

SOUTH AFRICAN MINERAL INDUSTRY

2017/2018

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mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

DEPARTMENT: MINERAL RESOURCES

REPUBLIC OF SOUTH AFRICA

Directorate: Mineral Economics

SOUTH AFRICA'S MINERAL INDUSTRY

2017/2018

The cover picture represents South Africa's Minerals Mining Industry.

Issued free by and obtainable from the

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First Published August 1984

This, the 36th edition, published 2019

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ISBN: 978-0-621-47154-0

FOREWORD

South Africa's economy is built on the country's enormous mineral resources and, the mining sector continues to play an economic and socio-economic role in the country's development. The Mineral resources reserves that are still beneath the soil of the Republic are estimated at R2.5 trillion. With exploration continuing, there is room for more reserves to be discovered and validated. The country accounts for 94 percent of known global reserves of the platinum group metals (PGMs), 73.7 percent of chrome, 29 percent of manganese, 18.4 percent of vanadium and 10.5 percent of gold reserves. The country has the potential to supply a large share of the global demand for many commodities, but its rich endowment of natural resources and high mineral potential can only be developed and extended through a vibrant exploration sector. 2017, global expenditure increased to \$7.95 billion an increase of 14.4 percent from 1535 companies. This increase could be attributed to improved metal prices. However, contrary to an increase in global exploration expenditure during 2017, South African has continued to experience declining exploration expenditure, despite improved commodity prices in recent years.

In 2017, mining contributed R334.7 billion or 8 percent to gross domestic product from R306.2 billion in 2016 an increase of R28.4 billion. The increase in production and value addition by mining can be attributed to the recovery in prices of commodities. The improved commodity prices brought the mining industry back into profitability. If the value-added contribution of processed minerals presently included in the manufacturing sector's figures were added to that of mining and quarrying, the impact of mining on the national accounts would be significantly higher.

For government, as it seeks to leverage the country's comparative advantage in mineral resource endowment to create a competitive advantage for domestic mineral beneficiating entities, thus playing a contributory role towards setting the country's growth trajectory on a production led growth path. South Africa's minerals industry is open to investment, in exploration, mining and value addition activities. South Africa is leading in known global reserve for platinum, chrome and manganese which accounts for 91 percent, 75.2 and 29 percent correspondingly and, it ranks in the top 10 in 12 mineral commodities. However, most of the identified mineral resources and reserves were discovered by means of obsolete exploration methods. Thus, there is a huge potential for the discovery of other world-class deposits, by means modern exploration technologies. To this end there are several projects that the government has is undertaking through Council for Geoscience, such as high intensity 10-year mapping programme and the development of an integrated, multi-disciplinary geological platform at a scale of one in fifty thousand [1:50, 000], nationwide. Also, the government is coordinating all the research initiatives related to exploration modernization, led by Department of Science and Technology, across the mining and minerals value chain to ensure that the sector's impact and benefit are optimised.

Thus, addressing challenges facing the mining industry would significantly improve the outlook of the sector, making it viable and resilient. To this end, the Mining Charter was finalised in 2018 and the MPRD Amendment Bill was withdrawn, providing the much needed policy certainty. These developments paved the way for investment into the country, despite a myriad of challenges that the sector faces. It is against this background that there is hope that the country will grow stronger among the favourite mining investment destinations. As a leading producer and supplier of a range of minerals, the country offers a highly competitive investment location, ensuring that it can meet specific trade and investment requirements of prospective investors and business people, whilst also meeting the development needs of its populace. To this end, there is a positive outlook of investment for the industry with an anticipated capital expenditure on projects of about R127 billion and an estimated 35 thousand new job opportunities in the next four years.

I wish to on behalf of Mineral Economics team thank the staff of the Mineral Policy and Promotion for their continued sterling performance in contributing to the compilation of this flagship publication, as well as the industry for its support and cooperation. Special appreciation is extended to the interns Ms. Nancy Rabuma, Mr. Tshepo Rakhudu and Ms. Mmapoo Maredi who contributed to the edition. I also wish to extend appreciation to Mr Omphemetse Moumakwa and Khangele Revombo, both of whom did a sterling job of holding the ford while the responsible Deputy-Directors where respectively on leave and assisting the department in other priority areas. Lastly, I wish to thank and congratulate Mr. Refiloe Motsie on his promotion to the post of Deputy-Director responsible for Industrial Minerals, after he diligently acted in that position, for more than two years.

A handwritten signature in black ink, appearing to read 'RAY MASETLANA', with a stylized flourish at the end.

MR RAY MASETLANA

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ABBREVIATIONS AND SYMBOLS

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

FOR	free on rail	SA	South Africa
FSU	Former Union of Soviet Socialist Republics (USSR)	S.ton	Short ton
		t	metric ton
g	gram	t/a	tons per annum
Ga	giga year	TCF	trillion cubic feet
g/t	gram per ton	UAE	United Arab Emirates
GAR	gross as received	US	United States of America
GWe	net gigawatts electric	USBM	United States Bureau of Mines
ILZSG	International Lead and Zinc Study Group	USGS	United States Geological Survey
INSG	International Nickel Study Group	w	withheld
kcal	kilocalorie	WBMS	World Bureau of Metal Statistics
kg	kilogram	y	year
kg/t	kilogram per metric ton	y-o-y	year-on-year
km	kilometre	\$	US dollar, unless stated otherwise
kt	kiloton	C\$	Canadian dollar
kt/a	kiloton per annum	£	British pound sterling
lb	pound avoirdupois	%	percent

EXPLANATORY NOTES

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

PART ONE: SOUTH AFRICA'S MINERAL INDUSTRY

GENERAL REVIEW

E Mokwena, E Malematja and V Madzuhe, TR Masetlana

INFRASTRUCTURE DEVELOPMENTS

South Africa is one of the major mining and mineral jurisdiction in the world. The mining industry has played an important role in shaping the development trajectory of the South African economy, for over a century. Cities and towns have been built on the backbone of the mining industry as well as other related industries such as manufacturing, financial services, electricity, transportation, etc. South Africa is a highly diversified economy with abundance of resources, extensive and modern infrastructure networks. Infrastructure development is at the core of every country's economic growth and development. Infrastructure plays a major role in economic growth and poverty reduction, conversely the lack of infrastructure affects productivity and, could lead to high production costs, which hinders growth by reducing competitiveness of business and the ability of government to pursue economic development. According to public sector Infrastructure update, the public sector has spent more than 2.7 trillion on infrastructure between 1998/99 and 2016/17.

The South African infrastructure strength also extends to the financial sector, to complement the development of the mining industry and economy in general. South Africa's banking system is well-developed, offering a matured market with a good regulatory and legal framework. The South African Reserve Bank (SARB) oversees the local banking services industry. The non-banking financial services industry such as insurances and lending institutions are governed by the Financial Service Board (FSB). Mechanisms such as capital adequacy and prudential requirements imposed by the central bank are in place to ensure a sound banking regulatory compliance.

Infrastructure constraints have limited the degree to which South Africa has benefited from the commodities' boom for minerals depending on rail or energy-intensive processes such as iron and manganese ores, coal and ferro-alloys. The main constraints have been transport (rail), water (to support mining processes) and energy infrastructure capacity that have been unable to expand to meet demand, mainly due to funding constraints. Railway bottlenecks present major impediments to miners and, have been cited by mining companies as the main deterrent to entering the sector.

The local mining industry, especially the precious metals remains under pressure and fragile. However, there is a silver lining with the industrial minerals sector, which has shown sustained growth. Government continues to prioritise infrastructure investment, as it has plans to spend R987.4 billion on infrastructure development in the next three years until 2020, which will stimulate demand for building materials. Government's infrastructure development programme is set to

continue driving the demand for construction materials in the medium term. This growth will be underpinned by expansion in public works programmes, coupled with energy and transport A

In a bid to stimulate economic growth, government has developed a National Infrastructure Plan to better coordinate and monitor activity in the construction industry. Government's commitment towards infrastructural development will cover all priority areas in rail, road and ports, dams, irrigation, sanitation as well as energy. This will have a positive signal for future growth in the industry and the broader economy. There is a huge drive to develop the country's rail network and ports infrastructure in a bid to improve the ease of doing business in South Africa and thus, increase the level of investment.

Current and future mining activity should continue to generate new infrastructure such as roads, railway lines, electricity supplies, schools and hospitals that, although provided for mining and minerals industry and its workforce, can also benefit the rest of the population (i.e. communities within the vicinity of mining), first and foremost. The agglomeration of the infrastructure around mining will continue to play a pivotal role in the development of future infrastructure through the complementing the government infrastructure plans. There are several key government institutions that are playing a significant role in the development of the South African economy and mining industry.

Transnet

South Africa (SA) boasts the most modern and extensive infrastructure in Africa, with a highly developed transport infrastructure, consisting of extensive road and rail networks. Transnet is a public company wholly owned by the government and, it is a leading player in the Southern African transport sector, supporting the country's freight logistics network. Its activities extend beyond the borders of South Africa, into other African states and the rest of the world. Parts of emerging world and resource-rich regions are stabilising due to a continued commodity price recovery and, this bodes well for Transnet as the transportation and handling of key commodities such as coal, manganese and iron ore will be in demand. Significant improvement in infrastructure will provide a boost to the sector over the coming years. Transnet's plan to overhaul and expand the railway network, will allow for much efficient transport and export of coal as well as reducing mining companies' operating costs.

Transnet continue to play its role in creating transport infrastructure capacity as well as maintaining and improving the reliability of existing services to contribute positively towards a growing and inclusive economy. The company plans to migrate from the Market Demand Strategy (MDS) which was adopted in 2012 to the new Transnet 4.0 Strategy. At the inception of the MDS in 2013, the strategy aimed at advancing south Africa's developmental objectives which include Broad-Based Black Economic Empowerment, supplier and enterprise development and skills development and planned to create approximately 588 000 direct jobs. The MDS has undertaken some of the country's largest capital projects which resulted in an increase in rail, port and pipeline capacity in the past six years. Some of the projects completed under the MDS planning horizon includes phase 1 of the manganese expansion rail network, a new port administration building in the port of Ngqura and the multi-product pipeline. The company continued to execute its infrastructure investment programme, spending R21.8 billion in 2017, which took the total investment under MDS to R165.6 billion in the past six years. Transnet 4.0 strategy's key objectives are directed towards increasing

the connectivity, density and capacity of the integrated port, rail and pipeline network. The new strategy plans to take the organisations to new heights of digitization and innovation, of which an additional amount of R163.7 billion will be invested in the next five years to 2023.

Transnet Freight Rail (TFR) is the largest division within Transnet, representing the group's rail freight transport interests. The company maintains extensive rail network which provide strategic links between ports and production hubs and, connect with the railways of the SADC region. The Transnet freight rail increased its revenue by 11.7 percent in 2017 to R43.7 billion, driven by railed coal export of 77 Million Tons. The coal line is the main channel for coal exports, which starts with the mines in Mpumalanga and ends at the port of Richards Bay Coal Terminal (RBCT). An amount of R2.8 billion was invested in the coal line capacity expansion to 81 Mt per annum and, R55 million was invested for the upgrade of yards, lines and electricity equipment. The iron ore line is the main export channel for iron ore from the mines in the Northern Cape to the Port of Saldanha. The export volumes of iron ore increased marginally by 2.3 percent to 58.5 Mt in April 2018, compared to 57.2 Mt in 2017, due to extreme weather conditions that disrupted the operations. The company also invested about R164 million in the Waterberg upgrade stage II to grow rail capacity through incremental upgrades of the existing rail networks, electrical upgrades and improved trains control systems. The Waterberg region is regarded as the next strategic growth node of the coal sector as it has 40 percent of South Africa's remaining coal reserves; therefore, the availability of infrastructure is critical for current and future mining developments.

Portnet

Portnet, a subsidiary of PSA Corporation Limited, was formed in 2000 with the aim of helping the port and shipping, to increase productivity and save costs through the greater use of information technology and the internet. Portnet is the largest port authority in Southern Africa, with the best-equipped and most efficient network of ports in Africa. The network connects the ports of South Africa and the rail networks of the Sub-Saharan region. Most of South Africa's minerals are exported through five major ports, the largest of which is Richards Bay Coal Terminal (RBCT) which has grown into an advanced 24-hour operation, with a design capacity of 91 Mt per annum. The terminal is bulk handling facility of coal exports from South Africa, making the country a preferred source of coal for international markets. South Africa's coal exports are mostly sent to India, China, and Europe. Demand drivers include growth in demand for seaborne thermal coal and other minerals to be exported to those countries/regions, that would sustain major expansion in global trade.

Eskom

Eskom was established in 1923 as the Electricity Supply Commission. In July 2002, it was converted into a public, limited liability company, wholly owned by government. It is a vertically integrated operation, that generates, transmits and distributes electricity to manufacturing industries, mining, commercial, agricultural, residential customers and redistributors. According to South Africa's Department of Energy (DOE), Eskom supplies roughly 90 percent of South Africa's electricity and, the remainder comes from Independent Power Producers (IPPs) and imports. Eskom buys and sells electricity with other countries in the SADC region, supplying approximately 40 percent of the electricity used in Africa. It is ranked among the top ten utilities in the world, in terms of generation capacity. South Africa plans to diversify its electricity generation mix. Currently,

about 85 percent of South Africa's generation capacity is from coal-fired power stations, about 5 percent from one nuclear power plant, and 2 percent from hydroelectric plants, with a small amount from a wind station and solar power.

South Africa's renewable energy industry is relatively small, but the country plans to expand renewable electricity capacity to 18 200 MW by 2030. Renewable energy sources include wind, solar power, biomass, landfill gas and small hydro technologies. Eskom's 2018 annual report highlighted that the company remains committed to environment sustainability and reducing carbon footprint, with purchases of renewable from IPPs, coupled with their own investment in renewables. Government signed 27 renewable energy IPP agreements in April 2018 to ensure certainty required by investors. The highly anticipated update of Department of Energy's Integrated Resource Plan (IRP) will further restore policy certainty in the electricity sector, providing a clear indication of the country's energy mix and strengthen Eskom's future role in this regard.

Eskom started the capacity expansion programme in 2005, building new power stations and high-voltage transmission power lines to meet South Africa's rising demand for electricity and, to diversify the energy mix. The programme is still on course and is expected to be completed by 2022, increasing generation capacity by 17 384 MW, transmission lines by 9 756 km and substation capacity by 42 470 MVA. Since its inception to March 2018, the capacity expansion programme has resulted in additional generation capacity of 10 750 MW, with 7 469 km of transmission lines and 36 900 MVA of substation capacity. The programme has costed R363.8 billion, to date. Kusile unit 1 and units 4 and 5 of Medupi power stations were commissioned in 2017, after completing reliability and compliance tests, adding 2 387 MW installed capacity to the grid.

In terms of human development, South Africa has a sizeable labour pool. The 2017 Human Development Index (HDI) survey, conducted by the United Nations in about 189 countries, placed South Africa at number 113, as a medium human development country. As a major mining country, South Africa's strengths include a high level of technical expertise as well as comprehensive research and development activities. The Government, through the Amended Skills Development Act of 2003, tightened regulations to ensure continuous improvement in the skill development strategies across all sectors. The Mining Qualifications Authority (MQA) is responsible for the provision and administration of skills development projects for the mining and minerals sector. Stakeholders in the mining and minerals sector, including the MQA, the Department of Minerals Resources and labour organisations provide Occupational Health and Safety (OHS) training, to reduce the prevalence of mining related fatalities and health issues related to mining.

MINERAL INDUSTRY STRENGTH

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

- The Witwatersrand Basin (through Mpumalanga, North West and Gauteng provinces) yields much of South Africa's gold output and, contains considerable resources of uranium, silver, pyrite and osmiridium;

- The Bushveld Complex, which is found in North West and Limpopo provinces, hosts platinum group metals (with associated copper, nickel and cobalt mineralisation), chromium and vanadium bearing titanium iron ore formations, as well as large deposits of the industrial minerals, including fluorspar and andalusite;
- The Transvaal Supergroup (Northern Cape and Limpopo provinces) contains enormous resources of manganese and iron ore;
- The Karoo Basin extends through Mpumalanga, KwaZulu-Natal, Free State provinces as well as Limpopo Province, hosting considerable bituminous coal and anthracite resources and shale gas discoveries;
- The Palaborwa Igneous Complex in Limpopo Province, hosts extensive deposits of copper, phosphate, titanium, vermiculite, feldspar and zirconium ores;
- Kimberlite pipes on the Kaapvall Craton, through Gauteng, Limpopo, North West and Northern Cape provinces host diamonds that also occur in alluvial, fluvial and marine settings;
- Heavy mineral sands lining the coast of the country, particularly in KwaZulu-Natal contain ilmenite, rutile and zircon;
- Significant deposits of lead-zinc ores associated with copper and silver are found in the Northern Cape near Aggeneys.

South Africa is leading in known global reserve for platinum, chrome and manganese which accounts for 91 percent, 75.2 and 29 percent correspondingly (Table 1). Since most of the identified mineral resources and reserves were discovered by means of obsolete exploration methods. There is still a significant potential for the discovery of other world-class deposits in areas not yet thoroughly explored, using modern exploration technologies. There are several projects that the government through Council for Geoscience is undertaking, such as to work on a high intensity 10-year mapping programme and to develop an integrated, multi-disciplinary geological platform at a scale of one in fifty thousand [1:50, 000], nationwide. Furthermore, the government is coordinating all the research initiatives related to exploration modernization, led by Department of Science and Technology- across the mining and minerals value chain to ensure that its impact is optimised.

TABLE 1: SOUTH AFRICA'S ROLE IN WORLD MINERAL RESERVES, PRODUCTION AND EXPORTS, 2017

COMMODITY	RESERVES				PRODUCTION				EXPORTS			
	Unit	Mass	%	Rank	Unit	Mass	%	Rank	Unit	Mass	%	Rank
Aluminium		*	*	*	kt	604	1.0	11	kt	471	2.7	8
Alumino-silicates	Mt	96	*	*	*	*	*	*	*	*	*	*
Antimony	kt	27	1.8	8	t	*	*	*	t	*	*	*
Chrome Ore	Mt	3 100	75.2	1	kt	16 573	54.3	1	kt	4 717	46.3	1
Coal	Mt	66 700	6.4	6	Mt	252	3.4	7	Mt	79.8	5.8	6
Copper	Mt	*	*	*	kt	65.5	*	*	kt	29.8	*	*
Ferro-chrome		*	*	*	kt	3 483	*	*	kt	2 950	*	*
Ferro-Mn/Fe-Si-Mn		*	*	*	kt	458.7	*	*	kt	271.8	*	*
Ferro-silicon		*	*	*	kt	82	*	*	kt	29	*	*
Fluorspar	Mt	41	15.8	1	Kt	218.4	3.3	4	kt	232.7	*	*
Gold	t	6 000	11.1	2	t	137.1	4.3	8	t	119.6	*	*
Iron Ore	Mt	770	0.9	11	Mt	74.9	3	7	Mt	60.9	4.3	4
Lead	kt	*	*	*	kt	48.1	*	*	kt	54.7	*	*
Manganese Ore	Mt	200	29	1	kt	14.1	62.1	1	kt	13.4	38.1	1
Nickel	Mt	3.7	5	3	kt	48.4	*	*	kt	36.8	*	*
PGMs	t	63 000	91	1	t	260.3	*	1	t	251	*	*
Phosphate Rock	Mt	1 500	2.1	5	kt	2 078	0,7	16	kt	683	*	*
Silicon Metal		*	*	*	t	4.7	*	*	t	10	*	*
Silver		*	*	*	t	62.5	*	*	t	53.2	*	*
Titanium Minerals	Mt	71.3	7.6	4	kt	2 288	22.6	1	kt	419	*	*
Uranium	ktU	*	*	*	ktu	303.6	*	*		*	*	*
Vanadium	kt	3 500	17.5	3	kt	14	*	*	kt	9.8	*	*
Vermiculite	Mt	14	*	*	kt	166.1	41	1	kt	68.1	*	*
Zinc	Mt	*	*	*	kt	30.7	*	*	kt	32.4	*	*
Zirconium	Mt	14	18.8	2	kt	400	25.9	2	kt	364	*	*

Sources: USGS, Mineral Commodity Summaries, 2018

Notes: Full details given in respective commodity chapters

* Information not available

#Resource

PRODUCTION OVERVIEW OF SELECTED MAJOR MINERALS

TABLE 2: SOUTH AFRICA'S PRODUCTION OF SELECTED MAJOR MINERALS, 2013 – 2017

COMMODITY	UNIT					
		2013	2014	2015	2016	2017
Coal	t	255 019 489	260 642 387	252 176 473	250 566 445	252 347 846
Cobalt	t	1 294	1 332	1 362	1 101	1 062
Copper	t	80 821	78 697	77 360	65 257	65 502
Chromite	t	13 652 883	14 037 722	15 655 661	14 707 518	16 573 021
Diamonds	ct	8 143 256	8 046 050	8 232 734	8 304 587	9 698 038
Gold	kg	159 472	149 634	144 504	142 091	137 133
PGMs	kg	264 188	188 444	275 515	263 653	260 264
Nickel	t	51 208	54 956	56 689	48 994	48 383
Lead	t	41 848	29 348	34 573	39 344	48 150
Manganese	t	11 055 658	14 051 244	11 033 717	10 805 809	14 143 794
Iron Ore	t	71 533 814	80 759 334	72 805 534	66 455 868	74 857 447
Zinc	t	30 145	26 141	29 040	26 695	30 778

Source: Department of Mineral Resources, Directorate: Mineral Economics

South Africa's mining industry has in the past few years experienced declined financial performance which was impacted by a slump in commodity prices and increased cost pressures. Local cost pressures, labour actions, and a continuing downswing in commodity prices have also resulted in shrinking margins and impairment provisions. However, improving commodity prices since the beginning of 2017, and upwards trends in global demand especially in major trading partners of South Africa reinvigorated the mining industry in 2017. Most commodities within the mining industry had performed quite well through an increase in production with the exclusion of gold, PGMs, and nickel, which recorded decrease of 3.5 percent 1.3 percent and 1.2 percent correspondingly (Table 2). Declining prices of precious metals particularly the PGM's has put a lot of pressure on the production of precious metals. Furthermore, the appreciation of the rand to average R13. 29 in 2017 from R14.70 in 2016 ended putting the South African deep-level gold and platinum mines under severe pressure.

The South African mining sector's prospects in the coming years appear positive even though the forecasted growth rates remain very much muted. Furthermore, the speed and extent of the recovery is still uncertain due to lack of structural changes in the economy. The mining industry is facing numerous challenges which include amongst others such as an increase in extraction costs; incomplete regulatory policies and skills shortages. However, the prices of most key metals are sustaining strength and improving confidence in investment in the mining industry. The increase in prices will be mainly due to growing Chinese demand for minerals which remains strong. Furthermore, Indian economic development will be sustaining most of the commodity prices as it further accelerates its economic development albeit not in the same pace as the Chinese development over the last two decades.

Although, the global economy is still fragile, the recovery in industrial activity has coincided with a pickup in global trade, after two years of marked weakness. These present an opportunity for the mining industry in South Africa, going forward. The world economy's acceleration in 2017, mainly due to an upswing under way across nearly all the world's major economies improving the global economic mood. However, that economic mood was clouded by policy uncertainty, as the world trading system comes under mounting pressure.

EXPLORATION EXPENDITURE BY REGION, 2017

The total global exploration expenditure declined in 2016 by 20.8 percent with the total of \$6.95 billion, from 1582 companies. However, in 2017, global expenditure increased to \$7.95 billion an increase of 14.4 percent from 1535 companies. This increase could be attributed to improved metal prices.

Contrary to an increase in global exploration expenditure during 2017, South African has been experiencing declining exploration expenditure, despite improved commodity prices in recent years. This could be attributed to numerous challenges relating to instability within the policy environment. The ramification of declining exploration expenditure is dire, if the mining industry is to reclaim its eminence as one of the key industries that contributes to the economic growth and development of the country.

Latin America continues to be the most popular exploration destination since 1994. The region's share increased to a record high of 30 percent of the global budget from 29 percent in 2016, with six countries, Chile, Peru, Mexico, Brazil, Argentina and Colombia, accounting for 91 percent share of the region's total budget. Gold was the top Latin American exploration target for the third year in a row, with 44 percent of planned spending in the region, while base metals share went up from 38 percent in 2016 to 40 percent. The Rest of the World region, covering Europe and most of Asia, had the second largest budget with 17.4 percent share, led by allocations of \$387 million and \$336 million for China and Russia respectively, while Kazakhstan, Finland, India, Serbia and Sweden have each attracted more than \$50 million in exploration budgets in 2017. China held the region's top position, with 28 percent of total allocations for the seventh time in the past eight years and, gold was the region's top target for the third year in a row. Canada remained in third place in 2017, with 13.8 percent share of the total global budget. Ontario accounted for 28 percent of the region's exploration budget, followed by Quebec with 21 percent. In 2017, the gold share increased to 62 percent from 50 percent in 2016. On the other hand, exploration expenditure for both copper and

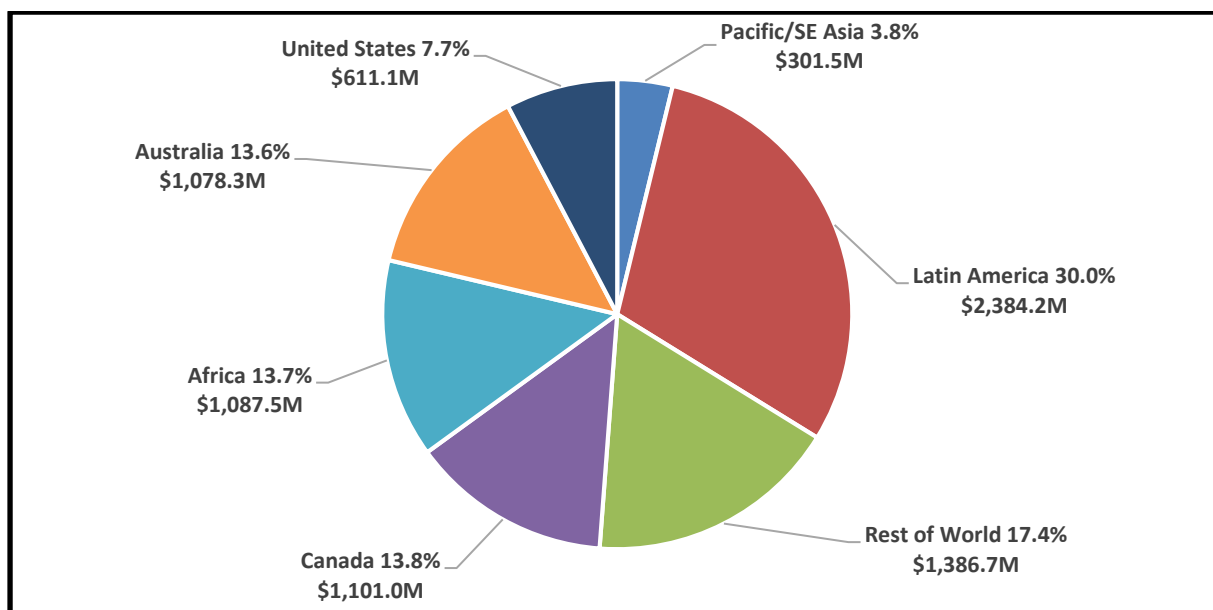
zinc decreased in 2017, but a 78 percent increase in nickel allocations increased base metals' share of Canada's budget from 14 percent in 2016 to 15 percent in 2017. Africa remained in fourth place with 13.7 percent share of the total global budget with Democratic Republic of Congo (DRC), Burkina Faso, Tanzania and South Africa as the most significant exploration destinations in the region. The exploration expenditure's share of gold in Africa went up from 51 percent in 2016 to 61 percent in 2017, resulting from West Africa's exploration budget, particularly Burkina Faso. However, the lower copper allocations for DRC, pushed the base metals share from 23 percent in 2016 to 17 percent in 2017.

In fifth place since 2004, was Australia with 13.6 percent share of total global budget, with Western Australia as the most popular exploration destination. Gold remained the top exploration target with a 24 percent year-on-year increase in allocations, while base metals increased by only 5 percent. Gold and copper exploration in the United States, kept that country in sixth place regionally, with a 7.7 percent share. Nevada, Arizona and Alaska states accounted for 73 percent of the total. Gold remained the top United States exploration target with 20 percent share in 2017 and base metals' share decreased from 34 percent in 2016 to 31 percent in 2017. The last spot was occupied by Pacific/Southeast Asia region with Indonesia, Papua New Guinea and the Philippines accounting for the bulk of the region's 3.8 percent share of the total global budget. Base metals were the top exploration target with 50 percent and gold with 47 percent.

Although Africa in general, had limited mineral exploration activities, it is home to more than half of the total earth resources, that need funds to be explored, using modern technologies.

There is a strong correlation between commodity prices and exploration expenditure. Rising prices and increasing industry confidence will also contribute to growth in budgets by the major and intermediate producers, who are realizing the benefits of increased cash flows. Metals prices are anticipated to continue rising in 2018, which will eventually translate into higher financing levels, compared with recent years.

FIGURE 1: DISTRIBUTION OF EXPLORATION EXPENDITURE BY REGION, 2017



Source: S&P Global Market Intelligence

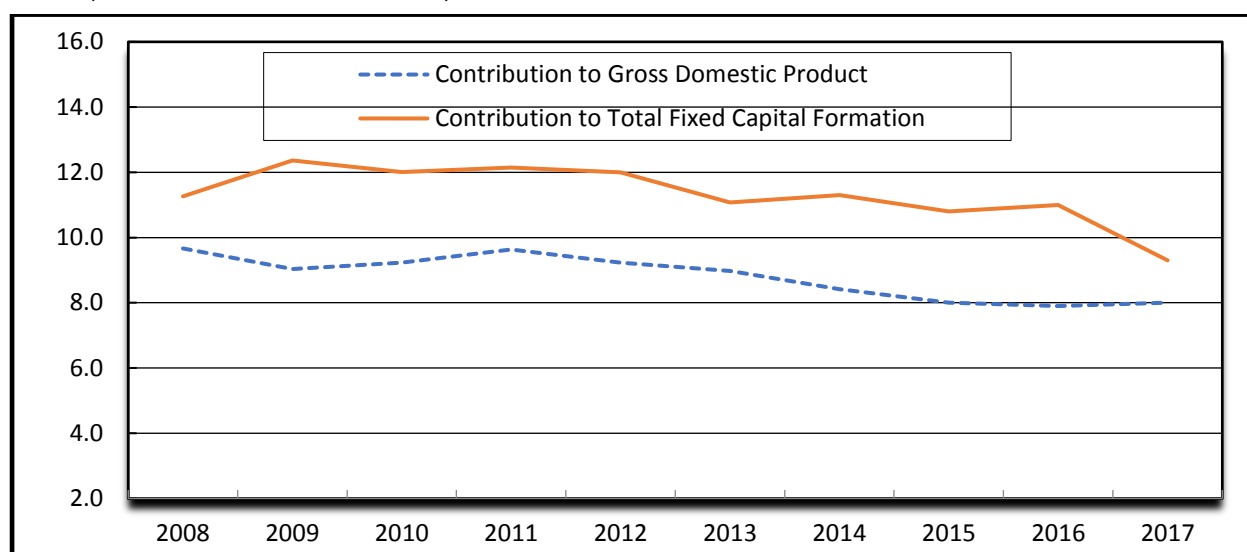
THE ROLE OF MINING IN THE NATIONAL ECONOMY

The South African economy recorded a positive rate of 1.3 percent in 2017, which was better than anticipated, fueled by upswing in commodity prices. The positive developments in the economy provided a platform to restart the economic engines and, boosted investor confidence. The mining industry grew by 4.6 percent in 2017, following a difficult beginning of 2017 by the mining industry.

Mining industry is one of the country's key economic sectors with potential for substantial contribution to economic growth, job creation, transformation and infrastructure development, consistent with the government's objectives of higher and more balanced economic and inclusive growth. In 2017, mining contributed R334.7 billion or 8 percent to gross domestic product from R306.2 billion in 2016 an increase of R28.4 billion (Figure 2 and Table 3). The increase in production and value addition by mining can be attributed to the recovery in prices of commodities. The improved commodity prices brought the mining industry back into profitability. If the value-added contribution of processed minerals presently included in the manufacturing sector's figures were added to that of mining and quarrying, the impact of mining on the national accounts would be significantly higher.

Critical and imperative factors that are considered to have an impact on the gross fixed capital formation of mining industry include amongst others the cost of labour; current market and potential market size; availability of skilled labour; cost of capital; availability of infrastructure; real exchange rate; exchange rate stability; rate of inflation; financial health and overall economic stability that include political stability. During the year 2017, the South African government and mining ministry made efforts and took initiatives to mitigate the challenges and stabilise the economy in dealing with the negative factors viability of the industry.

FIGURE 2: PERCENTAGE CONTRIBUTION OF MINING AND QUARRYING TO GROSS DOMESTIC PRODUCT AND TOTAL FIXED CAPITAL FORMATION OF SOUTH AFRICA, 2008-2017 (CURRENT RENT PRICES)



Source: South Africa Reserve Bank: Quarterly Bulletin, June 2018

Investment is regarded as a catalyst in the mining industry and, is essential in stimulating long run sector growth through improvements in productivity, which subsequently enhances job creation and overall economic growth. Investment enhances the country's productive capacity and goes a long way in driving economic development. Mining and quarrying contribution to Gross Fixed Capital Formation (GFCF) was 9.3 percent in 2017. Gross Fixed Capital Formation within the mining industry declined from R93 billion in 2016 to R80 billion in 2017 resulted from the constrained fiscal space, policy uncertainty (in the mining sector in particular).

TABLE 3: CONTRIBUTION OF MINING AND QUARRYING TO GROSS DOMESTIC PRODUCT, FIXED CAPITAL FORMATION AND TOTAL NATIONAL EXPORTS OF GOODS, and 2008 – 2017 (at current prices)

CONTRIBUTION TO VALUE ADDED				CONTRIBUTION TO FIXED CAPITAL FORMATION			CONTRIBUTION TO NATIONAL TOTAL EXPORT OF GOODS		
National Gross				TotalFixed					
Year	Domestic Product	From Mining		Capital Formation	From Mining		Total Exports	From Mining	
	R'million	R'million	%	R'million	R'million	%	R'million	R'million	%
2007	1 792 076*	156 970*	8.8	406 257*	40 206*	9.9	533 791*	162 203*	30.3
2008	2 137 190*	197 643*	9.2	556 997*	58 645*	10.6	728 802*	221 925*	30.8
2009	2 227 146*	200 824*	8.8	539 440*	64 140*	12.0	589 267*	176 837*	30.0
2010	2 494 860*	230 350*	9.2	529 431*	63 555*	12.0	668 856*	224 955*	33.6
2011	2 724 400*	261 575*	9.6	578 014*	68 819*	11.8	794 850*	281 910*	35.5
2012	2 932 879*	267 344*	9.1	625 643*	73 738*	11.5	822 382*	269 124*	32.7
2013	3 190 960*	288 085*	9.0	719 785*	78 481*	11.1	930 908*	290 645*	31.2
2014	3 420 317*	286 163*	8.4	781 657*	86 962*	11.1	1 006 030*	279 074*	27.7
2015	3 560 588	286 522	8.0	826 286	89 377	10.8	1 038 330	267 513	25.8
2016	3 871 214	306 212	7.9	846 291	93 352	11.0	1 104 213	267 937	26.7
2017	4 171 729	334 667	8.0	871 476	80 877	9.3	1 108 322	328 523	29.6

Sources: Department of Mineral Resources, Directorate Mineral Economics
South African Reserve Bank, Quarterly Bulletin, June 2018

Notes: *Revised figures

During 2017, the mining sector benefitted from the continued improvement of commodity prices as well as the strengthening of the rand, especially towards the end of the year. The total state revenue from the mining sector increased significantly, from R18.5 billion in 2016 to R19.6 billion in 2017. The industry took a turn for the better and saw substantial gains in the month of December 2017, which provided the much-needed relief to company income tax, as a once-off payment of R1.7 billion was also received (Table 4). Manganese was the largest contributor at an increase of 119 percent followed by chrome and copper at 95 and 82 percent respectively.

TABLE 4: CONTRIBUTIONS OF MINING AND QUARRYING TO STATE REVENUE, 2009–2017
(in R' million)

Commodities	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018
CEMENT	485.00	251.80	270.61	303.10	421.57	13.31	165.53	17.61	10.32
CHEMICAL AND FERTILIZER MINERAL MINING	330.25	8.13	273.43	117.23	220.11	275.09	169.99	173.27	100.87
CHROME	1703.97	1618.09	1769.33	1729.45	3200.50	1973.63	818.23	2190.51	4265.50
COAL	2613.64	2451.79	2873.13	2048.22	1401.60	1429.35	1375.58	3653.24	3549.11
COPPER	237.91	296.68	639.33	231.34	314.52	82.59	151.63	159.22	289.35
CRUDE PETROLEUM & NATURAL GAS	28.85	23.78	344.86	79.72	7.79	15.05	22.48	58.68	-5.03
DIAMOND MINING	162.21	468.60	802.06	575.23	303.65	164.05	57.34	290.71	652.00
GOLD AND URANIUM	1101.80	662.71	724.87	1061.08	387.37	599.08	139.21	582.91	501.80
IRON ORE	2773.64	6392.70	5407.85	3548.26	6290.33	4227.42	696.32	5614.18	4199.91
MANGANESE	1325.65	750.22	377.58	420.79	147.80	28.32	66.52	82.03	179.92
OTHER METAL ORE MINING	271.50	737.13	615.85	358.60	706.63	865.38	422.06	1533.93	1662.91
OTHER MINING NOT SPECIFIED	1737.21	1249.15	1646.50	1234.58	1945.68	1716.15	1443.61	1956.97	1849.10
PLATINUM	1187.59	2348.49	2645.72	694.21	3388.38	1824.04	1208.69	1910.09	2243.98
STONE QUARRYING, CLAY AND SAND-PITS	207.82	131.22	476.17	401.92	178.81	104.16	144.30	264.21	144.59
Grand Total	14167.05	17390.47	18320.42	12803.71	18899.16	13317.62	6881.50	18487.55	19644.33

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

Notes: # In respect of leased mines

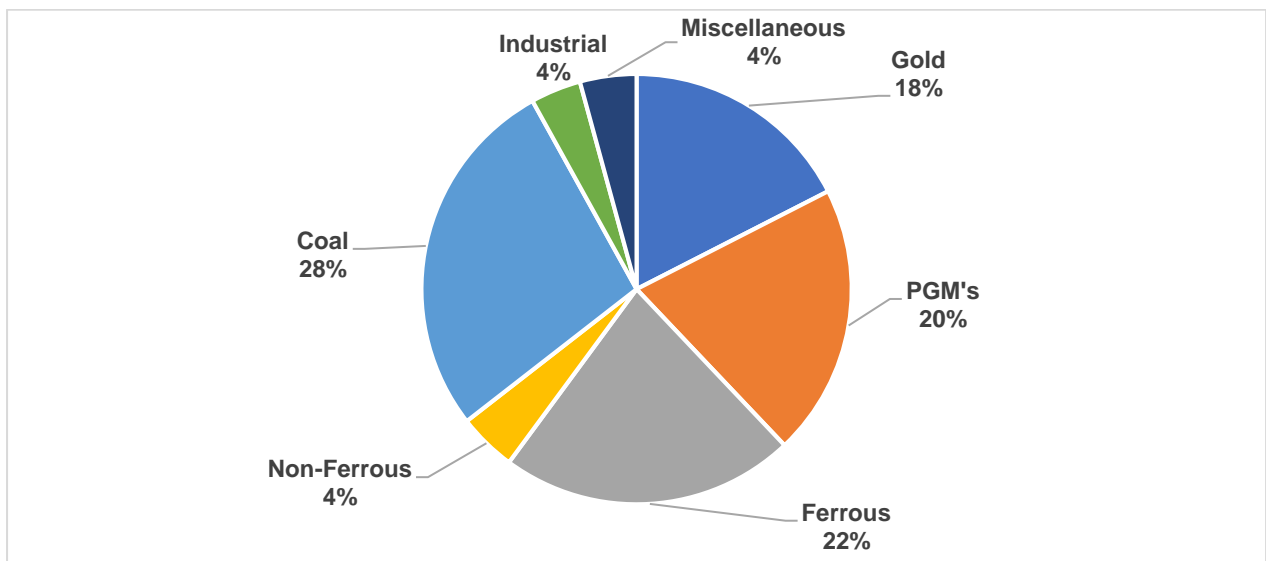
* Revised figure

PRIMARY MINERAL SALES IN 2017

Mining companies, particularly gold and PGM's, were under pressure from rising operating costs, capital investment and geological condition have been in decline making it difficult to create new jobs. The world's deepest gold mine, Mponeng outside Carletonville in North West, is almost five times as deep as the world's tallest skyscraper, Burj Khalifa in Dubai. The appreciation of the rand since the latter part of 2017 has led to poorer than expected financial results of key gold mines, through lower earnings and higher production costs.

The year 2017 was described as a challenging year with alleged policy uncertainty and weak economic growth. The economy descended into technical recession during the first half of the year before rebounding later in that year to ensure that a growth rate is eventually recorded. However, South Africa's total primary minerals sales value increased significantly by 11.8 percent from R424.4 billion in 2016 to R474 billion in 2017 resulted in recovery of most commodity prices and high demand for commodities, such as iron ore, copper and coal (Table 5). Coal remained the major local earner at R69 billion in 2017 from R61.49 billion in 2016, representing an increase of 12 percent, followed by gold, which increased significantly by 19.4 percent from R14.9 billion in 2016 to R17.8 billion in 2017 and PGM's, which increased by 7.2 percent from 11.1 billion in 2016 to 11.9 billion in 2017. South Africa's mineral export sales revenue increased by 11 percent to R328.5 billion in 2017 from R294.9 billion in 2016 (Table 5 and Figure 3). Although some USD price gains were offset by the appreciation of rand from R14.70 in 2016 to R13.28 in 2017, the improved prices brought the industry back into profitability. Furthermore, the primary minerals export sales percentage contribution to the country's total exports value of goods also increased significantly by 42.8 percent in 2017 from 26.7 percent in 2016 (Figure 4). Overall, the primary sales of most commodities performed quite well with the marginal increase in the rand basket price achieved, which more than offset the strong rand.

FIGURE 3: CONTRIBUTION OF PRIMARY MINERAL COMMODITIES TO TOTAL SALES REVENUE 2017



Source: Department of Mineral Resources, Directorate Mineral Resources

TABLE 5: MINERAL PRODUCTION AND SALES 2017

TABLE OF MINERAL PRODUCTION AND SALES 2011								
COMMODITY		PRODUCTION	LOCAL SALES (FOR)		EXPORT SALES (FOB)		TOTAL SALES	
		Quantity	Quantity	Value (R)	Quantity	Value (R)	Quantity	Value (R)
1. Precious								
Diamonds	ct	9 698 038	**	**	**	**	**	**
Gold	kg	137 133	34 181	17 849 770 286	119 592	65 102 402 101	153 773	82 952 172 382
Platinum-group								
metals	kg	260 264	**	11 966 659 946	251 354	85 069 236 519	**	97 035 896 465
Silver	kg	62 536	2 868	21 788 134	53 207	339 888 522	56 075	361 676 656
2. Semi-precious stones			*	*	*	*	*	*
3. Ferrous®	t	102 574 312	*	17 694 772 007	79 064 124	87 568 978 007	*	105 263 750 014
4. Non-ferrous+®	t	2 840 493	1 954 152	4 981 922 909	937 368	15 788 242 066	2 891 520	20 770 164 975
5. Energy								
Coal	t	252 347 846	181 346 975	69 105 622 815	70 049 139	61 277 987 000	251 396 114	130 383 609 815
Uranium oxide	kg	303 684	**	**	**	**	**	**
6. Industrial®				15 040 046 322	2 971 870 309		18 011 916 631	
7. Miscellaneous				1 459 626 073	174 709 423		1 634 335 496	
TOTAL#				146 046 946 887	328 523 968 686		474 570 915 573	

Source: Department of Mineral Resources, Directorate Mineral Economics

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

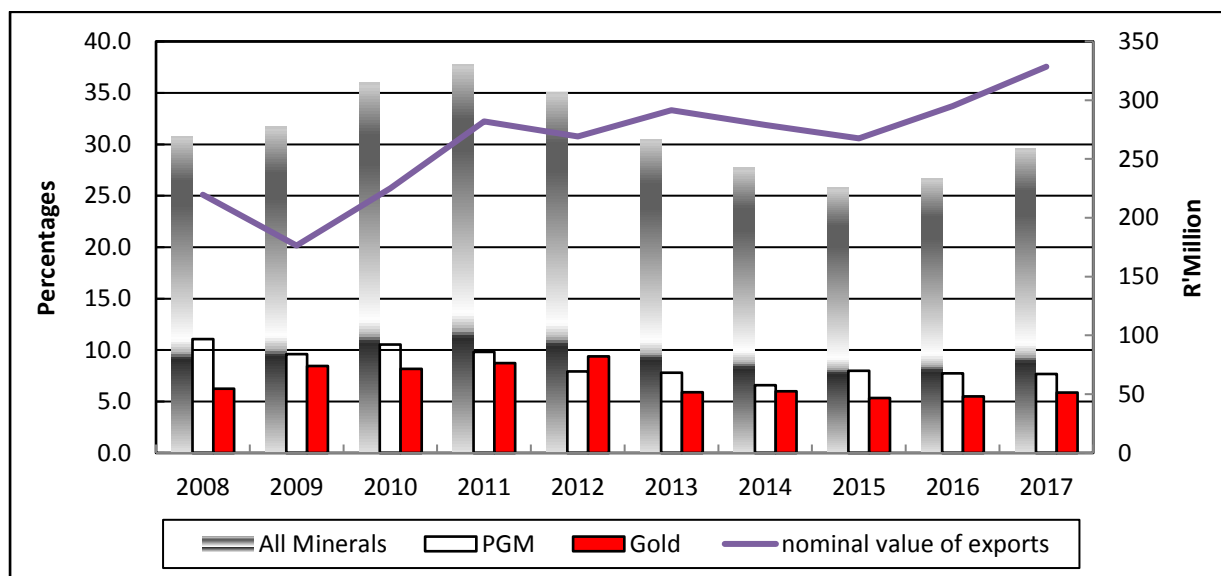
**Not available: where applicable, earnings are included under Miscellaneous'

@ Full details given in respective overview chapters

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

*Nil

FIGURE 4: CONTRIBUTION OF PRIMARY MINERALS TO SOUTH AFRICA'S EXPORTS[#] 2008-2017



Sources: Department of Mineral Resources, Directorate Mineral Economics,
South Africa reserve bank: Quarterly Bulletin, June 2018

Notes: +Includes gold

Total exports of goods only, including gold

TABLE 6: SOUTH AFRICA'S PRIMARY MINERAL SALES BY PROVINCE, 2017

PROVINCE	LOCAL SALES(FOR)		EXPORT SALES(FOB)		TOTAL SALES	
Mpumalanga	60 582 906	41.5	77 840 124	23.7	138 423 030	29.2
North West	17 096 451	11.7	63 786 518	19.4	80 882 969	17.0
Northern Cape	11 895 906	8.1	75 041 998	20.8	86 937 905	18.3
Limpopo	24 164 623	16.5	52 918 624	16.1	77 083 248	16.2
Gauteng	12 875 365	8.8	34 824 968	10.6	47 700 334	10.1
Free State	8 869 241	6.1	16 138 301	4.9	25 007 543	5.3
KwaZulu-Natal	5 674 848	3.9	4 973 876	1.5	10 648 725	2.2
Western Cape [#]	3 894 884	2.7	2 999 555	0.9	6 894 439	1.5
Eastern Cape	992 718 197	0.7	0	0.0	992 718 197	0.2
TOTAL[#]	146 046 964	100.0	328 523 968	100.0	474 570 915	100.0

Source: Department of Mineral Resources, Directorate Mineral Economics

Note: # Hydrocarbons were produced and sold at a value of R1 966 million locally

During the period under review, the bulk of the total mineral revenues were generated from Mpumalanga, Northern Cape, North West, Limpopo and Gauteng provinces collectively accounting for 90.8 percent of the total primary mineral sales revenue (Table 6). Mpumalanga has been the leading contributor to both local and export sales revenue with 41.5 percent. Mpumalanga is mainly dependent on coal as a major contributor towards minerals revenue, North West depends on PGMs, Northern Cape on diamonds, and Limpopo on PGMs, diamonds, copper as well as coal and Gauteng on gold.

SELECTED PROCESSED MINERAL SALES

The production of processed minerals increased by 5.9 percent from 6.18 tons in 2016 to 6.55 tons in 2017 (Table 7). The major contributors to the total of selected processed minerals production were chromium alloys and manganese alloys, which contributed 53.2 and 7.0 percent respectively. Consequently, total sales revenue of the selected processed minerals increased by 10.5 percent from R71.5 billion in 2016 to R79.0 billion in 2017, as local sales increased by 6.3 percent from R13.0 billion in 2016 to R13.9 billion in 2017, and export sales increasing by 11.5 percent from R58.4 billion to R65.1 billion (Table 7).

TABLE 7: SOUTH AFRICA'S PRODUCTION, LOCAL AND EXPORT SALES OF SELECTED PROCESSED MINERAL PRODUCTS, 2017

COMMODITY	PRODUCTION	LOCAL SALES		EXPORT SALES		TOTAL SALES	
		Mass	Value (FOB)	Mass	Value (FOB)	Mass	Value (FOB)
	T	T	R'000	T	R'000	T	R'000
Chromium alloys	3 483 637	523 700	6 228 617	2 950 848	37 461 378	3 474 548	43 689 995
Manganese alloys	458 672	38 295	592 227	271 807	4 068 387	310 102	4 660 614
Vanadium ⁺	14 222	291	110 314	9 816	2 757 723	10 107	2 868 038
Other: Classified ^x	2 590 706	470 582	7 283 456	1 871 067	22 972 826	2 341 649	30 256 281
TOTAL 2016	6 180 805	1 108 773	13 094 039	5 215 159	58 408 052	6 323 932	71 502 092
TOTAL 2017	6 547 237	1 032 868	14 214 614	5 103 538	67 260 314	6 136 406	81 474 928

Sources: Department of Mineral Resources, Directorate Mineral Economics

: United State Geological Survey

Notes: ⁺ Contained vanadium

^x Comprises aluminium, titanium slag, zinc metal, low-manganese pig iron, silicon alloys and metal, phosphoric acid, and antimony trioxide

Mpumalanga province was the major contributor to the total selected processed mineral sales accounting for 38.8 percent, followed by KwaZulu-Natal and North-West provinces at 31.9 percent and 23.8 percent respectively (Table 8). Collectively, KwaZulu-Natal, Mpumalanga and North-West provinces accounted for 94.5 percent of the total processed minerals sales revenue. Chromium and manganese alloys dominated the Mpumalanga contribution, whilst 67.3 percent of KwaZulu-Natal's total selected processed mineral sales revenue was derived from aluminium metal. The total processed mineral sales revenue of the North West was derived from chromium which contributed 85.2 percent. The three provinces (North West, KwaZulu-Natal and Mpumalanga) together dominated both the local and export sales revenue of processed minerals, with a collective contribution of 96 percent for local sales and 94.1 percent for export sales, respectively.

TABLE 8: SOUTH AFRICA'S LOCAL AND EXPORT SALES OF SELECTED PROCESSED MINERAL PRODUCTS BY PROVINCE, 2017

PROVINCE	LOCAL SALES		EXPORT SALES (FOB)		TOTAL SALES	
	(FOR)					
	R'000	%	R'000	%	R'000	%
KwaZulu-Natal	6 377 637	44.9	19 589 128	29.1	25 966 765	31.9
Mpumalanga	6 459 684	45.4	25 172 999	37.4	31 632 683	38.8
North West	815 017	5.7	18 588 874	27.6	19 403 891	23.8
Gauteng	443 121	3.1	1 813 144	2.7	2 256 265	2.8
Western Cape	91 575	0.6	1 798 741	2.7	1 890 316	2.3
Limpopo	27 581	0.2	297 426	0.4	325 007	0.4
TOTAL	14 214 615	100.0	67 260 313	100.0	81 474 927	100.0

Source: Department of Minerals Resources, Directorate Mineral Economics

SOUTH AFRICA'S IMPORTS OF SELECTED PRIMARY AND PROCESSED MINERAL PRODUCTS, 2017

South Africa is well able to supply for most of its minerals demand, however, there are some minerals and mineral products, which still need to be imported due to lack of local resources. The total value of imports increased by 12.8 percent from R27.7 billion in 2016 to R31.3 billion in 2017 (Table 9). South Africa will need to strengthen beneficiation and develop projects that will produce some products locally and substitute imported goods, to reduce the imports. The imports value of primary ferrous commodities increased by 67.5 percent, while processed ferrous commodities increasing by 1.1 percent. During the same period coking coal increased by 49.9 percent from R9.4 billion in 2016 to R14.2 billion in 2017 due to cheaper imports from China. However, diamonds and manufactured industrial minerals sales value decreased by 12.9 percent and 6.9 percent respectively.

TABLE 9: SOUTH AFRICA'S IMPORTS OF SELECTED PRIMARY AND PROCESSED MINERAL PRODUCTS, 2017

PRODUCT	VALUE (FOB)		
	2016 R'000	2017 R'000	Year on year % change
Precious			
Diamonds	1 856 465	1 615 189	-12.9
Other precious and semi-precious stones *	353 949	230 455	-34.9
Precious metals +	1 822 287	1 107 727	-39.2
<i>Ferrous</i> @			
Primary	539 254	903 035	67.5
Processed	2 088 429	2 111 595	1.1
<i>Nonferrous</i> @	351 982	240 198	-20.7
Coking Coal	9 492 649	14 230 952	49.9
<i>Industrial</i> @			
Primary	2 078 238	2 180 268	4.9
Processed	388 149	500 861	29.0
<i>Manufactured</i>	8 774 606	8 173 089	-6.9
TOTAL#	27 746 008	31 293 962	12.8

Source: South African Revenue Service, 2017

Notes: * Includes natural and synthetic precious or semi-precious stones and dust and powders of these stones

+ Includes alloys containing base metals

@ Full details given in relevant chapters

TOTAL EMPLOYMENT IN 2017

Overall mining employment increased by 1.4 percent in 2017 to 464 765 people compared to a contraction of 4.6 percent in 2016. The rebound in mining employment was underpinned by the strong performance of the chrome sector, manganese and coal sector which increased by 10.9 percent, 10.3 percent and 6.8 percent correspondingly. During the same period, remuneration in the mining sector increased by 7.3 percent from R120.0 billion in 2016 to R128.8 billion in 2017, due to an increase in bonuses paid to employees (Table 10).

TABLE10: EMPLOYMENT AND WAGES IN SOUTH AFRICA'S MINING INDUSTRY, 2008–2017

YEAR	EMPLOYMENT		WAGES				
	Number employed	As % of total economically active population	Total		Per worker per annum		As % of total mining revenue [#]
			Nominal	Real ⁺	Nominal	Real ⁺	
2008	518 519*	2,9	60 876*	65 193*	125 730*	134 647*	20.3
2009	492 219*	2,9	66 096*	68 935*	140 049*	146 064*	27.4
2010	498 906*	2,9	74 318*	78 044*	156 430*	164 273*	24.7
2011	512 878*	2,9	86 972*	91 866 *	179 118*	189 196*	23.5
2012	524 632*	2,9	93 608*	78 120*	148 904*	124 267*	25.7
2013	509 914*	2,5	100 859*	106 892*	209 627*	222 399*	25.5
2014	491 098*	2,5	101 859*	106 502*	207 410*	216 864*	25.7
2015	480 209*	2,3	114 085*	97 210*	237 573*	202 569*	29.3
2016	458 214*	2,0	120 066*	126 450*	262 554*	276 514*	27.4
2017	464 765	2,1	128792	128 792	277 112	277 122	27.1

Sources : Quarterly Labour Force Survey (Stats SA), December 2017

Department of Mineral Resource, Directorate Mineral Economics

Notes: [#] Export plus local commodity sales

⁺ Deflated by means of the CPI with 2008 as base year

* Revised figures

In 2017, North West, platinum province remained the largest contributor to total mining employment and remuneration at 30.9 percent and 30.6 percent respectively. Provincial employment distribution was distinctly unequal with five provinces (North West, Mpumalanga, Gauteng, Limpopo and the Northern Cape) employing 88.9 percent of the total mining workforce, which in turn earned 90 percent of the total remuneration (Table 11).

TABLE11: EMPLOYMENT AND REMUNERATION BY PROVINCE, 2017

PROVINCE	EMPLOYEES		TOTAL REMUNERATION	
	Number	%	R million	%
North West	143 753	30.9	39 464	30.6
Mpumalanga	95 823	20.6	27 612	21.4
Gauteng	64 014	13.7	17 822	13.8
Limpopo	72 653	15.6	19 816	15.4
Free State	34 543	7.4	9 215	7.2
Northern Cape	37 831	8.1	11 309	8.8
KwaZulu-Natal	10 805	2.3	2 516	1.9
Western Cape	3 801	0.8	852	0.7
Eastern Cape	1 542	0.3	186	0.1
TOTAL	464 765	100,0	128 792	100,0

Source: Department of Mineral Resources, Directorate Mineral Economics

MINERALS AND METALS PRICES 2017

Commodity prices fluctuates, driven by changes in global demand and supply. Commodity price instability has a negative impact on economic growth and, may lead to increased poverty. Developing countries are particularly affected by external shocks that can result in increased poverty. On the other hand, China, which is the world's largest consumer of commodities has adopted steps to develop its economy during 2017, including measures to cut industrial overcapacity, enforce tougher pollution controls, increase financial regulation and controlling risky lending. The Chinese economy is expected to slow down in 2018, due to these measures, which will lead to declining demand for commodities.

Minerals and metals prices have shown a declining trend in the past five years, but most commodities showed improvement in 2017 compared with 2016. Non-Ferrous minerals and metals such as copper, antimony, lead, zinc and nickel recorded price increase in 2017, also, gold, palladium and rhodium were not left behind. The platinum price however, registered a 6.2 percent decrease in 2017 compared with 2016. The trend of the dollar plays a big role on how commodities perform.

Gold

The gold price traded above \$1 300/ozt in September 2017 after starting the year averaging \$1 192.63/ozt in January. The yellow metal went up by 6 percent in 2017, as geopolitical tensions in North Korea strengthened also, three interest rate hikes by the Fed failed to deter investors from buying the safe haven asset. Gold price gained a 2.2 percent yearly average increase of \$1 275.80/ozt compared with an average of \$1 248.18/ozt in 2016. Continued geopolitical tensions in Korea and in the Middle East, as well as a resurrection of political uncertainty in Europe could drive the gold price up marginally in 2018.

PGMs

Palladium and rhodium prices outperformed the group with a significant increase in 2017, compared with 2016. Rhodium price rose by 90.4 percent in 2017, from \$834.29/ozt in January 2017 to \$1 588.68/ozt in December 2017 and ended the year with an average of \$1 474.00. The price of palladium traded at \$752.95/ozt in January 2017 and was at \$1 030.42/ozt in December 2017, the highest since January 2001 and, averaged \$993.20/ozt for the year from an average of \$612.66/ozt in 2016, an increase of 62.1 percent. This increase in palladium could be attributed to a change to petrol powered cars in regions such as Europe where diesel powered cars are no longer favoured. However, this change has impacted negatively on platinum price since the metal is used in diesel cars. In 2017, platinum price dipped by 6.4 percent, from \$975.29/ozt in January to \$912.95/ozt in December with an annual average of \$925.80/ozt from \$986.94/ozt in 2016.

Copper

Supply constraints escalated the price of copper in 2017. The metal opened the year with the monthly average of \$5 737.43/t in January 2017, and closed with an average of \$6 801.16, an increase of 18 percent. Again, the annual average copper price increased in 2017 at \$5 792.39/t compared with \$4 863.23/t in 2016, which is an increase of 19.1 percent. The price of copper may continue with an upward trend in 2018 due to growing global demand.

Nickel

Nickel price went up by 14.5 percent in 2017, from an average of \$9 963.97/t in January to an average of \$11 409.21/t in December, due to increasing demand for the elements needed to produce batteries used in electric vehicles. The annual average price increased by 8.6 percent in 2017, from an average of \$9 594.05/t in 2016 to an average of \$10 421.66/t. Nickel price could increase in 2018 resulting from increasing demand of batteries for electric cars.

Coal

Coal prices strengthened in 2017, due to high demand from China. Coal steam fob and for prices increased by 19.9 percent and 10.4 percent respectively in 2017, with the annual average price of R871.67/t and R364.03/t from the average of R727.21/t and R329.85/t in 2016. The outlook for coal is not positive since China government introduced tough anti-pollution measures. Natural gas on the other hand, may improve in 2018.

SMALL-SCALE MINING (SSM) SECTOR IN SOUTH AFRICA

The Department of Mineral Resources through its Small-Scale Mining Directorate has been promoting small-scale mining activities in South Africa for over a decade. This intervention is seeking to ensure that small-scale miners operate within a prescribed legal framework, improve efficiency, protect the environment while working, receive assistance to access markets and create sustainable job opportunities.

A decade ago it was estimated that about 6 million of the world's 30 million mineworkers were engaged in small-scale mining. Since most of the major small-scale mining countries were surveyed at the time, it can be assumed that 11 to 13 million people worldwide are currently engaged in small-scale mining. In view of the extent of small-scale mining, there is plenty of incentive for ensuring that it contributes fully to economic and social development, particularly at the local level. Small-scale mining can generate substantial local purchasing power and lead to a demand for locally sourced inputs (food, equipment, tools, and housing) when they are available, or encourage their production. At the national level, the export of high-value metals and minerals from small scale mines can make a major contribution to foreign exchange earnings.

The scarcity of resources and the economic pressures place an obligation on the State to efficiently allocate and utilise available resources for the benefit of the highest number of people. It is with that background that the focus on SMME support is on high impact, quality minerals related projects, so that more can be achieved with less. The impact of regulations on the development and sustainability on the Small-Scale Mining sector cannot be underestimated.

Although alluvial diamond mining as well as inland salt mining also play a significant role in the small-scale mining sector, the bulk of the demand for small-scale mining ventures is associated with industrial commodities, such as slate, sand, clay, sandstone, dolerite and granite to produce infrastructural development products such as tiles, clay and cement bricks, aggregates and dimension stone for cladding. This is evidenced from the more than 90% of small-scale mining applications received for these commodities and taken through the process of legalisation, feasibility studies, limited capitalisation, monitoring and auditing.

The DMR SSM support programme is in line with the Government's Nine Point Plan which includes the "unlocking of the potential of Small, Medium and Micro Enterprises (SMMEs), Co-operatives, Township and Rural Enterprises". The Small-Scale Mining sector, which targets deposits that are not large enough for large mining companies, is geared towards attracting further additional investment to allow for sustained exploration for new deposits. There is an emerging view that small firms and entrepreneurs are of vital importance for the economic development. This is evident in the focus on government's attention to small firms and entrepreneurs.

MINERAL BENEFICIATION IN SOUTH AFRICA

Minerals beneficiation remains a critical component of Government's set of policies to overcome the triple developmental challenges of unemployment, income inequality and poverty. Since the adoption of the Minerals beneficiation strategy for South Africa in 2011, there has been work undertaken to implement the interventions proposed in the strategy. The following activities have been undertaken by the DMR and its SOEs in implementing the provisions of the mineral beneficiation strategy:

- The Mining Charter was amended and gazetted to:
 - Promote security of mineral supply through the mineral beneficiation equity element. The element allows a mining right holder to offset their historically disadvantaged persons ownership obligation, by supporting mineral beneficiation
 - Leverage the procurement capacity of the mining industry to create domestic demand for locally manufactured mining inputs through the Inclusive Procurement Element of the Charter
- Mintek, supported by the Department of Mineral Resources and Department of Science and Technology, continues to support mineral beneficiation through continued research and development. Amongst its key projects, is research into development of Platinum Group Metals (PGMs) catalysis, which will support domestic mineral beneficiation of PGMs and, also create a new demand driver for these minerals as demand begins to decline for use in autocatalytic convertors.
- The entities, SADPMR and SDT continue to ensure security of supply of diamonds and precious metals, by implementing various provisions of the Precious Metals Acts and Diamonds Amendment Acts.
- Work led by the Department of Public Enterprises has resulted in the development of a short-term pricing agreement for electricity which is intended to support electricity intensive industries such as smelters by allowing them to apply to Eskom to charge them cheaper tariffs.

Challenges however, remain, in promoting domestic mineral beneficiation that will require Government wide coordination to address them.

MINING PROSPECTS AND FUTURE DEVELOPMENTS

The mining industry also offers unparalleled opportunities for both local and international investors in leading mining firms. The industry provided impetus for the development of infrastructure and contributes greatly to the country's secondary industries. In the long term, the rise of the electrical vehicles would have major implications for the platinum industry, of which South Africa has the largest global proven reserves. The outlook for greener transportation is gaining momentum, as countries like the United Kingdom join France and Norway in resolving to ban fossil-fuel car sales in the coming decades. The vehicle manufacturers in these countries are gearing up to announce plans to abandon the combustion engine.

These developments within the platinum industry require an urgent intervention and shift in focus, to have a sustainable platinum mining industry. Also, needing attention is the gold industry which is showing the characteristics of the platinum sector, apart from the price of gold which is much higher than the platinum price.

Industrial minerals comprise of a highly diverse group of minerals and rocks that are mostly used for the country's developmental agenda in construction, agriculture and chemicals. The mining of Industrial Minerals has important implications for locally driven industrialisation programmes towards broad based development. The sector presents the country with an opportunity to develop a strong and varied industrial base, whereby small- scale miners can contribute to the creation of decent jobs as well as poverty alleviation. These minerals, despite their low unit value, offer the highest, most sustained and realistic potential for greater value retention and linkages with the rest of the economy.

Consumption of industrial minerals is mostly driven by domestic demand from the construction and agricultural sectors, addressing issues of food security. The biggest strength of industrial minerals is that their consumption correlates strongly with GDP growth per capita in various sectors like construction and agriculture. Their ability to be used in various applications differentiates them from other minerals and makes their consumption an indicator of structural transformation.

TABLE 12: METALS/MINERALS PRICES (2013- 2017)

COMMODITY	UNIT					
		2013	2014	2015	2016	2017
Aluminium High Grade, LME Cash	\$/t	1849.25	1865.87	1661.57	1603.89	1972.42
Antimony, Metal Bulletin Free Market	\$/t	10347.67	9446.58	7298.67	6498.36	8346.17
Cadmium, Metal Bulletin Free Market	\$/lb,	96.06	87.83	53.77	63.99	81.67
Coal* - Steam: Local FOR	R/t	260.43	285.94	306.81	329.85	364.03
Export FOB	R/t	689.73	692.74	617.90	727.21	871.67
Anthracite: Local FOR	R/t	932.38	970.41	1027.93	1022.87	1086.62
Export FOB	R/t	867.11	775.93	777.28	681.54	834.65
Cobalt, Metal Bulletin Free Market	\$/lb,	13.17	14.40	13.24	11.95	27.78
Copper: Grade A, LME Cash	\$/t	7335.84	6859.69	5500.67	4863.23	5792.39
Ferrochrome: Charge 52% Cr*	\$/lb, Cr	1.16	1.18	1.07	0.99	1.36
Ferromanganese: High Carbon 7,5% C*	€/t	775.52	746.68	721.83	752.25	1226.49
Ferrovandium 70-80% V*	\$/kg V	27.66	25.51	18.65	18.35	33.02
Gold, London Price	\$/ozt	1410.91	1266.21	1160.35	1248.18	1275.80
Ilmenite Concentrate 54% TiO ₂	A\$/t	291.38	195.22	123.04	105.89	157.77
Lead, LME Cash	\$/t	2141.14	2095.67	1783.27	1870.74	2314.40
Lithium Ore: Petalite 4%	\$/t	212.50	212.50	212.50	212.50	212.50
Manganese Ore: 48-50% Metallurgical*	\$/mtu	5.42	4.52	3.06	5.21	5.82
Molybdenum: Molybdic Oxide*	\$/lb. Mo	10.40	11.70	6.83	6.54	8.26
Nickel, LME Cash	\$/t	15018.27	16864.58	11833.15	9594.05	10421.66
Palladium, London Price	\$/ozt	724.99	802.47	691.51	612.66	872.18
Platinum, London Price	\$/ozt	1487.02	1384.57	1054.28	986.94	949.26
Rhodium, Johnson Matthey Base Price	\$/ozt	1065.07	1171.43	955.40	693.64	1105.09
Rutile Concentrate 95% TiO ₂	A\$/t	1681.93	1012.97	841.18	711.62	809.48
Silver, London Price	\$/ozt	23.76	19.08	15.70	17.10	17.08
Tin, LME Cash	\$/t	22370.00	21916.14	16080.54	17980.91	20135.13
Vanadium Pentoxide*	\$/lb,	6.00	5.45	3.62	3.68	7.06
Zinc, Special High Grade	\$/t	1912.33	2162.00	1931.23	2090.71	2896.40
Zircon: Foundry Grade, Bulk, FOB	A\$/t	1514.58	1124.09	1076.42	1102.94	976.92

Project pipelines

Already, there is a positive outlook of investment for the industry with an anticipated capital expenditure on projects of about R127 billion and an estimated 35 thousand new job opportunities in the next four years. The government will continue on its path to invite investors into the country through various mining investment advocacy programmes such as relevant conferences, seminars, workshops and so on. While South Africa is well endowed with mineral resources, it should not overly rely on the exploitation of mineral resources, to ship out raw material but, should strongly drive value addition to raw minerals and diversification of the economy. In addition, the country needs to move with speed to ensure that its share of exploration, increases to replenish the mineral resources to sustain mining and development.

Licensing

During the period 2016/2017, a total of 196 prospecting licences were issued, with the first quarter recording the highest at 59 licenses and the fourth quarter, a low of 40 of %. With regards to mining rights, a total of 59 mining rights were issued, with the first quarter recording a high of 25 licenses and the third quarter a total of 9 mining rights, surpassed by the fourth at 10 mining rights. With the total issued mining rights at 59, it is envisaged that upon assumption of production, the country will improve its rank, globally in terms of production and this will also contribute immensely, to revenue generation and new job opportunities.

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PART TWO: REVIEW OF SELECTED COMMODITIES

PRECIOUS METALS AND MINERALS OVERVIEW

DO Moumakwa

PRODUCTION AND SALES

South Africa was the world's largest producer of platinum-group metals (PGMs) and the 8th largest producer of gold, in 2017. The country's PGMs and Gold production jointly stood at just over 397 tons (t) in 2017 (Table 13), a 2.1 percent decrease when compared with 2016. The decrease was attributed to both gold and PGMs, which fell by 3.6 percent and 1.3 percent, respectively, as several shafts were put on care and maintenance. South Africa (SA) improved its ranking to become the 6th largest diamond producer by volume, with an output of 9.7 million carats (Mct), an increase of more than 16 percent when compared with 2016 (Table 13), as a result of increased kimberlites contribution from undiluted ROM ores and improvements in grades from Petra operations, as well as the processing of higher grades at De Beers' Venetia mine. The country remained the 4th largest producer by value, after producing just over US\$1.3 billion worth of rough diamonds.

TABLE 13: SOUTH AFRICA'S PRODUCTION AND SALES OF PRECIOUS METALS, 2017.

COMMODITY	YEAR	PRODUCTION	LOCAL SALES		EXPORT SALES		TOTAL SALES	
		t	t	R million	t	R million	t	R million
GOLD	2017	137.1	34.2	17 850	119.6	65 102	153.8	82 952
	2016	142.2	25.8	15 214	121.6	73 211	147.4	88 425
PGMs	2017	260.3	31.8	11 967	251.4	85 069	283.1	97 036
	2016	263.7	31.0	11 094	250.5	85 318	281.5	96 412
DIAMONDS (Mct)	2017	9.7	1.0	7 927	9.1	10 231	10.1	18 157
	2016	8.3	1.6	8 334	9.0	12 436	10.6	20 770
PRECIOUS METALS TOTAL*	2017	397.4	66.0	29 816	370.9	150 172	436.9	179 988
	2016	405.9	56.8	26 308	372.1	158 529	428.9	184 837

Source: DMR, Directorate Mineral Economics

*Gold and PGMs totals only

The precious mineral's total sales mass (excluding diamonds) amounted to 436.9 t, an increase of just under 2 percent compared with 2016, with the corresponding value dropping by 2.6 percent to just under R180 billion. Diamond's total sales mass and revenue declined by 4.7 percent and 12.6 percent, respectively.

EMPLOYMENT

An average of 303 070 workers were employed in the precious metals and minerals sector in 2017, representing 65 percent of total mining employment. Precious metal and mineral's employment declined by 1.5 percent compared with 2016 (Table 14), with the gold and diamond sectors dropping by 3.1 percent and 4.3 percent, respectively, while employment in the PGMs sector remained almost flat. However, total remuneration rose by 3.7 percent to just under R82 billion, resulting in a 5.3 percent increase in the average remuneration per employee.

TABLE 14: EMPLOYMENT AND REMUNERATION IN SOUTH AFRICA'S PRECIOUS METALS AND MINERALS MINES, 2013 - 2017.

YEAR	AVERAGE NUMBER OF EMPLOYEES	TOTAL REMUNERATION (R'000 000)	AVERAGE REMUNERATION R/employee
2013	337 336	63 550	188 388
2014	322 477	61 990	192 231
2015	309 692	70 695	228 275
2016	307 793	78 903	256 351
2017	303 070	81 805	269 921

Source: DMR, Directorate Mineral Economics

OUTLOOK

Total world gold demand is expected to increase in 2018, due to an expected drop in the gold price. Similarly, physical demand, particularly bullion-demand is expected to increase, as some sources indicate an increase in bullion purchases. South Africa's production is expected to dip slightly, due to some major production units being placed on care and maintenance. The sector is, expected to remain under immense pressure due to relatively low prices, impacting negatively on high cost operations.

Global PGMs supplies, particularly Pt and Rh, are not expected to change much in 2018, as the impact of shaft closures in SA are likely to be offset by increased production at other operations. However, the Pt market is expected to drift further into surplus, as a result of further reduction in autocatalyst and jewellery demand, compounded by increased recycling, which is expected to put a downward pressure on prices and SA exports. The Pd market is expected to move closer to balance in 2018, resulting in moderate increase in SA exports and prices. Strong autocatalyst and

chemical demand for Rh are expected to persist in 2018 but, increased secondary supplies could push the market into marginal surplus.

Global rough diamond production is expected to continue rising in 2018, due to some expected mining developments, along with new advanced large stone recovery technology adopted by some producers, such as Alrosa in Russia and Petra Diamonds in SA. However, global demand for rough stones may drop, with manufacturers reportedly overstocked with polished diamonds from 2017, although this may be partially offset by stable demand for polished stones, led by positive sentiments on the Chinese and US markets. In line with global trends, SA rough diamond sales may also fall, with local sales continuing their downward trend due to lack of positive sentiments.

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DIAMONDS

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SUPPLY-DEMAND

World rough diamond output rose by 12.6 percent to more than 150 million carats (Mct) in 2017, valued at more than US\$14 billion (Table 15). The Russian Federation remained the top producer by both volume and value, accounting for 28.2 percent and 29.1 percent, respectively. Canada replaced the Democratic Republic of Congo (DRC) as the 2nd largest producer by volume, while Lesotho replaced Sierra Leone in the top 10. South Africa (SA) overleapt Angola and became the 6th largest producer by volume and remained 4th by value, after accounting for 6.4 percent and 9.2 percent, respectively.

TABLE 15: WORLD ROUGH DIAMOND PRODUCTION, 2017

Country	MASS			VALUE		
	<i>x1000 cts</i>	<i>%</i>	<i>Rank</i>	<i>US\$ mil</i>	<i>%</i>	<i>Rank</i>
Angola	9 439	6.3	7	1 105	7.8	5
Australia	17 134	11.4	5	200	1.4	8
Botswana	22 961	15.2	3	3 329	23.6	2
Canada	23 234	15.4	2	2 060	14.6	3
DR of Congo	18 903	12.5	4	157	1.1	10
Lesotho	1 126	0.7	10	343	2.4	7
Namibia	1 948	1.3	9	1 011	7.2	6
Russian Federation	42 614	28.2	1	4 112	29.1	1
South Africa*	9 682	6.4	6	1 304	9.2	4
Zimbabwe	2 507	1.7	8	175	1.2	9
Other	1 378	0.9		329	2.3	
2017	150 926	100.0		14 125	100.0	
2016	134 070			12 401		

Source: KPCS Statistics

SA's 2017 total rough diamond production increased significantly by 16.6 percent to 9.7 Mct from 8.3 Mct in 2016, despite a more than 36 percent decline in marine production (Table 16). The overall increase in production was attributed to increased kimberlites contribution from undiluted ROM ores and improvements in grades from Petra operations, as well as the processing of higher grades at De Beers' Venetia mine, coupled with the return to stability of the global diamond market, while the increase in alluvial production was due to increased activity by small-scale miners and the recovery by Alexkor, despite Transhex closing both Bloeddrif and Baken mines. De Beers was responsible for 57 percent of SA production, Petra contributed more than 41 percent while Alexkor and Transhex each accounted for less than 1 percent. Rough diamond production from kimberlites accounted for more than 95 percent of SA production, followed by alluvial production at 4 percent, while alluvial production accounted for less than one percent.

TABLE 16: SOUTH AFRICA'S ROUGH DIAMOND PRODUCTION AND SALES, 2017.

Source	Production	Local sales		Export sales		Total Sales	
	Mass (cts)	Mass (cts)	Value (R mil)	Mass (cts)	Value (R mil)	Mass (cts)	Value (R mil)
<i>Kimberlite</i>							
2017	9 224 666	612 875	4 568.64	9 030 254	9 852.50	9 643 129	14 421.14
2016	7 847 300	1 200 886	4 090.69	8 890 341	11 865.64	10 091 227	15 956.33
<i>Alluvial</i>							
2017	391 235	370 979	3 069.59	67 204	321.98	438 183	3 391.57
2016	346 791	337 212	3 714.94	94 339	530.94	431 551	4 245.88
<i>Marine</i>							
2017	70 561	35 535	274.87	5 207	21.23	40 742	296.10
2016	110 496	72 255	489.67	17 709	39.25	89 964	528.92
<i>Total</i>							
2017	9 686 462	1 019 389	7 913.11	9 102 665	10 195.71	10 122 054	18 108.81
2016	8 304 587	1 610 353	8 295.30	9 002 389	12 435.83	10 612 742	20 731.13
% Change	16.6	-36.7	-4.6	1.1	-18.0	-4.6	-12.6

Source: DMR, Directorate Mineral Economics

Local sales mass continued to decline, albeit by a smaller yet significant margin of just under 37 percent in 2017. De Beers was responsible for approximately 14 percent of the decline after the State Diamond Trader (SDT) purchased less stones from the company than the previous year. The SDT is mandated by the Diamonds Second Amendment Act no. 30 of 2005, to purchase up to 10 percent of run-of-mine (ROM) production from all SA producers for sale to local cutting and polishing industry. In 2016, the SDT purchased only certain size ranges, which made up a relatively smaller percentage of De Beers allocations. However, a larger portion of the decline in local sales was attributed to lower sales from Petra Diamonds, whose sales fell by approximately half from just under 1 Mct in 2016 to 0.5 Mct in 2017, due to according to the company, lower demand fueled by tax-related issues. In line with reduced sales mass, local sales value declined by 4.6 percent to just under R8 billion.

Export sales mass increased by a modest 1.1 percent to 9.1 Mct, despite De Beers increasing its sales by 27 percent to 5.2 Mct. After offering 10 percent of their ROM production to the SDT as per legislation, De Beers exports the remaining stones, excluding the so-called exceptional stones but, including those rejected by the SDT, to Botswana for aggregation. Petra, on the other hand, sells at least additional 15 percent to local diamond beneficiation licence holders, while the remainder is offered for sale at the South African Diamond Exchange and Export Centre (DEEC) under the auspices of the SADPMR, with parcels remaining unsold exported and sold to international customers. However, despite lower local sales, Petra's export sales mass declined by 4 percent to 3.5 Mct, probably due to subdued demand. Total export sales value dropped by 18.0 percent, an indication of relatively depressed rough prices, fueled by subdued demand.

Antwerp remained the largest trading platform for rough stones, accounting for more than 80 percent of trade in the world's rough diamond production. The main rough supplier to Antwerp remained Russia, which supplied more than half of its production. In 2017, a total of 233 Mct of diamonds were imported to and exported from Antwerp, with 223.1 Mct of rough stones traded on the market. Mumbai in India remained the second largest rough trading hub, while Surat remained the major centre for cutting and polishing. The volume of rough diamonds imports in India increased significantly by 35 percent in 2017 to just under 2 Mct, with the volume dominated by lower-quality small goods. Dubai in the UAE, is now the third largest rough trading hub, followed by Hong Kong and Shanghai in China. The US remained the world's largest market for polished diamonds.

KEY DEVELOPMENTS IN SA

The global rough diamond industry was marked by higher rough diamond prices, which boded well for SA's key developments in terms of exploration, production ramp-ups and downstream value addition and, subsequently job creation. However, this could not prevent closure and suspension of mining activities at other operations that were rendered uneconomic.

De Beers' Venetia underground mining project continued to make progress, on time and within budget. The \$2.1 billion project is not only seen as a life-extension activity, but also as an expansion as the ore treated annually at the mine will rise from approximately 5 Mt to 5.9 Mt, with around 132 Mt of ore produced over the life of mine, yielding an estimated 94 Mct. Having commenced in 2012, the project is currently expected to advance to underground production in 2023, although there are possibilities that production could be brought back to 2021. Meanwhile, De Beers decided to place its Voorspoed mine on the market to afford allow a lower cost operator the opportunity to take the mine beyond 2020, when it is scheduled to close.

Petra Diamonds made significant progress on the R4 billion C-Cut Phase 1 expansion project, which will initially extend its Cullinan mine's lifespan by approximately 15 years. The current mine plan envisions a LoM to 2030. The project will consolidate the mining areas from 8 to 3, and, will assist in reducing production costs from over R 280/t to R 200/t over the next 2 to 3 years. The mine's production is expected to increase from the current 729 496 cts to 2.2 million cts by the 2019 financial year, when the C-Cut is set to reach full production. Phase 2 of the project, which is still at the conceptual phase, is set to commence in 2019.

Transhex placed its Baken mine in the Northern Cape, on care and maintenance from the 1st November 2017. According to the company, this was necessitated by low carat production and subsequent financial losses that had made the operation unsustainable. The mine incurred a loss of more than R35 million in the 2017 financial year, ended March 31, and a further loss of more than R46 million between April and July. The company had earlier in February, placed its Bloeddrif mine, also in Northern Cape, on care and maintenance, due to declining diamond grades and stone sizes, coupled with increasing production costs and subsequent financial losses.

EMPLOYMENT

An average of 17 991 people were employed in the diamond industry in 2017 (Table 17), 4.3 percent less than in 2016. This was attributed to retrenchments at De Beers Voorspoed mine, Petra's Finsch mine and Transhex's alluvial operations. Since retrenchments affected mostly workers at the lower end of the salary scale, total remuneration rose by 3.4 percent, resulting in 8.0 percent increase in the average remuneration per employee.

TABLE 17: EMPLOYMENT AND REMUNERATION IN SA'S DIAMOND MINING INDUSTRY, 2013-2017.

YEAR	AVERAGE NUMBER OF EMPLOYEES	TOTAL REMUNERATION (R'000 000)	AVERAGE REMUNERATION (R/employee)
2013	13 547	2 870	211 855
2014	15 203	3 629	238 703
2015	17 246	4 359	252 754
2016	18 804	5 073	269 783
2017	17 991	5 243	291 423
% Change (YOY)	-4.3	3.4	8.0

Source: DMR, Directorate Mineral Economics

OUTLOOK

Global rough diamond production is expected to continue rising in 2018 due to some expected mining developments, along with new advanced large stone recovery technology adopted by some producers, such as Alrosa in Russia and Petra Diamonds in SA. Likewise, SA production is expected to increase, despite the closure of Voorspoed mine, aided by continuous improvement plans at various operations, most notably Finsch, Cullinan and Venetia. However, global demand for rough stones may drop, with manufacturers reportedly overstocked with polished diamonds from 2017, although this may be partially offset by stable demand for polished stones, led by positive sentiments on the Chinese and US markets. In line with global trends, SA rough diamond sales may also fall, with local sales, in particular, continuing their downward trend due to lack of positive sentiments.

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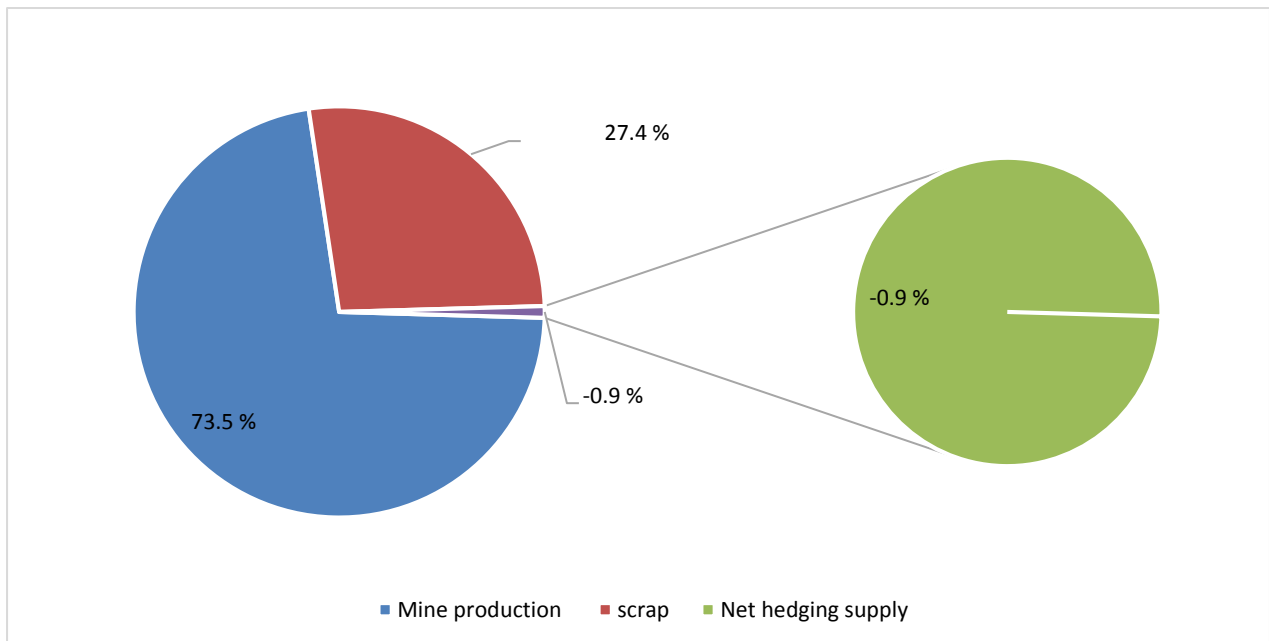
GOLD

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SUPPLY-DEMAND

Total world gold supply, which includes mine production, scrap supply and producer hedging decreased by 3.7 percent from 4 582.4 tons (t) in 2016 to 4 412.7 t in 2017. In contrast with 2016, global mine production decreased by 0.11 percent to 3 241 t, on the back of reduced mining output, due to environmental concerns in China as well as a crackdown on illegal mining in Indonesia. However, global mine supply accounted for 73.5 percent of total supply. Scrap supply also decreased by 7.4 percent and contributed 27.4 percent to total supply (Fig 5). Producer hedging shrank by roughly 16.0 to the supply-side of the market for the 1st time in 4 years. This was largely based on a Russian producer maintaining delivery on agreed hedging contracts and to a lesser extent, Australian and African operators.

FIGURE 5: GLOBAL GOLD MINE SUPPLY, 2017.



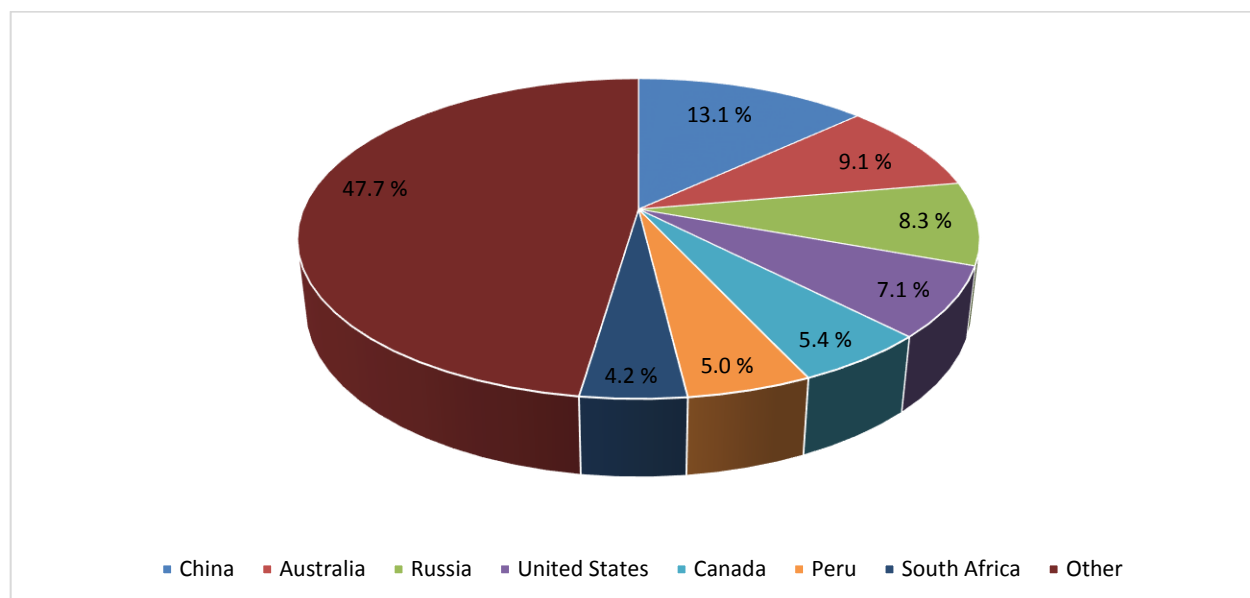
Source: O'Connell, et al, 2017, pp 9-10

Adjusted Global Fig: DMR Statistics Sub-Directorate, 2018

Despite a slightly reduced output, China remained the largest gold producer, contributing 13.1 percent to world production, followed by Australia and Russia, at 9.1 percent and 8.3 percent, respectively. South African (SA) gold production contracted by 3.6 percent, from 142.202 t in 2016 to 137.133 t in 2017, contributing roughly 4.2 percent to global production. Local production

decreased on the back of care and maintenance of several unproductive shafts. However, SA's global production ranking, stabilised at 8th place (Fig 6). SA's production-profile was strong throughout the year, especially in the 2nd and 3rd quarters. Despite the incidence of Care and Maintenance, lower yields, and production stoppages, SA's gold mining was still vibrant, as Harmony acquired one of AngloGold Ashanti's mines during October. Surprisingly, production in the East Rand Gold Field, offset losses in the Wits Basin.

FIGURE 6: SHARE OF GLOBAL PRODUCTION BY COUNTRY, 2017.



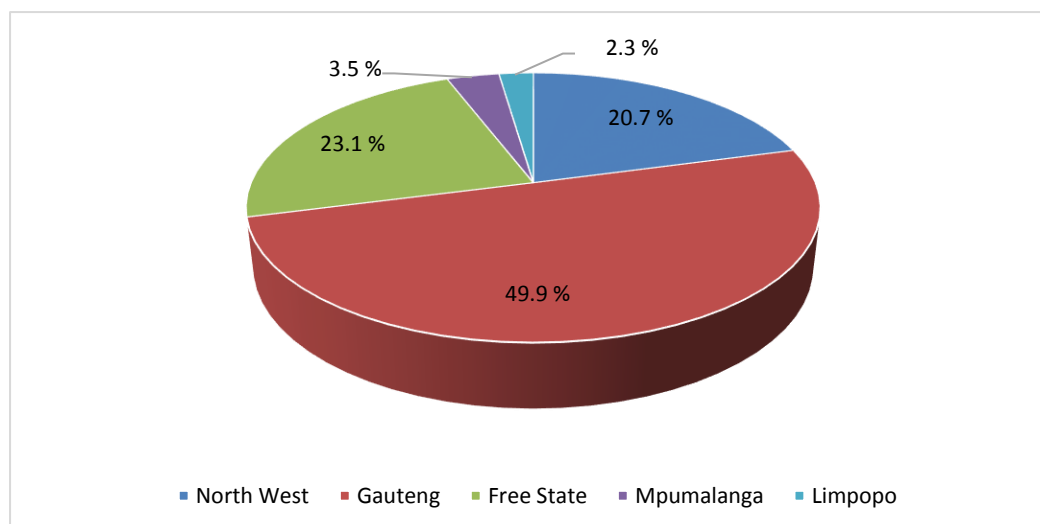
Sources: O Connell, et al, 2017, pp 22 - 23

DMR, Directorate Mineral Economics, 2017-2018: #

In 2017, 59 production entities contributed to total local gold production as opposed to 56 entities in 2016. Of these entities, 34 primary gold mining operations contributed 96.0 percent of total production. Platinum Group Metals (PGM) contributed 3.9 percent, while by-production from non-ferrous (Nickel) made up the balance (0.10 percent). In 2017, there was no gold recovered as a by-product from copper and antimony operations.

Gauteng remained the largest producer of gold at 49.9 percent of total production, followed by the Free State and North-West Provinces at 23.1 percent and 20.7 percent respectively. The Mpumalanga and Limpopo Provinces contributed 3.5 and 2.3 percent respectively (Fig 7).

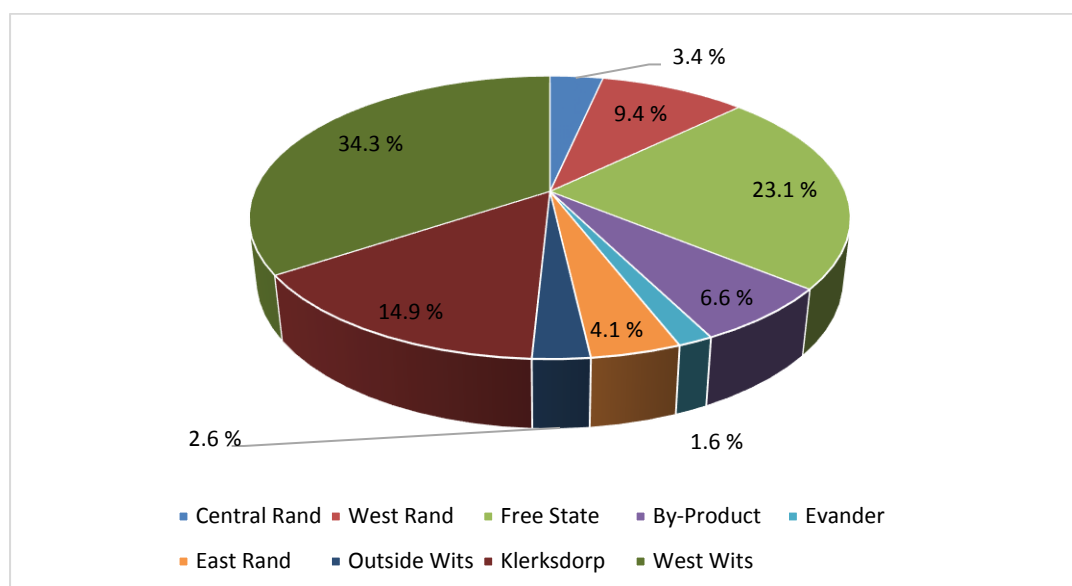
FIGURE 7: SOUTH AFRICA'S PRIMARY GOLD PRODUCTION SPLIT BY PROVINCE, 2017.



Source: DMR, Directorate Mineral Economics-2017, 2018

The West Wits Line yielded the largest gold production, at 34.3 percent of total production, followed by the Free State goldfield and Klerksdorp goldfield at 23.1 percent and 14.9 percent respectively (Fig. 8). West Rand Goldfields contributed 9.4 percent, while the remainder (inclusive of by-product of recovery plants and production), contributed 18.3 percent to total production.

FIGURE 8: SOUTH AFRICA'S PRIMARY GOLDFIELD PRODUCTION, 2017.



Source: DMR, Directorate Mineral Economics: 2017-2018.

Note: ° Gold mines outside the Witwatersrand Basin.

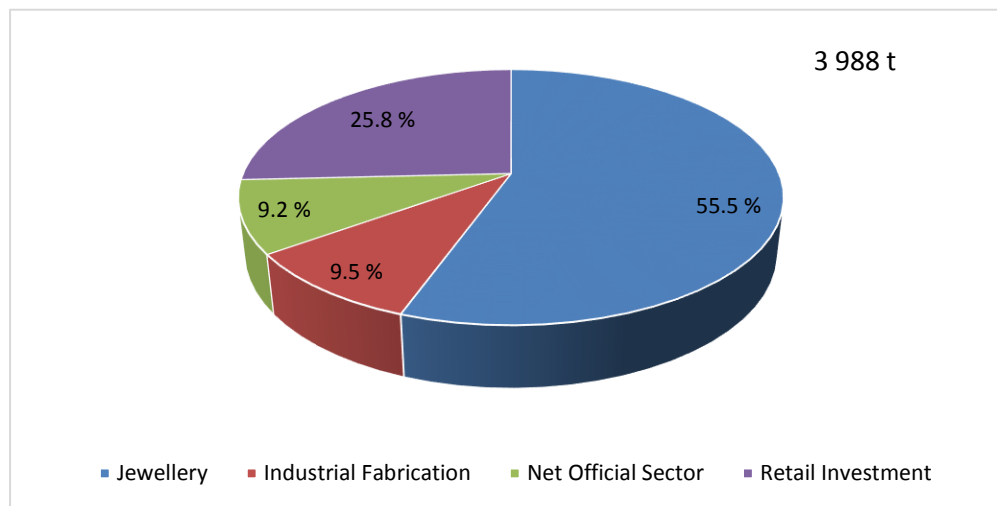
* Platinum and base metal mines.

Total world gold demand increased by 10.0 percent from 3 630 t in 2016 to 3 988 t in 2017, mainly on the back of a 13.0 percent increase in the demand for jewellery fabrication. Additionally,

Industrial fabrication increased by 4 percent, for the first time since 2010, driving global demand upwards.

Net official sector purchases rose by 36.0 percent to 366 t, on the back of Russian purchases amounting to 200 t as well as gold acquisitions by Turkey (Fig 9). During the period under review, total identifiable investment (physical bar, coin investment and Exchange Traded Funds (ETF's) movements decreased to 125 t, on the back of lacklustre coin demand and bar demand. The latter fell due to a lack of price action and competition from other asset classes.

FIGURE 9: WORLD GOLD DEMAND MARKETS*, 2017.



Source: O'Connell, et al, 2018, pp 7&8 – 9

SA's gold market demand drivers consist of fabrication and specialised uses, such as dentistry and electronic fabrication, as well as gold reserve purchases through the South African Reserve Bank (SARB). In 2017, Central Banks remained buyers of gold, on the back of strong net official sector purchasing volumes, rising by 36.0 percent in 2017. However, the SARB's gold reserves did not increase that drastically. Local gold reserves remained flat at 125.3 t in 2017. The SARB's gold reserve value decreased by 4.7 percent from R66.34 billion in 2016 to R66.25 billion in 2016, largely due to a 9.5 percent stronger R/\$ exchange rate.

An increase in local uptake for jewellery manufacturing, dentistry and electronics impacted positively on local sales mass resulting in a 43.4 percent increase. Local sales via the Rand Refinery (RR) increased, as was evident by the large uptake of gold granules used in the fabrication of gold coins and mints.

Export sales mass decreased by 10.1 percent, driven by the incidence of lower direct fine gold sales receipts to overseas entities, inclusive of international banks (Table 18). However, total sales mass increased by 0.3 percent, and the stronger R/\$ exchange rate eroded sales value by 8.1 percent.

TABLE 18: SOUTH AFRICA'S PRODUCTION AND SALES OF GOLD, 2012-2017.

Year		Local sales		Export sales		Total Sales	
	Production	Mass	Value	Mass	Value	Mass	Value
			R'000		R' 000		R'000
2012	154.2	11.3	4,862,748	164.9	71,961,757	176.2	76,824,504
2013	158.9	10.0	4,192,863	151.5	65,793,912	161.5	69,986,775
2014	151.6	8.5	3,450,974	136	59,898,125	144.6	63,349,098
2015	144.5	15.9	7,385,852	118.1	55,314,074	133.9	62,699,927
2016	142.2	25.3	14,919.703	103.7	60,572.047	129.0	75,491.750
2017	137.0	36.2	19,606.197	93.2	49,785.597	129.4	69,391.795
Y-o-y (%)	-3.7	43.4	31.4	-10.1	-17.8	0.3	-8.1

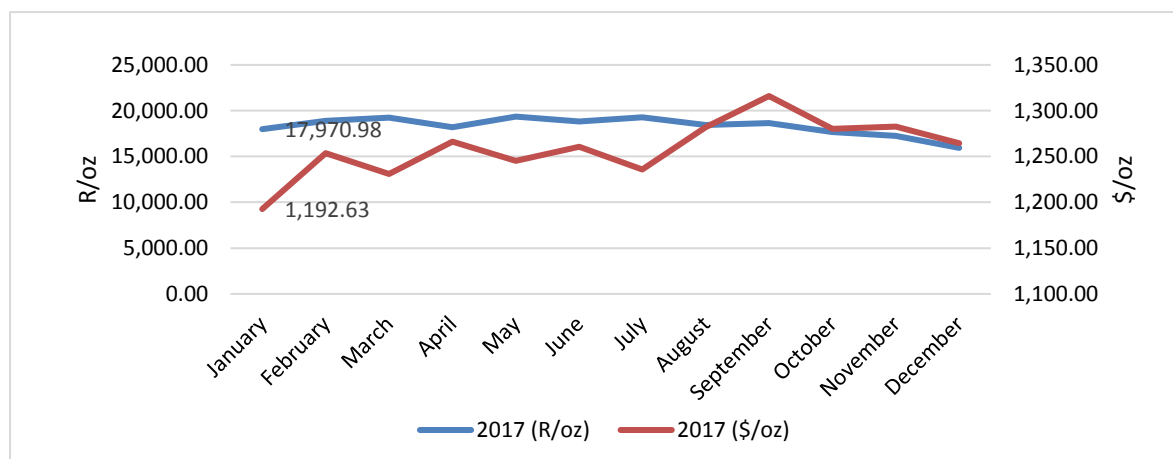
Source: DMR Statistics: 2012-2017

*: Adjusted figs (DMR), 2012-2017 Statistics Sub-Directorate

AVERAGE GOLD PRICES AND REVENUES

In 2017, the average gold price in dollars responded positively to geopolitical instability in Korea, during mid-June 2017. However, United States inflation rates, positive job announcements and strong US non-farm job data, while a stronger R/\$ exchange rate offset these gains in SA, resulting in lower sales revenue. The rand/dollar exchange rate (R/\$) responded positively on the back of economic security. From 2016 to 2017, the dollar gold price (\$/oz) increased by 0.9 percent to \$1 259.23/oz. In contrast, the R/oz increased by 8.5 percent to R16 651/oz, in 2017. R/oz gold prices decreased on the back of a 9.45 percent stronger (R/\$) exchange rate in 2017 (Fig 10).

FIGURE 10: AVERAGE GOLD PRICE MOVEMENTS IN RANDS AND DOLLARS, 2017.



Source: LBMA, 2017& 2018

SARB, 2017 and 2018

The average \$/oz gold price increased by 3.2 percent in Q1 2017 to Q2 2017 on the back of a weak-performing Chinese economy. During this period, the R/oz price rose by 2.9 percent to \$1 257.20/oz. However, in the second quarter, a 0.3 weaker (R/\$) supported R/oz gains, which stood at R12 461/oz. Similarly, the \$/oz gold price increased by 3.2 percent to \$1 257.89/oz due to the emergence of additional upbeat United States economic data and higher interest rates. From the second quarter to the third quarter, gold price in R/oz increased by 1.3 percent, supported by a 1.6 percent stronger gold price. However, from the third quarter to the fourth quarter a 3.6 percent stronger R/\$ exchange rate, resulted in a lower R/oz gold price (R13 063.92/oz). The price in \$/oz fell by 0.11 percent, on the back of decreased investment. During the period under review, the drop in the price of gold responded only to the geopolitical tension in North Korea as was expected.

A 9.45 percent stronger R/\$ exchange rate coupled with a 17.8 percent drop in export sales mass in 2017, resulted in an 8.1 percent reduction in revenue. The 0.9 percent increase in the gold price, could not offset the stronger rand during this period. Local sales value increased by 31.4 percent on the back of a 43.4 percent increase in sales mass. Total sales mass increased by 0.3 percent, but total sales value decreased by 8.1 percent.

POSITIVE-KEY DEVELOPMENTS

During 2017, SA's mining industry remained vibrant with various positive-developments, including expansions and refurbishments totalling R547 million. These developments are expected to add nearly 1 000 full-time job opportunities in two to three years. Furthermore, the gold industry was marked with a surprising recommissioning of a gold mine in Kwazulu-Natal, which is expected to produce in the Province, for the first time, since 2013. A major transaction between Harmony and Moab involving, inter -alia the sale of an asset will also contribute additional ounces to Harmony.

On the 2nd of February, DRDGold announced that it will spend R507 million to access additional mineral reserves. This could potentially extend the operating life of Ergo by 15 years to 2031.

Roughly three million ounces (3 Moz) of gold could be mined compared to 1.8 million oz identified before the study. This includes 162.4 kilometres (km) of pipelines and pump stations.

Pan African Resources announced a R40 million refurbishment of underground shafts at its Evander Gold Mines in Mpumalanga province. According to the producer, underground mining operations at Evander Mines will commence after the completion of the refurbishment program, which had been expected to be completed on April 15, 2018 with the hoisting of approximately 6 000 t of mines ore currently stored within the Evander Mines underground infrastructure.

On 19 April 2017, the major shareholder of Blyvooruitzicht announced an upward revision in the capital costs (from \$70 million-\$85 million) to recommence mining activities. Mine activities are expected to be facilitated through the treatment of surface tailings dumps (1.3 Moz) and restarting underground mining at a rate of between 50 000 oz-100 000 oz, respectively. The transaction has been earmarked for development, pending positive market developments.

On 8 June 2017, Birrell Mining International (BMI) reopened the recently acquired Bosveld Mining's Klipwal gold mine in Natal. As a result, gold production in Kwazulu-Natal is expected to resume for the first time, since 2013 financial year. Expansion from July 2017 onwards will include the recommissioning of lower-levels and overall deeper underground mining. BMI was responsible for the mines' care and maintenance programme since 2016. The acquisition will retain Black Economic Empowerment (BEE) at 26 percent. The mine is expected to contribute over 15 000 ounces (oz) of gold.

Harmony announced on 19 October that it is intending to buy Anglo Gold Ashanti's Moab Khotsong mine for R300 million. This could result in the producer becoming a 1.5 million ounce producer.

Despite the incidence of Care and Maintenance positive developments in the gold industry proves that SA's mines are still well-poised and geared to weather exceptionally difficult market-related conditions. This yet again strengthens the argument that the South African Industry is not a sunset gold mining industry

EMPLOYMENT

Total employment in the gold mining sector decreased by 3.1 percent from 116 545 in 2016 to 112 908 in 2017 (Table 19). This was due to several operations being placed on Care and Maintenance. Male employment decreased 4.1 percent. In contrast, female employment increased by 4.6 percent. Total remuneration decreased by 0.8 percent, in-line with the decrease in general employment. Remuneration of female employment increased by 11.7 percent, while male remuneration decreased by 2.2 percent.

TABLE 19: GOLD MINES EMPLOYMENT AND REMUNERATION, 2012–2017

YEAR		NUMBER OF EMPLOYEES*		REMUNERATION		
	Total	Male	Female	Total	Male	Female
				R ' 000	R ' 000	R ' 000
2012	142,201	129,940	12,261	22,238,338	20,342,069	1,896,269
2013	131,738	119,394	12,345	23,470,035	21,349,841	2,120,195
2014	118,794	106,983	11,811	22,683,949	20,483,413	2,200,536
2015	115,055	102,847	12,208	24,582,438	22,158,620	2,423,818
2016	116,545	103,852	12,693	28,528,568	25,614,081	2,914,487
2017	112,908	99,630	13,278	28,303,771	25,047,590	3,256,182

Source: DMR, Directorate Mineral Economics

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

OUTLOOK

Total world gold demand is expected to increase in 2018, due to an expected drop in the gold price. Similarly, physical demand, particularly bullion-demand is expected to increase as some sources indicate an increase in bullion purchases. This increase will be in-line with a higher global investment in grade jewellery, potentially boosting investment demand and EFT's, respectively.

Global production is expected to rise in 2018 through to 2019, supported by Chinese plant-upgrades and Russian production increases. However, South Africa's production is expected to dip slightly, due to some major production units being placed on Care and Maintenance. The gold sector is, however, expected to remain under immense pressure due to relatively low (bearish) prices, impacting negatively on high cost operations. However, the price might escalate to \$1 500/oz towards the end of 2018. Gold scrap supply (which provides a rich source of local supply) is expected to decrease slightly from the previous year on the back of a strengthening rand against the dollar. Local gold demand is expected to increase, due to the ramp-up of local jewellery hubs, in support of beneficiation in the country.

The price in R/oz terms is forecasted to increase by 2.4 percent to R16 643/oz, backed by a weaker R/\$ exchange rate. The price in \$/oz is expected to stabilise at \$1 260/oz, despite a strong dollar.

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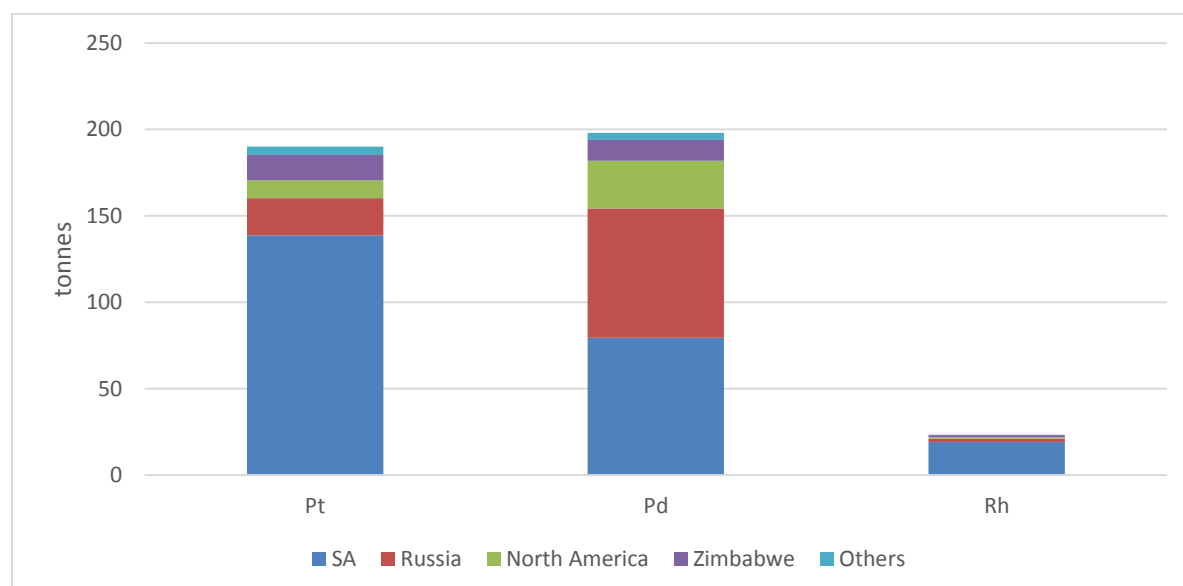
PLATINUM-GROUP METALS (PGMs)

Donald O Moumakwa

SUPPLY-DEMAND

Global platinum (Pt) supplies remained almost flat at just over 190 metric tonnes (t), with South Africa (SA) remaining the largest supplier of the metal accounting for 73 percent, after sourcing additional supply from pre-existing stocks of refined metal (Fig. 11). Russia supplied more than 11 percent, with Norilsk Nickel supplying some metal from inventories, after sales of Russian-origin metal fell slightly short of production. Palladium (Pd) supplies fell by 6 percent to 198.1 t on the back of lower shipments from Russia. As a result, SA became the largest supplier of Pd in 2017, accounting for over 40 percent of global supplies, followed by Russia at just under 38 percent. Rhodium (Rh) supplies fell by 3 percent to 23.3 t in 2017, due to lower production from SA, although the country still supplied more than 81 percent of the metal. Other supplies of Pt, Pd and Rh came from other countries such as North America and Zimbabwe, with the latter accounting for more than 5 percent of each of the three metals.

FIGURE 11: GLOBAL PGMs SUPPLY, 2017.



Source: Johnson Matthey's PGM Market Report, May 2018.

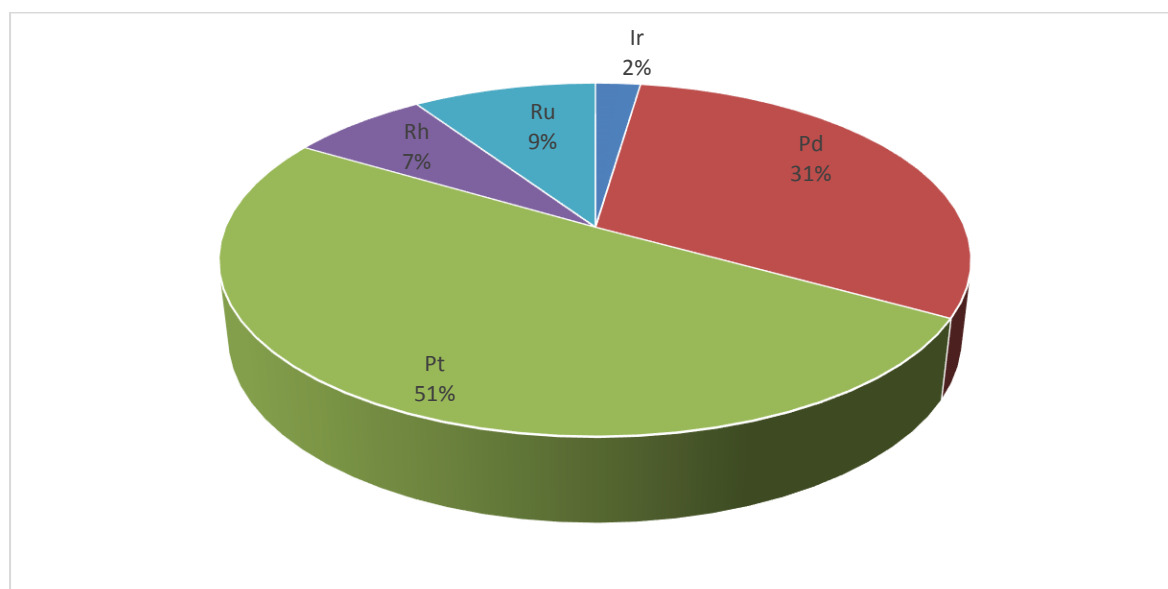
SA's PGMs mine production (including ruthenium and iridium) fell slightly by 1.3 percent to 260.3 t in 2017 (Table 20), due to mining suspension at Maseve mine in mid-year and the closure of Bokoni mine at the end of September. However, these closures were partly offset by incremental gains at other operations, most notably Mogalakwena and Bafokeng Rasimone Platinum mines, where output rose by 13.8 percent and 29 percent, respectively. Just over half of SA's total production was attributed to Pt output (Fig. 13), which fell by 1.5 percent to 131.2 t. However, Pd production rose by 5.1 percent on the back of strong performance from Mogalakwena, where the exploited Platreef contains slightly more Pd than Pt. A combination of Rh, iridium (Ir) and ruthenium (Ru) production made up less than 20 percent of the country's total PGMs output. Export sales mass of all PGMs remained almost flat, despite a slight increase in Pt exports.

TABLE 20: SA PGMs MINE PRODUCTION AND SALES, 2016-2017.

	Production	Local sales		Export sales		Total Sales	
	Mass (t)	Mass (t)	Value (R mil)	Mass (t)	Value (R mil)	Mass (t)	Value (R mil)
<i>Pt</i>							
2017	131.2	11.5	4 614.2	129.4	51 363.9	140.9	55 978.2
2016	133.2	13.7	6 387.0	128.0	58 672.2	141.7	65 059.1
% Change	-1.5	-16.3	-27.8	1.1	-12.5	-0.6	-14.0
<i>Pd</i>							
2017	80.1	16.5	6 140.9	67.2	23 387.7	83.6	29 528.6
2016	76.3	13.6	3 907.9	66.8	18 573.3	80.5	22 481.3
% Change	5.1	20.6	57.1	0.5	25.9	3.9	31.3
<i>Rh</i>							
2017	18.4	1.9	837.2	17.6	7 544.6	19.5	8 381.8
2016	19.2	1.9	608.0	17.6	5 441.5	19.5	6 049.6
% Change	-4.2	-1.1	37.7	-0.2	38.6	-0.2	38.6
<i>All PGMs</i>							
2017	260.3	31.8	11 971.5	251.4	85 069.2	283.1	97 040.7
2016	263.7	31.0	11 093.8	250.5	85 318.5	281.5	96 412.3
% Change	-1.3	2.5	7.9	0.3	-0.3	0.6	0.7

Source: Directorate Mineral Economics.

FIGURE 12: SA PGMs MINE PRODUCTION, 2017.



Source: Directorate Mineral Economics.

Despite record industrial consumption, gross Pt demand fell by 2.5 percent to 247.7 t in 2017 due to lower investment, jewellery and autocatalyst demand (Table 21). Industrial demand rose by 10.4 percent to 48 t, led by bullish demand from the glass and chemical sectors. Investment volumes fell by more than 40 percent to 11.1 t, with most of the decline occurring in the Japanese investment bar sector, despite the stabilization of ETFs holdings in SA after 2 years of heavy liquidation. Jewellery fabrication demand contracted by 5 percent to 71.4 t, as karat gold jewellery gained market share in China. The consumption of Pt in autocatalysts fell by a modest 1.1 percent due to

lower diesel car production in Europe. Lower gross demand and a small increase in recycling resulted in the Pt market being slightly oversupplied by 3.1 t in 2017.

TABLE 21: GLOBAL PGMs DEMAND, 2017.

tonnes	Pt	Pd	Rh
Autocatalyst	102.4	261	26.5
Jewellery	71.4	5.4	0
Industrial	48	54.8	5.8
Investment	11.1	-12	0
Other	14.8	4.3	0.7
<i>Total Gross</i>	247.7	313.5	33.0
Recycling	-60.7	-90.4	-9.6
<i>Net Demand</i>	187	223.1	23.4
Supply	190.1	198.1	23.3
<i>Balance</i>	3.1	-25	-0.1

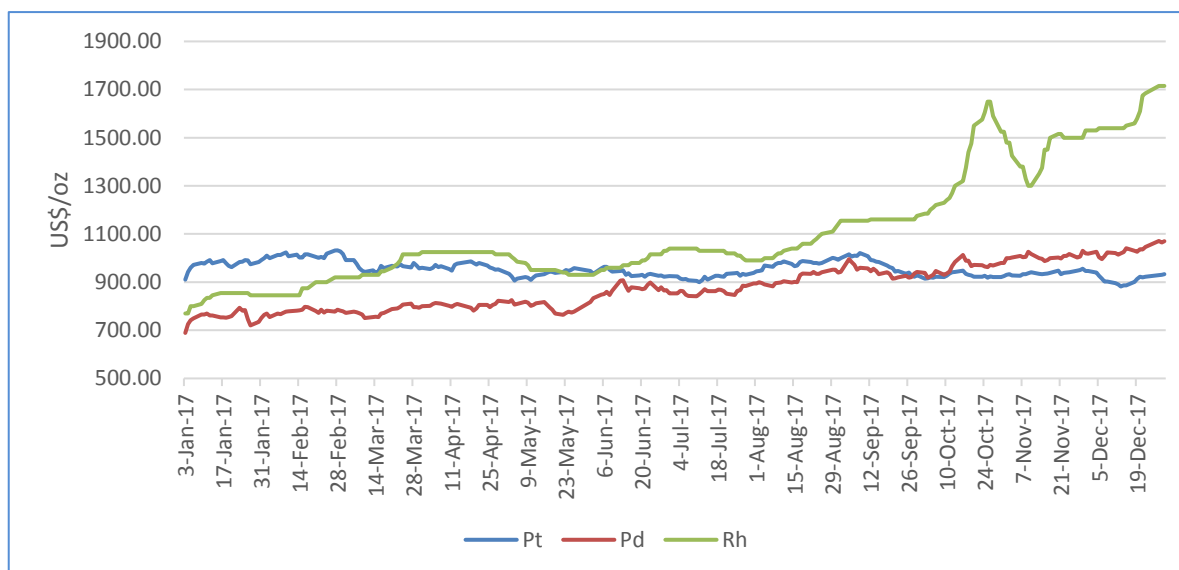
Source: Johnson Matthey's PGM Market Report, May 2018.

By contrast, the Pd market was undersupplied by a further 22.1 t in 2017, as autocatalyst demand increased significantly by 5.7 percent to an all-time high of 261 t, due to the continued increase use of the metal in light duty gasoline vehicles in North America and China. Total gross demand for the metal rose by 7.7 percent to 313.5 t, part of which was accounted for by the 16 percent increase in recycling. The rhodium market remained close to balance in 2017, with a 5.1 percent increase in total gross demand, driven by strong autocatalyst consumption, offset by a 14.3 percent increase in secondary supplies from autocatalyst recycling.

PRICES

PGMs prices experienced mixed fortunes in 2017. The Pt price continued to suffer as a result of, among others, weak sentiments, concerns over the longer-term future of the diesel engines and the potential disruptive effects of the battery powered electric vehicles as well as expectations of tightening US economic policy. The metal started the year at \$911/oz and reached a high of \$1 032/oz at the end of February, as a result of EU car sales, before reaching a low of \$882 in December, due to lack of trend-setting momentum on the demand side (Fig. 12). The platinum price per ounce gained only \$22 in 2017, averaging \$953, 3.8 percent less than in 2016 (Table 22).

FIGURE 13: DAILY PGMs PRICES, 2017.



Source: Johnson Matthey Base Prices.

Pd traded in tandem with Pt during the first three months of the year, opening at \$689/oz, which was to be its lowest for the year. However, tax cuts and economic growth in China and the US sent car sales and palladium consumption sharply high, putting an upward pressure on prices for the remainder of the year, until the metal overtook Pt in September. Aided by supply shortages, Pd reached a high of \$1 071/oz in December and closed the year at \$1 070/oz. The metal gained \$381 in value in 2017, with its average price rising significantly by 42 percent when compared with 2016. Rh more than doubled in value in 2017, gaining \$945, on the back of extremely high physical demand from the chemical and automotive industries. The metal's price averaged \$1 107/oz for the year, just over 59 percent higher than in 2016.

TABLE 22: US BASE PRICES OF PGMs, 2017.

(\$/oz)	Pt	Pd	Rh
Opening Price	911	689	770
Closing Price	933	1070	1 715
Losses/Gains	22	381	945
High	1 032	1 071	1 715
Low	882	689	770
2017 Average Price	953	876	1 107
2016 Average Price	991	617	696
% Change (Ave. Price)	-3.8	42.0	59.1

Source: Johnson Matthey Base Prices.

KEY DEVELOPMENTS IN SA

Restructuring continued in SA PGMs industry in 2017, as low Pt prices persisted. A number of acquisitions were witnessed as some producers sold mines or stakes, in operations they no longer considered profitable, while others chose to put operations under care and maintenance, with a view of restarting them once the market conditions improve. However, some new mine developments continued to progress well, with production expected to commence in the next few years.

Sibanye-Stillwater made an all-share offer, valued at R5.15 billion, to acquire Lonmin. Each Lonmin shareholder will be entitled to receive 0.967 new Sibanye-Stillwater shares for each Lonmin share held, which would result in Lonmin shareholders holding 11.3 percent of the enlarged Sibanye-

Stillwater Group. The transaction is expected to be concluded during the second half of 2018, affecting approximately 890 jobs. According to Lonmin, 12 600 jobs must be cut over the next three years, irrespective of whether the transaction goes through or not, since some shafts are old and deemed unprofitable. The company had earlier in the year taken full ownership of the Pandora Joint Venture (JV), after acquiring Amplats' 42.5 percent stake and Mvelaphanda Resources' 7.5 percent interest.

Royal Bafokeng Platinum (RBPlat) entered into a \$74 million deal with Platinum Group Metals (PTM) to acquire the concentrator plant and surface assets of PTM's Maseve mine. The mine borders RBPlat's Styldrift I project, near Rustenburg. Having produced the first concentrate in February 2016, the mine was shut down for several months in the middle of 2017, as it was said to be underperforming and needed a new mining plan, paving the way for RBPlat to bid. The Department of Mineral Resources (DMR) has since granted consent in terms of Section 11 of the MPRDA for the transfer of the entire issued capital of Maseve Investment II, the holding company of the Maseve mine, to RBPlat. According to RBPlat, the transaction would allow the company to preserve jobs and combine Maseve with its adjacent operations, while also providing early access to its Fritschgewaagd orebody at the Styldrift mine.

Northam Platinum received government approval for the R1 billion acquisition of a portion of the mining right and associated resource from the Amandelbult mine on the north-western boundary of Northam's Zondereinde mine. According to Northam, the resource holds significant benefits for the company, including extending the Zondereinde economic life of mine to beyond 30 years and early access to additional higher-grade Merensky and UG2 reefs. Northam had earlier acquired the mothballed Eland Platinum mine and a concentrator from Glencore for R175 million cash. The mine is located near Brits in the North West province and has a resource of 21.3 Moz of 4E. Previously put on care and maintenance until the Pt price improved, Northam is now considering early reopening of the mine, given the fact that it is rich in Rh, which has more than doubled in price, since 2017.

Impala Platinum (Implats) and Platinum Group Metals (PTM) closed the first phase of Waterberg transaction, that saw the former purchasing a 15 percent interest in the project for \$30 million. Implats has the option to increase its stake to 50.01 percent, following the completion of the DFS currently underway. Japan Oil, Gas and Metals National Corporation (JOGMEC) will retain certain metal marketing rights to final metal related to the project. Platinum Group would retain a 31.96 percent direct and indirect interest in Waterberg resources, if Implats were to exercise its full option. The Waterberg project is one of the few large Pd dominant deposits in the world. PTM believes that as a result of its shallow depth, good grades and a fully mechanised mining approach, the Waterberg project has the opportunity to be a safe mine within the lowest quartile of the industry cost curve.

Ivanhoe Mines' Platreef project, located on the northern limb of the Bushveld Igneous Complex, reached another key milestone with the completion of the definitive feasibility study (DFS) for the first phase of production. Some of the key DFS features are; mineral resources containing 41.9 Moz of 4E, a planned initial average yearly production rate of 476 koz of 4E plus 21 million pounds of nickel and 13 million pounds of copper. Ivanhoe plans to develop the mine in three phases, the first of which involves construction of an underground mine, a concentrator and other associated infrastructure to support an initial production rate of 4 Mt a year by early 2022. The second phase involves doubling production to 8 Mt a year, while the final phase will ramp production further up, to a steady-state of 12 Mt a year. Once complete, the project is expected to employ more than 2 000 people within the first 4 years of production.

Wesizwe completed the commissioning of the main and service shafts, as well as the ore-handling system at its Bakubung platinum mine project near Rustenburg. The mine is expected to have a lifespan of 35 years and employ over 3 100 people at steady-state production, which is estimated at 255 kilo tonnes per month (ktpm) for 24 years. Four mining levels are planned, ranging from 690 m to 810 m below collar, with both the Merensky and UG2 reefs exploited. Initially the Merensky Reef ore will be mined at the rate of 180 ktpm and the UG2 ore will make up the balance of 50 ktpm. Once the Merensky has been depleted, the full 255 ktpm will be generated from UG2 ore.

Atlatsa Resources JV Bokoni mine was idled, as the company implemented a 2-phase restructure plan. Phase 1 involves placing the mine under care and maintenance, during which JV partners will continue to review various alternatives for the mine's future sustainability, depending on future circumstances. Phase 2 involves acquisition by Amplats and inclusion into its adjacent mining rights, the resources specified in the Kwanda North and Central Block prospecting rights for R300 million. Atlatsa and Amplats will retain their 51 percent and 49 percent respective shareholdings in the JV, with both parties continuing to investigate opportunities for either or both to divest of their interest.

EMPLOYMENT

Average employment in the PGMs industry continued to decline, albeit by a smaller margin, falling by 0.2 percent to 172 171 in 2017 as restructuring continued across the industry (Table 23). However, total remuneration increased by 6.5 percent, probably because retrenchments mainly affected workers at the lower end of the remuneration scale, resulting in a 6.7 percent rise in the average remuneration per employee.

TABLE 23: EMPLOYMENT (INCLUDING CONTRACTORS) AND REMUNERATION IN SOUTH AFRICA'S PGMs MINES, 2013-2017.

YEAR	AVERAGE NUMBER OF EMPLOYEES	TOTAL REMUNERATION (R'000 000)	AVERAGE REMUNERATION (R/employee)
2013	192 051	37 210	193 751
2014	188 480	35 677	189 288
2015	177 391	41 754	235 378
2016	172 444	45 301	262 700
2017	172 171	48 258	280 291
% Change (YOY)	-0.2	6.5	6.7

Source: DMR, Directorate Mineral Economics

OUTLOOK

Global PGMs supplies, particularly Pt and Rh, are not expected to change much in 2018, as the impact of shaft closures in SA are likely to be offset by increased production at other operations. However, the Pt market is expected to drift further into surplus, as a result of further reduction in autocatalyst and jewellery demand, compounded by increased recycling, even though industrial demand is expected to remain relatively strong. This is likely to put a moderately downward pressure on prices and SA exports. Autocatalyst demand for Pd is set to continue reaching new records, but with primary metal held back last year expected to be released back into the market, and secondary supplies expected to rise, the Pd market is expected to move closer to balance in 2018, resulting in moderate increase in SA exports and prices. Strong autocatalyst and chemical demand for Rh are expected to persist in 2018 but, increased secondary supplies would push the

market into marginal surplus. As a result, SA sales and Rh prices are expected to increase only marginally, in 2018.

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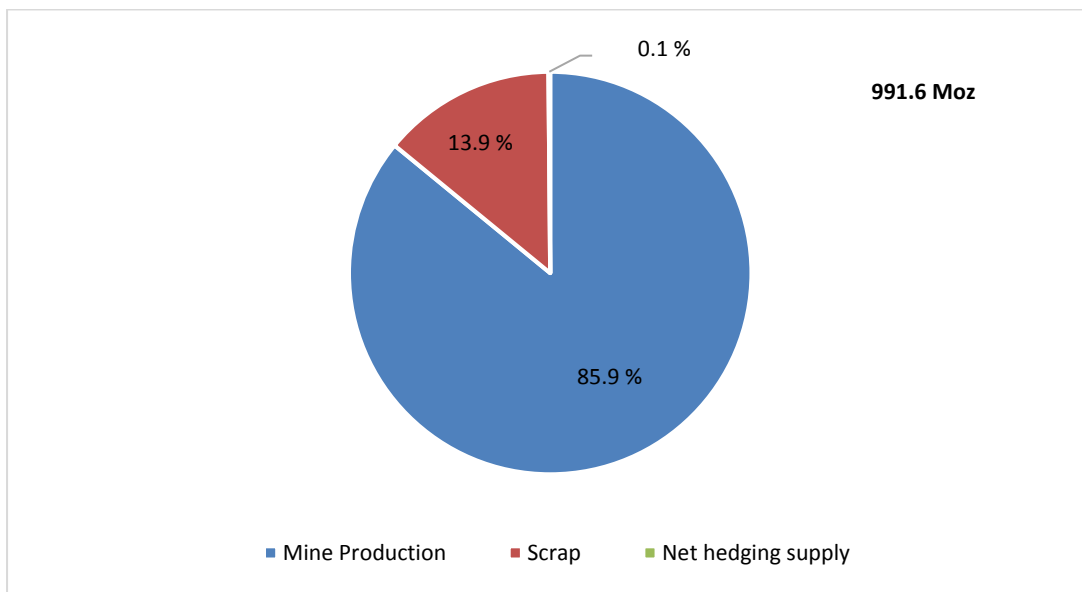
SILVER

PJ Perold

SUPPLY-DEMAND

Global silver supply, which consist of primary mine production and secondary-supply, decreased by 2.91 percent from 1 009.4 Moz in to 991.6 Moz in 2017 (Figure 14). Mine production, inclusive of output from the lead and copper operations remained the largest single contributor to total mine supply at 85.9 percent (852.1 Moz). Scrap and Net hedging supply contributed 13.9 percent and 0.1 percent, respectively. Mexico was the world's largest producer of silver at 196.4 Moz. Peru and China retained their 2nd and 3rd production-ranking globally, producing 147.5 Moz and 112.6 Moz.

FIGURE 14: GLOBAL SILVER PRODUCTION BY SOURCE, 2017.



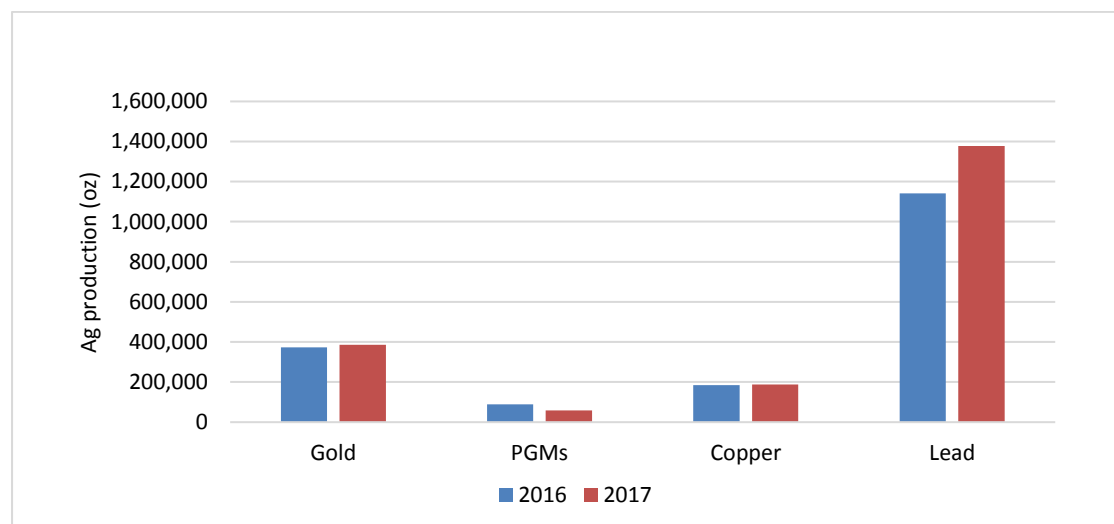
Source: Silver Survey, 2018

Preliminary statistics, 2018

In contrast to global production, South Africa's (SA) production rose by 12.4 percent from 1.73 Moz in 2016 to 1.95 Moz in 2017, mainly on the back of a 12.4 percent increase in lead production. To a lesser extent, production from copper and gold operations increased by 1.6 percent and 3.6 percent, respectively. Silver produced as a by-product of Platinum Group Metals (PGMs) decreased by 33.4 percent. SA produces the metal exclusively as a by-product of lead, copper, gold as well as PGM operations. The country's total silver production contributed only 0.1 percent to total world supply, retaining its global ranking as the twentieth largest producer.

The metal, derived from lead operations contributed the largest percentage to local silver production by far at 68.5 percent. In addition, production from lead operations increased by 20.7 percent from 1.1 Moz in 2016 to 1.4 Moz in 2017, mainly due higher-grade areas accessed. Production from gold, copper and PGMs operations contributed 19.2 percent, 9.3 percent and 2.9 percent to total SA production, respectively. Silver recovered from gold increased by 3.6 percent, from 373 299 oz in 2016 to 386 559 oz, due to higher throughput from shafts of the likes of AngloGold Ashanti and Sibanye. Production from copper operations increased by 1.6 percent, due to a ramp-up in production at Black Mountain, which resulted in a higher grade-recovery. In contrast, production from PGMs operations decreased by 33.4 percent (Fig.15).

FIGURE 15: S.A SILVER PRODUCTION BY SOURCE, 2016-2017



* Including recovery ops

Local sales mass and value decreased by 21.0 percent and 26.4 percent, respectively due to an unexpected decrease in uptake. In contrast, Export sales mass and value increased by 17.6 percent and 10.8 percent respectively, owing to higher exported quantities of ore-volumes as well as the increase in the average price of the metal. Despite a relatively lower increase in the silver price in 2017, total sales revenue amounted to R361.7 million, a 7.5 percent increase as compared with 2016 revenue, due to higher sales mass (Table 24).

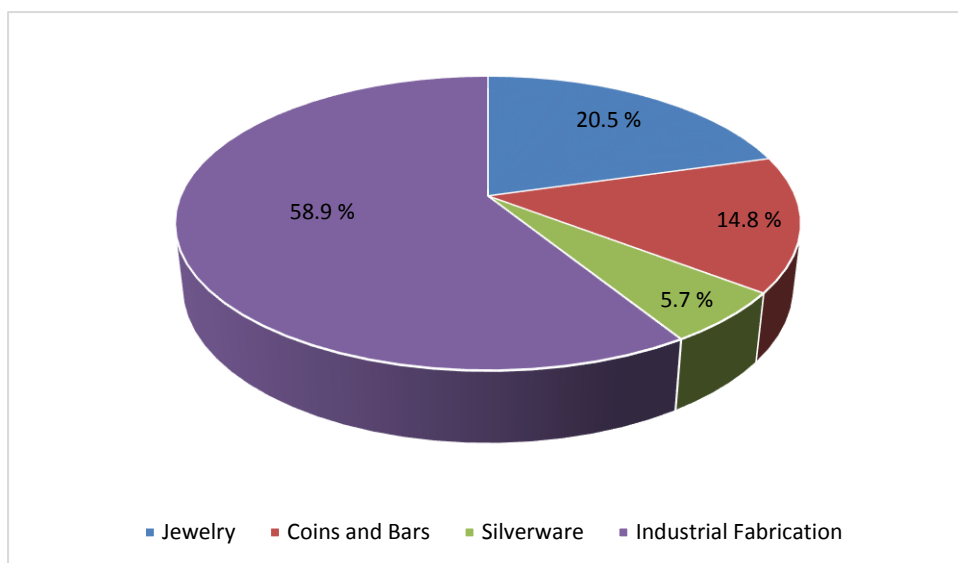
TABLE 24: SOUTH AFRICA'S PRODUCTION AND SALES OF SILVER, 2007-2017.

Year	Production	Local sales		Export sales		Total Sales	
		Mass	Value	Mass	Value	Mass	Value
		Moz	R'000	Moz	R' 000	Moz	R'000
2007	2.2	0.1	11. 0	2.5	224.1	2.6	235.0
2008	2.4	0.3	10. 9	2.8	318.6	3.0	346.8
2009	2.5	0.3	28. 3	2.3	256.2	2.5	287.1
2010	2.5	0.2	30. 9	2.5	350.4	2.7	386.1
2011	2.4	0.3	35. 6	2.3	531.9	2.6	611.9
2012	2.2	0.2	49. 6	2.5	533.2	2.5	582.9
2013	2.2	0.2	43. 2	2.0	410.2	2.2	453.3
2014	1.2	0.1	27. 0	1.7	315.1	1.8	342.1
2015	1.2	0.1	21.7	1.4	244.5	1.9	266.2
2016	1.8	0.1	29.6	1.5	306.9	1.6	336.5
2017	2.0	0.1	21.8	1.7	339.9	1.8	361.7
Y-o-y (%)	11.1	0.0	-26.4	13.3	10.8	12.5	7.5

Source: DMR Statistics, 2007-2017, Provisional Stats, 2017/18, Preliminary Data: 2017/18

World silver demand, which consists of industrial fabrication, coins and bars, jewellery and silverware fell by 2.3 percent to 1 017.60 Moz. The largest declines were experienced in coin and bar uptake, falling by 27.3 percent from 207.80 Moz in 2016 to 151.10 Moz in 2017. In contrast, Industrial fabrication demand increased by 3.8 percent to 599 Moz on the back of a recovery of demand O'Connell (2018) et al, p 10. Electronics, brazing, alloys, solders, photography and photovoltaics, increased by 18.7 percent to 94.10 Moz. The demand for silverware increased by 11.5 percent to 58.40 Moz in 2017. The largest components of total demand were industrial fabrication at 58.9 percent of total demand, followed by jewellery at 20.5 percent and coins and bars, at 14.8 percent. (Fig. 16). South Africa's local silver demand was primarily driven by jewellery and electronic components.

FIGURE 16: WORLD SILVER CONSUMPTION (Moz) BY SECTOR, 2017.



Source: World Silver Survey, 2017

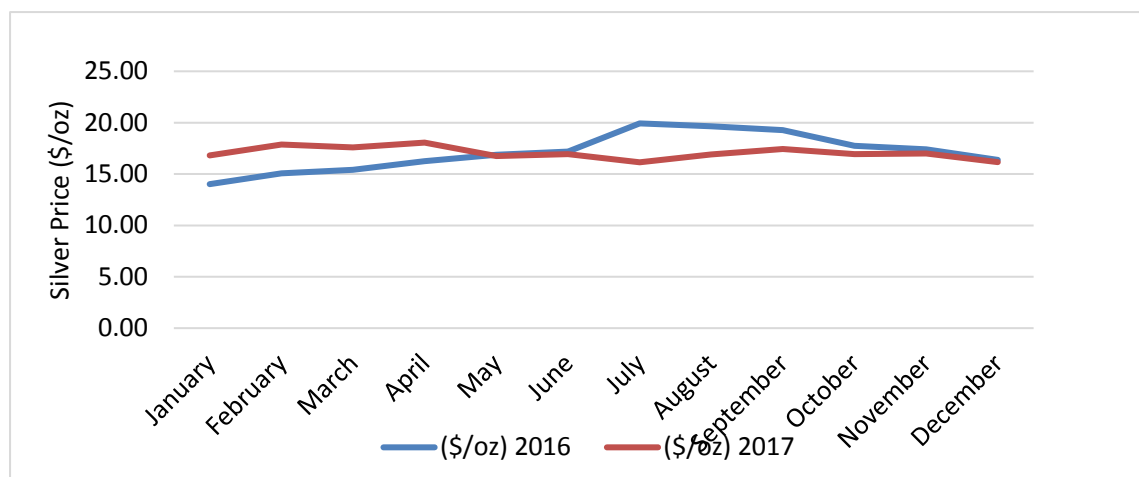
PRICES AND REVENUE

The overall average silver price remained relatively unchanged at 0.3 percent from \$17.10/oz in 2016 to \$17.05/oz in 2017 (Figure 17). However, the R/oz silver price decreased by 9.3 percent, due to a 9.5 percent stronger rand. This follows the relatively upbeat price from January to April, on the back of Trump election-optimism.

However, by the end of the 2nd quarter optimism started dwindling as the US started showing signs of a much-anticipated recovery in the publication of job-data. In addition, from May to July, the price dropped by 3.7 percent from \$16.76/oz to \$16.14/oz on the back of stronger US macroeconomic data, which included job growth.

From August to December, the price declined by 7.4 percent to \$16.16/oz. During the time-frame, silver reached a high of \$17.45/oz in September as there was a slight increase in geopolitical tension in Northern Korea.

FIGURE 17: MONTHLY AVERAGE SILVER PRICES, 2017.



Source: Silver fixings, LBMA, 2017&2018

OUTLOOK

Global silver supply is expected to decrease in-line with continued lower ramp-ups of primary global productions on the back of global emission cuts. Like the anticipated saturation-point, total silver output will continue to decrease, albeit very marginally in 2018, given the strong ramp-up of mine production in South America. Global scrap-supply is expected to increase moderately, in-line with the expected increase in average silver prices. Global government sales, however could increase, backed by strong demand for silver bullion bars as the price rises.

In South Africa, silver output is expected to increase by at least between 2.0 and 3.0 percent, mainly due to higher lead recovery (lead operations will stabilise at Vendata, post-2016 decline) and copper recovery. Furthermore, increased gold production from higher recovered grades will aid in further increasing local production. The silver price is expected to remain flat, increasing by a mere 0.2 percent to \$17.5/oz, because of the US trade wars with China, which could make the commodity market uncertain. Perhaps more importantly, silver's price in R/oz will increase due to an expected weaker R/\$, bringing some relief to local miners, in terms of contra-price cycles of the metal produced as a by-product.

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ENERGY MINERALS OVERVIEW

K L Revombo

INTRODUCTION

Coal, uranium, oil and natural gas are the most crucial components of South Africa's energy mix. These three forms the backbone of the country's energy sector which is the heartbeat of the economy. Presently, about 72.1% of our country's primary energy needs are provided by coal. Coal is used in electricity generation, various industries, synthetic fuels and domestic heating and cooking. About 91.3 percent of the electricity generated in the country is from coal. South Africa's coal resources are ranked sixth in the world.

Uranium, the second significant component in the country's energy mix, accounts for about 5.6 percent of the country's electricity. The country's uranium reserves are ranked fifth globally. South Africa's Necsa (South African Nuclear Energy Corporation SOC Limited) is the only company on the African continent with an American Society of Mechanical Engineers III (ASME III) and ASME VIII certification for the design and manufacture of nuclear components and equipment. The majority of the uranium is produced mainly as a by-product from the treatment of gold-bearing ores. The country's coal reserves are located mainly in Mpumalanga, northern Kwazulu-Natal and Limpopo provinces.

South Africa's oil and gas resources have dwindled drastically to the extent that the country did not produce oil for three consecutive years. The country hosts very small deposits of oil. However, the country potentially hosts large quantities of shale gas in the Karoo basin.

PRODUCTION AND SALES

According to the BP Statistical Review 2018, global oil production rose by 0.6 million b/d, below average for the second consecutive year. US (690,000 b/d) and Libya (440,000 b/d) posted the largest increases in output, while Saudi Arabia (-450,000 b/d) and Venezuela (-280,000 b/d) saw the largest declines. Regionally, North America, Commonwealth of Independent States (CIS) and Africa are the only two that recorded growths of 4.3 percent, 0.9 percent and 5 percent in that order. The Middle East accounted for 34.1 percent of the total global oil production, followed distantly by North America's 21.7 percent and CIS's 15.4 percent. The USA continued to be the leading oil producer for three consecutive years, accounting for 14.1 percent of the global oil output, followed by Saudi Arabia's 12.9 percent and Russia's 12.2 percent. South Africa did not produce crude oil in 2017 (Table 25).

TABLE 25: SOUTH AFRICA'S PRODUCTION AND SALES OF ENERGY COMMODITIES, 2017

COMMODITY	YEAR	PRODUCTION	LOCAL SALES		EXPORT SALES		TOTAL SALES	
		kt	kt	R'000	kt	R'000	kt	R'000
Coal	2016	250 653	183 213	61 455 037	73 603	53 905 148	256 816	115 360 185
	2017	260 122	181 347	69 105 623	79 775	69 788 115	261 122	138 893 738
Uranium Oxide	2016	0.38	-	-	-	-	-	-
	2017	0.26	-	-	-	-	-	-
Subtotal	2016	250 653	183 213	61 455 037	73 603	53 905 148	256 816	115 360 185
	2017	260 122	181 347	69 105 623	79 775	69 788 115	261 122	138 893 738
Natural Gas	2016	645.78	645.78	1 169 034	-	-	646	1 169 034
	2017	589.70	589.70	1 200 018	-	-	590	1 200 018
Natural Gas Condensate	2016	38.80	38.80	275 667	-	-	39	275 667
	2017	31.15	31.15	256 533	-	-	31	256 533
Subtotal	2016	685	685	1444701	-	-	685	1 444 701
	2017	621	621	1 456 551	-	-	621	1 456 551
Total	2016	251 338	183 898	62 899 738	73 603	53 905 148	257 501	116 804 886
	2017	260 743	181 968	70 562 173	79 775	69 788 115	261 743	140 350 289

Source: DMR, Mineral Economics Directorate

Global oil consumption grew by an average of 1.8 percent (1.7 mbb/d). The largest growths by country were recorded by Czech Republic with an increment of 16.4 percent (29 thousand barrels per day (tbb/d)). However, volumetrically, the USA recorded the largest increase of 193 tbb/d, followed by China with a growth of 497 tbb/d and India with 131 tbb/d. Organization for Economic Cooperation and Development's (OECD) oil consumption grew by 482 tbb/d (one percent), whereas non-OECD countries' increased by 1216 tbb/d (2.4 percent) and the European Union's oil consumption grew by 240 tbb/d (1.9 percent). The CIS's consumption improved by 0.9 percent (39 tbb/d).

In 2017, natural gas production increased by 4 percent (131 billion cubic metres (bcm)) to 3680.4bcm from 3549.81bcm in 2016. Regionally, the largest gas producer was North America, accounting for 25.9 percent of the global gas production, followed by CIS's 22.2 percent and Middle East's 17.9 percent. Countries that recorded the largest percent increases in gas production were Egypt, Kazakhstan and Australia, with growths of 22.1 percent, 18.6 percent and 18 percent respectively. Syria recorded the biggest percentage drop of 14.6 percent, followed by Netherlands' 12.6 percent and Germany's 7.6 percent. South Africa's natural gas production declined by 8.7 percent from 645.8 kt in 2016 to 589.7 kt in 2017, owing to diminishing reserves. Similarly, natural gas condensate decreased by 19.7 percent to 31.15 kt during the same period.

Natural gas consumption grew by 3 percent (96 bcm) in 2017, the fastest rates since the immediate aftermath of the financial crises. The growth in consumption was led by Asia, with particularly strong growth in China (15.1 percent, 31 bcm), supported by increases in the Middle East (Iran 6.8 percent, 13 bcm) and Europe (Germany 6.5 percent, 5.3 bcm).

World coal production grew by 3.4 percent to 7727.328 in 2017 from 7491.987 in 2016, the fastest growth since 2011. This growth was mainly driven by USA's and China's growths that were 6.6 percent (41.5 Mt) and 3.6 percent (112.6 Mt) respectively. All regions but South and Central America increased their coal output. The region with the largest increase of 129.6 Mt (2.8 percent) was Asia Pacific, followed by North America's 39.1 Mt (5.6 percent) and Europe's 34.2 Mt (5.8

percent). China remained the world's leading coal producer, with 3 523.3 Mt coal production, followed distantly by India's 716 Mt and United States' 702.26 Mt.

World uranium production decreased by 4.5 percent from 62 366 tonnes uranium (tU) (73 548 U₃O₈) in 2016 to 59 531 tU (70 201 U₃O₈) in 2017, owing to the oversupplied market that prompted production cuts from some producers. Kazakhstan remained the top producer in 2017 contributing 39.3 percent of total global uranium production, followed by Canada's 22.0 percent and Australia's 9.8 percent. South Africa's uranium production decreased by 32.5 percent from 381.7 tU (450.1 U₃O₈) in 2016 to 257.5 tU (303.7 U₃O₈) in 2017.

Nuclear electricity generation increased by 1.2 percent from 2 490 terawatt hours (TWh) in 2016 to 2 519 TWh in 2017, accounting for 10.6 percent of global electricity generation. France is the leading country in the world generating 71.6 percent of its electricity from nuclear power, followed by Ukraine's 55.1 percent and Belgium's 49.9 percent. SA, the only country in Africa generating nuclear electricity, drew only 6.7 percent of its electricity from nuclear energy in 2017. Globally, nuclear power was generated from 447 nuclear reactors in 2017 as compared to 438 in 2016, with seven of new reactors coming from China. The USA had the highest number of reactors at 99, followed by France's 58 and Japan's 42. South Africa has only two Nuclear reactors situated at Koeberg power station in the Western Cape.

EMPLOYMENT

In 2017 the number of employees in the energy sector grew by 6.71 percent to 83298 from 78 086 in 2016 (Table 26). Coal continued to dominate this sector by accounting for about 99.07 percent of the total jobs in the energy sector, with uranium and natural gas accounting for the remainder. The oil industry did not contribute to employment in 2017 as PetroSA stopped its operations due to reserves exhaustion.

TABLE 26: EMPLOYMENT AND GROSS REMUNERATION ON MINES AND PLANTS IN THE SOUTH AFRICAN ENERGY INDUSTRY, 2008 – 2017

YEAR	EMPLOYEE	REMUNERATION	
	Number	R'000	R'000/Employee
2008	65 739	11 138 368	169.4
2009	70 970	12 947 469	182.4
2010	75 021	14 352 946	191.3
2011	78 761	16 242 879	206.2
2012	83 538	17 612 592	210.8
2013	89 055	19 163 272	215.2
2014	87 235	20 795 751	238.4
2015	78 631	20 098 719	255.6
2016	78 086	21 284 622	272.6
2017	83 298	22 651 498	271.9

Source: DMR, Mineral Economics Directorate

Total remuneration increased by 6.42 percent to R22.7 billion owing to the higher number of employees in 2017 compared to 2016. The average annual per capita earnings in energy sector declined by 0.3 percent to R 271 933.

OUTLOOK

The South African energy sector continues to be the backbone of the country's economy. Coal, accounts for more than 93 percent of the electricity generated in the country, while also accounting for 30 percent of the country's liquid fuels generated via the Sasol's coal-to-liquid technology. Coal will therefore continue to dominate South Africa's energy mixture. The gas industry, as well as the nuclear industry have potential to play an important role in the country's energy mix. The Council for Geoscience is undertaking a geoscientific research project in the Karoo Basin that is believed to host shale gas and uranium resources. The report will quantify both the shale gas and uranium resources and their economic potential. These two resources will play an important role in decarbonizing the country's economy.

It is evident that the biggest commodity consumer, China, is also experiencing some slowing down in both industrial production and trade volume. These developments will not give an impetus to commodity prices. The oil prices have shown some improvements, averaging \$76 /bbl in the third quarter of 2018 at some point reaching a 4-year high above \$81 /bbl on lack of urgency from OPEC to boost output. It is expected that higher oil prices will taper off as demand for oil is seen to be decreasing and the USA shale gas also advancing to break the oil cartel.

The South African coal export prices have been trending up in 2018, reaching a maximum of \$108.64 /t by July. It is forecast that the country's coal export price will average about \$102 /t in 2018. Much of the demand for South African coal is expected to come from Asian countries, especially India. The domestic coal prices are also expected to improve albeit slightly as the country's economy is in recession and energy consumption will also slow down. Local demand however is expected to improve in other local industries such as metallurgy. With the number of operating mines increasing, it is expected that coal production will increase in 2018.

South Africa's natural gas production is forecast to decrease in 2018, continuing with this downward trend for the third consecutive year due to depleting reserves. Again, PetroSA is yet to start producing from the new project in the F-O field, also known as Project Ikhwezi. The amount of shale gas available in South Africa is still unclear, with estimates ranging between 20 trillion cubic feet (tcf) and over 400 tcf and none of these reserves has yet been proven and lower value is probably closer to reality. These figures will be clarified by the research work being done by the CGS.

While there is a possibility of shale gas breakthrough, exploratory fracking is still needed to determine the commercial prospects of shale gas. Exploration for shale gas is now allowed to proceed and the Petroleum Agency of South Africa is tasked with looking at the applications. So far, only five applications have been received. To support the shale gas industry, urgent steps need to be implemented by relevant government departments, in collaboration with industry, to coordinate all skills planning initiatives needed to develop a single, coordinated development plan for the shale gas industry.

There are no major changes expected in the country's uranium industry in 2017 as there are no new mines to be commissioned soon.

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COAL

KL Revombo

SUPPLY - DEMAND

At the end of 2017, global proven coal reserves decreased by 9.2 percent to 1 305 012 million tons (Mt) from 1 139 331 Mt at the end of 2017 (Table 27). China and Indonesia reviewed their coal reserves and reported decreases of 43.1 percent and 11.6 percent respectively. Only Poland and India reported increases in their reserves. Poland's reserves grew by 6.8 percent, while India's rose by 3.1 percent. These proven reserves represented about 134 years of production at current levels. The United States of America (USA) hosted the largest coal reserves, accounting for 24.2 percent of the global total, followed by Russia (15.5 percent) and Australia (14 percent). Ranked sixth globally, South Africa accounted for 5.9 percent of the global reserves.

TABLE 27: WORLD COAL RESERVES, PRODUCTION AND EXPORTS, 2017

COUNTRY	RESERVES ¹			PRODUCTION ¹			EXPORTS ²		
	Mt	%	Rank	Mt	%	Rank	Mt	%	Rank
Australia	144 818	14.0	3	501.1	6.6	4	378.9	27.7	2
Canada	6 582	0.6	11	59.5	0.8	11	31.1	2.3	7
China	138 819	13.4	4	3 376.1	44.7	1	3.56	0.3	10
Colombia	4 881	0.5	12	89.4	1.2	10	86.1	6.3	5
India	97 728	9.4	5	729.8	9.7	2	-	-	-
Indonesia	22 598	2.2	10	487.6	6.5	5	390.6	28.5	1
Kazakhstan	25 605	2.5	9	106.0	1.4	9	27.1	2.0	8
Poland	25 811	2.5	8	127.0	1.7	8	-	-	-
Russia	160 364	15.5	2	387.2	5.1	6	189.7	13.8	3
South Africa*	66 700	6.4	6	260.1	3.4	7	79.8	5.8	6
Ukraine	34 375	3.3	7	34.2	0.5	12	-	-	-
Netherlands	-	-	-	-	-	-	24.40	1.78	9
USA	250 916	24.2	1	702.3	9.3	3	88	6.4	4
Other	55 815	5.4	-	688.5	9.1	-	71.1	5.2	-
Total	1 035 012	100.0	-	7 548.8	100	-	1 370.3	100	-

Source: ¹BP Statistical Review of World Energy, June 2016

²Coal Information 2016, International Energy Agency – OECD/IEA

*DMR, Mineral Economics Directorate – reserves, production

*South Africa's export figures are those obtained from Ports

In 2017, global coal output decreased by 9.2 percent to 7 548.8 Mt compared to 7 726.8 Mt in 2016 (Table 27). The biggest fall in production at 187.1 Mt was recorded by China, followed by USA's 111.4 Mt and, at a distant third was Australia's 11.3 Mt. Regardless of shedding the most output in 2017, China at 3376.1 Mt remained the top global coal producer, followed by India's 729.8 Mt and the USA's 702.3 Mt.

South Africa's saleable coal production grew by 4.20 percent from 250.6 Mt in 2016 to 261.6 Mt in 2017, owing to the number of producing mines that increased from 86 in 2016 to 92 in 2017. Total run-of-mine (ROM) production increased by 3.07 percent from 319.1 Mt in 2016 to 328.8 Mt in 2017. Despite the decrease of 65 percent to 64.7 percent of the total ROM production, opencast mining remained the leading method of coal production in the country, followed by board and pillar's 33.32 percent (a slight increase from 2016's 31.96 percent), stooping's 0.58 percent (a decrease from 1.59 percent in 2016) and longwall's 1.40 percent remained unchanged from 2016. The top five major producers starting with the top producer include Anglo American, Exxaro, Sasol Mining, South32 and Glencore. These top five producers accounted for 74 percent of the country's total saleable coal production in 2017. Junior coal producers accounted for the remaining 26 percent. The three largest Black Economic Empowerment (BEE) companies, namely, Exxaro Resources, Tegeta Exploration and Resources Pty Ltd and Muhanga Mines Pty Ltd, accounted for 25 percent of the country's total saleable production. Overall, BEE companies and junior coal miners accounted for about 46.3 percent of South Africa's total saleable production.

TABLE 28: SOUTH AFRICA'S PRODUCTION AND SALES OF SALEABLE COAL, 2008 - 2017

YEAR	PRODUCTION	LOCAL SALES				EXPORT SALES	
		MASS	VALUE (FOR)		MASS	VALUE (FOB)	
	Mt	Mt	R'000	R/t	Mt	R'000	R/t
2008	252.7	197.0	30 104 161	153	60.6	44 706 204	737
2009	250.6	184.7	34 463 054	187	60.5	30 934 920	512
2010	257.2	186.4	33 702 229	181	66.8	37 477 184	561
2011	250.7	177.9	37 253 525	209	68.8	50 548 678	735
2012	258.6	185.7	43 921 277	237	76.0	52 226 904	687
2013	256.1	183.4	49 447 281	270	73.2	50 911 117	696
2014	261.4	183.0	54 924 215	300	75.4	50 881 592	675
2015	252.2	179.2	56 586 469	316	75.4	47 560 905	631
2016	250.6	183.2	61 445 037	339	73.6	53 905 148	732
2017	260.1	181.3	69 055 619	381	79.8*	69 788 115	875

Source: Mineral Economics Directorate, DMR

* Mineral Economics Directorate, Richardsbay Coal Terminal and Grindrod Terminals

Just like all the previous years, the Witbank coalfield remained the largest producer, accounting for 54 percent of the country's total saleable production, followed by Highveld's 25.88 percent, Waterberg's 10.14 percent, and Sasol-Vereeniging's 6.40 percent. This data clearly shows that the Witbank Coalfield's production is dwindling every year, falling from 57.7 percent of the total saleable production in 2016 to 54 percent in 2017. The Highveld and Waterberg coalfield grew their saleable production in 2017 by 3.14 percent and 1.02 percent respectively. In 2017, the Mpumalanga Central basin, which comprises Witbank, Highveld and Ermelo coalfields, accounted for 81.62 percent of the country's total production, down from 82.5 percent in 2016.

South Africa's anthracite saleable production, which accounted for just above one percent of the country's saleable coal production, surged by 10 percent from 2 628 kt in 2016 to 2 886 kt in 2017 (Table 28).

TABLE 29: SOUTH AFRICA'S PRODUCTION AND SALES OF ANTHRACITE, 2008 – 2017

YEAR	PRODUCTION	LOCAL SALES		EXPORT SALES			
		MASS	VALUE (FOR)	MASS	VALUE (FOB)		
	kt	kt	R'000	R/t	kt	R'000	R/t
2008	2 207	961	581 207	604	1 265	762 064	602
2009	1 658	786	549 620	699	598	517 126	863
2010	2 074	1 197.7	933 123	779	874	717 086	821
2011	2 554	1 259.4	1 127 675	895	983	892 137	907
2012	3 005	1 520.5	1 455 444	957	1 227	1 179 215	961
2013	3 621	1 763.1	1 627 462	923	1 141	1 025 465	899
2014	3 517	1 917.9	1 888 234	985	2 178	1 588 858	730
2015	3 396	1 800.0	1 851 799	1029	1 602	1 239 071	773
2016	2 628	1 663.0	1 676 092	1008	1 930	1 340 023	694
2017	2 886	1 867.0	2 026 923	1085	1 766	1 459 951	826

Source: Mineral Economics Directorate, DMR

Bituminous coal production, which accounted for more than 98 percent of South Africa's total saleable coal production, also grew by 3.79 percent to 260.1 Mt from 250.6 Mt in 2016 (Table 30).

TABLE 30: SOUTH AFRICA'S BITUMINOUS COAL PRODUCTION AND SALES, 2008 – 2017

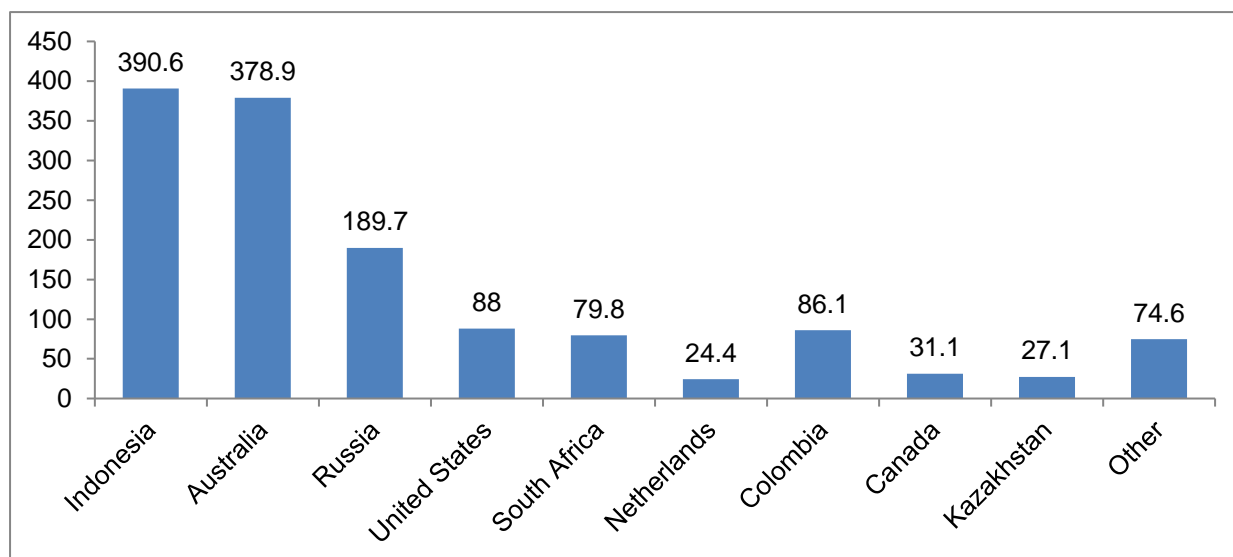
YEAR	PRODUCTION	LOCAL SALES			EXPORT SALES		
		MASS	VALUE (FOR)		MASS	VALUE (FOB)	
		Mt	R'000	R/t	Mt	R'000	R/t
2008	250.5	196.1	29 522 953	151	59.4	43 944 138	740
2009	248.9	183.9	33 913 433	184	59.9	30 417 794	508
2010	255.1	185.2	32 769 106	177	65.9	36 760 098	558
2011	248.2	176.6	36 125 849	205	67.8	49 656 540	732
2012	255.6	184.1	42 465 833	231	74.8	51 047 689	683
2013	252.9	182.2	47 975 553	263	73.4	50 788 019	692
2014	257.9	181.1	53 035 981	293	73.2	49 292 734	673
2015	248.8	177.4	54 734 670	309	73.8	46 321 834	628
2016	247.9	179.6	59 768 946	333	71.7	52 565 125	733
2017	249.5	179.5	67 078 699	374	78.0	68 328 163	876

Source: Mineral Economics Directorate, DMR

* Mineral Economics Directorate, Richardsbay Coal Terminal and Grindrod Terminals

The International Energy Agency reported that in 2017, global coal export of all types of coal increased by 3.3 percent to 1 386 Mt from 1 326.9 Mt in 2016. In 2017 Indonesia overtook Australia to be the world's leading coal exporter, exporting 390.6 Mt. Australia exported 378.9 Mt and third was Russia with 189.7 Mt (Figure 18). The top three exporters accounted for about 70 percent of the global total coal export.

FIGURE 18: MAJOR COAL WORLD EXPORTERS (Mt), 2017

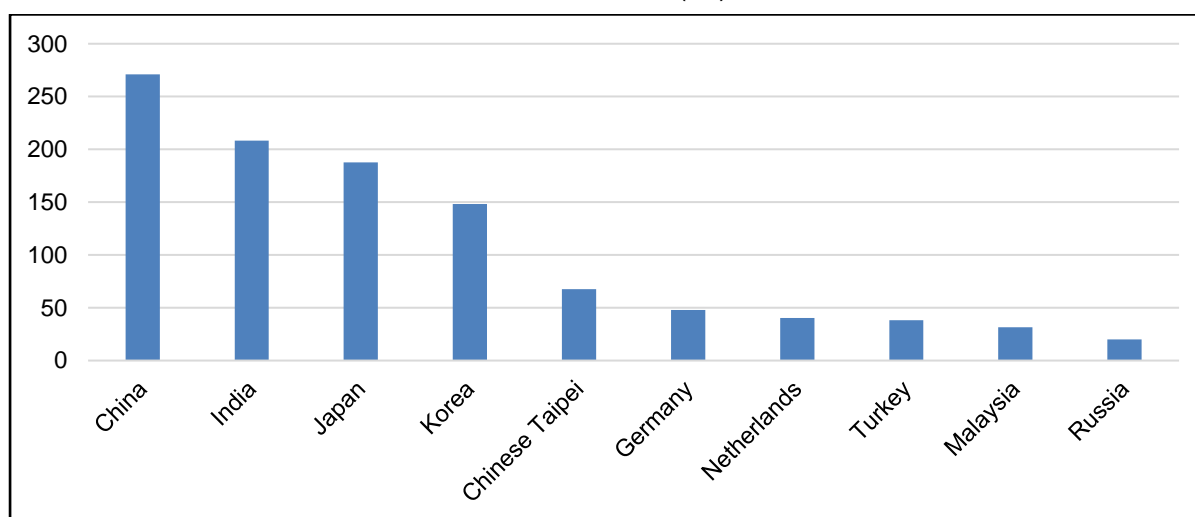


Source: Coal Information 2018

South Africa's Figure: Mineral Economics Directorate, Richardsbay Coal Terminal and Grindrod Terminals

In 2017 total world imports grew by 5.2 percent to 1386.9 Mt from 1318.3 Mt in 2016 owing to China, whose imports increased by 6.1 percent to 271.1 Mt. China, with 271.1 Mt, was the top coal importer in 2017, followed by India with 208.3 Mt, Japan (187.5 Mt) and Korea with 148.2 Mt (Figure 19). These four Asian countries together accounted for 58.77 percent of total global imports. If Tapei, which is the fifth top coal importer is added, 63.65 percent of the global coal import is accounted for by Asia Pacific countries.

FIGURE 19: MAJOR WORLD COAL IMPORTERS (Mt), 2017

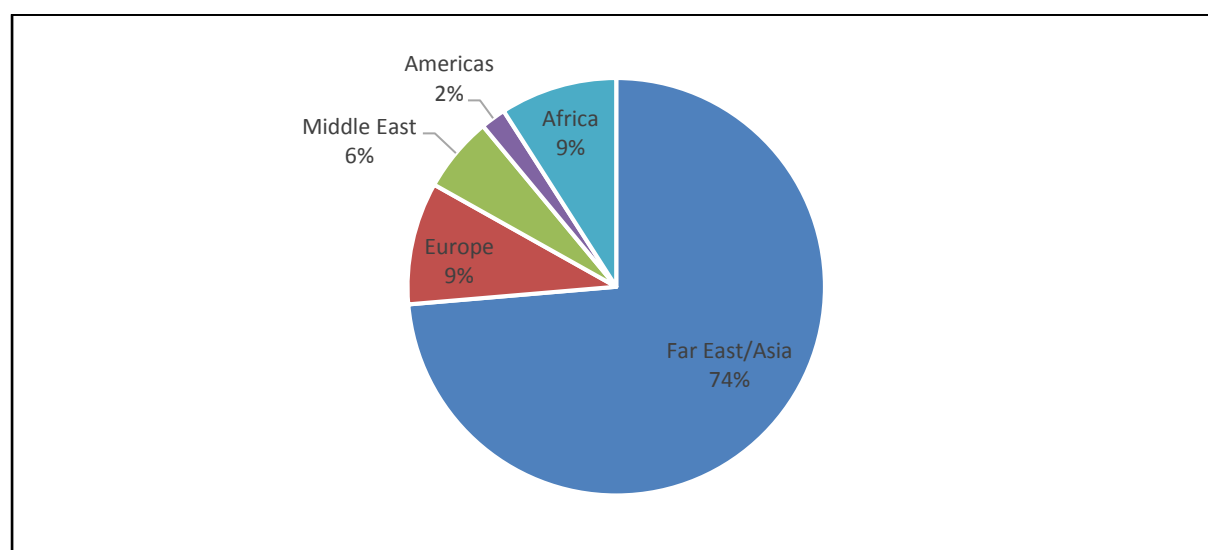


Source: Coal Information 2017

According to the ports and South African Revenue Services Customs, South Africa's coal exports increased by 8.4 percent to 79.8 Mt in 2017 from 73.6 Mt in 2016. Asia continued to be the leading importer of South African coal in 2017. Asia / Far East accounted for 74 percent of South Africa's

total exports, up from the 64.38 percent in 2016, followed by Europe and Africa, both on 9 percent (Figure 20).

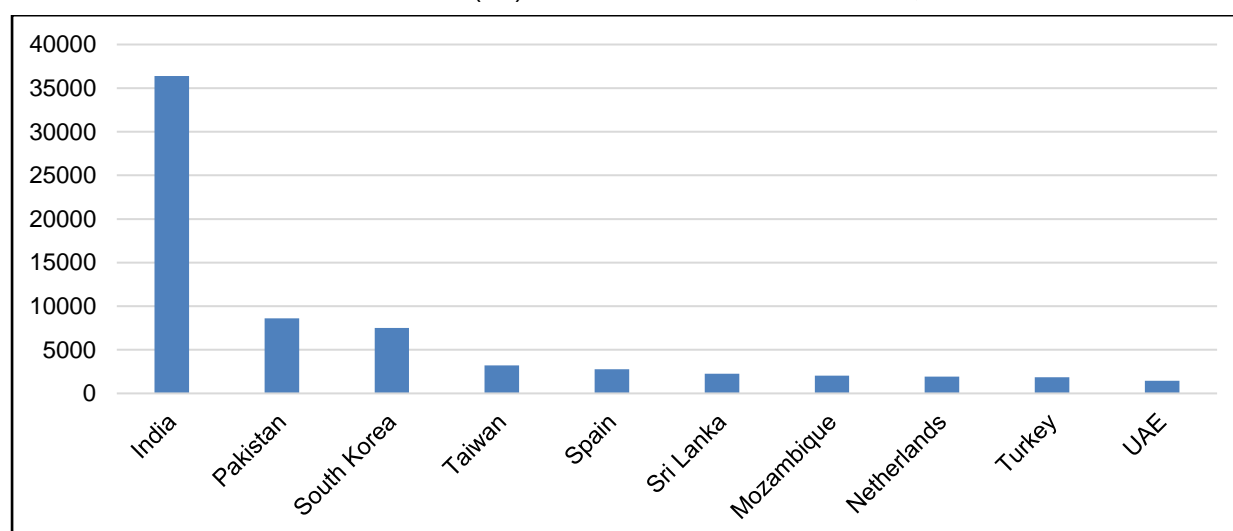
FIGURE 20: SOUTH AFRICA'S EXPORT PERCENTAGE BY REGIONAL DESTINATION, 2017



Source: South African Revenue Services Customs

Despite India's import of South Africa's coal decreasing from 49.63 percent of the total South Africa's exports in 2016 to 44.67 percent in 2017, India continued to be the leading importer of South Africa's coal, followed by the Pakistan's 10.56 and South Korea's 9.23 percent (Figure 19). In Africa, Mozambique displaced Morocco for the first time in four years as the leading importer of South Africa's coal, importing about 2.02 Mt (2.48 percent) of the country's total exports, followed by Egypt and Mauritius, each with 0.8 Mt (0.98 percent).

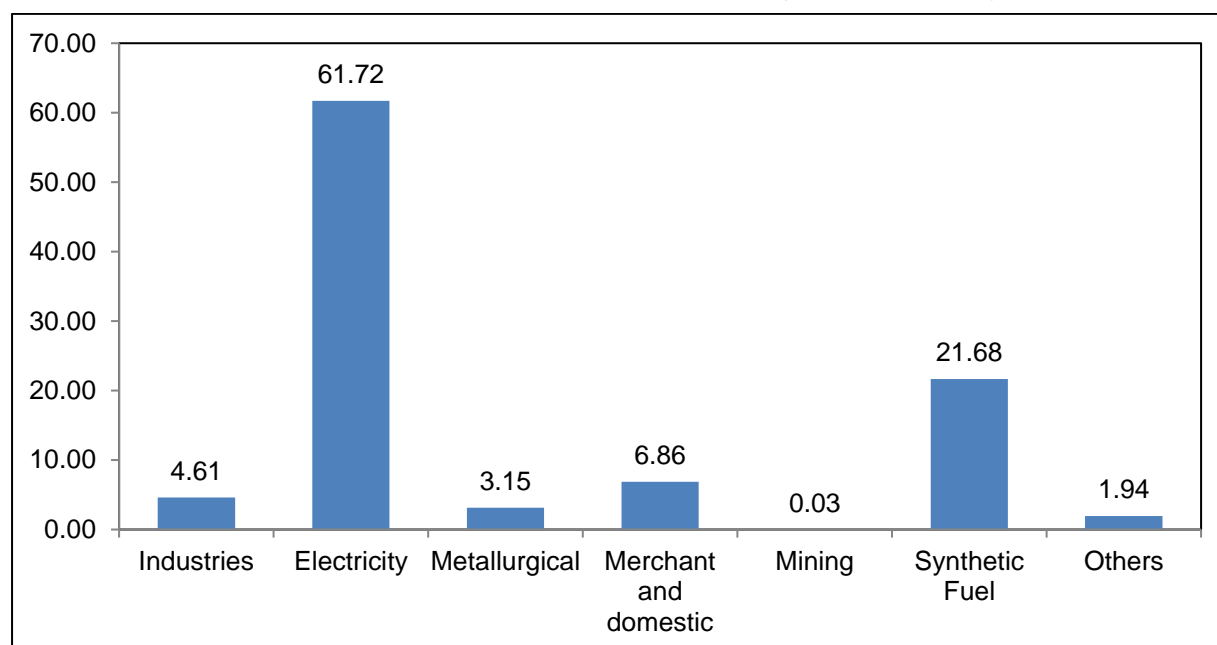
FIGURE 21: TOP 10 IMPORTERS (Mt) OF SOUTH AFRICA'S COAL, 2017



Source: South African Revenue Services Customs

South Africa's coal consumption dropped by 1.1 percent to 181.3 Mt in 2017, from 183.2 Mt in 2016, owing to the country's slowing economy that resulted in lower demand from the electricity sector which is the major consumer of the country's local coal sales. Similarly, bituminous coal's local sales volume decreased 0.06 percent to 179.5 Mt. However, anthracite local sales volumes increased by 12 percent to 1.87 Mt due to improved demand from steel makers.

FIGURE 22: LOCAL COAL CONSUMPTION BY SECTOR (PERCENTAGE), 2017



Source: DMR, Mineral Economics Directorate

Despite three additional Medupi units (units 5 – unit 3) becoming operational, South Africa's electricity industry consumed less coal in 2017 compared to 2016. The electricity industry consumed 61.72 percent (111.9 Mt) of the total local sales, down from 64.91 percent (117.6 Mt) in 2016 (Figure 22). The Synthetic Fuel industry consumed 21.86 percent (39.32 Mt), also down from 22.06 (39.98 Mt) in 2016. The Merchants and Domestic overtook the Industries to be the third biggest consumer with 6.86 percent (12.45 Mt).

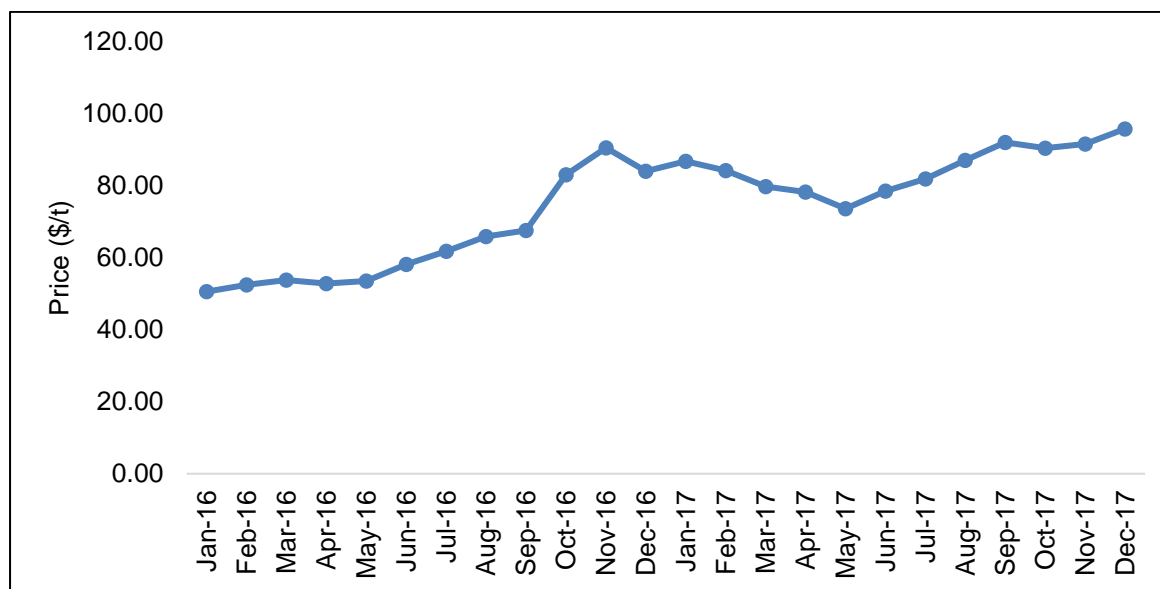
PRICES AND REVENUE

The recovery of the coal export prices that started at the beginning of 2016 continued up to November 2016 when the South African coal export prices reached \$90.42 /t. Following a four-year slump from 2012 to 2015, coal prices started to improve at the beginning of 2016. The average Richards Bay (FOB) export price improved by 31.73 percent from \$64.44/t in 2016 to \$84.89/t in 2017. In rands per ton (R/t), the average export price surged 20.48 percent from R938.87/t in 2016 to R1131.15/t in 2017.

Coal export prices opened the 2017 year at \$86.65 /t, continuing on a downward trend flooring at \$73.53 /t by May 2017 (Figure 23), mainly due to the environmental pressures that are choking off

demand of coal used in power stations worldwide. Thereafter, the export prices recovered and increased steadily to reach an annual peak of \$95.70/t in December 2017. These prices were mainly boosted by India, a major importer of South Africa's coal, increased its imports of coal since falling output from hydro, wind and nuclear power coincided with a seasonal decline in coal mining in India.

FIGURE 23: RBCT MONTHLY COAL PRICES, JANUARY 2016 – DECEMBER 2017



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

Domestic coal prices grew by 12.71 percent to average R381.25 /t in 2017 from R338.25 /t in 2016, boosted mainly by the perceived supply constraint to Eskom.

For the fifth year in a row, coal retained its status as the biggest revenue generator, accounting for R138.84 billion (29.26 percent) of the total mining revenue followed by PGM's R97.04 billion (20.44 percent) and Gold's R82.95 billion (17.48 percent). Revenue generated from local coal sales increased by 12.4 percent to R69.06 billion from R61.45 billion in 2016, mainly due to higher prices in 2017 compared to 2016. Export sales recorded a massive 29.5 percent growth in revenue to R69.79 billion in 2017 from R53.91 billion in 2016 boosted mainly by the higher export prices and higher sales volumes.

MAJOR DEVELOPMENTS IN 2017

In February 2017, South African transport utility company, Transnet, announced that it would from 2018 be able to offer 6 Mt/y in coal rail capacity on its Waterberg line in the Limpopo province to Richards Bay in KwaZulu-Natal province. Transnet added that this capacity would double to 12 Mt/y by 2020. The rail route Transnet wants to beef up runs from Lephalale to Thabazimbi and then on to Richards Bay in KwaZulu-Natal province. Transnet also indicated that once capacity had been beefed up in the Waterberg, Transnet would set about extending the line to Botswana. Subsequently, in March 2017, Transnet, reinstated negotiations with coal mining companies

regarding increasing rail capacity from the Limpopo province, where the large Waterberg coal field is located. With these negotiations, Transnet sought to establish whether the projected volumes were, in fact realistic and, what timeframes are anticipated to bring the coal to market. Transnet also reviewed companies' prospecting and mining rights, as well as their resource and reserve statements".

In March, Eskom announced that it intended to reduce the supply of coal to its power stations by 15.6 mt in the next five years, as it adopted some 4,000MW of renewable power from independent power producers. Eskom 40mt trucks of coal to the country's power stations. Eskom also expressed that it has already reduced that demand by 3 Mt/y and that, it will further reduce it by 15.6 Mt over five years by 2022. This was after Eskom announced that it would decommission five of its oldest power stations over a 10-year period including Hendrina, Kriel, Komati, Grootvlei and Camden, all of which are situated in the Mpumalanga province. In concert with this programme, the utility was registering more renewable IPP contracts.

In March 2017, the South African Coal Report reported that BEE exports via RBCT dropped as juniors explore other sale options. This drop in export volumes from Richard Bay Coal Terminal's (RBCT's) black empowerment scheme, known as Quattro last year, was because the emerging coal miners were supplying the fuel through third party traders and mining companies. This trend is fuelled by some major coal producers with assets with a high cost of production or has resource challenges, preferring to buy from some of the smaller players. This in turn is preferred by the BEE producers because the export market is relatively agnostic in terms of where the coal is coming from.

In May 2017, production started at Johannesburg Stock Exchange (JSE)-listed Wescoal's expanded Khanyisa colliery, in Mpumalanga, which will ramp up to 100 000 t/m over a six-month period.

In another important development that took place in June 2017, anthracite miner Petmin delisted from the JSE, following a management buyout of the firm. Management bought the 577-million shares in issue for R617-million.

Diversified miner South32 announced in November 2017 its intention to establish its South African coal division as a standalone business and eventually sell it off.

And in December 2017, Coal exploration and mining company Canyon Coal's Khanye opencast mine, in Gauteng, comes on stream. The colliery will produce 200 000 t/m of run-of-mine coal when it reaches full production.

MERGERS AND ACQUISITIONS

In February 2017, Wescoal Holdings announced its R525 million bid, in the form of cash and shares, for Keaton Energy. This acquisition will lift Wescoal's coal exports beyond its current 1 Mt/y. Keaton will come with some 2.4 Mt/y of production from Vanggaatfontein, a mine in Mpumalanga, and the Moabsvelden project. However, the deal is conditional on Keaton selling Leeuw Mining, a subsidiary company that controls Vaalkrantz, and anthracite mine in Kwazulu-Natal.

Still in February 2017, Buffalo Coal Corporation, the Johannesburg Stock Exchange listed coal producer, issued about 4.3 million shares to STA Coal Mining Company in lieu of some US\$214,345 in cash. The shares issued by Buffalo Coal, which owed contract mining fees to STA Mining, were subject to a four-month trading restriction and in line with an agreement signed with the mining contractor in October 2015. Buffalo Coal has repeatedly been bailed out by its Canadian shareholder, Resource Capital Fund following a series of labour and geological problems at its Magdalena and Avimore collieries which it operates in South Africa's KwaZulu-Natal province.

PROJECTS

The recovery of the global economy started in the fourth quarter of 2016. The coal industry also benefited from this recovery. A couple of new projects came online in 2017, Sasol's Shondoni Mine, Canyon's Khanyisa Colliery and Black Royalty's Chilwavirusiku Colliery. Table 31 below, summarises some of the major projects that some companies have invested in to boost the country's coal industry.

TABLE 31: MAJOR COAL PROJECTS CURRENTLY UNDER CONSTRUCTION

Project Name	Company	Value of investment	Project timeline	Run of Mine Production / Mtpa	Employment Implications	Life of mine /Years
Impumelelo	Sasol Mining	R4,6 billion	Phase 1 completed in June 2016, Phase 2 June 2019.	8,5	Not stated	35
Boikarabelo	Resource Generation	\$545 million	2019	14	2500 Construction Phase	100
					709 Permanent	
Makhado Coking Coal	MC Mining	R1.1 billion	2019	5.5	Not stated	46
Belfast Coal Project	Exxaro Resources	R3,8 billion	H1 2020	2,7	6 000	17
Vele Mine Expansion	MC Mining	R450 million	Not stated	2,7	Not stated	16
Grootegeeluk Phase 6	Exxaro Resources	R4.8 billion	2020	1.7	Not stated	Not stated
Leeuwpans Life Extension	Exxaro Resources	R600 million	H2 2018	2.7	Not stated	10
Thabametsi	Exxaro	R3.2 billion	2021	3.9	Not stated	30

Source: Research Channel Africa

EMPLOYMENT

Due to the increased number of operating mines, the number of employees in the coal industry increased by 6.2 percent from 77 259 in 2016 to 82 527 in 2017 (Table 32). As a percentage, the coal industry's contribution towards the country's total mining workforce increased by 5.31 percent to 17.76 percent from 16.86 percent in 2016. Male workers continued to dominate as they accounted for 87 percent of total employment in the coal sector, while female workers accounted for 13 percent (a single percent improvement from 2016).

TABLE 32: EMPLOYMENT IN THE COAL SECTOR, 2008 – 2017

Year	Average number of employees			Earnings - R1 000		
	Total	Males	Females	Total	Males	Females
2008	65484	60804	4680	11020687	10194389	826298
2009	70791	65227	5564	12815351	11717347	1098004
2010	74025	67348	6677	14186482	12803317	1383166
2011	78580	71545	7035	16094850	14523209	1571641
2012	78579	71542	7037	16039447	14469109	1570338
2013	88039	79270	8769	18949314	16855402	2093913
2014	86242	77109	9133	20581868	18156465	2425403
2015	77747	68820	8927	19932153	17412771	2519383
2016	77259	67944	9315	21111665	18370819	2740845
2017	82527	72148	10379	22470299	19480825	2989474

Source: DMR, Mineral Economics Directorate

In 2017, earnings in the coal sector grew by 6.44 percent to R22.4 billion from R21.1 billion in 2016 mainly due to the increased number of employees. The average per capita earnings in the coal industry were R272 278, representing 0.35 percent decline from 2016's R273 258. Average per capita earnings in the coal industry was lower than the country's mining industry's average of R277 112. Productivity in the coal industry, in terms of production per employee fell by 2.77 percent to 3.15 kt per employee in 2017.

OUTLOOK

Coal prices were on an upward trend in 2017, supported by strong demand from top commodities user China. Chinese coal demand is through the roof because, domestically, China is not producing enough. Even though China did not import South Africa's coal in the past two years, it (China) strongly influences the global coal prices as South Africa competes with all coal producers globally.

It therefore expected that the South African coal export price will continue with the upward trend underpinned by demand from Asia, especially India. South African coal export prices are predicted to average above \$98 /t in 2018, even though it will still be lower than the highest average of above \$110 /t reached in 2011 /12. This price growth will prevail as coal continues to be the preferred option to increase power generation in growing economies.

Solid consumption and growth are expected for India, Indonesia and China in 2018. This forecast of a continued significant role for coal in the world's electricity generation mix is corroborated by many coal sector analysts, including those at the World Coal Association (WCA) and the International Energy Agency (IEA).

According to the IEA's projections, coal will continue to account for 27 percent of the world's electricity supply to 2040. It also forecasts that coal-based electricity supply will increase by about 9 percent by 2040, owing largely to electrification and economic growth, as well as industrialisation, in Asia.

Creamer Media reports that, according to Boston Consulting Group (BCG), even though there have been multiple coal-fired power station project cancellations in countries such as India, about 100 GW of capacity is currently under construction in the region. The bulk of this capacity is being constructed in India, Indonesia, Taiwan, Vietnam, Malaysia, the Philippines, Pakistan and Bangladesh, with more projects on the drawing board. Coal based electricity demand is also expected to increase in South Africa, Tanzania, Ghana, Nigeria and Kenya, albeit on a smaller scale.

Coal will continue to be an important source of primary energy in South Africa for the next decade or more. It is predicted that in 2018, South Africa's saleable coal production will increase by more than two percent to 266 Mt supported by several new mines that came online late in 2017 and at the beginning of 2018. Coal exports are also expected to grow to reach about 80 Mt in 2018.

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HYDROCARBON FUELS

KJ Tshetlhanyane

WORLD

Supply-Demand

World proven oil reserves amounted to 1 696.6 billion barrels in 2017 (Table 33). The Middle East holds the largest oil reserves globally, accounting for 47.6 percent, followed by South and Central America's 19.5 percent, North America's 13.3 percent and Commonwealth of Independent States' (CIS) 8.5 percent. Africa is ranked at number five accounting for 7.5 percent.

TABLE 33: WORLD RESERVES AND PRODUCTION OF OIL AND NATURAL GAS, 2017.

	Proved Reserves				Production			
	Oil		Gas		Oil		Gas	
	bbl x 10 ⁹	%	m ³ x 10 ¹²	%	1000 bbl/d	%	m ³ x 10 ⁹	%
OPEC COUNTRIES								
Algeria	12.2	0.7	4.3	2.2	1540	1.7	91.2	2.5
Angola	9.5	0.6	-	-	1674	1.8	-	-
Indonesia	3.2	0.2	2.9	1.5	949	1	68	1.8
Iran	157.2	9.3	33.2	17.2	4982	5.4	223.9	6.1
Iraq	148.8	8.8	3.5	1.8	4520	4.9	10.4	0.3
Kuwait	101.5	6	1.7	0.9	3025	3.3	17.4	0.5
Lybia	48.4	2.9	1.4	0.7	865	0.9	11.5	0.3
Nigeria	37.5	2.2	5.2	2.7	1988	2.1	47.2	1.3
Qatar	25.2	1.5	24.9	12.9	1916	2.1	175.7	4.8
Saudi Arabia	266.2	15.7	8	4.2	11951	12.9	111.4	3
United Arab Emirates	97.8	5.8	5.9	3.1	3935	4.2	60.4	1.6
Venezuela	303.2	17.9	6.4	3.3	2110	2.3	37.4	1
Subtotal	1210.7	71.6	97.4	50.5	39455	42.6	854.5	23.2
OTHER SELECTED COUNTRIES								
Argentina	2.2	0.1	0.3	0.2	593	0.6	37.1	1.0
Australia	4	0.2	3.6	1.9	346	0.4	113.5	3.1
Brazil	12.8	0.8	0.4	0.2	2734	3	27.5	0.7
Brunei	1.1	0.1	0.3	0.1	113	0.1	12	0.3
Canada	168.9	10	1.9	1.0	4831	5.2	176.3	4.8
China	25.7	1.5	5.5	2.8	3846	4.2	149.2	4.1
Ecuador	8.3	0.5	-	-	531	0.6	-	-
Europe and Eurasia	158.3	9.3	62.2	32.1	17807	19.2	1057.4	28.8
India	4.5	0.3	1.2	0.6	865	0.9	28.5	0.8
Malaysia	3.6	0.2	2.7	1.4	697	1.0	78.4	2.1
Mexico	7.2	0.4	0.2	0.1	2224	2.4	40.7	1.1
Oman	5.4	0.3	0.7	0.3	971	1.0	32.3	0.9
United States of America	50	2.9	8.7	4.5	13057	14.1	734.5	20
Other	33.9	2.0	8.4	4.3	4579	4.9	338.5	9.1
Subtotal	485.9	28.6	96.1	49.5	53194	57.6	2825.9	76.8
Total	1696.6	100	193.5	100	92649	100	3680.4	100

Source: BP Statistical Review of World Energy, 2018.

OPEC: Organization of the Petroleum Exporting Countries.

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

Global oil production grew by 0.7 percent to 92.6 million barrels per day (bbl/d) in 2017 as compared with 92.0 million barrels in 2016, driven by production increases from USA, Canada, and Libya. Regionally, Africa, North America and CIS were the only regions that yielded an increase in their production in 2017. They all contributed 5.0 percent, 4.3 percent, 0.9 percent and 5.0 percent, respectively. Africa's increase in production was driven mainly by production from Libya which more than doubled from 426 thousand barrels a day in 2016 to 865 thousand barrels a day in 2017. All other regions comprising of Europe (-1.3 percentage), Middle East (-0.8 percentage), Asia Pacific (-2.1 percentage) and South and Central America (-3.2 percentage), recorded a decline in production during the period under review.

The world proven gas reserves amounted to 193.5 trillion cubic metres (m³) in 2017. Regionally, Middle East holds the largest reserves accounting for 40.9 percent, followed by CIS's 30.6 percent, and Asia Pacific's 10.0 percent. Africa is ranked fourth with just 7.1 percent. By country, Russian Federation holds the largest reserves with 18 percent, followed by Iran's 17.2 percent and Qatar's 12.9 percent globally.

Global gas production increased by 4.0 percent to 3 680.4 billion m³ in 2017 from 3 549.8 billion m³ in 2016, driven by increased output from Africa, CIS and Asia Pacific.

Global primary energy consumption increased by 1.9 percent to 13 511.2 million tonnes oil equivalent (Mtoe) in 2017, driven mainly by developing countries and the improving global economy. Middle East recorded the largest percentage in terms of consumption increase, recording 3.4 percent, followed by Asia Pacific's 3.1 percent and Africa's 2.9 percent during the period under review. Together these three accounted for 52.4 percent of total primary energy consumption.

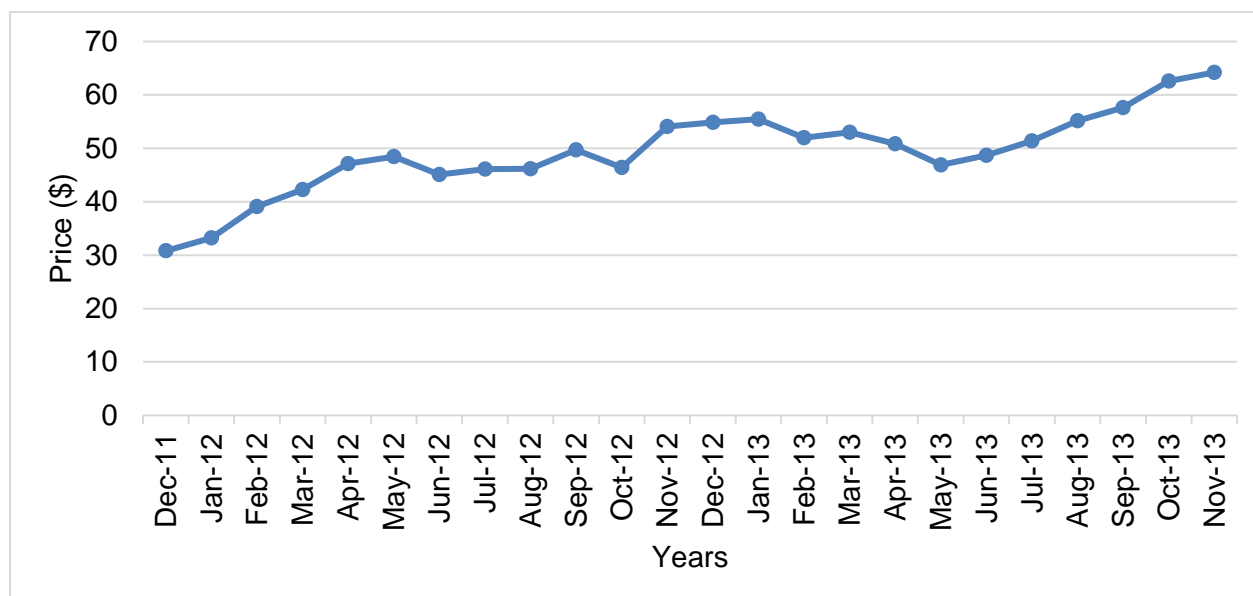
Global oil consumption grew by 1.8 percent to 98 186 thousand barrels per day in 2017 compared to the previous year. Regionally, Asia Pacific registered the largest increase of 3.0 percent, followed by Africa's 2.5 percent and Europe's 1.9 percent.

Natural gas consumption increased by 3.0 percent to 3 670.4 billion m³ in 2017 from 3 574.2 billion m³ in 2016. Africa recorded the largest growth percentage at 6.8 percent, followed by Asia Pacific's 6.2 percent and Middle East's 5.7 percent. Together, these three regions account for 39.5 percent to total natural gas consumption globally. By Country USA was the largest consumer accounting for 20.1 percent, followed by Russian Federation's 11.6 and Japan's 3.2 percent.

Prices

The annual average Brent crude oil price surged by 23.5 percent to \$54.4/bbl in 2017 from \$44.0/bbl in 2016 (Figure 24). The increase in oil price was mainly due to OPEC production cuts to induce prices, demand increase, and geopolitical tensions experienced during the period under review. Brent crude oil price opened the year at \$30.8/bbl and slowed down in June 2016 due to production increase from Canada, Middle East and rising stocks of crude oil in the USA. December 2016, oil price increased to \$54.1/bbl following announcement by OPEC to reduce production. However, prices were unstable in the first two quarters of 2017 going down as far as \$46.9/bbl in June, fueled by production increase from the USA. The production curb from OPEC began to hamper the market in the third quarter of 2017 which saw oil price increase from \$48.7/bbl in July to \$64.2/bbl in December.

FIGURE 24: MONTHLY AVERAGE BRENT CRUDE OIL PRICES, JANUARY 2016 – DECEMBER 2017.



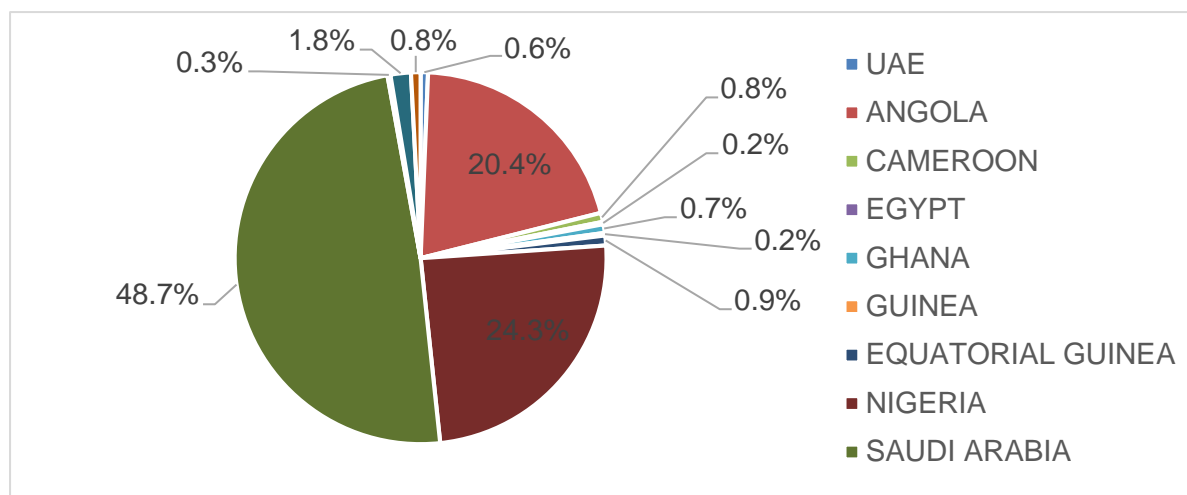
Source: www.Indexmundi.com

South Africa.

There was no production of crude oil reported in South Africa in 2017, even though it is known have about 15 million barrels of crude oil proven reserves situated in the Orange Basin and Bredasdorp Basin, that remain unexplored. However, the country continues to import crude oil requirements to meet its local demand. South Africa's imported 16 843 million tonnes of crude oil in 2017. About 48.7 percent was imported from Saudi Arabia, 24.3 percent from Nigeria and 20.4 percent from Angola (Figure 25). The three countries account for 93.4 percent of imported crude oil while the remaining balance was received from other countries around the world.

South Africa has the second biggest refining capacity in Africa, after Egypt, estimated at 703 000 bbl/d. The four crude oil refineries situated in Durban (Sapref and Enref), Cape Town (Chevref), and Sasolburg (Natref), have the capacity to produce 503 000 bbl/d. Sapref refinery is the largest of the four, with production capacity ranging from 180 000 bbl/d to 190 000 bbl/d, followed by Enref's 125 000 bbl/d, Natref's 108 500 bbl/d and Chevref's 100 000 bbl/d. Apart from producing fuel using crude oil, the country has the 195 000 bbl/d capacity to produce synfuel from gas and coal as an input. Production of Synfuels comes from Sasol's 150 000 bbl/d coal-to-liquid (CTL) plant in Secunda and The Petroleum Oil, and Gas Corporation of South Africa's (PetroSA) 45 000 bbl/d gas-to-liquid (GTL) plant situated in Mossel Bay. Sasol source coal for Secunda CTL plant from its mines in Mpumalanga Province.

FIGURE 25: SOUTH AFRICA'S CRUDE OIL IMPORTS, 2017.



Source: South African Revenue Services, 2018.
UAE: United Arab Emirates.

South Africa's natural gas production declined by 8.7 percent from 645.8 kt in 2016 to 589.7 kt in 2017, owing to diminishing reserves. Like natural gas, gas condensate decreased by 19.7 percent to 31.1 kt during the same period. All the produced natural gas and condensate was consumed locally. Most of the country's gas production comes from the state-owned company PetroSA's Moss Gas F-A and South Coast Complex fields which supply feedstock to its GTL refinery in Mossel Bay, Western Cape Province.

According to Creamer Media's Liquid Fuels Report, the Orange Basin is believed to have large potential of oil and gas as some discoveries such as the ibhubezi gas project have been made at the site. The project was discovered in the 1980s by a company called Soekor. Proved reserves of 210 Billion Cubic Feet (Bcf) and proved plus probable reserves of 540 Bcf have been discovered at the basin since it was discovered. The reserves possibly will be extended to approximately 8 Trillion cubic feet (Tcf) subject to further development and appraisal work. The project is believed to be economically viable with the current estimated resources. Sunbird company, which is the majority shareholder of the project, is said to be aiming to develop the project for market availability by 2020.

In 2017, PetroSA entered into a contract with Rosgeo, The Russian geological exploration company, to explore Block 9 and Block 11a for oil and gas in the South Coast. The agreement which is estimated at \$400 million will see Rosgeo conducting geological surveys and drilling exploratory wells at the identified wells. The project is expected to extract about 4 million m³ a day of gas to be delivered to the company's Mossel Bay's GTL refinery.

The Industrial Development Corporation (IDC) agreed a R218 million loan to Renergen for the development of a natural gas resource through the creation of a 107-kilometer (km) pipeline network and associated gas processing facilities. Renergen is the company involved with Tetra4 project of gas production in the Free State. The project comprises of 13 wells which commenced production in 2016.

Employment.

The hydrocarbon industry employed 150 employees in 2017, a 20 percent increase when compared to the previous year (Table 34). The increase was due to additional employees from Tetra4 company. Total earnings increased by 11.1 percent to R98.1 million in 2017 from R88.3 million in 2016. However, per capita earnings declined by 7.4 percent to R654 012 during the same period under review.

TABLE 34: SOUTH AFRICA'S HYDROCARBON EMPLOYMENT, 2016-2017.

YEAR	TOTAL EMPLOYMENT	TOTAL EARNINGS (R)	PER CAPITA EARNINGS (R)
2016	125	88,304,737	706,438
2017	150	98,101,868	654,012
% Change	20	11.1	-7.4

Source: DMR, Directorate Mineral Economics.

Outlook

World primary energy consumption is expected to grow in 2018 as the global economy continues to grow and the demand increases. World consumption of oil is also expected to increase in 2018 fueled by higher demand from developing markets. China is expected to continue its vast consumption even though their policies to decarbonize the transport sector will influence their consumption. Much of their consumption will come from petrochemical feedstock.

World oil production is expected to increase in 2018 fueled by output improvement from USA, Brazil, Canada, Mexico and Norway. Improved output from these countries is expected to outweigh production cuts from OPEC.

Brent crude oil price is estimated to increase in 2018 but at a very low pace, driven by higher demand from emerging markets and OPEC production cuts despite production increase from the USA and other countries. Lower production from OPEC is expected for the whole year in 2018.

Global gas consumption is expected to grow in 2018, due to increased demand from China and Europe. China's environmental plans to reduce emissions caused by other sources of energy polluting the environment has led to the increase usage of natural gas. The other factor that will contribute to the increased demand in the next year is liquified natural gas from USA, Australia and China. World gas production is also expected to improve driven by higher demand anticipated in 2018 and beyond.

South Africa's Natural gas production is expected to remain at current levels in 2018 as there are no projects planned to start during the year. The ibhubesi project is expected to unlock the countries oil and gas production should the project commence in the short term.

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URANIUM

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SUPPLY - DEMAND

World known uranium resources recoverable at \$130/kg, were estimated at 5 718 kilotonnes of uranium (ktU) at the end of 2017. Australia hosted the world's largest known recoverable uranium resources accounting for 29.1 percent of the world's total, followed by Kazakhstan's 13 percent, Canada's 8.9 and Russia's 8.8 percent (Table 35). South Africa (SA), at 5.6 percent, was 5th in the world and hosts Africa's largest resources followed by Niger and Namibia.

TABLE 35: WORLD URANIUM RESOURCES AND PRODUCTION, 2017

COUNTRY	URANIUM RESOURCES			PRODUCTION			
	RAR			2016	2017		
	(ktU)	%	Rank	(tU)	(tU)	%	Rank
Australia	1 664.1	29.1	1	6 315	5 882	9.8	3
Canada	509.8	8.9	3	14 039	13 116	22.0	2
China	272.5	4.9	8	1 616	1 885	3.2	8
India	-	-	-	385	421	0.7	11
Namibia	267	4.6	9	3 654	4 224	7.1	4
Niger	291.5	5.1	6	3 479	3 449	5.8	5
Kazakhstan	745.3	13	2	24 575	23 391	39.3	1
Russia	507.8	8.8	4	3 004	2 917	4.9	6
South Africa	322.4	5.6	5	382	257*	0.4	12
Ukraine	115.8	2.1	12	1 005	550	0.9	10
USA	62.9	1.1	14	1 125	940	1.6	9
Uzbekistan	131.1	2.3	11	2 404	2 404	4.0	7
Others	828.2	14.5		383	94	0.2	
World total	5 718.4	100		62 366	59 531	100	

Sources: OECD's NEA & IAEA, *Uranium 2017: Resources, Production and Demand*

+ World Nuclear Association, *Market Report data, 2018*

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

*Mineral Economics Directorate

World uranium production decreased by 4.5 percent from 62 366 tonnes uranium (tU) (73 548 U₃O₈) in 2016 to 59 531 tU (70 201 U₃O₈) in 2017, owing to the oversupplied market that prompted production cuts from producers such as Kazakhstan and Canada. Kazakhstan remained the top producer in 2017 contributing 39.3 percent of total global production, followed by Canada's 22.0 percent and Australia's 9.8 percent. Together, these four countries accounted for 71.1 percent of world production in 2017.

In Africa, Namibia was the largest producer accounting for 7.1 percent of world uranium production, followed by Niger's 5.8 percent and SA's 0.4 percent. Namibia's uranium production increased by 15 percent to 4 224 tU in 2017, while Niger's fell by 0.9 percent to 3 449 tU.

South Africa's uranium production decreased by 32.5 percent from 381.7 tU (450.1 U₃O₈) in 2016 to 257.5 tU (303.7 U₃O₈) in 2017, due to the oversupplied market, lower demand and low prices. The decline in uranium production can also be attributed to the decrease in gold production, which recorded a 3.7 percent decline to 137.1 kt in 2017. The country mainly produces its uranium output as a by-product from gold mines. All the uranium produced is exported through the Nuclear Fuel Corporation of South Africa (Nufcor).

Uranium demand is mainly driven by nuclear power plants, where it is consumed as nuclear fuel and it is considered a better alternative to fossil fuels, which are deemed as more harmful to the environment. Nuclear power was generated from 447 nuclear reactors in 2017 as compared to 438 in 2016, with seven of new reactors coming from China (Table 36). The USA had the highest number of reactors at 99, followed by France's 58 and Japan's 42. South Africa has only two Nuclear reactors situated at Koeberg power station in the Western Cape.

Nuclear electricity generation increased by 1.2 percent from 2 490 terawatt hours (TWh) in 2016 to 2 519 TWh in 2017, accounting for 10.6 percent of global electricity generation. France is the leading country in the world generating 71.6 percent of its electricity from nuclear power, followed by Ukraine's 55.1 percent and Belgium's 49.9 percent. SA drew only 6.7 percent of its electricity from nuclear energy in 2017. It is the only country in the entire Africa continent generating nuclear power.

TABLE 36: WORLD NUCLEAR POWER REACTORS AND URANIUM REQUIREMENTS, 2017.

COUNTRY	NUCLEAR ELECTRICITY		REACTORS		URANIUM	REACTORS		URANIUM
	GENERATION		OPERABLE		REQUIRED	OPERABLE		REQUIRED
	2016		2016		2016	2017		2017
	billion TWh	% of elec	No	MWe	(tU)	No	MWe	(tU)
Belgium	40	49.9	7	5 943	1 015	7	5 943	987
Canada	96	14.6	19	13 553	1 630	19	13 553	1 592
China	247.5	3.9	30	26 849	5 338	37	33 657	8 289
France	379.1	71.6	58	63 130	9 211	58	63 130	9 502
Germany	72.2	11.6	8	10 728	1 689	8	10 728	1 480
Japan	29.1	3.6	43	40 480	680	42	39 952	662
Korea (South)	141.1	27.1	24	21 677	5 013	24	22,505	4 730
Russia	187.5	17.8	34	25 264	6 264	35	26 865	5 380
USA	805	20	99	98 990	18 161	99	99,647	18 996
UK	63.9	19.3	16	9 373	1 734	15	8 883	1 772
Ukraine	85.6	55.1	15	13 107	2 251	15	13 107	1 944
Sweden	63.1	39.6	9	8 849	1 471	8	8,376	1 188
Spain	55.6	21.2	7	7 002	1 271	7	7 121	1 275
South Africa	15.1	6.7	2	1 830	304	2	1 830	279
SUBTOTAL	2 281		370	346 090	56 035	370	355 297	58 076
Others	238		68	35 473	7 372	71	37 038	6 938
World	2 519	10.6	438	381 563	63 404	447	392 335	65 014

Notes:

% of elec: percent contribution to national electricity production

MWe: Megawatt net (electrical as distinct from thermal)

TWh: terawatt-hour

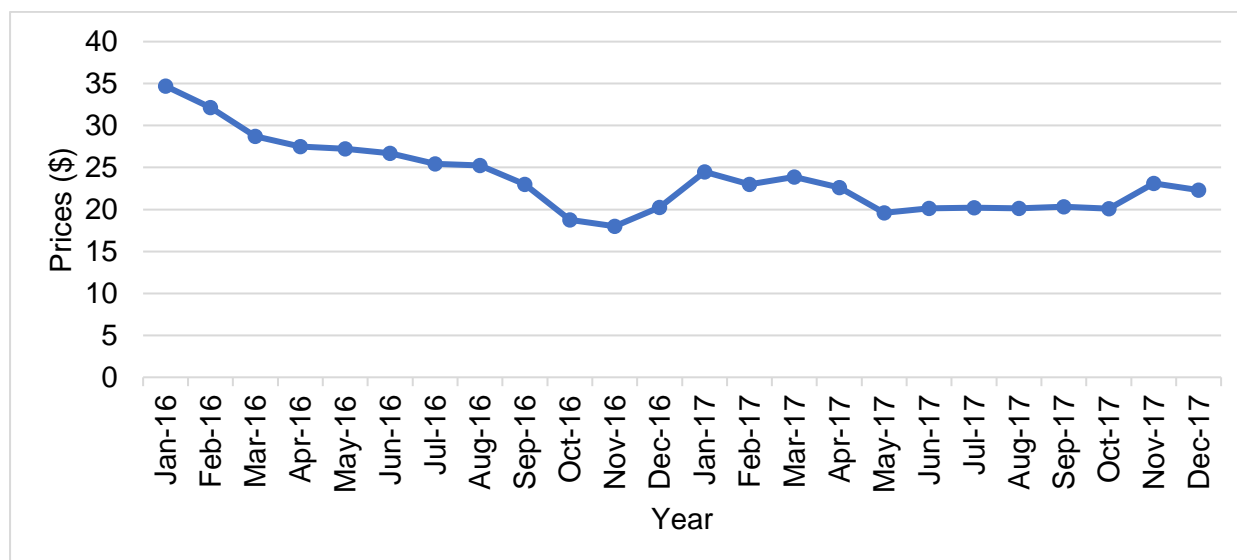
Sources: World Nuclear Association, 2018

PRICES AND REVENUES

Uranium prices have been on a decline since 2011 after the Fukushima incident in Japan. The average uranium spot price decreased by 15.2 percent from \$25.6/lb in 2016 to \$21.7/lb in 2017. In 2017, uranium spot price opened the year at \$24.5/lb, a 20.9 percent increase as compared to \$20.3/lb closing 2016, driven by Kazatomprom's announcement to reduce their production capacity

by 10 percent. However, uranium spot price recorded a decline to \$19.6/lb in May 2017 and, remained stable until October 2017 after production cuts could not drive prices up. Uranium spot price recorded an increase of 15.2 percent in November 2017 to \$23.1/lb as compared to the previous month, following an announcement by Cameco to reduce production. By the end of 2017 prices were at \$22.32/lb.

FIGURE 26: AVERAGE MONTHLY SPOT URANIUM PRICES, 2016-2017.



Source: www.cameco.com

South Africa's export sales unit value was no exception, as it recorded a decline of 22.1 percent from R780/kg in 2016 to R608/kg in 2017. The country's uranium total sales revenue fell by 45.1 percent to R170.1 million in 2017 as compared with the previous year, due to decrease in prices and sales quantity. Total sales quantity decreased by 29.5 percent to 279.9 kt in 2017.

DEVELOPMENTS

In October 2017, Eskom was granted permission by the Department of Environmental Affairs to build a 4000 megawatts nuclear power plant in Dufnefontein, Western Cape, next to the existing Koeberg Power Station. However, the construction of the plant is subject to approval by National Nuclear Regulators granting the utility company an installation site license. The project will comprise of construction and operation of Generation III pressurised water reactor type nuclear power station with two to three reactor units.

AngloGold Ashanti sold its several gold and uranium assets in the Vaal river region to Harmony Gold Mining in October 2017. Among the assets sold are Moab Khotsonong mine, Great Nolingwa mine, entire interest in uranium calcining facility, Nuclear Fuels Corporation of South Africa, and the entire interest in Margaret Water Company. The transaction is estimated at \$300 million.

The Sibanye Stillwater Cooke's Ezulwini uranium plant was placed on care and maintenance in October 2017. The decision to place the plant on care and maintenance came after Sibanye ceased Cooke 4 operations in August 2016. The plant was the second largest producer of uranium as a by-product from 4 tonnes of gold annually.

OUTLOOK

Global uranium production is expected to remain modest in 2018 driven by production cuts from Kazakhstan's Kazatomprom, depressed prices and subdued demand. Global supply from Uranium inventories held by nuclear utilities in secondary market continues to hamper primary producers' need to expand output. It is estimated that nuclear utilities have sufficient inventories to cover up supply for approximately thirty months in the USA, five years in Japan and seven years in China.

South Africa's uranium production is expected to decrease in 2018, as the current low-prices situation is not encouraging investment in existing and new projects. The country's uranium production trend will also depend on the gold output performance since it is produced as a by-product.

Uranium demand which is mainly driven by development of new nuclear reactors, is estimated to remain modest in 2018 as most of nuclear reactors under construction are not expected to come on board next year. However, looking at a medium-term outlook, demand is expected to increase as some of the reactor constructions are likely to come on line by 2023.

Uranium spot prices have been constrained by uncertainties since the 2011 Fukushima nuclear disaster in Japan that led to closure of some reactors, increased stockpiling and decrease in demand of the commodity. The uranium spot price expected to remain depressed in 2018 owing to continued market glut, even though some major producers plan on reducing their outputs. New nuclear facilities planned or expected to come online in the coming years as well as production curb, will reduce the supply surplus in the market, thereby causing possible price improvements. Prices are expected to average between \$25/lbs and \$28/lbs in 2018.

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NON-FERROUS METALS AND MINERALS OVERVIEW

L Ramane

INTRODUCTION

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

PRODUCTION AND SALES

In 2017, South Africa's production of primary non-ferrous metals and minerals, excluding titanium and zircon, increased by 6.7 percent to 194 kt compared with 182 kt the previous year due to a rise in production of some metals including lead (+22.4%) and zinc (+15.3%) (Table 37). Local sales volume decreased by 1.2 percent to 36.2 kt compared with 36.6 kt in 2016 mainly as a result of the drop-in sales for cobalt (-23.3%) and copper (-3.6%). However, local sales revenue rose by 7.4 percent to R3.5 million compared with R3.2 million in 2016, driven by the rising commodity prices in 2017. Export sales volume and revenue increased by 13.1 and 7.1 percent to 154.3 kt and R9.92 billion, as a result of improved demand from major consuming countries.

South Africa's total production of non-ferrous metals and minerals (primary and processed), improved by 16.9 percent to 4 324 kt in 2017, compared with 3 699 kt in 2016, due to an increase in both the production of primary and processed minerals (Table 37). Total sales volumes and revenue also increased by 28.7 percent and 10.3 percent respectively, despite the drastic drop in local sales for titanium slag.

TABLE 37: SOUTH AFRICAN PRODUCTION AND SALES OF NON-FERROUS METALS AND MINERALS, 2017 AND 2018

	PRODUCTION		LOCAL SALES		EXPORT SALES		TOTAL SALES	
COMMODITY	YEAR	Quantity (t)	Quantity	Value (R'000)	Quantity (t)	Value (R'000)	Quantity (t)	Value (R'mil)
ANTIMONY METAL IC	2017	0	0	0	0	0	0	0
	2016	350	0	0	0	0	0	0
COBALT METAL IC	2017	1 062	46	21 550	593	374 440	639	395 989
	2016	1 101	60	20 381	609	211 743	669	232 124
COPPER	2017	65 503	25 731	2 120 088	29 874	2 207 458	55 605	4 327 545
	2016	65 257	26 680	1 923 681	27 417	1 821 207	54 097	3 744 887
LEAD METAL IC	2017	48 150	0	0	54 683	1 419 829	54 683	1 419 829
	2016	39 344	0	0	39 408	884 986	39 408	884 986
NICKEL	2017	48 383	10 393	1 344 463	36 799	4 923 158	47 192	6 267 622
	2016	48 994	9 866	1 300 550	42 861	5 799 816	52 727	7 100 366
TITANIUM CONCENTRATE	2017	2 271 828	1 831 588	1 250 871	415 886	1 403 310	2 247 474	2 654 182
	2016	1 856 341	1 303 516	955 264	202 814	1 743 992	1 506 330	2 699 255
ZINC METAL IC	2017	30 778	0	0	32 366	990 268	32 366	990 268
	2016	26 695	0	0	26 091	538 325	26 091	538 325
ZIRCON CONCENTRATE	2017	361 813	7 670	98 021	359 413	4 374 088	367 083	4 472 110
	2016	377 430	4 580	62 386	348 522	4 069 143	353 102	4 131 529
PRIMARY SUBTOTALS	2017	2 827 517	1 875 428	4 834 994	929 614	15 692 552	2 805 042	20 527 545
	2016	2 415 512	1 344 702	4 262 262	687 722	15 069 211	2 032 424	19 331 473
ALUMINIUM METAL	2017	603 960	198 814	5 283 513	470 843	12 198 031	669 657	17 481 544
	2016	651 801	228 390	5 475 280	426 518	9 948 341	654 908	15 423 622
TITANIUM SLAG	2017	893 162	173	1 701	785 103	6 019 261	785 276	6 020 962
	2016	631 212	17 659	105 577	604 086	5 063 397	621 745	5 168 975
PROCESSED SUBTOTALS	2017	1 497 122	198 987	5 285 215	1 255 946	18 217 292	1 454 933	23 502 507
	2016	1 283 013	246 049	5 580 858	1 030 604	15 011 739	1 276 653	20 592 597
NONFERROUS TOTALS	2017	4 324 639	2 074 415	10 120 208	2 185 560	33 909 844	4 259 975	44 030 052
	2016	3 698 525	1 590 751	9 843 120	1 718 326	30 080 949	3 309 077	39 924 069

Source: DMR, Directorate Mineral Economics

*** Withheld

PRICES

Non-ferrous minerals and metals prices were on a positive trajectory in 2017, owing to supply deficits and increasing demand for these minerals. As a result, cobalt was the most bullish, increasing by 116 percent to \$25.20/lb compared with \$11.67/lb in 2016. Zinc and lead prices upsurge by 38.5 and 23.7 percent to an annual average of \$2 896.40 /t and \$2 314.43 /t, respectively. The copper price also rose by 26.7 percent to an average \$6 959.92 /t, compared with \$4 863.23 /t that was recorded in 2016. Aluminium spot price increased by 20.0 percent to average US\$2 014/t in 2017 as compared the previous year, fuelled by environmental production cuts from China, sanctions imposed on Russia and improved demand.

Nickel also improved by 8.8 percent to \$10 434.4/t in 2017 in compared with to \$9 594.05 in 2016. The increase was driven by supply reduction from the Philippines and rising demand for nickel in electric vehicles.

EMPLOYMENT

Employment and Total Remuneration in the South African non-ferrous metals and minerals sector increased by 8.0 and 9.9 percent to 16 318 employees and R4 440 billion respectively, compared to the previous year (Table 38). This is as a result of the increased employment in the lead (+81.0%), antimony (+23.8%) and nickel (+13.6%) sectors. As a result of the increase in production per capita earnings have dropped by 0.7 percent, to R272 092 in 2017 from R273 877 the previous year.

TABLE 38: SOUTH AFRICA'S NON-FERROUS METALS AND MINERALS: EMPLOYMENT AND GROSS REMUNERATION, 2013-2017

YEAR	EMPLOYEES	REMUNERATION	
		R'000	Per Capita Payments
2013	15 535	3 589 019	231 028
2014	15 642	3 648 455	233 247
2015	16 346	3 932 417	240 574
2016	14 757	4 041 599	273 877
2017	16 318	4 440 002	272 092

Source: DMR, Directorate Mineral Economics

OUTLOOK

Demand for nonferrous minerals and metals will be mainly driven by the renewable energy and battery technology sectors considering the increased consumption of base metals such as cobalt, nickel, lead and aluminium. However, supply could be curtailed by slower ramp-up of new capacity, tighter environmental constraints, sanctions against commodity producers, and rising costs. If new supply does not come into the market, this could also drive prices for base metals higher. All base metals prices are expected to increase in 2018, led by nickel. This is mainly due to growing demand and supply tightness. Nickel prices are expected to remain 30 percent higher than in 2017, despite

a slight moderation from their recent sharp rise, that reflect hopes for buoyant electric vehicle demand and the risk of Russian sanctions.

Moderate growth is expected in the production of South Africa's nonferrous minerals and metals, mainly due to additional output of lead and zinc from the Gamsberg mine owing to a ramp-up in production. Additionally, growth in the PGMs sector is also expected to improve nickel and cobalt output. However, higher prices and increased demand for base metals will boost export revenue.

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ALUMINIUM

KJ Tshetlhanyane

WORLD

SUPPLY – DEMAND

Aluminium production is reliant on aluminium oxide (Alumina) extracted from bauxite ore, which is found in abundance around the world. After bauxite ore is mined, alumina is chemically extracted from it, using the Bayer process, which is the principal industrial means of refining bauxite to produce alumina. The alumina is then purified to produce the aluminium metal. South Africa does not have quantified bauxite reserves and alumina refineries. All the produced aluminium in the country is from alumina imported from Australia.

World refined aluminium production increased marginally by 0.9 percent to 58.5 Mt in 2017 compared with 2016 (Table 39), due to increased production capacity from China and Russia. China remained the largest producer in the world contributing 55.2 percent, followed by Russia's 6.6 percent and Canada's 5.5 percent. South Africa contributed only 1.0 percent to world production and is ranked at number 14.

TABLE 39: WORLD ALUMINIUM SMELTER CAPACITY, PRODUCTION AND EXPORTS, 2017.

COUNTRY	SMELTER CAPACITY	PRODUCTION			EXPORTS		
		Kt	%	Rank	Kt	%	Rank
Australia	1 720	1 481	2.5	5	1 182	6.7	4
Bahrain	1 050	981	1.8	7	193	1.1	11
Brazil	1 400	801	1.4	9	195	1.1	10
Canada	3 270	3 212	5.5	3	2 672	15.1	1
China	44 500	32 273	55.2	1	506	2.9	7
India	3 600	2 028	3.5	5	1 067	6.0	5
Iceland	870	862	1.5	8	696	3.9	6
Norway	1 550	1 247	2.1	6	1 264	7.2	3
Russia	3 900	3 879	6.6	2	1 619	9.2	2
South Africa	715	604*	1.0	11	471*	2.7	8
UAE	2 600	2 387	4.1	4	-	-	-
USA	2 000	740	1.3	10	467	2.6	9
Other	9 725	7 954	13.6		7346	41.6	
TOTAL 2017	76 900	58 449	100		17 678	100	
2016	75 500	57 910	100		18 307		

Source: WBMS, 2018

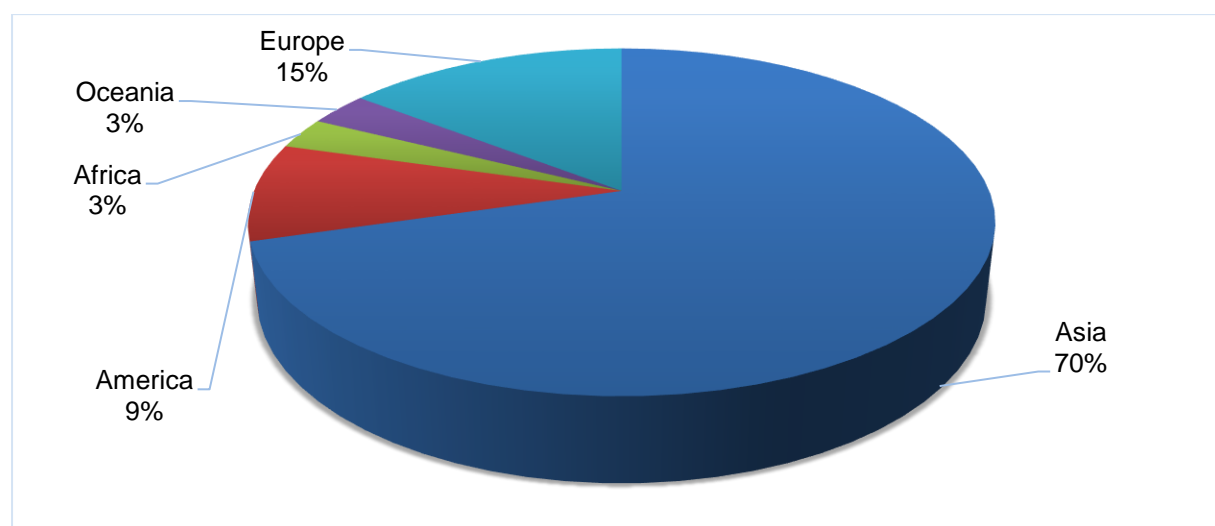
USGS, Mineral Commodity Summaries.

* DMR, Mineral Economics Directorate.

Regionally, Asia at 70.4 percent continued to dominate the world's refined aluminium production, followed by Europe's 14.5 percent and America's 9.1 percent (Figure 27). Oceania and Africa were the least contributors with 3.1 percent and 2.9 percent, respectively.

South Africa's total production of refined aluminium decreased by 7.3 percent to 604.0 kt in 2017 from 651.8 kt in 2016, attributed to an electric arc incident that interrupted 36 carbon lined steel vessels (pots) in November 2017. It therefore was the second largest producer of refined aluminium in Africa accounting for 36.3 percent of 1 663.0 kt in 2017, behind Mozambique's 37.7 percent.

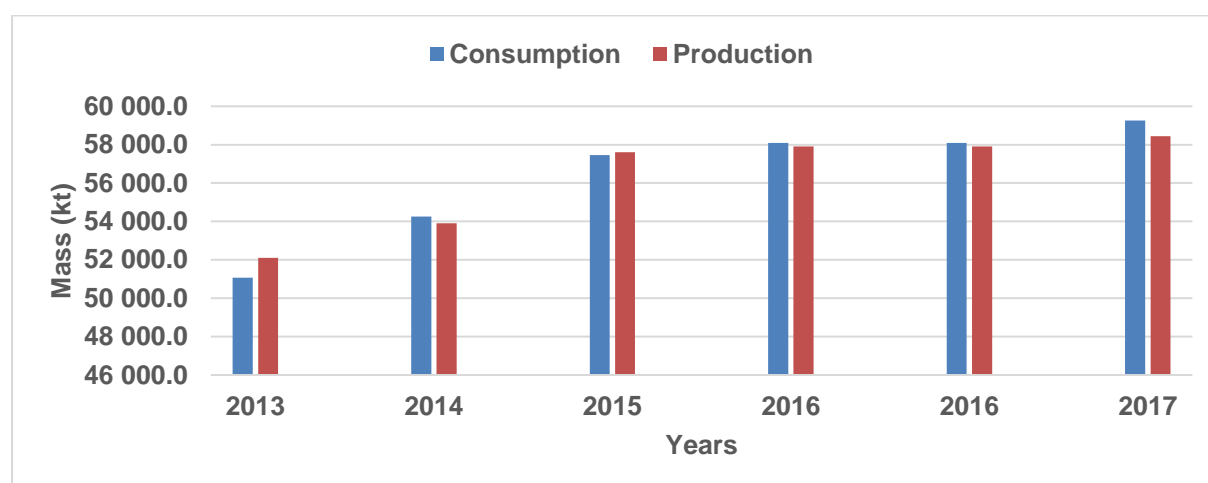
FIGURE 27: WORLD REFINED ALUMINIUM PRODUCTION BY REGION, 2017.



Source: World Bureau Metal Statistics, 2018.

World refined aluminium consumption grew by 2.0 percent to 59.3 Mt in 2017 from 58.1 Mt in 2016 (Figure 28), fuelled by China's developments in the automotive and construction sectors, and United States of America's (USA) economic growth and housing market.

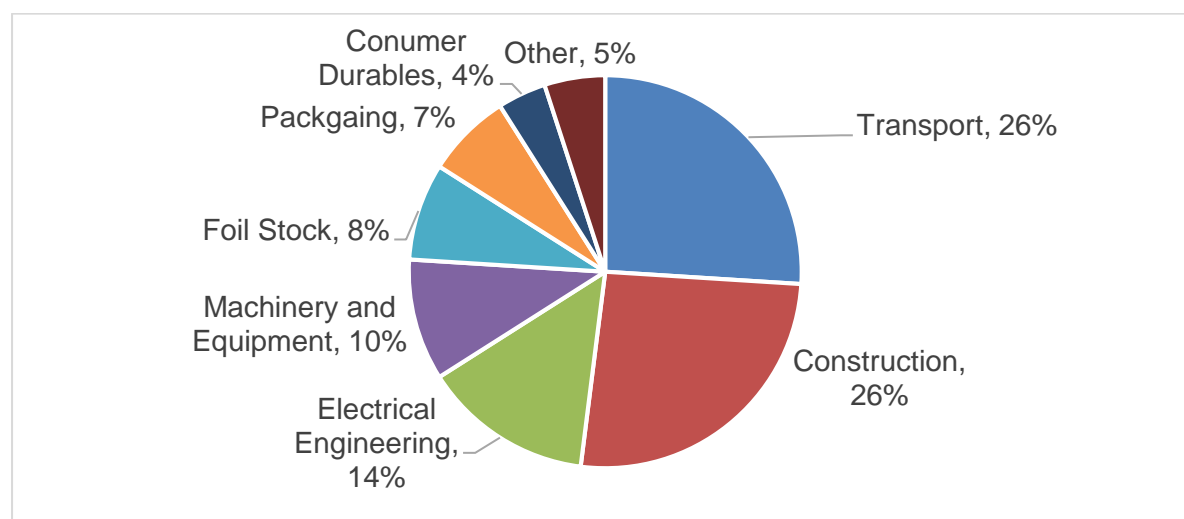
FIGURE 28: WORLD ALUMINIUM SUPPLY AND CONSUMPTION 2013-2017.



Source: World Bureau Metal Statistics, 2018.

Demand for refined aluminium was driven by the transport and construction sectors, with each contributing 26 percent to total consumption, electrical engineering sector at 14 percent and machinery and equipment sector at 10 percent (Figure 29). Together these four sectors (transport, construction, electrical engineering, machinery and equipment) accounted for 76 percent, while the remaining 24 percent came from the consumer durables sector together with packaging sector, foil stock sector and other sectors.

FIGURE 29: INDUSTRIAL DEMAND FOR HIGH GRADE PRIMARY ALUMINIUM, 2017.

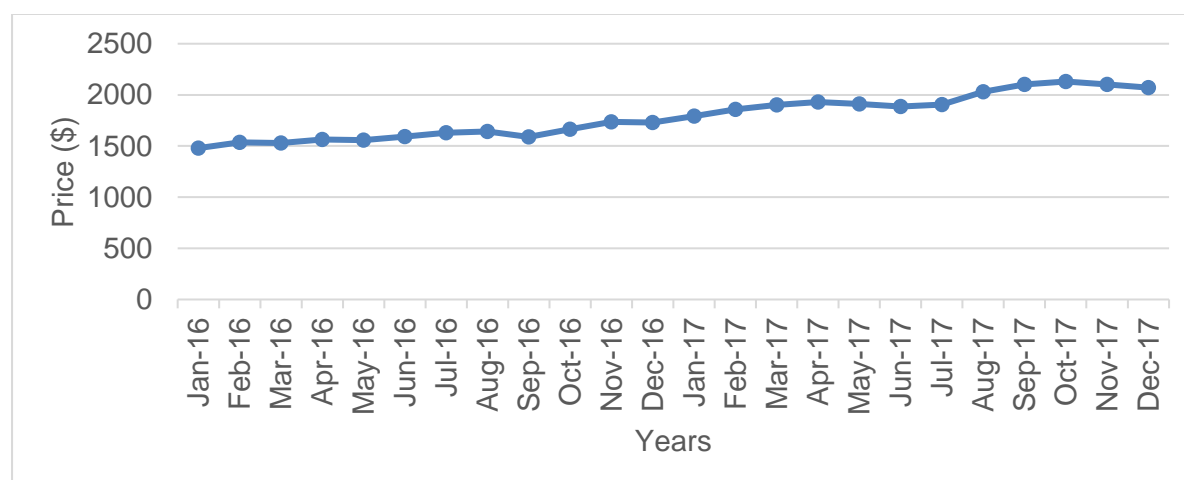


Source: www.statista.com.

PRICES AND REVENUE

Aluminium spot price increased by 22.7 percent from US\$1 604/t in 2016 to average US\$2 014/t in 2017, fuelled by production cuts from China and sanctions that were imposed on Russia's Rusal company (Figure 30). Aluminium producers from China were ordered to reduce their production during winter season, as part of the country's strategy to reduce smog in industrial towns.

FIGURE 30: LONDON METAL EXCHANGE CASH SETTLEMENTS PRICES FOR 2016-2017.



Source: London Metal Exchange.

South Africa's local sales revenue declined by 3.5 percent to R5.3 billion in 2017, as compared with 2016. The decrease in revenue was due to lower sales volume made during the period under review, despite an increase in prices. Local sales volume fell by 12.9 percent to 198.8 kt. Export sales volume and revenue surged by 10.4 percent and 22.6 percent to 470.8 kt and R12.2 billion, respectively. The increase in export sales volume and revenue was due to increase in prices and demand from abroad, fuelled by consumption from construction and transport sectors.

EMPLOYMENT

South Africa's total employment from the aluminium sector increased by 1.0 percent in 2017 to 2 390 employees, compared with 2 366 in 2016, due to increased number of contract employees (Table 40). Total remuneration to all employees grew by 5.8 percent to R866.9 million in 2017, fuelled by salary increases and number of employees. As a result, per capita earnings grew by 4.7 percent to R362 741 during the period under review. However, labour productivity declined by 8.3 percent to 253/t in 2017 from 275/t in 2016.

TABLE 40: EMPLOYMENT AND REMUNERATION IN SOUTH AFRICA'S ALUMINIUM SMELTERS IN 2017

YEAR	EMPLOYEE	REMUNERATION		PRODUCTION
	Number	R'000	Per Capita Earnings R	Labour Productivity t
2013	3 481	1 334 484	383 362	237
2014	2 934	878 619	299 495	262
2015	2 462	815 919	331 405	292
2016	2366	819 828	346 504	275
2017	2 390	866 951	362 741	253

Source: DMR, Directorate Mineral Economics.

OUTLOOK

Aluminium demand is expected to grow in the short term, supported by increased consumption from China's residential and infrastructure construction, as well as the United States of America's housing sector. The requirement by countries such as China and Europe to produce light motor vehicles will also fuel the demand for aluminium in the medium term. Demand increase is also expected to be driven by consumer durables from Asian markets and batteries used in electric cars.

Aluminium production is expected to grow in 2018, driven by increased demand for the commodity and production increase or startups from countries such as Iran, Israel and Azerbaijan. Aluminium prices are expected to increase in 2018, driven by supply, higher consumption from the automotive and construction sector.

South Africa's aluminium output is expected to grow slowly in 2018, as all pots are progressively being returned to production, following the electric arc incident that disrupted operations towards end of 2017. However, the expected growth will also depend on the growing global demand.

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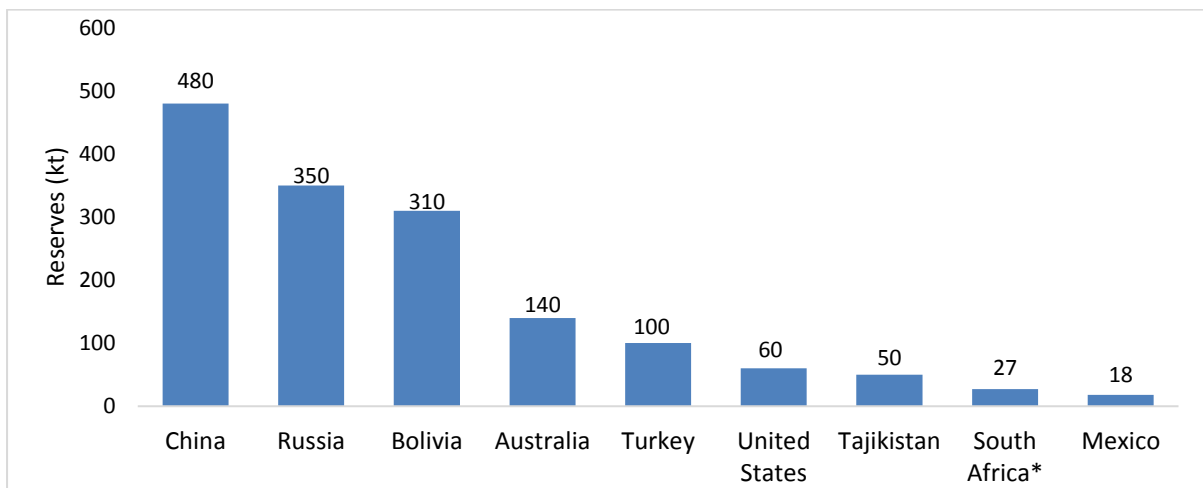
ANTIMONY

N Mahala

SUPPLY AND DEMAND

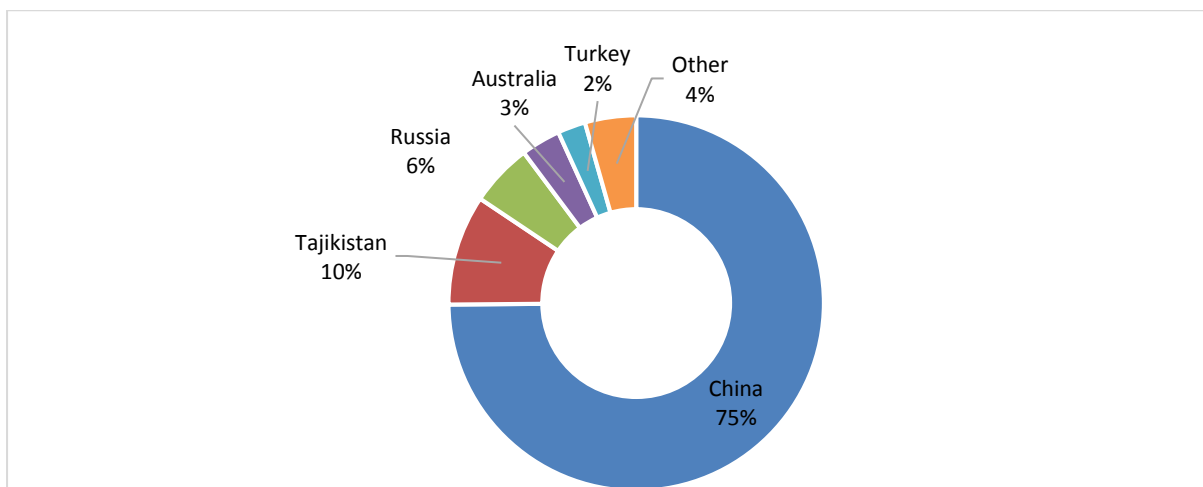
Global antimony reserves increased by 2.3 percent to 1 535 kt in 2017, compared to 2016. China hosts about 31.3 percent of reserves, followed by Russia at 22.8 percent and Bolivia 20.2 percent. South Africa's reserves at 27 kt, puts the country at the 8th position of global rankings (Figure 31). World supply of primary antimony increased slightly by 3.5 percent from 142 kt in 2016 to 147 kt in 2017. China claims a lion's share of the supply, accounting for 74.8 percent, while Tajikistan, Russia and Australia are responsible for 9.5, 5.4, and 4.0 percent, correspondingly (Figure 32). Stibium Mining's, the sole producer of antimony in South Africa, underground operations remain under care and maintenance and there was no antimony production over the review period.

FIGURE 31: GLOBAL RESERVES OF ANTIMONY



Source: U.S. Geological Survey, Mineral Commodity Summaries, January 2018.

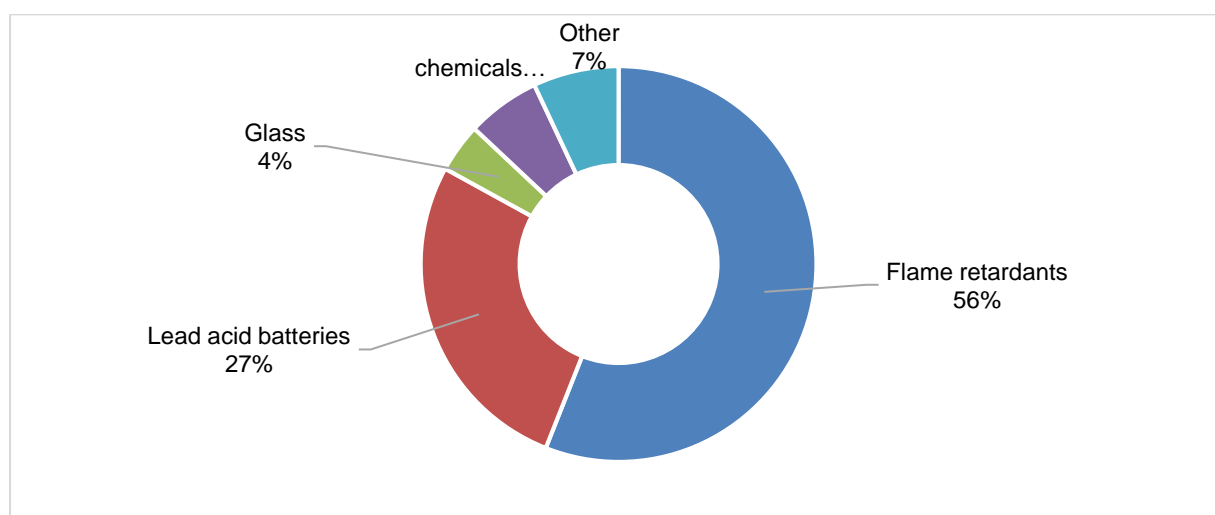
FIGURE 32: GLOBAL PRODUCTION OF ANTIMONY



Source: U.S. Geological Survey, Mineral Commodity Summaries, January 2018.

Demand for antimony is mainly driven by its application in flame retardants and lead acid batteries industries, which account for over 83 percent of the total demand. About 10 percent of demand comes from chemicals and glass sectors, with remaining 7 percent emanating from various non-metallurgical uses (Figure 33). In 2017, antimony demand was estimated to have grown by one percent to 190 kt compared to the previous year. Asia, led by China, remained the main consumer of antimony with over 50 percent of global consumption being attributed to that region. Europe and North America are also major antimony consuming regions.

FIGURE 33: ANTIMONY DEMAND BY END USE

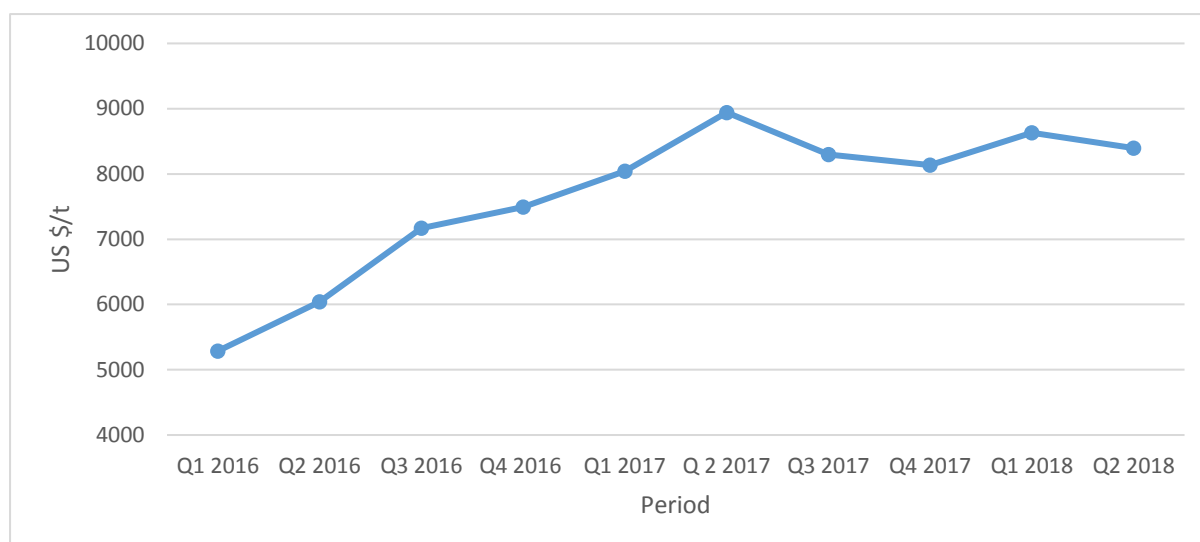


Source: Iluka

PRICES

On annual average basis, antimony spot price increased by 28.6 percent from US\$6 498/t in 2016 to US\$8 355/t in 2017, due to limited stock inventories in China, as government authorities continued to shutdown smelters that do not comply with environmental regulations in that country. By second quarter of 2017, spot price reached the highest level peak, at US\$9 000/t, but began to decline in the second half of 2017 to averages of US\$ 8 300/t, as stock inventories started to improve slightly (Figure 34).

FIGURE 34: ANTIMONY PRICES, 2016-2018



Source: Metal Bulletin

EMPLOYMENT

Employment in the antimony sector increased by 23.4 percent from 240 employees in 2016 to 297 in 2017, which can be attributed to the increased surface gold dumps retreatment activities. Remuneration of employees was also boosted by 40 percent to R73.5 million over the same period, with per capita earnings increasing by 5.8 percent to R248 thousand (Table 41).

TABLE 41: EMPLOYMENT AND REMUNERATION IN THE ANTIMONY SECTOR, 2017

YEAR	EMPLOYEES	REMUNERATION	
	Number	R'000	Per Capita Earnings
2013	865	127 870	147 827
2014	810	120 508	159 887
2015	443	41 159	79 921
2016	240	56 155	233 981
2017	297	73 540	247 609

Source: DMR, Mineral Economics Directorate

DEVELOPMENTS

After a successful takeover of the liquidated Cons Murch Mine (the only antimony mine in South Africa) by Stibium Mining from Village Main Reef in 2015, the mining operation have been resuscitated – although the primary focus is currently the retreatment of mine dumps for gold production which has always been produced as a by-product. The underground operations remain under care and maintenance with mine management projecting that fully fledged mining operations will commence within the first half of 2019. Stibium Mining is strategically using the revenues from current gold production to recapitalize its entire mine in terms of improving underground infrastructure and acquisition of latest mine technology in order to improve the operational

efficiency of the mine. Cons Murch ore body is the world's largest antimony mineralisation outside China and, has production capacity of 5 500t per year of antimony.

OUTLOOK

Global demand of antimony is expected to increase by 5-10 percent in 2019, owing to the projected increases in its end use applications, particularly in flame retardants, lead acid batteries and plastics. However, future supply will continue to be uncertain due to strong implementation of robust environmental regulations in China, which have resulted in a number of mines in that country, being closed for non-compliance. It is expected that supply in 2019 will range between 142 kt -144 kt. Antimony prices are more likely to increase by 5 percent to US\$ 8 814.75/t in 2019. South Africa's Stibium Mine is expected to recommence its antimony production in 2019 with low output of about 200 t.

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COBALT

Lerato Ramane

SUPPLY - DEMAND

World cobalt reserves amounted to 7.0 Mt in 2017 (Table 42). The Democratic Republic of Congo (DRC) at 49.3 percent, still held the world's largest cobalt reserves, followed by Australia's 16.9 percent and Cuba's 7.0 percent. Most cobalt is mined as a by-product of copper or nickel mining except for in Morocco and artisanal cobalt mined from the DRC.

World cobalt production declined by less than a percent in 2017 to 110 kt, compared with 111 kt in 2016, mostly as a result of reduced supply from Australia and New Caledonia. The DRC remained the world's largest producer of cobalt, accounting for 58.2 percent, followed by Russia's 5.1 percent and Australia's 4.5 percent. South Africa's production, at 1.0 percent is ranked 10th.

TABLE 42: WORLD RESERVES AND MINE PRODUCTION OF COBALT, 2017

COUNTRY	RESERVES			MINE PRODUCTION		
	kt	Percent	Rank	t	Percent	Rank
Australia	1 100	16.9	2	5 000	4.5	3
Canada	270	3.5	6	4 300	3.9	4
Cuba	500	7.0	3	4 200	3.8	5
DRC	3 400	49.3	1	64 000	58.2	1
Madagascar	130	2.1	8	3 800	3.5	7
New Caledonia	64	0.9	9	2 800	2.5	9
Philippines	290	3.9	4	4 000	3.6	6
Russia	250	3.5	6	5 600	5.1	2
South Africa [±]	29	0.4	10	1 062	1.0	10
Zambia	270	3.8	5	2 900	2.6	8
Other	617			12 338		
TOTAL 2017	7 100			110 000		
2016	7 100			111 000		

Sources: USGS, January 2018

**DMR, Mineral Economics Directorate (mine production)*

South Africa's cobalt is derived from nickel and platinum-group metals (PGMs) mining. Cobalt production decreased by 3.5 percent to 1 062 t in 2017, compared with 1 101 t in 2016 due to a drop-in nickel and PGMs production (Table 43).

TABLE 43: SOUTH AFRICA'S LOCAL AND EXPORT SALES OF COBALT, 2008-2017

YEAR	PRODUCTION	LOCAL SALES				EXPORT SALES	
		Mass	Value (FOR)		Mass	Value (FOR)	
	t	t	R' 000	R/t	t	R' 000	R/t
2008	244	43	26 231	608	261	167 774	642
2009	238	75	20 435	272	183	63 181	346
2010	840	58	16 110	278	493	135 424	275
2011	862	43	10 789	251	450	114 457	254
2012	1 102	33	7 439	227	614	147 320	240
2013	1 294	51	11 868	233	740	193 226	261
2014	1 332	50	16 754	335	753	243 954	324
2015	1,362	64	21 970	343	703	253 885	361
2016	1,101	60	20 381	340	609	211 743	348
2017	1,062	46	21,550	468	593	374,440	631

Source: Directorate Mineral Economics, DMR

World refined cobalt production rose by 9.3 percent to 104.80 kt in 2017, compared with 95.85.0 kt in 2016. The drop in major producing countries such as Zambia (-46%), DRC (-33%), and Russia (-26%) was offset by increases in Mexico (+63%), China (+20%) and Finland (13%) (Table 44). China, at 60 percent, remained the largest global refined cobalt producer, followed by Finland's 12 percent and Canada's 6 percent. South Africa accounts for 1.0 percent and it is ranked at number 11.

TABLE 44: REFINED COBALT PRODUCTION BY COUNTRY, 2016 AND 2017

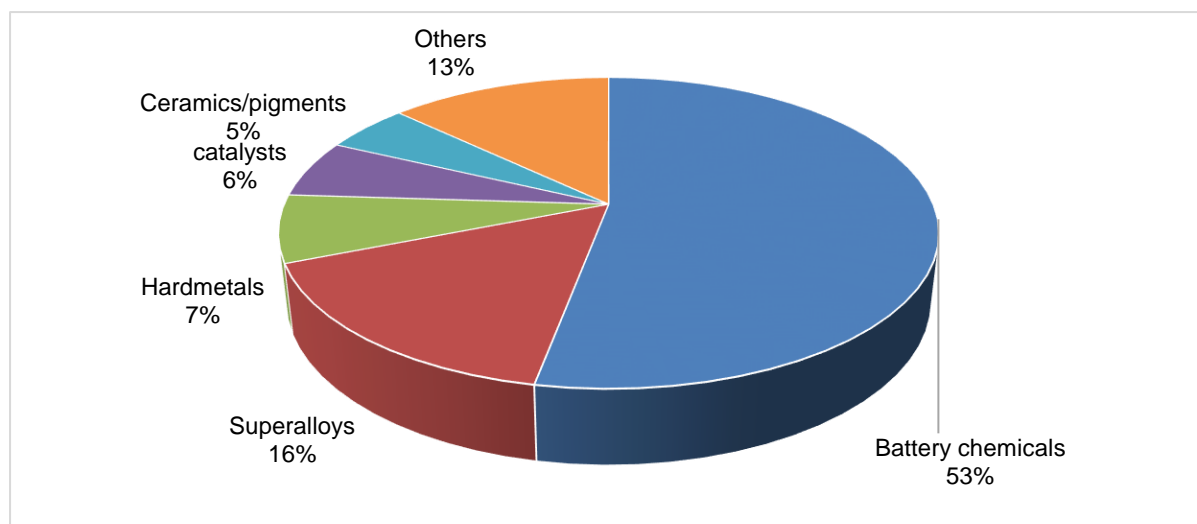
COUNTRY	2015	2016		
	T	t	Percentage	Rank
Australia	3 200	3 000	2.9%	8
Canada	5 541	6 301	6.0%	3
China	52 520	62 800	59.9%	1
D R of Congo	300	200	0.2%	13
Finland	11 200	12 600	12.0%	2
Japan	4 300	4 200	4.0%	4
Madagascar	3 270	3 053	2.9%	7
Mexico	400	650	0.6%	12
Morocco	1 570	1 400	1.3%	10
Norway	3 500	3 500	3.3%	5
Russia	2 300	3 100	3.0%	6
South Africa*	700	600	1.0%	11
Zambia	4 600	2 500	2.4%	9
Other	2049	438		
TOTAL 2017	95 851	104 804		

Source: Cobalt Institute.org

*Mineral Economics Directorate, DMR

World cobalt demand in 2017 reached a record breaking 103.9 Mt, which is a 10.8 percent increase, compared with the previous year. Battery chemicals are the largest consumer of cobalt, accounting for 53 percent of the total cobalt demand. It is followed by super alloys at 16 percent and hard metals at 7 percent. Pigments and ceramics account for 5 and 6 percent, respectively (Fig.32). The use of lithium-ion batteries in the electric vehicle (EV) market remains the most important growth driver for cobalt demand, followed by its use in energy storage sector.

FIGURE 35: COBALT CONSUMPTION BY END USE, 2017



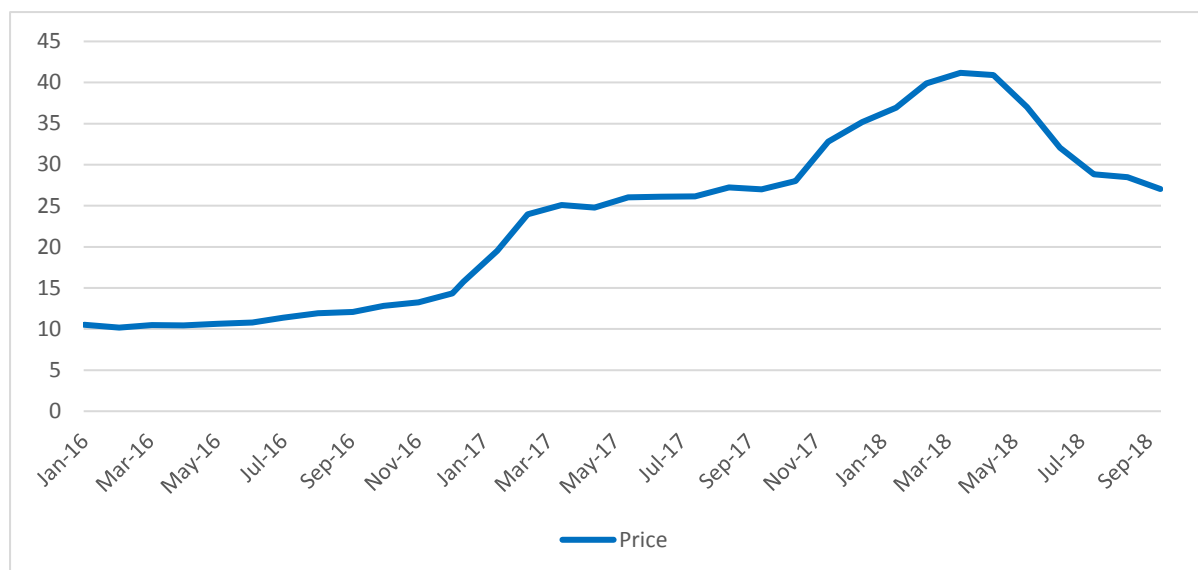
Source: Darton Commodities

South African exports of cobalt dropped by 2.6 percent to 593 t in 2017, compared to the previous year. Locally, cobalt consumption fell to 48 t in 2017 compared with 2016, owing to the lack of demand. In South Africa, cobalt is used in the manufacturing of alloys, batteries, ceramics, glass, plastics as well as catalysts in the gas-to-liquid process.

PRICES AND REVENUE

After reaching a twelve year low in December 2015, the cobalt price started a slow continuous recovery over the course of 2016, supported by a gradual strengthening of market fundamentals. By the end of 2017, the price was bullish and, increased by 116 percent to \$25.20/lb compared with \$11.67/lb in 2016 (Figure 36). This is as a result of the reduced supply, combined with strong demand from consumers. The price continued on an upward spiral, peaking at \$41.17/lb in April 2018. However, the price has been plunging downwards, reaching \$37.01/lb in June 2018 and further sliding down to \$27.03/lb in October, mostly owing to the mining policy changes in the Democratic Republic of Congo (DRC). Additional to the amended mining code, cobalt might be declared a strategic mineral in the DRC, which will further dampen investor confidence in that country. Furthermore, the potential substitution of cobalt in favor of nickel in Electric Vehicles is also putting additional pressure on prices.

FIGURE 36: COBALT PRICE, 2016 – 2018



Sources: Metal Bulletin

South Africa's local and export sales revenues declined by 7.5 and 16.6 percent to 20.38 million and R211.74 million in 2016, respectively. This was as a result of the weak cobalt price and the drop in cobalt output. Local and export unit sales values, also fell by 1.0 and 3.7 percent in 2016 to R339.7/t and R347.7/t, respectively.

OUTLOOK

By 2019 most of the metal supply projects that would have been commissioned over the past few years and, are expected to be operating close to capacity, with incremental production from ramp-up phases levelling off. Except for some metal production facilities in the DRC, where no new cobalt metal projects are scheduled to materialize within the coming years. As a result of the additional capacity, global metal output is expected to increase by an average of 3 percent until 2023.

Demand is still expected to surpass supply for the foreseeable future. It is projected to increase by an average of 10 percent until 2023. The use of cobalt in EV battery materials is anticipated to increase reaching 1.7 million vehicles in 2018. Cobalt use in EV batteries is therefore forecasted to grow just over 40 percent to 12 600 Mt. The imbalance between supply and demand will keep the cobalt price high.

South Africa's cobalt production is expected to remain stagnant, considering the lack of growth from the domestic Nickel and PGMs sectors. However, the high demand for cobalt will also boost export earnings.

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COPPER

Silungiselelo Mnyameni

SUPPLY AND DEMAND

In 2017, global copper reserves were estimated at 790 Mt, with Chile accounting for the largest reserves at 21.5 percent, followed by Australia's 11.1 percent and Peru's 10.3 percent. South Africa accounted for 1.4 percent of world reserves and was ranked 11th (Table 45).

World copper mine production decreased by 1.3 percent to 20.17 Mt in 2017, compared with 20.43 Mt in 2016. This was primarily driven by decline in production in Chile, which was negatively affected by industrial action as well as lower ore grade and lower output in Indonesia, that was negatively affected by a temporary ban on concentrate exports from January to April 2017. However, these reductions in output were partially offset by increases in Kazakhstan and Peru's concentrate outputs, with both countries benefiting from new and expanded capacity. Chile continued to be the world's largest copper producer, contributing 5.5 Mt to total output, followed by Peru at 2.4 Mt and China at 1.6 Mt (Table 45).

TABLE 45: WORLD RESERVES AND MINE PRODUCTION IN 2017

COUNTRY	#RESERVES			PRODUCTION		
	Mt	%	Rank	Kt	%	Rank
Australia	88	11.1	2	888	4.4	7
Canada	11	1.4	11	606	3.0	11
Chile	170	21.5	1	5503	27.3	1
China	27	3.4	7	1568	7.8	3
DRC	20	2.5	9	1091	5.4	5
Indonesia	26	3.3	8	666	3.3	10
Kazakhstan	6	0.8	13	750	3.7	8
Peru	81	10.3	3	2445	12.1	2
Poland	28	3.5	6	420	2.1	12
Russia	30	3.8	5	720	3.6	9
South Africa	11	1.4	11	*66	0.4	13
USA	45	5.7	4	1257	6.2	4
Zambia	20	2.5	9	942	4.7	6
Other	227	28.7	-	3239	16.1	-
TOTAL 2017	790	100.0		20 172	100.0	
TOTAL 2016	720	-	-	20 425	-	-

Source: #USGS, January 2018

**Directorate Mineral Economics*

World Bureau of Metal Statistics, 2018

On the African continent, the Democratic Republic of Congo (DRC), South Africa and Zambia were the largest producers of copper, collectively contributing 2.1 Mt to global output. In South Africa, copper production increased by 1.5 percent to 66 kt in 2017 compared with 65 kt in 2016 (Table 46), this was primarily due to higher production from Platinum Group Metals (PGMs), that increased by 12.9 percent to 29.2 kt. Copper production from zinc mining increased slightly by 2.8 percent to 5.1 kt, while production from primary copper mine, Palabora Copper Mine decreased by 9.4 percent.

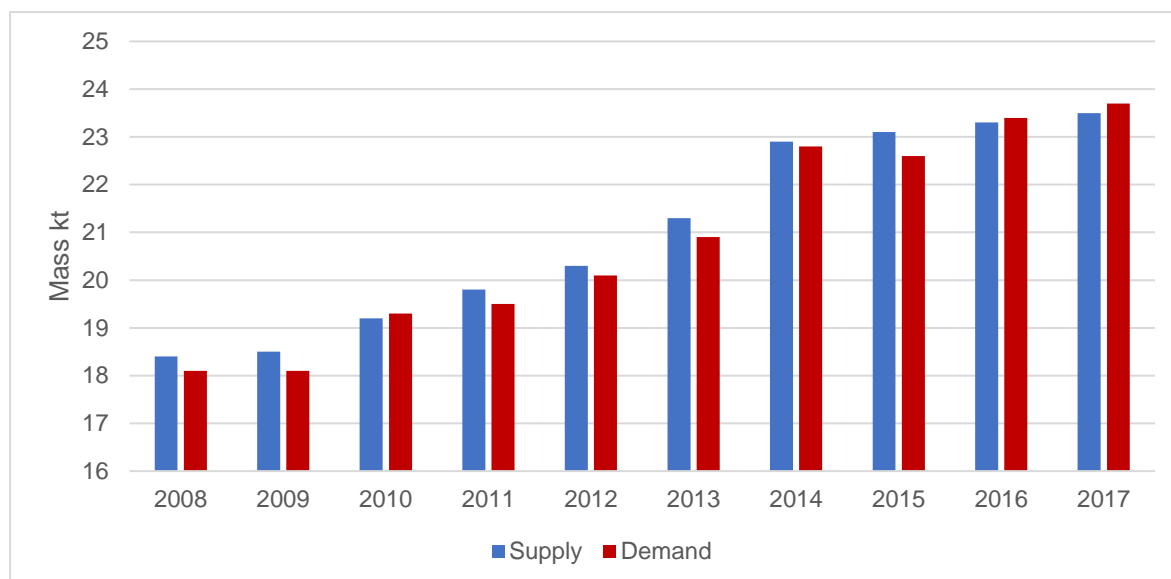
TABLE 46: SOUTH AFRICA'S PRODUCTION, LOCAL AND EXPORT SALES OF COPPER 2008 - 2017

YEAR	PRODUCTION		LOCAL SALES		EXPORT SALES		
	Mass	Mass	Value (FOR)		Mass	Value (FOR)	
	kt	kt	R'000	R/t	kt	R'000	R/t
2008	97	68	4 120 564	6 0168	33	1 507 356	45 860
2009	93	68	2 835 737	41 695	27	1 022 782	38 152
2010	84	57	3 160 029	55 750	25	1 209 297	48 718
2011	89	60	3 937 749	65 168	26	1 495 100	58 581
2012	70	55	3 575 956	65 454	27	1 598 770	59 562
2013	81	57	4 090 333	72 358	26	1 760 669	67 104
2014	79	45	3 483 784	77 411	37	2 466 769	67 242
2015	77	37	2 703 423	73 044	38	2 497 528	66 482
2016	65	27	1 923 681	72 102	27	1 821 207	66 426
2017	66	26	2 120 088	82 394	30	2 207 458	73 892

Source: Directorate Mineral Economics, 2017

The Global refined copper production growth of 0.9 percent to 23.52 Mt in 2017 was driven by rising output in China, the largest producer for the red metal, followed by India and Zambia. Higher output was also recorded in Belgium, Canada and Germany which offset declines in Chile, DRC, Japan and the US (Figure 34). Lower refined output resulted from a series of planned and unplanned shutdowns at major smelters and lower output at SX-EW plants. Regionally, Africa, Asia and Europe's refined copper production rose by 0.5, 4.5 and 2.4 percent, correspondingly. Both America and Oceania recorded decreases of 6.8 percent and 14.9 percent, respectively.

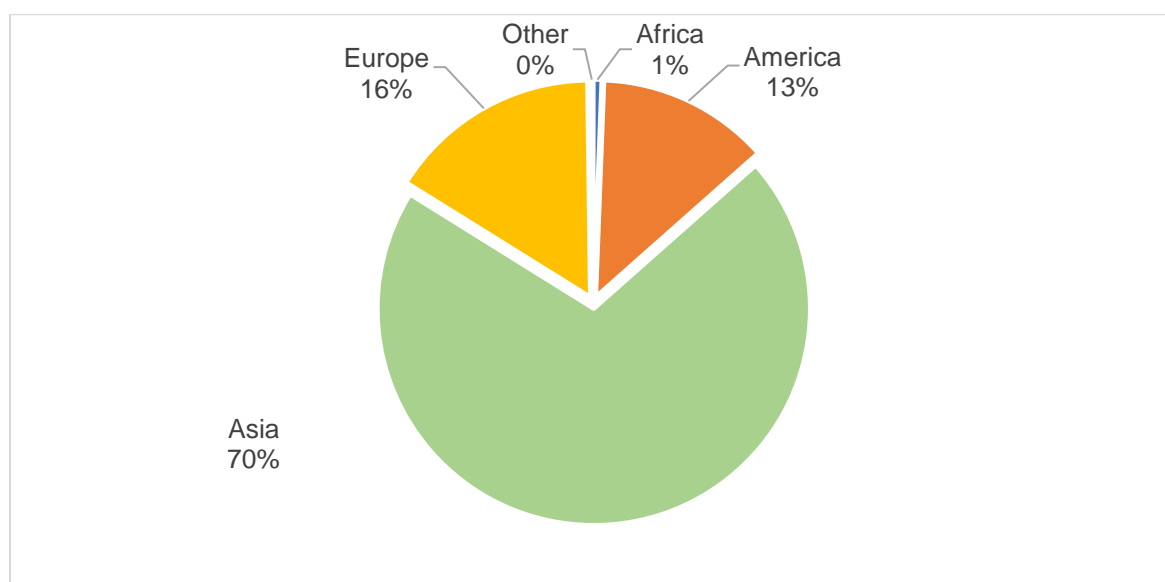
FIGURE37: GLOBAL REFINED COPPER PRODUCTION AND DEMAND, 2008 – 2017



Source: World Bureau of Metal Statistics, 2018

In 2017, refined copper demand rose by 1.4 percent to 23.73 Mt, as a result of global economic growth, driven by infrastructural development in major countries and for modern technological applications (Figure 37). Regionally, copper consumption was dominated by Asia accounting for 70 percent to world usage followed by Europe's 16 percent and the America's 13 percent (Figure 38). Africa's 1 percent usage represents a 2.9 percent increase in 2017 compared with 2016.

FIGURE 38: REGIONAL COPPER METAL CONSUMPTION, 2017

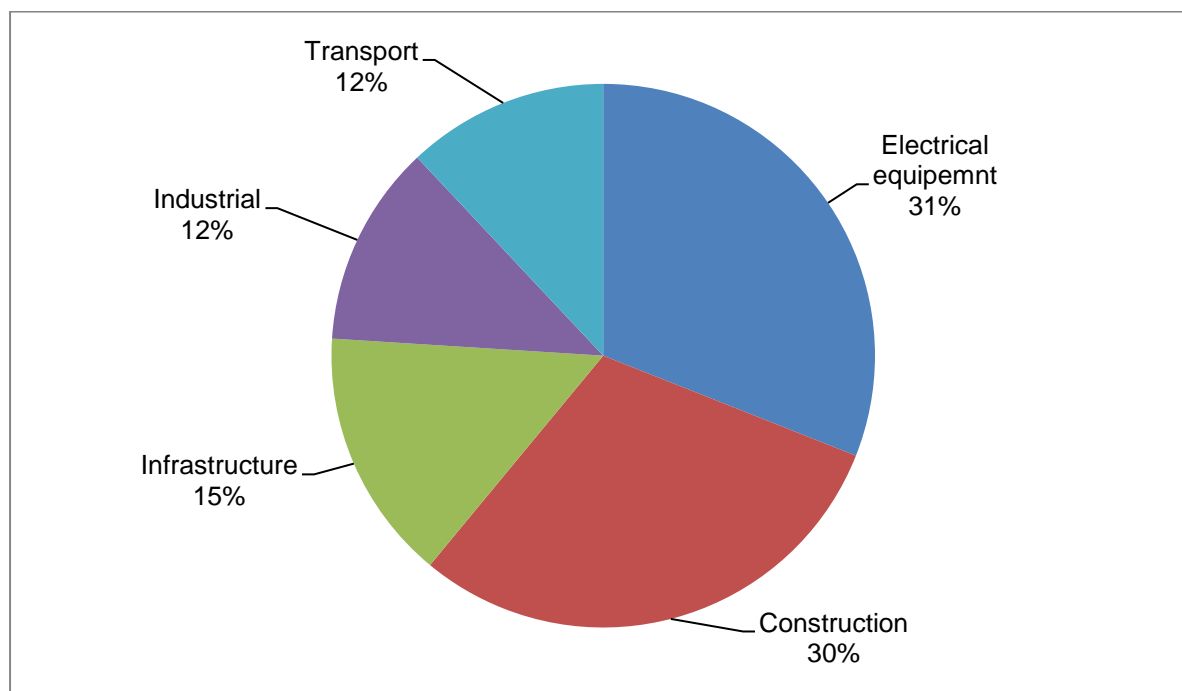


Source: World Bureau of Metal Statistics, 2018

Copper is consumed in downstream industries for use in products such as automobiles, appliances and electronics. In 2017, 31 percent of the world's copper was used in the manufacture of electric

equipment and 30 percent in the building construction sector (Figure 39). Infrastructure sector accounted for 15 percent, while transport and industrial sectors consumed 12 percent each.

FIGURE 39: MAJOR END USE OF REFINED COPPER BY SECTOR 2017



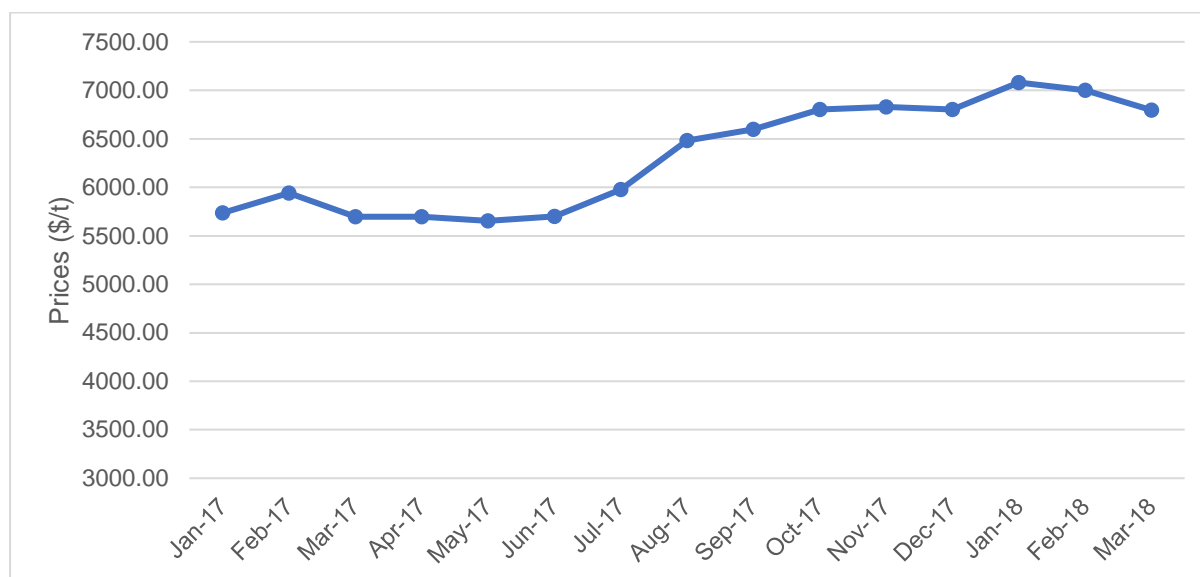
Source: International Copper Study Group, 2017

South Africa's consumption fell by 3.7 percent to 26 kt, compared with 27 kt recorded in 2016, due to a drop in industrial activities that are copper intensive in the country. Export sales increased by 11.1 percent to 30 kt, compared with 27 kt recorded in 2016 (Table 44). Most of the copper produced locally, was sold to Asian markets, Switzerland and Argentina. About 50 percent of copper rod consumed locally was converted into copper cables, 26 percent was consumed in domestic wiring, while about 9 percent was consumed in the automobile industry. The balance was used in transformers, telecommunication, cord sets and other segments.

PRICES

In 2017, the annual London Metal Exchange (LME) copper price surged by 26.7 percent to an average \$6 959.92 /t, compared with \$4 863.23 /t that was recorded in 2016. This was driven by strong global demand for the red metal. In the first half of the 2017, prices traded on a tight range between \$5 737.43 /t in January and \$5 699.48 /t in June (Figure 40). Prices broke out of the range in July, trading at \$5 978.60 /t and, continued the upward trend throughout the second half of the year reaching \$6 828.71 /t in November of the same year. The positive market price reaction was driven by global trend towards cleaner energy as well as electric vehicles, which are copper intensive. The upward trend continued in 2018, reaching a three year high at \$7 080.30 /t in January. In the first quarter of 2018, prices closed lower at \$6 795.76 /t in March, resulting from concerns over looming trade war between two major world's economies, China and the US.

FIGURE 40: LME CASH SETTLEMENT COPPER PRICES (MONTHLY AVERAGE), 2017-2018



Source: DMR, Directorate Mineral Economics

London Metal Exchange (LME)

Local unit values increased by 14.3 percent to R82 394 /t bolstered by higher copper market prices. As a result, revenues generated from local sales rose by 10.5 percent to R2.1 billion (Table 46). Export unit values also increased by 11.2 percent to R73 892 /t. Revenue generated from export sales surged by 22.2 percent to R2.2 billion from R1.8 billion in 2016.

EMPLOYMENT

In 2017, South Africa's primary copper mine employed 3 476 people, representing a slight increase of 0.4 percent compared with the previous year (Table 47). This can be attributed to the completion of the Lift II development in the last quarter of that year, that is not yet running at full capacity.

TABLE 47: EMPLOYMENT AND REMUNERATION IN SOUTH AFRICA'S COPPER MINES IN 2017

YEAR	EMPLOYEE	REMUNERATION	
		R'000	Per Capita Earning (R)
2013	3 474	1 243 166	357 849
2014	3 536	1 294 225	366 014
2015	3 516	1 367 945	389 063
2016	3 463	1 530 537	441 990
2017	3 476	1 634 437	470 206

Sources: DMR, Directorate Mineral Economics

Total remuneration increased by 6.8 percent to R1.6 billion from R1.5 billion in 2016, due to salaries increase as well as bonus payment to employees (Table 45). As a result, average earnings per employee increased by 6.4 percent to R470 206 per year compared with R441 990 in 2016. Employee's productivity did not change at 19 t/ employee compared to 2016.

DEVELOPMENTS

Galileo Resources plc, a London based exploration and development mining company, is currently undertaking an exploration programme in the Concordia copper project located in the Okiep Copper District in the Namaqualand Complex in Northern Cape Province, South Africa. The company is concluding the final geophysics data reports by consulting companies GeoSpec Instruments and Minxcon Consulting, that were generated during a field and induced polarisation (IP) geophysics exploration programme undertaken late last year. The data showed a potential for near-surface bodies and an increase in chargeability at deeper levels in both prioritised areas, Homeep and Shirley geological trends. In March 2017, Galileo resources commenced the drilling programme that comprised of up to six reverse circulation holes down to 300 m depths. The objective of the drilling programme focused principally, on testing the reliability and usefulness of geophysics anomalies in identifying copper mineralisation targets.

In August 2016, the Department of Mineral Resources granted a renewal for prospecting rights of Concordia to SHIP Pty Ltd, the holder of the rights and the Galileo Resources' partner in the project for a further three years to August 2019.

OUTLOOK

World copper mine production is expected to grow by 2 percent in 2018 to 20.6 Mt and by a further 1.2 percent to 20.8 Mt in 2019. Most of the growth expected in 2018 is due to the recovery from constrained output last year, mainly in Chile and Indonesia and the re-starting of temporarily closed capacity in the DRC and Zambia. In 2019, Chile, the DRC, Peru and Zambia are expected to be the biggest contributors to mine production growth.

In 2018, world refined copper production is expected to increase by 2.7 percent to 24.1 Mt and by further 2.7 percent in 2019. This growth is expected to come from the secondary production, resulting from improved availability of scrap, as well as growth in solvent-extraction and electrowinning output, arising from the restart of temporarily closed capacity in the DRC. In 2018, refined copper consumption is expected to increase by 2.1 percent to 24.2 Mt and by a further 2.6 percent in 2019, driven by sustained growth in copper demand as a result of its importance to the modern technological society. Rising production of electric vehicles as well as infrastructural developments in major countries such as China and India, are also expected to play a significant role in driving the copper consumption higher.

Copper prices are anticipated to continue on an upward trend in 2018, driven by rising demand on the back of limited supply. On the LME warehouses, inventories are expected to decline, as investors anticipate a looming short fall in the market. Copper prices are expected to rise above \$7 000 /t in 2018, taking into consideration the current global economic growth as well as positive investor sentiments for the red metal.

The South Africa as in the mid-term budget released in October 2018, set aside R15.9 billion towards infrastructure programmes, supporting industrialisation, and the Expanded Public Works Programme. That reprioritising of infrastructural investment, which supports growth and job creation, is likely to drive the demand for copper higher.

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LEAD

Silungiselelo Mnyameni

SUPPLY DEMAND

In 2017, global lead reserves were estimated at 88 Mt by the United States Geological Survey (USGS). Australia, at 39.8 percent, hosted the world's largest reserves, followed by China (19.3 percent), Peru (7.2 percent) and Mexico (6.4 percent). South Africa, with only 0.3 percent of the world total was ranked 10th (Table 48).

World lead mine production decreased by 6.2 percent to 4 704 kt in 2017, compared with 5 015 kt in 2016, despite production increases from China, which was offset by a sharp decrease in Australia following the closure of Century mine as well as cutbacks in output at Glencore's operations.

TABLE 48: WORLD RESERVES AND MINE PRODUCTION OF LEAD, 2017

COUNTRY	#RESERVES			PRODUCTION		
	Mt	%	Rank	kt	%	Rank
Australia	35	39.8	1	441	8.9	2
China	17	19.3	2	2 443	49.1	1
India	2.2	2.5	7	171	3.4	7
Ireland	0.6	0.7	9	18	0.4	11
Mexico	5.6	6.4	5	241	4.8	5
Morocco	0.1	0.1	11	42	0.8	10
Peru	6.3	7.2	4	307	6.2	4
Russia	6.4	7.3	3	187	3.8	6
South Africa	0.3	0.3	10	*48	1.0	9
Sweden	1.1	1.3	8	69	1.4	8
USA	5	5.7	6	313	6.3	3
Other	8.4	9.5	-	3 183	13.9	-
TOTAL	88	100	-	4 972	100	-

Source: World Bureau of Metal Statistics, 2018

#USGS, Mineral Commodity Summaries January 2018

*DMR, Directorate Mineral Economics

South Africa's lead mine production increased by 23.1 percent to 48 kt in 2017, compared with 39 kt in 2016. The increase in production was due to higher ore grade mined in the second half of the year at the primary lead mine. Export sales also increased by 41 percent to 55 kt, compared with 39 kt sold in 2016, resulting from rising demand for the metal (Table 49). South Africa exports all its lead mine production to China, France and Switzerland.

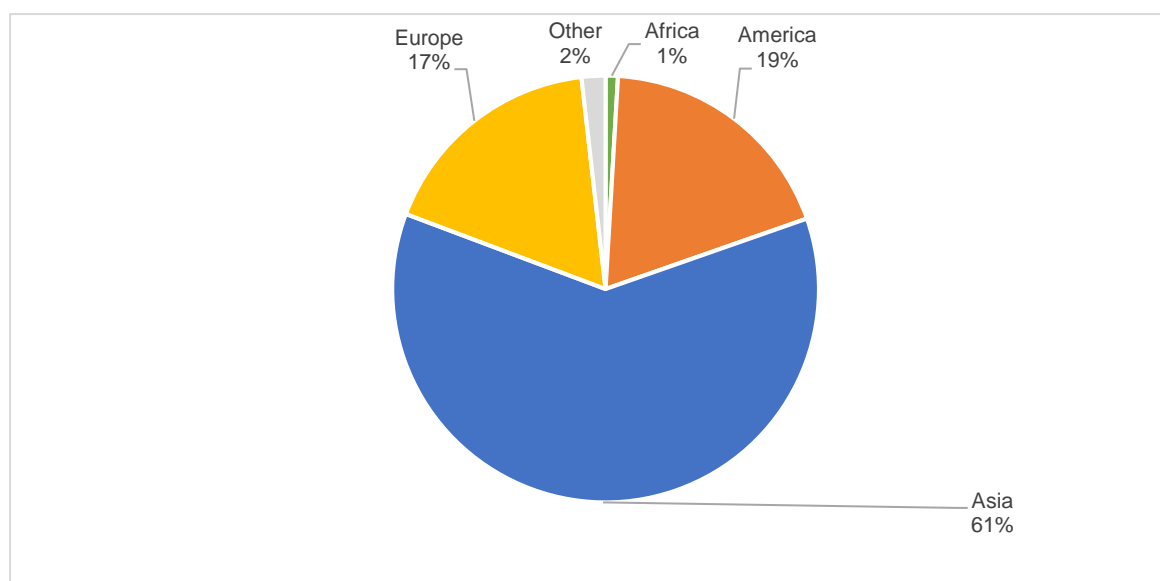
TABLE 49: SOUTH AFRICA'S PRODUCTION, LOCAL SALES AND EXPORTS OF LEAD 2008 - 2017

YEAR	PRODUCTION	LOCAL SALES			EXPORT SALES		
	Mass	Mass	Value (FOR)		Mass	Value (FOB)	
	kt	t	R'000	R/t	kt	R'000	R/t
2008	46	-	-	-	50	612 042	12 180
2009	49	-	-	-	44	482 903	11 002
2010	51	-	-	-	53	696 738	13 123
2011	54	-	-	-	52	762 929	14 569
2012	52	-	-	-	54	811 498	15 132
2013	42	-	-	-	38	683 219	18 066
2014	29	-	-	-	33	659 777	19 765
2015	35	-	-	-	27	511 477	18 732
2016	39	-	-	-	39	884 986	22 457
2017	48	-	-	-	55	1 419 829	25 965

Source: DMR, Directorate Mineral Economics

Global refined lead production increased slightly by 0.4 percent to 11.17 Mt compared with 11.12 Mt in 2016. This was due to higher output from India and the US, which was sufficient to offset declines from Australia, China and South Korea. Regionally, Asia continued to dominate refined lead production contributing 61 percent to the total output followed by the Americas' 19 percent and Europe at 18 percent (Figure: 41). Africa's refined lead production, at 1 percent to the global production, was recorded at 104 kt. South Africa, at 47 kt, was the largest producer of refined lead in the continent, followed by Morocco at 42 kt and Nigeria at 21 kt.

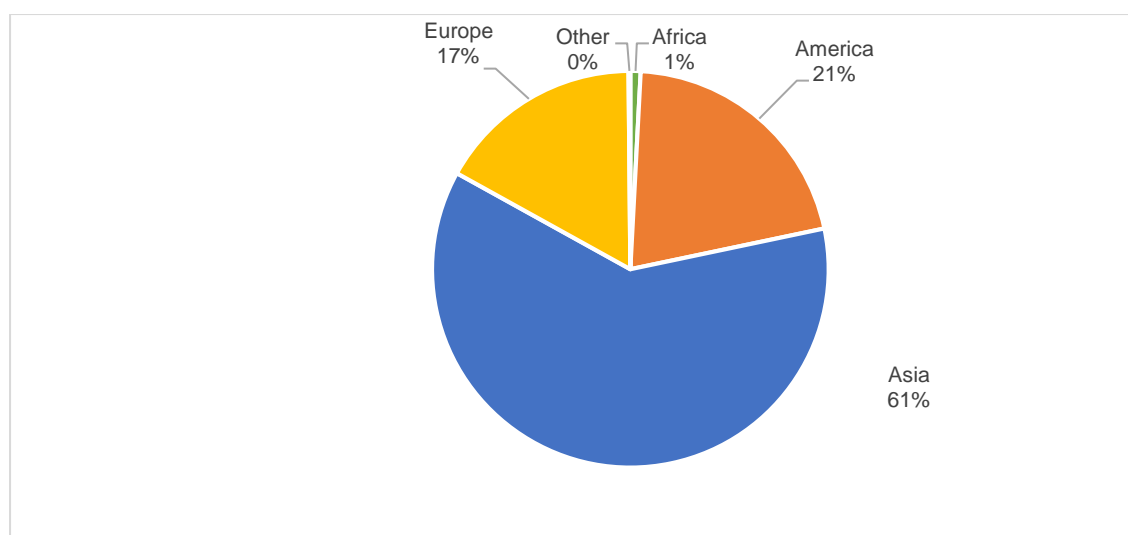
FIGURE 41: REGIONAL REFINED LEAD PRODUCTION 2017



Source: World Bureau of Metal Statistics, 2018

World refined lead metal consumption rose by 2.9 percent to 11.60 Mt in 2017, compared with 11.28 Mt in 2016. This was driven by higher demand from the US, Germany as well as China. Regionally, Asia continued to dominate the global lead consumption accounting for 61 percent followed by the America's 21 percent and Europe at 17 percent (Figure 42). Africa's consumption decreased by 3 percent to 97 kt in 2017 and contributed 1 percent to global lead usage. South Africa dominated Africa's consumption, accounting for 58.8 percent of the continent's usage, followed by Morocco at 20.6 percent.

FIGURE 42: REGIONAL REFINED LEAD CONSUMPTION 2017

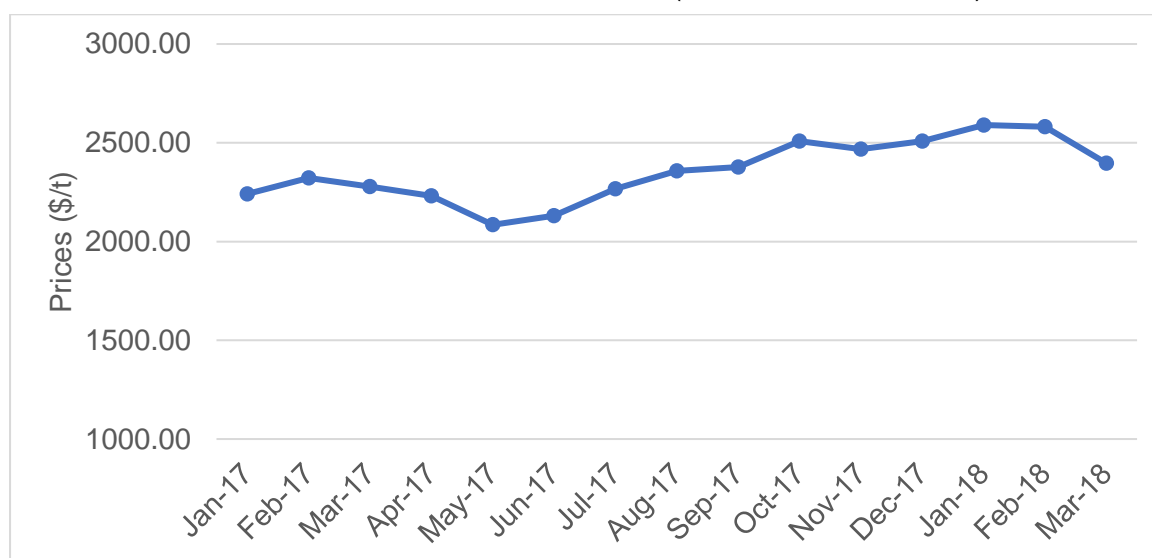


Source: World Bureau of Metal Statistics, 2018

PRICES

In 2017, lead prices surged 23.7 percent to an annual average of \$2 314.43 /t compared with 2016. Prices went up by 3.6 percent in February to \$2 321.73 /t before dropping by 10.2 percent to reach the low at \$2 084.69 /t in May 2017 (Figure 43). This was driven by rising of inventories on the London Metal Exchange (LME) warehouse. In the second half of the year, prices rallied 20.3 percent from the low that was recorded in May at \$2 084.69 /t to \$2 508.82 /t in December 2017, owing to concerns over mine supply shortages following strict environmental regulations imposed by China to fight pollution, causing mines and smelters to shut down. In January 2018, prices continued to rise, peaking at \$2 589.77 /t before retreating to \$2 397 /t in March of the same year.

FIGURE 43: LEAD CASH SETTLEMENT PRICES (MONTHLY AVERAGE) IN 2017 - 2018



Source: DMR, Directorate Mineral Economics

London Metal Exchange (LME)

South Africa's export sales revenues increased by 60.5 percent to R1 420 billion in 2017, compared with R885 million recorded in 2016, (Table 49). This was due to rising unit value for the lead concentrates, increasing by 15.6 percent from R22 457 in 2016 to R25 965 per unit in 2017.

EMPLOYMENT

In 2017, total employment in South Africa's lead mines increased by 81 percent to 2 984 from 1 649 employees in 2016, as a result of increased man power for the development of Gamsberg mine (Table 50). Total earnings increased by 39.5 percent to R437 million, compared with R313 million in 2016. Despite higher earnings recorded, per capita earnings decreased by 22.9 percent to R146 285 in 2017. This resulted from the employment of a large number of lower paid contractor. Employees' productivity decreased by 27.3 percent to 16 t/ employee compared with 22 t/ employee in 2016, due to a large number of employees participating in the development of a new mine.

TABLE 50: EMPLOYMENT AND REMUNERATION IN SOUTH AFRICA'S LEAD MINES IN 2017

YEAR	EMPLOYEE	REMUNERATION	
		R'000	Per Capita Earnings R
2013	1 437	205 403	142 939
2014	1 424	219 004	153 795
2015	1 311	241 156	183 995
2016	1 649	312 856	189 725
2017	2 984	436 513	146 285

Source: DMR, Directorate Mineral Economics

DEVELOPMENTS

Horomela Mining Investment and Resources, a South African based 100 percent black owned base metal explorer and aspiring junior mining company, is currently conducting exploration for lead and zinc resources, together with associated resources like copper, cobalt, manganese, nickel, iron ore and silver, in the Namaqualand, Northern Cape.

On the 14 properties that cover about 150 000 ha, the company is primarily focussed on the Steinkopf 22 area. The initial exploration work (drone surveys, magnetic mapping and scoping studies) for the 400 ha Steinkopf 22 licence has been concluded, and that an extensive drilling programme is expected to be undertaken by the in-house exploration team. The company expects to produce an exploration results report for Steinkopf 22 – compliant with the South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves by the end of 2018.

The company believes that the results will attract more partners and investors into the project. Currently the exploration programme is being funded through shareholder loans. Horomela Resources aims to have the majority of its properties at bankable feasibility study stage by 2019, which will enable it to exploit supply gaps, owing to production loss from mines that are nearing the end of their life.

OUTLOOK

Global lead mine production is forecast to increase by 4.2 percent to 5.18 Mt in 2018, due to higher output in China, following the re-opening of smaller operations that were closed as a result of environmental issues in 2015. Other contributions are expected from Australia as well as Cuba, because of expected higher output from a new and Castellanos mines, that were commissioned in October 2018.

Global refined lead production is expected to grow by 3.8 percent to 11.59 Mt in 2018. That will mainly be influenced by higher output in China and the US. In China, higher output is expected from the country's secondary sector following upgrades to comply with environmental regulations

after a total shut down in 2015. In the US, a 10 percent increase is expected, recovering from a significant reduction in 2017.

Global refined lead consumption is expected to rise by 2.6 percent to 11.90 Mt in 2018, driven by 3.4 percent expected demand from China's industrial and automotive sector. In Europe, demand for lead-acid battery is expected to increase by 2.1 percent, resulting from a positive outlook in the automotive sector and power storage in the renewable energy sector.

LME lead prices are expected to sustain the robust margins in 2018, as a result of tighter primary supply and falling levels of inventories held at LME warehouses. Given the less projects expected to come on stream while global economic growth is improving, the outlook for lead price looks positive for the coming years. This is anticipated to be driven by the rising automotive sector as well as the booming power storage in the renewable energy sector. Hence, LME lead prices are expected to remain at an annual average above \$2 000 /t in 2018. LME stock levels are gradually decreasing as investors anticipate a shortage in the short to medium term, this is expected to put an upward pressure on prices.

South Africa's lead mine production is expected to rise as a result of the higher-grade ores on the feed as well as additional output expected from Gamsberg mine, as they ramp up production. Positive outlook for lead prices incited interest in lead and zinc mining resulting in recent exploration work, that is underway in the Namaqualand in Northern Cape. These projects have incentives to take full advantage of market prices, as the cycle is expected to change to more favourable conditions.

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NICKEL

Nancy Rabuma and Lerato Ramane

SUPPLY-DEMAND

World nickel reserves were estimated at 74 Mt in 2017. Australia had the largest reserves, at 19 000 kt, accounting for 26 percent of global nickel reserves, followed by Brazil and Russia at 16 percent and 10 percent respectively. South Africa accounts for 3.7 percent of world reserves and it is ranked 7th (Table 51).

World nickel production increased by 0.5 percent to 2.10 Mt in 2017, compared with 2.09Mt in 2016, due to rising production capacity in some major producing countries, in particular Indonesia, where production increased significantly by 101 percent to 400 Mt. As a result, Indonesia registered the highest production in 2017 accounting for 19.1 percent of global output, followed by the Philippines at 11 percent, Canada and New Caledonia at 10 percent each. South Africa is ranked 11th, contributing 2.3 percent to the global nickel production.

TABLE 51 WORLD NICKEL RESERVE AND MINE PRODUCTION, 2017

COUNTRY	RESERVE			MINE PRODUCTION		
	kt	Percent		kt	Percent	
United states	130	0.2	13	23	1.1	14
Australia	19 000	25.7	1	190	9.1	5
Brazil	12 000	16.2	2	140	6.7	7
Canada	2 700	3.6	9	210	10.0	4
Chana	2 900	3.9	8	98	4.7	8
Colombia	1 100	1.5	12	49	2.3	12
Cuba	5 500	7.4	4	51	2.4	10
Guatemala	1 800	2.4	10	68	3.2	9
Indonesia	4 500	6.1	6	400	19.1	1
Madagascar	1 600	2.2	11	45	2.2	13
New Caledonia	-			210	10.0	3
Philippines	4 800	6.5	5	230	11.0	2
Russia	7 600	10.3	3	180	8.6	6
South Africa	3 700	5.0	7	49	2.3	11
Other countries	6 500	8.8		150	7.2	
TOTAL	74 000	100		2 100	100	

Source: USGS, Mineral Commodity Summaries, Nickel

*DMR, Mineral Economics Directorate

In line with global trends, South Africa's production also decreased slightly by 1.0 percent to 48.4 kt in 2017, compared with 48.9 kt in 2016, due to production stoppage for maintenance work at the major producer's mine (Table 52). Local sales volumes rose by 6.1 percent to 10.4 kt in 2017 from 9.8 kt in 2016, while export sales volumes declined by 14.0 percent to 36.8 kt in 2017 due to the lack of demand from major consuming countries.

TABLE 52: SOUTH AFRICA'S PRODUCTION AND SALES OF NICKEL, 2008-2017

YEAR	PRODUCTION		LOCAL SALES		EXPORT SALES		
	Mass	Mass	Value	Unit value	Mass	Mass	Value
	kt	kt	R'000		kt	kt	R'000
2008	31.7	6.7	1 151 894	171 924	23.5	4 103 711	174 626
2009	34.6	9.0	949 855	105 539	27.3	3 251 353	119 097
2010	40.0	7.3	1 073 290	147 168	33.1	4 911 462	148 522
2011	43.3	14.5	2 326 440	160 924	26.6	4 075 750	152 962
2012	45.9	11.3	1 539 962	136 182	35.5	4 892 384	137 786
2013	51.2	8.9	1 216 372	136 303	40.5	5 743 349	141 741
2014	55.0	8.1	1 429 476	176 435	48.1	7 705 911	160 139
2015	56.7	9.1	1 278 526	140 931	47.7	7 033 115	147 510
2016	48.9	9.8	1 300 550	131 821	42.8	5 799 815	135 317
2017	48.4	10.4	1 344 463	129 362	36.8	4 923 158	133 785

DMR Mineral Economics Directorate

In 2017, world refined nickel production decreased by 8.2 percent to 1 022.3 Mt from 1 114.1 Mt in 2016, as a result of supply contraction from major producing countries (Table 53). At 19.8 percent, China remained the largest producer of refined nickel followed by Canada and Russia at 16.1 and 15.4 percent, respectively.

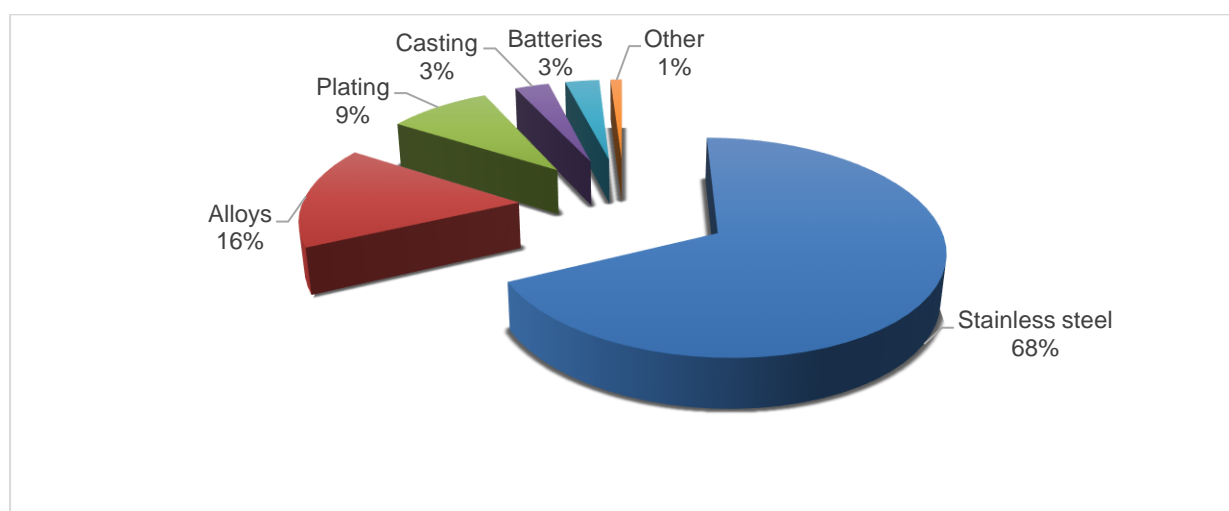
TABLE 53: WORLD REFINED NICKEL PRODUCTION, 2017

COUNTRY	REFINED PRODUCTION			
	2016(Mt)	2017 (Mt)	percentage	rank
Australia	117.9	106.5	10.4	4
Canada	158.3	164.3	16.1	2
China	219.9	202.6	19.8	1
Finland	85.1	85.2	8.3	6
France	4.3	3.2	0.3	12
Japan	63.1	61.4	6.0	7
Madagascar	42.1	35.5	3.5	10
Norway	92.7	86.5	8.5	5
Russia	189.7	157.5	15.4	3
South Africa	42.7	41.4	4.0	9
South Korea	47.4	52.5	5.1	8
United Kingdom	45.2	25.8	2.5	11
World total	1 114.1	1 022.3	-8.2	

Source: WBMS, World Bureau of Metal Statistics

In 2017, global nickel consumption grew slightly, by an estimated 1.1 percent to 1 924.2 Mt from 1 902.9 Mt in 2016, with China as the engine of world primary nickel usage. This growth was supported by the stainless-steel production and additional demand from the battery sector. The stainless-steel industry is the largest consumer of nickel, accounting for about 68 percent of the global metal consumption, followed by alloys and plating at 16 percent and 9 percent, respectively (Figure 44). The remainder was consumed in rechargeable batteries and catalysts. Future increase in batteries and EVs will register considerable change in the nickel sector.

FIGURE 44: THE PRIMARY END-USES FOR NICKEL

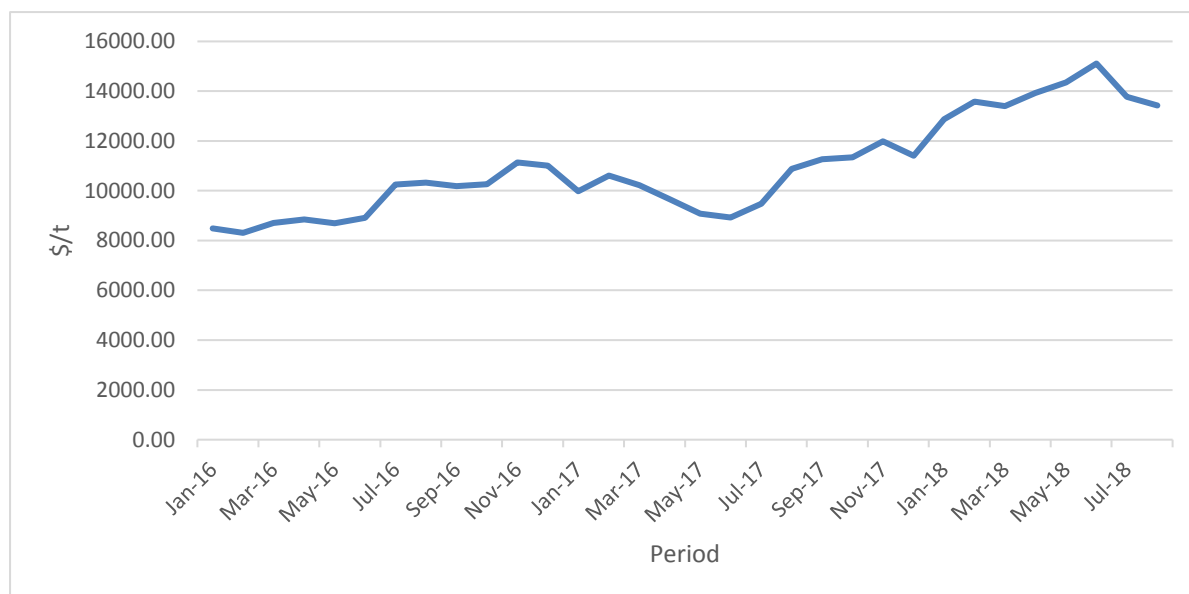


Source: international nickel study group 2017

PRICES AND REVENUE

The annual average price increased by 8.8 percent to \$10434.4/t in 2017 in relation to \$9594.05/t in 2016. The increase in commodity price was driven by supply reduction from the Philippines and long-term prospects linked to electric vehicles. For most part of 2017 nickel prices has shown moderated growth until May in the same year. In May 2017, Nickel prices fell by 9.2 percent to \$8 810/t, due to poor commodity demand and lifting of exports ban by Indonesian government. The commodity price picked up in June 2017 and continued an upward trend until November 2017. However, in the last month of 2017 Nickel prices declined by 4.9 percent to \$11 402, 11/t, owing to non-compliance with environmental regulations, which resulted in production cuts across top producers. Since the beginning of 2018, nickel prices have been trending upwards, reaching an all-time high of \$15 110,95/t in June 2018, attributed to the sharp fall in inventory stock.

FIGURE 45: MONTHLY AVERAGE NICKEL PRICE, 2016-2018



Source: LME, Metal Bulletin

In 2017, South Africa's local sales revenue generated, increased by 3.4 percent to R1 344 billion compared with R1 300 billion in 2016 resulting from growth in local sales volume. However, export sales revenue declined by 15.1 percent to R4 923 billion in the same period propelled by lower sales volume.

EMPLOYMENT

Employment in the nickel sector rose by 13.6 percent to 2 792 employees in 2017 compared with 2 457 employed in 2016, due to increasing number of permanent employees at Nkomati mine. However, total remuneration decreased by 3.1 percent to R5.84 billion in 2017 from R6.03 billion in the previous year. As a result, per-capita payments also decreased by 14.8 percent, driven by decrease in total annual salary attributed to job losses due to retrenchment in 2016.

TABLE 54: EMPLOYMENT IN THE PRIMARY NICKEL SECTOR

YEAR	TOTAL EMPLOYEES	TOTAL REMUNERATION (R)	PERCAPITA PAYMENTS
2013	3 149	571 601 731	181 518
2014	3 092	609 828 343	197 228
2015	3 381	688 679 384	203 691
2016	2 457	603 725 305	245 716
2017	2 792	584,802,945	209,457

Source: DMR, Mineral Economics Directorate

OUTLOOK

In 2018, global nickel mine production is expected to remain relatively stable attributed to increased output from Indonesian nickel mines, which will offset reduced mine supply from the Philippines. The Philippines shut down some of the country's operation, as a measure to fight against environmental irregularities in 2017.

In 2018, global market for nickel demand is expected to register significant growth during the forecasted period until 2023. This significant growth will result from increasing smelting capacity in Indonesia, growth in energy storage system, increasing demand for stainless, favorable pricing, increased usage of nickel in rechargeable batteries and electric vehicle.

In 2018, nickel prices are expected to continue an upward trend, propelled by commodity demand, abridged supply from the Philippines, newly built smelters in Indonesia and long-term predictions linked to electric vehicles. Long term nickel prices are expected to rise at a compound annual rate of 19.1 percent from US\$ 15 110.95/t in 2018 to US\$18 000/t in 2030.

In South Africa, growth in nickel output will be driven by the PGMs sector, new projects in the sector will provide additional capacity in the country, where nickel is a by-product. Growth in the stainless-steel sector is expected to improve, following the approval of increase of tariffs on stainless steel flat product imports, which flooded the market. This tariffs increase might potentially improve competitiveness of the local industry and, enable industry manufacturing stainless steel to flourish.

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8. *WBMS, World Bureau of Metal Statistics*

TITANIUM

N Mahala

SUPPLY AND DEMAND

Titanium minerals, also known as mineral sands, are mined in over 20 twenty countries, globally. Ilmenite and rutile are the main mineral concentrates for titanium, with ilmenite accounting for about 92 percent of the world's consumption of titanium minerals. World titanium reserves increased by 12.5 percent to 930 Mt in 2017, compared to the reserves recorded in 2016. Australia has the largest reserves, accounting for 29.9 percent of the world; followed by China at 23.6 percent. South Africa's titanium reserves account for 7.6 percent of the world, which puts the country in the top 5 of world largest reserves (Table 55).

TABLE 55: WORLD RESERVES AND PRODUCTION OF TITANIUM, 2017

COUNTRY	RESERVES			PRODUCTION		
	Mt	%	Rank	kt	%	Rank
Australia	279	29.9	1	1 350	16.9	2
Brazil	43	4.6	6	50	0.6	14
Canada	31	3.3	9	475	5.9	5
China	220	23.6	2	800	10.0	3
India	92.4	9.9	3	220	2.7	10
Kenya	67	7.2	5	455	5.7	5
Madagascar	40	4.3	7	140	1.7	12
Mozambique	14	1.5	10	557	7.0	4
Norway	37	4.0	8	260	3.2	9
Senegal	-	-	-	310	3.9	7
Sierra Leone	0.5	0.1	-	160	2.0	11
South Africa*	71.3	7.6	4	2 288	28.6	1
Ukraine	8.4	0.9	11	440	5.5	6
USA	2	0.2	12	100	1.2	13
Vietnam	1.6	0.2	13	300	3.7	8
Other	26.4	2.8	-	105	1.3	-
Total 2017	934	100.0		8 010	100	
Total 2016	830			6 940		

Sources: USGS, Mineral Commodity Summaries, January 2018

*Department of Mineral Resources, Mineral Economics Directorate

In 2017, titanium global production increased by 15.4 percent to 8.0 Mt, compared to the previous year on the back foot of strong global economic growth during that period (Table 55). South Africa remains the largest supplier of global titanium concentrates, with production, surging by 20.5

percent to 2.2 Mt over the same reporting period, due to high demand in 2017. Both local and export sales increased by 43 percent and 106 percent to 1.9 Mt and 419 kt respectively (Table 56).

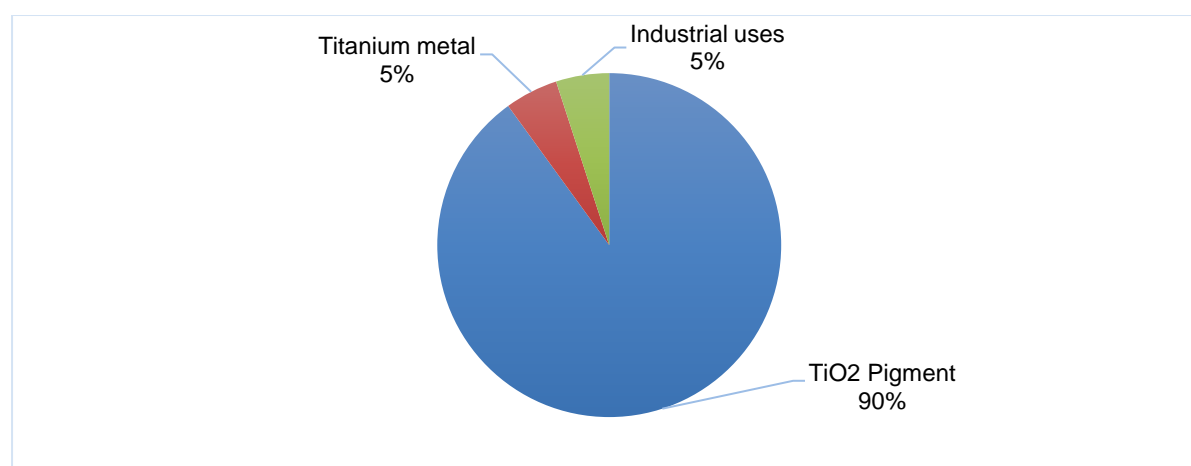
TABLE 56: SOUTH AFRICA'S TITANIUM PRODUCTION AND SALES, 2008-2017

YEAR	PRODUCTION	LOCAL SALES			EXPORT SALES		
	Mass	Mass	Value (FOR)		Mass	Value (FOB)	
	kt	kt	R'M	R/t	kt	R'M	R/t
2008	2 439	2 087	427	205	165	563	3 417
2009	2 507	1 621	414	256	105	494	4 694
2010	2 339	2 009	434	216	136	581	4 262
2011	2 896	2 355	562	239	136	658	4 820
2012	2 801	2 621	2 315	883	95	1 451	15 190
2013	2 604	2 682	2 712	1 011	100	1 028	10 256
2014	2 511	2 757	2 934	1 064	123	1 025	8 329
2015	1 982	1 937	2 303	1 189	108	992	9 151
2016	1 895	1 329	998	751	203	1 743	8 599
2017	2 285	1 908	1 368	717	419	1 432	5 788

Source: Department of Mineral Resources, Mineral Economics Directorate

Titanium minerals' production is principally driven by demand emanating from titanium dioxide (TiO₂) pigment market, which is used in applications such as paint, plastics, paper, and inks and fibres. The TiO₂ pigment accounts for 90 percent of titanium minerals demand and the remaining 10 percent is shared equally, between titanium metal and industrial uses, with the latter find many applications in abrasives, welding rods, and metallurgic fluxes (Figure 46). In 2017, the global demand for titanium concentrate was estimated to have increased by 2 percent year on year and amounted to 7.19 Mt, which is close to the all-time peak demand observed in 2011.

FIGURE 46: TITANIUM DEMAND BY END USE

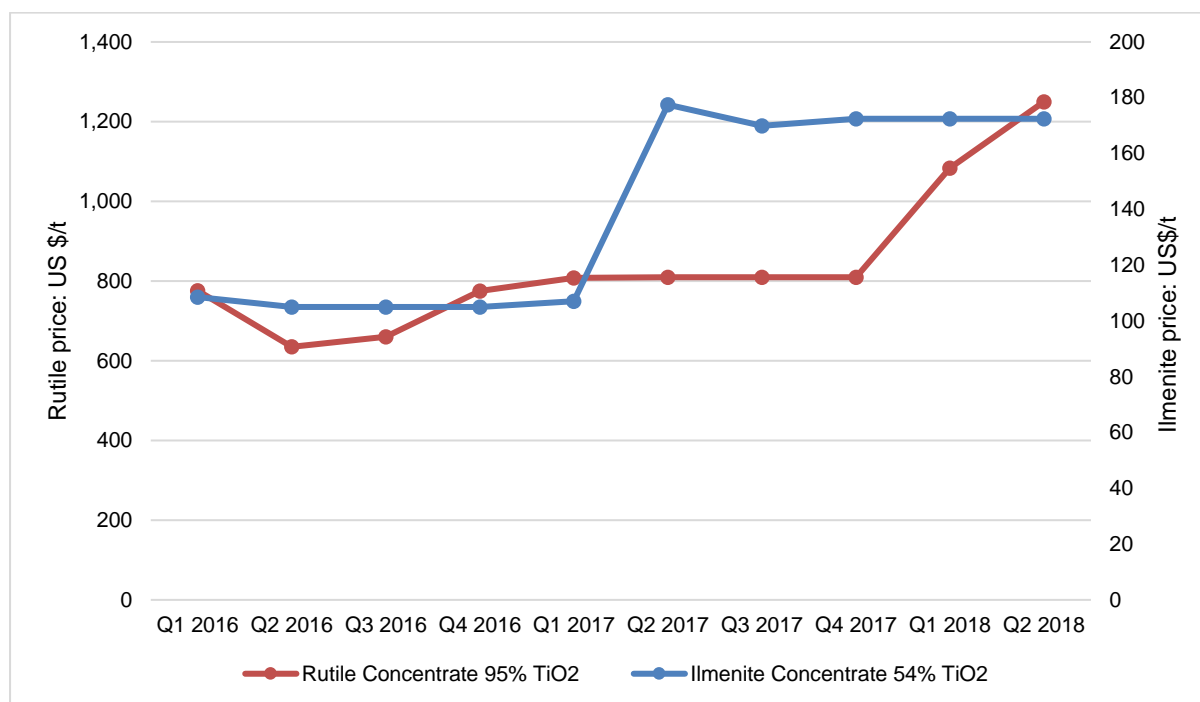


Source: Iluka

PRICES AND REVENUE

Following slow global economic growth in 2016, titanium market was in surplus, with ilmenite prices registering an average price of US \$106/t. In the second quarter of 2017, ilmenite price increased by a whopping 65 percent to US \$178/t compared to previous quarter, due to positive effect of strengthening global economy over that period. Excluding the first quarter of 2017, average ilmenite prices for the remaining three quarters of 2017 was at US \$170/t, which was the price observed during the first half of 2018 (Figure 47). Rutile price in 2016 was also fragile with an average of US \$712/t, but it had increased by 13.7 percent to an average of US \$809/t in 2017. Furthermore, rutile price increased by 33.7 percent and 15.4 percent to US \$1 083/t and US \$1 250/t in first quarter and second quarter of 2018 respectively due to supply shortages in an increasing demand period (Figure 47).

FIGURE 47: METAL BULLETIN PRICES FOR RUTILE AND ILMENITE, 2015 – 2018



Source: Metal Bulletin, 2016-2018

South Africa's titanium revenues are strongly influenced by international prices since the country is the price taker in the market. Thus, revenue accrued from total sales of titanium minerals increased slightly by 2.2 percent to R2.8 billion in 2017 compared to 2016 revenue.

EMPLOYMENT

South Africa's titanium mines are the largest employer in the nonferrous sector, responsible for over 35 percent of labour. In 2017, employment in the titanium mines declined slightly, by 3.5 percent to 6 360 employees, compared to the previous year due to retrenchments and resignations at some of the mines. Over the past six years, 2012 – 2017, employment in these mines recorded an average of 6 601 employees per year. Employees total remuneration improved by 10.5 percent from R1.42 billion in 2016 to R1.57 billion in 2017 due to overall annual wage increases. Per capita earnings for employees also increased from R216 thousand in 2016 to R247 thousand in 2017 (Table 57). Labour productivity increased by 24.9 percent to 359.9t per employee in 2017 compared to 287.5t per employee in 2016.

TABLE 57: EMPLOYMENT AND REMUNERATION IN THE TITANIUM SECTOR IN 2017

YEAR	EMPLOYEE	REMUNERATION	
	Number	R'000	Per Capita Earnings R'000
2013	6 335	1 373 440	217
2014	6 576	1 342 184	204
2015	7 243	1 494 836	206
2016	6 591	1 423 953	216
2017	6 360	1 572 754	247

Source: DMR, Mineral Economics Directorate

DEVELOPMENTS

Feasibility studies have been concluded at Richards Bay Minerals' (RBM) Zulti South Project that aims to replace the depleting reserves at Zulti North Mine. The project is awaiting final approval of the mining right and thereafter, RBM will fully migrate the mining operations to Zulti South, with phase one expected to come online in the first half of 2019. Phase one will deliver 2 500 t of heavy mineral concentrate per hour. This project will sustain the current RBM's production rates of titanium minerals and zircon, as well as securing of over 4000 jobs in its operations in Richards Bay, for the next two decades. Zulti South capital investment is valued at about R5 billion.

Developmental work is progressing well at Nyanza Light Metals and Avertana's joint venture project, Nyanza Titanium Dioxide Pigment Plant. Primarily, the project involves the construction of R4 billion titanium dioxide pigment production facility in Richards Bay's Industrial Development Zone (IDZ). Nyanza Plant is expected to produce about 50 000 tonnes of titanium dioxide pigment per annum, for both local and global markets from 2019. Titanium feedstock for the plant's production will be secured from Evraz Highveld Steel and Vanadium's steel slag waste from its Emalahleni operations. About 550 permanent jobs and additional 1 200 indirect jobs are projected when the plant reaches its full production capacity.

OUTLOOK

Global demand for titanium feedstock is expected to increase by 2 percent to 7.33 million tonnes in 2019, as pigment producers are maximizing the output to meet the growing demand, particularly in the high grade feedstock. Ilmenite prices are likely to remain at current (2018) levels of US \$170/t to US \$175/t in 2019. However, high grade rutile prices are forecasted to continue to rally up by 10 percent to annual average of US \$ 1 375/t in 2019 compared to 2018 prices on the back foot of emerging supply deficit for both chloride grade and sulphate grade feedstocks in the market.

South Africa's supply is expected to decline by over 10 percent in 2018 due to production disruptions at Richards Bay Minerals that were caused by community unrest in the first half of that year. However, in 2019 production is expected to return to its normal output level of plus 2 million tonnes.

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ZINC

Silungiselelo Mnyameni

SUPPLY DEMAND

In 2017, world zinc reserves were estimated at 230 Mt, according to United States Geological Survey (USGS). Australia hosted the world's largest zinc reserves, accounting for 27.8 percent, followed by China (17.8 percent) and Peru (12.2 percent). South Africa hosted 6.5 percent of the world zinc reserves and ranked 5th (Table 58).

World zinc mine production increased by 1.9 percent to 13.17 Mt in 2017, compared with 12.92 Mt in 2016. This was primarily due to higher output from Peru, India and Canada. Furthermore, additional output came from a significant increase in Burkina Faso, Eritrea and Russia which were sufficient to offset lower production in China, the US and Kazakhstan. Africa collectively accounted for 3.4 percent (449 kt) of the world total output. Namibia, at 132 kt, had the continent's largest zinc mine production followed by Burkina Faso's 101 kt, Eritrea at 94 kt, Morocco at 58 kt and South Africa's 31 kt (Table 58).

TABLE 58: WORLD RESERVES AND MINE PRODUCTION OF ZINC, 2017

COUNTRY	RESERVES			#PRODUCTION		
	Mt	%	Rank	kt	%	Rank
Australia	64	27.8	1	759	5.8	5
Canada	5.4	2.3	9	344	2.6	8
China	41	17.8	2	4 996	37.9	1
India	11	4.8	7	816	6.2	3
Ireland	1.1	0.5	10	135	1.0	9
Kazakhstan	13	5.7	6	347	2.6	7
Mexico	20	8.7	4	683	5.2	6
Namibia	-	-	-	132	1.0	10
Peru	28	12.2	3	1 473	11.2	2
South Africa	15	6.5	5	*31	0.2	11
USA	9.7	4.2	8	786	6.0	4
Other	22.3	9.7		2 555	20.2	-
Total	230	100		13 166	100	

Source: *DMR, Directorate Mineral Economics

#World Bureau of Metal Statistics, 2018 USGS, January 2018

South Africa's zinc mine production increased by 14.8 percent to 31 kt in 2017, compared with 27 kt recorded in 2016 (Table 59), due to higher ore grades from the country's sole zinc mine, throughout the year. Export sales increased by 23.1 percent to 32 kt, compared with 26 kt recorded

in 2016. Unit price also went up by 48.3 percent from R20 633 /t to R30 596 /t in 2017. All the zinc concentrate produced in the country is sold on the export market.

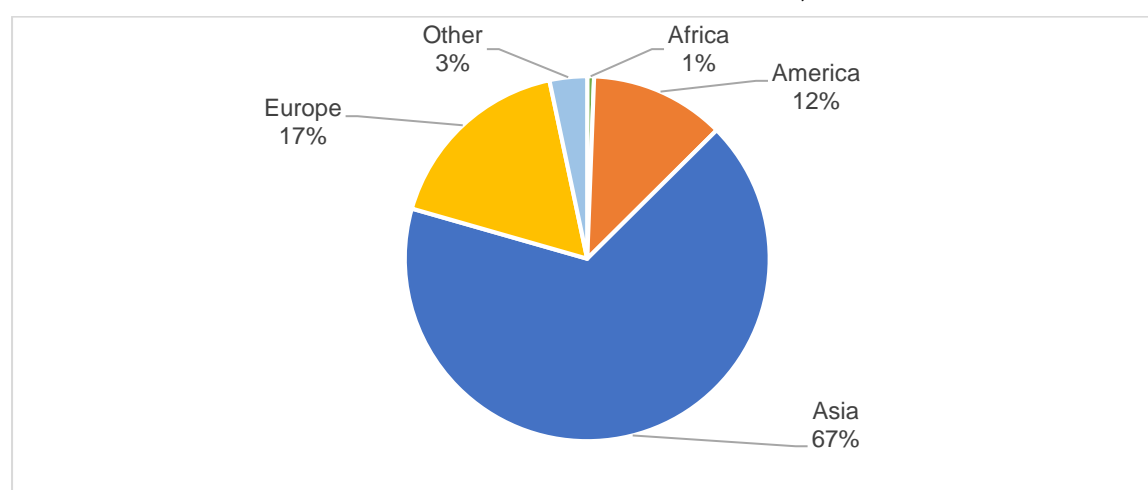
TABLE 59: SOUTH AFRICA'S PRODUCTION AND SALE OF ZINC METAL IN CONCENTRATE 2008 - 2017

YEAR	LOCAL SALES				EXPORT SALES		
	PRODUCTION	Mass	Mass	Value (FOR)	Mass	Value (FOB)	
		kt	kt	R'000	kt	R'000	R/t
2008		29	27	221 725	8 150	-	-
2009		28	22	170 925	7 603	-	-
2010		36	31	279 821	9 054	4	43 393
2011		37	17	169 416	9 917	20	233 150
2012		37	-	-	-	38	444 536
2013		30	-	-	-	26	335 687
2014		26	-	-	-	28	455 631
2015		29	-	-	-	30	447 493
2016		27	-	-	-	26	538 325
2017		31	-	-	-	32	990 268

Source: DMR, Directorate Mineral Economics

Global refined zinc metal output rose marginally at 0.2 percent, to 13.76 Mt in 2017, compared with 13.73 Mt in 2016. Higher output from Belgium, India, Mexico and the Republic of Korea was partially balanced by decreases in Australia, Canada, China and Peru. Regionally, Asia was the largest producer of the metal accounting for 67 percent followed by Europe (17 percent) and America (12 percent) as depicted in Figure 48. Africa's refined zinc production declined by 11.7 percent to 84 kt in 2017 compared with 94 kt in 2016, accounting for 1 percent of global production.

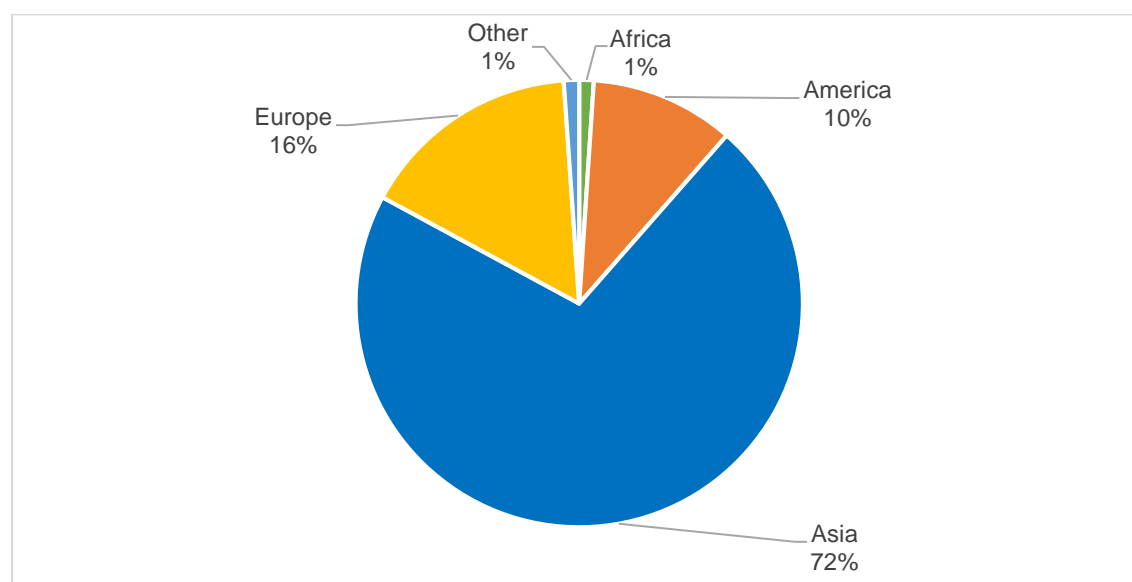
FIGURE 48: REGIONAL PRODUCTION OF REFINED ZINC, 2017



Source: World Bureau of Metal Statistics, 2018

World zinc consumption increased by 2.8 percent to 14.33 Mt in 2017 compared with 13.93 Mt that was recorded in 2016. China, the largest consumer of the galvanising metal, accounted for 48.6 percent of total world consumption. Regionally, Asia continued to dominate global zinc consumption accounting for 72 percent, followed by Europe's 16 percent and America's 10 percent (Figure 49). Africa's consumption declined by 0.7 percent to 150 kt in 2017, accounting for 1 percent to global zinc usage. However, it dominated the continent's consumption; accounting for 40.7 percent of Africa's zinc usage, followed by Egypt (14 percent) and Nigeria (7.9 percent).

FIGURE 49: REGIONAL CONSUMPTION OF REFINED ZINC, 2018

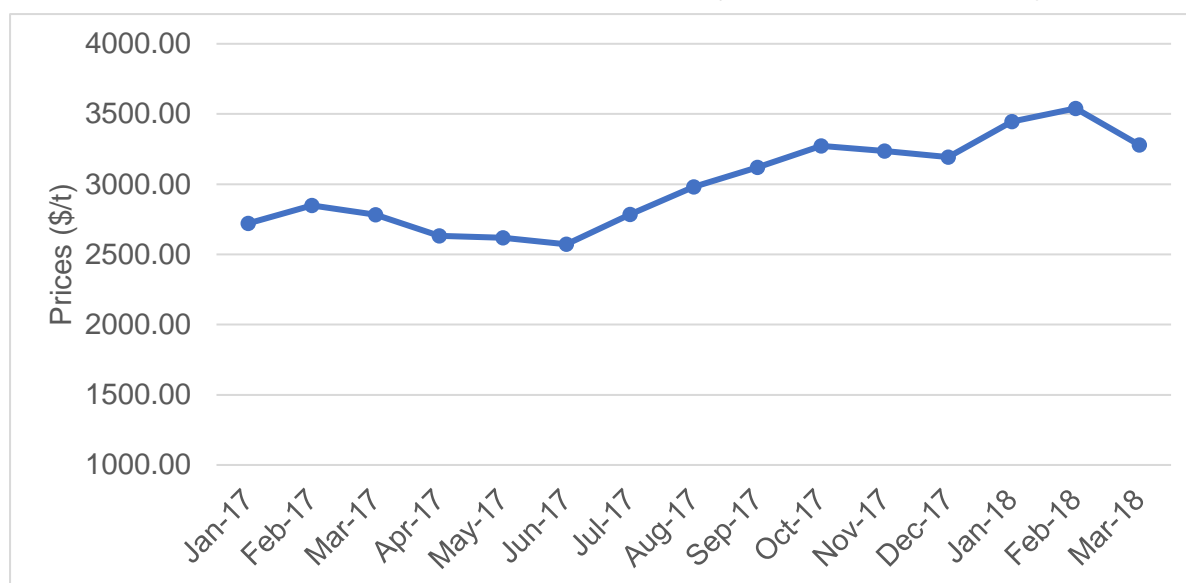


Source: World Bureau of Metal Statistics, 2018

PRICES

In 2017, London Metal Exchange (LME) zinc prices rallied throughout the year, on the back of mine supply concerns, declining warehouse stocks and a positive demand outlook from China. LME zinc prices surged 38.5 percent to an annual average of \$2 896.40 /t compared with \$2 090.71 /t recorded in 2016. In the first quarter (Q1) of 2017, prices recorded an average of \$2 781.06 /t, that was followed by a 6.2 percent decline in the Q2, where a low of \$2 608 /t was recorded in June 2017 (Figure 50). In Q3 and Q4 of the year, prices increased significantly by 17.7 and 11.7 percent, respectively. This was driven by China's economic growth stimulus measures, which bolstered the demand for industrial metals. In 2018, prices continued an upward trend from an average of \$3 447.20 /t in January to a decade high at \$3 539.78 /t in February then, traded lower in March at \$3 280.48 /t. This was primarily driven by negative sentiments concerning the looming trade war between China and the US.

FIGURE 50: LME ZINC CASH SETTLEMENT PRICE (MONTHLY AVERAGES), 2017-2018



Source: DMR, Directorate Mineral Economics

London Metal Exchange (LME)

In South Africa, zinc unit price increased by 48.3 percent to R30 596 /t in 2017 compared with 2016 (Table 56). Higher demand for zinc concentrates, as the global mine supply shortages intensified, put an upward pressure on zinc prices, resulting in a significant rise on the country's export unit price. Export sales rose by 23.1 percent to 32 kt and, revenues generated also rose by 84 percent to R990 million in 2017 compared with R538 million in 2016.

DEVELOPMENTS

In January 2017, Orion Minerals NL, an Australian company, exercised its option to acquire the unlisted South African company, Agama Exploration & Mining (Pty) Ltd, which holds 73.33 percent prospecting rights in the Prieska zinc-copper project. The transaction included cash payment as well as share acquisition in terms of Broad Based Black Economic Empowerment ownership.

The Prieska project, located 270 kilometres south-west of Kimberly in the Northern Cape's Areachap Belt, is recorded as one of the world's 30 largest volcanogenic massive sulphide (VMS) base metal deposits. The project covers the former Prieska Copper Mine (PCM), which was prematurely closed by previous owners, due to depressed prices at the time, as well as the nearby newly acquired Marydale and Vardocube prospecting rights.

During the eighteen-month period from March 2017, the company drilled over 50,000m that resulted in a JORC mineral resource of 29.4 Mt at 3.8 percent zinc and 1.2 percent copper. In April 2018 a mining right as well as an environmental authorisation application were lodged, as the company aims to fast track the project to production by the last quarter of 2020.

Orion aims to complete the bankable feasibility study (BFS), that was commissioned in July 2017, in the last quarter of 2018. In parallel to BFS, the company is progressing with key commercial work streams that include concentrate marketing, project financing and optimal structure. The company issued shares to the value of \$3.47 million to raise capital for the current activities, as it aims to fast track the project to production.

OUTLOOK

Global zinc mine production is anticipated to increase by 3.4 percent to 13.62 Mt in 2018. This will be driven mainly by an expected 2.3 percent rise in China and a further 3.9 percent increase in Peru. Additional output is expected from South Africa's Gamsberg mine when it comes onstream in the second half of 2018. Another increase is forecast from commissioning of New Century Resources' 262 000 tonnes per year tailings project in Queensland, Australia.

World refined zinc metal is expected to increase by 3.6 percent to 14.25 Mt in 2018. This will be mainly influenced by a rise in China's output of 3.4 percent and a recovery in Canada's production, where output in 2017 was negatively impacted by a strike at Noranda Income Fund's Valleyfield refinery. Production in Europe is also forecast to increase by 5.2 percent, primarily as a consequence of higher output in Belgium, Italy, the Netherlands and Norway. A further increase is expected in Australia's refined zinc metal production as a result of an increase in available domestic concentrate.

World refined zinc consumption is anticipated to increase by 2 percent to 14.51 Mt in 2018. Higher demand is expected from China, resulting from rising galvanised steel production as well as rising demand in the US and Europe, particularly in Belgium and Italy, due to increased infrastructural development. Higher usage is expected to rise in India and the Republic of Korea and, to remain stable in Japan.

Zinc prices are forecast to trade lower in 2018, driven by the escalating trade dispute between two world's major economies, China and the US, rising global protectionism as well as stronger dollar. However, this anticipated decrease is mainly sentiment driven, with zinc fundamentals remaining largely tight and likely to drive price higher in the medium to long term.

In South Africa, the 250 kt of zinc concentrate per annum at full capacity at Gamsberg project is expected to come on stream in the second half of 2018. Another interesting project, Prieska copper-zinc project in the Namaqualand district, in Northern Cape, is being fast tracked into production by 2020. These projects are expected to raise South Africa's contribution to world zinc supply, moving the country to one of the top ranking zinc producers.

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ZIRCON

N Mahala

SUPPLY AND DEMAND

Global zircon reserves amounted to 74.4 Mt in 2017. Australia, which has the largest reserves and hosts about 63.2 percent, while South Africa at second place, accounts for 18.8 percent (Table 60). Global production of zircon improved by 7.5 percent to 1 545 kt in 2017 compared to 2016, with South Africa and Australia responsible for 65 percent of the overall production. The increase in production was in response to the increasing global zircon demand which was influenced by economic growth in the United States, Europe and Asia.

TABLE 60: WORLD RESERVES AND PRODUCTION OF ZIRCON, 2017

COUNTRY	RESERVES			PRODUCTION		
	Mt	%	RANK	kt	%	RANK
Australia	47	63.2	1	600	38.8	1
China	0.5	0.7	5	140	9.1	3
India	3.4	4.6	3	40	2.6	7
Indonesia	0	0.0	-	120	7.8	4
Mozambique	1.8	2.4	4	75	4.9	5
Senegal	0	0.0	-	60	3.9	6
South Africa*	14	18.8	2	400	25.9	2
United States	0.5	0.7	5	0	0.0	-
Other countries	7.2	9.7	-	110	7.1	
Total 2017	74.4	100.0		1 545	100.0	
Total 2016	75			1 437		

Sources: USGS, Mineral Commodity Summaries, January 2018

*Department of Mineral Resources, Mineral Economics Directorate

South Africa's zircon production primarily comes from titanium mines, which are located in the provinces of Western Cape and KwaZulu Natal. In 2017, the country's production declined slightly by 3.9 percent to 362 kt compared to the output of 2016, due to poor production performances at Richards Bay Minerals and Tronox mines. However, local and export sales increased by 100 percent and 4.3 percent to 10 kt and 349 kt respectively, over the reporting period, amid improved smelter availability and utilisation at RBM and Tronox. Thus, local revenue generated by local sales doubled to R126.9 million, while export revenue increased by 4.3 percent to R4.4 billion year on year in 2017 (Table 61). Local ceramics industry was robust in 2017 hence the higher sales and revenue.

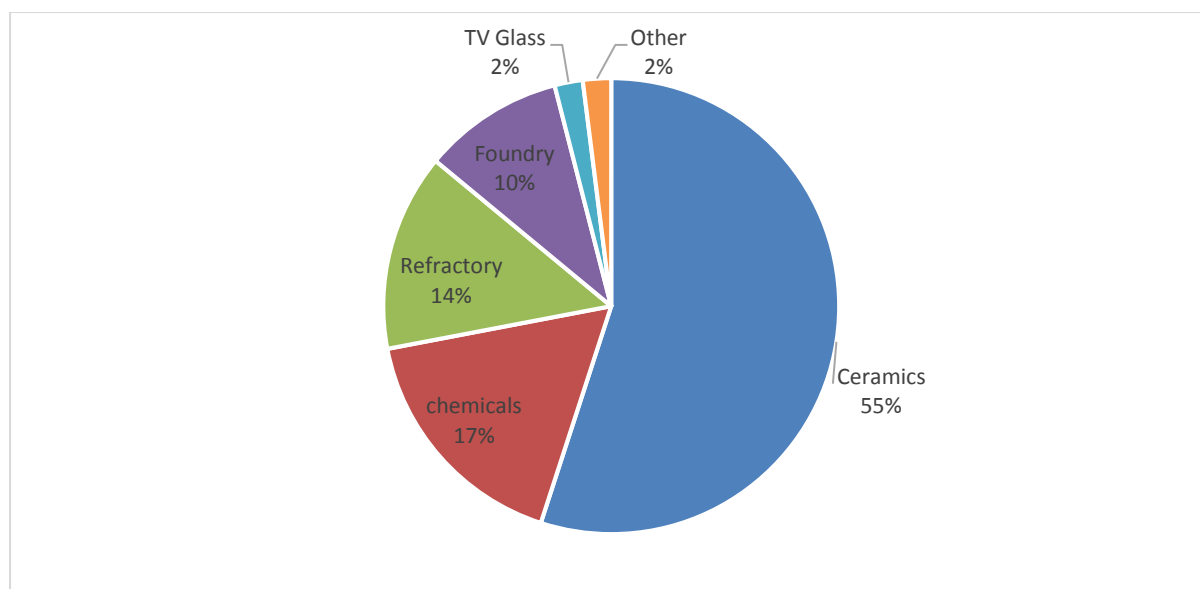
TABLE 61: SOUTH AFRICA'S ZIRCON PRODUCTION AND SALES, 2007-2017

YEAR	PRODUCTION		LOCAL SALES		EXPORTS SALES		
	Mass	Mass	Value (FOR)		Mass	Value (FOB)	
	kt	kt	R'000	R/t	kt	R'000	R/t
2007	382	16	93 501	5 645	345	1 946 624	5 656
2008	396	18	113 576	6 102	403	2 575 873	6 378
2009	349	9	63 701	7 134	281	1 945 080	7 639
2010	389	18	111 613	6 333	684	4 348 995	6 354
2011	432	20	266 564	13 336	508	6 816 474	13 406
2012	367	7	132 761	18 928	214	4 008 161	18 760
2013	224	11	125 327	11 113	438	4 819 625	11 013
2014	398	12	138 836	11 768	431	4 601 410	10 679
2015	380	8	116 784	13 286	404	4 818 346	11 931
2016	377	5	62 386	13 621	349	4 069 143	11 675
2017	362	10	126 944	12 915	364	4 439 868	12 363

Department of Mineral Resources, Mineral Economics Directorate

The largest end use market for zircon is in ceramic industry where it used as an opacifier and it accounts for 55 percent of the overall demand. Chemicals, refractory, and foundry account for 17, 14 and 10 percent correspondingly; with TV glass and other uses, only accounting for 2 percent each (Figure 51). In 2017, global demand for zircon was estimated to be between 1.1 Mt to 1.2 Mt, which represents an increase of 3 percent, compared to demand observed in 2016. China is the largest consumer of zircon, overtaking Europe over the past decade, due to ongoing industrialization and urbanization programme in the former.

FIGURE 51: ZIRCON DEMAND BY END USE, 2017



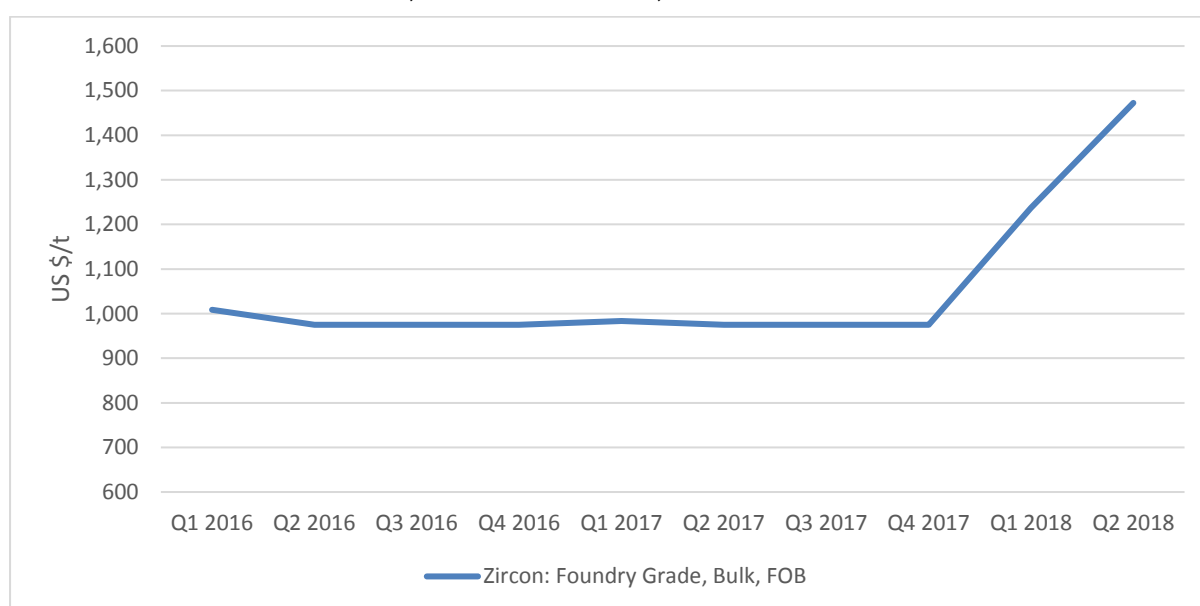
Source: TZMI

PRICES AND REVENUE

Following a period of static demand between 2012 and 2016, global zircon demand slowly recovered in 2017, as clearly demonstrated by the behaviour of prices in figure 44 below. In 2016, zircon recorded an average price of US \$ 983/t free on board (FOB) Australia, but this dropped to an average price of US \$ 977/t in 2017, due to slowdown in Chinese housing sector, which had negative impact on ceramic tile output. However, prices shot up by 27 percent to US \$1 237/t in the first quarter of 2018, compared to previous quarter. During the second quarter of 2018, zircon price recorded an average of US \$ 1 473/t on the back foot of the supply gap in the market.

In Rand terms, zircon unit price increased from R1 248/t in 2016 to R1 268/t in 2017. Based on local and export sales indicated in Table 62, South Africa's revenue from zircon operations increased by 10.5 percent to R4.6 billion in 2017 from R4.1 billion recorded in 2016.

FIGURE 52: ZIRCON PRICES, FOB AUSTRALIA, 2016-2018



Source: Metal Bulletin

EMPLOYMENT

There are only two primary zircon mines in South Africa. The other zircon production balance comes from titanium minerals, as a co-product. In 2017, employment in the primary zircon mines declined by 10.1 percent to 310 workers compared to the employment recorded in 2016. Decline in employment is attributed to retrenchments and retirements at zircon mines. Employees total remuneration increased by 1.7 percent to R104.4 million year on year over the review period. Per capita earnings improved by 6.4 per cent to R316 thousand in 2017, from R297 thousand in 2016 (Table 62). Employees' productivity increased by 6.3 percent from 1 092.8t per employee in 2016 to 1 161.3t per employee in 2017, which is very impressive considering that employment declined by major factor compared to the decline in production.

TABLE 62: ZIRCON EMPLOYMENT, 2013-2017

YEAR	EMPLOYEE	REMUNERATION	
	Number	R'000	Per Capita Earnings
2013	179	42,114	235,271
2014	184	38,437	208,897
2015	373	100,309	268,924
2016	345	102,616	297,440
2017	310	104 394	316 345

Source: Department of Mineral Resources, Mineral Economics Directorate

OUTLOOK

Zircon global demand growth is expected to range between 3 to 4 percent annually from 2018 through 2021, mainly driven by the continued growth rates in Europe and United States of America, improved offtake by China, as well as the continued growth in India and the Middle East. In terms of supply, global output is expected to decline by 4 to 5 percent annually, from 2019 to 2025, which could lead to reduced global supply of 800 000t from the current base of over one million tonnes. This tight supply is attributed to the declining zircon reserves and lacklustre discovery of new resources.

The supply gap in the zircon market continues to drive prices upwards. For 2018, zircon prices are estimated to reach an average levels of US \$ 1 500/t and, to grow by 10 percent to US \$ 1 650/t in 2019. Although high prices are appreciated by producers, however, such market fundamentals might trigger a substitution of zircon in many of its applications – for example chromite and olivine can be used in foundry application instead of zircon.

South Africa's zircon production is expected to decline in 2018 by about 5 to 8 percent, on the backdrop of production disruptions at RBM operations caused by disgruntled members of local communities. Following the resolutions of these community unrests late in 2018, South Africa' zircon production will return to its normal levels in 2019.

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FERROUS METALS AND MINERALS OVERVIEW

R Ravhugoni

GLOBAL DEMAND

South Africa is a major producer and supplier of primary ferrous minerals and their alloys. With more than 85 percent of global consumption of iron ore, manganese, chrome and vanadium; steel manufacturing is by far the leading demand driver of ferrous minerals. Global crude steel production stood at 1 691 million tons (Mt) in 2017, up by 5.3 percent compared with 2016. An increase was noted in the Middle East, Asia and Oceania, except the Commonwealth of Independent States (CIS). China remained the largest steel producer at 831.7 Mt in 2017, up by 5.6 percent year on year.

SOUTH AFRICA'S PRODUCTION AND SALES

South Africa's aggregated production of ferrous minerals increased by 14.7 percent to 105 336 kilo tons (kt) (Table 63). The increase in production was notable in all major ferrous commodities, mainly manganese ore, which saw an astounding increase of 31.0 percent, while chrome ore and manganese ore increased by 12.5 percent and 12.6 percent, respectively. Iron ore contributed approximately 70.8 percent to total ferrous production in 2017, with chrome ore and manganese ore contributing 15.7 percent and 13.4 percent, respectively. Ferrous total sales mass increased by 6.8 percent, with the corresponding revenues increasing by 30.3 percent, due to an improvement in most ferrous prices. The South African chrome ore, for the grades 44 percent concentrate and UG2, increased by 35 percent and 37 percent respectively, while the Turkish lumpy grade traded at a premium of 337.5 dollars per ton (\$337.5/t), a 41.6 percent increase from 2016. Iron Ore spot price, for grade 62 percent iron ore content (62Fe), averaged at \$71.8/t in 2017, an increase of 22.8 percent from \$58.4/t in 2016. Manganese ore for the grade 44 percent increased by 3.3 percent to 6.3 dollars per dry metric ton unit (\$6.3/dmtu) with that of its alloy, High Carbon Ferro Manganese (HCFMn), 78 percent grade increasing by 1.8 percent to \$1532/t during the same period. The increase in ferrous prices was largely attributed to strong demand from China due to the significant improvement in the country's steel market and subsequent growth in ferroalloy production.

TABLE 63: SOUTH AFRICA'S PRODUCTION AND SALES OF FERROUS MINERALS, 2016 AND 2017

COMMODITY	YEAR	PRODUCTION	LOCAL SALES		EXPORT SALES		TOTAL SALES	
		kt	kt	R' million	kt	R' million	kt	R' million
CHROME ORE	2017	16 553	8 844	10 804	4 656	12 329	13 501	23 134
	2016	14 708	8 726	8 164	4 684	9 541	13 382	17 690
IRON ORE	2017	74 643	7 073	5 137	60 678	44 188	67 751	49 326
	2016	66 295	6 160	3 855	58 237	39 125	64 398	42 981
MANGANESE ORE	2017	14 140	1 361	1 671	13 403	30 611	14 764	32 283
	2016	10 805	917	888	11 238	18 852	12 156	19 741
TOTAL	2017	105 336	17 278	17 612	78 737	87 128	96 016	104 743
	2016	91 808	15 803	12 907	74 159	67 518	89 936	80 412

Source: DMR, Directorate Mineral Economics

South Africa's aggregated production of ferroalloys declined by 4.3 percent to 3 793 kt (Table 64), with chromium alloys contributing 86.1 percent to the ferroalloys total production, followed by manganese alloys at 11.6 percent. Total sales mass of ferroalloys stood at 3 518 kt, a 17.2 percent

drop compared with 2016. Despite this, the corresponding total sales revenue increased by 1.6 percent, due to slight improvement in prices.

TABLE 64: SOUTH AFRICA'S PRODUCTION AND SALES OF FERROALLOYS, 2016 AND 2017

COMMODITY	YEAR	PRODUCTION	LOCAL SALES		EXPORT SALES		TOTAL SALES	
			Mass	Revenue	Mass	Revenue	Mass	Revenue
		kt	Kt	R' million	kt	R' million	kt	R' million
CHROMIUM ALLOYS	2017	3 268	498	5 944	2 646	35 611	3 145	41 555
	2016	3 524	533	5 192	3 284	33 379	3 817	38 571
MANGANESE ALLOYS	2017	443	38	592	262	3 911	300	4 503
	2016	370	25	249	341	3 095	366	3 344
FERRO SILICON	2017	82	43	717	29	561	73	1 278
	2016	73	40	629	25	527	66	1 156
TOTAL	2017	3 793	579	7 253	2 937	40 083	3 518	47 336
	2016	3 967	598	6 070	3 650	37 001	4 249	43 071

Source: DMR, Directorate Mineral Economics

EMPLOYMENT

Employment in the ferrous mineral sector rose to at 42 481 in 2017, an 8.43 percent increase compared with 2016 (Table 65), in line with the increase in the number of operations. The number of mines increased by 9.2 percent in 2017, to 71, compared with 65 mines in 2016. The increase in employment was notable across all the sectors, with both manganese and chrome ore sectors increasing by 10.2 percent and 10.9 percent respectively, while the iron ore sector saw an increase of 5.17 percent. Total remuneration increased by 7.20 percent in 2017 compared with 2016, with remuneration per employee declining by 1.13 percent.

TABLE 65: SOUTH AFRICA'S FERROUS MINE EMPLOYMENT AND GROSS REMUNERATION

YEAR	AVERAGE NUMBER OF EMPLOYEES	TOTAL REMUNERATION (R'000)	REMUNERATION /EMPLOYEE
2011	46 713	10 536 930	225 567
2012	51 864	9 692 127	186 875
2013	49 324	10 634 969	215 614
2014	50 416	12 041 059	238 834
2015	47 277	12 794 119	268 096
2016	39 179	12 131 485	309 642
2017	42 481	13 004 580	306 130

Source: DMR, Directorate Mineral Economics

OUTLOOK

According to World Steel Short Range Outlook, global steel demand will grow by 3.9 percent to reach 1 657 Mt, with demand from China expected to increase by 6.0 percent. Steel demand in developed economies is anticipated to increase by 1.0 percent in 2018, with demand from emerging economies expected to increase by 3.2 percent. Growth in the construction sector, from developing economies is likely to moderate in 2018, after a recovery in momentum in 2017, while automotive markets in developed economies will soften, on the back of slow demand, raising fuel prices and interest rates. Demand for automobiles is projected to grow at a healthy pace in developing countries in 2018. The lack of a strong growth engine to replace China and a long-term decline in steel intensity due to technological and environmental factors will continue to weigh on steel demand in the future. As a result, the market is expected to correct in 2019 thus impeding ferrous metals and alloys prices. South Africa's production and exports are expected to moderate in 2019, in response to low prices, coupled with low demand from major steel producing countries.

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CHROMIUM

M Khaile

SUPPLY – DEMAND: CHROME ORE

In 2017, world resources of chrome were estimated at 11 billion tons, the bulk of which are found in Southern Africa. South Africa's reserves were estimated at 3.1 billion tons, making it the undisputed host of chrome at 75 percent, followed by Kazakhstan and Zimbabwe at 7.8 and 3.4 percent, respectively (Table 66). World chrome ore production amounted to 30.5 million tons (Mt), a 2.3 percent rise from 2016. At 16.5 Mt, South Africa remains the largest producer of chrome ore, followed by Kazakhstan and India at 4.5 and 4.1 Mt, respectively

TABLE 66: WORLD CHROME ORE RESERVES, PRODUCTION AND EXPORTS, 2017.

COUNTRY	RESERVES#			PRODUCTION#			EXPORTS#		
	Mt	%	Rank	kt	%	Rank	kt	%	Rank
South Africa*	3,100	75.2	1	16,573	54.3	1	4,717	46.3	1
Kazakhstan	320	7.8	2	4,522	14.8	2	914	9.0	3
India	27	0.7	6	4,124	13.5	3	106	1.0	11
Turkey	12	0.3	7	1,262	4.1	4	1,501	14.7	2
Finland	41	1.0	5	972	3.2	5	15	0.1	12
Oman	<i>In other</i>	-	-	439	1.4	9	452	4.4	6
Albania	<i>In other</i>	-	-	571	1.9	6	483	4.7	5
Pakistan		-	-	264	0.9	11	343	3.4	7
Brazil	14	0.3	7	540	1.8	7	115	1.1	10
Iran	<i>In other</i>	-	-	349	1.1	10	294	2.9	8
Zimbabwe	140	3.4	3	477	1.6	8	570	5.6	4
Madagascar	N/A	-	-	193	0.6	12	210	2.1	9
Russia	46	1.1	4	70	0.2	13	0.4	0.004	13
Other	420			192	0.6		472	4.6	
2017	4,120	100		30 548	100		10 192	100	
2016	4 074			29 016			9 273		

Sources: #ICDA Statistical Bulletin 2018, *DMR Mineral Economics Directorate

South Africa's high grade chrome ore (typically between 34 and 47 percent Cr₂O₃) positions the country as the preferred supplier of both primary and Upper Group 2 ore. Chinese ferrochrome smelters are geared to consume the latter material, once it has been blended with LG6 ore, which has a Cr₂O₃ content ranging between 43 to 47 percent. As such, South Africa's exports of chrome amounted to 4.7 Mt in 2017, half of which comprised of UG2 chrome ore, and were destined to China. Other significant exporters of chrome were Turkey and Kazakhstan, which contributed a combined 24 percent to total chrome ore exports in 2017.

Generally, chrome ore with a high Cr₂O₃ content (i.e. 46 to 55 percent) and a chrome-to- iron ratio of about 2:1 is used in metallurgical applications, while lower grades of ore are used in the chemical, foundry and refractory industries. In 2017, 94 percent of chrome output was consumed for metallurgical purposes, including ferrochrome production, while 3 percent went into foundry

sands. The chemicals and refractory sectors accounted for 2 and 1 percent of global chrome ore consumption, respectively.

South Africa's total chrome ore production (including UG2) rose by a significant 12.7 percent to 16.5 Mt in 2017, despite a 1.3 percent contraction in Platinum Group Metals (PGMs) production. The spike in chrome production can be attributed to extremely favourable UG2 and primary ore prices – the price of UG2 chrome and, the 44 percent concentrate rose by an astounding 37 and 35 percent, respectively during this period. UG2 chrome is recovered as a by-product of PGMs mining in South Africa, and serves as a secondary revenue stream for PGMs producers. UG2 chrome accounted for just over 30 percent of total chrome production in 2017. Export sales mass increased by a marginal 0.7 percent from 4.7 Mt in 2016, an improvement from the 2016 decline. Chrome ore found much favour on the local market, however, with local sales mass reaching 8.9 Mt during the period under review, a 1.6 percent increment when compared with 2016, notwithstanding the 1.1 percent decline in ferrochrome production (Table 67).

TABLE 67: SOUTH AFRICA'S CHROME ORE PRODUCTION AND SALES, 2007 – 2017.

YEAR	PRODUCTION		LOCAL SALES		EXPORT SALES		
		Mass	Value	Unit Value	Mass	Value	Unit Value
	kt	kt	R' 000	R/t	kt	R' 000	R/t
2007	9 665	7 389	2 346 982	315	893	659 467	747
2008	9 683	7 116	4 131 020	581	762	1 267 931	1 664
2009	7 561	4 880	2 081 058	426	1 709	1 571 311	1 155
2010	10 871	7 267	4 159 308	572	1 929	2 459 473	1 275
2011	11 865	7 202	5 227 339	721	2 152	3 649 136	1 628
2012	11 317	6 683	4 681 855	701	2 470	3 594 282	1 455
2013	13 690	8 483	5 870 717	692	4 168	5 891 833	1 414
2014	14 038	10 048	7 771 424	773	3 695	5 834 876	1 579
2015	15 656	9 833	8 093 409	823	4 821	8 104 128	1 681
2016	14 708	8 728	8 164 638	936	4 684	9 541 381	2 037
2017	16 573	8 871	10 832 640	1 221	4 717	12 586 563	2 668

Source: DMR Mineral Economics Directorate

SUPPLY – DEMAND: FERROCHROME

World ferrochrome production rose to 12.9 Mt in 2017, an improvement of 8.7 percent when compared with 2016 (Table 68). The rise was mainly due to Zimbabwe, Sweden, and India increasing their ferrochrome output during 2017. Zimbabwe's growth in ferrochrome production was more pronounced at 164 percent, with about 40 percent of its smelting capacity coming online. South Africa remained in second place, after China, with production falling to 3.48 Mt from 3.52 Mt in 2016. China's production however, remained relatively unchanged at 5.47 Mt, in response to price fluctuations. South Africa accounted for 45 percent of global ferrochrome exports, followed

by Kazakhstan and India at 18 and 13 percent, respectively, the majority of which fed into China's stainless steel industry in 2017.

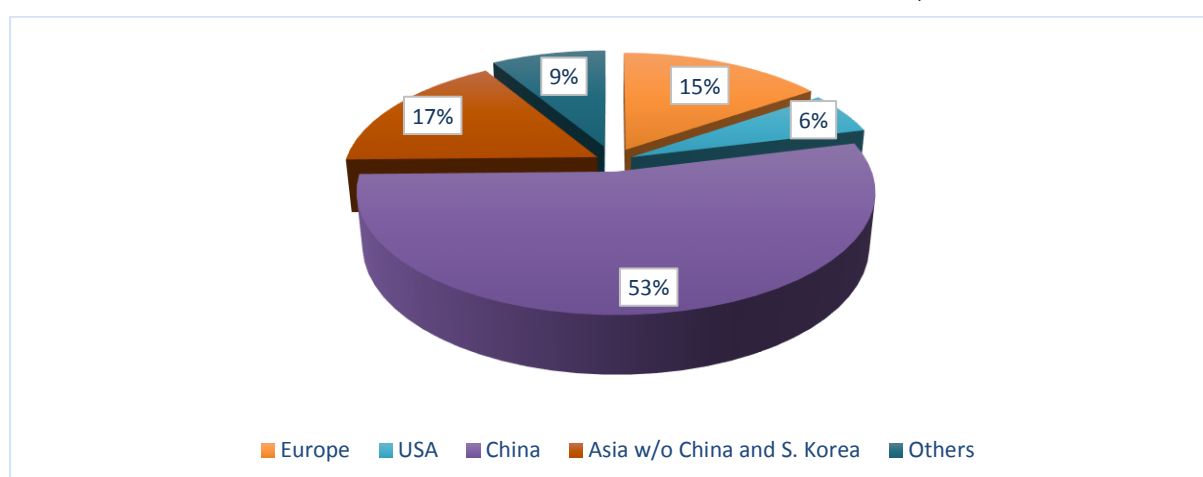
TABLE 68: WORLD FERROCHROME PRODUCTION AND SALES, 2017.

COUNTRY	PRODUCTION#			EXPORTS#		
	kt	%	Rank	kt	%	Rank
China	5 474	42.1	1	107	1.6	8
South Africa*	3 484	26.8	2	2 951	45.0	1
Kazakhstan	1 422	10.9	3	1 151	17.6	2
India	1 306	10.1	4	830	12.7	3
Russia	256	2.0	6	281	4.3	4
Finland	416	3.2	5	213	3.3	5
Brazil	153	1.2	7	21	0.3	11
Zimbabwe	82	0.6	9	167	2.5	6
Turkey	107	0.8	8	129	2.0	7
Sweden	108	0.8	8	105	1.6	8
Albania	49	0.4	10	33	0.5	10
Oman	84	0.6	9	72	1.1	9
Other	50	0.4		491	7.5	
2017	12 991	100		6 551	100	
2016	11 941			6 738		

Source: *DMR Mineral Economics Directorate, #ICDA Statistical Bulletin 2018,

World high carbon ferrochrome (HC FeCr) consumption in stainless steel production rose to 12.1 Mt in 2017, compared with 11.4 Mt in 2016, driven by a 6.2 percent increase in stainless steel production, the bulk of which was attributed to China, the world's leading producer of stainless steel (Figure 53). Stainless steel producers in China enjoy subsidies from the central government, which lowers their production costs significantly compared to other non-subsidised countries.

FIGURE 53: WORLD'S LEADING STAINLESS STEEL PRODUCERS, 2017.



Source: ISSF, 2018

South Africa's ferrochrome production, of which HC FeCr constitutes almost 100 percent, decreased by 1.1 percent to 3.4 Mt in 2017 when compared with 2016 (Table 69), with producers such as Hernic going into business rescue during this period. Local sales mass decreased by 1.6 percent to 524 kilo tons (Kt) in 2017 in comparison with 2016 despite the 6.2 percent increase in domestic stainless steel production, while export sales saw a 10.1 percent contraction during the same period. Worth noting is the more than 80 percent exportation of ferrochrome output, an indication of the continued strife in the domestic stainless steel industry.

TABLE 69: SOUTH AFRICA'S FERROCHROME PRODUCTION AND SALES, 2007 – 2017.

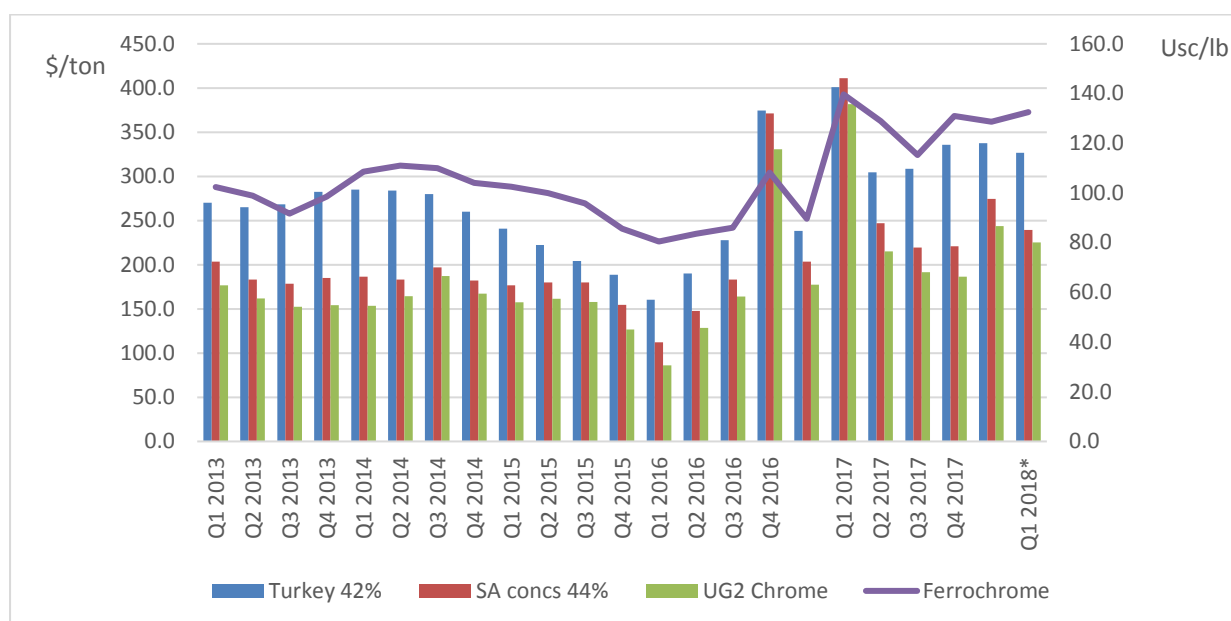
YEAR	PRODUCTION		LOCAL SALES		EXPORT SALES		
		Mass	Value	Unit Value	Mass	Value	Unit Value
	kt	kt	R' 000	R/t	kt	R' 000	R/t
2006	3 030	353	1 352 224	3 832	2 581	10 370 421	4 017
2007	3 552	395	1 995 161	5 047	2 969	15 520 338	5 227
2008	3 269	334	3 415 822	10 227	2 525	28 355 767	11 230
2009	2 346	432	2 252 973	5 215	2 621	15 881 599	6 059
2010	3 607	397	2 851 837	7 183	3 116	24 216 069	7 772
2011	3 426	451	3 430 563	7 620	3 048	23 793 442	7 817
2012	3 063	443	3 402 210	7 677	2 745	22 290 876	8 120
2013	3 219	360	2 983 322	8 286	2 802	25 552 642	9 120
2014	3 719	571	5 105 685	8 937	3 192	31 079 849	9 737
2015	3 685	613	5 678 536	9 265	3 101	30 284 468	9 767
2016	3 524	533	5 192 025	9 733	3 284	33 379 185	10 163
2017	3 484	524	6 228 617	11 770	2 951	37 461 378	12 649

Source: DMR Mineral Economics Directorate

PRICES AND REVENUES

Chrome ore prices performed exceedingly well in 2017 compared with 2015 and 2016, when an oversupplied market caused prices to plummet by over 22 percent. The effects of tightened supply was evident in the 35 and 37 percent increase in the South African 44 percent concentrate and UG2 grades, respectively. The Turkish lumpy grade traded at a premium of 337.5 dollars per ton(\$337.5/t), a 41.6 percent increment from 2016. The ferrochrome price moved in tandem with the price of feedstock, rising on average by 43.7 percent during the period under review. Revenue generated from local sales of chrome ore and ferrochrome amounted to over R17 billion in 2017, while revenue from exports stood in excess of R50 billion, making the export market incredibly lucrative for local producers.

FIGURE 54: CHROME ORE AND FERROCHROME PRICES, 2017



Source: CRU 2018

EMPLOYMENT

Average employment in South Africa's chrome industry stood at 17 143 in 2017, a year-on-year increase of 10.9 percent, with around 67 percent of workers enjoying permanent employment (Table 70). Improved demand and prices meant that producers had to employ additional labour in order to meet production targets. Labour productivity increased by 1.5 percent to 967 tons per worker, while total labour remuneration showed an improvement of 13.9 percent from R4.2 billion in 2016.

TABLE 70: EMPLOYMENT IN SOUTH AFRICA'S CHROME INDUSTRY, 2012 - 2017

YEAR	EMPLOYEES	TOTAL REMUNERATION	AVERAGE REMUNERATION	LABOUR PRODUCTIVITY
		R' 000	R/employee	t/employee
2012	19 758	3 430 889	173 645	572
2013	18 357	3 840 461	209 210	746
2014	18 623	4 038 859	216 875	754
2015	18 449	4 416 943	239 414	848
2016	15 449	4 214 813	272 821	952
2017	17 143	4 803 810	280 220	967

Source: DMR Mineral Economics Directorate

KEY DEVELOPMENTS

During 2017, Hernic opted for business rescue, mainly due to its largest investor, Mitsubishi, disinvesting in the company. Samancor is therefore in the process of acquiring Hernic, pending the Competition Commission's approval. Samancor also succeeded in taking over International Ferro Metals South Africa's (IFM-SA) assets (excluding Sky Chrome) as well as ASA Metals, now known as T.A. Ferrochrome. Assore, which has a joint stake in Assmang with African Rainbow Minerals, has succeeded in acquiring 100 percent ownership in Dwarsrivier Chrome Mine, which brings its chrome operations to a total of two, the other being Zeerust Chrome Mine, which was put on care and maintenance in 2015.

OUTLOOK

Indonesia's stainless steel production is expected to expand in the near future, delivering an additional 4.5 Mt to the global market by 2022. Therefore, the bulk of the increase in global stainless steel production is likely to come from Indonesia from 2018 going forward. To this end, Indonesia will certainly rival China as a ferrochrome demand driver, although ferrochrome demand is forecast to grow at only 3.5 percent globally.

The market is expected to correct in the coming year, thus retarding supply and bringing chrome ore prices to a minimum of around \$150/t, but rising to about \$172/t in quarter 4 of 2018. Therefore, China's imports of South African chrome ore is forecast to rise by 7.6 percent to 10.8 Mt by the end of 2018, 48 percent of which is likely to be UG2 chrome. In addition, the contribution of chrome ore to total mining revenue in South Africa is likely to remain stable at 5 percent, while PGMs' share of total mining revenue is expected to drop to almost 20 percent in 2018, further encouraging the influx of the by-product into the market.

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IRON ORE

RC Ravhugoni

SUPPLY – DEMAND

World iron ore resources are estimated to be greater than 800 billion tons of crude ore containing more than 230 billion tons of iron. Global iron ore reserves were estimated at 83 billion tons in 2017, with Australia accounting for 28.9 percent of the world's reserves, followed by Russia and Brazil at 16.9 percent and 14.5 percent, respectively. South Africa, at 770 million tons (Mt) of known iron ore reserves, accounted for only 0.9 percent of global reserves (Table 71). Following a decline of 2.1 percent in 2016, global iron ore production increased by 7.6 percent in 2017 to 2 400 Mt, with China, South Africa and India particularly responsible for the decline. Australia was the largest producer of iron ore, contributing 37 percent to total global production, followed by Brazil and China at 18 percent and 14 percent, respectively. South Africa's iron ore production stood at 68 Mt, contributing only 3 percent to global iron ore production. South Africa's production increased by 3.0 percent in 2017 compared with 2016, due to improved demand from China and increased production on the back of recovered iron ore prices.

TABLE 71: WORLD IRON ORE RESERVES, PRODUCTION AND EXPORTS, 2017

COUNTRY	RESERVE#			PRODUCTION+			EXPORTS+		
	Mt	%	Rank	Mt	%	Rank	Mt	%	Rank
Australia	24000	28.9	1	880	37	1	841.0	55.5	1
Brazil	12000	14.5	2	440	18	2	375.0	24.8	2
China	7200	8.7	5	340	14	3	0.0	0.0	0
India	5200	6.3	6	190	8	4	24.0	1.6	6
Russia	14000	16.9	3	100	4	6	17.0	1.1	8
Ukraine	2300	2.8	7	63	3	7	33.0	2.2	6
South Africa	770	0.9	9	68	3	7	65.0	4.3	4
Iran	1500	1.8	8	35	1	9	18.0	1.2	10
United States	760	0.9	9	46	2	8	8.0	0.5	7
Canada	2300	2.8	7	47	2	8	42.0	2.8	5
Sweden	2200	2.7	8	27	1	9	22.0	1.5	7
Other	9500	11.4	4	110	5	5	69.0	4.6	3
2017	83000			2400			1514		
2016	82000	100		2230			1542	100	

Sources: * DMR Directorate Mineral Economics, 2017, -ISSB, # USGS, 2018 (Reserve – Iron content), +CRU (exports data)

Global steel production stood at 1 691.2Mt in 2017, a 5.2 percent increase compared with 2016, with global steel demand dropping by 2.3 percent in the same period. China remained the largest steel producer at 831.7 Mt in 2017, a 5.6 percent increase year on year. Due weak demand from the steel sector, global iron ore exports decreased by 1.8 percent to 1 514Mt in 2017 compared to 1 542Mt 2016 with Australia being the leading exporter at 55.5 percent, followed by Brazil at 24.8 percent and South Africa in the 4th place at 4.3 percent.

TABLE 72: SOUTH AFRICA'S PRODUCTION AND SALES OF IRON ORE: 2008 - 2017

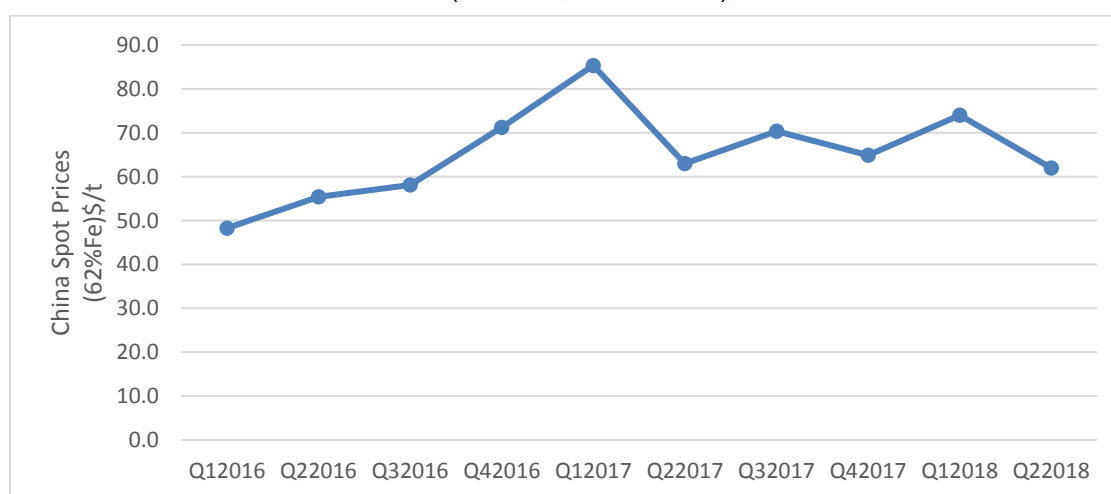
YEAR	PRODUCTION	LOCAL SALES			EXPORT SALES		
		Mass	Value	Unit Value	Mass	Value	Unit Value
	kt	kt	R'000	R/t	Kt	R' 000	R/t
2008	48 983	11 258	1 974 629	175	32 766	20 267 206	619
2009	55 313	8 369	1 888 801	226	44 550	25 242 934	567
2010	58 709	10 561	3 270 746	310	47 493	40 148 279	845
2011	58 057	9 844	4 207 746	427	51 763	58 444 148	1126
2012	67 100	8 393	4 448 978	530	57 110	48 193 830	844
2013	71 543	9 295	5 782 442	622	58 180	57 385 286	986
2014	80 759	9 571	5 741 815	600	61 962	52 957 447	855
2015	70 947	7 303	4 878 887	672	62 773	33 599 516	532
2016	69 295	6 160	3 855 829	626	58 237	39 125 635	672
2017	74 834	7 073	5 137 619	726	60 869	44 333 905	728

Source: DMR Directorate Mineral Economics, 2017

PRICES AND REVENUE

Average annual iron ore spot prices, for grade 62 percent iron content (62%Fe) averaged at \$70.8/t in 2017, a 21.6 percent increase compared with an average spot price of \$58.2/t in 2016 for the same grade (Figure 55). This was due to decreased port stocks for higher grade lumpy ore in China, coupled with increased demand for this type of ore. The iron ore spot price hit a high of \$94.86/t in February 2017 and declined by 5.8 percent to \$86/t in March 2017. Prices continued to decline and averaged at a low of \$55/t in June 2017, before increasing to reach an average of \$74/t in August 2017. However, prices did decline, again, to an average spot price of \$61/t in October 2017 and concluded the year at an average spot price of \$71/t in December 2017. The up and down of iron ore spot prices resulted in steel mills opting to buy cheaper iron ore that is stockpiled in ports, rather than the higher-grade, seaborne metal supplied by the likes of BHP and Rio, thus impacting iron ore prices

FIGURE 55: IRON ORE PRICES (62% Fe, CFR China), 2016 – Q2 2018



Source: www.crugroup.com- Iron ore prices 2016 to 2018

EMPLOYMENT

Employment in South Africa's iron ore industry increased by 5.1 percent from 16 491 in 2016 to 17 345 in 2017, contributing 3.7 percent to total mining employment during this period (Table 73). Permanent employees made up about 48.5 percent and contractor's 51.5 percent of total employment, as most mines, including Sishen, Khumani and Kolomela increased their labor force, taking advantage of recovered iron ore prices and increased demand. As indicated in Table 73, total remuneration and average remuneration per employee decreased by 1.4 percent and 6.1 percent, respectively. This was largely due to an increase in the number of contractors, as iron ore producers ramped up production, taking advantage of recovered demand from China. Average labor productivity doubled to 4.3 kilotons per employee, indicating improved and efficient working conditions.

TABLE 73: SOUTH AFRICA'S IRON ORE INDUSTRY'S EMPLOYMENT AND REMUNERATION: 2017

YEAR	EMPLOYEES	TOTAL REMUNERATION	AVERAGE REMUNERATION	LABOUR PRODUCTIVITY
		R'000	R/employee	t/employee
2010	18 216	3 037 417	166 744	3 223
2011	22 361	6 506 607	290 980	2 596
2012	23 380	4 690 572	200 923	2 870
2013	21 145	4 845 091	229 136	3 383
2014	21 798	5 659 707	261 063	3 705
2015	20 613	6 224 916	301 990	3 442
2016	16 491	5 878 117	356 443	2 161
2017	17 345	5 791 755	334 907	4 314

Source: DMR Directorate Mineral Economics, 2017

KEY DEVELOPMENTS

2017 saw Junior iron-ore miner Assen Iron Ore, under Mangwe Mining coming into the iron ore stream in South Africa. Manngwe Mining plans to expand its asset base and increase production at its existing operation over the next five years, to provide integrated steel and mining company ArcelorMittal South Africa (AMSA) with between four million tons and five million tons of iron ore a year. The mine has some measured resources of 20Mt, with an estimated 12-year life of mine and, phase one of the development of the mine will focus on mining detrital ore, for an estimated 3-year period. This will be done while a feasibility study for the exploitation of the main orebody of high-quality hematite calcitic and banded iron ores located in the mountainous area is being finalized. The mine and dense-media-separation (DMS) plant was developed at a cost of R180-million and will initially target production of 60 000 t/m of saleable ore for delivery exclusively to Arcelo Mittal South Africa (AMSA). The mine currently employs about 220 people on site, which includes the contractors that installed the R120 million DMS plant.

Autumn Skies Resources and Logistics (ASR & L) has been developing its Autumn Skies Iron Ore (ASIO) mine, which is South Africa's first private fully Black Economic Employment (BEE) owned iron ore mine. The mine has an investment capital of R182 million, and about 42 000 tons of ore will be transported every month, via the Transnet Sishen-Saldanha rail. An estimated 504 000 tons will be produced for the first year and was due to commence on the 1st February 2018, with a hope of reaching 1Mtpa over the next 12 to 18 months. The primary pilot production and logistics runs

were successful with approximately 20 000 tons on stockpile at Transnet Port Terminal (TPT) in Saldanha harbor. The mine will be producing top grade export iron ore, due to a new Jig Plant that was expected to come on stream by the end of January 2018 and, a new Crushing and Screening Plant was expected to come on line at the end of March 2018. Autumn Skies Iron Ore Mine will employ approximately 153 employees and contractors, adding growth and prosperity to the Northern Cape population, which is tremendously dependent on the mining industry.

OUTLOOK

It is anticipated that global steel demand will reach 1 616 Mt in 2018, an increase of 5.2 percent compared to 1 535 Mt over 2017. Global growth is expected to moderate, mainly due to slower growth in China, while in the rest of the world, steel demand will continue to maintain its current momentum. World steel demand is recovering well, driven largely by cyclical factors rather than structural. The lack of a strong growth engine to replace China and a long-term decline in steel intensity due to technological and environmental factors, will continue to weigh on steel demand in the future.

Together with weakening iron ore demand in China over the medium-term, increases in both iron ore production and seaborne exports from new iron ore projects are the key drivers that will continue to add pressure to iron ore prices in 2018 and 2019. In addition, elevated prices for high-grade material and a strong US Dollar are also bringing idled projects, that were previously unprofitable, back to the market. It is expected that 2018 will mark the low point of the iron ore cycle with prices averaging \$52/t. From 2019/2020 a gradual price recovery is expected as a more concentrated industry structure leads to enhanced pricing power and positive cost push. Incentive price analysis indicates long run price support around \$60/t Cost and Freight (CFR) effective from 2025. Despite added production from mines such as Assen Iron Ore and Autumn Skies Iron Ore mine in 2018, South Africa's iron ore production is expected to stagnate at about 58Mt, as the mines such as Assen Iron ore and Autumn Skies would not have reached full production ramp up.

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MANGANESE ORE

RC Ravhugoni

SUPPLY – DEMAND

Global manganese reserves averaged 680 million tons (Mt) in 2017, with South Africa leading at 29.4 percent, followed by Ukraine and Brazil at 20.6 percent and 17.6 percent, respectively (Table 74). Global manganese ore production averaged 22.7 Mt, a 42.1 percent increase compared with 2016, with South Africa contributing 62.1 percent, followed by China and Australia at 15.6 percent and 9.7 percent respectively. The increase in global manganese ore production was due to an increase in South Africa's production by 3.1 percent from 13.4kt in 2016. World crude steel production reached 1 691.2 million tons (Mt) for the year 2017, increasing by 4.0 percent compared to 2016. Crude steel production increased in all regions in 2017, except in the CIS, which remained stable. China's crude steel production in 2017 reached 831.7 Mt, up by 5.7 percent, compared with 2016, with the countries share in steel production increasing to 49.6 percent compared from 49.4 percent. The European Union, an economic and political block, which consists of 28 countries, Belgium, Bulgaria, Czech Republic, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Croatia, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden, United Kingdom, (EU-28), produced 168.7 Mt of crude steel, an increase of 4.1 percent compared to the previous year.

TABLE 74: GLOBAL MANGANESE ORE RESERVES, PRODUCTION AND EXPORTS: 2016-2017

COUNTRY	RESERVES#			PRODUCTION*			EXPORTS#		
	MT	%	Rank	Mt	%	Rank	Mt	%	Rank
South Africa	200	29.4	1	14.1*	62.1	1	13.4	38.1	1
China	48	7.1	5	2.5	15.6	2	0.36	1.7	7
Australia	94	13.8	4	2.2	9.7	3	5.5	15.6	2
Gabon	20	2.9	7	1.6	7.0	4	4.3	12.2	3
India	34	5.1	6	0.79	3.5	6	1.1	3.1	5
Brazil	120	17.6	3	1.2	5.3	5	2.6	7.4	4
Ukraine	140	20.6	2	0.38	1.7	7	0.8	2.3	6
Other	24	3.5		0.76	3.3		7.1		
2017	680	100		22.7	100		35.2	100	
2016	690			16			21.6		

Source: +USGS 2018 # CRU Group 2017 # Directorate Mineral Economics, DMR*

South Africa's manganese ore production increased by 2.9 percent to 14.1Mt in 2017 compared to 13.7 Mt in 2016 (Table 75). Export mass increased by 19.2 percent, due to demand for lower grade ore, especially from China. Mines such as Tshipi e Ntle, exported most of the lower grade manganese ore (35 percent and lower manganese ore content), which was previously considered as waste, and formed part of the mine's stockpiles, apart from their higher-grade ore export, thus increasing export mass. South Africa's manganese alloys are dominated by high carbon ferromanganese (HCF_{FeMn}), which accounts for about 57.5 percent of the total alloy production, followed by silico-manganese (SiMn) and medium carbon ferromanganese (MCF_{FeMn}), at about 34.9 percent and 12.9 percent respectively.

TABLE 75: SOUTH AFRICA'S MANGANESE ORE PRODUCTION AND SALES, 2008 – 2017

Year	Production	Local sales		Export sales	
		Mass	Value	Mass	Value
	Kt	Kt	R'000	kt	R'000
2008	6 807	*	1 761	4 689	15 581
2009	4 578	*	583	3 975	5 003
2010	7 171	*	1 320	5 986	9 340
2011	8 651	*	1 325	6 772	8 569
2012	8 943	*	1 134	7 497	9 685
2013	10 957	*	1 506	7 961	12 969
2014	14 051	*	1 644	9 644	14 734
2015	15 952	*	703	10 026	12 657
2016	13 735	*	827	11 245	18 861
2017	14 140	*	1 671	13 403	30 403

Source: DMR, Mineral Economics, 2017, (*) – withheld

The country's manganese alloys output increased by 23.8 percent to 458 kt in 2017, compared with 2016. Similarly, local sales mass increased by 52 percent, while export sales mass saw a decline of 20.5 percent over the same period. (Table 76).

TABLE 76: MANGANESE ALLOYS PRODUCTION AND SALES: 2008-2017

Year	Production		Local sales		Export sales		
	mass	Mass	Value	Unit Value	Mass	Value	Unit value
	Kt	kt	R'million	R/kt	kt	R'million	R/kt
2008	762	126	1 767	14 037	682	1 190	17 451
2009	404	68	597	8 839	413	3 624	8 772
2010	790	65	600	9 264	751	7 015	9 338
2011	1 064	54	482	8 927	854	7 407	8 673
2012	882	60	526	8 749	681	6 158	9 037
2013	787	82	737	8 955	577	4 927	8 539
2014	970	104	1 020	9 780	659	6 334	9 619
2015	614	34	365	10 557	496	4 756	9 572
2016	370	25	249	9597	341	3095	9056
2017	458	38	592	15464	271	4068	14968

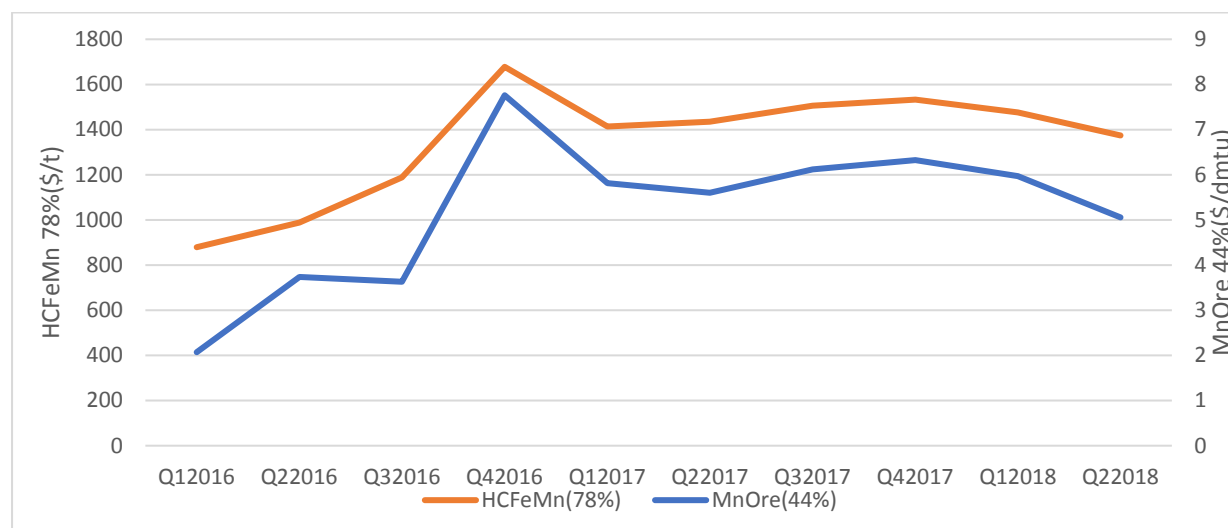
Source: DMR Directorate, Mineral Economics, 2017

PRICES AND REVENUE

Manganese ore prices were supported by supply-side factors in China rather than strong demand, which helped the metal sustain its high price level for longer. Prices for manganese ore prices 44 percent grade declined by 25 percent in Q1 2017 to \$5.8/dmtu while, those for HCFMn 78 percent grade also declined by 15.7 percent to \$1413/t (Figure 56). This was on the back of accumulated ore at Chinese ports, which transferred into stocks, reaching 3.5Mt. Chinese steel mills held off ferroalloys purchases, resulting in lower ferroalloys production, leading to a slowdown in manganese ore demand. Prices showed signs of recovery in Q4 2017, with manganese ore for the grade 44 percent increasing by 3.3 percent to \$6.3/dmtu with that of HCFMn 78 percent grade increasing by 1.8 percent to \$1532/t during the same period, driven by strong demand from China due to the significant improvement in the country's steel market and subsequent growth in ferroalloy production. Manganese ore export sales revenue responded accordingly, increasing by

a staggering 61.2 percent, to R30 403 billion, compared with the R18861 billion in 2016. Manganese alloys export revenue followed suite, increasing by 65.3 percent, to R 14 968 billion, from R 9 656 billion in 2016. The increase in revenue was largely contributed by increased demand from China.

FIGURE 56: MANGANESE ORE AND MANGANESE HIGH CARBONFERROMANGANESE PRICES:



Source: CRU prices 2017

EMPLOYMENT

Employment in South Africa's manganese ore industry increased by 10 percent from 7 239 employees in 2016 to 7 981 employees in 2017, due to a significant increase in the number of established employees by 10.3 percent (Table 77). Permanent employees and contractors made up about 50.7 percent and 49.3 percent of total employment, respectively. Total remuneration increased by 20 percent in line with the increase in employment. Average normal earnings per employee also increased by 8 percent due to some producers paying bonuses, and retrenchment packages in that period. Average labor productivity averaged at 1.7 kt per employee in 2017, declining by 7.1 percent compared with 2016.

TABLE 77: SOUTH AFRICA'S MANGANESE ORE INDUSTRY'S EMPLOYMENT, 2010 - 2017

YEAR	EMPLOYEES	TOTAL REMUNERATION	AVERAGE REMUNERATION
		R'000	R/employee
2010	5 879	946 139	160 476
2011	7 460	1 277 636	171 257
2012	8 685	1 565 264	179 998
2013	9 866	1 948 537	194 903
2014	9 966	2 302 514	231 036
2015	8 639	2 199 372	254 586
2016	7 239	2 038 555	281 581
2017	7 981	2 437 046	305 340

Source: DMR Directorate Mineral Economics, 2017

KEY DEVELOPMENTS IN SOUTH AFRICA

2017 saw one of South Africa's new mines, Tshipi e Ntle, becoming the largest manganese ore mine exporter in South Africa, and the third largest producer, globally. With these achievements, the mine remains on track to achieve its record production target of 3 Mt for the financial year 2018. The mine is awaiting the awarding of the mining right, for its proposed Mokala Manganese project, which is said to have an estimated 80Mt of manganese ore resource, of which 12Mt will be amenable to open cast mining. Agreements have been reached, for the joint venture of Lehating Mining and a future mining right within the Wessels prospecting area.

OUTLOOK

Global steel demand is envisaged to reach 1,616.1 Mt in 2018, an increase of 1.8 percent compared with 2017. For 2019, global steel demand is estimated to grow by 0.7 percent. to reach 1,626.7 Mt. Steel production cuts in China during the heating season, are expected to reduce demand for ferroalloys, thus decreasing their production and demand for manganese ore. This is expected to lead to manganese ore price declines. Manganese demand will continue to track the development of world steel production, though the use of manganese per tonne of steel has been on a declining trend in recent years. Global steel output remains buoyant, underpinned by strong Chinese crude steel output. However, with Chinese crude steel output expected to stabilise over the medium term, and with manganese ore and alloy production currently increasing strongly, there is a possibility for the manganese market to move into oversupply which should incite an overdue correction in prices.

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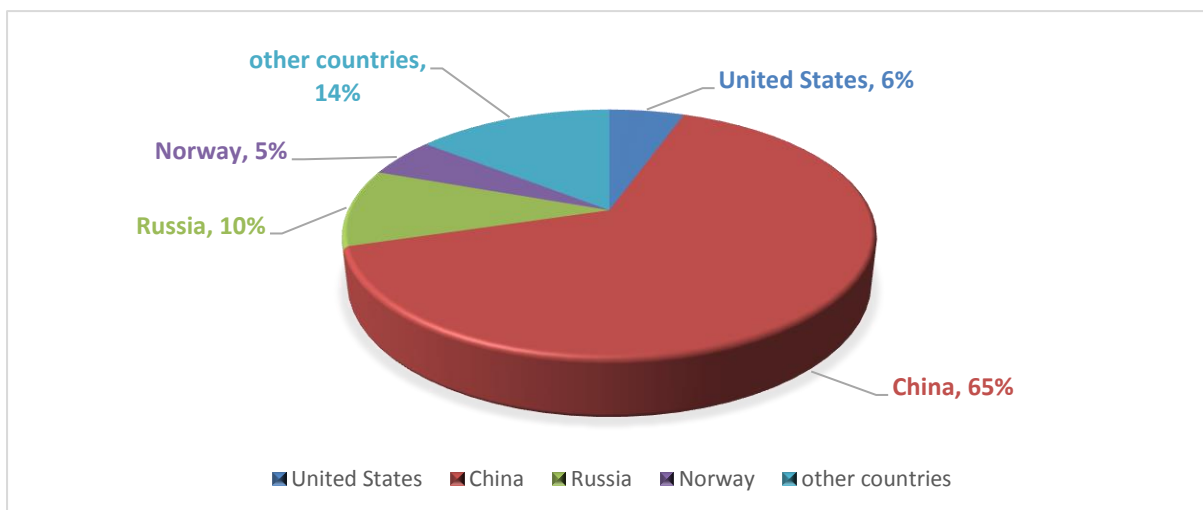
SILICON

R.C Ravhugoni

SUPPLY-DEMAND

Silicon is the second most common element in the Earth's crust, even though it is hard to find it in nature as a pure element. Sources of silicon are not quantitatively estimated due to their abundance and are reported to be passable to supply world demand for decades. The global oversupply in the market combined with decreased steel production and weak aluminium alloy demand have negatively affected global silicon demand, ferrosilicon and silicon metal production, which declined by a combined 4 percent to 740 Million tons (740 Mt tons) in 2017. China continued to dominate the markets in 2017, with an output of 65 percent of total silicon production (Figure 57), followed by Russia at 10 percent, with Norway and the United States of America contributing less than 10 percent each.

FIGURE 57: GLOBAL SILICON PRODUCTION PERCENTAGE BY COUNTRY 2017



Source: USGS Geological Survey 2017

Global silicon metal consumption grew by 6.3 percent in 2017, compared with 2016, supported by strong growth in all of its main end-use sectors, especially solar. Consumption in solar applications almost quadrupled between 2010 and 2017, driven by the enormous growth of photovoltaic solar installations worldwide. However, South Africa's silicon production decreased by 82.3 percent to 4.7 kilo tons in 2017 compared with 2016 (Table 78) due to closures of most of the furnaces. Local sales mass stood at 1.0 kt, a 9.1 percent decline compared with 2016, while exports mass followed the same trend, declining by 59.7 percent to 26.9 kt in 2017. High electricity tariffs coupled with low silicon metal demand, lead to a decline in production, as most furnaces were closed during this period.

TABLE 78: SOUTH AFRICA'S PRODUCTION AND SALES OF SILICON METAL, 2008 – 2017

YEAR	PRODUCTION		LOCAL SALES		EXPORT SALES		
	Mass	Mas	Value		Mass	Value	
	kt	s kt	R'000	R/t	kt	R'000	R/t
2008	51.8	3.9	87 443	22 438	53.5	1213 107	22 669
2009	38.6	6.4	91 586	14 310	38.4	640 413	16 677
2010	46.4	10.8	106 016	9 816	62.4	822 406	13 187
2011	58.8	10.6	66 576	6 283	63.1	1 073 668	17 008
2012	53	15.1	62 044	4 099	59.4	928 424	15 641
2013	34.1	2.1	26 354	12 604	31.3	809 719	25 882
2014	47.2	1.6	41 381	25 663	40.8	1 183 683	29 011
2015	46.3	1.9	53 781	27 383	42.2	1 508 051	35 716
2016	26.6	1.1	29 351	27 431	25.6	741 125	28 869
2017	4.7	1	27 581	26 934	10.3	297 426	28 745

Source: DMR, Directorate Mineral Economics: 2017

Global ferrosilicon consumption was lower in 2017 compared with 2016, even though world crude steel output grew by 20 percent over the same period. The main reasons for this decline in ferrosilicon consumption have been a trend towards using less ferrosilicon per tonne of crude steel in China, and very slow growth in world output of iron castings, partly because of greater use of aluminium in place of cast iron in automobiles. South Africa's ferrosilicon production decreased by 34.1 percent to 48.2 kt in 2017 compared with 73.2 kt in 2016. (Table 79). Ferrosilicon producers in Limpopo and Mpumalanga closed down in 2017, due to high electricity prices, resulting in a decline in production and local sales, while weak demand from China and global overcapacity in production of steel resulted in a decline of export sales mass. Local sales mass decreased by 23.7 percent to 30.9 kt, while export mass decreased by 66.7 percent to 8.6 kt in 2017 compared with 25.8 kt in 2016, bringing the total sales volume to 56.2 kt, a 15.2 percent drop compared with the previous year.

TABLE 79: SOUTH AFRICA'S PRODUCTION AND SALES OF FERROSILICON, 2008 - 2017.

YEAR	PRODUCTION		LOCAL SALES		EXPORT SALES		
	Mass	Mass	Value	Unit value	Mass	Value	Unit value
	kt	kt	R'000	R/t	kt	R'000	R/t
2008	134.5	71.2	842 183	11 835	44.2	512 037	11 573
2009	110.4	60.9	659 855	10 835	43.6	460 901	10 571
2010	127.7	63.6	710 333	11 169	59.2	631 765	10 672
2011	126.2	57.3	693 448	12 111	67	811 277	12 115
2012	83.1	57.2	702 315	12 269	32.7	436 858	13 360
2013	78.4	52.1	724 560	13 941	32.4	503 142	17 128
2014	87.7	46.3	709 886	15 332	29.8	495 148	16 615
2015	91.8	45.4	696 349	15 395	34.4	615 023	18 105
2016	73.2	40.5	629 729	15 497	25.8	527 325	22 255
2017	48.2	30.9	522 321	16 872	8.6	237 692	27 517

Source: DMR, Directorate Mineral Economics: 2017

PRICES AND REVENUE

Prices for both silicon metal and ferrosilicon are mainly cost driven in the long term, though supply-demand factors can have a major impact on prices in the short term. Through 2017 and the first half of 2018, prices for both silicon metal and ferrosilicon have been much higher than in the preceding two years, partly due to rising production costs and market tightness. Average ferrosilicon spot prices, based on US market increased by 20.5 percent to \$1 284.1/t in 2017 compared with \$1 066.1/t in 2016, reflecting a recovery in an oversupplied market the previous year. For the same period, Silicon metal prices saw a slight decline of 1.1 percent to \$1 664.1/t compared with \$1 682/t in 2016.

OUTLOOK

Overall supply will continue to exceed global silicon metal demand for some time due to sluggish demand from secondary downstream producers, this despite expected output from new smelter operations coming on stream, and the resumption of production from China over the monsoon season. This disparity will exert downward pressure on silicon metal prices in 2018. The US market is expected to experience the steepest decline in prices during this time as prices in the European Union (EU) and other markets already have seen a sharp downward correction. Rising replacement costs will remain the main driver of US silicon metal prices until the final outcomes of the US antidumping and countervailing duty investigations are known. The resulting impact on trade flows will potentially also influence prices to some extent in other markets, the EU in particular. Temporarily, a combination of higher production costs and tightening supply suggests that silicon metal prices outside the USA will advance at least moderately during early 2018. Silicon production in South Africa is expected to increase as companies due to a Special Pricing Agreement (SPA) between Eskom and Silicon Smelters. The agreement was confirmed by The National Energy Regulator of South Africa (Nersa), approved in August, and expected to commence no later than 01/07/2018, and continue for a maximum of two years. This will see Silicon producers, who had initially suspended production to resume, taking advantage of the agreement, thus increasing production in South Africa.

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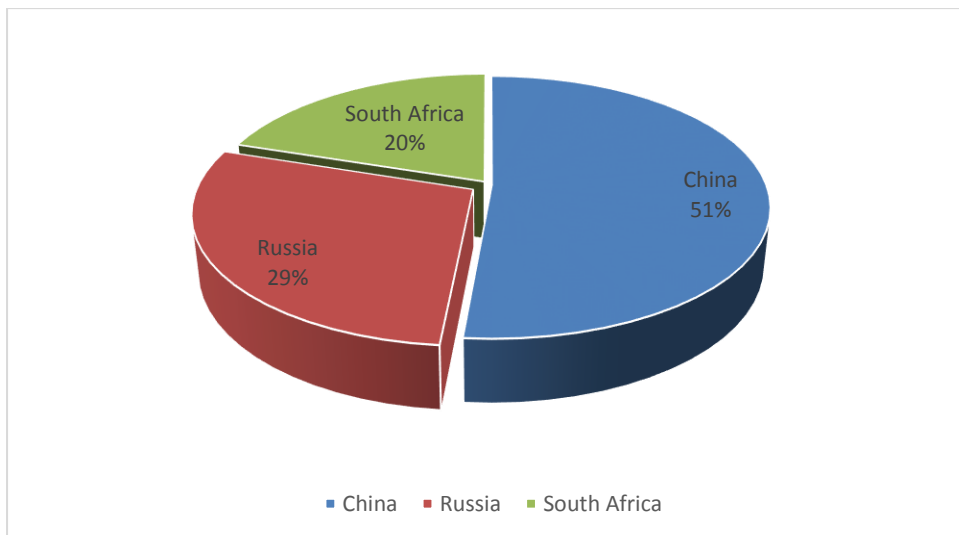
VANADIUM

Mandisa Khaile

SUPPLY – DEMAND

In 2017, world vanadium reserves were estimated at 20 million tons (Mt), with more than half being located in China, and the remainder apportioned to Russia and South Africa (Figure 58). Vanadium is mainly used in steelmaking in the form of ferrovanadium (FeV) and, is preferred for its anti-corrosion properties, as well as its ability to reduce the overall weight of material, and has as a result found application in the aerospace and automotive industries. Vanadium pentoxide (V_2O_5) is another vanadium product that is mostly used as an electrolyte in vanadium redox flow batteries.

FIGURE 58: WORLD VANADIUM RESERVES, 2017

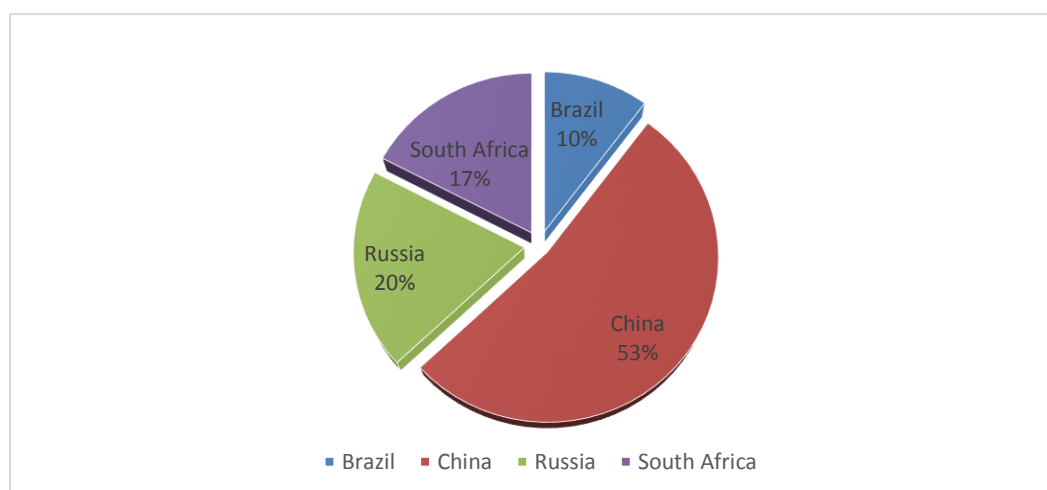


Source: USGS, *Mineral Commodity Summaries*, 2018

In 2017, China, the leading consumer of vanadium products, enforced stricter standards to tensile strength of rebar products, which gave impetus to the demand for vanadium and vanadium products in that country and, although supply tightened, it helped boost prices to levels higher than those recorded in 2014. On the other hand, the vogue of vanadium redox flow batteries (VRFBs) in the recent past, coupled with a ban on import scrap in China, has lunged the V_2O_5 market into a near deficit during 2017, which was further exacerbated by the sustained closure of Evraz Highveld's vanadium operations.

Global vanadium production amounted to 80 kilo tons (kt) in 2017, a 1.3 percent increase from 2016. China accounted for 53 percent of global output, making it the leading producer. Sadly, South Africa came second to Russia, which produced 20 percent of the world's vanadium output, with Brazil accounting for only 10 percent (Figure 59). Amid stricter regulations in China, the country displayed resilience, as production still rose by 2.3 percent, triggering the global increase. This was well aligned with steel production, which rose by 3.3 percent to 1 689 million tons (Mt) from 1 627 Mt in 2016.

FIGURE 59: WORLD VANADIUM PRODUCTION, 2017



Source: USGS Mineral Commodity Summaries, 2018

South Africa's vanadium production fell by 10.7 percent year-on-year (y-o-y) in 2017, (Table 80), with zero production coming from Evraz Highveld Steel & Vanadium, since opting for business rescue in 2015, leaving only two major players in the local vanadium space, viz. Glencore and Bushveld Minerals. Local sales mass remained relatively unchanged at 291 tons (t), while export sales mass decreased by 2.9 percent, amid supply shortages.

TABLE 80: SOUTH AFRICA'S PRODUCTION AND SALES OF VANADIUM, 2008 – 2017

YEAR	PRODUCTION	LOCAL SALES			EXPORT SALES		
		Mass	Value (FOB)		Mass	Value (FOB)	
	kt	kt	R'mil	R/kg	kt	R'mil	R/kg
2008	20.3	2.3	893	391	12.1	3 090	256
2009	14.4	1.8	267	149	11.9	1 360	116
2010	22.6	1.9	286	152	16.9	2 182	129
2011	21.7	1.7	270	155	17.9	2 288	128
2012	20	1.4	211	148	15.5	2 279	147
2013	21.3	2	349	147	15.1	2 637	175
2014	21.5	2	381	187	13.6	3 174	232
2015	17.8	1	193	193	10.6	2 122	201
2016	15.9	0.3	72	243	10.1	1 926	191
2017	14.2	0.3	110	379	9.8	2 757	280

Source: DMR, Mineral Economics, 2017

PRICES AND REVENUE

V₂O₅ and FeV supply deficits contrived the exceptional performance of prices during 2017, with the former averaging 11.74 dollars per pound (\$11.74/lb) in the first quarter (Figure 60). By the end of quarter 3, the V₂O₅ price had peaked to an average of \$20/lb, but lost momentum by 8.9 percent by quarter 3, to \$18.22/lb. Year-on-year, the price of FeV rose in excess of 87 percent to \$40.93 per kilogram, on the back of improved demand by Chinese steelmakers. In light of this, export sales

revenue saw an increase of over 40 percent from R1.9 billion in 2016, despite a 9.5 percent appreciation of the rand against the US dollar. Local sales revenue, on the other hand, also responded positively to supply side challenges, increasing to R110 million compared with R72 million in 2016.

FIGURE 60: MONTHLY FERROVANADIUM AND VANADIUM PENTOXIDE PRICES, 2014 - 2017



Source: Metal Bulletin, 2018

EMPLOYMENT

Average annual employment in South Africa's vanadium industry saw a dramatic 25 percent decrease, following retrenchments at Evraz Highveld Steel & Vanadium (Table 81). Similarly, total remuneration also declined by 15 percent from R670 million in 2016 to R569 million in 2017. The rise in average remuneration per employee in 2017 was effected by the drop in the number of workers in-service, coupled with an increase in severance pay-outs during the same period.

TABLE 81: EMPLOYEMENT IN SOUTH AFRICA'S VANADIUM INDUSTRY, 2011-2017

YEAR	EMPLOYEES	TOTAL REMUNERATION	AVERAGE REMUNERATION	LABOUR PRODUCTIVITY
		R' 000	R/employee	t/employee
2011	1 436	520 683	326 593	15
2012	1 489	533 741	358 456	13
2013	1 496	585 744	391 540	14
2014	1 534	634 265	415 427	14
2015	1 493	566 334	379 326	12
2016	1 480	670 910	453 221	11
2017	1 109	569 257	513 345	13

Source: DMR, Mineral Economics, 2017

KEY DEVELOPMENTS

South Africa's first VRF battery is set to be commissioned by Bushveld Energy for testing by Eskom, as part of its energy mix diversification. This is also in an effort to advance the vanadium value chain in the country, which will go a long way towards realising government's mineral beneficiation objectives. After opting for business rescue in 2015, Mapochs was provisionally liquidated in 2016 and, finally went on auction and sold to the Chinese company, International Resources Limited (IRL) in 2017. The Ironveld High Purity Iron Vanadium and Titanium project, which is located in the Limpopo province, will no longer continue with the construction of a 15 Mega Watts (15MW) smelter to process vanadium ore, but will instead acquire a smelting facility with half the envisaged capacity, negotiations of which are currently on afoot.

OUTLOOK

The ban on scrap imports in China is expected to see around 5.5 kt of V_2O_5 being cut from the country's annual production while consumption rises by almost 30 percent, thus heightening prices, yet leaving the market out of balance. Around 50 to 60 percent of the lumpy ore which was produced by Mapochs is expected to come on stream, once the mine restarts possibly in 2019. Being one of the leading producers of vanadium globally, South Africa is well positioned to sway the market back into balance, once this development sees fruition. However, sluggish steel output in China might negate this, even amid structural steel regulations by the government of that country. In the interim, these developments are expected to bolster prices to the \$30/lb and \$61.89/kg marks for V_2O_5 and FeV, respectively, going into 2018.

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INDUSTRIAL MINERALS OVERVIEW

PR Motsie

INTRODUCTION

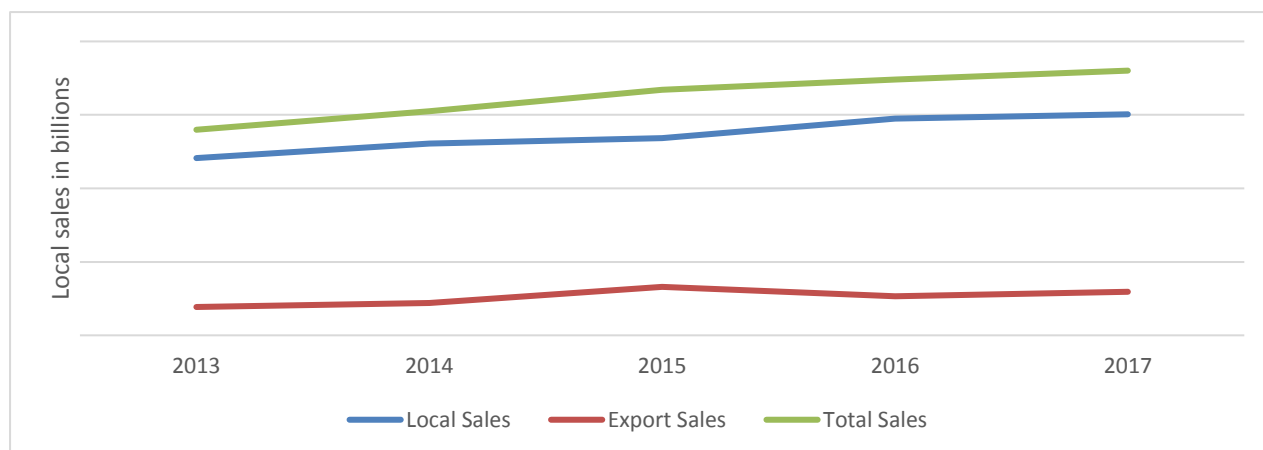
Industrial minerals comprise of a highly diverse group minerals and rocks that are mostly used for a country's developmental agenda in construction, agriculture and chemicals. The minerals are generally high volume, low value commodities compared with other minerals, making their economic exploitation highly dependent on transport costs and distance to the market. Because of their low value, some companies mining these minerals have a high degree of vertical integration, in that they mine raw materials and beneficiate them to the stage of final product.

The mining of industrial minerals has important implications for locally driven industrialisation programmes towards broad based development. The industrial minerals sector presents the country with the opportunity to develop a strong and varied industrial base whereby small-scale miners can contribute to the creation of decent jobs as well as poverty alleviation. These minerals, despite their low unit value, offers the highest, most sustained and realistic potential for greater value retention and linkages with the rest of the economy. Key to this sector, is the performance of the mineral consuming market which drives the demand for industrial minerals. This is often led by the economic performance, population growth and development.

SALES TRENDS

Between 2013 and 2017, total sales of primary industrial minerals grew at a compound annual rate of 6.4 percent (Fig 61). Total revenue generated from industrial minerals sales in 2017 was R18 billion, an increase of 3.5 percent compared with the previous year and accounted for 3.8 percent of total revenue to mining contribution. Local sales value increased by 2 percent to R15 billion while export sales rose by 11.7 percent to R3 billion resulting from high export volumes of fluorspar compared with the previous period (Table 83).

FIGURE 61: INDUSTRIAL MINERAL SALES, 2013 – 2017



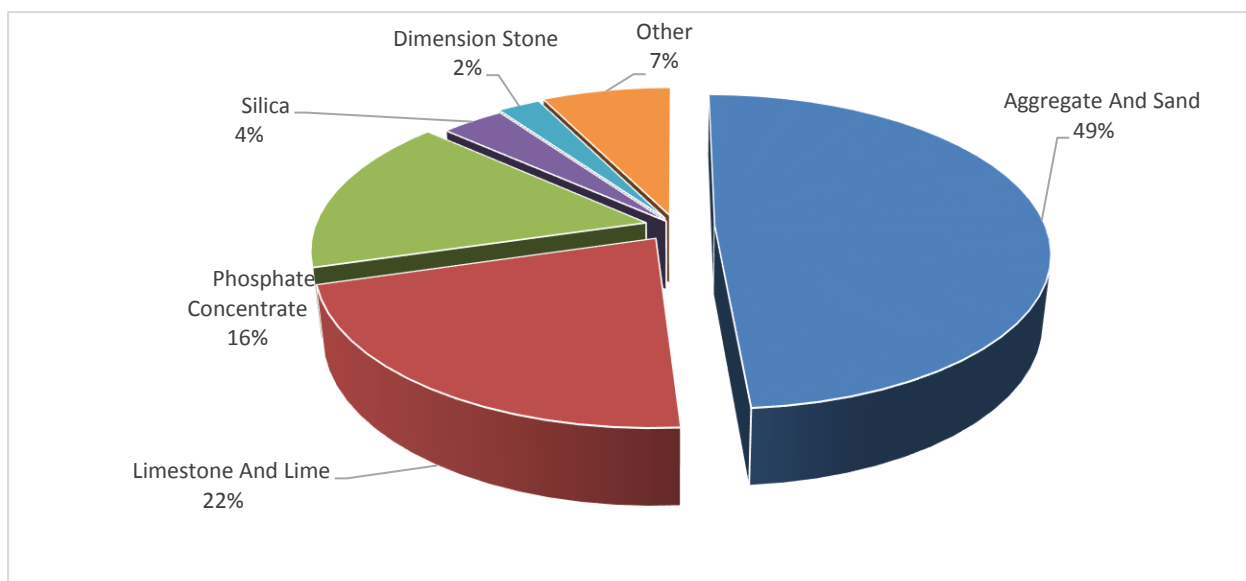
Source: DMR, Directorate Mineral Economics

DOMESTIC SALES

Consumption of industrial minerals is mostly driven by domestic demand from the construction and agricultural sectors (Fig 62). As most industrial minerals are low priced commodities and sold in large volumes, their economic exploitation is highly affected by transport costs and distance to markets. Hence, logistics account for a large share of the final delivered price of the mineral.

The value of industrial minerals sold locally, increased by 2 percent from R14.7 billion in 2016 to R15 billion in 2017 (Table 82 & 83), because of increased demand for special clays in various applications ranging from ceramics, liquid fertilisers and construction. Demand for special clays in construction improved on the back of power-plants built programme.

FIGURE 62: LOCAL SALES VALUE OF INDUSTRIAL MINERALS, 2017

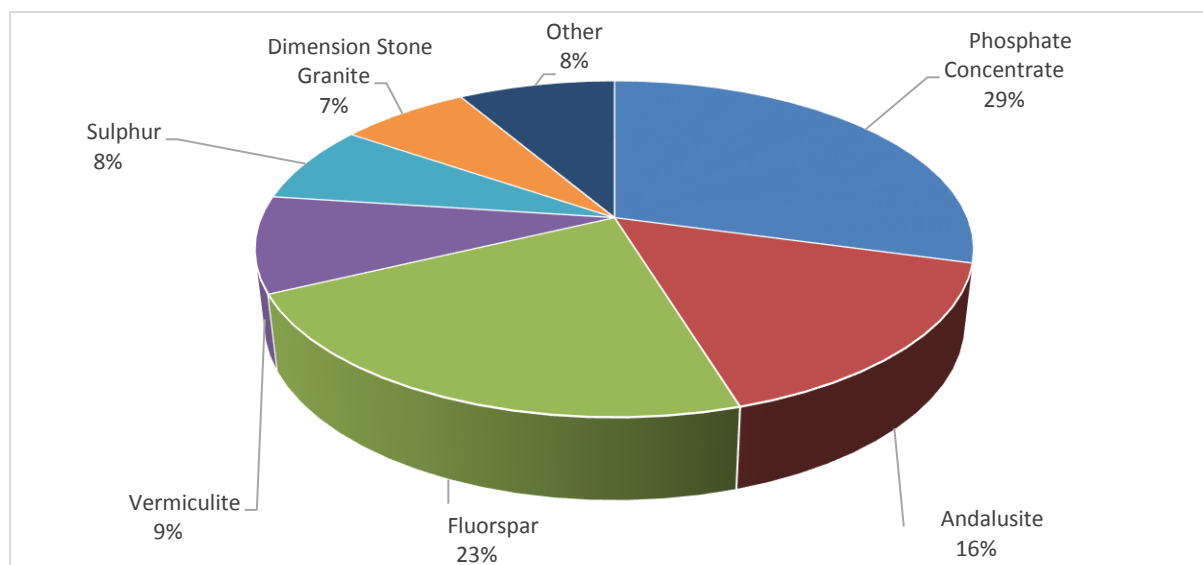


Source: DMR, Directorate Mineral Economics

EXPORT SALES

Export sales values of industrial minerals increased by 11.7 percent from R2.7 billion in 2016 to R3 billion in 2017 mainly due to increased demand of fluorspar in international markets. Furthermore, export sales were driven by an increase phosphate rock demand. The biggest contributors to export sales of industrial minerals in 2017 were phosphate rock (29 percent), fluorspar (23 percent) and andalusite (16 percent) (Fig 63).

FIGURE 63: EXPORT SALES OF INDUSTRIAL MINERALS, 2016

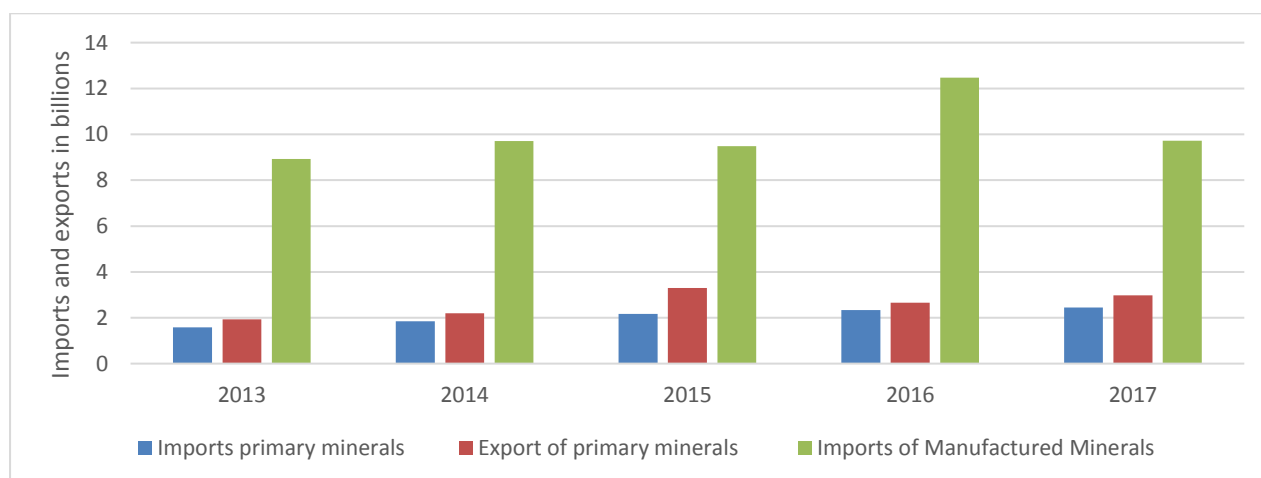


Source: DMR, Directorate Mineral Economics

IMPORTS

In 2017, expenditure on imports of primary industrial minerals increased by 5.1 percent to R2.5 billion compared with 2016, owing to a surge in sulphur imports for fertilisers (Table 84 and Fig 64). Imports of manufactured industrial commodities decreased by 22 percent to R9.7 billion in the same period, resulting from the decrease in glass and glassware products imports compared with 2016 (Table 85).

FIGURE 64: IMPORTS AND EXPORTS OF PRIMARY AND MANUFACTURED INDUSTRIAL MINERALS, 2013 – 2017

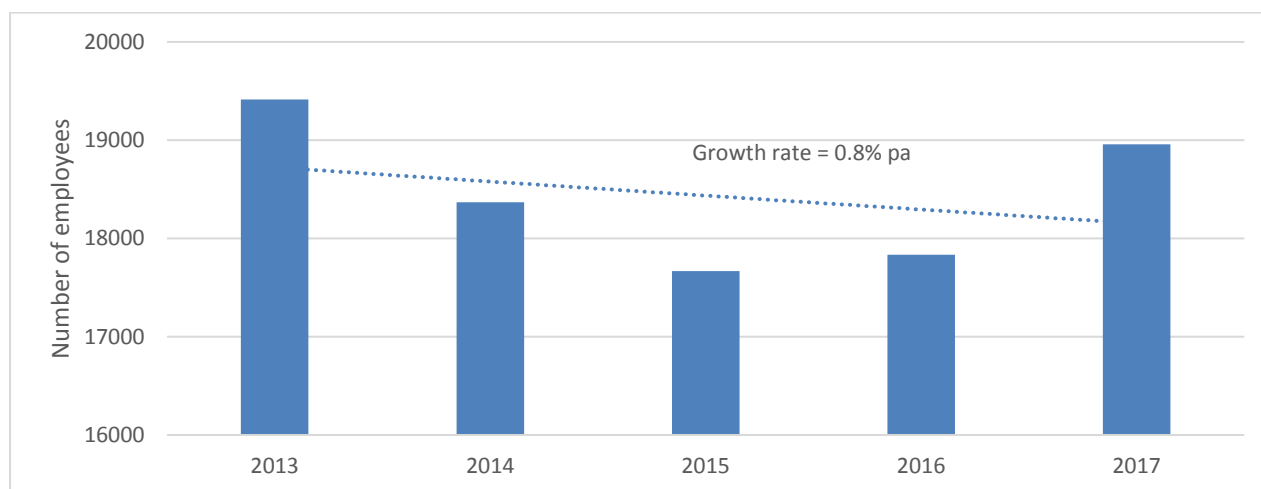


Source: RSA, Commissioner for South African Revenue Service, 2013 – 2017

EMPLOYMENT

Employment in the industrial minerals sector declined by an annual rate of 0.8 percent for the period 2013 to 2017 (Fig 65). However, the sector's employment increased by 6.3 percent (year-on-year), to 18 957 employees in 2017. Industrial minerals employment accounts for 4.1 percent of the total mining workforce, with average annual earnings per employee of R186 374 in 2017, a 5 percent increase from 2016. Revenue generated per employee decreased by 2.6 percent compared with the previous period.

FIGURE 65: EMPLOYMENT IN THE INDUSTRIAL MINERALS SECTOR, 2013 – 2017



Source: DMR, Directorate Mineral Economics

OUTLOOK

South Africa's GDP growth is projected to average 0.7 percent in 2018 and gradually rise to 2.3 percent by 2021. In a bid to get the economy on a higher growth path and to encourage job creation, the President of the Republic has announced a plan to support economic recovery by establishing an infrastructure fund among other initiatives, to partner with private sector to increase investment in public infrastructure.

Total revenue generated from industrial minerals sales in 2017 was R18 billion, accounting for 3.8 percent of total revenue contribution to mining amid recovery in commodity prices. The impact of domestic factors on economic growth has been partially offset by improved global growth and commodity prices. Tight supply and strong demand of certain industrial minerals such as fluorspar has provided confidence that strong prices will continue into 2019. Recent years' restriction of supply of fluorspar by China has also led to an upward pressure on prices while strong end-market demand will carry on supporting high prices.

Growth in industrial minerals is optimistic on the back of rising demand for fertilisers from the agricultural sector on the back of a continuous increase in crop production to accommodate the growing population. In South Africa, production capacity is expected to increase in the medium term as Kropz, Elandsfontein mine is anticipated to come online in the second half of 2019.

Expected improvement in activity in the construction sector will also support the demand of industrial minerals underpinned by public sector infrastructure expenditure over the next three years, which is estimated at R834.1 billion. South Africa is moving towards accelerated service delivery and it is anticipated that this drive will improve construction activity as infrastructure is one of the main beneficiaries and will subsequently lead to an increase in demand for industrial mineral commodities.

TABLE 82: SOUTH AFRICA'S PRIMARY INDUSTRIAL MINERAL PRODUCTION AND SALES, 2016

COMMODITY	PRODUCTION	LOCAL SALES (FOR)		EXPORT SALES (FOB)		TOTAL SALES	
	Mass (t)	Mass (t)	Value (R)	Mass (t)	Value (R)	Mass (t)	Value (R)
General							
Andalusite	**	**	**	**	**	**	**
Feldspar	127 872	114 195	56 180 710	0	0	114 195	56 180 710
Fluorspar	177 280	10 836	**	162 800	**	173 636	**
Gypsum	262 457	217 704	42 484 389	0	0	217 704	42 484 389
Kieselguhr	**	**	**	**	**	**	**
Magnesite	**	**	**	**	**	**	**
Mica	8	0	0	0	0	0	0
Mineral Abrasives	255 257	0	0	130 308	58 921 898	130 308	58 921 898
Perlite	**	**	**	**	**	**	**
Phosphate Rock	1 696 533	1 555 464	**	476 386	**	2 031 850	**
Pyrophyllite	**	**	7 923 417	**	16 630 953	**	24 554 370
Silica	1 886 069	1 910 920	512 220 499	11 461	34 067 506	1 922 381	546 288 005
Sulphur	280 830	124 894	125 926 713	160 497	266 835 583	285 391	392 762 296
Talc	4 462	4 462	9 469 320	0	0	4 462	9 469 320
Vermiculite	166 483	10 514	24 847 606	56 752	272 705 725	67 266	297 553 331
Salt	473 339	460 443	169 762 159	0	0	460 443	169 762 159
Clays							
Attapulgit	16 374	12 947	6 471 592	0	0	12 947	6 471 592
Bentonite	148 742	117 131	68 056 909	0	0	117 131	68 056 909
Fireclay	985 333	646 630	39 878 255	0	0	646 630	39 878 255
Flintclay	10 203	16 136	29 221 613	533	1 810 153	16 669	31 031 766
Plastic Clay	0	1 588	460 663	0	0	1 588	460 663
Kaolin	21 141	24 070	8 757 911	0	0	24 070	8 757 911
Limestone and Lime	23 355 077	21 129 584	3 011 744 037	5 638	8 388 645	21 135 222	3 020 132 682
Dimension Stone							
Granite		194 143	382 147 969	113 397	245 022 011	307 540	627 169 980
Marble		0	0	0	0	0	0
Slate		60	87 266	0	0	60	87 266
Aggregate Sand and		65 629 556	7 095 152 168			65 629 556	7 095 152 168
Miscellaneous			3 151 373 553		1 753 683 175		4 905 056 728

TOTALS	14 742 166 749	2 658 065 649	17 400 232 398
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Source: DMR, Directorate Mineral Economics

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

***Classified, included under Miscellaneous*

TABLE 83: SOUTH AFRICA'S PRIMARY INDUSTRIAL MINERAL PRODUCTION AND SALES, 2017

COMMODITY	PRODUCTION	LOCAL SALES (FOR)		EXPORT SALES (FOB)		TOTAL SALES	
	Mass (t)	Mass (t)	Value (R)	Mass (t)	Value (R)	Mass (t)	Value (R)
General							
Andalusite	**	**	**	**	**	**	**
Feldspar	116 705	129 691	66 730 035	0	0	129 691	66 730 035
Fluorspar	218 399	9 061	**	232 712	**	241 773	**
Gypsum	320 685	236 944	50 195 071	0	0	236 944	50 195 071
Kieselguhr	**	**	**	**	**	**	**
Magnesite	**	**	**	**	**	**	**
Mica	21	8	72 000	0	0	8	72 000
Mineral Abrasives	257 439	0	0	212 639	209 031 822	212 639	209 031 822
Perlite	**	**	**	**	**	**	**
Phosphate Rock	2 079 294	1 690 338	**	683 076	**	2 373 414	**
Pyrophyllite	**	**	10 507 680	**	14 653 904	**	25 161 584
Silica	2 401 071	2 241 896	540 350 624	3 219	6 050 799	2 245 115	546 401 423
Sulphur	256 700	103 945	108 558 227	155 737	222 435 206	259 682	330 993 433
Talc	3 728	3 727	8 664 863	0	0	3 727	8 664 863
Vermiculite	166 084	9 962	25 053 542	68 697	274 920 062	78 659	299 973 604
Salt	492 844	479 607	190 173 847	102	93 205	479 709	190 267 052
Clays							
Attapulgit	18 333	15 485	8 697 282	0	0	15 485	8 697 282
Bentonite	165 141	114 308	90 663 438	0	0	114 308	90 663 438
Fireclay	430 650	588 021	41 151 971	0	0	588 021	41 151 971
Flintclay	10 064	27 814	31 606 624	945	2 518 419	28 759	34 125 043
Plastic Clay	0	1 331	313 945	0	0	1 331	313 945
Kaolin	31 295	23 794	11 345 805	0	0	23 794	11 345 805
Limestone and Lime	23 765 183	21 049 790	3 248 305 551	16 483	17 908 502	21 066 273	3 266 214 053
Dimension Stone							
Granite		178 152	365 536 276	107 995	207 771 003	286 147	573 307 279
Marble		0	0	0	0	0	0
Slate		848	752 615	0	0	848	752 615
Aggregate and Sand		66 772 032	7 347 966 306			66 772 032	7 347 966 306
Miscellaneous			2 892 194 574		2 016 487 387		4 908 681 961

TOTALS	15 038 840 276	2 971 870 309	18 010 710 585
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Source: DMR, Directorate Mineral Economics

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

***Classified, included under Miscellaneous*

TABLE 84: SOUTH AFRICA'S IMPORTS OF SELECTED PRIMARY INDUSTRIAL MINERAL COMMODITIES, 2015 – 2017

COMMODITY	2015		2016		2017	
	Mass (t)	Value (R)	Mass (t)	Value (R)	Mass(t)	Value (R)
Salt (25.01)	13 636	227 575 664	455 346	241 825 289	436 702	268 568 821
Iron pyrites (25.02)	250	1 333 036	309	1 950 352	263	1 492 253
Sulphur (25.03)	363 097	688 740 181	383 860	530 681 328	534 443	778 401 487
Graphite Natural (25.04)	486	11 346 744	698	12 340 707	947	12 635 581
Sands (25.05)	19 819	31 445 012	10 450	23 562 627	9 702	13 878 021
Quartz (25.06)	3 013	38 605 707	4 391	43 631 557	3 502	37 075 742
Kaolin (25.07)	17 318	85 882 423	13 794	84 598 607	10 641	64 442 452
Bentonite (25.08.10)	89 292	117 892 442	94 494	125 008 360	87 936	111 139 357
Fire clay (25.08.30)	1 496	7 999 270	792	3 537 866	2 377	11 722 443
Other clays (25.08.40)	4 355	23 300 579	3 225	23 499 567	5 133	33 793 854
Alumino silicates (25.08.50)	233	1 094 188	209	1 059 921	366	1 440 565
Mulite (25.08.60)	24	510 963	26	464 598	9	193 926
Chamotte (25.08.70)	138	388 008	36	262 024	225	2 220 371
Chalk (25.09)	919	2 390 067	1 014	3 093 019	198	955 939
Phosphates (25.10)	87	873 992	61 233	13 329 258	61	13 329 258
Barrytes & Witherite (25.11)	2 801	15 028 516	2 101	11 029 945	2	11 029 945
Kieselguhr (25.12)	5 554	37 889 485	4 300	34 318 224	5 853	46 043 650
Natural Abresives (25.13)	1 645	8 177 468	1 902	8 618 345	2	8 618 345
Slate (25.14)	2 976	12 125 568	631	3 367 094	554	3 491 352
Marble (25.15)	1 282	16 729 943	8 059	15 213 384	8 463	14 994 355
Granite (25.16)	13 245	77 669 889	39 012	80 620 663	38 987	79 640 399
Pebbels (25.17)	3 891	24 935 748	35 997	22 200 924	39 381	29 426 263
Dolomite (25.18)	832	7 033 575	15 368	15 450 304	24 022	14 966 949
Magnesite & Magnesite (25.19)	58 538	339 655 567	79 158	568 486 596	65 323	375 745 020
Gypsum & Plasters (25.20)	152 330	56 332 686	151 625	62 348 026	150 234	60 364 391
Limestone (25.21)	99	378 679	54	220 965	42	542 336
Slaked,quick, hydraulic lime (25.22)	32 325	42 889 065	38 222	90 498 309	47 121	133 283 637
Asbestos (25.24)	3	1 846	20	386 862	10	185 868
Mica (25.25)	955	5 580 424	721	4 271 313	818	4 685 127
Steatite (25.26)	9 137	44 017 788	8 854	43 692 285	12 606	63 334 674
Borates Natural (25.28)	2 510	10 324 910	1 607	5 676 250	4 030	9 883 739
Feldspathoids (25.29)	8 726	23 831 984	10 038	30 320 696	10 711	26 484 673

Other Minerals (25.30)	64 804	200 913 044	69 676	225 785 785	68 742	215 785 666
TOTAL		2 162 894 461		2 331 351 050		2 449 796 459

Source: *RSA, Commissioner for South African Revenue Service, 2015 – 2017*

Note: *Codes in brackets refer to subchapters of the Harmonised System*

TABLE 85: SOUTH AFRICA'S IMPORTS OF MANUFACTURED INDUSTRIAL MINERALS COMMODITIES, 2015 – 2017

Commodity	2015	2016	2017
	Value (FOB)	Value (FOB)	Value (FOB)
	R	R	R
Articles of stone, plaster, cement, asbestos, mica or similar materials	1 892 180 601	2 138 386 233	2 182 025 292
Building stone (68.02)	353 347 211	365 753 721	297 806 564
Worked slate & articles of slate (68.03)	33 812 676	25 997 622	23 678 279
Millstones and grindstones (68.04)	244 721 602	278 980 168	388 776 945
Natural abrasive powders (68.05)	337 437 593	392 324 632	362 853 996
Slag wool, rock wool & similar mineral wools (68.06)	653 412 280	839 710 993	838 913 858
Articles of asbestos-cement (68.11)	81 018 583	62 134 965	86 666 272
Fabricated asbestos fibres (68.12)	10 612 900	5 018 138	5 883 249
Friction material (68.13)	163 432 007	150 821 137	161 604 157
Worked mica & articles thereof (68.14)	14 385 749	17 644 857	15 841 972
Refractories	1 220 392 117	1 223 969 122	1 040 280 922
Of siliceous fossil meals (69.01)	23 767 976	19 578 882	10 640 507
Other bricks (69.02)	994 930 204	1 001 048 708	858 458 395
Other refractory ceramic goods (69.03)	201 693 937	203 341 532	171 182 020
Ceramic products	5 026 416 033	5 410 793 567	4 950 783 483
Ceramic building bricks (69.04)	3 215 148	2 134 588	15 635 556
Roofing tiles (69.05)	8 587 245	4 469 740	7 616 063
Ceramic pipes (69.06)	2 648 812	1 112 101	633 780
Unglazed ceramic (69.07)	297 104 954	330 433 549	1 702 598 618
Glazed ceramic (69.08)	1 463 369 281	1 621 582 941	0
Ceramic wares for laboratory (69.09)	2 328 034 754	2 527 403 358	2 353 785 570
Ceramic sinks (69.10)	235 049 693	254 598 638	231 752 422
Tableware (69.11)	306 349 808	298 480 399	274 221 182
Ceramic tableware (69.12)	288 638 233	273 918 670	272 214 436
Ceramic articles (69.13)	64 618 977	59 522 842	49 806 304
Other ceramic articles (69.14)	28 799 128	37 136 741	42 519 552
Glass and glassware (70.00)	1 345 034 615	3 705 694 096	1 549 617 585
TOTAL	9 484 023 366	12 478 843 018	9 722 707 282

Source: RSA, Commissioner for South African Revenue Service, 2015 – 2017

Note: Codes in brackets refer to subchapters of the Harmonised System

AGGREGATE AND SAND

M Maredi

SUPPLY AND DEMAND

The market for aggregate and sand is primarily driven by the construction sector in various applications including concrete making, mortar and, also as base material. Local sales volume increased by 2.7 percent year-on-year, in spite of depressed activity in the construction sector, (Table 86). Local sales went up by 4.3 percent from R7.1 billion to R7.4 billion. The surge in local sales resulted from the increase in the unit price of aggregate stone and sand material.

TABLE 86: SOUTH AFRICA'S SALES OF SAND AND AGGREGATE BY MASS, 2008 – 2017

YEAR	+COARSE			xFINE			TOTAL		
	Mass	Value (FOR)		Mass	Value (FOR)		Mass	Value (FOR)	
	kt	R'000	R/t	kt	R'000	R/t	kt	R'000	R/t
2008	45 218	3 358 639	74	13 391	416 364	31	58 609	3 775 003	64
2009	41 182	3 491 901	85	12 422	403 784	33	53 604	3 895 685	73
2010	39 078	3 419 386	88	13 279	457 693	34	52 357	3 877 079	74
2011	38 203	3 570 160	89	13 392	492 323	37	51 595	4 062 483	79
2012	40 009	3 948 031	99	13 365	528 329	40	53 374	4 476 359	84
2013	46 553	4 710 248	101	14 861	616 553	42	61 414	5 326 801	87
2014	47 972	5 310 874	111	14 220	605 774	43	62 192	5 916 648	95
2015	48 991	5 808 230	119	14 788	693 854	47	63 779	6 502 084	102
2016	51 035	6 435 356	126	14 594	659 796	45	65 630	7 095 152	108
2017	52 415	6 661 536	127	14 357	686 430	48	67 394	7 399 277	110

Source: DMR, Directorate Mineral Economics

Notes: +Includes Crusher Sand
xNatural Sand

Demand for aggregate and sand is predominantly derived from the construction industry, which is road upgrades, residential and non-residential buildings. The value of building plans passed by municipalities (at current prices) decreased by 2.5 percent in 2017, compared with 2016. An increase was reported in the additions and alterations category. However, the value of buildings recorded as completed by municipalities (at current prices) increased by 19.5 percent (to R12 billion) in 2017, compared with 2016. Non-residential buildings reported an increase of 11.4 percent, residential buildings accounted for 6.3 percent and additions and alterations accounted for 1.8 percent.

PRICES

The average unit value of both aggregates and sand increased, year-on-year. The unit value of aggregates increased by 0.8 percent in 2017, when compared to 2016 and, sand increased by 6.7 percent (Table 86). This improvement is owing to the increase in national inflation in the second and third quarter of 2017. The construction price index (Statssa) showed that the price index of aggregate stone increased by 2.9 percent and sand by 2.4 percent.

EMPLOYMENT

Employment in the sector increased slightly by 2.5 percent from 7 553 to 7 738 personnel (Table 87). Labour productivity increased by 0.23 percent from 8.69 kt/employee to 8.71 kt/employee in 2017. Revenue generated per employee, also improved by 1.8 percent to R956 226/employee (from R939 382/employee). Average annual earnings rose in 2017 by 3.9 percent to R160 509 per employee.

TABLE 87: SOUTH AFRICA'S AGGREGATE AND SAND QUARRIES EMPLOYMENT AND REMUNERATIONS

YEAR	EMPLOYEES	TOTAL REMUNERATION
		R'000
2013	7 510	939 998
2014	7 421	1 037 945
2015	7 452	1 115 964
2016	7 553	1 167 306
2017	7 738	1 242 021

Source: DMR, Directorate Mineral Economics

RECENT DEVELOPMENTS

Wilson Bayly Holmes (pty) limited has been contracted in a number of projects that are currently underway and will translate positively, into improved growth for the construction sector. These projects include the new platform and road for the south extension of the Booyendale mine valued at R952 million, the construction of a boutique hotel and art museum in Cape Town to the value of R411 million and the construction of Sasol's new ash dam to the value of R1.1 billion.

Raubex has acquired Doornhoek (Northern Gauteng) and Transkei (Eastern Cape) aggregate quarries during the 2017 financial year, as a strategic move towards less cost of obtaining and ease of access to the raw materials. The group has secured work to the value of R678 million on two wind farm projects.

Métier continued pursuing the acquisition of an aggregates business to simultaneously diversify their portfolio and improve access to raw materials for the group. During the 2017 financial year, the group began investing into a greenfield aggregates project called Cato Ridge Quarry Proprietary Limited and, concluded a 50% partnership with Umhlali Quarry Proprietary Limited (joint venture).

OUTLOOK

With KwaZulu Natal being one of the biggest construction hubs, the R200 billion infrastructure programme is said to change the face of the province and the construction industry. It is anticipated that the planned projects and investments in infrastructure will drive improvements in the construction sector and consequently, will result in increased margins for the aggregate and sand industry. Building plans passed show signs of improvement in the construction sector, which will mean an increase in demand for raw materials.

Finance Minister announced that government was “*building a pipeline of investment opportunities and infrastructure projects*” as part of redoubled efforts to address low levels of investment, which had been identified as the main barrier of growth in the recession-afflicted South African economy. Affordable housing projects are on the cards to cater for the country’s lower and middle income citizens. This includes the Human Settlements Housing Program led by the Department of Human Settlements, which involves the construction of 1.6 million housing units by 2019. This will not only improve economic growth but will boost construction activity and ultimately the demand for raw materials (aggregates).

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ALUMINO-SILICATES

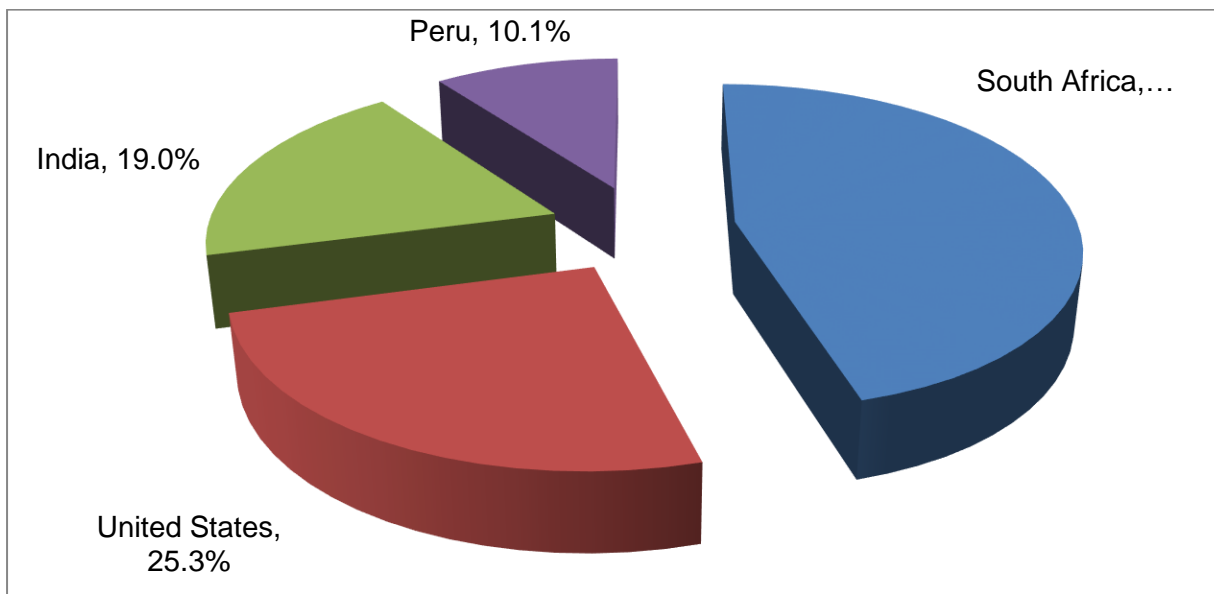
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SUPPLY AND DEMAND

WORLD

World production of alumino-silicate minerals increased by 5.9 percent from 373 kt in 2016 to 395 kt in 2017, owing to growth in world steel production. Andalusite was pursued by most customers, as a substitute for bauxite following China's government-led inspections and shutdowns in 2017, which resulted in a slash in bauxite output. The move brought about a peak in demand for andalusite, which is better priced than bauxite. South Africa was the largest producer of andalusite at 46 percent, followed by the United States (US) at 26 percent, India's 19 percent and Peru's 9 percent (Fig. 66).

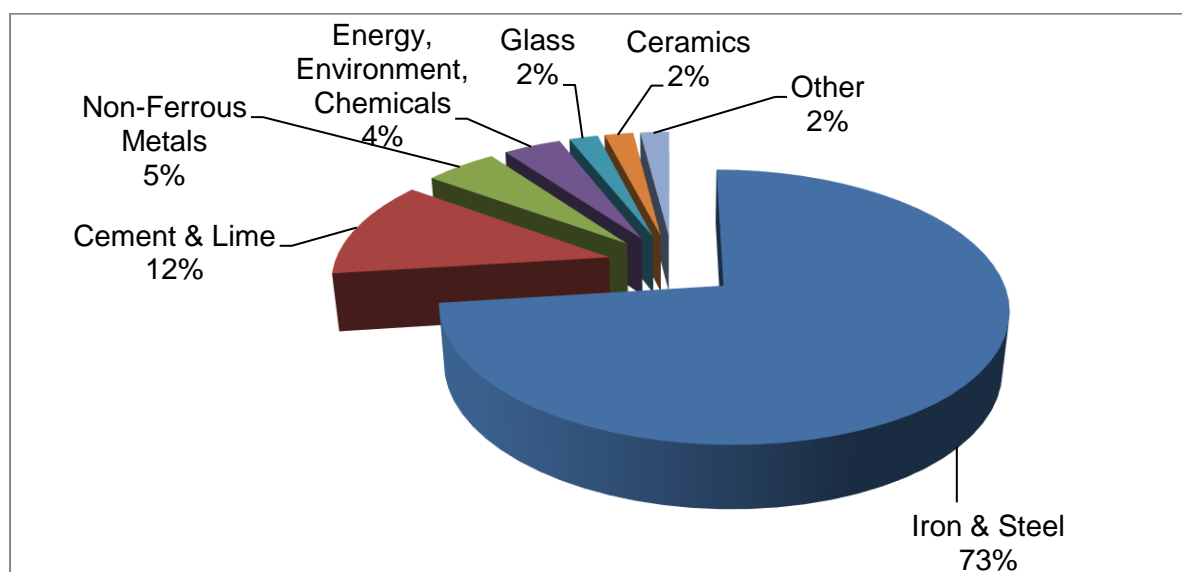
FIGURE 66: WORLD PRODUCTION OF ALUMINO-SILICATES BY COUNTRY, 2017



Sources: USGS, 2018

The andalusite industry is driven by the growth of the refractory industry. Of the total world refractories market, which was estimated to be 40 Mt, iron and crude steel industry is the largest end-use sector of refractories, consuming approximately 73 percent of refractories production according to Roskill (Fig. 67). So, even relatively small changes in steel output bring a disproportionally large impact on refractory demand. The second largest refractories market is the cement and lime sector, which consumed 12 percent of the total, followed by non-ferrous metals at 5 percent and the remainder Energy, Environment, Chemicals (EEC) at 4 percent, glass, ceramics industry and other mineral products at 2 percent each.

FIGURE 67: WORLD REFRACTORIES MARKET BY END-USERS, 2017



Source: Roskill Information Services, 2017

World Steel Association mentioned that steel production increased by 3.8 percent year-on-year (y-o-y) from 1.63 billion tons in 2016 to 1.69 billion tons in 2017 owing to increases in production, both in developed and developing countries. Driving demand for andalusite was an improved performance in the refractories end markets, due to rising steel output, and a widespread shortage affecting several other refractory raw materials, such as bauxite and alumina. The global demand for longer lasting, higher quality and low-cost refractories is rising in emerging economies of the Asia Pacific, especially China and India, due to rapid economic growth.

Global aluminosilicates market is highly fragmented and dominated by regional players. Major players compete based on their pricing strategies. Moreover, owing to increasing demand for customized products, players also must compete on the research and development strategies. Therefore, the industry is characterized by high degree of competition that is expected to remain same for the forecast period.

SOUTH AFRICA

There are currently two main andalusite deposits mined in South Africa, one near Burgersfort in eastern Limpopo and the other at Thabazimbi in western Limpopo. Imerys South Africa has mines and plants at both ore deposits (Annesley at Burgersfort and Rhino at Thabazimbi); Andalusite Resources has a mine and plant at the Thabazimbi deposit. Imerys reduced its andalusite production capacity by closing down its Krugerspost mine.

South Africa's production of andalusite increased by more than 20 percent in 2017. This apparent increase is as a result of disruptions in production in 2016 at one of the operations, which embarked on a water pipeline-built programme to improve output in future. Locally and internationally, andalusite is largely used by steel producers. Local sales decreased by more than 40 percent because of lower product demand from the ferro-alloy, iron and steel producers, as several

refractory producers closed. Export of andalusite increased by more than 20 percent in 2017, owing to increased margins as world steel recovered resulting in higher demand for refractories.

TABLE 88: SOUTH AFRICA'S PRODUCTION, LOCAL SALES AND EXPORTS OF ANDALUSITE, 2008–2017

YEAR	PRODUCTION	LOCAL SALES			EXPORTS		
		Mas s	Value (FOR)		Mass	Value (FOB)	
	Kt	Kt	R'000	R/t	Kt	R'000	R/t
2008	217	75	115 292	1 534	148	289 175	1 954
2009	165	53	97 918	1 855	109	253 554	2 326
2010	189	92	167 667	1 829	134	321 933	2 406
2011	*	*	*	*	*	*	*
2012	*	*	*	*	*	*	*
2013	*	*	*	*	*	*	*
2014	*	*	*	*	*	*	*
2015	*	*	*	*	*	*	*
2016	*	*	*	*	*	*	*
2017	*	*	*	*	*	*	*

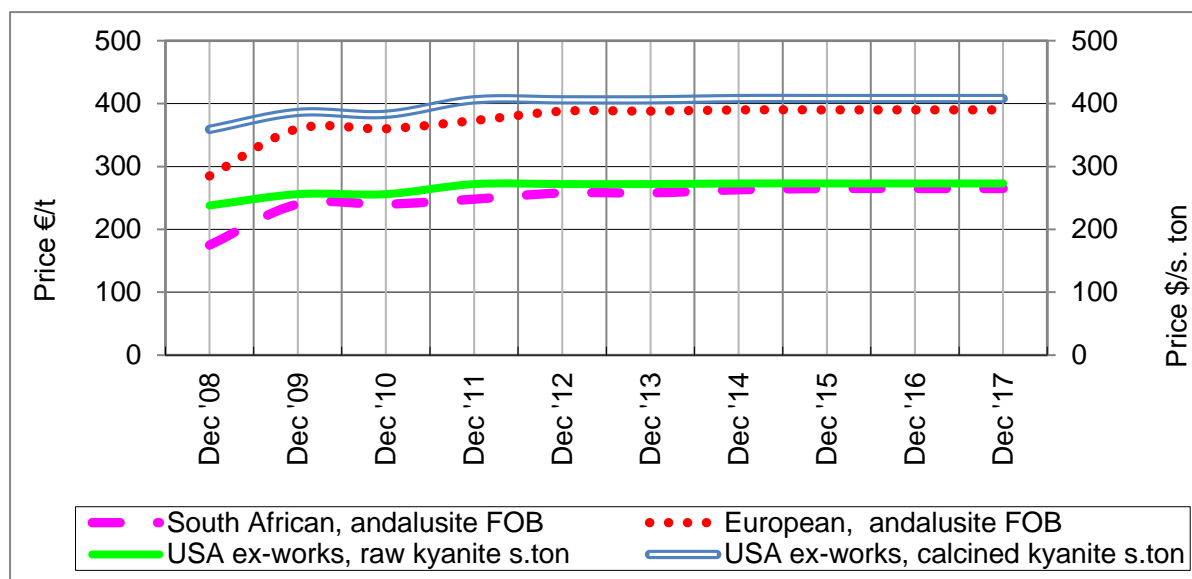
Source: DMR, Directorate Mineral Economics

Note: *Data withheld for reasons of confidentiality

PRICES AND REVENUES

Andalusite, kyanite and sillimanite are alumino-silicate minerals, with high Al_2O_3 content varying from 63 percent (high-grade) to below 40 percent (low-grade), and silica content of about 37 percent. The South African market prices (2 000 tonne bulk, FOB) for 57 - 58 percent aluminium trioxide (Al_2O_3) andalusite concentrate were stagnant in the range of €240 - €290/t in 2017 (Fig. 68). The European FOB prices for 55 - 59 percent Al_2O_3 were also stagnant in the range of €355 - €425/t in 2017. The US prices for raw and calcined 55 - 60 percent Al_2O_3 kyanite were in the range of \$225 - \$320/t and \$375 - \$440/t in 2017, respectively (Fig. 60).

FIGURE 68: WORLD ALUMINO-SILICATES PRICES, 2008–2017



Source: Industrial Minerals, 2017

Contract prices for andalusite have edged up by about 10 percent from previous levels, with spread consumer demand further compounding limited availability of material.

EMPLOYMENT

Employment in the aluminosilicate industry increased by 6.8 percent from 339 employees in 2016 to 362 employees in 2017, because of additional staff complement requirement, ahead of production ramp up (Table 89).

TABLE 89: SOUTH AFRICA'S ALUMINO-SILICATE MINES: EMPLOYMENT, 2008–2017

YEAR	EMPLOYEES	TOTAL REMUNERATION
		R'000
2008	742	62 956
2009	765	68 471
2010	472	65 953
2011	429	*
2012	392	*
2013	398	*
2014	349	*
2015	337	*
2016	339	*
2017	362	*

Source: DMR, Directorate Mineral Economics

*Total Remuneration figures withheld for reasons of confidentiality

RECENT DEVELOPMENTS

Imerys, the largest producer of andalusite with operations in France and South Africa has been aiming to expand output to meet the additional demand. In 2017 Imerys South Africa managed to produce 30 percent more andalusite compared to 2016. It had brought online, a previously decommissioned crushing plant in Thabazimbi, South Africa as well as new equipment in Annesley.

Imerys Refractory Minerals intends to apply for the closure of Anref Mine, as all mining activities have been completed. The Basic assessment application was submitted on 15th June 2018. The decision to apply for closure followed an extensive review of the mining operation as well as certain contributing factors, including: decrease in demand for the product (andalusite) and feasibility of mining in the area (specifically capital costs required with regards to transport of material to Rhino Andalusite Mine in Thabazimbi for processing). Anref was an Andalusite mine situated west from the town of Groot Marico, which is 25 km east of Zeerust in the North-West Province.

OUTLOOK

As the broad balance between supply and demand that has been seen in the sector over the last few years has given way to a situation shortage in the short term, there is anxiety over future security of supply. Limited availability is expected to persist throughout 2018, following a shortage that became apparent in the previous year, when production issues resulted in lower output in major andalusite-producing regions, forcing suppliers to deliver less than they originally agreed to on contracts. Delivery of some volumes will have to be deferred to the subsequent years.

Market patterns of andalusite trade are likely to change going forward, because suppliers are entering into shorter contracts while demand is high, and output is limited, and prices are set to increase. Currency volatility may also influence market prices, considering that United States (US) Dollar is going through a particular weak phase and South African Rand has depreciated strongly over the short term.

The continued demand for andalusite by China for its refractory industry will drive the demand for andalusite. Although end users, other than the steel industry consume less andalusite, they have a strong impact on the growth of andalusite industry. The ceramic, glass, aluminum and cement industry will contribute heavily to the growth of andalusite industry in future. However, fluctuations of major currency such as Euro and Dollar, rising oil prices and availability of cheap bauxite could hamper the growth of this market. Andalusite can be used as an alternative to calcined bauxite for some refractory applications.

While the market demand is increasing, South African producers have taken the opportunity to start critical upgrades to their process to be able to meet market demand. Whilst this is still in the process, they are anticipating higher production and sales results from 2018 onwards.

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DIMENSION STONE

M Maredi

SUPPLY AND DEMAND

In 2017 the global dimension stone mining market was valued at \$75 billion, up by 1.6 percent, with export volumes increasing by 14.4 percent reaching 88. 1 Mt (USGS). Local sales volume in 2017 declined by 7.3 percent to 179.9 kt from 194.1 kt, while sales value declined by 3.9 percent, when compared to 2016 (Table 90). This was largely driven by subdued activity in the construction sector for most part of 2017, exacerbated by the threat of cheap synthetic products flooding the market. Export sales volume and value declined by 4.8 percent and 15.2 percent respectively, as a result of poor demand for granite from export markets. There was also a sharp decline in world exports of blocks and slabs, which was mainly due to the concurrent contraction in demand from India and China, which have always represented the main market for exports of this product category.

TABLE 90: SOUTH AFRICA'S LOCAL SALES AND EXPORTS OF DIMENSION STONE 2008 – 2017

	LOCAL SALES			EXPORTS		
YEAR	Mass	value (FOR)		Mass	Value (FOB)	
	Kt	R'000	R/t	Kt	R'000	R/t
2008	458.0	489 346	1 069	85.6	211 674	2 474
2009	334.6	340 493	1 018	61.7	126 508	2 050
2010	336.3	236 999	545	65.4	120 407	1 840
2011	271.4	241 802	1 014	111.2	150 212	1 350
2012	213.4	299 717	1 587	84.0	124 246	1 479
2013	256.1	338 568	1 322	75.0	135 477	1 802
2014	155.0	357 963	2 130	78.3	164 769	2 104
2015	170.0	372 814	2 195	101.1	242 231	2 396
2016	194,1	382 148	1 968	113	245 022	2 161
2017	179,9	367 229	2 041	108,0	207 771	1 924

Source: DMR, Directorate

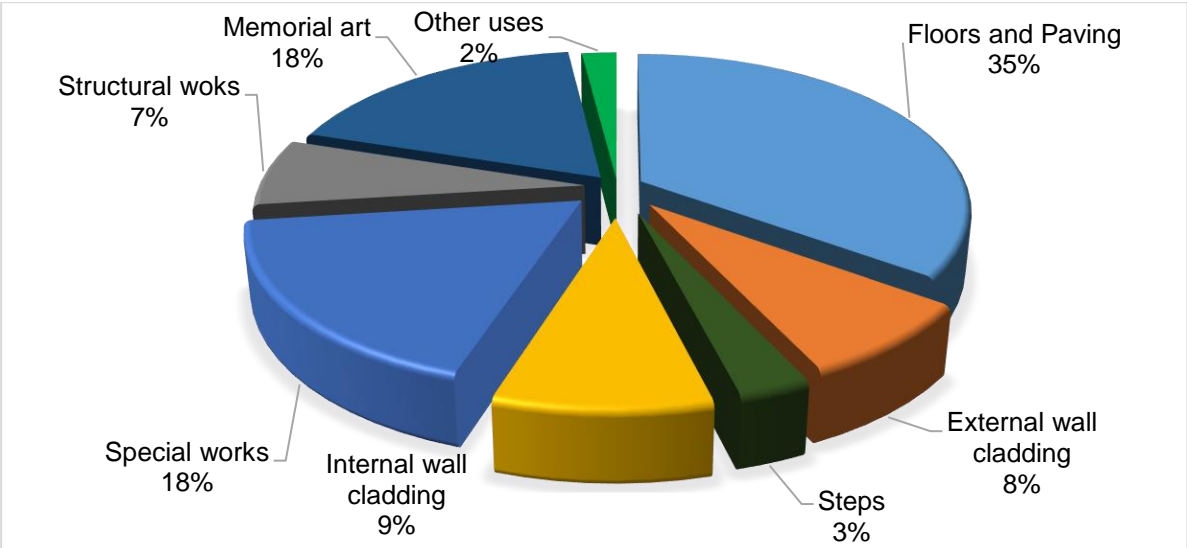
Note: In the absence of available data, production is taken to be equal to total sales volume

DEMAND

Dimension Stone materials offer distinct qualitative features, as compared to other material derived from the natural rock, which means they can perform both structural and decorative architectural

functions in building and construction as well as in internal decoration and landscaping projects. Dimension stone is mainly consumed in the construction sector (over 80 percent) with other applications such as funerary and special works, making up the balance (Figure 69). Dimension stone is used for the construction and refurbishment of commercial and residential buildings.

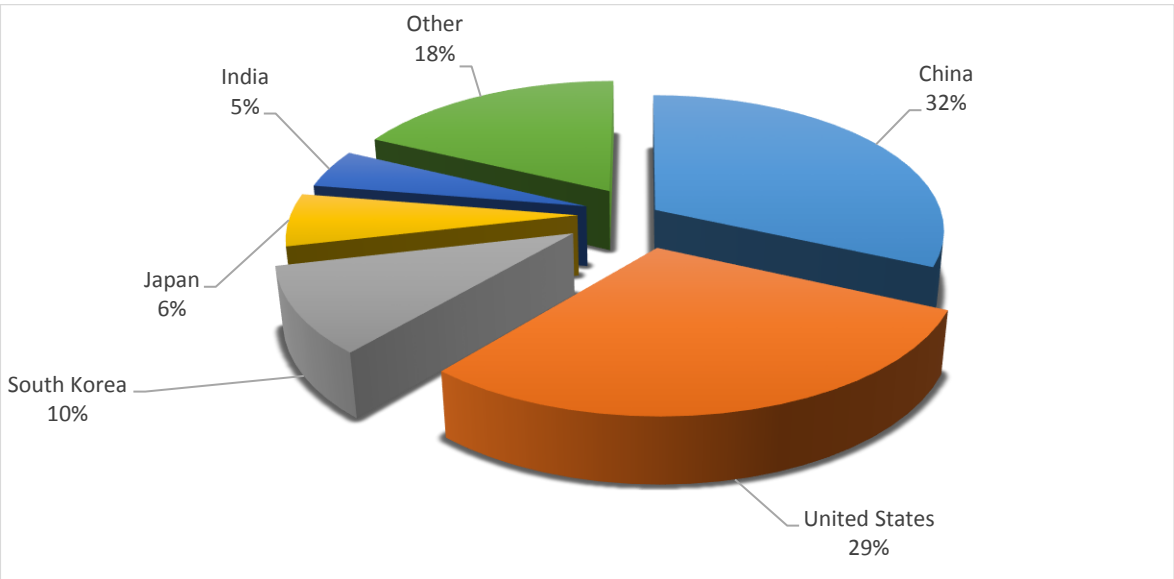
FIGURE 69: WORLD CONSUMPTION OF DIMENSION STONE BY SECTOR



Source: (Ashmole, 2014)

Global consumption of dimension stone was chiefly driven by demand from China, which imported more than any other country. China accounted for 32 percent of consumption, followed by the United States at 29 percent, South Korea at 10 percent, Japan at 6 percent and India at 5 percent. China overtook the United States in 2017, importing natural stone to the value of \$2.78 billion, denoting a robust improvement of 25.4 percent, compared to the previous year (IMM Carrara). China imported almost only raw blocks and the USA nearly only value-added products.

FIGURE 70: WORLD DEMAND OF NATURAL STONE BY COUNTRY



Source: IMM Carrara, Stone sector, 2017

PRICES

The price of dimension stone varies, depending on the stone's quality and type (sometimes to the specification of the client). In 2017, the average local sales unit value increased by 3.7 percent to R2 041/ton, owing to increase in the local demand for slate tiles. Inversely, average export prices declined by 11 percent to R1 924/ton, due to the oversupply of raw blocks in the global market on the back of anticipated demand for raw products that never materialised. Furthermore, synthetics flooding the global market as a substitute for the raw material, contributed to the downward pressure on export prices.

EMPLOYMENT

South Africa's dimension stone sector employed 1 560 employees in 2017, a 0.5 percent increase from the 1 553 personnel in 2016 (Table 91). This is owing to the improvement in the slate industry. Slate production is labour intensive, therefore improved capacity, growing demand and new entrants resulted in increased number of employees. However, labour and revenue productivity declined by 6.8 percent and 8.7 percent respectively, as a result of reduced quantities of raw blocks sold in 2017. Raw blocks make up the bulk of the consumption of dimension stone. Remuneration increased by 11.5 percent in 2017 due to increased number of personnel and also, several mines paid STR payments (Severance, Termination and Redundancy payment) and bonuses during the year.

TABLE 91: SOUTH AFRICA'S DIMENSION STONE EMPLOYMENT, 2013 – 2017

YEAR	EMPLOYEES	TOTAL REMUNERATION
		R'000
2013	1 781	165 311
2014	1 584	151 974
2015	1 340	146 532
2016	1 553	162 793
2017	1 560	181 507

Source: DMR, Directorate

RECENT DEVELOPMENTS

Despite the South African economic downturn and the reduced sales in the dimension stone industry due to a decline in the sales of rough blocks, the slate industry has grown significantly. There was drastic increase in the volumes sold, particularly slate used for tile floors. The slate sector also saw four new mines being opened in the fourth quarter of 2017 and the first quarter of 2018. Bushmanland is in the final stages of converting their prospecting right into a mining right for dimension stone. A work group brought to life by IMM Carrara has expressed its support for

nanotechnology and new surface treatment of natural stone, in efforts to improve the quality and desired properties of the stone.

OUTLOOK

The introduction of new technology allowing the natural stone to assume some of the desired properties of ceramics and engineered stone, will have a positive impact in future, towards the demand and competitiveness of dimension stone worldwide. The emergence of new technology will come in handy for sectors such as the slate sector that faces challenges of providing the preferred quantity of the stone. And, with South Africa having comparative advantage in the type of slate that is found only in the country, this will provide the country with an opportunity to meet the appetite for local demand and ultimately move towards the global market. The anticipated upswing in construction activity and increasing usage in coatings and fillers will assist to drive a turnaround in the stone industry following an increase in number of housing projects approved by local municipalities. Growth of 11.4 percent year-on-year of flats and townhouses is expected, amid the number of approved plans.

The government has pledged R834.1 billion to invest in infrastructure, which will have a significant impact on the construction sector and the demand for raw materials. A stimulus package was also announced by the government, which will include a R400 billion Infrastructure Fund that will be used to reduce the current fragmentations of infrastructure spend. The projects will help accelerate service delivery, which is at the core of the government's priorities, through large-scale projects focused on building of schools, national roads, housing and water infrastructure.

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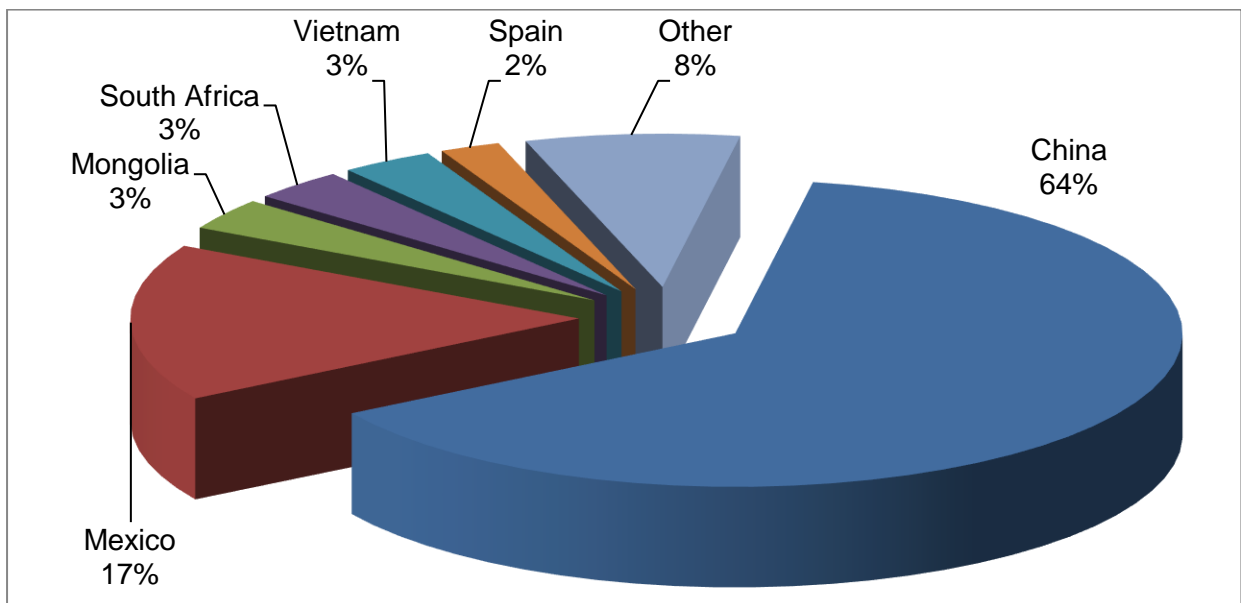
FLUORSPAR

M Modiselle

SUPPLY AND DEMAND

Total world production of fluorspar increased slightly by 0.9 percent from 5.93 Mt in 2016 to 5.98 Mt in 2017, owing to new projects that came online. South African SepFluor's Nokeng Fluorspar mine construction began with production in 2018 and is expected to be fully achieved in early 2019. Canada Fluorspar mine in St Lawrence officially opened a 200 kt per year operation in October 2017 with trial productions. Afghanistan fluorspar producer Amania Mining is expected to start commercial production of acid-grade material (acidspars) in 2018. Fluorspar producers in Canada, Vietnam and South Africa are ramping up output, at the time when Chinese supply has been curtailed because of environmental legislation. Entry of new players (Vietnam) has balanced the shut down or reduced production of others, particularly in Namibia, Kenya and Bulgaria. China remained the world's leading fluorspar producer accounting for 64 percent of world production followed by Mexico's 17 percent, Mongolia, South Africa and Vietnam at 3 percent each and Spain at 2 percent (Fig. 71) (United States Geological Survey, 2018).

FIGURE 71: WORLD FLUORSPAR PRODUCTION, 2018



Source: USGS, 2018

Producers of fluorspar and hydrogen fluoride (HF) face challenges related to declining ore quality. High-quality ore reserves are being exhausted while newer resources are smaller in size and are often located in politically unstable regions. Over the past years, world fluorspar markets have experienced a great deal of uncertainty. Prices were depressed, and volumes dropped, while the supply mix shifted, as large producers reduced output and new suppliers started to increase production.

The year 2017 was epitomized by the shift from Chinese producers dominating the market, as federally-imposed environmental regulations squeezed output in that country. Canada, Vietnam, Thailand and South Africa, all moved in on China's market share. Fluorspar demand increased during 2017, mainly due to decreased exports from China. China, Mexico and South Africa accounts for 81 percent of global acidspar supply and 63 percent of the total international acidspar trade. Looking at consumption patterns, global metspar volumes have reduced by 19 percent, since their peak in 2013; the estimated volume for 2016 was around 2.3 Mt.

South Africa's fluorspar production increased by 23.2 percent from 177 kt in 2016 to 218 kt in 2017 due to improved plant recovery rates and expansion of the pit to ease access of ore utilization and throughput at one of the country's leading producer (Table 92). Local sales volumes decreased by 0.2 percent from 11 kt in 2016 to 9 kt in 2017, while export sales volumes increased by 42.9 percent from 163 kt in 2016 to 233 kt in 2017. Domestic fluorspar sales decreased, owing to lower demand as customers closed their operations due to depressed market conditions. Export sales increased due to increased demand and developing new markets.

TABLE 92: SOUTH AFRICA'S PRODUCTION AND SALES OF FLUORSPAR, 2008 – 2017

YEAR	PRODUCTION	LOCAL SALES	EXPORTS
		Mass	Mass
	Kt	Kt	Kt
2008	299	25	276
2009	198	18	135
2010	157	18	179
2011	196	19	175
2012	170	14	189
2013	155	17	136
2014	164	14	131
2015	121	11	124
2016	177	11	163
2017	218	9	233

Source: DMR, Directorate Mineral Economics

Note: Sales turnover figures withheld for reasons of confidentiality

PRICES

Since the global financial crisis in 2008, the upswings and downswings from 2009 until 2017, acidspar demand has been driven by a combination of environmental legislation and demand, resulting in a short-term downward trend in price. There was a shaky start to 2017 for the fluorspar markets, as prices remained low resulting from a lackluster demand and an oversupplied market. Chinese prices were also climbing on curtailed supply, as the environmental legislation took hold. Towards the last quarter of 2017 an increase in export prices from China was noted due to the lower export volumes coming from that country, which had a direct upward pressure on the fluorspar prices globally.

Chinese fluorspar spot prices spiked to a four-year high from the second half of 2017. Spot metspar (min 85% CaF₂) FOB China prices were assessed at \$290-310/t in June 2017 and at \$350-370/t in December 2017, while acidspar, 97% CaF₂, wet filtercake, FOB China was traded at \$380-400/t in June 2017 and at \$400-420/t in December 2017.

EMPLOYMENT

Productivity increased by 7.9 percent to 0.82 kt per employee in 2017 compared with 0.76 kt per employee in 2016. Average earnings decreased by 0.5 percent from R320 284 per employee in 2016 to R318 735 per employee in 2017 (Table 93). The increase in average productivity was due to a rise in the number of employees, which totaled 264 in 2017 compared with 232 in 2016.

TABLE 93: SOUTH AFRICA'S FLUORSPAR QUARRIES: EMPLOYMENT AND REMUNERATION, 2008-2017

YEAR	EMPLOYEES	TOTAL REMUNERATION R'000
2008	605	62 027
2009	432	59 128
2010	297	49 836
2011	453	68 467
2012	579	100 409
2013	252	64 220
2014	233	68 900
2015	228	66 282
2016	232	74 306
2017	264	84 146

Source: DMR, Directorate Mineral Economics

RECENT DEVELOPMENTS

SepFluor's Nokeng fluorspar mine at Rust de Winter, north-east of Pretoria, Gauteng Province in South Africa secured all finances and started construction activities in the second half of 2017 and, has production capacity of 210 kt per year. The mine is expected to produce 180 kt of acid grade fluorspar per year and 30 kt per year of metallurgical grade fluorspar with impurities of less than 10 parts per million (ppm) arsenic and 1 percent iron. The mine is on budget and schedule to bring its first shipments of around 5 – 10 kt to the market as early as January and February 2019, with no major delays in the ramp-up.

SA Fluorite is also emerging with its development of the Doornhoek fluorspar deposit, anticipating securing their mining rights by the end of 2018. The Doornhoek project is in a joint venture with ferrochrome giant Eurasian Natural Resources Corp (ENRC), a company with extensive experience in exploration and mining. The project contains in excess of 500 Mt of both indicated

and inferred resources at an average grade of 14 percent CaF_2 . The anticipated production target is 275 kt per annum. Construction employment is estimated at over 200 employees and full mine operational employment is estimated at 222 direct jobs. The company's detailed environmental management programme and environmental impact assessment for the Doornhoek project, have been approved by the DMR, while final appeals are being dealt with. A marketing study is also underway and infill drilling as well as metallurgical studies are planned as part of a bankable feasibility study. The company is currently seeking partners and offtake agreements to allow for the completion of a bankable feasibility study.

OUTLOOK

China remains a major global supplier of fluorspar, with a downstream focus that will continue to rationalize supply on the back of its new environmental policies, which are expected to have a big impact on economic growth. Overall fluorspar market trends are currently volatile and, if the reduction in fluorspar export volumes from China persists, upward pressure on the fluorspar prices and demand for fluorspar will increase in the short term.

The trend of increasing acidspar consumption within China, combined with interruptions of mining from dynamite restrictions and anti-pollution controls are resulting in an opportunity for development of acidspar sources outside of China. Commencement of constructions at Canada Fluorspar and Sepfluor's Nokeng mines demonstrates that they would be likely be the next producers on the back of growing demand. Despite China's new environmental policy, it will remain the largest producer of fluorochemicals and aluminum. Under these market growth estimations, acidspar demand is expected to increase at around 4-5 percent per year from 2018-2022. The fluorochemicals market is likely to receive a boost from infrastructure development in emerging economies and, demand for acidspar is expected to be high with 2.7 percent compound annual growth rate (CAGR) during the period from 2017 to 2025. It is expected that the global fluoropolymers market will have a 5 percent CAGR in 2021. Despite the introduction of alternative options, Fluorinated Refrigerants will continue to grow at approximately 4 percent CAGR up to 2022. The growth in fluorspar markets especially downstream and end-user markets, will lead to increased demand for South African fluorspar. This will unearth South Africa's appetite to be a stepping stone to the unserved African markets owing to its strategical logistical position. Long term aluminum demand will continue to increase at 4 percent CAGR up to 2025.

Tight supply and strong demand have given fluorspar producers confidence that strong prices will continue into 2019. Restricted fluorspar supply from China has pushed prices higher over 2018 and, with strong end-market demand, producers believe that the market conditions will carry on supporting high prices. However, the anticipated entrance of Sepfluor's Nokeng and Canada Fluorspar mines will have a downward pressure on prices. Production from South Africa's Sepfluor's Nokeng Fluorspar mine is expected to come online as early as February 2019. Sepfluor remain confident that its product will reach the market on-schedule, with capacity to produce 210 kt per year of fluorspar.

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LIMESTONE AND DOLOMITE

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SUPPLY AND DEMAND

The year 2016 marked a good year in terms of construction activity in South Africa and, in anticipation of the same trend towards 2017, there was an increase in the production of limestone of about 1.8 percent. However quantity of limestone sold locally declined by 0.4 percent in 2017 to 21 Mt on the back of subdued demand for cementitious products (TABLE 94). The estimated total cement demand was approximately 13 Mt against an industry production capacity of 17 Mt. Local sales increased by 7.9 percent as a result of increased prices caused by the national inflation.

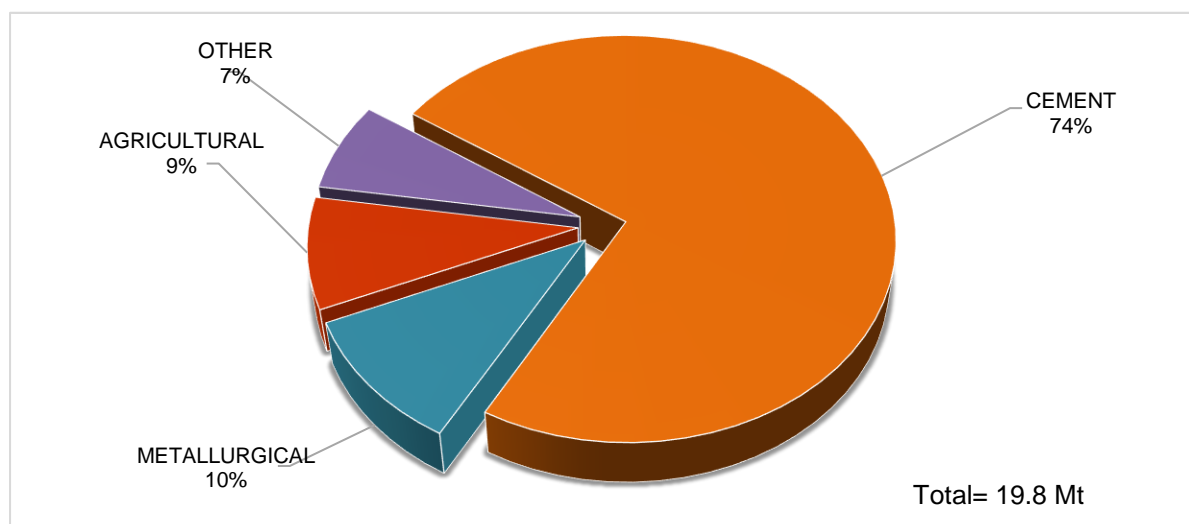
TABLE 94: SOUTH AFRICA'S PRODUCTION AND LOCAL SALES OF LIMESTONE AND DOLOMITE FOR NON - AGGREGATE USE, 2008 – 2017.

YEAR	PRODUCTION	LOCAL SALES		
		Mass	Value (FOR)	
	kt	kt	R`000	R/t
2008	23 495	19 781	1 899 279	96
2009	22 698	20 008	2 105 297	105
2010	22 480	19 226	2 271 133	118
2011	21 630	18 507	2 591 727	140
2012	21 637	18 479	2 517 772	136
2013	21 966	20 097	2 804 944	140
2014	21 776	19 340	2 785 855	144
2015	22 905	20 406	2 902 761	142
2016	23 355	21 130	3 011 744	143
2017	23 765	21 050	3 248 306	154

Source: DMR, Directorate Mineral Economics

Demand for limestone is primarily derived from the consumption and use by the cement sector, which accounts for over 74 percent of the total demand for limestone. This is followed by the metallurgical and agricultural sector accounting for 10 percent and 9 percent respectively, of the 19.8 Mt (Figure 72).

FIGURE 72: DEMAND FOR LIMESTONE BY SECTORS, 2017



Source: DMR, Directorate Mineral Economics

Local sales quantity of limestone in the cement industry declined by 3.7 percent, this is attributed to less tender activity and depressed economic conditions. Contrary to the decline in the quantity sold, sales value increased by 3 percent owing to increase in the unit price. Local sales volume and value of limestone for metallurgical purposes increased by 5.7 percent and 8.1 percent respectively, due to increasing investment in the localisation of steel making plants and mini mills in an effort to stay competitive in the current fluctuating steel market. Local sales volume of limestone used for agricultural purposes surged by 29.9 percent and sales increased by 35.5 percent. This was as a consequence of a better performing agricultural sector in the second quarter of 2017. Despite the drought that hit South Africa in 2017, the agricultural sector performed very well posting a growth of 33.6 percent and becoming the main contributor to improvement of the country's GDP.

TABLE 95: SOUTH AFRICA'S LOCAL SALES OF LIMESTONE AND DOLOMITE BY APPLICATION, 2008 – 2017.

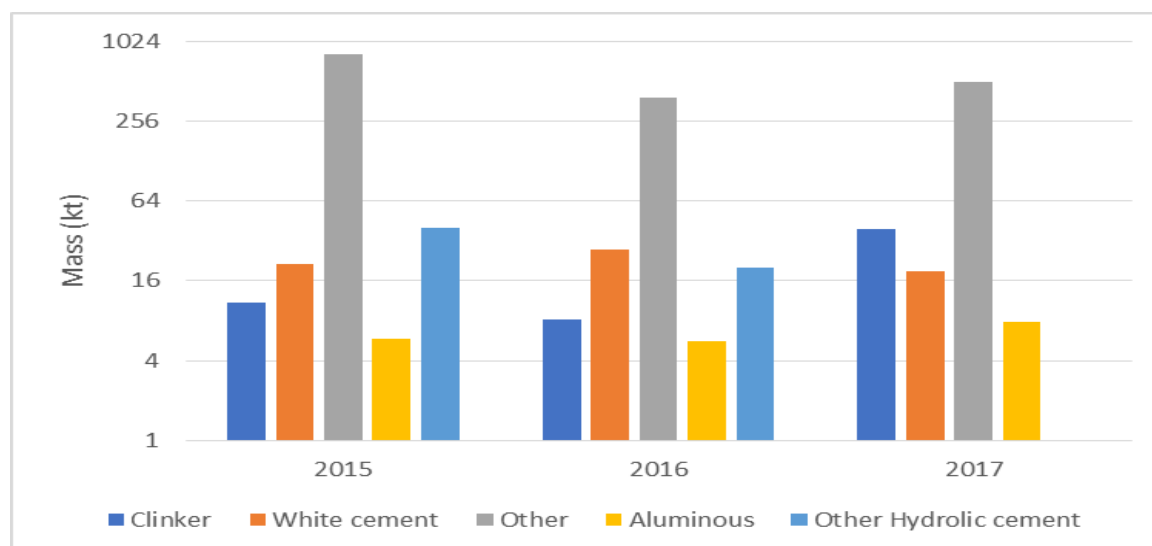
YEAR	CEMENT			METALLURGICAL			AGRICULTURAL			OTHER		
	Mass	Value (FOR)		Mass	Value (FOR)		Mass	Value (FOR)		Mass	Value (FOR)	
	kt	R`000	R/t	kt	R`000	R/t	kt	R`000	R/t	kt	R`000	R/t
2008	14 252	403 215	28	1 372	120 083	87	879	72 263	82	1 646	381 022	231
2009	14 800	462 122	31	1 244	118 213	95	855	81 762	96	1 616	404 149	250
2010	13 458	443 978	33	1 910	190 589	100	783	86 553	111	1 781	447 341	251
2011	12 373	456 522	37	1 745	194 042	111	901	101 081	112	1 948	472 135	242
2012	12 358	463 196	37	1 703	208 933	123	1 083	140 557	130	2 125	525 422	247
2013	13 053	496 711	38	1 825	241 671	132	947	133 771	141	3 085	744 057	241
2014	13 099	521 370	40	1 826	258 363	141	987	147 994	150	2 174	617 952	284
2015	14 456	649 452	45	1 818	257 905	142	999	164 124	164	2 018	651 824	323
2016	15 182	675 776	45	1 970	295 359	150	1 343	197 597	147	1 507	614 333	408
2017	14 622	696 047	48	2 082	319 417	153	1 744	267 547	153	1 393	594 583	427

Source: DMR, Directorate Mineral Economics

CEMENT IMPORTS

The quantity of white cement and other hydraulic cements products imported declined significantly. However, imports for other cement products surged by 29.4 percent (Figure 73). The volume of clinker imports tripled in 2017 as compared to 2016. The total cement imports increased by 29 percent year-on-year to a total of 502 665 tons, compared to the 388 607 tons imported in 2016. China now being the largest importer, accounted for about 84.5 percent of the total imported cement. According to PPC's most recent operational update, the surge in cement imports came along with a drop of between 3 – 4 percent in overall cement demand in South Africa. This is owing to incentives offered by exporting countries, albeit cement exports declined by 18 percent year-on-year to 768 111 tons, South Africa remains a net exporter of cement.

FIGURE 73: SOUTH AFRICA'S IMPORTS OF CEMENT PRODUCTS, 2015 – 2017.



Source: Sars, South African Revenue Services

LIME

The use of lime in various industrial processes such as steel and ferro-alloys production, chemical processes and water purification shows the versatility of the mineral. Sales quantity and value of burnt lime (quicklime) for pyrometallurgical and chemical applications increased by 7.4 percent to 1.11 Mt and 12 percent to R1.22 billion respectively. Sales quantity of hydrated lime for water purification decreased by 19.9 percent to 47 kt and for chemical use quantity sold doubled to 31 kt in 2017 compared to 2016. Domestic sales quantity of lime increased by 7.1 percent to 1.21 Mt in 2017, compared to 1.13 Mt in 2016 (Table 96). This was largely driven by demand for hydrated lime for water purification applications.

TABLE 96: SOUTH AFRICA'S LOCAL SALES OF LIME, 2016 – 2017.

LIME PRODUCT	2016			2017		
BY SECTOR USE	Mass	Value (FOR)		Mass	Value (FOR)	
	kt	R'000	R/t	kt	R'000	R/t
Quicklime						
Pyrometallurgical	470	435 316	927	545	519 605	954
Chemical	565	655 372	1 159	567	701 683	1 236
SUB-TOTAL	1 035	1 090 689	1 054	1 112	1 221 288	1 098
Hydrated lime						
Water purification	59	90 684	1 546	47	73 842	1 555
Chemical	15	15 628	1 075	31	45 023	1 469
Other	20	31 678	1 611	18	30 558	1 683
SUB-TOTAL	93	106 312	1 145	96	149 423	1 552
TOTAL	1 128	1 197 001	1 061	1 208	1 370 712	1 134

Source: DMR, Directorate Mineral Economics

PRICES

The high national inflation resulted in an increase in prices. Limestone prices for the metallurgical and agricultural sector went up by 2 percent and 4.1 percent respectively. In 2017, the cement sector increased prices by between 3 – 5 percent in the first and third quarters, due to high national inflation during that period. Local price of limestone for cement rose by 6.7 percent (Table 92). Overall prices for limestone increased by 7.7 percent. The increase in prices resulted in improved sales value of limestone.

EMPLOYMENT

The number of employees declined by 3 percent to 2 771 personnel in 2017 from 2 856 in 2016 on the back of weaker economic conditions (Table 97). However, this did not hamper productivity as both labour and revenue productivity increased by 4.9 percent and 11.2 percent respectively. Remuneration of workers improved by 2.6 percent to R6.26 million (from R6.10 million). The improvement in remuneration is owing to bonuses paid in the third and fourth quarter of 2017.

TABLE 97: SOUTH AFRICA'S LIMESTONE AND DOLOMITE QUARRIES: EMPLOYMENT AND REMUNERATION, 2008 – 2017.

YEAR	EMPLOYEES	TOTAL REMUNERATION
		R`000
2008	2 517	321 698
2009	2 490	359 959
2010	2 635	410 250
2011	2 723	425 537
2012	2 811	438 208
2013	2 980	468 648
2014	2 673	509 250
2015	2 774	537 967
2016	2 744	587 871
2017	2 771	626 151

Source: DMR, Directorate Mineral Economics

RECENT DEVELOPMENTS

PPC launched a new and extended product range, despite economic headwinds. The company launched its fit-for-purpose 'Sure' product range, with each of the six products in the range, each carefully designed for a specific application. PPC, in collaboration with China's Sinoma Construction have successfully ignited the kiln at the Slurry Kiln 9 project in Madikwe in the North West province. Once testing on the kiln is done, the 3300t/day line will be transferred to PPC to start commissioning. The entity is looking into replacing their Riebeeck plant with a 'semi-brownfield' facility that used around 25 percent of the current plant's equipment.

Afrimat has acquired the Emfuleni Clinker Ash Dump, situated in Vereeniging, in close proximity to its clients. This acquisition will ensure an additional three to four years to the lifespan for the Clinker Group.

Afrisam plans to establish a new plant in the Western Cape. The group envisages that, this will result in lessened costs of cement to ready-mix concrete operations, whilst being able to pursue other uses more aggressively. The entity expects to spend about R3 billion, which will start with the commissioning of a cement mill and bagging mill, and later followed by the construction of the kiln, once there is sufficient demand to support the level of investment.

OUTLOOK

The Ministry of Investment, Trade and Industry in Botswana plans to restrict imports of cement following the introduction of new legislation. It will require 70% of cement to be sourced from local producers with only 30 percent allowed to be imported. The new regulations are intended to regulate improved trade with South Africa.

South Africa is expected to create growth in the construction sector in the next four years on the back of infrastructure investment in the transport and logistics, energy, and low-cost housing sectors (2017 National treasury report). The number of approved building plans grew by 6 percent, this will ensure activity in the construction sector underpinned by the ever increasing need for

housing as urbanisation rates continue to rise. These projects will ultimately have a positive impact on the production and sales of limestone. The country is moving towards accelerated service delivery and it is anticipated that this drive will improve construction activity as infrastructure is one of the main beneficiaries and will subsequently lead to an increase in demand for limestone.

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PHOSPHATE ROCK

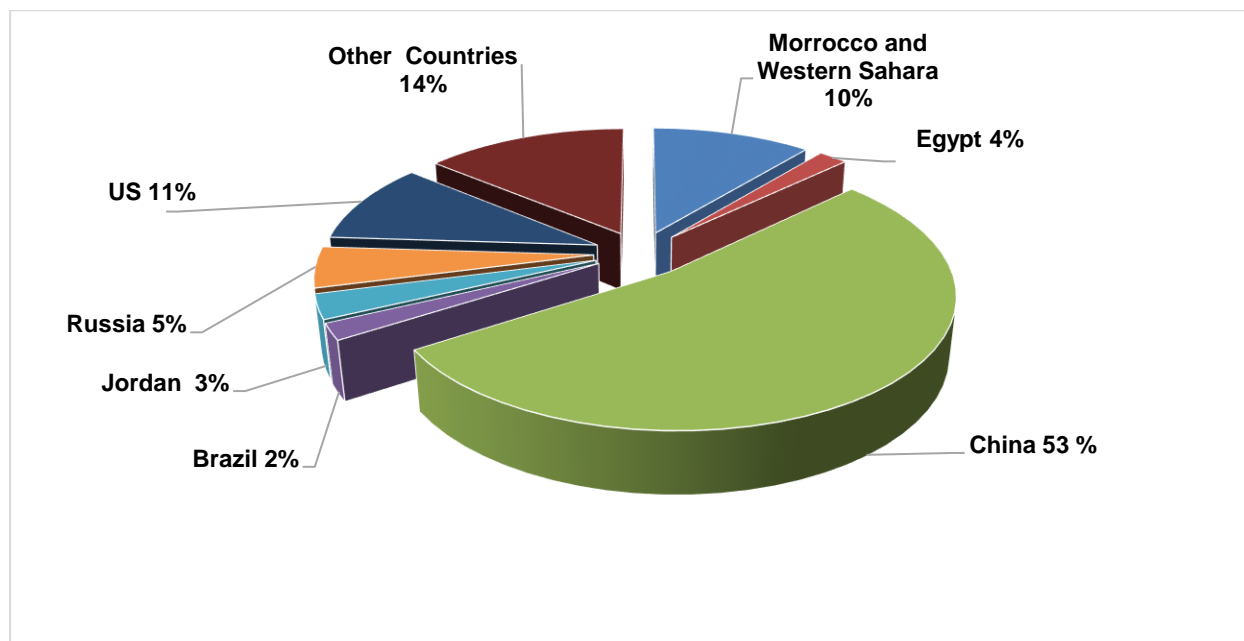
M Muravha

SUPPLY AND DEMAND

According to the United States Geological Survey (USGS), there more than 300 billion tonnes (Bt) of phosphate resources globally including 70 Bt of mineable reserves in more than 23 countries. Morocco & Western Sahara have the largest reserves of Phosphate rock, accounting for 50 Bt followed by China with 3.3 Bt and Algeria at 2.2 Bt. South Africa is ranked 5th, accounting for 1.5 Bt. The global phosphate markets' supply is heavily concentrated in North Africa, with OCP, the state-owned Moroccan miner having exclusive access to almost three quarters of the world's phosphate reserves.

World production of phosphate rock increased by 3.1 percent to 263 Mt in 2017 compared with 255 Mt in 2016. In 2017, a new phosphate rock mine and fertilizer facility began operation in Saudi Arabia, which increased production capacity in that country to 10.5 Mt per year from 5 Mt per year. China is the world's largest phosphate producing country and accounted for 53 percent of production followed by the United States at 11 percent and Morocco & Western Sahara at 10 percent each (Figure 74).

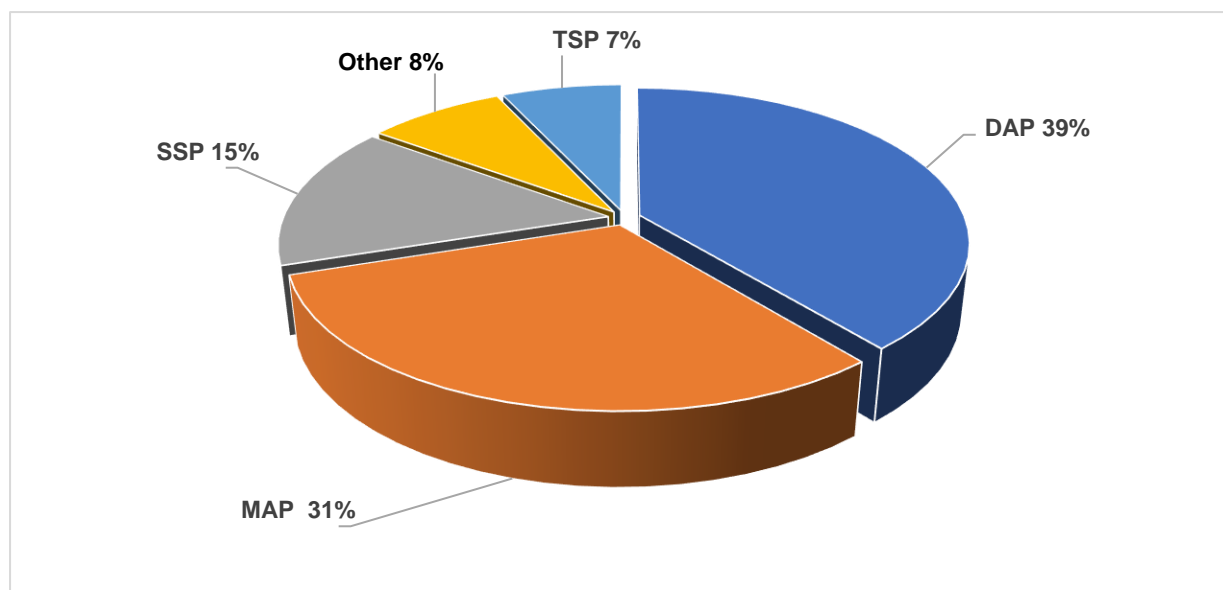
FIGURE 74: PHOSPHATE ROCK PRODUCTION BY COUNTRY, 2017



Source: USGS 2018

Fertilisers account for 87 percent of global phosphate demand, feed accounts for 7 percent, while food and industrial uses comprise a further 6 percent. Of the phosphate produced globally, *diammonium phosphate* (DAP) accounts for 39 percent of demand, monoammonium phosphate (MAP) 31 percent, single super phosphate (SSP) 15 percent, trisodium (TSP) 7 percent and the remaining 8 percent for other uses (Figure 75).

FIGURE 75: WORLD PHOSPHATE ROCK DEMAND



Source : CRU

South Africa's production of phosphate rock increased by 22.5 percent to 2 078 kt in 2017 compared with the previous year (Table 98). Production increased at the country's largest producer, Foskor, in spite of the company continuing to experience operational problems with its mining fleet as well as primary and secondary crushers. The mine also experienced slower site establishment and engagement of the mining contractor after the outsourcing of the Foskor North Pit, closure of the Foskor South Pit haul road for safety reasons. Local sales volumes increased by 8.6 percent to 1 689 kt in 2017 compared with 1 555 kt in 2016. Export volumes increased by 43.5 percent to 683 kt in 2017 from 476 kt in 2016. There were no exports in other months of 2016 owing to weak demand.

TABLE 98: SOUTH AFRICA'S PRODUCTION AND SALES OF PHOSPHATE ROCK, 2008-2017

YEAR	PRODUCTION	LOCAL SALES	EXPORTS
	Mass Kt	Mass kt	Mass Kt
2008	2 287	2 687	0
2009	2 237	2 268	0
2010	2 148	1 880	25
2011	2 575	2 155	194
2012	1 831	1 415	620
2013	2 131	1 634	170
2014	2 011	1 640	227
2015	1 852	1 190	828
2016	1 696	1 555	476
2017	2 078	1 689	683

Source: DMR, Directorate Mineral Economics

PRICES

Phosphate rock prices rose steeply from \$350/t in November 2017, peaked at around \$420 /t in March 2018, and have since fallen to \$400/t. DAP/MAP prices were driven by strong Indian demand, although these have been largely offset by increased Chinese export availability. For 2017, average DAP selling price was \$335/t fob plant. This is a decrease from average selling prices in 2016 of \$443 /t. Prices rallied higher at the end of 2017 and the start of 2018 and, this can be attributed to a tighter Chinese market. Chinese product availability after a domestic demand peak season, is expected to weigh down on prices amid competition from the Middle East and North Africa.

EMPLOYMENT

Local employment increased by 21.3 percent from 2 898 employees in the previous year to 3 516 employees in 2017, as a result of recruitment of seasonal contractors (Table 99). Consequently, remuneration also increased by 23.4 percent from R766.1 million in the previous year to R945.7 million in 2017 (Table 99). However, productivity slightly decreased by 0.10 percent from 0.66 kt per employee to 0.59 kt per employee in 2017 as result of continuous operational challenges at a major producing mine.

TABLE 99: SOUTH AFRICA'S PHOSPHATE SECTOR EMPLOYMENT, 2013- 2017

Year	Employees	Remuneration
2013	3 6548	878.7
2014	3.242	789.5
2015	2 809	725.1
2016	2 898	755.1
2017	3 516	945.7

Source: DMR, Mineral Economics Directorate, 2013-2017.

DEVELOPMENTS

A new phosphate mine (Elandsfontein Phosphate Project Mine) in the Western Cape owned by Kropz is in its preparation stages, scheduled to start production during the second half of 2019. The mine has a capacity to produce 1.4 Mt of phosphate rock. The company secured an off-take agreement with Foskor, which will see Kropz selling a third of its production to Foskor (largest phosphate producer). South Africa is a substantial net importer of fertiliser products for its agricultural produce and the deal will ensure sufficient access to phosphate material to local farmers.

Glenover phosphate project (34 percent owned by Galileo Resources) have entered into an agreement to undertake a two phase, pilot plant phosphate flotation study (PPFS). The outcome of the study has led to developments of Glenover phosphate phase earth project in the North of Thabazimbi in the Limpopo Province. The company plans to inject US\$ 300 000 towards the first phase of the PPFS (water and ore variability study).

Foskor completed the sealing-off of the Selati tailings dam decant outlet pipe, eliminating related environmental risk. The company is continuing with the North Pit Pushback project as planned, which will extend the life of the North pit mine to 30 years. The project should be complete in the next three years.

OUTLOOK

World mine production capacity, excluding China, is projected to increase to 168 Mt by 2021 from 147 Mt in 2017, according to industry analysts. The bulk of capacity increases is expected from Egypt, Jordan, Morocco, Senegal, and Turkey. Phosphate rock production in China is estimated to be around 85 Mt but, this is considerably lower than the official data published by the Government of China. As demand for fertiliser minerals continues to grow, competition among suppliers is also set to increase, while the quality of mineral reserves is declining. In these circumstances, processing techniques will be key to preserving producer margins, increasing the effectiveness of fertiliser end products, and for minimising waste in an industry that continues to be closely scrutinised for its efficiency and environmental impact.

World consumption of P_2O_5 , contained in fertilisers and other uses, was projected to increase to 48.8 Mt in 2021 from 45.7 Mt in 2017. Asia and South America would account for about 70 percent of the projected growth.

In South Africa, production capacity is expected to increase in the medium term, on the back of additional production Kropz, Elandsfontein mine in the Western Cape. The introduction of the new mine will be supported by the anticipated increase in demand for fertilisers, underpinned by the need for more food reserves due to a growing population.

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SPECIAL CLAYS

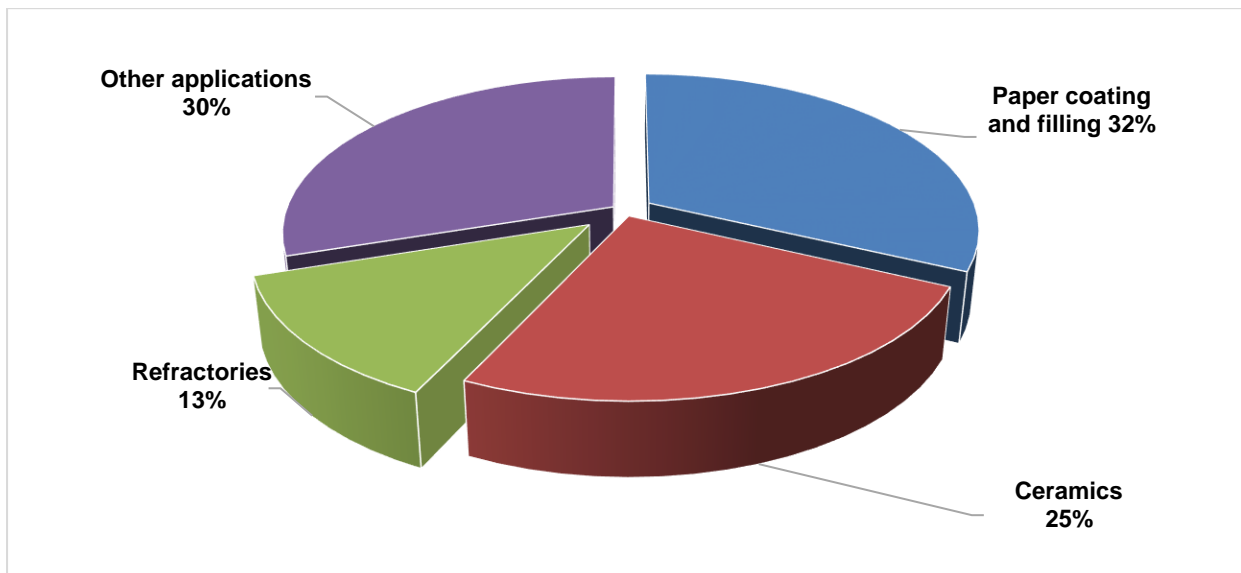
M. Muravha

SUPPLY AND DEMAND

Special clays are a group of products derived from several different clay minerals found in a wide range of geological environments. The term special clays in this chapter refer to attapulgite, bentonite and kaolin. Special clays minerals have numerous industrial uses in the paper, chemical and oil industries. The paper industry is the largest end-user of kaolin, where it is used for filling and coating of paper, due to its ability to enhance brightness, gloss, paint absorbency as well as smoothness of the paper. In 2017 global demand for kaolin from paper coating and filling sector accounted for 32 percent. Ceramics and refractories accounted for 25 percent and 13 percent respectively, while other applications accounted for 30 percent (Figure 76).

The paper market remains the largest end-user of kaolin. However, the ceramic segment, which includes sanitary ware, tableware and tile is growing fast, having increased by 31.6 percent in 2017. Another kaolin market that is becoming highly significant, is the lightweight ceramic proppants, used in hydraulic fracturing. Population growth is driving the construction sector and creating demand for tiles, sanitaryware and tableware. Ceramic demand is growing while paper demand is declining, due digitization.

FIGURE 76: GLOBAL KAOLIN DEMAND BY SECTOR



Source: USGS, 2018

Bentonite on the other hand is used in various industries such as binders in iron and steel manufacturing, mineral oil and liquor purification, absorbent and ground water barrier. In 2017 the pet litter market accounted for 42 percent of bentonite consumption, while the drilling mud application accounted for 26 percent and other applications, for 32 percent. The oil and gas drilling application was the largest user in 2016. However, the demand for bentonite use in drilling fluid fluctuates with drilling activities. The total number of active rigs around the world was 2 096 early

in 2018, which is an increase of 49 percent from 1 405 in 2016. The increase in oilfield activity has not brought about a similar uptick in demand for oilfield minerals, which reflects the changing dynamics of the drilling fluid market.

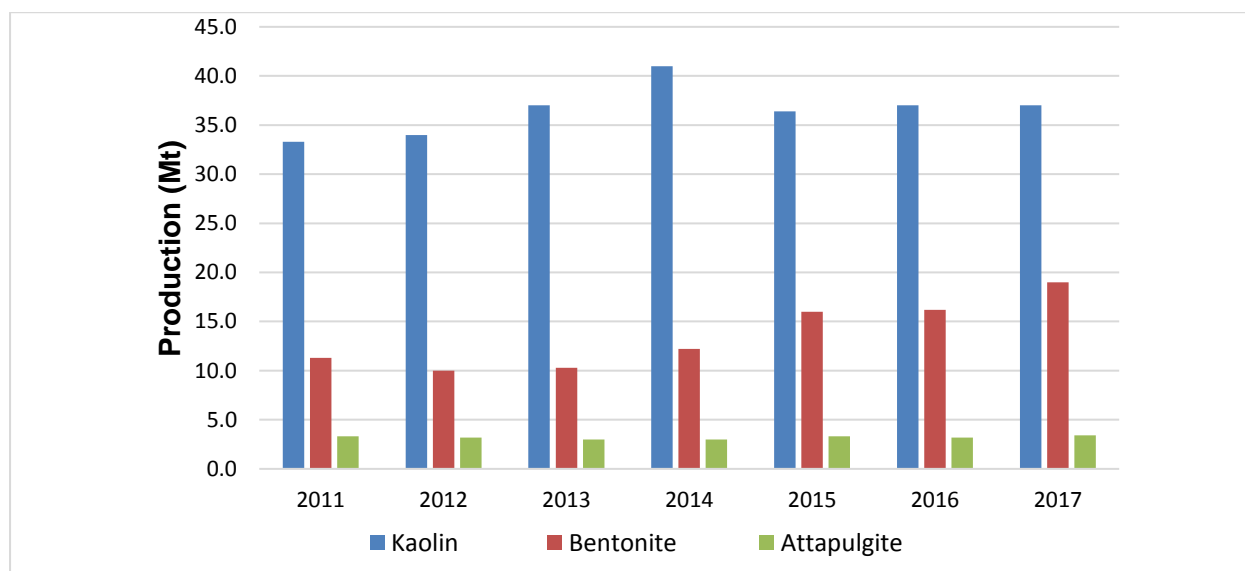
Another type of special clay is attapulgite for which, demand is also mainly driven by oil drilling and pet litter markets. Pet waste accounted for more than 84 percent of the attapulgite global market demand in 2017. There is growing demand for paints & coatings from increasing construction activities in emerging economies. In addition, an increasing application scope of attapulgite in medical and pharmaceuticals as well as agricultural sectors are opening new opportunities for attapulgite. Other markets include agricultural suspensions, catalyst and molecular sieves.

In 2017, total world production of kaolin increased by 5.7 percent from 35Mt in 2016 to 37Mt, as a result of growing demand for ceramic proppants used by the oil and gas industry. The main producing countries of kaolin in 2017 were United States (US), which accounted for 15 percent of the total kaolin production followed by Germany with 11.6 percent and India with 11.1 percent. Overall, healthy trends were evident in ceramics markets such as sanitaryware, table ware and floor tiles.

The total world production of bentonite remained constant at 19 Mt in 2017 (Figure 77). Foundry and Industrial Opportunity Partners (IOP) markets continued to drive bentonite consumption. China accounted for 29.5 percent of the total world production of bentonite followed by United States with 19.5 percent and Turkey with 16.3 percent. Oilfield activity is the key driver for demand of a number of clay minerals, including bentonite, and other frack sand, although the pickup in demand for some of these minerals has lagged. Many operators continue to prefer oil-based muds, over water-based, reducing demand for bentonite.

Total world production of attapulgite increased by 3.3 percent from 3.2 Mt in 2016 to 3.4 Mt in 2017, as a result of increased demand from pet waste absorbents. United States accounted for 50 percent of the total world production of attapulgite followed by Spain with 19.1 percent, Mexico and Greece at 7.6 percent and 7.1 percent, respectively.

FIGURE 77: GLOBAL SPECIAL CLAYS PRODUCTION: 2011-2017



Source: USGS, 2018

South Africa's production of kaolin increased by 39.3 percent from 21.1 kt in 2016 to 29.5 kt in 2017 due improved demand from ceramics (Table 100). Volumes sold locally decreased by 8.7 percent to 21.9 kt, while local sales value increased by 19.3 percent to R10.5 million in 2017.

TABLE 100: SOUTH AFRICA'S PRODUCTION AND LOCAL SALES OF KAOLIN, 2008-2017

YEAR	PRODUCTION	LOCAL SALES		
		Mass	Value (FOR)	
	kt	kt	R'000	R/t
2008	39.2	33.5	9 068	271
2009	31	30.1	9 343	311
2010	29.9	28.2	9 960	353
2011	15.2	22.4	10 375	463
2012	20.4	21.9	12 187	586
2013	22.3	35.2	16 740	475
2014	26	20.7	11 805	570
2015	12.1	19.9	5 444	273
2016	21.2	24.1	8 757	364
2017	29.5	21.9	10 451	476

Source: DMR, Directorate Mineral Economics

South Africa's production of attapulgite increased by 17 percent from 14.5 kt in 2016 to 17.0 kt in 2017 as a result of increased demand from cat litter and liquid fertilisers. Volumes sold locally increased by 31.1 percent to 14.6 kt in 2017 whilst the corresponding sales values consequently increased by 69.6 percent to R7.7 million, as a result of higher unit value prices. (Table 101).

TABLE 101: SOUTH AFRICA'S PRODUCTION AND LOCAL SALES OF ATTAPULGITE, 2008 - 2017

YEAR	PRODUCTION	LOCAL SALES		
		Mass	Value (FOR)	
	kt	kt	R'000	R/t
2008	69.9	69.9	20 783	297
2009	54.4	54.2	16 015	295
2010	57.6	57.3	17 585	290
2011	14.4	14.4	6 572	455
2012	15.8	15.9	7 171	452
2013	21.2	15.4	8 417	547
2014	16.7	16.7	7 549	451
2015	18.3	17.7	9 386	530
2016	14.5	11.1	4 567	411
2017	17.0	14.6	7 745	532

Source: DMR, Directorate Mineral Economics

Local bentonite production increased by 17.7 percent from 134.1 kt to 157.8 kt in 2017, as a result of increased demand from power plant construction projects. Local sales volumes increased by 4.4 percent from 102.5 kt in 2016 to 106.9 kt in 2017, because of increased demand from foundry and civils markets, while local sales value increased by 39.8 percent to R88.2 million (Table 102).

TABLE 102: SOUTH AFRICA'S PRODUCTION AND LOCAL SALES OF BENTONITE, 2008 -2017

YEAR	PRODUCTION	LOCAL SALES		
		Mass	Value (FOR)	
	kt	kt	R'000	R/t
2007	45.8	87.3	49 749	570
2008	44.1	96.1	64 670	673
2009	40.3	59.8	37 585	628
2010	82.3	124.6	82 594	659
2011	120.4	177	118 344	669
2012	120.6	159.9	119 629	748
2013	177.2	169.6	123 077	726
2014	156.8	113.6	57 914	510
2015	165.5	138.2	62 927	455
2016	134.1	102.5	62 081	455
2017	157.9	106.9	88 175	824

Source: DMR, Directorate Mineral Economics

DEVELOPMENTS

Midden Mining Pty Ltd identified a new bentonite prospect in the Western Cape Province, South Africa, at Matjesfontein farm near Mossel Bay. The prospecting right is underlain by Cretaceous rocks of the Uitenhage group, which includes bentonitic horizons and interlayered tuffs of the Kirkwood Formation. The strata dip gently to the north and are underlain in the south by conglomerates of the Enon Formation and sandstones and shales of the Cape System. The Geological exploration and field mapping conducted to date has located a bentonite outcrop estimated to be approximately 0.5 to 1 metre thick.

PRICES

The price of kaolin for No 1 paper coating and No 2 paper coating grades were flat between \$147 - \$203/t and \$126 - \$198/t, respectively. However, prices increased globally for all kaolin products for industrial applications, calcined kaolin products for paper applications, and hydrous kaolin products for thermal paper applications.

Bentonite price remained flat, despite the uptick in drilling. The pace of drilling soared over the past two years, but the increase in oilfield activity has not brought about a similar uptick in demand for oilfield minerals. Sales of bentonite remained stagnant as buyers are skimping on drilling mud to cut costs. The prices for cat litter grade free on board (FOB) European port remained unchanged in 2017 compared with 2016 at a range of €42 - 60/t. The Indian, crushed, dried, loose, in bulk, cat litter grade prices and the American Petroleum Institute (API) grade also remained constant at a range of \$32 - 36/s. ton and \$86 - 125/s. ton respectively.

TABLE 103: GLOBAL PRICES OF KAOLIN AND BENTONITE, 2016-2017.

KAOLIN	2016	2017
No 1 paper coating grade	\$147-203/s.ton	\$147-203/s.ton
No 2 paper coating grade	\$126-198/s.ton	\$126-198/s.ton
BENTONITE	2016	2017
Cat litter, grade 1-5 mm, bulk, FOB Main European port	€42-60/s.ton	€40-62/s.ton
Indian, cat litter grade, crushed, dried, loose, in bulk, FOB Kandla	\$32-35/s.ton	\$32-35/s.ton
Foundry grade, bagged, railcars, ex-works Wyoming	\$97-124/s.ton	\$97-124/s.ton
Iron Ore Pelletising (IOP) grade, crude, bulk, ex-works Wyoming	\$50-65/s.ton	\$50-65/s.ton

Source: Industrial Minerals

EMPLOYMENT

South Africa's special clays industry employed a total of 322 employees in 2017 up by 7.3 percent when compared to 2016. The increase in employees can be attributed new appointments in bentonite sector. (Table 104). Remuneration also increased by 10.2 percent from R38.4 million in 2016 to R42.4 million in 2017. Productivity decreased by 61.5 percent from 3.9 kt per employee in 2016 to 1.5 kt per employee in 2017.

TABLE 104: SOUTH AFRICA'S SPECIAL CLAYS EMPLOYMENT, 2013-2017

Year	Employees	Remuneration
2013	328	37 188 650
2014	323	36 246 841
2015	359	42 361 584
2016	300	38 441 871
2017	322	42 377 525

Source: DMR, Directorate Mineral Economics

OUTLOOK

Global kaolin market is expected to grow at 8.8 percent (CAGR) between 2018 and 2025, on the back of anticipated infrastructural developments around the world. Increasing demand in novel applications including printing inks and portland cement is expected to open new opportunities for growth in the long term. Paper-grade kaolin is expected to make a comeback in the long run, as there is pressure for retailers to reduce their use of plastic packaging. Companies are switching to the use of paper packaging, which is likely to spell a turnaround in kaolin demand. Despite signs of a looming rebound in production in the paper market, many producers remain bearish about the potential for paper to drive demand for kaolin. Globally, paper and board production grew by 1.5 percent in 2017, reaching 420 million tonnes, according to the Confederation of European Paper Industries. But kaolin producers are primarily looking at sanitaryware and tableware as growth areas. Growing demand for ceramic products is expected to be one of the primary market drivers. In addition, rapid industrialization in emerging economies from Asia Pacific, Central and South America. The Middle East is expected to fuel product demand across numerous applications between 2018 and 2025.

Locally, rising construction activities are also expected to result in an increase in demand for paintings. This will boost kaolin growth in the construction sector. Also, the rising need for ceramic products including tiles, and sanitary ware as well as its growing use in the cement industry as a supplementary material is anticipated to positively impact industry growth.

The global market for Bentonite is expected to grow by 3.8 percent from 2018 to 2025. Foundry sands application will continue its dominance over the forecast period, due to continual growth in automotive and machinery industry. Other applications with strong demand include civil engineering and edible oil refining. By product type, sodium bentonite is expected to lead the market over 2018 to 2025 due to the increasing preference for green sand casting process in the foundry. Regionally, Asia Pacific is anticipated to retain its dominance in bentonite industry due to high demand for bentonite in the construction industry.

Over the last decade, growth came from the drilling mud industry driven by oil and gas exploration activities as demand for global energy increased. However, the slow recovery of global oil prices might impact negatively on oil and gas exploration. Furthermore, the role of drilling agents seem to be lessening, as there is increase in oilfield activity, but no change in the drilling fluid market.

Locally, the Eskom Kusile project, now nearing completion, has been boosting South Africa's demand for bentonite. However, exploration of shale gas resources in the Karoo is expected to boost production of bentonite, as it is used extensively as drilling mud during exploration drilling. The finalisation of exploration rights application is being fast tracked to ensure the project commences in the short term.

Globally, attapulgite market witnessed substantial growth over the past few years, on account of increasing demand from oil & gas industry. Growing demand for paints & coatings, owing to increasing construction activities in emerging economies is likely to positively impact the attapulgite market in the next six years. In addition, demand will be driven by the cat litter market growth. Furthermore, increasing application scope of attapulgite in medical and pharmaceuticals as well as agricultural sectors is likely to open new opportunities for attapulgite in near future.

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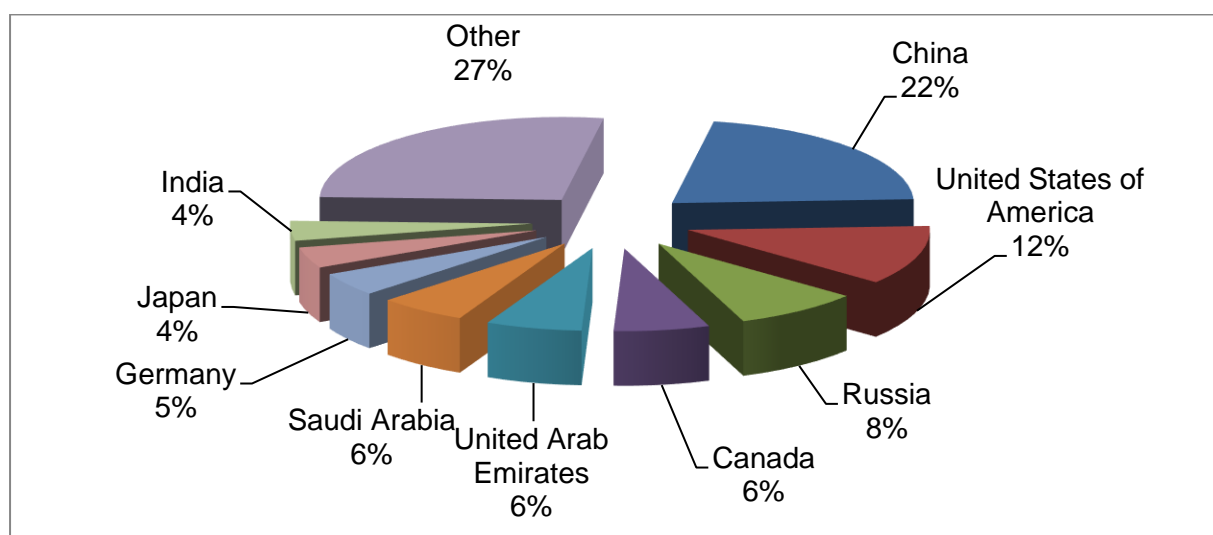
SULPHUR

M Modiselle

SUPPLY AND DEMAND

World production of sulphur in all forms (SAF) increased by 0.1 percent from 82.8 Mt in 2016 to 82.9 Mt in 2017. China's production of sulphur continues to increase as the country's hydrocarbon sector evolved and phosphate output improved. China reclaimed its leading position back from United States of America (USA), which overtook it since 2015 and accounted for 22 percent of total world production. USA's production was 12 percent, while Russia remained constant at 8 percent, followed by Canada, United Arab Emirates and Saudi Arabia at 6 percent each, Germany at 5 percent while India, which remained unchanged at 4 percent (Fig. 78).

FIGURE 78: WORLD PRODUCTION OF SULPHUR BY COUNTRY, 2017



Source: USGS, 2018

Sulphur is one of the most important input raw material in industrial applications. It is used principally, as sulphuric acid in many chemical and industrial processes and, it is particularly important in the manufacture of phosphate fertilisers, the single largest end user for sulphur consumption. Sulphur market was highly volatile during the last quarter of 2017 and, the extent and velocity of the soar caught most market players by surprise. More dynamic movements on the supply and demand side, generally led to increased price volatility. The early 2018 saw sulphur market shift from relative bullishness and seller optimism about prices to uncertainty followed by more pessimism.

In South Africa, most elemental sulphur is transformed to sulphuric acid. Sulphur is recovered as a by-product from an oil refinery/synthetic fuels producer, platinum group metals (PGMs), zinc and copper mines. South Africa's production of sulphur in all forms (SAF), inclusive of elemental sulphur and sulphuric acid decreased slightly by 8.6 percent from 281 kt in 2016 to 257 kt in 2017 (Table

105). Sulphur recovery from oil refineries recorded a 0.9 percent decrease from 196 kt in 2016 to 194 kt in 2017, owing to ongoing increased demand in oil and gas refineries.

Sulphuric acid production from Palabora Mining Company (PMC), a copper mine in South Africa, decreased by 35.8 percent from 54.9 kt in 2016 to 35.3 kt in 2017, following a further decline in copper production, as a result of maintenance and repair at that mine. There was no recovery of sulphuric acid as a by-product from zinc and gold mines in 2017 (Table 105). Sulphuric acid production from PGM mines declined by 8.7 percent from 30.1 kt in 2016 to 27.6 kt in 2017, owing to the declining total mining supply attributable to a reduced output.

TABLE 105 - SOUTH AFRICA'S PRODUCTION OF SULPHUR IN ALL FORMS, 2016-2017

SOURCE	2016		2017	
	Mass		Mass	
	t	%	t	%
Oil refineries / Synthetic fuels	195 716	70	193 876	75
Gold mines	0	0	0	0
Copper mines	54 929	20	35 262	14
Zinc mines	0	0	0	0
PGM mines	30 185	10	27 562	11
	280 830	100	256 700	100

Source: DMR, Directorate Mineral Economics

Local sales mass of South Africa's sulphur in all forms (SAF) production decreased by 16.8 percent to 104 kt in 2017 compared with 125 kt in 2016, owing to weaker demand (Table 106). Local sales value decreased by 13.6 percent from R125 million in 2016 to R108 million in 2017 owing to a decline in the sulphur markets. Export sales mass of SAF decreased by 2.5 percent from 160 kt in 2016 to 156 kt in 2017 and, the export sales value decreased by 16.8 percent from R267 million in 2016 to R222 million in 2017. A decrease in export sales was due to a decline in global demand.

TABLE 106 – SOUTH AFRICA'S PRODUCTION AND SALES OF SULPHUR IN ALL FORMS, 2008-2017

YEAR	PRODUCTION		LOCAL SALES		EXPORT SALES		
	Mass		Mass	Value	Mass	Value	
	Kt	Kt	Kt	R'000 R/t		R'000	R/t
2008	571		315	548 705 1 740	110	351 860	3 190
2009	536		332	293 105 883	62	27 193	436
2010	375		256	168 911 660	96	48 795	511
2011	338		217	116 645 538	121	199 581	1 658
2012	257		150	123 405 821	125	241 351	1 924
2013	270		133	67 127 506	141	231 606	1 647
2014	277		156	132 463 847	128	213 742	1 664
2015	284		149	138 962 930	133	310 365	2 332
2016	281		125	125 927 1 008	160	266 836	1 663
2017	257		104	108 558 1 044	156	222 435	1 428

Source: DMR, Directorate Mineral Economics

South Africa's imports mass of SAF increased by 16.3 percent from 638 kt in 2016 to 742 kt in 2017, while the imports value increased by 24.3 percent from R854 million in 2016 to R1 062 million

in 2017 (Table 107). South Africa imports crude oil and other finished products at a price set at the international level, including importation costs, e.g. shipping costs. The country is importing more sulphur than it produces due to shortage of refining capacity for liquid fuels.

TABLE 107 – SOUTH AFRICA'S IMPORTS OF SULPHUR, 2008 – 2017

YEAR	CRUDE/UNREFINED			SUBLIMED & OTHER ⁺			TOTAL		
	Mass Kt	Value (FOB)		Mass Kt	Value (FOB)		Mass Kt	Value (FOB)	
		R'000	R/t		R'000	R/t		R'000	R/t
2008	791	3 436 560	4 344	173	754 037	4 358	964	4 190 597	4 347
2009	525	354 611	675	46	10 141	220	571	364 752	639
2010	593	377 801	637	63	51 396	816	656	429 197	654
2011	715	1 073 705	1 502	191	336 572	1 762	906	1 410 277	1 557
2012	506	843 456	1 667	94	124 605	1 326	600	968 061	1 613
2013	489	530 362	1 085	160	223 846	1 399	649	754 208	1 162
2014	537	866 566	1 614	894	183 964	206	627	1 050 530	1 675
2015	364	690 623	1 897	58	120 327	2 075	422	810 950	1 922
2016	384	530 681	1 382	254	323 164	1 272	638	853 845	1 338
2017	534	778 401	1 458	207	283 989	1 372	742	1 062 391	1 432

Source: RSA, Commissioner for South African Revenue Service, 2008 – 2017

Notes: ⁺ All forms of sulphur other than those specifically referred to

PRICES

Recent spikes in global sulphur prices in the third and fourth quarters of 2017, were due to Chinese purchase, which was above a year ago levels, as dwindling port stocks encouraged speculative buying. The surge in China spot sulphur prices pushed up from \$190/t to \$220/t between September and November 2017. The Chinese spot buyers scrambled to secure products, while prices were quickly rising, doors opened for greater speculative trader activity which probably exaggerated the spike. This was driven by lower than expected supply from Chinese refineries and higher than expected demand from phosphate producers leading to shortage in stock. Eventually, the global prices quickly reversed to spot price of \$150/t in December 2017. In spite of the odd relatively short-term correction, prices have increased almost uninterrupted, since the first half of 2016. While some metal buyers could afford higher acid prices, other buyers were feeling the pinch from the acid price inflation.

OUTLOOK

Overall sulphur demand grew substantially, faster than supply during 2017, but overall production growth is at the highest. A market surplus was previously expected in 2018 however, the surplus is now forecast to emerge in 2019. There remains significant uncertainty in sulphur markets concerning the near-term direction of prices because the market remains finely balanced, but buyers are reasonably stocked and comfortable. Sulphur prices in the current market tend to be limited on both the upside and downside by the cost margins of supply sources. On the demand side, sulphur prices are primarily determined by phosphate fertiliser values and production rates and so, the short-term forecast for Diammonium phosphate (DAP) influences the sulphur outlook.

For sulphuric acid, the nature of the product means that producers are unable to stockpile volumes, and therefore the market must always be balanced at any price necessary, sometimes leading to negative Free on Board (FOB) prices. In addition, taking into account forecasts for downstream phosphate and substitute (for some buyers) sulphur, the market also considers the view for base metals markets, which are a source of supply as well as demand.

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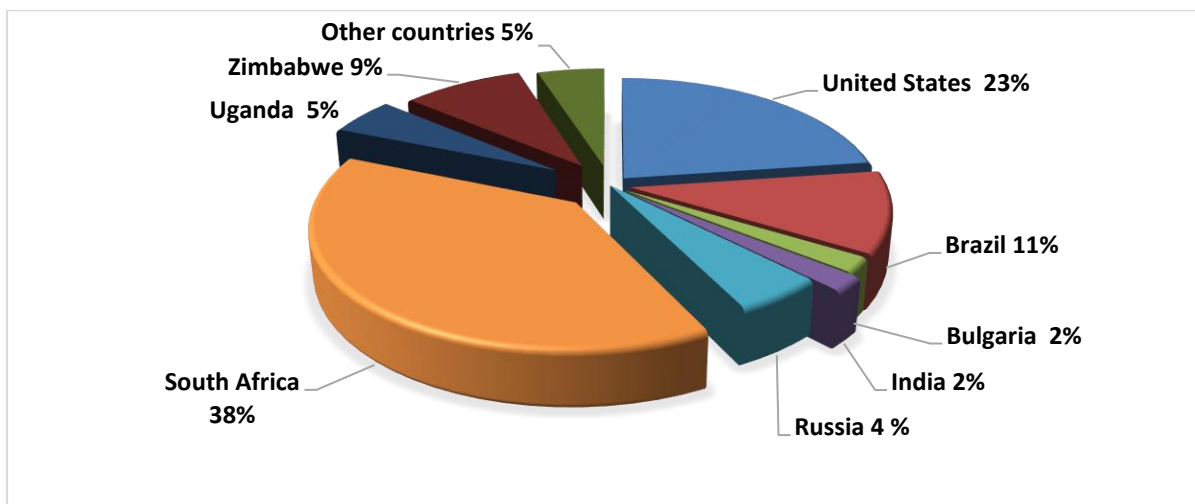
VERMICULITE

Munyadziwa Muravha

SUPPLY DEMAND

World production of vermiculite is estimated to have increased by 8.6 percent from 405 kt to 440 kt in 2017. Production increased as a result of ramped-up facilities in South Africa, Uganda and Turkey.

FIGURE 79: WORLD PRODUCTION OF VERMICULITE BY COUNTRY, 2017



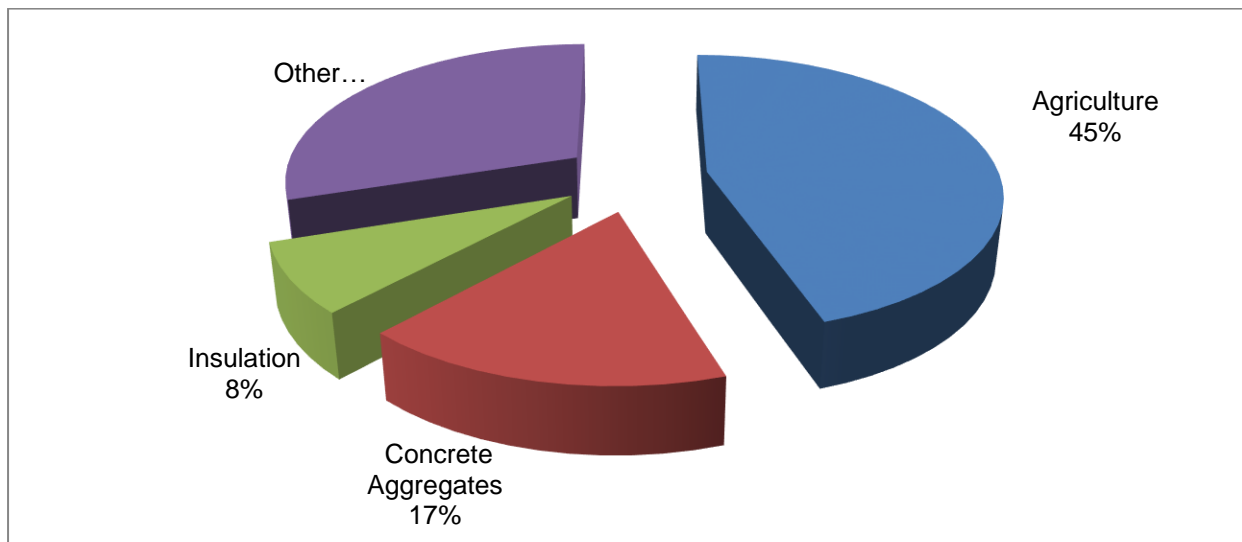
Source: USGS, 2018

South Africa (SA) remained the world's largest producer of vermiculite, contributing about 39 percent to total world production, followed by United States of America (USA) at 23 percent and Brazil at 11 percent (Figure. 79). South Africa and the USA have held leading ranks for almost a decade, but have since been decreasing output until 2016, when SA's output started to increase. The USA and SA output were stable at 100 kt and 166 kt pa in 2017, respectively. The restart of Namakera by Black Mountain Resources, which acquired the vermiculite mine from African Phosphate Pty. Ltd. in 2016, raised vermiculite production in Uganda in 2017. The mine is considered one of the largest and highest quality vermiculite assets, globally. A Zimbabwean mine also considered to host one of the largest vermiculite deposit containing significant portions of medium to coarse grade material intermittently produced vermiculite concentrate.

Vermiculite is widely used in horticulture, because of its characteristics to control soil moisture and host mineral fertilisers. Other commercial applications include building plaster; fire protection; refractory; friction linings; special coatings; animal feed; and packaging. Horticulture accounted for

45 percent of vermiculite consumption followed by light weight concrete at 17 percent and insulation applications at 8 percent (Figure 80). Demand for vermiculite was strong in 2017, with fresh interest coming from the fire protection product market, as this is linked to construction, where vermiculite is used in fire proof plasters. Demand for vermiculite grew in China, India and Australia where there is a concentration of building projects. It has been estimated that demand for vermiculite varies between 450 kt/annum and 500 kt/annum

FIGURE 80: VERMICULITE CONSUMPTION BY SECTOR, 2017



Source: USGS Commodity Summaries, 2018

Europe remains the main market for South African's vermiculite whilst North America and Asia show, big growth potential for future consumption. Palabora Mining Company (PMC), the sole producer of vermiculite in South Africa, has raised its warehousing capacity in the port of Antwerp and, will do likewise in the UK late in 2018, to accommodate extra demand. PMC is the biggest vermiculite supplier exporting to U.S., Asia, Japan, UK and Europe.

PMC's production of vermiculite decreased slightly by 0.23 percent to 166.1 kt in 2017 compared with 166.5 kt in 2016. The fresh interest coming from the fire protection product market, has however not resulted in a spike in volumes yet, as this will later be determined by the actual amount of vermiculite used for the end product.

TABLE 108: SOUTH AFRICA'S PRODUCTION, LOCAL SALES AND EXPORTS OF VERMICULITE, 2008- 2017

YEAR	PRODUCTION	LOCAL SALES		EXPORTS SALES			
	Mass	Mass	Value		Mass	Value (FOB)	
	kt	kt	R'000	R/t	kt	R'000	R/t
2008	199.8	10.7	11 002	1 026	204.5	273 239	1 336
2009	193.3	9.5	10 236	1 073	164.6	238 295	1 448
2010	199.3	10.4	12 927	1 241	166.5	216 305	1 299
2011	167.5	9.6	16 576	1 722	162.4	328 921	2 215
2012	132.8	7.5	15 692	2 102	96.5	279 696	2 898
2013	127.7	8.6	17 861	2 088	118.3	380 489	3 215
2014	143	9.2	19 027	2 055	144.4	461 928	3 200
2015	138.3	9.3	20 212	2 164	115.1	399 547	3 470
2016	166.5	10.5	24 847	2 363	56.8	272 705	4 805
2017	166.1	10	25 053	2 515	68.7	274 920	4 002

Source: DMR, Directorate Mineral Economics

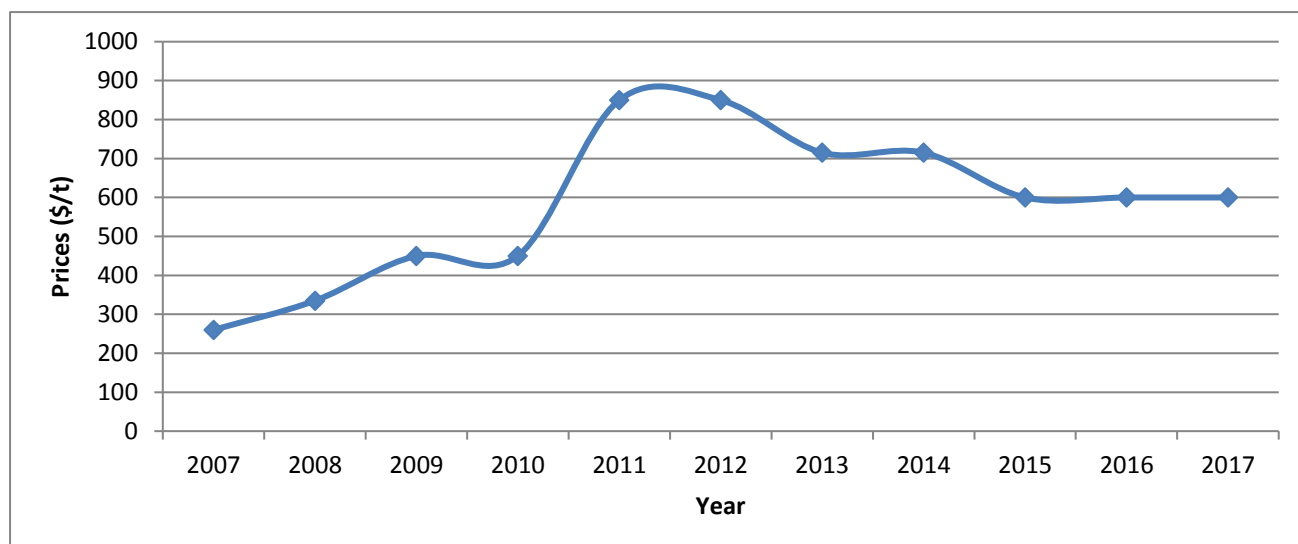
Tonnages sold locally decreased by 4.8 percent to 10.0 kt in 2017 compared with 10.5 kt in 2016, while local sales values increased by 0.8 percent to R 25.1 million in the same period. Export volumes increased by 21 percent from 56.8 kt to 68.7 kt in 2017, due to increased demand for coarser grade vermiculite. However, this grade of vermiculite remained in short supply even in 2017. Export sales values increased by 0.8 percent to R274.9 million from R272.7 million. Export unit prices decreased by 16.7 percent to R 4 002 from R 4 805.

About 80 percent of vermiculite sold to local consumers in South Africa is used in horticulture and agriculture applications, for soil aeration and moisture retention as well as in a number of mineral fertilisers. The balance is used in construction and insulation sectors. Population growth, changes in lifestyle and increasing consumer preferences towards healthy products have been driving the horticulture market upwards.

PRICES

In 2017, concentrate (bulk, FOB Antwerp) prices remained unchanged at \$600/t, similar to 2016 and 2015 (Figure. 81). The increase in use of substitute products such as perlite in both horticulture and temperature insulation systems has resulted in a downward pressure in prices. However, price increases are looming in the background, with demand rising, subsequently some large producers of vermiculite have their focus on plant improvements as well as intention of aggressively exploring additional land to increase ore reserves. The size of the increase has not been disclosed yet. The companies are continually adjusting the production conditions to ensure they can produce the grades to match the requirements of the market.

FIGURE 81: VERMICULITE PRICES, 2008-2017



Source: Various editions of *Industrial Minerals Magazine*

DEVELOPMENTS

Black Mountain Resource Limited, an Australian company, transferred full ownership of its East African Namekara vermiculite mine in Uganda to its financial lenders, freeing it of all debts. Mining resumed again at the Namakara mine in 2017. The Namekara deposit has sufficient resources to last more than 50 years of production. It is a portion of the larger East African vermiculite project, which has about 55 million tons of inferred resources and, is considered to be one of the world's largest deposits.

OUTLOOK

A number of vermiculite producing companies across the world have ramped up their production and, this is expected to have a positive impact on the overall world supply of vermiculite. A company in Turkey amongst many other companies has also began production at the country's first vermiculite mine at Karakoc deposit in Sivas (Central Turkey). Consumers' demand for coarser grains is on the rise while producers strive to produce the required grades. Demand is expected to stay strong throughout 2018 at the back of new interest coming from the fire protection product market. Vermiculite prices are expected to increase slightly, as a number of companies have

intensified the quest to aggressively explore additional ore reserves to stabilise coarse grain supply.

SA's production is expected to increase in 2018 as PMC has also ramped up its facilities recently. The company continues to ensure quality control of grade produced, in order to hold on to a bigger market share. Demand from the horticulture and agriculture markets could increase, as farmers continue the quest to increase crop production to curb the effects of recent droughts. The fire protection market is also expected to result in increased production for the country, in the long term, however, there have been no significant increases as yet. South Africa's anticipated growth in the construction industry in the long run, is expected to affect the vermiculite industry positively. Climate change and future scarcity of water are likely to drive vermiculite consumption, owing to the mineral's water retention characteristics.

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STATISTICS FOR OTHER INDUSTRIAL MINERALS

PR Motsie and M Maredi

NOTE: The following applies to all tables.

** Withheld for reasons of company confidentiality

* Nil

1. NATURAL ABRASIVES

TABLE 109: SOUTH AFRICA'S IMPORTS OF NATURAL ABRASIVES, 2008–2017

YEAR	Mass	Value (FOB)	
	t	R'000	R/t
2008	1 183	5 198	4 394
2009	1 208	7 419	6 141
2010	1 919	6 837	3 563
2011	2 095	6 393	3 051
2012	2 251	7 152	3 177
2013	2 088	8 239	3 946
2014	996	5 398	5 421
2015	1 645	8 177	4 971
2016	1 902	8 618	4 530
2017	900	8 918	9 906

Source: RSA, Commissioner for South African Revenue Service, 2008–2017

2. BARYTES

TABLE 110.1: SOUTH AFRICA'S PRODUCTION AND LOCAL SALES OF BARYTES, 2008–2017

YEAR	PRODUCTION		LOCAL SALES	
	Mass	Mass	Value (FOR)	
	t	t	R'000	R/t
2008	*	432	181	419
2009	*	284	119	419
2010	*	319	134	420
2011	*	189	79	420
2012	*	*	*	*
2013	*	*	*	*
2014	*	*	*	*
2015	*	*	*	*
2016	*	*	*	*
2017	*	*	*	*

Source: DMR, Directorate Mineral Economics

TABLE 110.2: SOUTH AFRICA'S IMPORTS OF BARYTES, 2008–2017

YEAR	Mass	Value (FOB)	
	t	R'000	R/t
2008	3 568	14 106	3 953
2009	2 823	13 805	4 890
2010	4 105	17 200	4 190
2011	3 146	11 747	3 740
2012	2 962	11 469	3 872
2013	3 128	10 195	3 259
2014	5 699	18 804	3 299
2015	2 801	15 029	5 365
2016	2 101	11 030	5 250
2017	2 446	10 586	4 327

Source: RSA, Commissioner for South African Revenue Service, 2008–2017

3. DIATOMACEOUS EARTH (KIESELGUHR)

TABLE 111: SOUTH AFRICA'S IMPORTS OF DIATOMACEOUS EARTH, 2008–2017

YEAR	Mass	Value (FOB)	
	t	R'000	R/t
2008	5 539	23 205	4 189
2009	3 930	16 075	4 090
2010	4 580	17 496	3 820
2011	5 261	19 572	3 720
2012	5 217	19 970	3 828
2013	4 016	18 940	4 716
2014	4 541	26 419	5 818
2015	5 554	37 889	6 822
2016	4 300	34 318	7 981
2017	5 853	46 044	7 867

Source: RSA, Commissioner for South African Revenue Service, 2008–2017

Note: Production statistics are not published because there is only one producer

4. FELDSPAR

TABLE 112: SOUTH AFRICA'S PRODUCTION, LOCAL SALES AND EXPORTS OF FELDSPAR, 2008–2017

YEAR	PRODUCTION	LOCAL SALES			EXPORT SALES+		
		Mass	Value (FOR)		Mass	Value (FOB)	
	Kt	Kt	R'000	R/t	Kt	R'000	R/t
2008	105.8	70.1	49 260	702	*	*	*
2009	101.4	72.9	55 248	758	*	*	*
2010	94.3	69.9	56 204	804	*	*	*
2011	101.6	98.9	61 031	617	*	*	*
2012	94.5	92.9	45 899	494	*	*	*
2013	191.4	186.5	101 444	544	*	*	*
2014	102.5	99.9	52 134	522	*	*	*
2015	130.2	119.8	63 450	530	*	*	*
2016	127.9	114.2	56 181	492	*	*	*
2017	116.7	129.7	66 730	515	*	*	*

Source: DMR, Directorate Mineral Economics

5. GRAPHITE

TABLE 113: SOUTH AFRICA'S IMPORTS OF NATURAL GRAPHITE, 2008–2017

YEAR	Mass	Value (FOB)	
	t	R'000	R/t
2008	1 003	20 101	20 041
2009	921	8 657	9 400
2010	1 108	12 891	11 634
2011	1 099	5 429	49 390
2012	768	10 372	13 505
2013	704	8 390	11 925
2014	603	9 208	15 270
2015	486	11 347	23 347
2016	698	12 341	17 691
2017	947	12 636	13 341

Source: RSA, Commissioner for South African Revenue Service, 2008–2017

6. GYPSUM

TABLE 114.1: SOUTH AFRICA'S PRODUCTION, LOCAL SALES, AND CONSUMPTION OF NATURAL GYPSUM, 2008–2017

NATIONAL CEMENT CONSUMPTION, 2008-2017					
YEAR	PRODUCTION	LOCAL SALES			CONSUMPTION FOR CEMENT+ [#]
		Mass	Value (FOR)		
			R'000	R/t	
	kt	kt			kt
2008	571	393	33 666	86	519
2009	598	397	36 616	92	***
2010	513	307	32 228	105	***
2011	476	323	36 831	114	***
2012	558	358	56 876	159	***
2013	559	327	58 288	178	***
2014	376	290	52 580	181	***
2015	232	213	40 367	190	***
2016	262	218	42 484	195	***
2017	321	237	50 195	212	***

Sources: DMR, Directorate Mineral Economics

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

[#] Includes synthetic gypsum.

*** Not available

TABLE 114.2: SOUTH AFRICA'S IMPORTS OF NATURAL GYPSUM, 2008–2017

YEAR	GYPSUM			GYPSUM PLASTERS		
	Mass	Value (FOB)		Mass	Value (FOB)	
		R'000	R/t		R'000	R/t
	t			t		
2008	1 939	3 343	1 724	11 290	14 303	1 267
2009	3 427	8 379	2 445	3 790	8 200	2 164
2010	24 506	7 884	321	6 386	10 903	1 707
2011	2 969	4 816	1 622	6 181	10 926	1 678
2012	10 957	10 015	9 141	7 407	12 775	1 725
2013	4 058	12 321	3 036	7 685	16 493	2 146
2014	66 261	28 971	437	7 597	18 219	2 398
2015	143 945	30 984	215	8 385	25 348	3 023
2016	142 529	30 774	216	9 096	31 574	3 471
2017	139 754	28 336	203	9 662	27 348	2 831

Source: RSA, Commissioner for South African Revenue Service, 2008–2017

7. MAGNESITE

TABLE 115.1: SOUTH AFRICA'S PRODUCTION AND LOCAL SALES OF MAGNESITE AND DERIVED PRODUCTS, 2008–2017

YEAR	PRODUCTION Kt	Mass Kt	LOCAL SALES	
			Value (FOR)	
			R'000	R/t
2008	83.9	111.1	51 864	467
2009	47.6	72.3	43 234	598
2010	27.7	73.6	63 982	869
2011	**	**	**	**
2012	**	**	**	**
2013	**	**	**	**
2014	**	**	**	**
2015	10.2	10.6	17 666	1 666
2016	8.8	9.0	15 015	1 673
2017	8.7	8.9	17 389	1 962

Source: DMR, Directorate Mineral Economics

TABLE 115.2: SOUTH AFRICA'S IMPORTS OF MAGNESITE AND MAGNESIA, 2008–2017

YEAR	MAGNESITE			MAGNESIA		
	Mass kt	Value (FOB)		Mass kt	Value (FOB)	
		R'000	R /t		R'000	R/t
2008	15.3	39 509	2 582	36.2	136 071	3 759
2009	25.5	10 850	4 254	41.8	139 175	3 328
2010	12.3	10 389	8 446	65.7	205 594	3 129
2011	10.4	14 709	1 410	96.2	324 992	3 376
2012	11.3	22 555	1 996	50.6	185 019	3 655
2013	21.8	37 277	1 710	54.6	230 046	4 208
2014	11.2	34 527	3 094	44.8	229 975	5 124
2015	9.8	36 785	3 754	51.3	302 871	5 904
2016	8.6	26 201	3 055	70.6	542 286	7 683
2017	12.3	32 904	2 673	52.4	342 841	6 544

Source: RSA, Commissioner for Service, South African Revenue, 2008–2017

8. MICA

TABLE 116.1: SOUTH AFRICA'S PRODUCTION, LOCAL SALES AND EXPORTS OF SCRAP AND FLAKE MICA; 2008-2017

YEAR	PRODUCTION	LOCAL SALES				EXPORT SALES		
		Mass t	Value (FOR)		Mass t	Value (FOB)		
			R'000	R/t		R'000	R/t	
2008	426	179	**	**	232	**	**	**
2009	299	245	**	**	106	**	**	**
2010	904	794	**	**	25	**	**	**
2011	633	431	**	**	174	**	**	**
2012	400	185	**	**	195	**	**	**
2013	309	113	**	**	*	**	**	**
2014	83	*	**	**	*	**	**	**
2015	29	*	**	**	*	**	**	**
2016	8	*	**	**	*	**	**	**
2017	21	8	**	**	*	**	**	**

Source: DMR, Directorate Mineral Economics

TABLE 116.2: SOUTH AFRICA'S IMPORTS OF MICA, 2008–2017

YEAR	Mass		Value (FOB)	
	t	R'000	R/t	
2008	296	1 103	3 727	
2009	358	933	2 608	
2010	483	1 152	2 385	
2011	507	1 353	2 668	
2012	425	1 353	3 184	
2013	633	2 997	4 524	
2014	862	3 853	4 471	
2015	955	5 580	5 842	
2016	721	4 271	5 920	
2017	818	4 685	5 728	

Source: RSA, Commissioner for Service, South African Revenue, 2008–2017

9. MINERAL PIGMENTS

TABLE 117: SOUTH AFRICA'S PRODUCTION AND SALES OF MINERAL PIGMENTS, 2008–2017

YEAR	PRODUCTION	LOCAL SALES			EXPORT SALES		
		Mass	Value		Mass	Value	
		t	R'000	R/t	t	R'000	R/t
2008	39	288	94	327	*	*	*
2009	183	119	40	339	*	*	*
2010	244	66	22	340	*	*	*
2011	226	19	7.6	400	*	*	*
2012	*	*	*	*	*	*	*
2013	*	*	*	*	*	*	*
2014	*	*	*	*	*	*	*
2015	*	*	*	*	*	*	*
2016	*	*	*	*	*	*	*
2017	*	*	*	*	*	*	*

Source: DMR, Directorate Mineral Economics

10. POTASH

TABLE 118: SOUTH AFRICA'S IMPORTS OF POTASH, 2008–2017

YEAR	POTASSIUM CHLORIDE		POTASSIUM SULPHATE		POTASSIUM NITRATE		TOTAL	
	Kt	R'000	Kt	R'000	Kt	R'000	Kt	R'000
2008	271.4	1 546 452	46.1	330 639	26.2	281 162	343.7	2 158 253
2009	139.6	618 360	24	129 297	14.8	101 451	178.4	849 108
2010	267.4	697 166	46.2	159 251	23.6	106 461	337.2	962 878
2011	265.1	867 674	52.6	219 149	27.8	170 730	345.5	1 257 553
2012	249.4	978 958	60.7	305 573	43	266 741	353.1	1 551 272
2013	274.1	1 209 391	50.5	253 304	23	189 429	347.5	1 652 124
2014	381.5	1 333 954	65.3	470 162	57	491 960	503.8	2 295 277
2015	377.4	1 434 886	39.6	323 091	29.6	254 352	446.6	2 012 329
2016	335.4	1 026 860	60.5	363 124	28.3	360 343	424.2	1 750 327
2017	305.8	899 436	376.4	325 074	9.0	93 089	691.2	1 317 599

Source: RSA, Commissioner for South African Revenue Service, 2008–2017

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

11. PYROPHYLLITE

TABLE 119: SOUTH AFRICA'S PRODUCTION, LOCAL SALES AND EXPORTS OF PYROPHYLLITE, 2008 – 2017

YEAR	PRODUCTION		LOCAL SALES		EXPORT SALES		
	t	Mass	Value (FOR)		Mass	Value (FOB)	
		t	R'000	R/t	t	R'000	R/t
2008	**	**	42 230	**	**	8 438	**
2009	**	**	38 449	**	**	9 795	**
2010	**	**	49 566	**	**	16 762	**
2011	**	**	31 277	**	**	201 423	**
2012	**	**	7 511	**	**	4 585	**
2013	**	**	5 750	**	**	4 944	**
2014	22 500	16 373	4 910	300	6 754	18 448	2 731
2015	17 352	12 579	4 901	390	3 315	11 436	3 450
2016	19 114	14 952	7 923	530	5 294	16 631	3 141
2017	55 048	13 793	10 508	762	4 213	14 654	3 478

Source: DMR, Directorate Mineral Economics

12. SALT

TABLE 120: SOUTH AFRICA'S PRODUCTION, LOCAL SALES AND EXPORTS OF SALT, 2008–2017

YEAR	PRODUCTION		LOCAL SALES		EXPORTS		
	kt	Mass	Value (FOR)		Mass	Value (FOB)	
		kt	R'000	R/t	kt	R'000	R/t
2008	430	437	123 537	282	*	*	*
2009	408	438	104 309	321	*	*	*
2010	394	423	126 306	298	*	*	*
2011	380	440	139 829	318	*	*	*
2012	399	480	155 293	324	*	*	*
2013	479	480	154 465	322	*	*	*
2014	494	492	160 818	327	*	*	*
2015	517	512	160 267	313	*	*	*
2016	473	460	169 762	369	*	*	*
2017	493	480	190 174	397	0.10	93.21	914

Source: DMR, Directorate Mineral Economics

13. SILICA

TABLE 121: SOUTH AFRICA'S PRODUCTION, LOCAL SALES AND EXPORTS OF SILICA, 2008–2017

YEAR	PRODUCTION	LOCAL SALES			EXPORT SALES		
		Mass	Value (FOR)		Mass	Value (FOB)	
	kt	kt	R'000	R/t	t	R'000	R/t
2008	3 342	3 059	351 474	115	959	1 486	1 550
2009	2 306	2 431	330 404	136	1 222	1 652	1 352
2010	2 863	3 026	470 618	155	1 042	1 632	1 567
2011	2 688	3 008	487 779	162	3 843	5 127	1 334
2012	2 151	2 356	543 599	205	18 821	334 899	17 94
2013	2 198	2 428	458 457	189	10 789	28 384	2 631
2014	2 604	2 622	548 129	209	15 959	46 794	2 932
2015	2 278	2 318	530 917	229	19 428	51 962	2 675
2016	1 886	1 911	512 220	268	11 461	34 068	2 972
2017	2 401	2 242	540 351	241	3 219	6 051	1 880

Source: DMR, Directorate Mineral Economics

14. TALC

TABLE 122.1: SOUTH AFRICA'S PRODUCTION AND SALES OF TALC, 2008–2017

YEAR	PRODUCTION	LOCAL SALES			EXPORT SALES		
		Mass	Value (FOR)		Mass	Value (FOB)	
	t	t	R'000	R/t	t	R'000	R/t
2008	5 145	6 591	5 606	851	*	*	*
2009	4 718	6 213	5 893	948	*	*	*
2010	3 150	5 370	5 573	1 038	*	*	*
2011	4 453	5 489	6 050	1 102	*	*	*
2012	4 765	5 568	7 084	1 272	*	*	*
2013	4 924	7 117	8 806	1 237	*	*	*
2014	4 827	5 606	8 297	1 480	*	*	*
2015	4 497	5 032	8 298	1 649	*	*	*
2016	4 462	4 462	9 469	2 122	*	*	*
2017	3 728	3 727	8 665	2 325	*	*	*

Source: DMR, Directorate Mineral Economics

TABLE 122.2: SOUTH AFRICA'S IMPORTS OF TALC, 2008–2017

YEAR	Mass	Value (FOB)	
	t	R'000	R/t
2008	8 142	25 114	3 084
2009	10 254	23 851	2 326
2010	9 818	26 908	2 741
2011	7 126	28 015	3 931
2012	7 696	27 556	3 581
2013	8 182	33 408	4 083
2014	9 096	43 500	4 782
2015	9 161	45 815	5 001
2016	8 854	43 692	3 156
2017	12 606	63 335	5 024

Source: RSA, Commissioner for South African Revenue Service, 2008–2017

PART THREE: GENERAL INFORMATION

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2107 Marshalltown

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Johannesburg

Tel: +27 (0)11 832 2600

Fax: +27 (0)11 832 1027

Mintek
Private Bag X3015
2125 Randburg

www.mintek.co.za

200 Malibongwe Drive
Randburg

Tel: +27 (0)11 709 4111

Telefax: +27 (0)11 793 2413

Petro SA
Private Bag X5
7499 Parow

www.petrosa.co.za

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Cape Town 7500

Tel: +27 (0)21 929 - 3000

Telefax: +27 (0)21 929 - 3144

NECSA
P O Box 582
0001 Pretoria

www.necsa.co.za

Church Street West, Elias Extension
Pelindaba, Brits District

Tel: +27 (0)12 305 4911

Telefax: +27 (0)12 305 3111

South African Agency for Promotion of
Petroleum Exploration and Exploitation (Pty) Ltd
Petroleum Agency SA
PO Box 1174
7499 Parow

www.petroleumagency.co.za

Petroleum House
7 Mispel street
Bellville, Cape Town

Tel: +27 (0)21 938 3500

Telefax: +27 (0)21 938 3520

The Industrial Development Corporation of SA Ltd
(IDC)
P O Box 784055
2146 Sandton

www.idc.co.za

19 Fredman Drive
Sandton

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Telefax: +27 (0)11 269 3116

South African Diamond and Precious Metals Regulator
P O Box 16001
2023 Doornfontein

www.sadpmr.co.za

251 Fox Street
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Tel: +27 (0)11 223 7000

Telefax: +27 (0)11 334 8898

National Nuclear Regulator

PO Box 7106

0046 Centurion

www.nnr.co.za Tel: +27 (0)12 674 7100

Telefax: +27 (0)12 663 5513

State Diamond Trader

P.O Box 61212

Marshalltown

2107

Suite 510, 5th Floor

SA Diamond Centre

www.statediamondtrader.gov.za 225 Main street, Johannesburg

Tel : +27 (0)11 334 2691

Telefax: +27 (0)11 334 1540

OTHER MINERAL-RELATED ORGANISATIONS

Aggregate and Sand Producers Association of
South Africa (ASPASA)

PO Box 61809

2107 Marshalltown

www.aspasa.co.za

89 FereroAve, Randpark Ridge,
Randburg

Tel: +27 (0)11 791 3327

Telefax: +27 (0)11 498 7269

Minerals Council South Africa

PO Box 61809

2107 Marshalltown

www.mineralscouncil.org.za

5 Marshall Street

Marshalltown, Johannesburg

Tel: +27 (0)11 498 7100

Telefax: +27 (0)11 834 1884

Copper Development Association (Pty) Ltd

P O Box 14785

1422 Wadeville

www.copper.co.za

53 Rendell Road

Wadeville, Germiston

Tel: +27 (0)11 824 3916

Telefax: +27 (0)11 824 3120

Federation of SA Gem & Mineralogical Societies
P O Box 36888 www.fosagams.co.za 29 26th Street
0102 Menlopark Menlopark

Tel: +27 (0)12 460 1494

Ferro Alloy Producers Association (FAPA) Metal Industries House
P O Box 1338 www.seissa.co.za 42 Anderson Street
2000 Johannesburg Johannesburg

Tel: +27 (0)11 833 6033

Telefax: +27 (0)11 298 9500

South African Mining Development Association (SAMDA) The Riviera Road
PO Box 2057 www.samda.co.za 606 Oxford corner North Avenue
2121, Parklands Ground Floor, Block 3, Office 2
2196, Rosebank

Tel: +27 (0)11 486 0510

Telefax: +27 (0)11 486 3194

Steel and Engineering Industries Federation of SA (Seifsa) Metal Industries House
P O Box 1338 www.seifsa.co.za 42 Anderson Street
2000 Johannesburg Johannesburg

Tel: +27 (0)11 298 9400

Telefax: +27 (0)11 838 9500

The Institute of Mine Surveyors of SA Minerals council South Africa, Room 509
P O Box 62339 www.ims.org.za 5 Hollard street
2107 Marshalltown Marshalltown

Tel: +27 (0)11 498 7682

Telefax: +27 (0)11 498 7681

The South African Institute of Mining and Metallurgy Minerals council South Africa, 5th floor
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2107 Marshalltown Marshalltown

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Telefax: +27 (0)11 838 5923

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