td>83,244</td>
<td>7,122</td>
</tr>
<tr>
<td>2013</td>
<td>131,738</td>
<td>191,260</td>
<td>13,579</td>
<td>18,358</td>
<td>21,127</td>
<td>9,842</td>
<td>88,039</td>
<td>7,719</td>
</tr>
<tr>
<td>2014</td>
<td>119,007</td>
<td>186,864</td>
<td>15,356</td>
<td>18,658</td>
<td>20,554</td>
<td>9,971</td>
<td>86,106</td>
<td>7,510</td>
</tr>
<tr>
<td>2015</td>
<td>115,029</td>
<td>186,465</td>
<td>18,313</td>
<td>18,450</td>
<td>20,554</td>
<td>8,639</td>
<td>77,747</td>
<td>7,421</td>
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<tr>
<td>2016</td>
<td>116,506</td>
<td>172,424</td>
<td>18,803</td>
<td>15,450</td>
<td>16,600</td>
<td>7,242</td>
<td>77,229</td>
<td>7,525</td>
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<tr>
<td>2017</td>
<td>112,200</td>
<td>172,171</td>
<td>17,991</td>
<td>17,991</td>
<td>17,345</td>
<td>7,981</td>
<td>82,248</td>
<td>7,602</td>
</tr>
</tbody>
</table>

Source: Department of Mineral Resources
### Total employee earnings by commodity (R'000)

<table>
<thead>
<tr>
<th>Year</th>
<th>Diamonds</th>
<th>Gold</th>
<th>Platinum group metals</th>
<th>Chromite</th>
<th>Iron ore</th>
<th>Manganese</th>
<th>Aggregate and sand</th>
<th>Coal</th>
<th>Dimension stone</th>
<th>Limestone</th>
<th>Salt</th>
<th>Other mines</th>
<th>South Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>1,072,164</td>
<td>9,846,411</td>
<td>4,373,273</td>
<td>325,815</td>
<td>345,814</td>
<td>133,244</td>
<td>158,611</td>
<td>4,287,493</td>
<td>82,010</td>
<td>149,925</td>
<td>19,234</td>
<td>1,334,320</td>
<td>22,128,314</td>
</tr>
<tr>
<td>2001</td>
<td>1,290,555</td>
<td>10,903,634</td>
<td>4,915,313</td>
<td>379,309</td>
<td>379,713</td>
<td>133,279</td>
<td>154,038</td>
<td>4,451,185</td>
<td>86,595</td>
<td>158,131</td>
<td>21,662</td>
<td>1,495,105</td>
<td>24,368,519</td>
</tr>
<tr>
<td>2002</td>
<td>2,051,312</td>
<td>12,323,540</td>
<td>5,936,849</td>
<td>379,783</td>
<td>379,713</td>
<td>133,279</td>
<td>154,038</td>
<td>4,451,185</td>
<td>86,595</td>
<td>158,131</td>
<td>21,662</td>
<td>1,495,105</td>
<td>24,368,519</td>
</tr>
<tr>
<td>2003</td>
<td>2,382,937</td>
<td>14,506,401</td>
<td>7,243,123</td>
<td>419,776</td>
<td>523,607</td>
<td>211,635</td>
<td>203,082</td>
<td>5,481,105</td>
<td>84,714</td>
<td>185,532</td>
<td>27,062</td>
<td>1,959,123</td>
<td>30,827,556</td>
</tr>
<tr>
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<td>16,496,400</td>
<td>9,063,872</td>
<td>468,816</td>
<td>575,174</td>
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<td>223,623</td>
<td>31,519</td>
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<tr>
<td>2005</td>
<td>2,167,797</td>
<td>17,371,250</td>
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<td>293,319</td>
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<td>230,035</td>
<td>35,518</td>
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<td>39,447,907</td>
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<td>18,341,043</td>
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<td>683,582</td>
<td>319,894</td>
<td>371,897</td>
<td>6,481,823</td>
<td>98,177</td>
<td>251,895</td>
<td>39,014</td>
<td>2,162,490</td>
<td>36,682,979</td>
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<tr>
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<td>2,192,902</td>
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<td>36,682,979</td>
</tr>
</tbody>
</table>

**Source:** Department of Mineral Resources
SAFETY
The Minerals Council and its member companies remain committed to the industry’s goal of zero harm for all people working at our operations - employees and contractors. The Minerals Council continues to be actively involved in a number of initiatives and partnerships aimed at eliminating fatalities and injuries in the mining industry.

Our Safety and Sustainable Development Department plays an important facilitative and co-ordinating role in the implementation of the 2024 milestones for mine health and safety in a manner that accelerates the achievement of the industry’s goal of zero harm. We achieve this through engagement with the Minerals Council’s Occupational Health and Safety Policy Committee, the Mining Occupational Safety and Health (MOSH) Learning Hub and the CEO Zero Harm Forum. We also engage with regional associations, including the Association of Mine Managers of South Africa (AMMSA) and the South African Colliery Managers’ Association (SACMA), the Department of Mineral Resources (DMR) and organised labour, through the Mine Health and Safety Council (MHSC), and with international industry bodies through the Minerals Council’s membership of the International Council on Mining and Metals (ICMM).

SAFETY PERFORMANCE AND TARGETS
During the 2014 MHSC Summit, all stakeholders agreed that we needed to accelerate the elimination of fatalities. The occupational safety milestone was therefore set to eliminate fatalities by December 2020 and to emphasise that every fatality was one too many.

A total of 88 fatalities were reported in 2017, compared with 73 fatalities recorded during the corresponding period in 2016. This marks a regression of 17% in fatalities, the first in 10 years. The regression in 2017 was compounded by multiple fatalities resulting from gravity and seismicity induced falls of ground.

The 2014 MHSC Summit occupational health milestone states that up to December 2016, there should be a 20% reduction in serious injuries every year, while from January 2017, there should be a 20% reduction in lost time injuries (LTIs). Up to 18 December 2017, the overall number of serious injuries reported was 2,534 compared with 2,785 during the same period in 2016. Although below the annual milestone reduction target of 20%, this is an improvement of 9%, which marks a second consecutive reduction in the number of serious injuries.

Since the last quarter of 2017, the Minerals Council and its members have taken the
following steps in response to the regression in mine fatalities:

- On 20 September 2017, the MOSH Learning Hub facilitated a “day of learning” workshop on seismicity so that lessons could be shared and relevant research identified following recent seismic events. The participants (from the platinum and gold sectors) unanimously expressed the need for preconditioning research as mine depths continue to increase.

- On 3 November 2017, upon reflection on the year-to-date occupational health and safety performance, the CEO Zero Harm Forum sent a letter to the Acting Chief Inspector of Mines and organised labour, expressing disappointment at the regression and highlighting some of the steps being taken by the CEOs in 2017 to hasten the journey to zero harm.

- The Minerals Council issued a media statement expressing disappointment at the increase in the number of fatalities.

- On 7 November 2017, the Minerals Council CEO delegation met with the Deputy Minister of Mineral Resources to discuss the regression as well as a proposal to accelerate an improvement in the industry’s occupational health and safety performance.

- The Minerals Council supported the MHSC Tripartite Leadership event in December 2017 to identify initiatives that would lead to reductions in fatalities, and greater compliance and collaboration.

- The Minerals Council, the South African Mining Development Association (SAMDA), the DMR, organised labour and the MHSC issued a joint media statement expressing grave concern about the regression in the rate of fatalities, despite progress and successes achieved by the industry over the past 20 years, towards improving the industry’s occupational health and safety performance.

Industry, unions and government signalled their intent to achieve further progress at the 2016 biennial MHSC Summit on Mine Health and Safety when all tripartite stakeholders signed a declaration to improve mine health and safety performance, harness the achievement of 2024 occupational health milestones and accelerate the industry’s journey to zero harm. The declaration of actions focuses on building tripartite visible felt leadership, building trust among stakeholders at various levels, aligning communication on zero harm among stakeholders, empowering employees and supervisors, and hosting annual health and safety days tailored to the respective needs of companies as part of their health and safety campaigns. In November 2018, industry tripartite stakeholders will convene a biennial Mine Health and Safety Summit to review progress in the implementation of occupational health and safety milestones.
OVERVIEW OF THE SOUTH AFRICAN MINING INDUSTRY continued

Number of fatalities by industry: 2007-2017

<table>
<thead>
<tr>
<th>Year</th>
<th>All</th>
<th>Gold</th>
<th>Platinum</th>
<th>Coal</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>220</td>
<td>115</td>
<td>53</td>
<td>15</td>
<td>37</td>
</tr>
<tr>
<td>2008</td>
<td>171</td>
<td>85</td>
<td>36</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>2009</td>
<td>166</td>
<td>81</td>
<td>41</td>
<td>18</td>
<td>26</td>
</tr>
<tr>
<td>2010</td>
<td>127</td>
<td>62</td>
<td>34</td>
<td>12</td>
<td>19</td>
</tr>
<tr>
<td>2011</td>
<td>123</td>
<td>51</td>
<td>37</td>
<td>12</td>
<td>23</td>
</tr>
<tr>
<td>2012</td>
<td>112</td>
<td>51</td>
<td>28</td>
<td>11</td>
<td>22</td>
</tr>
<tr>
<td>2013</td>
<td>93</td>
<td>37</td>
<td>27</td>
<td>7</td>
<td>22</td>
</tr>
<tr>
<td>2014</td>
<td>84</td>
<td>44</td>
<td>15</td>
<td>9</td>
<td>16</td>
</tr>
<tr>
<td>2015</td>
<td>77</td>
<td>33</td>
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<td>5</td>
<td>18</td>
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<tr>
<td>2016</td>
<td>73</td>
<td>30</td>
<td>28</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>2017</td>
<td>88</td>
<td>39</td>
<td>27</td>
<td>10</td>
<td>12</td>
</tr>
</tbody>
</table>

Source: Department of Mineral Resources

Industry fatality frequency rate (FFR) per million hours worked

Gold fatality frequency rate (FFR) per million hours worked

Platinum fatality frequency rate (FFR) per million hours worked

Coal fatality frequency rate (FFR) per million hours worked

Source: Department of Mineral Resources
HEALTH
The key health challenges in the mining industry are occupational lung diseases (silicosis, coal worker’s pneumoconiosis, occupational TB, etc.) and noise-induced hearing loss (NIHL). The industry has set targets for the elimination of these, and monitors incidence of exposures and diseases.

The Minerals Council has an occupational health reporting system but data for the whole industry is collated by the DMR.

HEALTH TARGETS AND PERFORMANCE

Targets
The mining industry adopted the 2014 Occupational Health and Safety Summit milestones in November 2014. To review progress in achieving these targets, the next biennial summit of the MHSC has been scheduled for November 2018.

Performance
The DMR publishes an annual report on occupational health statistics, including HIV/Aids, in October. The report includes data submitted to the DMR every year. Data from the Minerals Council and the DMR is used in reporting on the health performance of the mining sector.

Occupational hygiene
Occupational hygiene measurements and milestones are ideal in assessing performance as they are early indicators. According to the 2016 report submitted to the DMR, there was an overall reduction in over-exposure to occupational hygiene stressors.

The DMR does not report specifically on silica and coal dust exposure but the total airborne pollutants in a classification band (≥ occupational exposure limit) decreased from 4.73% in 2015 to 3.66% in 2016. The percentage of employees exposed to excessive noise has reduced from 90.6% in 2006 to 68.4% in 2016. Further reductions are required to prevent NIHL.

Cases of TB declined by 9.8% from 2015 to 2016. DMR data shows that HIV counselling in the industry improved from 62.9% in 2015 to 65.7% in 2016 while screening for TB also increased from 88.7% in 2015 to 96% in 2016. Our data show HIV counselling rates of 78% and 87% screening for TB. The industry milestone is counselling 100% of employees, which has not yet been met.

TB cases diagnosed in the industry: 2004-2017 (Minerals Council vs Department of Mineral Resources)*

Source: Data as per DMR IR4 Reports 2013-2015 and the then Chamber Reporting System 2015-2016

Harmony – Doornkop clinic
OVERVIEW OF THE SOUTH AFRICAN MINING INDUSTRY continued

Pulmonary tuberculosis: 2006-2016*

<table>
<thead>
<tr>
<th>Year</th>
<th>Gold</th>
<th>Platinum</th>
<th>Coal</th>
<th>Diamonds</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
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<td>2006</td>
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</tr>
<tr>
<td>2009</td>
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<td>935</td>
<td>16</td>
<td>1,697</td>
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<td>4,468</td>
</tr>
<tr>
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<td>1,696</td>
<td>1,005</td>
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<td>1,055</td>
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<td>2012</td>
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<td>1,134</td>
<td>1,696</td>
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<td>2,839</td>
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<td>1,436</td>
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<tr>
<td>2015</td>
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<td>1,134</td>
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<td>1,134</td>
<td>1,666</td>
<td>1,055</td>
<td>2,580</td>
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</table>

NIHL: 2006-2016*

<table>
<thead>
<tr>
<th>Year</th>
<th>Gold</th>
<th>Platinum</th>
<th>Coal</th>
<th>Diamonds</th>
<th>Other</th>
<th>Total</th>
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<td>626</td>
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<td>590</td>
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<td>2010</td>
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<td>117</td>
<td>93</td>
<td>1,994</td>
</tr>
<tr>
<td>2011</td>
<td>83</td>
<td>74</td>
<td>69</td>
<td>117</td>
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<td>1,994</td>
</tr>
<tr>
<td>2012</td>
<td>83</td>
<td>74</td>
<td>69</td>
<td>117</td>
<td>93</td>
<td>1,994</td>
</tr>
<tr>
<td>2013</td>
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<td>2014</td>
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<td>74</td>
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<td>117</td>
<td>93</td>
<td>1,994</td>
</tr>
<tr>
<td>2015</td>
<td>83</td>
<td>74</td>
<td>69</td>
<td>117</td>
<td>93</td>
<td>1,994</td>
</tr>
<tr>
<td>2016</td>
<td>83</td>
<td>74</td>
<td>69</td>
<td>117</td>
<td>93</td>
<td>1,994</td>
</tr>
</tbody>
</table>

* 2017 figures are yet to be released

Source: Department of Mineral Resources
OVERVIEW
OF THE SOUTH AFRICAN MINING INDUSTRY

Silicosis: 2006-2016*

<table>
<thead>
<tr>
<th>Year</th>
<th>Gold</th>
<th>Platinum</th>
<th>Coal</th>
<th>Diamonds</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
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<td>10</td>
<td>4</td>
<td>1,537</td>
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<tr>
<td>2007</td>
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<td>24</td>
<td>9</td>
<td>9</td>
<td>11</td>
<td>1,609</td>
</tr>
<tr>
<td>2008</td>
<td>1,671</td>
<td>78</td>
<td>7</td>
<td>6</td>
<td>16</td>
<td>1,778</td>
</tr>
<tr>
<td>2009</td>
<td>1,430</td>
<td>165</td>
<td>2</td>
<td>2</td>
<td>95</td>
<td>1,694</td>
</tr>
<tr>
<td>2010</td>
<td>1,642</td>
<td>89</td>
<td>3</td>
<td>2</td>
<td>8</td>
<td>1,742</td>
</tr>
<tr>
<td>2011</td>
<td>1,095</td>
<td>129</td>
<td>3</td>
<td>2</td>
<td>60</td>
<td>1,286</td>
</tr>
<tr>
<td>2012</td>
<td>1,115</td>
<td>277</td>
<td>5</td>
<td>5</td>
<td>19</td>
<td>1,420</td>
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<tr>
<td>2013</td>
<td>1,164</td>
<td>217</td>
<td>8</td>
<td>8</td>
<td>30</td>
<td>1,430</td>
</tr>
<tr>
<td>2014</td>
<td>837</td>
<td>178</td>
<td>8</td>
<td>8</td>
<td>39</td>
<td>1,063</td>
</tr>
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<td>2015</td>
<td>619</td>
<td>171</td>
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<td>26</td>
<td>19</td>
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<tr>
<td>2016</td>
<td>543</td>
<td>68</td>
<td>3</td>
<td>3</td>
<td>18</td>
<td>635</td>
</tr>
</tbody>
</table>

* 2017 figures are yet to be released
Source: Department of Mineral Resources

Harmony – Target mine health hub
MINING COST INFLATION

In 2017 the Minerals Council developed a composite mining input cost index. The objective of the index is to measure input cost inflation in the mining sector. Through this index, we can quantify the quantum movement of inputs costs, and when compared against the percentage movement in selling prices, we are able to make deductions about profitability in the sector.

Importantly, the index also has simulation properties, and has to date been successfully used in simulating the impact of the 19% electricity tariff by Eskom on the mining sector. The same has been done for the Regulatory Clearing Account (RCA) application by Eskom to the National Energy Regulator of South Africa (NERSA) and was also used during wage negotiations for simulating the impact of wage demand on the overall inflation curve.

The table alongside depicts the make up of the index, that is, the input components included in the index, as well as their respective shares to the total input costs.

<table>
<thead>
<tr>
<th>Cost basket</th>
<th>Total mining</th>
<th>Coal</th>
<th>Gold and uranium ore</th>
<th>Other mining</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intermediate cost basket</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mining and quarrying</td>
<td>1.22%</td>
<td>0.18%</td>
<td>0.39%</td>
<td>0.13%</td>
</tr>
<tr>
<td>Wood and wood products</td>
<td>1.52%</td>
<td>0.44%</td>
<td>8.37%</td>
<td>0.43%</td>
</tr>
<tr>
<td>Coke and refined petroleum</td>
<td>1.32%</td>
<td>1.54%</td>
<td>1.19%</td>
<td>1.28%</td>
</tr>
<tr>
<td>Basic chemicals</td>
<td>1.85%</td>
<td>1.03%</td>
<td>4.98%</td>
<td>1.45%</td>
</tr>
<tr>
<td>Other chemicals and man-made fibres</td>
<td>2.98%</td>
<td>3.20%</td>
<td>4.96%</td>
<td>2.52%</td>
</tr>
<tr>
<td>Rubber products</td>
<td>1.41%</td>
<td>2.46%</td>
<td>1.58%</td>
<td>1.08%</td>
</tr>
<tr>
<td>Metal products excluding machinery</td>
<td>1.85%</td>
<td>2.12%</td>
<td>3.92%</td>
<td>1.36%</td>
</tr>
<tr>
<td>Machinery and equipment</td>
<td>5.11%</td>
<td>5.86%</td>
<td>8.07%</td>
<td>4.30%</td>
</tr>
<tr>
<td>Electrical machinery and apparatus</td>
<td>0.93%</td>
<td>1.51%</td>
<td>1.59%</td>
<td>0.63%</td>
</tr>
<tr>
<td>Transport equipment</td>
<td>1.39%</td>
<td>1.47%</td>
<td>2.17%</td>
<td>1.20%</td>
</tr>
<tr>
<td>Electricity, gas and water</td>
<td>5.79%</td>
<td>3.00%</td>
<td>16.60%</td>
<td>4.37%</td>
</tr>
<tr>
<td>Wholesale and retail trade</td>
<td>4.93%</td>
<td>5.90%</td>
<td>7.38%</td>
<td>4.17%</td>
</tr>
<tr>
<td>Transport and storage</td>
<td>43.89%</td>
<td>43.04%</td>
<td>2.32%</td>
<td>52.49%</td>
</tr>
<tr>
<td>Finance, insurance, real estate and business services</td>
<td>4.69%</td>
<td>4.71%</td>
<td>10.14%</td>
<td>3.59%</td>
</tr>
<tr>
<td>Community, social and personal:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other producers</td>
<td>2.22%</td>
<td>2.22%</td>
<td>3.45%</td>
<td>1.97%</td>
</tr>
<tr>
<td>Imported Intermediate Inputs</td>
<td>18.92%</td>
<td>21%</td>
<td>22.66%</td>
<td>18.91%</td>
</tr>
<tr>
<td>Total intermediate costs (excl labour)</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Intermediate costs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compensation of employees</td>
<td>65%</td>
<td>69%</td>
<td>47%</td>
<td>69.5%</td>
</tr>
<tr>
<td>Total input costs</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Import adjustment</td>
<td>0.8125</td>
<td>0.7946</td>
<td>0.7873</td>
<td>0.8221</td>
</tr>
</tbody>
</table>
The graph and table on this page depict the patterns of the input cost index between 2013 and 2017. The table is particularly concerning in that it shows that input costs have persistently been increasing at a pace faster than selling prices, which is indicative of profit margin compression. This is consistent with the picture observed in the mining industry of the continued effort by mining companies to rationalise costs and downsizing operations. This index is updated on a monthly basis.

### Mining input cost index: Year-on-year 2013-2017

<table>
<thead>
<tr>
<th>Year</th>
<th>Total mining</th>
<th>Coal</th>
<th>Gold and uranium</th>
<th>Other mining</th>
<th>Total mining</th>
<th>Coal (Rand)</th>
<th>Gold price (Rand)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>10.5</td>
<td>10.5</td>
<td>11.3</td>
<td>10.4</td>
<td>5.4</td>
<td>5.8</td>
<td>-1.2</td>
</tr>
<tr>
<td>2014</td>
<td>10.4</td>
<td>10.2</td>
<td>12.0</td>
<td>10.0</td>
<td>4.1</td>
<td>3.5</td>
<td>1.3</td>
</tr>
<tr>
<td>2015</td>
<td>3.6</td>
<td>3.4</td>
<td>4.6</td>
<td>3.6</td>
<td>-4.1</td>
<td>-3.6</td>
<td>7.6</td>
</tr>
<tr>
<td>2016</td>
<td>8.7</td>
<td>8.4</td>
<td>10.5</td>
<td>8.3</td>
<td>11.4</td>
<td>5.6</td>
<td>24.1</td>
</tr>
<tr>
<td>2017</td>
<td>11.0</td>
<td>9.6</td>
<td>13.7</td>
<td>10.5</td>
<td>10.0</td>
<td>10.9</td>
<td>-8.5</td>
</tr>
<tr>
<td>Average (2013-2017)</td>
<td>8.9</td>
<td>8.4</td>
<td>10.4</td>
<td>8.6</td>
<td>5.4</td>
<td>4.4</td>
<td>4.7</td>
</tr>
</tbody>
</table>

**Source:** Minerals Council
South Africa was responsible for 4.2% of global gold production in 2017. And while the country has the deepest gold mines in the world it has the third largest gold reserves (6,000 tonnes) after Australia (9,500 tonnes) and Russia (8,000 tonnes).

While the number of people employed in the sector has been on the decline since 2007, total employee earnings have soared from R14.7 billion in 2007 to R29.5 billion in 2017.

Between 2016 and 2017, local sales (in volume) increased by 33% to 34 tonnes, and exports increased 19% to 119.6 tonnes, despite production having dropped 3.6% from 142 tonnes to 136 tonnes over the same period.

TOTAL SALES OF GOLD AMOUNTED TO R82.7 BILLION IN 2017.

**Source:** Department of Mineral Resources, Thomson Reuters and Minerals Council
GOLD continued

SOUTH AFRICA ACCOUNTED FOR 4.2% OF GLOBAL GOLD PRODUCTION IN 2017.

The figure alongside shows that the rand gold price is more volatile than both the rand-dollar exchange rate and the dollar gold price. This presents a major challenge for South African gold producers as it impacts on their ability to plan.
The table below depicts the mean and standard deviation of the actual values of the three series: rand/dollar exchange rate, gold price in dollars and the gold price in rands.

**Mean and standard deviation in actual values**

<table>
<thead>
<tr>
<th></th>
<th>R/$</th>
<th>Gold price in US$/oz</th>
<th>Gold price in R/oz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard deviation (Jan 1994-Feb 2018)</td>
<td>2.94</td>
<td>471.29</td>
<td>5,648.99</td>
</tr>
<tr>
<td>Mean/average (Jan 1994-Feb 2018)</td>
<td>7.89</td>
<td>757.67</td>
<td>6,747.05</td>
</tr>
<tr>
<td>Standard deviation (Mar 2013-Feb 2018)</td>
<td>1.83</td>
<td>89.72</td>
<td>1,978.49</td>
</tr>
<tr>
<td>Mean/average (Mar 2013-Feb 2018)</td>
<td>12.36</td>
<td>1,258.01</td>
<td>15,470.82</td>
</tr>
<tr>
<td>Standard deviation (Mar 2008-Feb 2013)</td>
<td>0.88</td>
<td>331.53</td>
<td>2,700.97</td>
</tr>
<tr>
<td>Mean/average (Mar 2008-Feb 2013)</td>
<td>7.97</td>
<td>1,291.00</td>
<td>10,200.60</td>
</tr>
<tr>
<td>Standard deviation (Mar 2003-Feb 2008)</td>
<td>0.54</td>
<td>147.67</td>
<td>1,108.28</td>
</tr>
<tr>
<td>Mean/average (Mar 2003-Feb 2008)</td>
<td>6.80</td>
<td>532.54</td>
<td>3,637.66</td>
</tr>
<tr>
<td>Standard deviation (Mar 1999-Feb 2003)</td>
<td>1.78</td>
<td>25.29</td>
<td>625.04</td>
</tr>
<tr>
<td>Mean/average (Mar 1999-Feb 2003)</td>
<td>8.14</td>
<td>288.86</td>
<td>2,366.19</td>
</tr>
</tbody>
</table>

How to read the table:

- For the rand exchange rate against the dollar (R/$), in the period Jan 1994 - Feb 2018 the average monthly rand/US dollar rate was 7.89 whilst the standard deviation was 2.94 i.e. the R/$ could fluctuate an average of -+R2.94 in this period.

- On the other hand, in the same period, the dollar gold price averaged $757.67 with a standard deviation of -+$471.29/oz.

- In the same period, the average gold price was R6,747.05/oz with a standard deviation of -+R5,649/oz.

- Why the rand exchange rate matters for the South African mining sector.

Because of such volatility, gold producers spend huge amounts of money hedging against currency fluctuations. For example, in 2017, gold miners lost slightly over R1 billion as a result of hedging against currency and price fluctuations.

Over the period from January 1994 to February 2018, the gold price averaged R6,747/oz. The higher standard deviation in the rand price of gold is a cause for concern for gold producers because input costs (including value-added items) in the gold industry are denominated in the domestic currency.
### Employment and earnings: South African gold mines

<table>
<thead>
<tr>
<th>Year</th>
<th>Gold mining employees</th>
<th>Earnings (R'000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>166,064</td>
<td>14,506,401</td>
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<tr>
<td>2008</td>
<td>166,423</td>
<td>15,960,051</td>
</tr>
<tr>
<td>2009</td>
<td>159,926</td>
<td>17,371,250</td>
</tr>
<tr>
<td>2010</td>
<td>157,019</td>
<td>19,877,668</td>
</tr>
<tr>
<td>2011</td>
<td>144,799</td>
<td>20,840,802</td>
</tr>
<tr>
<td>2012</td>
<td>142,200</td>
<td>22,238,338</td>
</tr>
<tr>
<td>2013</td>
<td>131,738</td>
<td>23,930,042</td>
</tr>
<tr>
<td>2014</td>
<td>119,007</td>
<td>23,383,408</td>
</tr>
<tr>
<td>2015</td>
<td>115,055</td>
<td>24,582,438</td>
</tr>
<tr>
<td>2016</td>
<td>112,479</td>
<td>28,731,311</td>
</tr>
<tr>
<td>2017</td>
<td>112,200</td>
<td>29,027,067</td>
</tr>
</tbody>
</table>

**Source:** Department of Mineral Resources and Minerals Council

---

**Graph:**

Gold mining employees and earnings

- **Number of employees**
- **Employee earnings (R’000)**

**Source:** Department of Mineral Resources and Minerals Council

---

DRDGOLD – Rehabilitation efforts at the DRDGOLD Ergo operations
PGMs

KEY 2017 FEATURES

R48.3 billion
total employee earnings

172,171
employees

Total sales of
R97 billion

Platinum group metals (PGMs) 38
Coal 42
Diamonds 44
Manganese 47
Iron ore 49
Copper 51
Chromite 53
Aggregate and sand 55
Silver 57
Uranium 59
Glossary 61
Some uses of PGMs are in catalysts for bulk-chemical production and petroleum refining, in computer hard disks, in hybridised integrated circuits, in multilayer ceramic capacitors, in glass manufacturing, in jewellery and in laboratory equipment.

Platinum is used in the medical sector while platinum and palladium, along with gold-silver-copper-zinc alloys, are used as dental restorative materials. Private individuals also use platinum, palladium and rhodium as a store of value, similar to gold.

South African PGM production and sales

<table>
<thead>
<tr>
<th>Year</th>
<th>Production</th>
<th>Local sales</th>
<th>Export sales</th>
<th>Total sales</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>tonnes</td>
<td>tonnes</td>
<td>R'000</td>
<td>tonnes</td>
</tr>
<tr>
<td>2007</td>
<td>304</td>
<td>-</td>
<td>12,350,290</td>
<td>258</td>
</tr>
<tr>
<td>2008</td>
<td>276</td>
<td>-</td>
<td>13,448,280</td>
<td>223</td>
</tr>
<tr>
<td>2009</td>
<td>271</td>
<td>-</td>
<td>4,322,869</td>
<td>251</td>
</tr>
<tr>
<td>2010</td>
<td>287</td>
<td>-</td>
<td>7,892,570</td>
<td>244</td>
</tr>
<tr>
<td>2011</td>
<td>289</td>
<td>-</td>
<td>10,619,219</td>
<td>244</td>
</tr>
<tr>
<td>2012</td>
<td>254</td>
<td>28</td>
<td>8,285,235</td>
<td>211</td>
</tr>
<tr>
<td>2013</td>
<td>264</td>
<td>28</td>
<td>8,886,103</td>
<td>239</td>
</tr>
<tr>
<td>2014</td>
<td>188</td>
<td>29</td>
<td>10,640,749</td>
<td>202</td>
</tr>
<tr>
<td>2015</td>
<td>276</td>
<td>32</td>
<td>11,149,886</td>
<td>254</td>
</tr>
<tr>
<td>2016</td>
<td>264</td>
<td>31</td>
<td>11,093,840</td>
<td>250</td>
</tr>
<tr>
<td>2017</td>
<td>260</td>
<td>31</td>
<td>11,971,452</td>
<td>251</td>
</tr>
</tbody>
</table>

172,171 PEOPLE EMPLOYED IN 2017, A DROP OF 0.1% FROM 2016.

Source: Department of Mineral Resources
### Annual platinum demand, by application (tonnes)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Autocatalyst</td>
<td>128.9</td>
<td>113.7</td>
<td>68.0</td>
<td>95.56</td>
<td>99.1</td>
<td>98.2</td>
<td>96.4</td>
<td>100.8</td>
<td>106.7</td>
<td>103.3</td>
<td>102.4</td>
</tr>
<tr>
<td>Autocatalyst - Recycling</td>
<td>(29.1)</td>
<td>(35.1)</td>
<td>(25.8)</td>
<td>(33.7)</td>
<td>(38.6)</td>
<td>(34.9)</td>
<td>(37.5)</td>
<td>(39.9)</td>
<td>(34.8)</td>
<td>(35.8)</td>
<td>(39.9)</td>
</tr>
<tr>
<td>Chemical</td>
<td>13.1</td>
<td>12.4</td>
<td>9.0</td>
<td>13.7</td>
<td>14.6</td>
<td>14.1</td>
<td>16.4</td>
<td>16.2</td>
<td>16.5</td>
<td>17.0</td>
<td>15.7</td>
</tr>
<tr>
<td>Chemical - Recycling</td>
<td>(0.2)</td>
<td>(0.3)</td>
<td>(0.3)</td>
<td>(0.3)</td>
<td>(0.6)</td>
<td>(0.7)</td>
<td>(0.8)</td>
<td>(0.9)</td>
<td>(1.0)</td>
<td>(1.0)</td>
<td></td>
</tr>
<tr>
<td>Electrical</td>
<td>7.9</td>
<td>7.1</td>
<td>5.9</td>
<td>7.2</td>
<td>7.2</td>
<td>5.5</td>
<td>6.8</td>
<td>7.1</td>
<td>7.2</td>
<td>7.3</td>
<td>7.3</td>
</tr>
<tr>
<td>Electrical - Recycling</td>
<td>(0.2)</td>
<td>(0.3)</td>
<td>(0.3)</td>
<td>(0.3)</td>
<td>(0.3)</td>
<td>(0.6)</td>
<td>(0.7)</td>
<td>(0.8)</td>
<td>(0.9)</td>
<td>(1.0)</td>
<td>(1.0)</td>
</tr>
<tr>
<td>Glass</td>
<td>14.6</td>
<td>9.8</td>
<td>0.3</td>
<td>12.0</td>
<td>16.0</td>
<td>4.7</td>
<td>2.9</td>
<td>6.6</td>
<td>6.9</td>
<td>7.5</td>
<td>11.3</td>
</tr>
<tr>
<td>Investment</td>
<td>5.3</td>
<td>17.3</td>
<td>20.5</td>
<td>20.4</td>
<td>14.3</td>
<td>13.9</td>
<td>27.2</td>
<td>8.6</td>
<td>14.1</td>
<td>19.3</td>
<td>11.1</td>
</tr>
<tr>
<td>Jewellery</td>
<td>65.6</td>
<td>64.1</td>
<td>87.4</td>
<td>75.3</td>
<td>77.0</td>
<td>86.6</td>
<td>94.1</td>
<td>90.0</td>
<td>87.9</td>
<td>76.1</td>
<td>71.4</td>
</tr>
<tr>
<td>Jewellery - Recycling</td>
<td>(20.4)</td>
<td>(21.6)</td>
<td>(17.6)</td>
<td>(22.9)</td>
<td>(25.2)</td>
<td>(27.9)</td>
<td>(24.6)</td>
<td>(23.7)</td>
<td>(17.9)</td>
<td>(23.0)</td>
<td>(19.8)</td>
</tr>
<tr>
<td>Medical and biomedical</td>
<td>72</td>
<td>7.6</td>
<td>7.8</td>
<td>7.2</td>
<td>7.2</td>
<td>7.0</td>
<td>6.6</td>
<td>6.6</td>
<td>6.5</td>
<td>6.8</td>
<td>6.8</td>
</tr>
<tr>
<td>Petroleum</td>
<td>6.4</td>
<td>7.5</td>
<td>6.5</td>
<td>5.3</td>
<td>6.5</td>
<td>3.5</td>
<td>4.9</td>
<td>5.1</td>
<td>4.0</td>
<td>4.4</td>
<td>6.9</td>
</tr>
<tr>
<td>Other</td>
<td>8.2</td>
<td>9.0</td>
<td>5.9</td>
<td>9.3</td>
<td>10.0</td>
<td>12.3</td>
<td>13.0</td>
<td>13.1</td>
<td>13.3</td>
<td>14.4</td>
<td>14.8</td>
</tr>
<tr>
<td>Total net demand</td>
<td>207.7</td>
<td>191.6</td>
<td>167.6</td>
<td>189.1</td>
<td>187.8</td>
<td>182.4</td>
<td>205.5</td>
<td>189.7</td>
<td>209.5</td>
<td>196.3</td>
<td>187.0</td>
</tr>
<tr>
<td>Movements in stocks</td>
<td>(2.5)</td>
<td>(6.8)</td>
<td>(19.8)</td>
<td>(0.8)</td>
<td>(14.0)</td>
<td>(5.7)</td>
<td>(24.6)</td>
<td>(30.8)</td>
<td>(20.6)</td>
<td>(10.4)</td>
<td>(0.2)</td>
</tr>
</tbody>
</table>

Source: Department of Mineral Resources

---

### Employment and earnings: South African platinum mines

<table>
<thead>
<tr>
<th>Year</th>
<th>Average number of employees in service</th>
<th>Earnings (R'000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>186,411</td>
<td>18,341,043</td>
</tr>
<tr>
<td>2008</td>
<td>199,948</td>
<td>23,344,340</td>
</tr>
<tr>
<td>2009</td>
<td>184,163</td>
<td>24,879,139</td>
</tr>
<tr>
<td>2010</td>
<td>181,969</td>
<td>26,688,548</td>
</tr>
<tr>
<td>2011</td>
<td>194,745</td>
<td>30,481,697</td>
</tr>
<tr>
<td>2012</td>
<td>197,752</td>
<td>34,393,197</td>
</tr>
<tr>
<td>2013</td>
<td>191,261</td>
<td>37,710,446</td>
</tr>
<tr>
<td>2014</td>
<td>186,865</td>
<td>35,652,303</td>
</tr>
<tr>
<td>2015</td>
<td>186,465</td>
<td>44,955,363</td>
</tr>
<tr>
<td>2016</td>
<td>172,424</td>
<td>45,913,336</td>
</tr>
<tr>
<td>2017</td>
<td>172,171</td>
<td>48,258,266</td>
</tr>
</tbody>
</table>

Source: Department of Mineral Resources
Ivanplats – Ivanhoe mines

EMPLOYEE EARNINGS INCREASED BY AN AVERAGE OF 13.5% BETWEEN 2005 AND 2017.

Annual palladium demand, by application (tonnes)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Autocatalyst</td>
<td>141.4</td>
<td>138.9</td>
<td>126.0</td>
<td>173.6</td>
<td>191.4</td>
<td>207.5</td>
<td>218.6</td>
<td>232.1</td>
<td>237.3</td>
<td>246.8</td>
<td>261.0</td>
</tr>
<tr>
<td>Chemical</td>
<td>11.7</td>
<td>10.9</td>
<td>10.1</td>
<td>11.5</td>
<td>13.7</td>
<td>16.3</td>
<td>15.3</td>
<td>15.0</td>
<td>18.6</td>
<td>12.7</td>
<td>16.4</td>
</tr>
<tr>
<td>Dental</td>
<td>19.6</td>
<td>19.4</td>
<td>19.8</td>
<td>18.5</td>
<td>16.8</td>
<td>15.8</td>
<td>14.1</td>
<td>14.6</td>
<td>14.8</td>
<td>13.3</td>
<td>12.4</td>
</tr>
<tr>
<td>Electrical</td>
<td>48.2</td>
<td>42.6</td>
<td>42.6</td>
<td>43.9</td>
<td>42.8</td>
<td>37.1</td>
<td>33.2</td>
<td>31.6</td>
<td>29.6</td>
<td>29.5</td>
<td>26.0</td>
</tr>
<tr>
<td>Investment</td>
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<td>8.1</td>
<td>13.1</td>
<td>19.4</td>
<td>17.6</td>
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<td>0.2</td>
<td>29.3</td>
<td>20.5</td>
<td>20.1</td>
<td>12.0</td>
</tr>
<tr>
<td>Jewellery</td>
<td>35.5</td>
<td>29.5</td>
<td>30.6</td>
<td>24.1</td>
<td>15.7</td>
<td>13.8</td>
<td>11.0</td>
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<td>71</td>
<td>5.9</td>
<td>5.4</td>
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<td>Other</td>
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<td>2.6</td>
<td>2.3</td>
<td>2.2</td>
<td>3.4</td>
<td>3.2</td>
<td>3.4</td>
<td>3.5</td>
<td>3.5</td>
<td>4.6</td>
<td>4.3</td>
</tr>
<tr>
<td>Total net demand</td>
<td>214.9</td>
<td>198.6</td>
<td>198.1</td>
<td>236.5</td>
<td>192.1</td>
<td>236.4</td>
<td>216.9</td>
<td>249.0</td>
<td>214.0</td>
<td>215.3</td>
<td>223.1</td>
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</table>

Movements in stocks

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>40.5</td>
<td>54.4</td>
<td>19.8</td>
<td>21.2</td>
<td>36.9</td>
<td>(34.7)</td>
<td>(18.1)</td>
<td>(59.6)</td>
<td>(14.0)</td>
<td>(26.5)</td>
<td>(24.4)</td>
</tr>
</tbody>
</table>

Annual average platinum price

---

Source: Department of Mineral Resources and Minerals Council
COAL

KEY 2017 FEATURES

252 million tonnes produced

82,248 employees

Total sales of R130 billion
In 2017, coal sales totalled R130 billion from approximately R112 billion in 2016. Among the three leading industries in the sector, only the coal industry recorded growth in employment; gold and platinum shed jobs. The growth in sales earnings in the industry is not commensurate with real net investment. Since 2009, net investment in the coal industry has declined at a rate of 10% per year – from R7.3 billion to R3.8 billion in 2017. The lacklustre performance of investment in this industry could not be more telling of the toxic regulatory environment in recent years. For one, 70% of coal volume is consumed domestically and more than 70% of electricity demand is generated from coal power. Yet even with Eskom building two massive coal-fired power plants, Kusile and Medupi, investment has not responded accordingly.

In 2017, the coal industry employed 82,248 people, representing about 17% of total employment in the mining sector. In the same year the coal industry spent R61 billion procuring goods and services, most of it locally. This contributed to creating and maintaining jobs in other industries.

South African coal production and sales

<table>
<thead>
<tr>
<th>Year</th>
<th>Production</th>
<th>Local sales</th>
<th>Export sales</th>
<th>Total sales</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>tonnes '000</td>
<td>tonnes '000</td>
<td>R’000</td>
<td>tonnes '000</td>
</tr>
<tr>
<td>2007</td>
<td>247,666</td>
<td>182,770</td>
<td>19,718,642</td>
<td>67,675</td>
</tr>
<tr>
<td>2008</td>
<td>252,699</td>
<td>197,033</td>
<td>30,104,161</td>
<td>60,631</td>
</tr>
<tr>
<td>2009</td>
<td>250,538</td>
<td>184,677</td>
<td>31,006,559</td>
<td>65,539</td>
</tr>
<tr>
<td>2010</td>
<td>257,206</td>
<td>186,366</td>
<td>37,442,650</td>
<td>66,770</td>
</tr>
<tr>
<td>2011</td>
<td>250,706</td>
<td>177,889</td>
<td>34,442,650</td>
<td>68,807</td>
</tr>
<tr>
<td>2012</td>
<td>259,012</td>
<td>185,548</td>
<td>44,091,664</td>
<td>76,009</td>
</tr>
<tr>
<td>2013</td>
<td>256,563</td>
<td>183,950</td>
<td>49,603,525</td>
<td>74,566</td>
</tr>
<tr>
<td>2015</td>
<td>252,176</td>
<td>179,135</td>
<td>56,574,200</td>
<td>75,376</td>
</tr>
<tr>
<td>2016</td>
<td>250,566</td>
<td>181,271</td>
<td>61,445,037</td>
<td>70,049</td>
</tr>
<tr>
<td>2017</td>
<td>252,343</td>
<td>181,347</td>
<td>69,083,470</td>
<td>70,049</td>
</tr>
</tbody>
</table>

Source: Minerals Council

82,248 PEOPLE EMPLOYED IN 2017 (77,228 IN 2016).

Employment and earnings: South African coal mines

Source: Department of Mineral Resources
DIAMONDS

KEY 2017 FEATURES

9.7 million carats produced

17,991 employees

Total sales of R18 billion

Petra Diamonds – Cullinan plant, fines plant, feed belt
South Africa ranks among the top 10 diamond producers globally, producing 10% of the world’s diamonds. In 2017 about 9.7 million carats of diamonds were produced locally. This marks a material 14.6% increase in production between 2016 and 2017. Total sales amounted to R18 billion.

The industry employed 17,991 people, who in turn earned R5.2 billion in 2017.

South African diamond production and sales

<table>
<thead>
<tr>
<th>Year</th>
<th>Production</th>
<th>Local sales</th>
<th>Export sales</th>
<th>Total sales</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Carats</td>
<td>Carats</td>
<td>Rand</td>
<td>Carats</td>
</tr>
<tr>
<td>2013</td>
<td>8,159,531</td>
<td>3,425,339</td>
<td>7,552,444,523</td>
<td>3,768,082</td>
</tr>
<tr>
<td>2014</td>
<td>8,095,037</td>
<td>3,168,609</td>
<td>8,800,677,674</td>
<td>5,619,831</td>
</tr>
<tr>
<td>2015</td>
<td>8,229,657</td>
<td>3,138,546</td>
<td>8,613,267,148</td>
<td>4,650,483</td>
</tr>
<tr>
<td>2016</td>
<td>8,302,110</td>
<td>1,609,160</td>
<td>8,325,337,788</td>
<td>9,002,389</td>
</tr>
<tr>
<td>2017</td>
<td>9,685,409</td>
<td>1,014,850</td>
<td>7,869,422,820</td>
<td>9,102,665</td>
</tr>
</tbody>
</table>

Source: Department of Mineral Resources and Minerals Council
Diamond industry employees and earnings

- **Number of employees**
- **Employee earnings**

**Source:** Department of Mineral Resources and Minerals Council
MANGANESE

KEY 2017 FEATURES

14 million tonnes produced

7,981 employees

Total sales of R32 billion

Rio Tinto – Richards bay minerals
South Africa is the world’s leading producer of manganese, producing more than 14.1 million tonnes in 2017, up from the 11.5 million tonnes produced in 2016. This marks a 22% increase in production between the years.

South Africa accounts for about 78% of the world’s identified manganese resources, with Ukraine accounting for approximately 10% in second place. There are currently no satisfactory substitutes for manganese.

Exports account for 96% of total sales, with the balance sold locally.

### South African manganese production and sales

<table>
<thead>
<tr>
<th>Year</th>
<th>Production</th>
<th>Local sales</th>
<th>Export sales</th>
<th>Total sales</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>tonnes</td>
<td>R’000</td>
<td>R’000</td>
<td>R’000</td>
</tr>
<tr>
<td>2007</td>
<td>5,996,086</td>
<td>934,900</td>
<td>2,636,526</td>
<td>3,571,426</td>
</tr>
<tr>
<td>2008</td>
<td>6,807,059</td>
<td>1,761,848</td>
<td>15,581,559</td>
<td>17,343,408</td>
</tr>
<tr>
<td>2009</td>
<td>4,578,770</td>
<td>583,601</td>
<td>5,003,011</td>
<td>5,586,612</td>
</tr>
<tr>
<td>2010</td>
<td>7,171,745</td>
<td>1,320,564</td>
<td>9,340,025</td>
<td>10,660,590</td>
</tr>
<tr>
<td>2011</td>
<td>8,651,842</td>
<td>1,325,213</td>
<td>8,569,853</td>
<td>9,895,067</td>
</tr>
<tr>
<td>2012</td>
<td>8,943,415</td>
<td>1,134,842</td>
<td>9,685,811</td>
<td>10,820,653</td>
</tr>
<tr>
<td>2013</td>
<td>10,957,133</td>
<td>1,506,434</td>
<td>12,969,544</td>
<td>14,475,979</td>
</tr>
<tr>
<td>2014</td>
<td>14,051,244</td>
<td>1,641,633</td>
<td>14,734,415</td>
<td>16,376,048</td>
</tr>
<tr>
<td>2015</td>
<td>15,952,416</td>
<td>860,473</td>
<td>12,657,774</td>
<td>13,518,248</td>
</tr>
<tr>
<td>2016</td>
<td>11,527,524</td>
<td>896,946</td>
<td>18,860,230</td>
<td>19,757,177</td>
</tr>
<tr>
<td>2017</td>
<td>14,143,794</td>
<td>1,724,512</td>
<td>30,637,426</td>
<td>32,361,939</td>
</tr>
</tbody>
</table>

Source: Department of Mineral Resources and Minerals Council

7,981 people employed in 2017, which is a 10% increase on 2016.

In 2017, employees earned R2.4 billion.

### Manganese industry employees and earnings

Source: Department of Mineral Resources and Minerals Council
IRON ORE

KEY FEATURES

R5.8 billion in employee earnings

17,345 employees

Total sales of R49.3 billion
For the first time in recent history, in 2017, domestic and export iron ore prices equalised, averaging R728/tonne. Historically, export prices have been more attractive for producers than local prices, except in 2015 when domestic prices averaged R675/tonne compared to R536/tonne for exports. The R728/tonne recorded in 2017 was still 35% lower than the peak export price of R1,119/tonne realised in 2011.

Employment peaked at 23,380 in 2012, dropping to 17,345 in 2017 (16,490 in 2016). However, employee earnings increased from R4.7 billion in 2012 to R6.3 billion in 2015 (though declining to R5.8 billion in 2017 from R5.9 billion in 2016). Employment in the iron ore industry is sensitive to export prices - as prices increase employment follows suit, at a one-year lag.

South African iron ore production and sales

<table>
<thead>
<tr>
<th>Year</th>
<th>Production</th>
<th>Local sales</th>
<th>Export sales</th>
<th>Total sales</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>tonnes '000</td>
<td>tonnes '000</td>
<td>tonnes '000</td>
<td>tonnes '000</td>
</tr>
<tr>
<td>2007</td>
<td>42,083</td>
<td>12,407</td>
<td>30,767</td>
<td>43,174</td>
</tr>
<tr>
<td>2008</td>
<td>48,983</td>
<td>11,258</td>
<td>32,766</td>
<td>44,024</td>
</tr>
<tr>
<td>2009</td>
<td>55,313</td>
<td>8,369</td>
<td>44,550</td>
<td>52,919</td>
</tr>
<tr>
<td>2010</td>
<td>58,709</td>
<td>10,561</td>
<td>47,493</td>
<td>58,053</td>
</tr>
<tr>
<td>2011</td>
<td>58,057</td>
<td>9,844</td>
<td>51,763</td>
<td>61,607</td>
</tr>
<tr>
<td>2012</td>
<td>67,100</td>
<td>8,393</td>
<td>57,110</td>
<td>65,503</td>
</tr>
<tr>
<td>2013</td>
<td>71,645</td>
<td>9,295</td>
<td>58,180</td>
<td>67,476</td>
</tr>
<tr>
<td>2014</td>
<td>80,759</td>
<td>9,571</td>
<td>61,963</td>
<td>71,534</td>
</tr>
<tr>
<td>2015</td>
<td>72,806</td>
<td>7,513</td>
<td>64,176</td>
<td>71,689</td>
</tr>
<tr>
<td>2016</td>
<td>66,456</td>
<td>6,161</td>
<td>58,645</td>
<td>64,806</td>
</tr>
<tr>
<td>2017</td>
<td>74,643</td>
<td>7,073</td>
<td>60,678</td>
<td>67,752</td>
</tr>
</tbody>
</table>

Source: Department of Mineral Resources

R5.8 BILLION IN EMPLOYEE EARNINGS.

Employment and earnings:
iron ore mines

<table>
<thead>
<tr>
<th>Year</th>
<th>Average number of employees in service</th>
<th>Earnings (R'000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>13,858</td>
<td>1,362,293</td>
</tr>
<tr>
<td>2008</td>
<td>13,256</td>
<td>1,667,837</td>
</tr>
<tr>
<td>2009</td>
<td>13,727</td>
<td>2,178,041</td>
</tr>
<tr>
<td>2010</td>
<td>18,216</td>
<td>3,037,418</td>
</tr>
<tr>
<td>2011</td>
<td>22,361</td>
<td>6,506,608</td>
</tr>
<tr>
<td>2012</td>
<td>23,380</td>
<td>4,690,573</td>
</tr>
<tr>
<td>2013</td>
<td>21,126</td>
<td>4,848,253</td>
</tr>
<tr>
<td>2014</td>
<td>21,794</td>
<td>5,691,818</td>
</tr>
<tr>
<td>2015</td>
<td>20,554</td>
<td>6,218,976</td>
</tr>
<tr>
<td>2016</td>
<td>16,601</td>
<td>5,886,297</td>
</tr>
<tr>
<td>2017</td>
<td>17,345</td>
<td>5,791,755</td>
</tr>
</tbody>
</table>

Source: Department of Mineral Resources
COPPER

KEY FEATURES

65,503 tonnes produced

Total sales of R4.3 billion
COPPER

In 2017, the South Africa produced 65,503 tonnes of copper, of which sales were split 40/60 (local/export), in volumes.

Substitutes for copper include aluminum, which is used in power cables, electrical equipment, automobile radiators, and cooling and refrigeration tubing. Titanium and steel are also substitutes which are used in heat exchangers. Optical fibre substitutes for copper are used in telecommunications applications. Plastics substitutes for copper are used in water pipe, drain pipe, and plumbing fixtures.

**South African copper production and sales**

<table>
<thead>
<tr>
<th>Year</th>
<th>Production</th>
<th>Local sales</th>
<th>Export sales</th>
<th>Total sales</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>tonnes</td>
<td>tonnes '000</td>
<td>R'000</td>
<td>tonnes '000</td>
</tr>
<tr>
<td>2007</td>
<td>116,973</td>
<td>76,2</td>
<td>4,020,296</td>
<td>37,2</td>
</tr>
<tr>
<td>2008</td>
<td>97,185</td>
<td>68,5</td>
<td>4,120,564</td>
<td>32,9</td>
</tr>
<tr>
<td>2009</td>
<td>92,850</td>
<td>68,0</td>
<td>2,835,737</td>
<td>26,8</td>
</tr>
<tr>
<td>2010</td>
<td>83,639</td>
<td>56,7</td>
<td>3,160,029</td>
<td>24,8</td>
</tr>
<tr>
<td>2011</td>
<td>89,297</td>
<td>60,4</td>
<td>3,937,749</td>
<td>25,5</td>
</tr>
<tr>
<td>2012</td>
<td>69,859</td>
<td>54,6</td>
<td>3,575,956</td>
<td>26,6</td>
</tr>
<tr>
<td>2013</td>
<td>80,821</td>
<td>56,0</td>
<td>4,056,792</td>
<td>26,2</td>
</tr>
<tr>
<td>2014</td>
<td>78,697</td>
<td>45,0</td>
<td>3,483,784</td>
<td>36,7</td>
</tr>
<tr>
<td>2015</td>
<td>77,360</td>
<td>37,0</td>
<td>2,703,423</td>
<td>37,6</td>
</tr>
<tr>
<td>2016</td>
<td>65,257</td>
<td>26,7</td>
<td>1,923,681</td>
<td>27,4</td>
</tr>
<tr>
<td>2017</td>
<td>65,503</td>
<td>25,7</td>
<td>2,120,088</td>
<td>29,9</td>
</tr>
</tbody>
</table>

**Source:** Department of Mineral Resources
CHROMITE

KEY 2017 FEATURES

R4.8 billion in employee earnings

17,154 employees

Total sales of R23.4 billion

Chromite

Aggregate and sand

Silver

Uranium

Glossary
South Africa is the world’s leading producer of chromium, which is used in the manufacture of stainless steel.

Ferrochromium production and beneficiation is an energy intensive process and, due to uncertainty of the availability and steeply rising cost of electricity, most processing of this metal has been moved offshore. Be that as it may, Eskom is currently producing surplus electricity and has made efforts to attract some mining beneficiation companies to invest in the country.

Employment figures for 2017 indicate that employment increased from 15,449 people in 2016 to 17,154. Employee earnings were R4.8 billion.

### South African chromite production and sales

<table>
<thead>
<tr>
<th>Year</th>
<th>Production (tonnes '000)</th>
<th>Local sales (tonnes '000)</th>
<th>Export sales (R'000)</th>
<th>Total sales (tonnes '000)</th>
<th>Total sales (R'000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>9.665</td>
<td>7.389</td>
<td>2,346,982</td>
<td>893</td>
<td>659,467</td>
</tr>
<tr>
<td>2008</td>
<td>9.683</td>
<td>7.116</td>
<td>4,131,020</td>
<td>762</td>
<td>1,267,931</td>
</tr>
<tr>
<td>2009</td>
<td>7.561</td>
<td>4.880</td>
<td>2,081,058</td>
<td>1,709</td>
<td>1,571,311</td>
</tr>
<tr>
<td>2010</td>
<td>10.871</td>
<td>7.267</td>
<td>4,159,308</td>
<td>1,929</td>
<td>2,459,473</td>
</tr>
<tr>
<td>2012</td>
<td>11.317</td>
<td>6.683</td>
<td>4,681,855</td>
<td>2,470</td>
<td>3,594,282</td>
</tr>
<tr>
<td>2013</td>
<td>13.690</td>
<td>8.483</td>
<td>5,870,717</td>
<td>4,168</td>
<td>5,891,833</td>
</tr>
<tr>
<td>2014</td>
<td>14.038</td>
<td>10.048</td>
<td>7,771,424</td>
<td>3,695</td>
<td>5,834,876</td>
</tr>
<tr>
<td>2015</td>
<td>15.656</td>
<td>9.833</td>
<td>8,093,409</td>
<td>4,821</td>
<td>8,104,128</td>
</tr>
<tr>
<td>2016</td>
<td>14.708</td>
<td>8.726</td>
<td>8,164,638</td>
<td>4,684</td>
<td>9,541,381</td>
</tr>
</tbody>
</table>

Source: Department of Mineral Resources

### Employment and earnings: South African chromite mines

<table>
<thead>
<tr>
<th>Year</th>
<th>Average number of employees in service</th>
<th>Earnings (R'000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>9,796</td>
<td>881,651</td>
</tr>
<tr>
<td>2008</td>
<td>12,279</td>
<td>1,305,781</td>
</tr>
<tr>
<td>2009</td>
<td>10,966</td>
<td>1,457,366</td>
</tr>
<tr>
<td>2010</td>
<td>13,982</td>
<td>2,082,481</td>
</tr>
<tr>
<td>2011</td>
<td>16,911</td>
<td>2,754,694</td>
</tr>
<tr>
<td>2012</td>
<td>19,762</td>
<td>3,434,492</td>
</tr>
<tr>
<td>2013</td>
<td>18,359</td>
<td>3,840,559</td>
</tr>
<tr>
<td>2014</td>
<td>18,658</td>
<td>4,046,774</td>
</tr>
<tr>
<td>2015</td>
<td>18,449</td>
<td>4,416,943</td>
</tr>
<tr>
<td>2016</td>
<td>15,449</td>
<td>4,214,813</td>
</tr>
<tr>
<td>2017</td>
<td>17,154</td>
<td>4,775,779</td>
</tr>
</tbody>
</table>

Source: Department of Mineral Resources and Minerals Council

### Chromite industry employees and earnings

Source: Department of Mineral Resources and Minerals Council
AGGREGATE AND SAND

KEY 2017 FEATURES

- 7,696 employees
- 66.2 million tonnes produced
- Total sales of R7.2 billion
The aggregate and sand industry is closely linked to the construction sector, therefore deriving its performance from the overall fixed capital formation in the country. In 2017, the sector produced 66.2 million tonnes of output at a value of R7.2 billion. It is worth noting that in volume terms, production increased 2.3% on 2016.

The industry is the smallest contributor to mining sector employment, having recorded 7,696 employees in 2017, with a total earnings bill of R1 billion.

### Employment and earnings:
**South African aggregate and sand**

<table>
<thead>
<tr>
<th>Year</th>
<th>Average number of employees in service</th>
<th>Employee earnings (R'000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>5,834</td>
<td>378,855</td>
</tr>
<tr>
<td>2008</td>
<td>6,427</td>
<td>453,210</td>
</tr>
<tr>
<td>2009</td>
<td>6,852</td>
<td>517,287</td>
</tr>
<tr>
<td>2010</td>
<td>7,009</td>
<td>574,669</td>
</tr>
<tr>
<td>2011</td>
<td>7,122</td>
<td>627,637</td>
</tr>
<tr>
<td>2012</td>
<td>7,719</td>
<td>753,758</td>
</tr>
<tr>
<td>2013</td>
<td>7,510</td>
<td>803,664</td>
</tr>
<tr>
<td>2014</td>
<td>7,421</td>
<td>872,786</td>
</tr>
<tr>
<td>2015</td>
<td>7,453</td>
<td>933,838</td>
</tr>
<tr>
<td>2016</td>
<td>7,578</td>
<td>974,477</td>
</tr>
<tr>
<td>2017</td>
<td>7,896</td>
<td>1,033,347</td>
</tr>
</tbody>
</table>

Source: Department of Mineral Resources

### South African aggregate and sand production and sales

<table>
<thead>
<tr>
<th>Year</th>
<th>Production tonnes</th>
<th>Total sales R'000</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>62,127,845</td>
<td>3,314,117</td>
</tr>
<tr>
<td>2008</td>
<td>60,996,383</td>
<td>3,757,580</td>
</tr>
<tr>
<td>2009</td>
<td>52,559,228</td>
<td>3,826,340</td>
</tr>
<tr>
<td>2010</td>
<td>51,803,437</td>
<td>3,809,924</td>
</tr>
<tr>
<td>2011</td>
<td>52,122,803</td>
<td>4,066,505</td>
</tr>
<tr>
<td>2012</td>
<td>53,373,625</td>
<td>4,476,359</td>
</tr>
<tr>
<td>2013</td>
<td>60,966,575</td>
<td>5,291,394</td>
</tr>
<tr>
<td>2014</td>
<td>62,972,237</td>
<td>5,967,061</td>
</tr>
<tr>
<td>2015</td>
<td>63,602,931</td>
<td>6,492,166</td>
</tr>
<tr>
<td>2016</td>
<td>64,741,418</td>
<td>7,008,880</td>
</tr>
<tr>
<td>2017</td>
<td>66,241,262</td>
<td>7,294,503</td>
</tr>
</tbody>
</table>

Source: Department of Mineral Resources

### Aggregate and sand industry employment and earnings

Source: Department of Mineral Resources and Minerals Council
SILVER

KEY 2017 FEATURES

R396.4 million total employee earnings

62.5 tonnes produced

Total sales of R361.6 millions
Silver production was 62.5 tonnes in 2017 compared to 52.1 tonnes in 2016.

Employee earnings increased from R250 million in 2006 to R611.9 million in 2011 and then declined to R396.4 million in 2017.

Silver is used in electronics, brazing solders and alloys, and photography. Demand from these areas is expected to decline. On the other hand, demand for silver in ethylene oxide production is projected to remain unchanged and its use in photovoltaics is projected to increase.

62.5 TONNES PRODUCTION 2017.
URANIUM

KEY 2017 FEATURES

303,684kg produced

A by-product of gold mining
Uranium production, a by-product of gold mining, has been in decline in tandem with lower gold production for at least the past decade.

After the Fukushima Daiichi nuclear disaster in Japan, as well as the increased usage of green and renewable energy sources, the use of nuclear energy has stagnated. Very few new nuclear power stations are being built outside China.

South African uranium production

<table>
<thead>
<tr>
<th>Year</th>
<th>Kilograms</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>557,525</td>
</tr>
<tr>
<td>2008</td>
<td>582,001</td>
</tr>
<tr>
<td>2009</td>
<td>654,086</td>
</tr>
<tr>
<td>2010</td>
<td>691,359</td>
</tr>
<tr>
<td>2011</td>
<td>626,117</td>
</tr>
<tr>
<td>2012</td>
<td>550,458</td>
</tr>
<tr>
<td>2013</td>
<td>626,279</td>
</tr>
<tr>
<td>2014</td>
<td>667,697</td>
</tr>
<tr>
<td>2015</td>
<td>527,780</td>
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<tr>
<td>2016</td>
<td>450,110</td>
</tr>
<tr>
<td>2017</td>
<td>303,684</td>
</tr>
</tbody>
</table>

Source: Department of Mineral Resources
GLOSSARY

Key words, terms and abbreviations used in this publication.

PGMs  Platinum group metals
oz    ounce (1 troy ounce = 31.1035 grams)
GFCF  Gross fixed capital formation
GDP   Gross domestic product

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