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ABBREVIATIONS AND SYMBOLS

A$	Australian dollar
B-billion	thousand million
CIF	cost, insurance and freight
e	estimate
FOB	free on board
FOR	free on rail
g/t	gram per ton
kg	kilogram
kt	thousand tons
lb	pounds avoirdupois
LME	London Metal Exchange
m	metre
Mt	million tons
Mt/a	million tons per annum
na	not available
ozt	troy ounce
t	metric ton
t/a	tons per annum
t/m	tons per month
µ	micro-
$	US dollar, unless stated otherwise
¥	yen
€	Euro
PGM	Platinum Group Metals
SARB	South African Reserve Bank
ETL	Exchange Traded Fund
SACCI	South African Chamber of Commerce and Industry
PICC	Presidential Infrastructure Co-ordination Committee
KPCS	Kimberley Process Certification Scheme

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1. ECONOMIC SYNOPSIS Q3 and Q4 2016

Global economic performance

Momentum in the global economy firmed up in the final quarter of 2016 year amid broad-based gains in developed economies and emerging markets. Global GDP grew 2.7 per cent year-on-year in Q4, above Q3's 2.5 per cent increase and marked the fastest growth in a year. Available data for Q1 2017 suggest that faster global growth could be here to stay. Strong economic figures have emerged from the U.S A. and the Eurozone despite an uncertain geopolitical backdrop. The global GDP growth is likely to pick up to 2.8 per cent in Q1, and continue on an upward trend throughout the year. After a rough 2016 for many emerging market economies, Brazil is expected to return to growth in the second quarter supported by less-tight monetary policy and a better investment climate, while Russia's recovery is seen picking up steam this year.

Meanwhile, China's economy accelerated on the back of strong manufacturing activity, and rising commodities prices supported gains in a number of emerging economies. Overall, the global economy grew 2.6 per cent in 2016, down from 3.0 per cent recorded in 2015.

Among the major emerging economies, the economic outlooks for Brazil, China, India and Russia were all held stable. At a regional level, growth prospects for Eastern Europe and the Middle East and North Africa deteriorated, while those for ex-Japan Asia, Sub-Saharan Africa and Latin America were mainly unchanged.

Sub-Sahara Africa (SSA)
It is reasonable to believe that growth in Sub-Saharan Africa is closer to finding the bottom. The performance of countries that have prioritised investment spending, mostly relying on external financing, will continue to outperform those of commodity-producing countries that typically rely on domestic savings to finance investment spending. A preliminary estimate shows that the region's aggregate GDP increased 1.1 per cent year-on-year in Q4 2016, which followed an equally weak 1.0 per cent expansion in Q3. As a result, growth is expected to have fallen to 1.2 per cent in 2016 from 3.2 per cent in 2015, which marks the region's worst economic performance since 1993. The combination of low commodity prices, weak external demand, severe weather conditions and security problems took a large toll on economic activity in the region last year.

South Africa
Following an increase of 0.4 percent in the third quarter of 2016, South Africa Real Gross Domestic product decreased by 0.3 percent in the fourth quarter of 2016. The negative Contributor to the growth in GDP were mining and quarrying industry followed by manufacturing industry which decreased by 11.5 percent and 3.1 percent respectively. The decrease in mining and quarrying was as a result of lower production in coal, iron ore and platinum. The real value added by mining decreased to 0.9 percent, due to the lower production in iron ore which recorded a decrease of 8.9 percent from R19 066 million in the third quarter of 2016 to R17 358 million in the fourth quarter of 2016. Other sectors that contributed to the decrease in mining were platinum and coal which offset the increase in the output volumes of diamond, gold and manganese over the period. Diamond recoded an increase of 1.2 percent, gold 1.23 percent while manganese increased by 18.7 percent respectively. However, the seasonally adjusted and annualized quarterly value added by mining declined from R230 105 million in the third quarter of 2016 to R223 212 million in the fourth quarter of 2016.

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2. THE PERFORMANCE OF SOUTH AFRICA'S PRECIOUS METALS AND MINERALS SECTOR DURING THE FIRST QUARTER OF 2017.

Despite workers returning to work after the holiday season, South Africa's (SA) precious metals production declined by 9.6 percent in the first quarter of 2017 (Q1 2017) when compared with Q4 2016 (Table 1), with gold production declining by 13.9 percent and PGMs production by 7.2 percent. This was largely attributed to Lonmin's planned production decline from the closing of high costs shafts, as well as gold production challenges at Free State, Vaal River and South Deep operations. However,

production improved by 10.8 percent year on year (y-o-y) due to a significant increase in PGMs production, after stock-taking and safety stoppages affected production during Q1 2016. This was despite a decrease in gold production as a result of lower underground recovery volumes at Driefontein and Cooke. In line with reduced output, total sales mass and value declined q-o-q, whereas a y-o-y increase in sales mass could not stop the corresponding value from declining, mainly as a result of a stronger rand against the dollar.

TABLE 1: SOUTH AFRICA'S QUARTERLY PRODUCTION AND SALES OF PRECIOUS METALS.

	Production (t)	Local sales		Export sales		Total sales	
		Mass (t)	value (R' mil)	Mass (t)	value (R' mil)	Mass (t)	value (R' mil)
Q1 2017	92.7	13.4	5 789.8	81.5	30 324.5	94.9	36 114.3
Q4 2016	102.5	14.1	6 406.4	91.1	35 328.6	105.2	41 735.0
Q1 2016	83.7	13.4	5 898.1	76.5	31 145.5	89.9	37 043.6
% Change(QQ)	-9.6	-4.7	-9.6	-10.5	-14.2	-9.8	-13.5
% Change(YY))	10.8	-0.1	-1.8	6.6	-2.6	5.6	-2.5

Consistent with past experience, diamond production decreased during the first quarter of the year when compared with the previous quarter, which is normally the case at Venetia mine after the holiday season. However, production improved by 19.5 percent y-o-y largely due to increased contribution from undiluted ROM ores and improvements in grades from Petra operations, as well as the processing of higher grades at Venetia mine. Total diamond sales mass and value fell by 17.0 percent and 22.0 percent, respectively, with the two also falling y-o-y. Local and export sales also dropped in terms of both carats and revenue. It must be borne in mind that, apart from prevailing trade conditions, diamond sales are also affected by the schedules of tenders (Petra) and sights (De Beers), the number and magnitude of which usually differ from quarter to quarter.

TABLE 2: SOUTH AFRICA'S QUARTERLY PRODUCTION AND SALES OF DIAMONDS.

	Production (ct)	Local sales		Export sales		Total sales	
		Mass (ct)	value (R' mil)	Mass (ct)	value (R' mil)	Mass (ct)	value (R' mil)
Q1 2017	2 119 340.0	283 486.0	2 015.9	2 074 362.0	2 071.3	2 357 848.0	4 087.2
Q4 2016	2 449 943.0	545 308.0	2 224.4	2 295 112.0	3 013.2	2 840 420.0	5 237.6
Q1 2016	1 773 398.0	493 240.0	2 606.1	2 716 444.0	3 404.5	3 209 684.0	6 010.7
% Change(QQ)	- 13.5	- 48.0	- 9.4	- 9.6	- 31.3	- 17.0	- 22.0
% Change(YY))	19.5	- 42.5	- 22.6	- 23.6	- 39.2	- 26.5	- 32.0

The gold price increased slightly q-o-q, but the emergence of international instability, coupled with uncertainty in United States elections, resulted in a 3.9 percent y-o-y increase. The average platinum price rose by 3.7 percent q-o-q and by 7.5 percent y-o-y, also as a result of sustained demand from the automotive sector. The average palladium price increased by 10.8 percent q-o-q and by 45.2 percent y-o-y, also on the back of improved automotive demand. Rhodium price rose significantly due to increased demand from the chemical and automotive industries. Polished diamond prices decreased by 1.1 percent and 2.8 percent, q-o-q and y-o-y, respectively, as a result of an oversupply in the market.

TABLE 3: AVERAGE PRICES ($/oz).

Period	Gold	Platinum	Palladium	Rhodium	PPI*	R/$
Q1 2017	1 225.8	985.8	764.0	904.2	120.6	13.1741
Q4 2016	1 219.4	950.8	689.4	754.3	121.9	13.9032
Q1 2016	1 180.1	917.0	526.1	670.0	124.0	15.8634
%change (q/q)	0.5	3.7	10.8	19.9	-1.1	-5.2
% change (y/y)	3.9	7.5	45.2	35.0	-2.8	-17.0

**PPI: Polished Diamond Price Index. This is a percentage number that shows the extent to which a price has changed over a period as compared with the price in a certain year, in this case April 2004-March 2005, taken as a standard year.*

SA production of precious metals is expected to rise during Q2 2017 as normal working conditions return without the interruption of the holidays. Gold demand is expected to increase due to an increase in geopolitical risks, rising inflationary pressures and a growth in Asian economies over the long-term. The average gold price is therefore expected to increase, due to a renewed uncertain market dynamics caused at least in part by the new administration in the United States. Demand for platinum is expected to increase, with the Indian jewellery industry giving hope to the metal. The price of platinum is therefore expected to increase modestly. Demand for both palladium and rhodium from the automotive sectors in China and the US is expected to increase, although the upward trend may slow down, resulting in modest increases in both metals' prices. As with the precious metals, diamond production is expected to increase in Q2 2017, with improved demand for polished diamonds expected to put an upward pressure on the PPI. Rough diamond sales are therefore also expected to increase in response to improved demand from cutting and polishing sectors.

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3. *www.idexonline.com*
4. *http://www.debeersgroup.com/en/reports/rough-diamond-sales.html*
5. *https://irssl.euroinvestor.com/asp/ir/PetraDiamonds/NewsRead.aspx?storyid=13580499&ishtml=1*
6. www.miningmx.com

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3. EMPLOYMENT AND REMUNERATION IN THE PRECIOUS SECTOR IN THE FIRST QUARTER OF 2017

Average employment in the precious metals (gold and PGMs) sector decreased slightly in the first quarter of 2017 (Q1 2017) when compared to Q4 2016 (Table 4) as continued retrenchments in the gold sector offset a slight increase in labour in the PGMs sector. Employment remained almost flat year-on-year. However, total earnings increased by 4.3 percent quarter on quarter (q-o-q) and by 12.1 percent year on year (y-o-y), mainly due to pay increases.

TABLE 4 QUARTERLY EMPLOYMENT AND EARNINGS IN THE PRECIOUS METALS SECTOR.

Gold	*Period*	*Males*	*Females*	*Contractors*	*Total*	*Earnings (Rmil)*
	Q1 2017	86,109	12,827	15 895	114 831	7 510
	Q4 2016	87,706	12,628	16 532	116 866	7 198
	Q1 2016	88 432	12 123	14 789	115 344	6 698
	% change (q-o-q)	*-1.8*	*1.6*	*-3.9*	*-1.7*	*4.3*
	% change (y-o-y)	-2.6	5.8	7.5	-0.4	12.1

PGMs						
	Q1 2017	110 441	15 194	47 633	173 269	11 670
	Q4 2016	110 220	15 038	47 478	172 736	12 232
	Q1 2016	113 189	15 073	44 763	173 024	10 633
	% change (q-o-q)	*0.2*	*1.0*	*0.3*	*0.3*	*-4.6*
	% change (y-o-y)	*-2.4*	*0.8*	*6.4*	*0.1*	*9.8*
Total						
	Q1 2017	196 550	28 021	63 528	288 099	19 180
	Q4 2016	197 925	27 667	64 010	289 602	19 430
	Q1 2016	201 621	27 196	59 552	288 369	17 331
	% change (q-o-q)	-0.7	1.3	-0.8	-0.5	-1.3
	% change (y-o-y)	-2.5	3.0	6.7	-0.1	10.7

Source: Statistics Directorate

In the diamond sector, average employment rose by 2.6 percent and 2.2 percent q-o-q and y-o-y, respectively, as expansion work continues at Venetia and Cullinan mines. In line with increased labour, total earnings rose by 9.9 percent q-o-q and by 12.5 percent y-o-y.

TABLE 5 QUARTERLY EMPLOYMENT AND EARNINGS IN THE DIAMOND SECTOR.

Diamonds	*Period*	*Males*	*Females*	*Contractors*	*Total*	*Earnings (Rmil)*
	Q1 2017	9 255	1 719	7 252	18 226	1 287
	Q4 2016	9 031	1 688	7 040	17 759	1 171
	Q1 2016	9 029	1 671	7 132	17 832	1 144
	% change (q-o-q)	*2.5*	*1.8*	*3.0*	*2.6*	*9.9*
	% change (y-o-y)	*2.5*	*2.9*	*1.7*	*2.2*	*12.5*

Source: Statistics Directorate

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4. IS BROWNFIELD EXPLORATION A SUSTAINBLE SOLUTION FOR ULTRA-DEEP LEVEL SHAFTS?

South Africa's gold production continues on a descending trend, declining on average by 46.9 percent over a decade (2006 – 2016). Due to the fact that majority of mines in the country are deep, it has been extremely difficult to access these deposit, which requires investment in suitable technology. The declining production of gold, requires increased investment in exploration, particularly Greenfield, to ensure new deposit and increased growth. South Africa's exploration budget decreased by R1 billion between 2014 and 2016, which is a concern for the gold sector and mining sector as a whole, considering that minerals are finite.

Due to the low risk associated with brownfield exploration as well as high aspect of discovering deposits of economic interest, it has recently re-emerged as a cost effective exploration-tool for producers, particularly those with Ultra-Deep Level Shafts (UDLS) at depths ranging between 1-3 Kilometres (km). Brownfield exploration, or near-mine exploration, refers to the revisiting of mined out areas of mineral deposits that were previously discovered. However, this type of exploration does not guarantee increased investment in terms of new mine development and ultimately, job creation.

Majority of producers have taken advantage of brownfield exploration to exploit previously sterile gold reserves. However due to the high costs associated with Ultra-Deep Level Shafts and continuing drop in production, it is critical that South Africa finds long lasting interventions to sustainably grow the gold sector in order to ensure continued mining, increased investment and job creation in line with the National Development Plan.

***Sources*:**

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2. MB Article: South Africa could benefit from New Gold Exploration and Mapping Initiatives
3. http://www.undervaluedequity.com/Mineral-Exploration-Companies-Greenfield-Exploration-vs.-Brownfield-Exploration.html

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5. SYNTHETIC DIAMONDS DO NOT POSE A SIGNIFICANT THREAT TO THE INDUSTRY

Technology helps sustain the stability and integrity of the industry.

A combination of soaring demand for diamonds and failure to find new large deposits has rendered the industry prone to the influx of synthetic diamonds, which are grown in laboratories in a matter of days and are, by the naked eye, completely indistinguishable from mined diamonds. Man-made or synthetic diamonds have been available for many years, but to date have predominantly been used for industrial purposes. However, it is the widespread availability of cheaper, synthetic gem diamonds for use in jewellery that is considered a threat to demand for natural diamonds. The main concern is that synthetic diamonds are sold under the disguise of natural diamonds, but technology is available to ensure that this is not a common occurrence.

Synthetic diamonds, which have deeper colours than natural diamonds, were first developed more than 30 years ago as a solution to the need for alternative coloured stones. They compete primarily with the smaller range of mined stones and, unfortunately, most mined diamonds are very small. Currently there is a niche market for gem-quality synthetic diamonds in jewellery applications, while lower quality stones are used in industrial applications such as lasers and as abrasives. The increasing number of people entering the urban upper middle classes in places like China and India is driving up global diamond demand and supply has not kept pace, bringing into focus the growing market for synthetic diamonds. According to the US Geological Survey, China is currently the world's largest producer of synthetic diamonds, selling between 6-10 billion carats annually for largely industrial uses. The threat to jewellery demand for natural stones appears insignificant, with the Chinese's polished imports rising by 1.2 percent to 7.7 million carats in 2016. Furthermore, synthetic gem quality diamonds are estimated to represent less than 1 percent of total world diamond supply.

The threat posed by synthetic diamonds cannot be ignored, particularly with their production ramping up slowly over time. Part of the problem is that synthetic diamonds are freely available on the market and cheaper than natural stones. Some countries do disclose whether or not the diamonds are synthetic, but it is the non-disclosure that causes a problem. Fortunately, the technology to distinguish between natural and synthetic diamonds has become advanced and currently plays a significant role in determining the authenticity of the stones. But technology has also enabled a higher quality of synthetic products to be made that more closely resemble a greater array of natural diamonds. It is therefore vital that technology to detect synthetics remains advanced to help ensure the stability and integrity of the entire diamond industry. It is also comforting that synthetic diamonds are not viewed favourably by consumers and require separate certification, a key industry control, which helps cement consumer confidence in the industry.

South Africa (SA) is one of the producers of synthetic diamonds for industrial purposes, but does not have synthetic gem quality diamond manufacturers. However, like other countries involved in the entire spectrum of the diamond value chain, SA is not oblivious to the possible threat posed by synthetic diamonds, but is taking comfort in the available technology to detect synthetics. It is one less problem for the SA diamond industry, which has other challenges but with measures in place to address them, in a bid to become the heartbeat of diamond beneficiation.

Sources:

1. www.diamonds.net, 23 March 2017.
2. SAIIA, 12 August 2014.
3. Business Day Live, 03 December 2013.
4. Rapaport, December 2013.
5. www.miningweekly.com, 08 June 2012.
6. www.miningweekly.com, 25 March 2005.
7. Kimberley Process Statistics.

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6. EMPLOYMENT AND REMUNERATION IN THE FERROUS SECTOR IN THE FIRST QUARTER OF 2017

Average employment in the ferrous sector reflected a 2.9 percent increase to 40 414 employees in the first quarter of 2017 (Q1 2017) from 39 271 employees in the fourth quarter of 2016 (Q4 2016), while the corresponding remuneration declined by 0.1 percent to R2.8 billion in the same period. The reason for increased employment was due to a 15.6 percent and 20 percent increase in the number of employees particularly contractors in the chrome ore and iron ore sectors respectively, with mines opting to release permanent employees and outsourcing most services such as maintenance on machines and equipment. Year on Year (y-o-y), average employment and remuneration declined by 2.4 percent and 0.1 percent, respectively.

TABLE 6: AVERAGE EMPLOYMENT IN THE FERROUS COMMODITIES SECTOR, QUARTER 4 2016

PERIOD	EMPLOYEES	TOTAL REMUNERATION
		R'000
Q1 2017	40 414	2 879 679 253
Q1 2016	41 414	2 883 457 883
Q4 2016	39 271	2 883 799 473
QQ % change	2.9	-0.1
YY % change	-2.4	-0.1

Source: DMR, Mineral Economics Directorate

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7. EUPHORIA AROUND VANADIUM REDOX BATTERIES

South Africa's appetite for renewable energy is fast gaining traction, with about 37 independent renewable energy projects contributing approximately 2 000 megawatt of electricity to the national grid. The Integrated Resource Plan forecasts that by 2025, power generation from renewables will increase to around 13 225 megawatt, bringing a new dawn for the energy storage market in the country.

Vanadium redox flow batteries (VRFB) is a promising storage technology for South Africa's energy storage needs going into the future. VRFB are preferred for their high voltage and unlimited charging capabilities, and are well suited for industrial use due to their physical dimensions. Furthermore, they are less deleterious to humans as well as the environment compared to lead acid batteries. In support for the energy storage market, the Industrial Development Corporation (IDC), through its New Industries Strategic Business Unit, in partnership with the U.S. Trade and Development Agency (USTDA), plans to develop and implement an energy storage industry development strategy roadmap for South Africa in order to expedite the country's energy storage value proposition.

With South Africa's comparative advantage in mineral resource endowments, opportunities for increased demand for vanadium as well as vanadium beneficiation for VRFB manufacturing are abound. Despite increased energy storage demand since 2011 at a compound average growth rate (CAGR) of 38 percent, South Africa's vanadium production declined by 17 percent in 2015 compared with 2014, and a further 4.5 percent in 2016. This was owing to a general decline in commodity prices, coupled with the shutting down of Evraz Highveld Steel & Vanadium, one of the country's leading steel and vanadium producers. Energy storage demand is expected to continue on a steady trajectory, and this, coupled with a positive forecast for the vanadium price for 2017, could be the redemption that local producers need to thrive amid the VRFB boom

Sources:

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2. *Draft 2016 Integrated Resource Plan*
3. *Mining Weekly, Volume 23 no. 2, January 27 – February 2 2017*
4. *GreenCape Energy Services, Market Intelligence Report, 2017*
5. *Bladergroen, B., Bischof-Niemz, T. (2015, October). Energy Storage. Presented at the South African International Renewable Energy Conference, Cape Town, South Africa.*
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8. SOUTH AFRICA'S PRODUCTION AND SALES OF NONFERROUS METALS AND MINERALS DURING THE FIRST QUARTER OF 2017

Preliminary data released by Mineral Economics Directorate indicate that South Africa's production of nonferrous metals and minerals, excluding aluminium and mineral sands, improved by 0.7 percent to 47.7 kt from 47.3 kt in the first quarter of 2017 (Table 7). This was due to increased lead and zinc production from Black Mountain mine. On a y-o-y basis, production rose by 11.3 percent. A decline in cobalt and nickel production was offset by increases in copper (15.5 percent), lead (29.2 percent) and zinc (28.5 percent).

TABLE 7: SOUTH AFRICA'S PRODUCTION AND SALES OF NONFERROUS METALS AND MINERALS IN THE FIRST QUARTER OF 2017

Period	Production	Local Sales		Export Sales		Total Sales	
	Quantity (t)	Quantity (t)	Value (R'mil)	Quantity (t)	Value (R'mil)	Quantity (t)	Value (R'mil)
Q1 2017	47,676	6,764	667	19,354	1,697	26,118	2,365
Q4 2016	47,324	10,999	963	32,590	2,357	43,589	3,320
Q1 2016	42,825	7,931	706	37,095	2,593	45,026	3,300
Q/Q (%)	**0.7**	**-38.5**	**-30.7**	**-40.6%**	**-28.0**	**-40.1**	**-28.8**
Y/Y (%)	**11.3**	**-14.7**	**-5.5**	**-47.8%**	**-34.6**	**-42.0**	**-28.3**

Source: Mineral Economics

Local sales volume and revenue fell by 38.5 and 30.7 percent to 6.8 kt and R667 million, respectively on q-o-q basis, as a result of falling demand for base metals. Export sales volume and revenue also declined by 40.6 and 28.0 percent to 19.4 kt and R1 697 million, respectively in the same period, due to lack of demand from major consuming countries, particularly China. The local unit value decreased by 7.2 percent, however, the export unit sale increased by 11.1 percent due to improving commodity prices. Both local and export sales revenue declined by 5.5 and 34.6 percent y-o-y, respectively. Local and export sales volumes also fell by 14.7 percent and 34.6 percent in the same period. Nonetheless, local and export unit sales increased by 0.3 and 19.9 percent y-o-y.

Base metals prices showed signs of improvement in the first quarter of 2017. Aluminium cash settlement price increased by 8.2 percent to US$1 849.7 in Q1 2017 compared with the last quarter, as a result of diminishing supply from China. London Metal Exchange (LME) copper settlement price rose by 9.7 percent to an average of $5 792.4 /t in the Q1 of 2017, compared to the previous quarter (Table: 8), due to increased demand, driven by China's infrastructural development. Rising demand for the lead acid battery in the automotive sector resulted in a 6.1 percent improvement for LME lead cash settlement price to an average of $2 280 /t in Q1 of 2017. The ongoing supply restrictions from the DRC pushed cobalt price up by 50.7 percent in Q1 of 2017, while zinc price also rose by 10.5 percent to $2 783.7/t, during the same period due to falling inventories in the warehouses as investors are anticipating a supply deficit. The speculation that the Indonesian export ban might be lifted exerted a downward pressure on nickel price resulting in a 4.5 percent decline to $10 272.8/t in the first quarter of 2017. This was compounded by the surplus in the refined nickel market.

TABLE 8: AVERAGE COMMODITY PRICES FOR THE FIRST QUARTER OF 2017

COMMODITY ($/t)	**Q1:2016**	**Q4:2016**	**Q1:2017**	**% CHANGE**
Aluminium	1 514.1	1 710.0	1 849.7	8.2
Cobalt ($/lb)	10.9	13.8	20.7	50.7
Copper	4 668.6	5 280.5	5 792.4	9.7
Lead	1 742.2	2 149.9	2 280.0	6.1
Nickel	8 498.9	10 803.9	10 272.8	-4.9
Zinc	1 675.9	2 518.2	2 783.7	10.5

Source: Metal Bulletin

South Africa's supply and demand of nonferrous minerals and metals is expected to continue increasing in the second quarter of 2017, driven by minor growth in the Chinese economy. In-line with global trends, South Africa's consumption will also show improvements, due to planned government infrastructure spending and a better performing automobile sector. Prices are expected to continue to rise with increasing demand from major consumers. However, the nickel price will remain under pressure until the Indonesian exports ban issue is resolved.

Sources:

1. DMR, Mineral Economics Directorate
2. International Lead and Zinc Study Group, Monthly Bulleting
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4. www.fastmarket.com
5. www.treasury.gov.za
6. Metal bulletin

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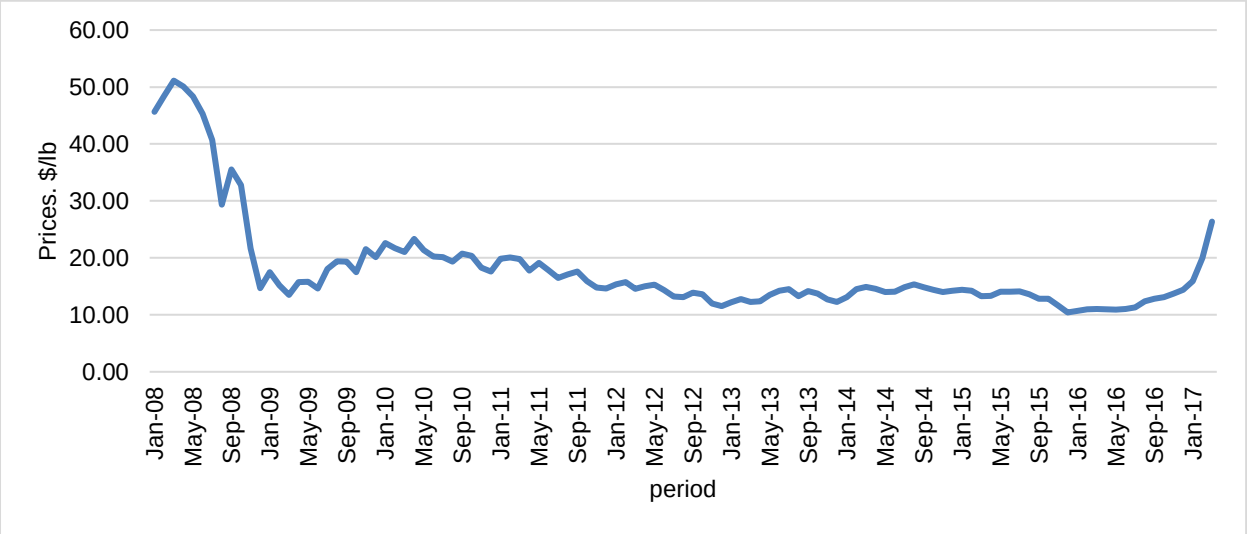
9. THE COBALT PRICE ON A POSITIVE TRAJECTORY

Signs of a recovery in the cobalt market

The market remained oversupplied for several years after the 2009 recession, exerting a downward pressure on prices. Since the beginning of the second quarter of 2016, the market has shown signs of recovery, with prices increasing from lows of $11.02/lb in March 2016 to $26.35/lb in March 2017, this represents a 139 percent increase (Fig. 1). The main driver for this increase is the strong demand for cobalt in lithium-ion batteries and a growing demand in other key end-use applications such as high performance alloys, tool materials, and catalysts.

Supply restrictions due to suspension of operation in the Democratic Republic of Congo (DRC) as well as reduced output from nickel producers have contributed to a tight cobalt market. As a result cobalt production declined by 2.4 percent in 2016, impacting directly on cobalt prices. The DRC produces more than 50 percent of the world's cobalt. These, coupled with strategic stockpiling by China State Reserve Bureau (SRB), may be artificially inflating the cobalt price. China is the world's leading consumer of cobalt, with nearly 80 percent of its consumption being used by the rechargeable battery industry.

FIGURE 1: COBALT PRICE, 2008 to 2017



Source: Metal Bulletin

Strong demand, supply constraints and speculative stockpiling, could contribute to further increases in the cobalt price in 2017. A similar trend was seen in 2003 to 2008 period, when prices were pushed up by undersupply, supply shortages, and high levels of global economic growth underpinned by strong Chinese demand. As a result, the price peaked at US$52/lb in March 2008. Considering all that, it is anticipated that the average cobalt price will continue to rise over the coming years as seen in the past, particularly with the strong overall demand set against a tight cobalt market. Despite the fact that cobalt

is produced as a by-product, South African cobalt producers will also benefit from rising cobalt prices, particularly as the country exports more than 90 percent of its cobalt.

Source:

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3. *http://www.mining.com/web/*
4. *Metal Bulletin*
5. *USGS, Mineral Commodity Summaries*

L Ramane

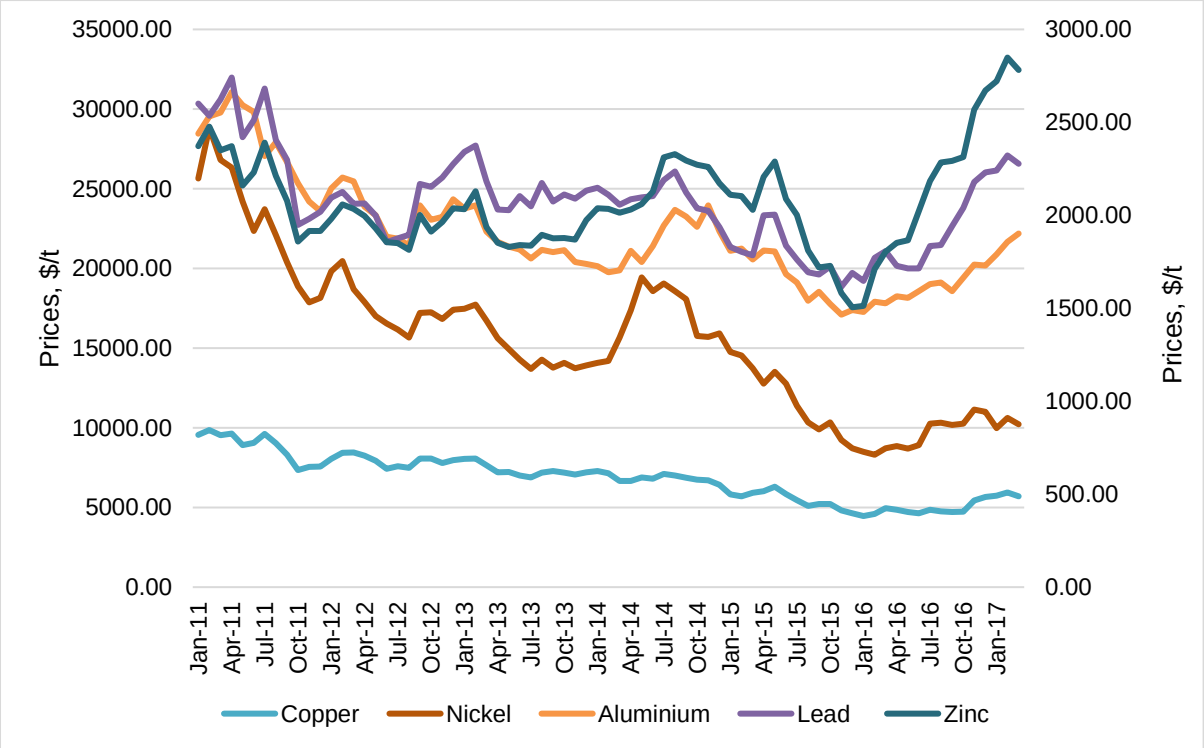
10. BASE METALS PEFORMANCE EXCEEDS EXPECTATION IN 2016

Base Metal prices shows signs of recovery in the second half of the year

Since 2012, there has been declines in base metal prices, resulting from lower global economic growth and overcapacity in the metals market. Restructuring of China's economy, the largest global metal consumer, from infrastructure and industry driven to services and consumption economy, which is less metal intensive worsened the situation.

Despite a dire outlook for 2016 from a multi-year bear market, base metal prices started showing signs of recovery in the last two quarters of 2016, as a result of unexpected deficits between supply and demand that developed in the industrial market. The biggest gains were registered in the zinc market, with prices increasing by 29.5 percent followed by lead (23.7 percent), nickel (21.6 percent), copper (11.5 percent) and aluminium (8.7 percent), (Fig 1). The upsurge in prices was aided by supply issues, among others: copper facing major disruptions at the world's two copper mines in Chile and Indonesia as well as shut downs in the Democratic Republic of Congo (DRC)'s copper belt; the closures of nearly half of the nickel industry in Philippines, the world's largest nickel producer, due to enforcement of environmental regulations; aluminium capacity reductions due to environmental issues as well as production cuts back by major producers (Glencore and Nyrstar) in the lead and zinc mines in response to weaker prices.

FIGURE 2: BASE METALS LME CASH SETLEMENT PRICES, JANUARY 2011 – MARCH 2017



Source: London Metal Exchange

The world economic growth projected to remain subdued in 2017 with growth projected to recover modestly to 3.4 percent in 2017 from 3.1 percent in 2016, according to the International Monetary Fund (IMF). South Africa's economic growth has averaged 1.6 percent since the global financial market crisis in 2009 and is expected to grow by 1.2 percent in 2017. South Africa as an exporter of minerals could benefit from economic activities that will be spurred by the global economic growth.

The country is repositioning itself for the next commodity growth cycle through investment in the developments of several new projects in base metals around the country. These projects include the newly developed Gamsberg mine expected to come on stream in 2018, Palabora Copper's Lift II which is expected to surface its first ore in Q3 of 2017. Other projects that are at exploration phases include Zebediela nickel projects located near Steelpoort in the Limpopo Province. The project is denounced to have world-class nickel sulphide deposit with over 37 Mt of resources. Another project is the Prieska zinc-copper project located in the south-west of Kimberly in the Northern Cape Province. The project extends from the prematurely closed Prieska Copper mine with assay confirming exceptionally higher grades of sulphide hosted copper and zinc mineralisation.

Sources:

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3. *Metal Bulletin Research, 2017 Outlook Report*
4. *Mining.Com, 23 February 2017*
5. *Mining Weekly, 11 March 2016*
6. *The Economic Times, 30 December 2016*
7. http://economictimes.indiatimes.com/markets/commodities/news/base-metals-shone-in-2016-zinc-lead-*nickel-copper-should-do-well-in-2017-too/articleshow/56258059.cms*

S Mnyameni

11. SOUTH AFRICA'S PRODUCTION AND SALES OF ENERGY COMMODITIES DURING THE FOURTH QUARTER OF 2016

According to preliminary statistics released by the Mineral Economics Directorate, in the quarter ending 31 December 2016, coal production increased by 0.2 percent year-on-year (y-o-y) to 60.80 Mt as Universal Coal returned New Clydesdale Colliery to operation in the last quarter of 2016. However, quarter-on-quarter (q-o-q) there was a 6.57 percent decline due to December shut down and maintenance.

Coal local sales volumes improved by 0.65 percent y-o-y to 45.03 Mt. Similarly to the production trend, this represented a 6.07 percent q-o-q decrease. Revenues generated from local sales grew by 7.69 percent y-o-y and 2.31 percent q-o-q to R16.42 billion mainly boosted by the coal unit price that increased by 24.57 percent y-o-y and 9.06 percent q-o-q to R365 per ton.

Coal exports decreased by 5.14 percent to 17.67 Mt y-o-y, a 10.47 percent increase on a q-o-q basis. The coal export unit value surged 27.88 percent y-o-y and 27.35 percent q-o-q to R922 /ton. Consequently, the export sales revenue also ballooned by 37.25 percent y-o-y and 40.38 percent q-o-q to R16.27 billion.

During the period under review, uranium production increased by 9.22 percent q-o-q and 7.63 percent y-o-y to 0.12 Mt. The increase in production was as a result of producers' response to improved prices. During the same period, natural gas production declined by 8.31 percent q-o-q and 49.81 percent y-o-y to 0.14 Mt. Similarly, natural gas condensate production plunged by 26.39 percent q-o-q and 51.19 percent y-o-y to 0.008 Mt. The decrease in natural gas was mainly due to diminishing resources at PetroSA's operating offshore fields.

TABLE 9: SOUTH AFRICA'S PRODUCTION AND SALES OF ENERGY COMMODITIES IN THE FOURTH QUARTER OF 2016.

Commodity	Period	Production	Local Sales			Export Sales			Total Sales	
		Quantity (Mt)	Quantity (Mt)	Value Billion (R)	Unit Value (R/t)	Quantity (Mt)	Value Billion (R)	Unit Value (R/t)	Quantity (Mt)	Value Billion (R)
Coal	Q4 2016	60,80	45,03	16,42	365	17,67	16,27	922	62,70	32,69
	Q3 2016	65,07	47,93	16,05	335	16,00	11,59	724	63,93	27,64
	Q4 2015	60,67	44,74	15,24	293	18,63	11,86	721	63,36	27,10
	Q4 2016 vs Q3 2016 (%)	-6,57	-6,06	2,31	9,06	10,47	40,38	27,35	-1,92	18,27
	Q4 2016 vs Q4 2015 (%)	0,20	0,65	7,69	24,57	-5,14	37,25	27,88	-1,05	20,63
Natural Gas	Q4 2016	0,14	0,14	0,27	1980	-	-	-	0,14	0,27
	Q3 2016	0,15	0,15	0,28	1853	-	-	-	0,15	0,28
	Q4 2015	0,28	0,28	0,48	1723	-	-	-	0,28	0,48
	Q4 2016 vs Q3 2016 (%)	-8,31	-8,31	-2,78	6,87	-	-	-	-8,31	-2,78
	Q4 2016 vs Q4 2015 (%)	-49,81	-49,81	-42,77	14,96	-	-	-	-49,81	-42,77
Natural Gas Condensate	Q4 2016	0,008	0,008	0,062	7823	-	-	-	0,008	0,062
	Q3 2016	0,006	0,006	0,046	7358	-	-	-	0,006	0,046
	Q4 2015	0,016	0,016	0,115	7058	-	-	-	0,016	0,115
	Q4 2016 vs Q3 2016 (%)	26,39	26,39	33,38	6,32	-	-	-	26,39	33,38
	Q4 2016 vs Q4 2015 (%)	-51,19	-51,19	-46,34	10,85	-	-	-	-51,19	-46,34
*Uranium (kt)	Q4 2016	0,12	-	-	-	0,15	0,09	390	0,15	0,09
	Q3 2016	0,11	-	-	-	0,06	0,05	551	0,06	0,05
	Q4 2015	0,11	-	-	-	0,09	0,11	407	0,09	0,11
	Q4 2016 vs Q3 2016 (%)	9,22	-	-	-	153,85	79,49	-29,22	153,85	79,49
	Q4 2016 vs Q4 2015 (%)	7,63	-	-	-	66,67	-21,18	-4,26	66,67	-21,18

Source: Directorate Mineral Economics

In tandem with its production trend, natural gas' local sales volumes dropped by 8.31 percent q-o-q and 49.81 percent y-o-y, to 0.14 Mt. Revenues generated from natural gas sales also tumbled by 2.78 percent q-o-q and 42.77 percent y-o-y, to R274 million. The unit value increased by 6.87 q-o-q and 14.96 percent y-o-y to R1 980/t, however, this could not offset the decline in revenue due to the decrease in sales volume. Similar to the natural gas, natural gas condensate local sales volume increased by 26.39 percent q-o-q and fell abruptly by 51.19 percent y-o-y to 0.008 Mt. Local sales revenue rose by 33.38 percent q-o-q to R62 million, and this was a 46.34 percent drop y-o-y. The unit value rose by 6.32 percent q-o-q and 10.85 percent y-o-y to R7 823/t

Uranium export volumes surged 153.85 percent q-o-q and 66.67 percent y-o-y to 0.15 kt. Uranium export revenue rose by 79.49 percent q-o-q to R90 million. However, this was a 21.82 percent y-o-y decline. The unit value decreased by 29.22 percent q-o-q and 4.26 percent y-o-y to R390 /t.

South Africa's natural gas and natural gas condensate production is expected to decline even further in the next quarter due to depleting resources from offshore gas fields owned by PetroSA. Consequently natural gas and natural gas condensate unit prices are likely to increase due to depletion of resources creating an undersupply in the country's gas industry. Uranium production, which is a by-product from South Africa's gold mines is expected to increase in the first quarter of 2017 due to commencement of production in gold mines post December break and improved prices.

It is expected that coal production will increase as some new operations ramp up during the first quarter of 2017. Local coal sales are also set to improve slightly as Eskom's Medupi unit 5 reaches full commercial operation in the first quarter of 2017. Kusile's unit one was also connected to the grid in the fourth quarter of 2016 and has since reached full load in March 2017. These additional two units will definitely increase local coal consumption. Local coal prices are also set to increase in relation to demand, and it is expected that a ton of coal will average R370 in the first quarter of 2017. Coal export sales are also expected to increase in the first quarter of 2017 as coal mines and the rail operations reach steady state after interruptions from above-average rainfall in January. The coal export price might breach the R1000 /t in the first quarter of the year as demand for this fossil fuel improves.

Sources:

1. *Directorate Mineral Economics*
2. *I. Solomons, Medupi's second unit powered for first time, generates 796 MW, in www.engineeringnews.co.za, accessed on 13 February 2017*

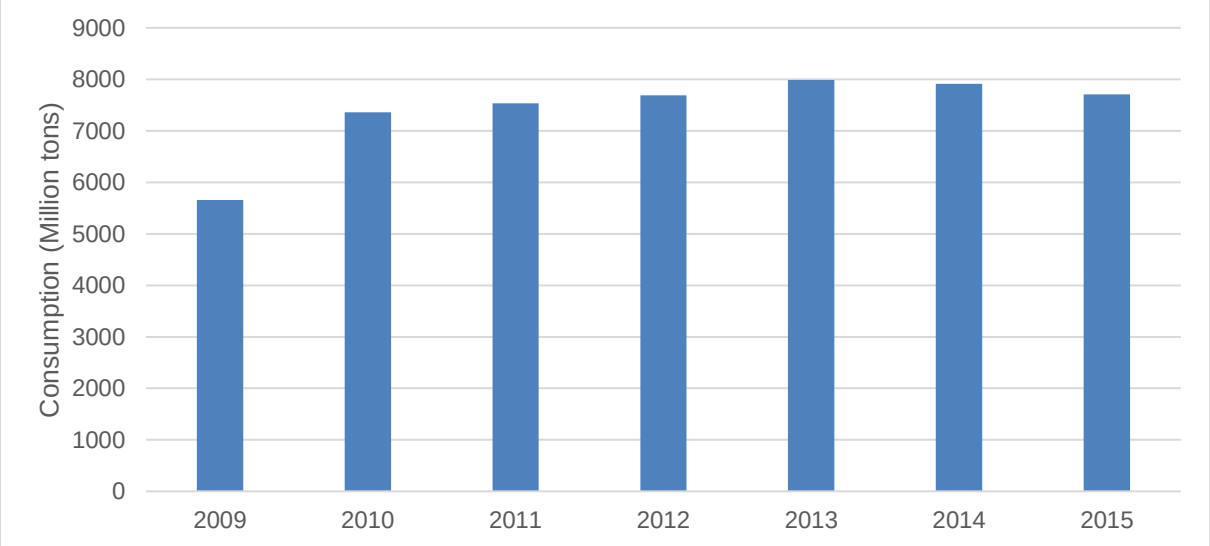
KL Revombo

12. THE COAL INDUSTRY IS IN TRANSITION

Coal prices, 2009 - 2016

The period between 2009 and 2013 saw the biggest increase in demand in the history of the coal industry (Fig 1), but prices fell nevertheless, because there was simply too much supply available. South Africa was not immune to the global situation, as such coal export prices have been on a downward trend from the first quarter of 2011 after reaching a maximum of $125 /t in January of 2011 (Fig 2).

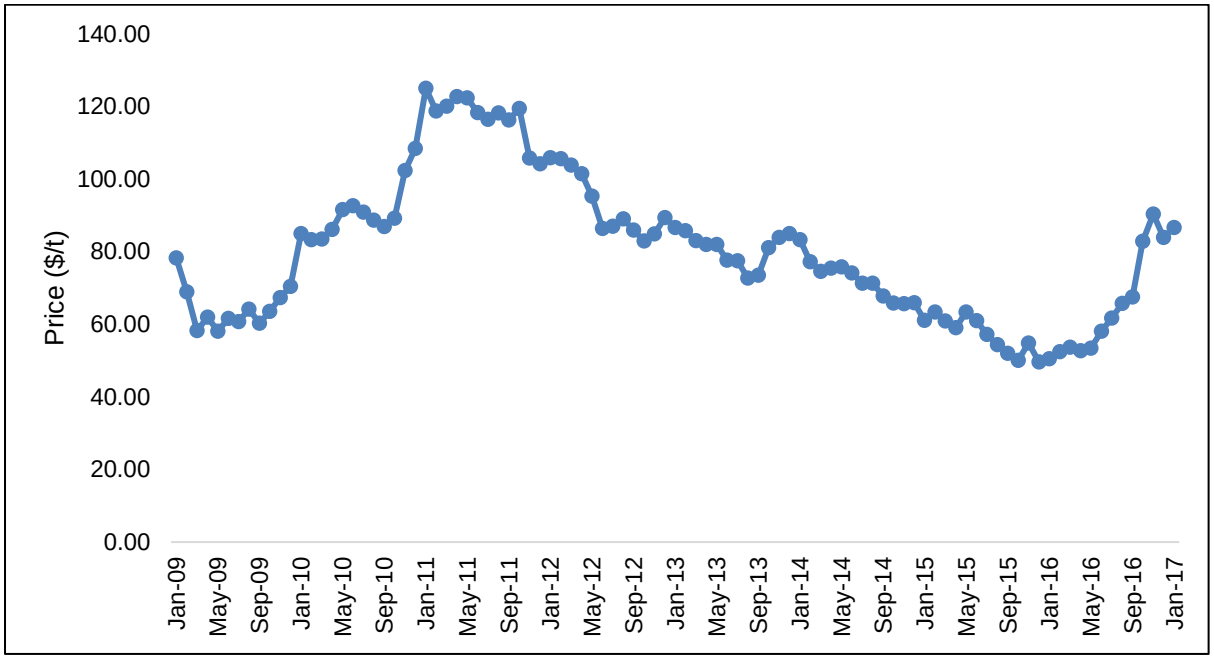
FIGURE 3: GLOBAL COAL CONSUMPTION 2009 - 2015



Source: Coal Information 2010 - 2016, International Energy Agency – OECD/IEA

Subsequently export coal prices were range bound between $120 /t and $116 /t for the remainder of 2011. Export coal prices continued to fall in 2012, reaching a minimum of $83.01 /t by October 2012 before rebounding slightly to reach $89.44 /t in January 2013. Prices continued on a downward slope in the next two years and to levels below $50/t. In October 2015, coal export prices had collapsed to $49.66/t. During this period, up to the fourth quarter of 2014 producers were able to lower their production costs, as a defensive measure. However, moving into 2015, the lower export prices started to weigh heavily on producers as marginal producers made big losses.

FIGURE 4: SOUTH AFRICA'S EXPORT COAL PRICES, 2009 – JANUARY 2017



Source: www.globalcoal.com

According to some analysts, on the South African Coal Futures, not only were spot prices lower than the cash costs of 50 percent of seaborne producers, but also, future prices for coal were $12/ton below spot prices. At that level, only 20 percent of global supply was viable, that is before accounting for capital needs. The market was being irrational, and was overdue for a rebound.

In line with the global export coal market, the South African export coal market has shown some price recovery in 2016. Coal export prices started their upward swing early in January 2016, maintaining it to a maximum of $90.42 /t by November 2016. Despite the tremendous price recovery, the structure of the South African coal market still needs some correction. Prices have not reached levels for a full market recovery, however, opportunities exist in the emerging markets:

- South Africa has made head ways in this regard with 50 percent of South African exports delivered in South Asia in 2016
- African coal demand is anticipated to reach 34 Mt of growth by the end of the next decade,
- It is forecast that 80 percent of South African coal exports will go to Africa and the Middle East by 2030,

According to Rodrigo, by 2030, Southeast Asian coal imports will be 50 percent bigger than the entire Atlantic coal market. The global seaborne coal market will grow by approximately 300 Mt between 2017 and 2030. At current prices, Indonesia and Australia will not be able to ramp-up production when the market needs it, which is from 2017 onwards. Only the lowest cost producers like Colombia and South Africa with existing spare capacity can expand capacity. Green field projects will be needed from the middle of the next decade - mainly from Australia and South Africa.

With coal export prices continuing to improve in 2017, the South African coal export will start to move back into profitability and it is expected that this will encourage by restarting the shelved projects and pursuing greenfield projects. The spin offs for new investments will be great for the country, delivering the much needed employment opportunities into South Africa's economy.

Sources:

1. *Coal Information 2010 - 2016, International Energy Agency – OECD/IEA*
2. *Rodrigo Echiverri, Presentation, IHS Markit South African Coal Export Conference 2017, 1-3 February 2017, Cape Town*
3.

KL Revombo

13. URANIUM MARKET'S LONG TERM OUTLOOK

Energy diversification likely to improve domestic nuclear demand

The uranium market has been experiencing challenges since the nuclear plant accident at Fukushima Daiichi in Japan on the 11th March 2011. The accident, which was primarily caused by a Tsunami, resulted in countries such as Germany and Switzerland phasing out some of their nuclear power reactors in favor of renewable energy sources.

However, developments of reactors as well as new operable reactors has been added on line to meet demand for power fueled by ever changing economic activities. . Currently there are 447 reactors operable in 31 countries around the globe which meet 11.0 percent of global electricity demand in addition to 59 other reactors that are currently under construction. New investment in nuclear reactors built programmes are expected to be driven by developments in China, Russia and India. Although new reactors are expected, this is likely to have no effect on prices as the industry faces market uranium glut. Global uranium production increased by 17.0 percent from 53 493 tU in 2015 to 62 850 tU in 2016. Production is expected to increase further by 4.8 percent in 2017 due to new mining projects which are planned to come on stream in Russia, Namibia and the United States of America.

South Africa (SA) is ranked among top five countries with large uranium reserves of approximately 322 kiloton (kt). Despite possessing relatively large deposits, SA is ranked at number eleven in terms of production, contributing only 1.0 percent of global production. The current low-price situation and sluggish global demand is not encouraging expansion investment in existing mining projects in the country. This is evidenced by the 14.72 percent decline in production in 2016 to 450.11 tU compared with 527.78 in 2015. Nuclear power currently contributes 6.0 percent to SA's energy basket with the remainder coming through coal fired plants. SA is in the process of diversifying its energy mix to decrease the contribution of coal as the main energy carrier. According to the National Development Plan (NDP), SA plans to add 9 600 MW of nuclear energy onto the national grid by 2030. The success of the plan will ensure that the country's energy demands are met to ensure the implementation of government programmes such as the energy intensive beneficiation. This presents an opportunity for the country's uranium mining industry to revitalize and put plans in place to grow this sector. In a long term perspective, an increase in uranium production is expected, supported by all major projects in the pipeline.

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Uramin's Ryst Kuil Uranium in the Western Cape and Sibanye Gold's West Rand Tailings Retreatment (WRTP) project in Gauteng will increase the country's uranium production in order to support the likely increase of nuclear contribution to the energy mix. The Ryst Kuil Uranoum project which is estimated to host 18.5 Mt resource with a 0.1 percent uranium content is at feasibility stage. Sibanye Gold's West Rand Tailings Retreatment (WRTP) project in Gauteng, is currently on a definitive feasibility study and awaits regulatory approvals. The WRTP is scheduled to start operations in 2020 with uranium production capacity of 907 t/y.

Global uranium production is expected to increase in 2017 driven by demand that will emanate from reactors under construction and planned ones around the world. According to World Nuclear Association, 287 new reactors are expected to come on line by 2035 The planned SA nuclear programme will improve sluggish domestic demand, in so doing leading to improved local production.

Sources

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3. *World Nuclear Association, 2017. Internet Website viewed: http://www.world-nuclear.org/information-library/facts-and-figures/world-nuclear-power-reactors-and-uranium-requireme.html*
4. VAN WYK J. *2013, 'South Africa's Nuclear Future' viewed 4 May 2017, from https://www.google.co.za/#q=south+africa's+nuclear+futur.html*

K Tshetlanyane

14. INDUSTRIAL MINERALS SECTOR PERFORMANCE – QUARTER 1, 2017

Total volume of sales of industrial minerals was down by 14.1 percent (q-o-q) to 23 Mt in the first quarter of 2017 compared with 26.8 Mt in the fourth quarter of 2016 (Table 10). The value of total sales declined by 8.1 percent recording R4.3 billion in the same period, owing to subdued market conditions. Local sales volumes dropped by 14.3 percent to 22.7 Mt resulting in a 10.9 percent decline in revenue to R3.4 billion. Export sales volume increased by 7.3 percent to 301 kt, as a result of lower off take in the domestic market which created an opportunity to export more phosphate rock resulting into increased export sales value by 13.1 percent to R565 million.

TABLE 10: SOUTH AFRICA'S SALES OF INDUSTRIAL MINERALS QUARTER 1, 2017 COMPARED WITH QUARTER 4, 2016

QUARTERS	LOCAL SALES (FOR)		EXPORT SALES (FOB)		TOTAL SALES	
	Mass (kt)	R'000	Mass (kt)	R'000	Mass (kt)	R'000
Q1 (2017)	22 707	3 405 321	301	565 369	23 007	3 970 689
Q4 (2016)	26 491	3 822 675	281	499 892	26 771	4 322 567
Q1 (2016)	21 749	3 430 455	260	642 168	22 008	4 072 623
Q1 2017 vs Q4 2016 (%)	**-14.3%**	**-10.9%**	**7.3%**	**13.1%**	**-14.1%**	**-8.1%**
Q1 2017 vs Q1 2016 (%)	**4.4%**	**-0.7%**	**15.8%**	**-12.0%**	**4.5%**	**-2.5%**

Source: DMR, Directorate Mineral Economics

The average local unit values of andalusite increased by 6.3 percent (q-o-q) to R1 722/t (Table 11). The increase was due to improved demand from the refractory industry as interest is gaining momentum in durable, high calibre low value refractories. Fluorspar prices marginally declined by 0.7 percent (q-o-q) to R2 887/t, as a result of high inventories and new capacities coming on stream.

Local sulphur prices on the other hand, surged by 45.5 percent to R1 287/t (q-o-q) as prices proved to be inflated in the first quarter of the year amid low production and demand in the domestic market. Vermiculite prices increased by 12 percent (q-o-q) to R2 672/t as demand for courser grades surges. Phosphate rock prices plummeted by 15.9 percent (q-o-q) to R1 247/t on the back of a drop, in demand for fertiliser applications. Prices for aggregate and sand increased by 1.3 percent (q-o-q) to R108/t, while prices for limestone went up by 13.8 percent (q-o-q) as a result of demand derived from the construction and civil industries. Dimension stone prices declined by 2.6 (q-o-q) percent to R1 927 as demand for natural stone products in the domestic market owing to competition from substitute products like techni-stones.

TABLE 11: AVERAGE UNIT VALUE OF SELECTED COMMODITIES

Commodity	Q1 (2017)	Q4 (2016)	% change
Andalusite	1 722	1 620	6.3%
Fluorspar	2 887	2 906	-0.7%
Sulphur	1 287	885	45.5%
Vermiculite	2 672	2 385	12.0%
Phosphate Rock	1 247	1 483	-15.9%
Limestone and dolomite	157	138	13.8%
Dimension stone	1 927	1 979	-2.6%
Aggregate and sand	108	106	1.3%

Source: DMR, Directorate Mineral Economics

Within an environment of subdued output growth total employment in industrial minerals managed to increase by 1.9 percent (q-o-q) to 18 715, with earnings also rising by 4.9 percent (q-o-q) from R844 million to R885 million (Table 12). Female employment declined slightly by 0.6 percent (q-o-q) from 2 024 employees to 2 012 employees.

TABLE 12: SOUTH AFRICA'S INDUSTRIAL MINERALS QUARTERLY EMPLOYMENT

Period		***Males***	***Females***	***Contractors***	***Total***	***Earnings (Rmil)***
Industrial Minerals	Q1 2017	11 788	2 012	4 914	18 715	885
	Q4 2016	11 726	2 024	4 609	18 359	844
	Q1 2016	11 728	1 957	3 889	17 574	756
	Q1 2017 vs Q4 2016 (%)	***0.5***	***-0.6***	***6.6***	***1.9***	***4.9***
	Q1 2017 vs Q1 2016 (%)	***0.5***	***2.8***	***26.4***	***6.5***	***17.1***

Source: DMR, Directorate Mineral Economics

Most industrial minerals applications are found in the construction industry. Consequently, the demand for these minerals is expected to rise in the medium term, underpinned by continued capital spending by general government in a bid to address infrastructure bottlenecks and fast-tracking the implementation of structural reforms aimed at boosting economic growth. In February 2017, the budget for fiscal 2017/18 was delivered and government plans to spend R947.2 billion on infrastructure development by 2020. Infrastructure development is the key driver not only to economic growth as identified by the National Development Plan, but also to poverty alleviation, job creation and skills development. The National Development Plan, as the overarching policy of government, will continue to drive the decisions aimed at achieving inclusive growth and eradicating the socio-economic challenges of unemployment, poverty and inequality.

Sources:

1. *DMR, Directorate Mineral Economics*
2. *South African Reserve Bank. Quarterly Bulletin, March 2017*

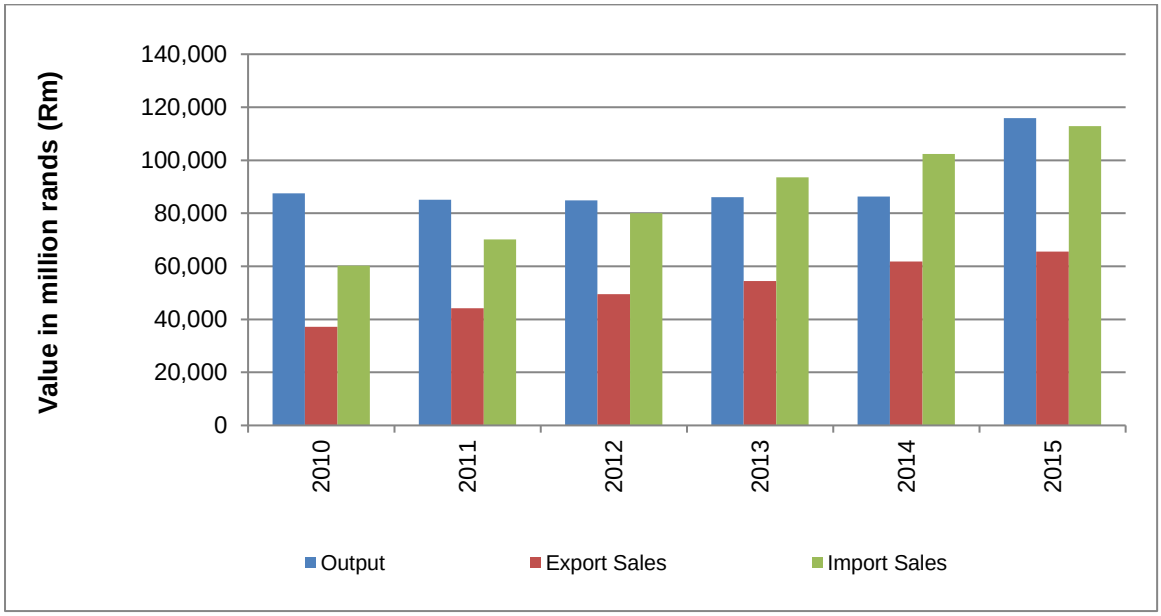
R Motsie

15 CHEMICAL EXPANSION IN SOUTH AFRICA

The South African chemical industry growth potential

South Africa's chemical industry is diverse and complex and it is the largest in Africa. It has a major role to play in ensuring that the growth of this sector in South Africa becomes a catalyst for continental competitiveness. South Africa is ranked among the top twenty five (25) chemical producing countries in the world, according to the *International Council of Chemical Associations (ICCA).* The industry is dominated by basic chemicals, with major production of liquid fuels, olefins, organic solvents and industrial mineral derivates, of which fluorspar is the raw material. The South African chemical industry consists of two broad based categories, namely upstream sector which is concentrated and well developed and downstream industries which is diverse but remains underdeveloped. A well-developed upstream industry is technologically intensive in the manufacture of basic chemicals as raw materials and downstream chemical sector is labour-intensive and turns the raw materials from upstream sector into intermediate and final products (the dti).

FIGURE 5: SOUTH AFRICA'S CHEMICAL INDUSTRY OUTPUT, EXPORT AND IMPORT SALES, 2010 -2015



Source: Quantec Research, 2016

The chemical sector has a potential of creating local value chain alignment and integration of other sectors into main stream economy leading to job creation. The South African chemical industry output was valued at R383 billion and basic chemicals output valued at R116 billion in 2015. The basic chemicals output grew by 4.15 percent from 2010-2015 (Fig. 1). The growth rate of the value of export sales from 2010-2015 was 11.25 percent and yielded R66 billion in 2015, while the import sales grew by 12.65 percent in the same period to record R113 billion. The chemical industry's contribution is about a quarter of South Africa's manufacturing production and it produces noteworthy yields that are used in practically all other economic sectors of industry. The chemical industry activities are creating work opportunities and will progressively do so, as such. The chemical industry employment was estimated at 156 570 employees and the employment figure of basic chemicals was 23 025 individuals with relative declines in employment being observed in the past two years (Quantec, 2016). The slow growth in employment matches with the moderate economic development seen in the industry. Amid the lower employment in the chemical industry, there is growth potential as more that 50 percent of South African chemical exports to African countries are still on the rise.

The fluorochemicals sector play a crucial role in meeting the needs of an expanding world and in providing solutions to the challenges of the future. It greatly contributes to a more sustainable society by developing innovative technologies and products while ensuring the safe, responsible and sustainable management of chemicals throughout their life cycle. The South African government through the Department of Trade and Industry and Department of Science and Technology are driving the Fluorochemical Expansion Initiative (FEI) industry projects which are aimed at expanding the country's fluorochemicals industry. This will be done through increased local beneficiation and value addition to the country's raw materials. It is anticipated that in the coming years the pharmaceutical industries will spur demand for fluorochemicals.

Sources:

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2. *Department of Trade and Industry, The Chemical Sector, http://www. thedti.gov.za*
3. *Engineering News, David Oliviera, South African Chemicals Industry has growth potential, 2014, http://www.engineeringnews.co.za/print-version/south-african-chemical-industry...*
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5. *Pelchem, http://www.pelchem.com/pelchem-leads-the-fluorochemical-expansion-initiative/*
6. *Quantec Research (Pty) Ltd, http://www.quantec.co.za*
7. *Review on chemicals, Department of Trade and Industry (the dti)*

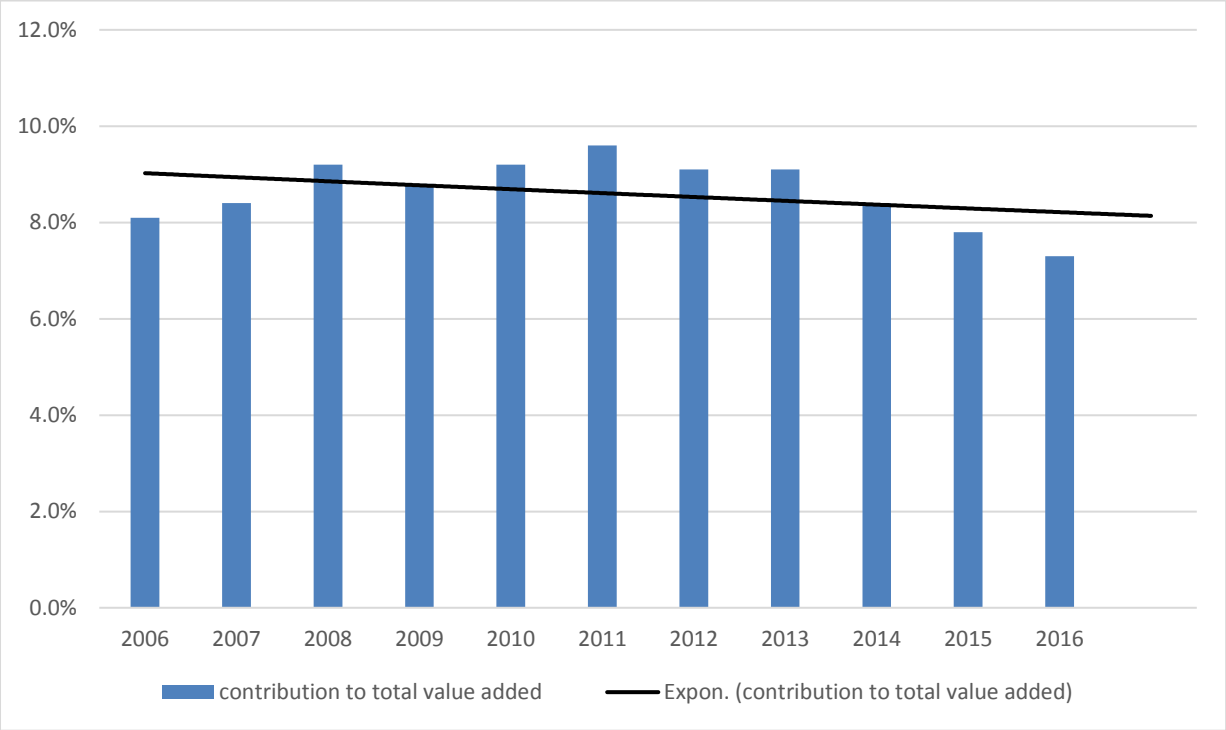
M Modiselle

16. CONTRIBUTION OF MINING TO GDP

Mining has been playing an indispensable role in the economy of South Africa for more than a century. Its contribution goes beyond mineral extraction and processing. Mining is linked to many other industries and sectors in the economy and it encourage other critical domestic economic activities, for example, transportation, energy, financial services, manufacturing of fundamental metals, cement manufacture and construction.

The extraction of minerals contributes substantially to economic activity in South Africa. In 2016, the mining industry contributed R225 billion towards the Gross Domestic Product (GDP) accounting a 7.3 percent and contributing R93 billion to fixed investment. (Fig 1). The industry is also a huge contributor to job creation, with 455 000 people employed by the sector in 2016.

FIGURE 6: CONTRIBUTION OF MINING TO TOTAL VALUE ADDED (%)



Source: South African Reserve Bank, Mining industry, 2016

Contribution by the mining industry to GDP peaked in 2011 following a global demand for raw materials recovery along with the global economy. According to *Statistics SA,* mining and quarrying growth rate improved by 12.8 percent and contributed 0.9 of a percentage point to GDP growth in the first quarter of 2017 compared with the fourth quarter of 2016. Even though the industry has displayed a downward trend in recent years compared with subsequent years the industry is anticipated to continue to contribute positively to GDP in future.

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5. *Statistics SA, P0441, 2017*

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17. SOUTH AFRICA'S PRODUCTION AND SALES FOR VERMICULITE DURING THE FIRST QUARTER OF 2017

South Africa is the world's largest producer of vermiculite and is accountable for about 39 percent of the world total production. About 80 percent of vermiculite sold to local consumers in South Africa is used in horticulture and agriculture, where its application is in soil moisture retention and hosting a

number of mineral fertilisers such as ammonium, potassium, calcium and magnesium. The balance is then used in construction and insulation sectors. Population growth and change in lifestyle as well as increasing consumer preferences towards healthy products are currently driving the horticulture market up.

Vermiculite production has shown an increase of 17 percent to 44.2 kt in the first quarter of 2017 (Q1: 2017) compared with 37.8 kt in the fourth quarter of 2016 (Q4: 2016) as depicted in table 12. This increase occurred as a result of high demand for horticulture and agriculture. However, local sales volume and revenue declined by 47.5 percent and 40.5 percent respectively on a quarter on quarter (q-o-q) basis. Production increased by 50.6 percent from 44.2 kt in Q1:2017 compared with 29.4 kt in Q4 of 2016 year on year (y on y), as a result of alternative market applications at the Palabora Mining Company. Export sales volume decreased by 6 percent to 10.4 kt in Q1:2017 compared with 11.1 kt in Q4:2016 due to reduced demand for medium to finer grains at the mine.

TABLE 13: SOUTH AFRICA'S QUARTERLY PRODUCTION AND SALES OF VERMICULITE

Period	Production (kt)	Local sales		Export sales		Total sales	
		Mass (kt)	value (R' 000)	Mass (kt)	value (R' 000)	Mass (kt)	value (R' 000)
Q1 2016	29.4	641	1 533	9	51 915	11.1	57 062
Q4 2016	37.8	2.9	6 976	11.1	53 473	14.1	60 450
Q1 2017	44.2	1.6	4 152	10.4	44 897	11.9	49 049
% Change (q-o-q)	**17**	**-47.5**	**-40.5**	**-6**	**-16**	**-14.8**	**-18.9**
% Change (y-o-y)	**50.6**	**-24.7**	**-19.3**	**15.3**	**-13.5**	**7.8**	**-14**

Source: DMR, Mineral Economics

South Africa's construction industry is expected to continue expanding until 2020 driven by investment in infrastructure, residential and energy project. As construction activities grow demand for vermiculite will follow suit.

Palabora Mining Company plans to expand its production to meet the future world demand from horticulture and agriculture markets which are expected to increase in Q4:2017 as the need for phosphate based fertilisers becomes eminent. Moreover, climate change and future availability of water are likely to drive vermiculite consumption, owing to its water retention characteristics and aeration in soil.

Sources:

1. *Department of Minerals, Directorate Minerals Economics*
2. *Palabora Mining company annual report.*
3. *WWW. Industrial Minerals. Com. 2016*

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18. SOUTH AFRICA'S PHOSPHATE ROCK PRODUCTION AND SALES DURING THE FIRST QUARTER OF 2017

South Africa's production of phosphate rock decreased by 13.7 percent (q-o-q) in the first quarter of 2017 to 479.4 kt compared to 555.7 in the fourth quarter of 2016 kt. This decline occurred as a result of work stoppages at one of the country's main producer. Local sales volume increased by 8.5 percent q-o-q from 488.4 kt to 530.1 kt (Table 1). Local sales revenue decreased by 8.8 percent (q-o-q) from

R720.6 million to R657.2 million. Export sales volume increased by 197.9 percent (q-o-q) from 56.7 kt to 169.0 kt while export sales value increased by 170.9 percent from R85.2 million to R230.6 million, as a result of operational challenges that led to less domestic demand making more rock available for export market. The year 2016 saw oversupply for the phosphate rock. Prices were under pressure in the international market and this is expected to continue during the 2017 financial year. Key importing countries generally had low demand.

TABLE 14: SOUTH AFRICA'S QUARTERLY PRODUCTION AND SALES OF PHOSPHATE

	Production (kt)	**Local sales**		**Export sales**		**Total sales**	
		Mass (kt)	**value (R' 000)**	**Mass (kt)**	**value (R' 000)**	**Mass (kt)**	**value (R' 000)**
Q1 2017	479.4	530.1	657 177	169.0	230 692	699.1	887 869
Q4 2016	555.7	488.4	720 660	56.7	85 162	545.1	805 822
Q1 2016	464.4	388.5	808 004	52.7	102 871	441.1	910 875
%Change (q-o-q)	**-13.7**	**8.5**	**-8.8**	**197.9**	**170.9**	**28.2**	**10.2**
%Change (y-o-y)	**3.2**	**36.5**	**-18.7**	**220.5**	**124.3**	**58.5**	**-2.5**

Source: Directorate Mineral Economics

South African production is expected to increase slightly as one of the country's major producers (Foskor) is focusing on improving efficiencies. Plans are also underway for prospecting marine phosphates projects in South Africa and this is expected to boost supply in the long run. Furthermore, there are projects aimed at alleviating food insecurity, these projects are expected to contribute to increased phosphate demand given its use in agriculture following effects of recent droughts.

Sources:

1. *Foskor Integrated Annual Report 2016*
2. *Patrick Heffer and Michael Prud'homme, Fertilizer Outlook 2016-2020. International Fertilizer Industry Association*
3. *United States Geological Survey, Mineral Commodity Summaries, Phosphate Rock, January 2017.*
4. *http://www.integer-research.com/2012/fertilizers-chemicals*
5. *www. Industrial Minerals. Com. 2016*

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