

FACTS AND FIGURES **2016**

Published June 2017



CHAMBER OF MINES
of South Africa

#MiningMatters #ItAddsUp










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R387 billion
total primary
mineral sales



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INTEGRATED ANNUAL
REVIEW 2016



CONSOLIDATED FINANCIAL
STATEMENTS 2016



FACTS AND FIGURES
POCKET BOOK 2016

FOREWORD

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. 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.

QUICK FACTS



R120 billion
Employee earnings



R304.4 billion
contribution to 2016 GDP



approximately
4.5 million
dependants supported



88%
of metals exported



457,698
direct jobs created

MESSAGE FROM THE CEO



ROGER BAXTER
Chief Executive Officer

The availability of credible statistics which paint an accurate picture of the South African mining sector is crucial for the Chamber of Mines.

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. It also allows the industry to accurately represent the wider impact of mining and its performance on the country as a whole.

The Chamber of Mines' 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 pocketbook 'Mine SA 2016' was published just before the Mining Indaba 2017 and has been distributed widely – it is also currently available on the Chamber 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 2016' publication is both an updated version of the pocketbook and a more comprehensive statistical reference guide to the South African mining sector. I hope it will prove useful.



Chamber Purpose and Vision

Chamber office bearers

Chamber economics team



THE MINING SECTOR 2016 AT A GLANCE

The monetary value of minerals produced is frequently used as a barometer of the mining sector's contribution to South Africa's economy. The relationships are however highly complex.

2016 was a difficult year for South Africa's mining sector. It contributed 7.3% to the gross domestic product of the country - a decline of 4.7% from 2015. Mining contributed 18% of private fixed investment (3.8% lower than 2015) and 11% of total fixed investment (also less than in 2015). It employed 7.9% of all private sector labour (-4.5% on 2015) and nearly 6% of all people employed in South Africa (5% less than in 2015).

2016 was a difficult year for South Africa's mining sector. It contributed 7.3% to the gross domestic product of the country - a decline of 4.7% from 2015. Mining contributed 18% of private fixed investment (3.8% lower than 2015) and 11% of total fixed investment (also less than in 2015). It employed 7.9% of all private sector labour (-4.5% on 2015) and nearly 6% of all people employed in South Africa (5% less than in 2015).

Exports of mining commodities increased by 10% in nominal rand terms due to the weaker exchange rate and slightly better commodity prices, but declined by 5% in dollar terms. Coupled with the weak performance of other merchandise exports from South Africa, commodity exports grew by nearly 2%, and by nearly 5% of South Africa's total exports.

When analysing the mining sector's performance over the last three to four years, it is clear that there has been considerable volatility across the board. Value add increased by 4% in 2013, decreased by 1.4% in 2014, rose by nearly 4% in 2015 and then decreased again by 4.7% in 2016.

Real volatility is reflected in the share of profits in value add. Annual reported profits before taxes declined by 60% in 2013, improved by 109% in 2014, declined by 170% in 2015 and improved again by 255% in 2016.

Due to the dollar prices of South African commodity exports declining by 8% in 2013, by 9% in 2014, 17% in 2015 and by 0.5% in 2016, employment numbers have declined by 3% every year since 2013, and by 5% in 2016. Although gross fixed investment has declined by only about 1% on average since 2013, the fact that the sector really is in survival mode is reflected in a progressively worsening net investment trend: -2.5% in 2013, -0.4% in 2014, -10.5% in 2015 and a more than 100% contraction in 2016.

However, there is reason for optimism – based on evaluation of the sector's performance since 2000. The commodity price cycle seems to have finally bottomed out, with a modest recovery recorded in 2016, and most forecasts indicating slight improvements in future.

The negative trend in recorded profits by the sector also appears to have bottomed out. Average quarterly profits reported by the sector to Statistics South Africa started to improve during 2016. Due to better commodity prices and profits, production responded and showed positive signs during the first quarter of 2017 (+3% compared to the same period in 2016). Whereas 40 000 jobs were lost from the beginning of 2015 (more than 1 500 per month) this slowed at the end of 2016 to around 400 per month.



7.3%
**contribution to South
Africa's gross domestic
product by the mining
sector in 2016**



Stats SA mining info

OVERVIEW OF THE SOUTH AFRICAN MINING INDUSTRY

Natural resources play an important role in the South African economy.

Their exploitation provides employment to thousands of South Africans. Their export contributes significantly to foreign exchange earnings which make it possible to import critical goods and services (including technology) that are necessary for the country's development.

South Africa is a top 10 producer globally of PGMs, gold, chromium and coal. Huge deposits remain untapped for most minerals including PGMs, gold, coal, chromium, and diamonds. However, large portions of these reserves are found several kilometres underground, which means innovative and state-of-the-art mining techniques are needed to extract the valuable minerals. This creates a significant challenge for the industry, but it has led to South African mines being at the forefront of extractive techniques and technological innovations, while also maintaining the industry's strong contributions to the South African economy.



Department of Mineral Resources

Table 1: Commodity summary – 2016

Group	Commodity	Local sales	Total sales	Total exports	Exports as a % of total sales
		R'000	R'000	R'000	
GOLD, PGMs, DIAMONDS AND SILVER	Gold	14,919,703	75,491,750	60,572,047	80.2
	PGMs	11,093,572	96,412,033	85,318,461	88.5
	Diamonds	8,311,909	20,824,679	12,512,770	60.1
	Silver	28,338	412,814	384,476	93.1
	Sub-total	34,353,522	193,141,276	158,787,754	
BASE MINERALS	Chrome	8,089,031	17,715,707	9,626,676	54.3
	Copper	1,923,681	3,744,887	1,821,206	48.6
	Iron ore	3,855,830	43,229,802	39,373,972	91.1
	Lead concentrate	0	884,986	884,986	100
	Manganese	879,774	19,741,075	18,861,301	95.5
	Nickel	1,300,550	7,100,366	5,799,816	81.7
	Zinc	0	538,325	538,325	100
	Coal	61,489,771	111,955,698	50,465,927	45.1
	Other non-metallic	3,826,108	6,243,740	2,417,632	38.7
	Miscellaneous	23,518,698	97,396,435	30,647,935	31.5
	Sub-total	104,883,443	308,551,021	160,437,776	
	Grand total	139,236,965	458,462,495	319,225,530	

Source: Department of Mineral Resources, 2016

OVERVIEW OF THE SOUTH AFRICAN MINING INDUSTRY continued

During 2016 the industry spent

R211.8 billion on various goods and services.

The mining industry's contribution to the economy goes beyond direct employment. Expenditure on resources produced by other sectors has created and retained thousands of jobs in sectors such as agriculture (e.g. timber), manufacturing (e.g. steel), finance and banking (e.g. interest paid and insurance), and construction. During 2016 the industry spent approximately R211.8 billion on various goods and services. It also contributed to the fiscus through taxes and royalties.

Table 2: Key mineral industry statistics for South Africa

Description	Unit of measurement	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Year-on-year % change 2015 to 2016	Average past decade
GROSS DOMESTIC PRODUCT													
Direct contribution of mining to GDP	R'millions nominal terms	157,672	197,643	200,824	230,350	261,575	267,344	288,085	286,163	284,012	304,362	7.2	247,803
Direct contribution of mining to GDP	R'millions constant 2010 prices	243,662	230,663	218,830	230,350	228,646	221,990	230,772	227,522	236,457	225,300	-4.7	229,419
Mining GDP growth rate	% YoY	-0.6	-5.3	-5.1	5.3	-0.7	-2.9	4.0	-1.4	3.9	-4.7		-0.8
Direct contribution of mining to GDP	US\$ millions equivalent	22,351	23,952	23,802	31,459	36,064	32,564	29,853	26,388	22,274	20,692	7.1	26,227
GDP	R'millions nominal terms	2,109,501	2,369,063	2,507,676	2,748,009	3,023,659	3,253,852	3,539,791	3,807,677	4,049,758	4,336,992	7.09	3,174,598
GDP	R'millions constant 2010 prices	2,624,840	2,708,600	2,666,939	2,748,008	2,838,258	2,901,078	2,973,293	3,023,826	3,063,101	3,071,660	0.28	2,861,960
Mining's contribution as % of total GDP nominal terms	%	7.5	8.3	8.0	8.4	8.7	8.2	8.1	7.5	7.0	7.0		7.9
Mining's contribution as % of total GDP real terms	%	9.3	8.5	8.2	8.4	8.1	7.7	7.8	7.5	7.7	7.3		8.0
FIXED INVESTMENT													
Direct contribution of mining to fixed investment (GFCF)	R'millions nominal terms	40,628	59,084	64,574	63,555	68,420	72,106	79,350	87,030	89,517	93,352	4.3	717,616
Direct contribution of mining to fixed investment (GFCF)	R'millions constant 2010 prices	49,643	62,349	65,969	63,555	65,953	65,438	65,871	66,884	66,224	63,740	-3.8	635,626
Total private sector fixed investment (private GFCF)	R'millions nominal terms	307,189	376,918	342,142	341,517	380,411	406,000	470,085	506,983	518,150	519,205	0.2	416,860
Total fixed investment (GFCF)	R'millions nominal terms	435,548	556,997	539,440	529,431	578,014	625,643	721,234	784,418	827,325	849,291	2.7	644,734
Mining fixed investment growth rate	% YoY	28.0	25.6	5.8	-3.7	3.8	-0.8	0.7	1.5	-1.0	-3.8		5.6
Direct contribution to fixed investment (GFCF)	US\$ millions equivalent	5,759	7,160	7,653	8,680	9,433	8,783	8,223	8,025	7,021	6,347	-9.6	7,708
Mining's contribution to private sector fixed investment (GFCF)	%	13.2	15.7	18.9	18.6	18.0	17.8	16.9	17.2	17.3	18.0	4.1	17.2
Mining's contribution as % of total investment	%	9.3	10.6	12.0	12.0	11.8	11.5	11.0	11.1	10.8	11.0	1.6	11.1

Note: GFCF is gross fixed capital formation

OVERVIEW OF THE SOUTH AFRICAN MINING INDUSTRY continued

Table 2: Key mineral industry statistics for South Africa continued

Description	Unit of measurement	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Year-on-year % change 2015 to 2016	Average past decade
SALES AND EXPORTS													
Total primary mineral sales	R'millions nominal terms	223,901	300,763	239,881	300,891	370,833	363,756	385,033	386,350	386,709	423,881	9.6	338,200
Total primary mineral sales	US\$ millions equivalent	31,739	36,449	28,431	41,093	51,127	44,307	39,899	35,627	30,328	28,818	-5.0	36,782
Mining industry primary exports	R'millions nominal terms	160,685	220,077	175,772	224,969	282,297	269,120	279,673	269,264	266,604	294,685	10.5	244,315
Mining industry primary exports	US\$ millions equivalent	22,778	26,671	20,833	30,724	38,921	32,780	28,981	24,830	20,909	20,034	-4.2	26,746
Total merchandise exports (FOB.)	R'millions nominal terms	513,418	680,268	536,491	609,357	719,552	751,332	867,021	942,826	970,667	1,053,628	8.5	764,456
Total exports (goods and services)	R'millions nominal terms	706,061	892,172	734,015	820,448	959,153	1,015,672	1,157,532	1,270,440	1,327,951	1,402,838	5.6	1,028,628
Primary mineral exports as % of total SA merchandise exports	%	31.3	32.4	32.8	36.9	39.2	35.8	32.3	28.6	27.5	28.0	1.8	32.0
Primary mineral exports as % of total exports	%	22.8	24.7	23.9	27.4	29.4	26.5	24.2	21.2	20.1	21.0	4.6	23.8
Mining export earnings per unit of GDP created	ratio	0.076	0.093	0.070	0.082	0.093	0.083	0.079	0.071	0.066	0.068	3.2	0.770
EMPLOYMENT													
Mining industry direct employment	numbers	495,150	518,729	491,794	498,906	512,878	524,632	510,099	495,568	478,868	457,332	-4.5	498,396
Total private non-agricultural employment	numbers	6,474,387	6,554,699	6,264,340	6,177,850	6,282,873	6,350,830	6,350,830	6,289,051	6,295,229	6,293,170	0.0	6,333,326
Total formal non-agricultural employment	numbers	8,286,379	8,449,497	8,204,820	8,155,885	8,351,626	8,457,653	8,506,588	8,531,056	8,498,432	8,539,212	0.5	8,398,115
Mining as % of total private non-agricultural employment	%	7.6	7.9	7.9	8.1	8.2	8.3	8.0	7.9	7.6	7.3	-4.5	7.9
Mining as % of total non-agricultural formal employment	%	6.0	6.1	6.0	6.1	6.1	6.2	6.0	5.8	5.6	5.4	-5.0	5.9
Remuneration paid to employees in mining	R'millions current	50,073	60,886	66,092	74,319	86,972	93,630	100,753	102,146	114,008	120,066	5.3	86,894
Remuneration paid to employees in mining	R'millions 2010 prices	67,423	79,407	81,181	82,957	90,506	93,630	95,939	92,000	97,076	96,324	-0.8	87,644
Average annual remuneration per mineworker	Rand	101,043	117,275	134,460	148,872	169,447	178,425	197,688	207,110	237,045	262,553	10.8	175 392

OVERVIEW OF THE SOUTH AFRICAN MINING INDUSTRY continued

Table 2: Key mineral industry statistics for South Africa continued

Description	Unit of measurement	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Year-on-year % change 2015 to 2016	Average past decade
EXCHANGE RATES													
Rand per US\$ exchange rate	R/US\$	7.05	8.25	8.44	7.32	7.25	8.21	9.65	10.84	12.75	14.71	15.4	9.45
Rand per euro	R/euro	9.66	12.05	11.70	9.71	10.08	10.55	12.82	14.40	14.14	16.28	15.1	12.14
Rand real effective exchange rate	Rand index	92.26	82.64	89.07	100.00	96.62	91.09	81.91	79.17	80.08	77.08	-3.7	86.99
COMMODITY PRICES													
Gold price	Rand per kg	173,380	253,904	288,965	316,397	401,466	483,171	480,258	484,338	521,929	647,462	24.1	405,127
Gold price	US\$/oz	697	872	971	1,225	1,569	1,668	1,411	1,266	1,160	1,248	7.5	1,209
Platinum price	Rand per kg	324,536	457,310	358,901	416,009	439,055	448,862	505,162	527,988	473,435	511,421	8.0	446,268
Platinum price	US\$/oz	1,304	1,571	1,206	1,611	1,716	1,550	1,484	1,380	1,053	986	-6.4	1,386

Figure 1: Mining industry expenditure: Sept 2015-June 2016

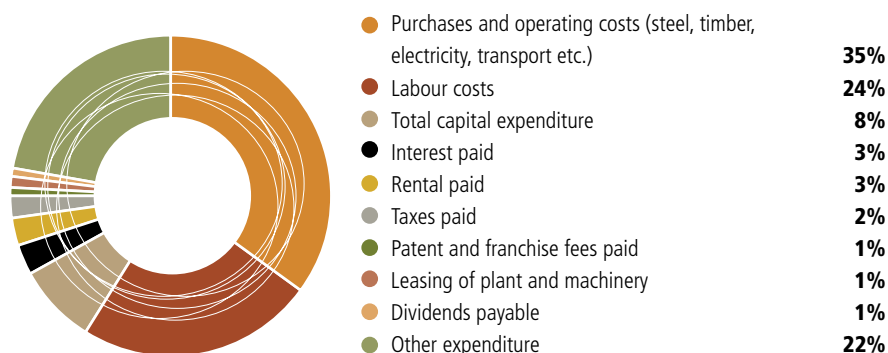
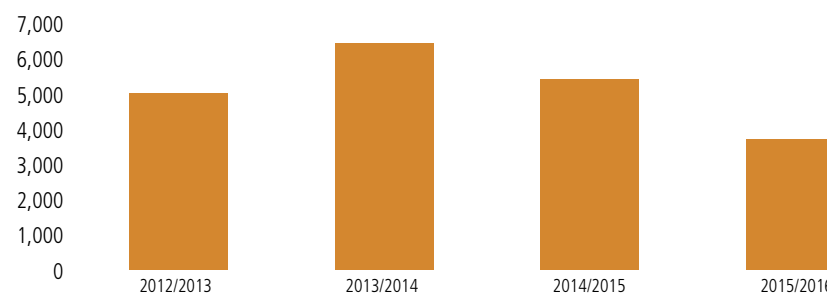


Figure 2: Mining industry royalties paid (R million)



OVERVIEW OF THE SOUTH AFRICAN MINING INDUSTRY continued



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

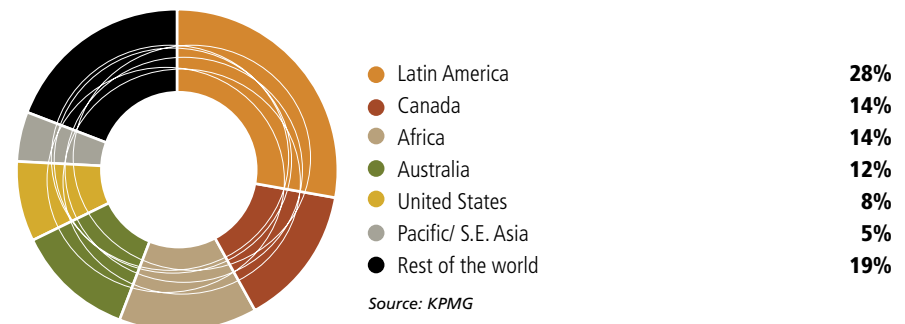
In 2016 some commodities, such as gold and platinum, saw the rand price gaining momentum while the dollar-denominated price declined.

Globally, in 2016, mining firms spent most of their exploration budgets in Latin America, while continental Africa tied for third place with Australia at 13%. (Detailed breakdowns of 2016 exploration expenditure for South African miners is currently not available.) However, in 2015 South African miners spent over R6 billion exploring new opportunities.

Source: KPMG and Chamber of Mines



Figure 3: Destination of worldwide exploration budgets for analysed non-fuel mineral commodities, 2015



OVERVIEW OF THE SOUTH AFRICAN MINING INDUSTRY continued

Table 3: South Africa's role in world mineral reserves, production & exports, 2012 (latest available data) – by mineral

Commodity	Unit of measurement	South Africa's reserves	World		Location of major reserves		
			Rank	%			
Aluminium	kt	*	*	*	*	*	*
Aluminosilicates (ore)	Mt	51	1	*	*	*	*
Antimony (metal)	kt	27	5	1.5	China	Russia	Bolivia
Chromium	Mt	3,100	1	85.0	South Africa	Kazakhstan	Zimbabwe
Coal	Mt	30,156	8	3.5	United States	Russia	China
Copper	kt	11,000	11	1.6	Chile	Peru	Australia
Ferrochromium	kt	*	*	*	*	*	*
Ferro-Mn/Fe-Si-Mn	kt	*	*	*	*	*	*
Ferrosilicon	kt	*	*	*	*	*	*
Fluorspar (contained CaF)	kt	41,000	3	17.1	*	*	*
Gold (metal)	t	6,000	2	11.8	Australia	South Africa	Russia
Iron Ore	Mt	650	12	0.8	Australia	Brazil	Russia
Lead (Metal)	kt	300	6	2.1	China	Australia	United States
Manganese (metal)	Mt	150	1	24.0	South Africa	Ukraine	Brazil
Nickel	Mt	3,700	7	4.9	Australia	New Caledonia	Brazil
Platinum group metals	t	63,000	1	95.5	South Africa	North America	Russia
Phosphate rock (contained concentrates)	kt	1,500,000	*	2.2	*	*	*
Silicon (metal)	kt	*	*	*	*	*	*
Silver (metal)	t	*	*	*	Peru	Poland	Chile
Titanium minerals (metals)	Mt	71	4	10.2	China	Australia	India
Uranium (metal, up to US\$ 80/kg)	t	279,100	6	5.2	Australia	Kazakhstan	Canada
Vanadium (metal)	kt	3,500	3	25.0	China	Russia	South Africa
Vermiculite	kt	14,000	1	*	*	*	*
Zinc (metal)	kt	14,000	8	3.3	China	United States	Australia
Zirconium minerals (metals)	kt	14,000	2	29.0	Australia	South Africa	Ukraine

Source: South African Department of Mineral Resources & US Geological Survey, Reston, Virginia

* = not available

OVERVIEW OF THE SOUTH AFRICAN MINING INDUSTRY continued

MINING PLAYS A BIG ROLE IN SIX PROVINCES

– offering not only employment but also supporting 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.

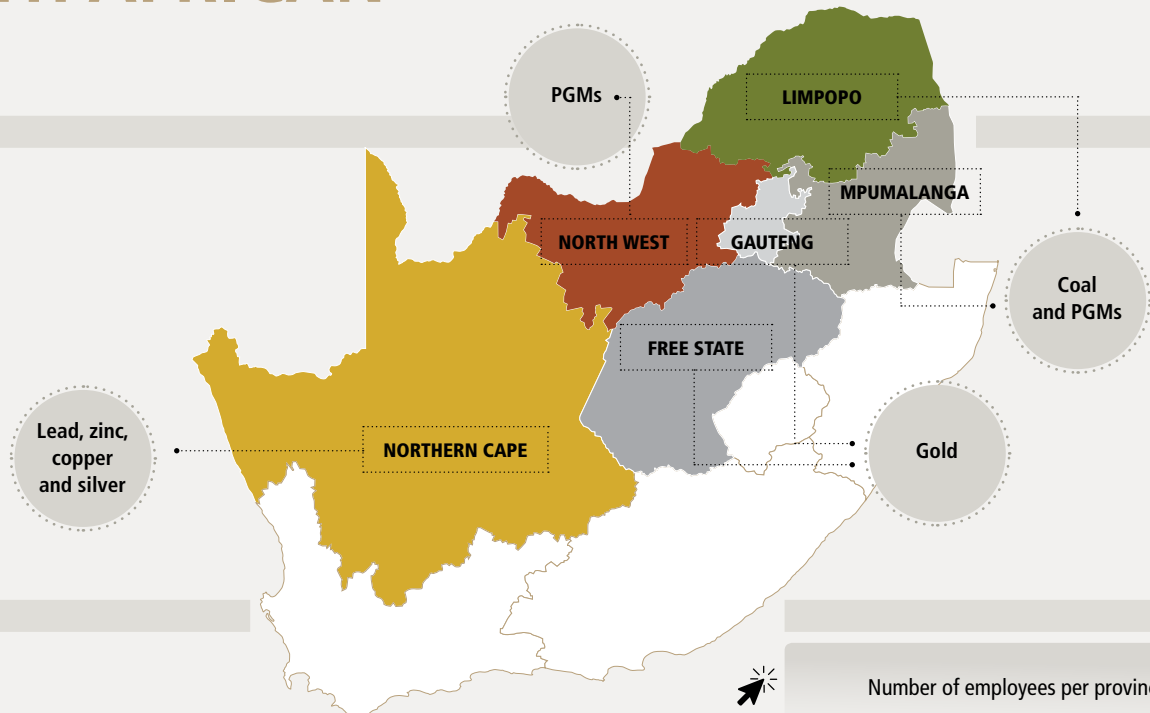


Table 4: Provincial overview (latest available data)

Province	Eastern Cape	Free State	Gauteng	KwaZulu-Natal	Limpopo	Mpumalanga	North West	Northern Cape	Western Cape
Total area (000km ²)	168,965	129,825	18,178	94,361	125,753	76,494	104,881	372,889	129,462
% of South African surface area	13.8	10.6	1.4	7.7	10.3	6.3	8.6	30.5	10.6
Sales of goods (R million)	594	20,061	44,899	13,086	45,345	114,439	84,698	69,485	5,203
% contribution	0.1	5.00	11.3	3.3	11.4	28.8	21.3	17.5	1.3
Salaries and wages (R million)	108	5,273	8,084	1,745	9,559	18,142	26,849	7,132	708
% contribution	0.1	6.8	10.4	2.2	12.3	23.4	34.7	9.2	0.9
Mine employees (number)	733	24,092	53,764	5,079	37,005	78,518	133,428	18,682	2,043
% contribution	0.2	6.8	15.2	1.4	10.5	22.2	37.8	5.3	0.6
Distribution of value added by mining industry (%)	0.2	6.6	10.3	3.0	24.6	21.7	27.8	5.4	0.4
Mining contribution to province's total value added (%)	0.2	10.2	2.4	1.5	27.0	22.6	33.5	20.2	0.2

Source: Stats SA Census 2015, Stats SA Mining Industry 2015

OVERVIEW OF THE SOUTH AFRICAN MINING INDUSTRY continued

Table 5: Number of fatalities by commodity, 2004-2016

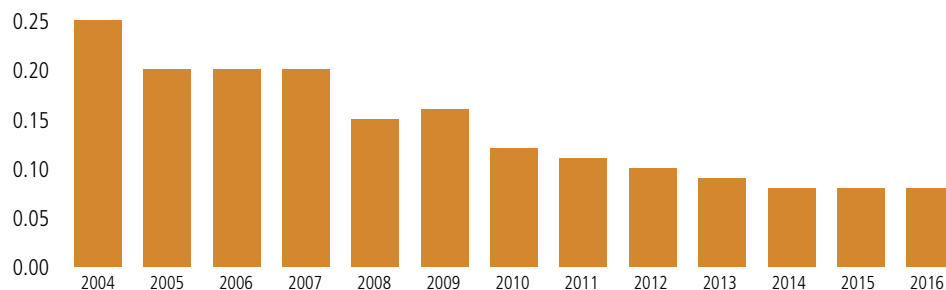
Commodity	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Gold	108	105	114	115	85	81	62	51	53	37	44	33	33
PGMs	65	47	40	53	36	41	34	37	28	28	15	22	27
Coal	20	16	20	15	20	18	12	12	11	7	9	5	4
Chrome	16	6	2	4	*	*	*	*	*	*	*	*	*
Diamonds	15	7	3	12	*	*	*	*	*	*	*	*	*
Copper	2	0	2	1	*	*	*	*	*	*	*	*	*
Clay	3	3	2	8	*	*	*	*	*	*	*	*	*
Iron ore	1	2	2	4	*	*	*	*	*	*	*	*	*
Granite DS	2	0	0	1	*	*	*	*	*	*	*	*	*
Limestone	3	5	5	1	*	*	*	*	*	*	*	*	*
Other	11	10	10	6	30	28	19	23	20	21	16	17	12
Total	246	201	200	220	171	168	127	123	112	93	84	77	73

Source: Department of Mineral Resources, as at June 2016

* Now included in "Other"

Figure 4: Fatality frequency rates – all sectors

Per 1 million hours worked



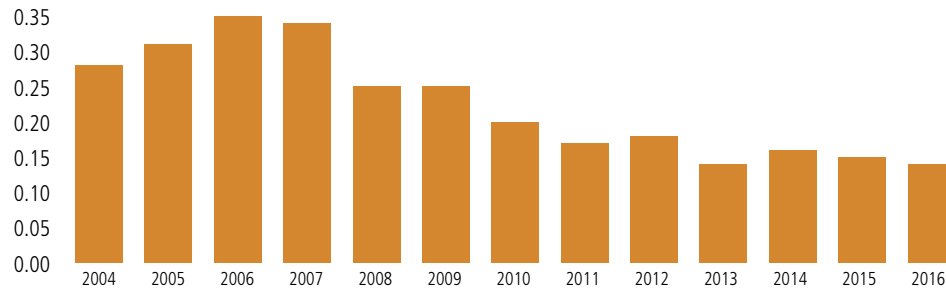
Source: Chamber of Mines



OVERVIEW OF THE SOUTH AFRICAN MINING INDUSTRY continued

Figure 5: Fatality frequency rates – gold

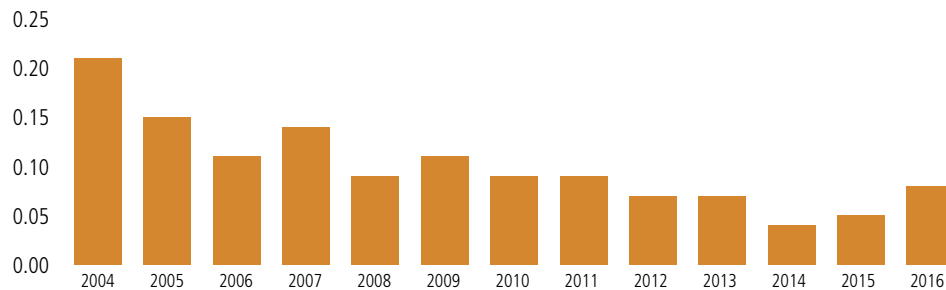
Per 1 million hours worked



Source: Chamber of Mines

Figure 6: Fatality frequency rates – PGMs

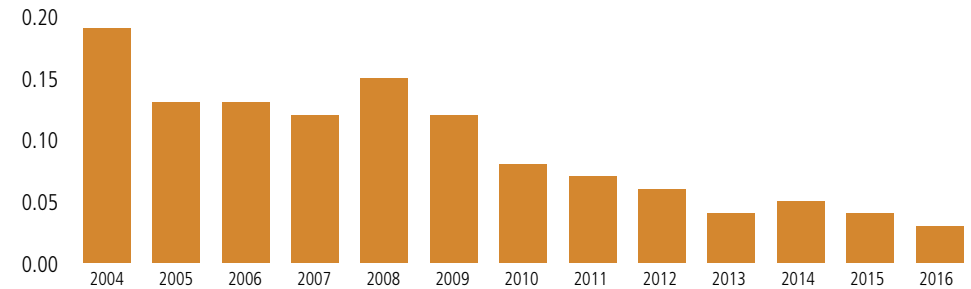
Per 1 million hours worked



Source: Chamber of Mines

Figure 7: Fatality frequency rates – coal

Per 1 million hours worked



Source: Chamber of Mines



OVERVIEW OF THE SOUTH AFRICAN MINING INDUSTRY continued

According to Stats SA, between 2010 and 2015, employees in the mining and utilities industries were the top performing earners, with the largest nominal increases in earnings also recorded for these two sectors (R2,500 and R1,500 respectively).

Using median monthly earnings of employees as a criterion for earning power, the mining sector ranked among the top three in the period 2010-2015.



Employment by commodity 2016

Table 6: Employment by commodity: 2004-2016

Year	Gold	PGMs	Iron ore	Copper	Chrome	Manganese	Diamonds	Coal	Aggregate and sand
2004	179,964	150,630	7,142	4,042	6,765	3,243	21,186	50,327	4,080
2005	160,635	155,034	7,492	3,746	7,894	3,335	22,033	56,971	5,210
2006	159,782	168,530	8,859	3,993	7,899	3,333	19,686	57,777	5,133
2007	166,064	186,410	13,857	4,241	9,796	3,239	19,471	60,439	5,834
2008	166,423	199,948	13,257	3,523	12,279	3,976	18,474	65,484	6,427
2009	159,926	184,162	13,728	3,366	10,966	5,003	11,601	70,791	6,852
2010	157,019	181,969	18,216	3,032	13,982	5,879	11,467	74,025	7,009
2011	144,799	194,745	22,360	3,237	16,911	7,460	12,047	78,580	7,122
2012	142,200	197,752	23,380	2,533	19,762	8,685	12,332	83,244	7,719
2013	131,738	191,260	21,127	2,930	18,358	9,842	13,579	88,039	7,510
2014	119,007	186,864	21,794	2,853	18,658	9,971	15,356	86,106	7,421
2015	115,055	187,756	20,760	2,805	18,470	8,657	17,481	77,773	7,525
2016	116,479	172,444	16,490	2,366	15,514	7,240	17,978	77,506	7,602

OVERVIEW OF THE SOUTH AFRICAN MINING INDUSTRY continued

In 2014 and 2015 average monthly earnings in the mining sector – respectively, R7,000 and R7,500 – tied for first spot with the earnings of workers in the Utilities industry.



Employee earnings by commodity 2016



Table 7: Total employee earnings by commodity – R'000

Year	Gold	PGMs	Iron ore	Copper	Chrome	Manganese	Diamonds	Coal	Aggregate and sand	Other mines and quarries	South Africa
2004	12,609,512	9,063,872	575,174	494,533	468,816	241,566	2,282,937	5,863,461	242,043	1,814,028	33,655,942
2005	12,153,245	11,357,785	623,842	468,167	556,587	293,319	2,632,182	6,481,823	312,073	1,803,956	36,682,979
2006	12,865,125	12,585,340	683,582	514,962	636,356	319,894	2,167,797	7,269,836	371,897	2,033,119	39,447,907
2007	14,506,401	18,341,043	1,362,293	*	881,651	405,313	2,192,902	8,692,014	459,706	3,231,562	50,072,886
2008	15,960,051	23,344,340	1,667,837	*	1,305,781	671,654	2,163,887	11,020,687	544,072	4,208,077	60,886,385
2009	17,371,250	24,879,139	2,178,041	*	1,457,366	736,842	1,790,007	12,815,351	620,999	4,242,596	66,091,591
2010	19,877,668	26,688,348	3,037,418	*	2,082,481	946,139	1,956,333	14,186,482	693,767	4,849,913	74,318,549
2011	20,840,802	30,481,697	6,506,608	*	2,754,694	1,277,636	2,141,484	16,068,639	746,991	6,153,517	86,972,067
2012	22,238,338	34,393,197	4,690,573	*	3,434,492	1,565,264	2,408,198	17,445,779	892,093	6,562,548	93,630,482
2013	23,930,042	37,710,446	4,848,253	*	3,840,559	1,946,529	2,870,536	18,949,314	939,998	5,717,067	100,752,743
2014	23,383,408	35,652,303	5,691,818	*	4,046,774	2,302,129	3,663,455	20,594,652	1,037,945	5,773,937	102,146,421
2015	24,582,438	45,015,319	6,262,574	*	4,429,346	2,201,482	4,419,947	19,966,427	1,119,776	6,010,629	114,007,939
2016	28,731,311	45,876,264	5,878,117	*	4,207,698	2,117,702	4,769,876	21,092,895	1,190,424	6,201,371	120,065,659

* Copper data for the last decade is not available

OVERVIEW OF THE SOUTH AFRICAN MINING INDUSTRY continued

Table 8: Median monthly earnings of employees by industry, 2010-2015 (R)

	2010	2011	2012	2013	2014	2015
Agriculture	1,295	1,300	1,495	1,733	2,153	2,231
Mining	5,000	5,800	6,000	6,000	7,000	7,500
Manufacturing	3,250	3,500	3,500	3,672	3,900	3,800
Utilities	6,000	6,000	6,000	8,666	7,000	7,500
Construction	2,437	2,600	2,600	2,800	2,816	3,000
Trade	2,505	2,800	3,000	3,000	3,033	3,100
Transport	3,500	3,600	3,800	3,900	4,000	4,000
Finance	3,501	4,333	4,000	4,000	4,000	4,000
Services	6,000	6,000	6,500	6,000	5,000	5,000
Private households	1,000	1,200	1,200	1,300	1,400	1,500
Total	2,900	3,000	3,115	3,033	3,033	3,100

Source: Stats SA



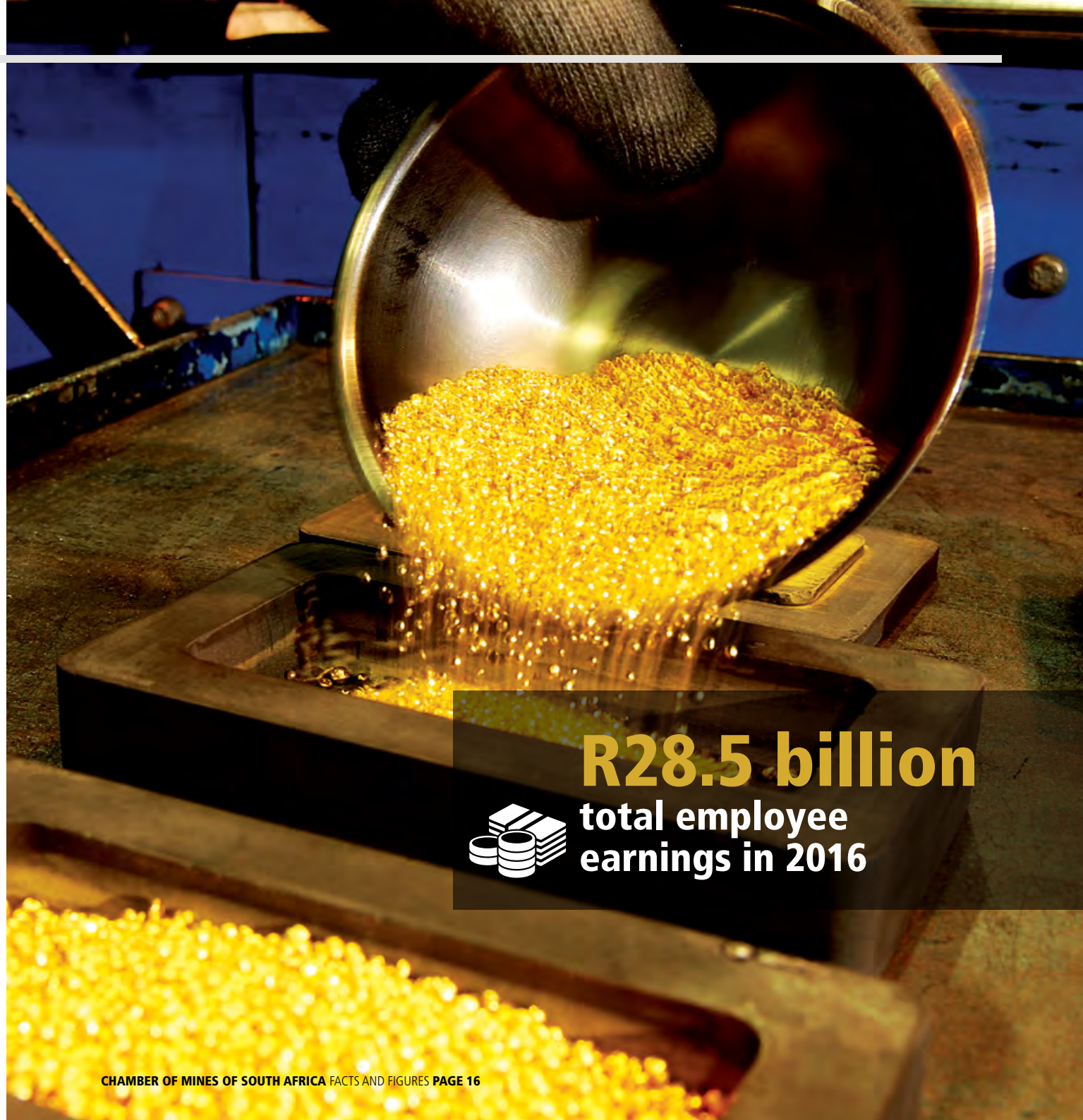
GOLD



South Africa was responsible for 4.4% of global gold production in 2016. 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). Although lower than 2012 levels, the price of gold was still higher than in 2007 and 2008, at US\$1,248/oz in 2016.

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 R28.5 billion in 2016.

Local sales (in volumes) were about 5% on average of total sales over the last 10 years. However, in 2015 local sales (as a share of total sales volumes) increased to 12%. The trend continued to nearly 20% of total sales in 2016.



R28.5 billion



total employee
earnings in 2016

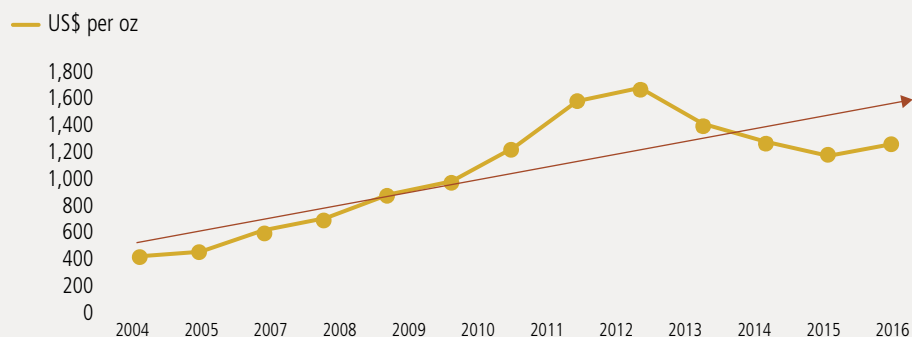
GOLD continued

Table 9: South African Gold production & sales

Year	Production	Local sales		Export sales		Total sales		World gold production	South African percentage of total
	tonnes	tonnes	Value R'000	tonnes	Value R'000	tonnes	Value R'000	tonnes	%
2004	337.3	3.9	289,410	343.1	28,982,777	347	29,272,188	2,504	13.5
2005	294.7	4.6	276,457	265.4	24,181,619	270.1	24,458,077	2,560.3	11.5
2006	272.1	5.7	347,093	277.4	36,722,301	283.1	37,069,394	2,495.4	10.9
2007	252.6	13	419,621	229.7	36,002,847	242.7	36,422,469	2,497.8	10.1
2008	212.7	8.8	720,790	190	43,994,482	198.8	44,715,273	2,429.9	8.8
2009	197.7	6.6	2,052,119	180.6	46,994,168	187.2	49,046,288	2,612	7.6
2010	188.4	7.2	1,997,761	176.9	51,037,449	184.1	53,035,210	2,739	6.9
2011	180.2	10.2	1,701,333	175.5	65,258,301	185.7	66,959,635	2,838.1	6.3
2012	154.2	11.3	2,055,697	164.9	71,961,756	176.2	74,017,454	2,860.6	5.4
2013	159.7	7.5	3,633,111	123.3	53,845,892	130.8	57,479,003	3,042	5.3
2014	151.6	7.1	4,862,747	118.9	52,276,414	126	57,139,161	3,131	4.8
2015	144.5	15.9	3,312,817	118.1	55,314,074	133.9	58,626,892	3,208.6	4.5
2016	142.1	25.3	2,918,628	103.7	60,572,047	129.0	63,490,676	3,222.3	4.4

Source: Department of Mineral Resources, GFMS Thomson Reuters, Chamber of Mines

Figure 8: Average annual gold price, US\$/oz



Source: Department of Mineral Resources



South Africa
accounted for

4.4%
of global gold
production in 2016



GOLD continued



Table 10: Chamber members – gold production

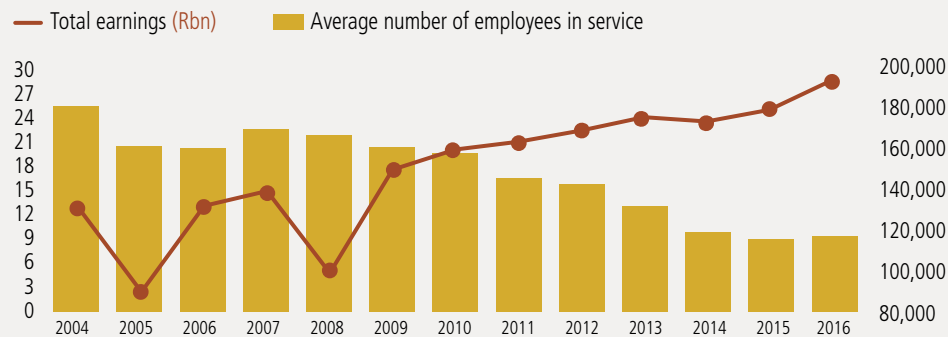
Year	Ore milled, tonnes (1,000)	Production (kgs)	Grade (g/t ton)
2004	59,702	282,031	4.72
2005	49,609	255,290	5.15
2006	50,349	235,043	4.67
2007	53,257	219,223	4.12
2008	50,999	182,489	3.58
2009	65,545	170,299	3.29
2010	73,803	160,646	3.04
2011	75,569	149,708	2.81
2012	66,119	124,252	2.91
2013	73,885	131,405	2.91
2014	*	*	*
2015	77,263	120,853	2.68
2016	*	*	*

* Data not available



More info

Figure 9: Employment & earnings – South African gold mines



Source: Department of Mineral Resources



South African gold
reserves still to be
mined of

6,000 tonnes



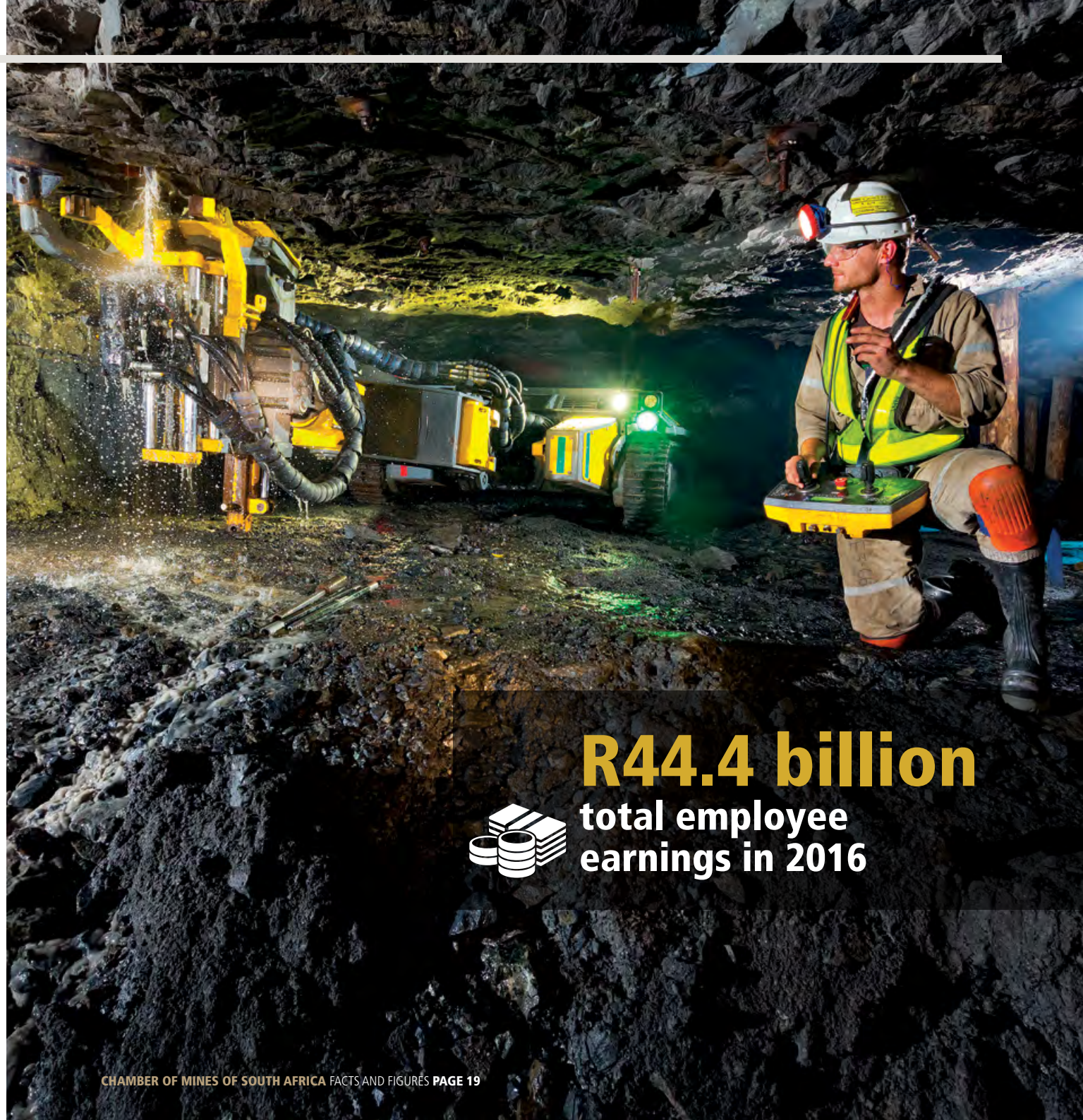
PGMS

In the last 10 years employment in the sector increased from 168,530 employees in 2006, to over 172,310 in 2016.

However, this is a significant decline from 2012 when there were 197,847 people employed. On the other hand, employee earnings have soared from R12.6 billion in 2006 to R45 billion in 2015 receding slightly in 2016 to R44.4 billion. On average, employee earnings increased by 16.4% in the period between 2005 and 2016.

The introduction of stricter emission standards for motor cars is expected to result in increased demand for PGMs (palladium, platinum, and rhodium) which are used in catalytic converters. In developing countries, motor vehicle production continues to increase and this is expected to increase demand for PGMs beyond 2016.

Other 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.



R44.4 billion
total employee
earnings in 2016

PGMs continued

Table 11: South African PGM production & sales

Year	Production	Local sales		Export sales		Total sales	
	tonnes	tonnes	Value R'000	tonnes	Value R'000	tonnes	Value R'000
2004	286	–	3,786,133	260	29,527,109	260	33,313,242
2005	303	–	4,969,108	259	33,481,439	259	38,450,547
2006	309	–	11,829,608	267	53,614,207	267	65,443,816
2007	303	–	13,172,114	262	65,573,441	262	78,745,555
2008	276	–	13,448,280	223	77,904,355	223	91,352,635
2009	271	–	4,322,869	251	53,459,307	251	57,782,176
2010	287	–	7,892,570	244	65,894,341	244	73,786,910
2011	289	–	10,619,219	244	73,234,047	244	83,853,266
2012	254	–	8,285,235	211	60,918,939	211	69,204,174
2013	264	28	8,886,103	239	75,348,535	266	84,234,637
2014	189	29	10,644,402	202	66,860,760	230	77,505,163
2015	276	32	11,149,886	254	82,988,098	287	94,137,984
2016	264	31	11,093,572	251	85,318,461	282	96,412,033

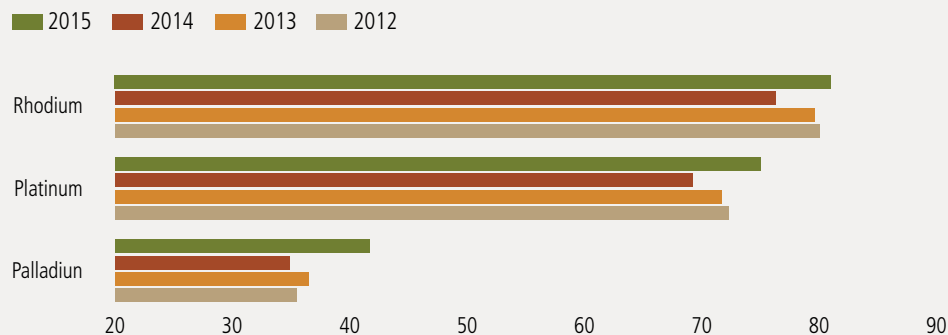
Source: Department of Mineral Resources



More info

Johnson Matthey

Figure 10: South African global share of newly-mined PGM production (%)



Source: Johnson Matthey (PGM Market Report, May 2016)



172,310
people employed
in 2016



PGMs continued

Table 12: Annual platinum demand, by application (tonnes)

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Autocatalyst	Gross	108.6	118.0	121.5	128.9	113.7	68.0	95.6	99.1	98.2	96.4	100.8	106.7
	Recycling	(21.5)	(24.0)	(26.8)	(29.1)	(35.1)	(25.8)	(33.7)	(38.6)	(34.9)	(37.5)	(39.9)	(34.8)
Chemical		10.1	10.1	12.3	13.1	12.4	9.0	13.7	14.6	14.1	16.4	16.2	16.5
Electrical	Gross	9.3	11.2	11.2	7.9	7.1	5.9	7.2	7.2	5.5	6.8	7.1	7.2
	Recycling	0.0	0.0	0.0	0.0	(0.2)	(0.3)	(0.3)	(0.3)	(0.6)	(0.7)	(0.8)	(0.9)
Glass		9.0	11.2	12.6	14.6	9.8	0.3	12.0	16.0	4.7	2.9	6.6	6.9
Investment		1.4	0.5	(1.2)	5.3	17.3	20.5	20.4	14.3	13.9	27.2	8.6	14.1
Jewellery	Gross	67.2	76.7	68.3	65.6	64.1	87.4	75.3	77.0	86.6	94.1	90.0	87.9
	Recycling	0.0	(15.5)	(17.3)	(20.4)	(21.6)	(17.6)	(22.9)	(25.2)	(27.9)	(24.6)	(23.7)	(17.9)
Medical & biomedical		0.0	7.8	7.8	7.2	7.6	7.8	7.2	7.2	7.0	6.6	6.6	6.5
Petroleum		4.7	5.3	5.6	6.4	7.5	6.5	5.3	6.5	3.5	4.9	5.1	4.0
Other		14.6	7.0	7.5	8.2	9.0	5.9	9.3	10.0	12.3	13.0	13.1	13.3
Total net demand		203.4	208.3	201.5	207.7	191.6	167.6	189.1	187.7	182.3	205.5	189.7	209.5
Movements in stocks		(1.6)	(1.7)	11.0	(2.5)	(6.8)	19.8	(0.8)	14.0	(5.7)	(24.6)	(30.8)	(20.6)

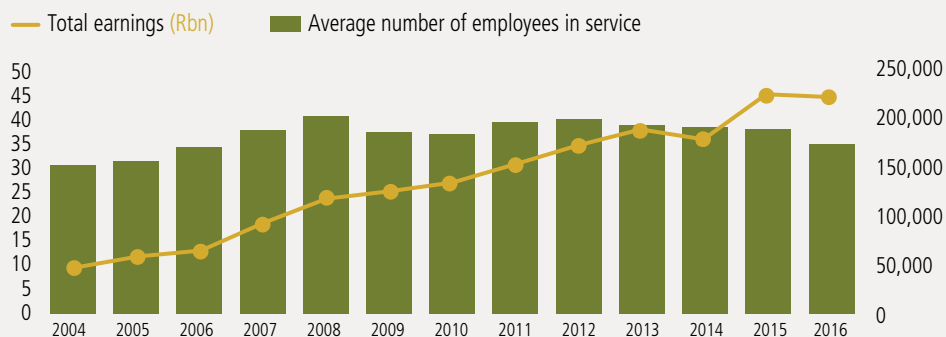
Source: Johnson Matthey, Platinum 2016

Totals may not add due to rounding

Before 2005 "Jewellery" and "Electrical" demand is net of recycling

Before 2005 "Medical & biomedical" was included in "Other"

Figure 11: Employment & earnings – South African platinum mines



Source: Department of Mineral Resources



Employee earnings
increased by an average of
16.4%
between 2005
and 2016



PGMs continued

Table 13: Annual palladium demand, by application (tonnes)

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Autocatalyst	Gross	117	120	124	141	138	126	173	191	207	218	232	237
	Recycling	(16)	(19)	(25)	(31)	(35)	(30)	(40)	(52)	(52)	(59)	(68)	(60)
Chemical		9	12	13	11	10	10	11	13	16	15	15	18
Dental		26	25	19	19	19	19	18	16	15	14	14	14
Electrical	Gross	28	39	46	48	42	42	43	42	37	33	31	29
	Recycling	6	(9)	(9)	(9)	(10)	(12)	(13)	(14)	(13)	(14)	(14)	(14)
Investment		8	28	6	1	8	13	19	(17)	14	(0)	29	(20)
Jewellery	Gross	3	2	46	35	29	30	24	15	13	11	8	7
	Recycling	181	220	(1)	(4)	(7)	(4)	(2)	(6)	(6)	(4)	(2)	(1)
Other		0	0	8	2	2	2	2	3	3	3	3	3
Total net demand		365	421	229	214	198	198	236	192	236	216	249	214
Movements in stocks		31	62	32	40	54	19	21	36	(34)	(18)	(59)	(14)

Source: Johnson Matthey, Platinum, May 2016

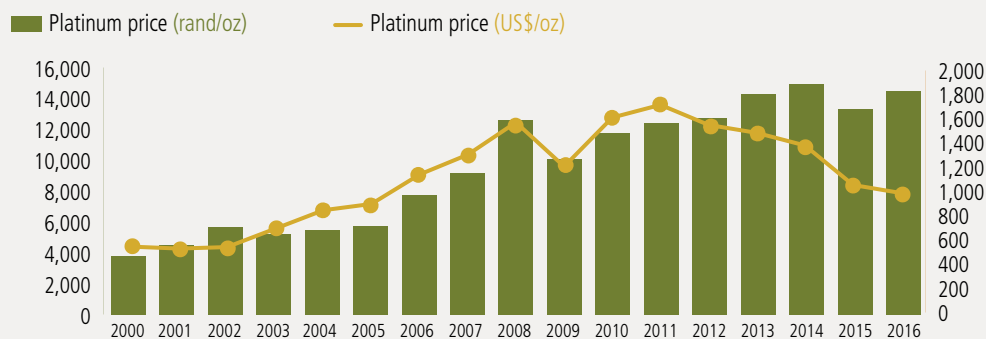
Totals may not add due to rounding

Before 2005 sales from Russian state stocks are incorporated in total Russian supply

Before 2005 "Zimbabwe" supply is incorporated in "Other"

Before 2005 jewellery and electrical demand is net of recycling

Figure 12: Annual average platinum price



Source: Department of Mineral Resources



COAL



Coal sales totalled approximately R112 billion in 2016. Historically, exports have accounted for an average of over 50% of sales since 1993. In the same period, coal export earnings averaged 12% of total merchandise exports, highlighting the industry's importance as a foreign exchange earner.

Of note is the fact that South Africa derives over 70% of its energy requirement (electricity and liquid fuels) from coal. South Africa exports coal mainly to India, representing 57% – or R28.7 billion – of total export sales in 2016. The European Union and western Asia are the second and third most important markets, with respective shares of 15.7% and 14.3% in 2016. In terms of volumes, exports were 28% of total production in 2016.

In 2016 the coal industry employed 77,506 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.



R112 billion
total coal
sales

COAL continued

Table 14: South African coal production & sales

Year	Production tonnes	Local sales		Export sales		Total sales	
		Mass 1,000t	Value R'000 (FOR)	Mass 1,000t	Value R'000 (FOB)	Mass 1,000t	Value R'000
2004	246,618	178,635	13,640,677	67,074	14,244,088	245,709	27,884,765
2005	244,990	173,423	14,888,927	70,400	20,733,937	243,822	35,622,863
2006	244,789	177,049	16,245,874	68,814	21,613,064	245,863	37,858,937
2007	247,666	182,770	19,718,642	66,938	24,181,783	249,708	43,900,425
2008	252,626	197,050	30,109,417	58,789	42,857,579	255,839	72,966,995
2009	250,582	182,473	33,667,339	59,122	30,265,174	241,595	63,932,513
2010	254,378	184,151	34,474,031	67,561	37,492,922	251,712	71,966,954
2011	251,157	178,063	37,378,412	69,044	50,625,090	247,107	88,003,502
2012	258,576	185,669	43,921,277	76,009	52,226,904	261,677	96,148,181
2013	256,534	183,914	49,569,211	74,566	51,813,484	258,480	101,382,695
2014	261,579	183,623	55,043,417	72,107	48,690,289	255,730	103,733,705
2015	252,077	179,133	56,573,687	74,357	46,669,026	253,491	103,242,712
2016	251,012	181,434	61,487,485	68,905	50,465,928	250,339	111,953,412

Source: Department of Mineral Resources

FOR: Free on road

FOB: Free on board



77,506
people employed
in 2016

Figure13: Coal sales by volume

(%)

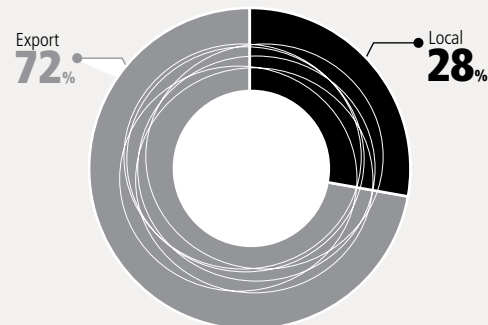


Figure14: Coal sales by value

(%)

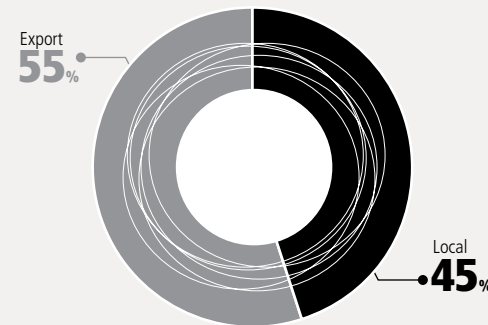
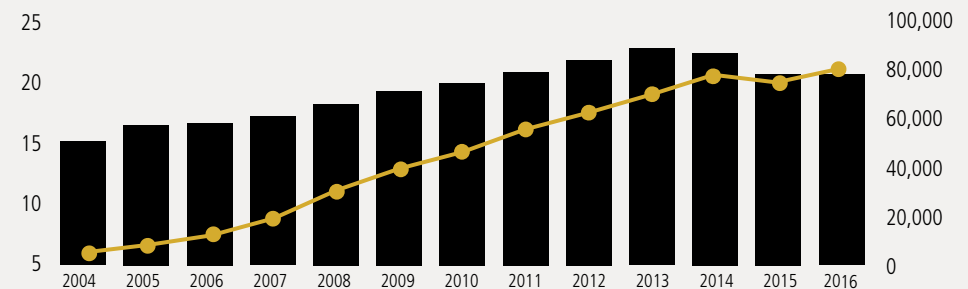


Figure 15: Employment & earnings – South African coal mines

— Total earnings (Rbn)

■ Average number of employees in service



Source: Department of Mineral Resources

DIAMONDS

South Africa ranks among the top 10 diamond producers globally, producing 10% of the world's diamonds. In 2016 about 8.5 million carats of diamonds were produced locally.

Total employee earnings have increased significantly in recent years from R1.9 billion in 2010 to over R4.7 billion in 2016.

This is due both to increased prices and a steady increase in employment. In 2010, there were 11,602 people employed in the diamond industry. In 2016 the number had increased to 17,978 people.



8.5 million
carats of diamonds
produced locally

DIAMONDS continued

Table 15: South African diamond production (carats)

2004	14,294,224
2005	15,776,427
2006	15,153,440
2007	15,250,185
2008	12,892,729
2009	6,103,189
2010	8,869,532
2011	7,046,277
2012	7,245,402
2013	8,159,531
2014	8,095,037
2015	8,229,657
2016	8,450,758

Source: Department of Mineral Resources



More info



R4.7 billion

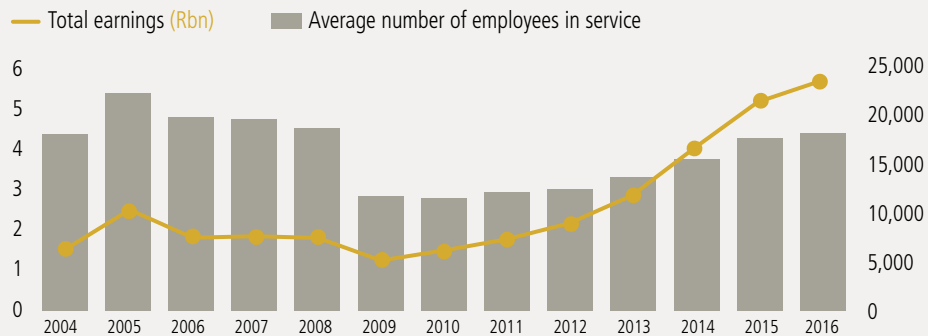
total employee earnings in 2016



17,978

people employed
in 2016

Figure 16: Employment & earnings – South African diamond mines



Source: Department of Mineral Resources



MANGANESE



South Africa is the world's leading producer of manganese, producing more than 13.7 million tonnes in 2016, down from 15.9 million tonnes in 2015.

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.

Most of what is produced locally is exported. Since peaking at 9,971 in 2014 employment numbers have declined to 7,240 in 2016. Employee earnings which had been increasing steadily since 2007 have remained virtually flat since 2014.



13.7 million
tonnes produced
in 2016

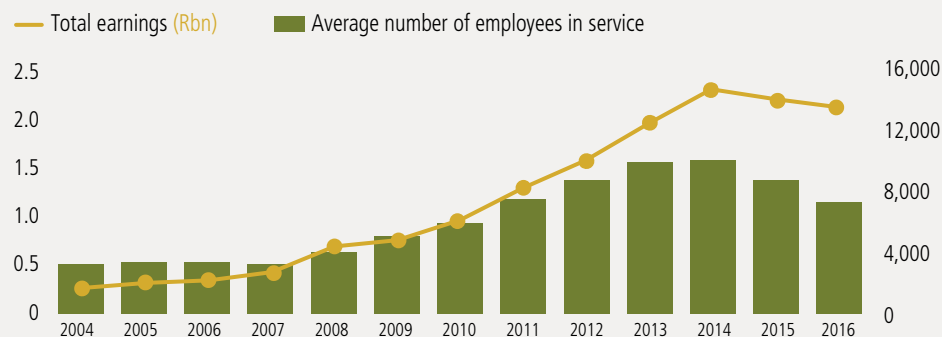
MANGANESE continued

Table 16: South African manganese production & sales

Year	Production	Local sales		Export sales		Total sales	
	tonnes	Mass 1,000t	Value R'000	Mass 1,000t	Value R'000	Mass 1,000t	Value R'000
2004	4,206,746	–	642,414	2,403	1,082,285	–	1,724,699
2005	4,611,683	–	681,861	2,119	1,518,965	–	2,200,826
2006	5,213,338	–	727,182	2,846	1,518,653	–	2,245,835
2007	5,996,086	–	934,901	3,691	2,636,526	–	3,571,427
2008	6,807,059	–	1,761,849	4,689	15,581,560	–	17,343,408
2009	4,578,770	–	583,602	3,976	5,003,011	–	5,586,613
2010	7,171,745	–	1,320,564	5,986	9,340,026	–	10,660,590
2011	8,651,842	–	1,325,214	6,773	8,569,854	–	9,895,067
2012	8,943,415	–	1,134,842	7,498	9,685,812	–	10,820,654
2013	10,957,133	–	1,506,434	–	12,969,545	–	14,475,979
2014	14,051,244	–	1,641,633	–	14,734,415	–	16,376,049
2015	15,952,416	–	860,474	–	12,657,775	–	13,518,249
2016	13,735,509	–	879,774	–	18,861,301	–	19,741,075

Source: Department of Mineral Resources

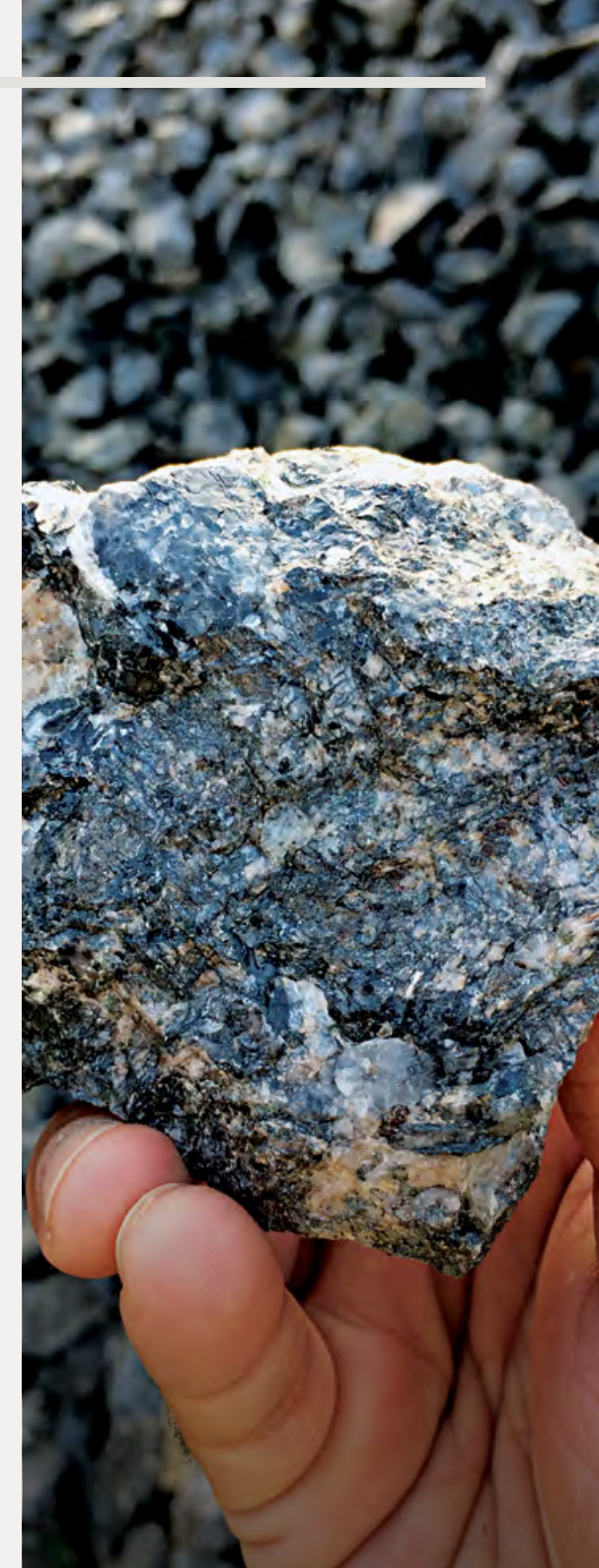
Figure 17: Employment & earnings – South African manganese mines



Source: Department of Mineral Resources



7,240
people employed
in 2016

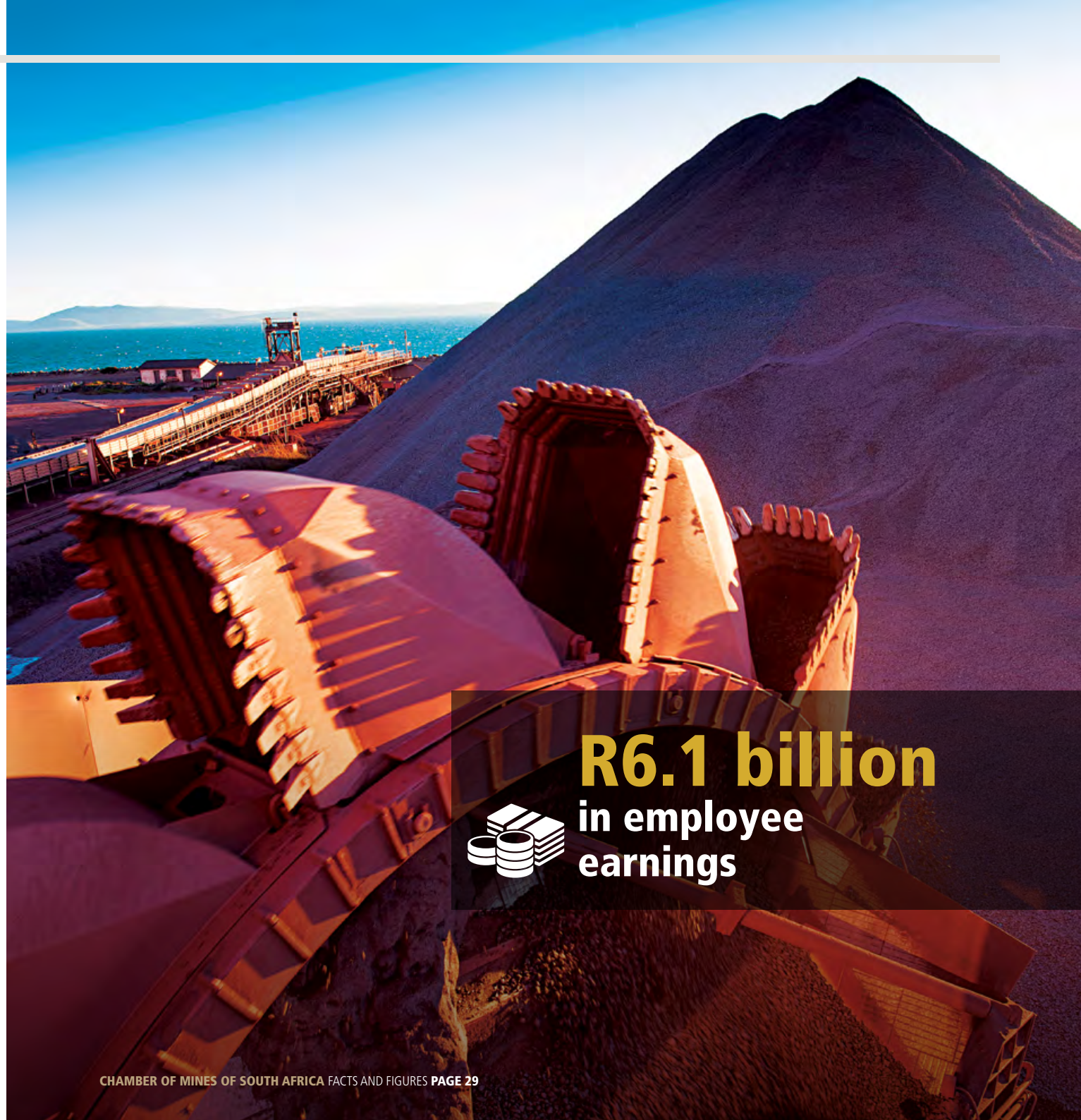


IRON ORE

Iron ore prices have been very volatile, contributing greatly to business uncertainty in the sector. Iron ore prices soared from US\$59.78/tonne in April 2009 to US\$179.6/tonne in January 2011.

Since then prices have wavered between US\$40.88/tonne in December 2015 and US\$80.82/tonne in January 2017.

Employment peaked at 23,380 in 2012, dropping to 16,490 in 2016. On the other hand, employee earnings increased from R4.7 billion in 2012 to R6.3 billion in 2015 (though declining to R5.9 billion in 2016). The increase in earnings, even as the number of people employed decreased, could be attributed to the presence of organised labour in the mining industry in general. The industry is still one of the most unionised in the economy.



R6.1 billion
in employee
earnings

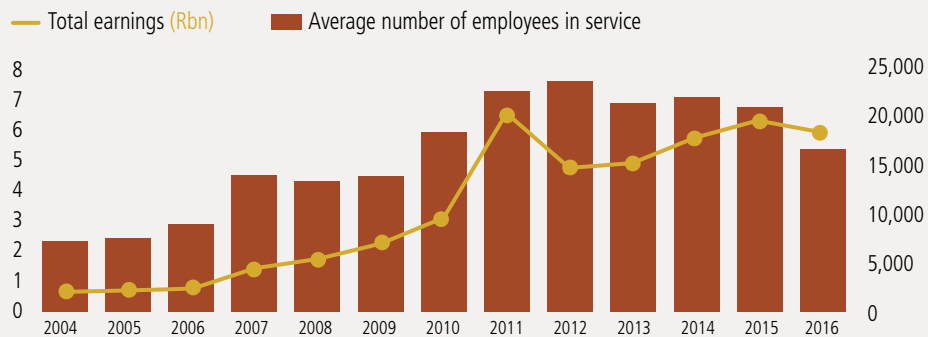
IRON ORE continued

Table 17: South African iron ore production & sales

Year	Production	Local sales		Export sales		Total sales	
	tonnes	Mass 1,000t	Value R'000	Mass 1,000t	Value R'000	Mass 1,000t	Value R'000
2004	39,322,048	12,431	1,145,600	24,745	3,439,885	37,176	4,585,485
2005	39,542,072	12,009	1,272,796	26,628	6,246,777	38,637	7,519,572
2006	41,371,896	12,036	1,398,450	27,371	8,532,831	39,407	9,931,281
2007	42,083,081	12,407	1,749,498	29,893	11,733,818	42,301	13,483,316
2008	48,982,537	11,258	1,974,629	32,766	20,267,206	44,024	22,241,836
2009	55,313,053	8,369	1,888,801	44,550	25,242,934	52,919	27,131,735
2010	58,709,330	10,561	3,270,327	47,493	40,148,279	58,053	43,418,606
2011	58,056,897	9,844	4,207,746	51,891	58,444,148	61,735	62,651,894
2012	67,100,474	8,393	4,448,978	57,110	48,193,830	65,503	52,642,808
2013	71,644,761	9,295	5,776,442	58,180	57,360,500	67,476	63,136,942
2014	80,741,034	9,572	5,741,815	61,945	52,944,638	71,516	58,686,453
2015	72,805,534	7,513	5,071,073	64,176	34,394,014	71,689	39,465,086
2016	66,455,868	6,161	3,855,830	58,644	39,373,973	64,805	43 229 803

Source: Department of Mineral Resources

Figure 18: Employment & earnings – iron ore mines



Source: Department of Mineral Resources



16,490
people employed
in 2016



COPPER

Copper production reached 116,973 tonnes in 2007. Since then there has been a steady decline and production stood at 65,257 tonnes in 2016. The market is equally divided between domestic consumption and exports.

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; and plastics substitutes for copper are used in water pipe, drain pipe, and plumbing fixtures.



65,257
tonnes produced
in 2016

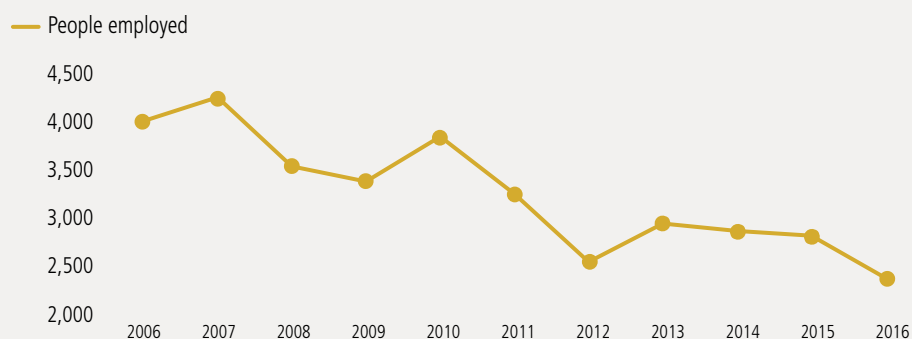
COPPER continued

Table 18: South African copper production & sales

Year	Production	Local Sales		Export sales		Total sales	
	tonnes	Mass 1,000t	Value R'000	Mass 1,000t	Value R'000	Mass 1,000t	Value R'000
2004	102,577	84	1,542,829	29	483,293	113	2,026,122
2005	103,856	82	1,926,378	30	656,721	112	2,583,100
2006	109,590	84	3,892,104	24	1,064,042	108	4,956,146
2007	116,973	76	4,020,296	37	1,813,662	113	5,833,958
2008	97,185	69	4,120,564	33	1,507,356	101	5,627,920
2009	92,850	68	2,835,737	27	1,022,782	95	3,858,519
2010	83,639	57	3,160,029	25	1,209,297	82	4,369,326
2011	89,297	60	3,937,749	26	1,495,100	86	5,432,849
2012	69,859	55	3,575,956	27	1,579,105	81	5,155,061
2013	80,821	56	4,056,792	26	1,760,781	82	5,817,573
2014	78,697	45	3,483,784	37	2,466,769	82	5,950,553
2015	77,360	37	2,703,423	38	2,497,528	75	5,200,951
2016	65,257	27	1,923,681	27	1,821,207	54	3,744,887

Source: Department of Mineral Resources

Figure 19: Estimated employment in copper mining



Source: Department of Mineral Resources



65,257t
of copper produced
in 2016

CHROMITE



South Africa is the world's leading producer of chromium, which is used in the manufacture of stainless steel. While China is the leading consumer of chromium and ferrochromium because of its production of stainless steel, South Africa has the largest reserves of the metal.

Ferrochromium production and beneficiation is highly energy intensive and due to uncertainty of the availability and steeply rising cost of electricity, most processing of this metal has been moved offshore.

While domestic sales have been volatile, demand in the export market has soared, from 1.9 million tonnes in 2010 to a record 4.7 million tonnes in 2016. Employment figures for 2016 indicate that employment declined from 18,470 people in 2015 to 15,514 in 2016. Employee earnings were R4.4 billion.



R4.4 billion
in employee
earnings

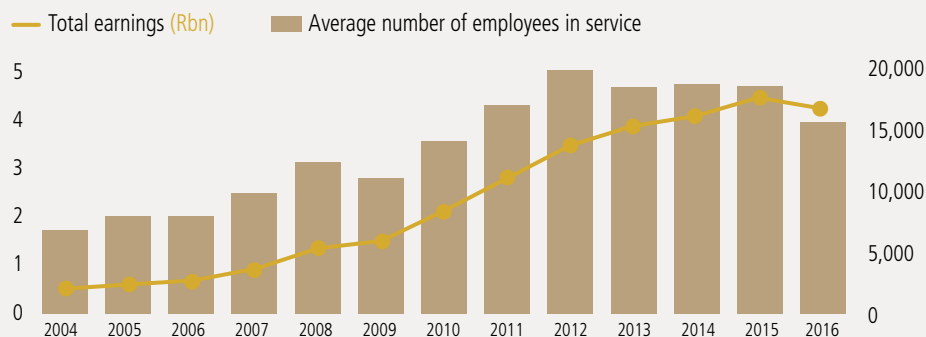
CHROMITE continued

Table 19: South African chromite production & sales

Year	Production	Local sales		Export sales		Total sales	
	tonnes	Mass 1,000t	Value R'000	Mass 1,000t	Value R'000	Mass 1,000t	Value R'000
2004	7,676,800	6,743	1,368,846	513	318,894	7,256	1,687,739
2005	7,552,237	6,128	1,468,521	657	442,045	6,785	1,910,566
2006	7,425,860	6,387	1,803,587	741	506,177	7,128	2,309,764
2007	9,664,656	7,389	2,346,982	893	659,466	8,282	3,006,448
2008	9,682,640	7,116	4,131,020	762	1,267,931	7,878	5,398,951
2009	7,560,938	4,880	2,081,058	1,709	1,571,311	6,589	3,652,368
2010	10,871,095	7,267	4,159,308	1,929	2,459,473	9,196	6,618,781
2011	10,721,360	7,434	5,382,328	2,000	3,237,219	9,434	8,619,547
2012	11,310,223	6,685	4,683,023	2,470	3,594,282	9,154	8,277,305
2013	13,644,699	8,483	5,870,717	4,168	5,891,833	12,651	11,762,549
2014	13,661,244	10,048	7,771,424	3,695	5,834,876	13,743	13,606,301
2015	14,037,722	9,864	8,112,016	4,821	8,104,128	14,685	16,216,145
2016	16,272,362	10,223	8,951,605	4,682	6,783,465	14,905	15,735,070

Source: Department of Mineral Resources

Figure 20: Employment & earnings – South African chromite mines



Source: Department of Mineral Resources



15,514
people employed
in 2016

AGGREGATE AND SAND



The aggregate and sand industry is closely linked to the construction sector. While the industry was adversely affected by the 2007/08 global financial crisis, production is back to pre-crisis levels indicating that the construction sector, particularly residential property, is growing again.

During the crisis years banks restricted credit flows to potential homeowners. Credit extension has since normalised and, indirectly, led to higher demand and increased production of aggregates and sand. Between 2009 and 2016 the value of sales increased by an average 6.7% with 2014 having seen the highest increase of approximately 9.2%.

The aggregate and sand industry is the smallest contributor to mining sector employment having recorded 7,602 employees in 2016. Average earnings per employee were also the lowest, at R148,804. One reason for these low earnings is the abundance of and easy access to these materials. Their extraction also requires no specialised skills.



R1.2 billion
total employee
earnings in 2016

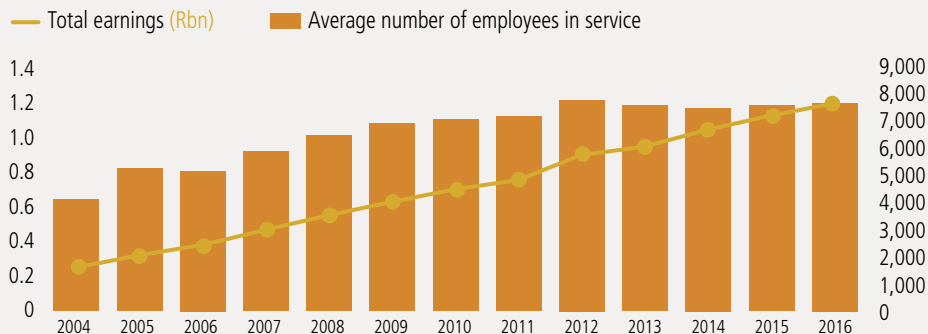
AGGREGATE AND SAND continued

Table 20: South African aggregate & sand sales

Year	Mass (tonnes)	Value (R'000)
2004	42,363,144	1,751,312,775
2005	49,463,101	2,217,002,135
2006	57,319,132	2,739,409,542
2007	62,127,845	3,314,117,233
2008	60,996,383	3,757,580,152
2009	52,559,228	3,826,340,295
2010	51,803,437	3,809,923,813
2011	52,122,803	4,066,505,212
2012	53,373,625	4,476,359,468
2013	60,966,575	5,291,393,954
2014	62,972,237	5,967,061,452
2015	63,602,931	6,492,165,756
2016	65,799,665	7,078,841,061

Source: Department of Mineral Resources

Figure 21: Employment & earnings – aggregate and sand



Source: Department of Mineral Resources

Between 2009 and 2016
the value of sales increased
annually by an average

6.7%

with 2014 having the highest
increase of approximately

9.2%



7,602
people employed
in 2016



SILVER



Silver production has a long history in South Africa. For the last 10 years the trend in production in the sector has been downwards from 86,9 tonnes in 2006 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 2016.

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.



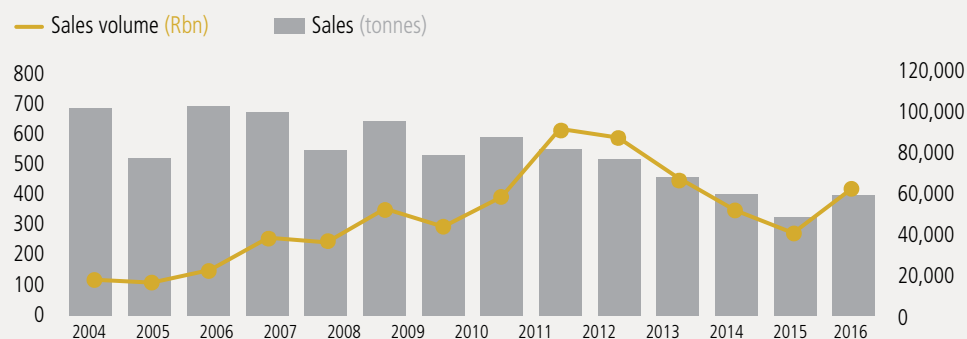
R396.4 million
total employee
earnings in 2016

SILVER continued

Table 21: South African silver production & sales

Year	Production	Local sales		Export sales		Total sales	
	tonnes	tonnes	Value R'000	tonnes	Value R'000	tonnes	Value R'000
2003	87.4	3.6	4,659	104.7	114,555	108.3	119,215
2004	70.9	4.8	7,483	71.8	93,995	76.6	101,478
2005	87.9	3.8	5,660	98.5	137,844	102.3	143,504
2006	86.9	4.7	11,026	94.6	239,595	99.3	250,621
2007	69.8	3.7	10,895	76.9	224,146	80.6	235,041
2008	75.2	7.9	28,272	87.0	318,573	94.8	346,845
2009	77.8	8.1	30,906	70.1	256,198	78.2	287,103
2010	79.3	7.8	35,639	78.9	350,440	86.7	386,079
2011	73.2	10.0	80,001	71.3	531,932	81.2	611,933
2012	67.3	6.1	49,591	70.3	533,232	76.4	582,824
2013	68.8	6.0	43,179	61.6	409,672	67.6	452,851
2014	37.3	4.3	27,011	55.1	315,097	59.3	342,107
2015	48.0	3.4	21,717	56.4	343,179	59.8	364,896
2016	52.1	3.6	28,338	54.9	384,476	58.5	412,814

Figure 22: Silver sales



Source: Department of Mineral Resources

52.1 tonnes
production 2016

© URANIUM

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



URANIUM continued

Figure 23: South African Uranium production (kg)

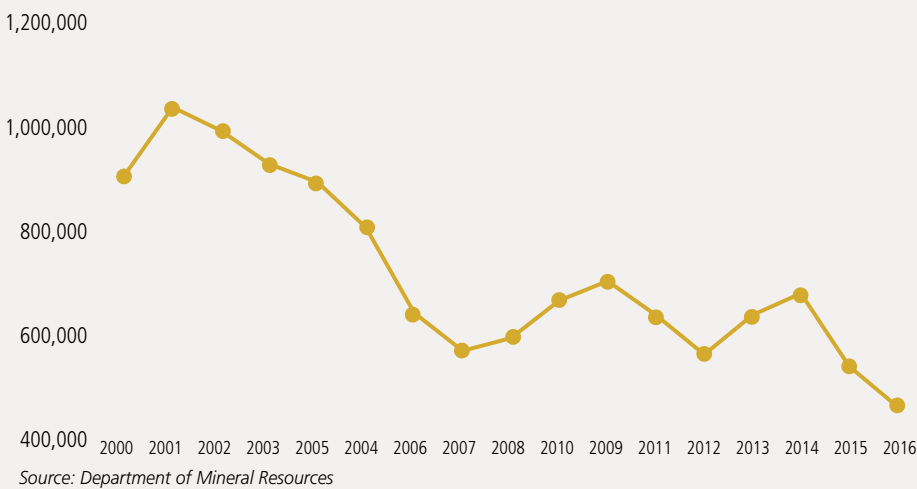


Table 22: Uranium as U₃O₈ – production

Year	Kilograms
2003	915,861
2004	880,943
2005	793,943
2006	630,103
2007	557,525
2008	582,001
2009	654,086
2010	691,359
2011	626,117
2012	550,458
2013	626,279
2014	667,697
2015	527,780
2016	450,110





GLOSSARY

Key words, terms and abbreviations used in the book

PGM	Platinum Group Metals
oz	ounce (1 ounce = 28.3495 grams)
GFCF	Gross fixed capital formation
GDP	Gross domestic product
FOB	Free on board – cost of product only, excludes transport cost
FOR	Free on road – cost of product only, excludes transport cost



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