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The Regulator
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Dear sir/madam

CHAMBER OF MINES COMMENT ON THE ESKOM RCA YEAR 2,3 AND 4 APPLICATION

Find below the Chamber of Mines comment on the Eskom 2014/15, 2015/16 and 2016/17 MYPD3 RCA application for your attention.

The Chamber of Mines has previously made a submission (dated 13 October 2017) in response Eskom's application for a 20% increase in electricity tariffs. We draw your attention to this earlier submission for the fact that we believe that all the recommendations advanced in that submission are still very relevant to this current RCA application.

The Chamber would like to thank the NERSA for the consultation on this MYPD3 RCA application.

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1. Introduction

The Chamber of Mines and its members remain committed to the sustainable growth of the South African economy. The Chamber of Mines welcomes and appreciates this opportunity to comment on Eskom's Regulatory Clearing Account (RCA) application for year 2,3 and 4. The Chamber wishes to highlight the specific areas of concern and impacts to our mining sector. The Chamber has always supported the multi-year price determination (MYPD) concept. Projects in the mining sector typically take several years to complete, and the measure of certainty on the electricity price trajectory provided by multi-year price determinations assists in project planning and evaluation.

Eskom applied to NERSA for a RCA of R66.6 billion for the year 2,3 and 4 of MYPD3 in addition to the already awarded 5.23% tariff increase for 2018/19 single year application. The Chamber also acknowledges that there might be another RCA application at a later stage for Year 5 of the MYPD3 amounting to some R 20 billion if the previous 4-year RCA applications are anything to go by.

Eskom's RCA application requests cost recoveries of R 44.381 billion for Revenue Variance over the three years, R 9.148 billion from international sales variance, R 7.418 billion for Regional IPPs, R3.473 billion for coal burn, R 2.805 billion for other primary energy and R1.948 billion for Open Cycle Gas Turbines which constitute the bulk of the RCA application for the 3-year period.

2. South African Mining Sector at a Glance

The mining sector is an important component of the South African economy and has been for over 100 years. The industry constitutes 6.8% of the economy contributing R312 billion to GDP in 2017. The sector employs 464 667, which represents 6.1% of private non-agricultural employment and 4.8% of total non-agricultural employment.

The industry contributed R93 billion to fixed investment in 2017, which constituted 18.2% of private sector fixed investment and 10.8% of the country's total fixed investment bill for the year. Over the decade between 2007 and 2017 a downward trajectory is evident in the industry's fixed investment activity, which should be a cause for concern, particularly regarding the industry's prospects.

The industry exported R307 billion worth of produce, 27% of the country's R1.1 trillion export book. In the 2016/2017 fiscal year the industry paid R5.8 billion in royalties and R 16 billion in taxes for the same period.

It is important to note the integral relationship that exists between the mining sector and the electricity sector. The mining sector is both a feed of input, in the form of coal, into the electricity sector and it is an important customer to the electricity sector, consuming approximately 30% of the electricity produced by Eskom.

In 2017, the coal mining industry, an important sub-component of the mining sector, produced 252 million tonnes of coal, representing an approximate sales value of R123 billion. Of the total coal production, 180 million tonnes were consumed domestically (predominately by Eskom) and 67 million tonnes were exported earning R54 billion in foreign earnings for South Africa.

3. Total Electricity Revenue

Table 1 shows the MYPD3 approved revenue, sales volumes, projected percentage Gross Domestic Product (GDP) growth and projected sales growth for the control period 1 April 2013 to 31 March 2018.

| Table 1: MYPD3 approved total electricity revenue, forecast sales volumes, % growth & projected % GDP growth | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 |
|---|---------|---------|---------|---------|---------|
| Total Allowed Electricity Revenue (R'm) | 149 937 | 163 584 | 180 332 | 196 378 | 216 322 |
| Forecast sales to customers (GWh)* | 217 890 | 219 744 | 224 877 | 229 495 | 234 519 |
| % Growth of sales | 2.4% | 0.9% | 2.7% | 1.5% | 2.1% |
| Projected % GDP growth | 2.6% | 3.6% | 3.6% | 3.9% | 4% |
| Exports or International sales (GWh) | 9 513 | 9769 | 10 761 | 9 618 | 9 507 |

**Export sales excluded but including Negotiated Pricing Agreements*

Source: NERSA decision, 28 February 2013

According to the Eskom MYPD3 application the forecasted sales volumes are based on electricity sales trends, the actuals sales volumes at the time of the application and market projections and the GDP growth. The forecasted sales volumes are further anchored by the growth projections Eskom obtained from its key customers that make up 80% of the sales volumes. The forecasted sales for the

Negotiated Pricing Agreements (NPA's) remained constant over the control period at around 11 303 GWh per annum in line with the contracts.

Historically there has always been a correlation between electricity sales growth and the GDP growth though the electricity growth would lag the GDP growth. Based on the projected GDP growth and the projections from key customers, the forecasted electricity growth sales by Eskom were reasonable and acceptable at the time of approval of the MYPD3.

The reductions in export/international sales about 2 300 GWh per annum during the control period was attributed to the anticipated increase of own generation capacity by the neighbouring countries and thus less reliant on Eskom's electricity supply. At the time of the application this assumption was reasonable as the neighbouring countries had announced their intention of creating their own generation capacity.

The electricity demand from 2013 (i.e. peak demand 35 546MW) onwards was less than that of 2008 (i.e. 36 959MW) and yet Eskom had returned to service additional generators of more than 3000 MW during this period.

4. Revenue Variance

2014/15

The revenue under-recovery for the 2014/15, 2015/16 and 2016/17 RCA applications makes up about 66.5% (i.e. R44 381m) of the total R66 686m. The reasons behind the under recovery of revenue lies primarily on Eskom in that they did not maintain their generation plants and were late in the commissioning of new plants. Due to the unavailability of electricity the economy could not grow as forecasted by the Treasury. This together with high electricity price resulted in mines, smelters and other businesses closing shop. Other companies bought diesel generators, fuel cells and solar panels to reduce reliance on Eskom.

Eskom in the meantime devised plans to keep the lights, which entailed:

- Request for all customers to reduce electricity consumption by 10%
- Load shedding
- Load curtailment

- Time of use tariffs which resulted in smelters closing during winter periods

There is no reason why Eskom should be compensated for lower sales volumes, Eskom asked the customers to use less electricity otherwise they would be load shed or curtailed. By Eskom's own admission the need for the RCA now being applied for was caused by Eskom's own failure to manage its build projects and operations efficiently and the customers should not bear the RCA. At the least the shareholder should find other means to pay for the costs emanating from Eskom's over inflated structure.

2015/16

During this period the black-outs increased in the form of load shedding and curtailment. The load curtailment and shedding are estimated to have occurred for more than 640 hours which equate to 26 days.

There is no reason why Eskom should be compensated for lower sales volumes, Eskom asked the customers to use less electricity otherwise they would be load shed or curtailed. By Eskom's own admission the need for the RCA now being applied for was caused by Eskom's own failure to manage its build projects and operations efficiently and the customers should not bear the RCA. At the least the shareholder should find other means to pay for the fixed costs.

2016/17

There was no load shedding during this period. Eskom in this period put a lot of energy and funds on improving the performance of its electricity generation fleet. The reduction in demand by energy intensive users and the sourcing of alternative electricity suppliers by distributors/municipalities are the main drivers of this significant reduction.

It is reasonable to expect such reductions in demand after the severe load shedding incidents in 2015/16. It is also reasonable to expect that Eskom would have reduced the fixed costs associated with the revenue shortfall since the call to reduce consumption came from Eskom.

Although it was clear to Eskom that they could not reach their sales volumes they did not implement measures to mitigate the sales variance. These measures include cold storage or mothballing of some of the most expensive to operate coal fired power stations. Eskom was aware of the possible solutions (cold storage mentioned in the Eskom Integrated Report 2015/16) to this conundrum, but they seem to have done nothing to remedy the situation

5. Primary Energy

Table 2 below shows the MYPD3 coal costs that were approved by NERSA on 28 February 2013 as well as the actual costs and variances as applied for by Eskom.

Table 2: Coal cost variance application

| MYPD3 RCA application | 2014/15 | 2015/16 | 2016/17 |
|-----------------------|---------|---------|---------|
| Coal (R'm) | 36 617 | 39 838 | 44 245 |
| Eskom actuals (R'm) | 37 191 | 43 838 | 43 886 |
| Variance (R'm) | 574 | 3 258 | -359 |

Table 3 below compares the NERSA approved coal burn volumes and Benchmark average coal costs the Eskom actuals which shows that in all the 3 years under consideration the coal burn volumes were less than the amounts assumed in the MYPD3 decision and this is consistent with the lower sales volumes. However, the Benchmark average costs were higher than those MYPD3 approved costs indicating that Eskom used more expensive coal than the Benchmark average. This is mainly because Eskom decided to take short term contract coal which was delivered by trucks. In this period the amount of coal on road increased to more than 33 000 kt.

Table 3: Coal burn volumes and Benchmark average costs

| | 2014/15 | 2015/16 | 2016/17 |
|-------------------------------|---------|---------|---------|
| Coal burn volumes (Mt) | 129 561 | 128 000 | 129 000 |
| Benchmark average costs (R/t) | 282.6 | 311.2 | 343 |
| Eskom actuals | | | |
| Eskom Coal burn actuals (MT) | 119 179 | 114 806 | 113 737 |
| Benchmark average costs (R/t) | 313.6 | 378.8 | 388.1 |
| | | | |

Coal costs 2014/15

The explanations provided by Eskom for higher unit costs of coal, such as, the conveyor belt at Duvha not working or delay in the commissioning of Medupi or production at RTS stations, Majuba and Tutuka being higher than planned, are all within Eskom's control and could have been managed efficiently to avoid cost overruns.

From the lower sales volumes Eskom would have been able to save R3 240m from the coal volume variances but instead purchased higher cost coal amounting which was R3 814m than the Benchmark average costs resulting in a R574m clawback being applied for.

Eskom inability to control costs that are within their control should not be promoted by allowing this clawback despite the leeway that the MYPD Methodology may provide in the pass-through mechanism.

Therefore, the coal costs variance of R574m should be disallowed. Instead the savings on coal costs derived from lower sales volumes together with the approved Benchmark average coal (including Alpha) of R268.5 per ton, resulting in a minimum give back to the customer of R3 240m +/- Coal volume variance at approved benchmark costs.

Coal costs 2015/16

From the lower sales volumes Eskom saved R4 953m by burning less coal but overspent R8 211m by using more expensive coal, resulting in a clawback of R 3 258m being applied for. Eskom provides the same explanation of the delay in the commissioning of Medupi and the use of expensive coal for Arnot and Tutuka for this variance.

Therefore, the coal cost variance of R3 258m should be disallowed. Similarly, the costs savings derived from lower sales volumes and approved benchmark average coal costs should be used to determine the amount to be given back to customers. The amount to be given to back to the customer is R4 953m +/- coal volume variance at approved benchmark costs.

Coal costs 2016/17

There is no explanation given by Eskom for the use of more expensive coal in this application. Although the application gives back R359m to the customers, the same approach as above should be followed.

Therefore, the amount to be given back to the customer because of lower sales volumes should be the cost savings emanating from lower coal burn and approved Benchmark average costs totalling to R5 889m +/- Coal volume variance at approved benchmark costs.

Consolidated Coal costs for 2014/15, 2015/16 and 2016/17

Table 4 below is the consolidated coal costs for all the RCA applications which allows for R14 082m to be given back to the customers.

Table 4: Consolidated coal costs

| | 2014/15 | 2015/16 | 2016/17 | TOTAL |
|--------------------------------|---------|---------|---------|---------|
| Eskom coal cost Variance (R'm) | 574 | 3 258 | -359 | 3 473 |
| Allowed cost variance (R'm) | -3 240 | -4 953 | -5 889 | -14 082 |

Eskom has a major influence on the domestic market for coal as it is the country's largest consumer. The fact that it has been buying and continues to buy coal from smaller mines to supplement supply from tied collieries and larger producers should not affect the price drastically. Eskom also has a primary energy department resourced with mining engineers for ensuring that mines with short to long-term supply contracts do not inflate their prices unnecessarily. The primary energy division must also ensure that mining companies with long-term contracts do not operate inefficiently or increase/decrease extraction rates at their collieries unnecessarily.

6. Open Cycle Gas Turbines (OCGT's) costs

The MYPD3 approved OCGT's costs for the period under review are shown in Table 5 below amount to R5 817m, which are R1 127m less than what Eskom applied for in MYPD3 whilst the actuals in the

3 years period under consideration are R18 846m which is 2.7 times more than the projections in the MYPD3 application.

Table 5: OCGT costs

| | 2014/15 | 2015/16 | 2016/17 | TOTAL |
|---|---------|---------|---------|--------|
| Eskom MYPD 3 OCGT application (R'm) | 3 258 | 1 788 | 1 898 | 6 944 |
| MYPD3 Approved OCGT costs (R'm) | 2 710 | 1 508 | 1 599 | 5 817 |
| Actual OCGT costs (R'm) | 9 546 | 8 960 | 340 | 18 846 |
| Variance | 6 836 | 7 182 | -1 259 | 13 678 |
| Cost applied for in line with 2013/14 RCA | 1 944 | 689 | -1259 | 1 948 |

Analysis of OCGT costs for 2014/15, 2015/16 and 2016/17

The variance of R13 678m (shown in Table 5) in OCGT costs is a significant misalignment between forecasts and actuals amplifies Eskom's inability to forecast and control as well as efficiently manage its costs.

OCGTs were mainly used to supplement the electricity system after power stations were not maintained. The EAF subsequently reduced to 75% in 2013/14, 74% in 2014/15, further decreased to 71% in 2015/16 and increased to 77% in 2016/17. The lower EAF instead of achieving 82% as stated in the MYPD3 is a clear indication of Eskom poor maintenance of its plant which had led to the electricity shortages in the country.

Some significant events such as the boiler explosion at one of the Duvha units, the collapse of the Majuba power station coal silo and long delays in commissioning of Kusile, Medupi and Ingula power stations. In response to these events and delays, Eskom operated its more-expensive OCGTs and drew on other short-term supply options to close the electricity supply/demand gap.

In 2016/17 Eskom underspent on the OCGT costs by R 1 259m due to the lower demand and improved performance of its electricity generation fleet, lower sales volumes and additional IPP's.

This is a misleading statement as the OCGT burn for 2016/17 was R60m and the additional R280m being allocated to the OCGT costs was for diesel storage and demurrage costs.

When assessing the above it becomes vivid that Eskom used OCGTs excessively to the detriment of the South African customers and itself. The over expenditure was obviously taken from Eskom income which was meant for other purposes. Using 2013/14 NERSA decision Eskom comes to the OCGT variance of R 1.958 which is misleading and does not show the extent of the over-use of OCGTs and its implications on Eskom's' revenue variance. Eskom is in this matter simply writing off the OCGT cost of R11.385 billion (RCA Adjustments 2015/16 and 2014/15) which was not used prudently and should be accounted for in the NERSA decision as an accrual to customers. The use of OCGTs was in no way prudent and should not be passed on to customers.

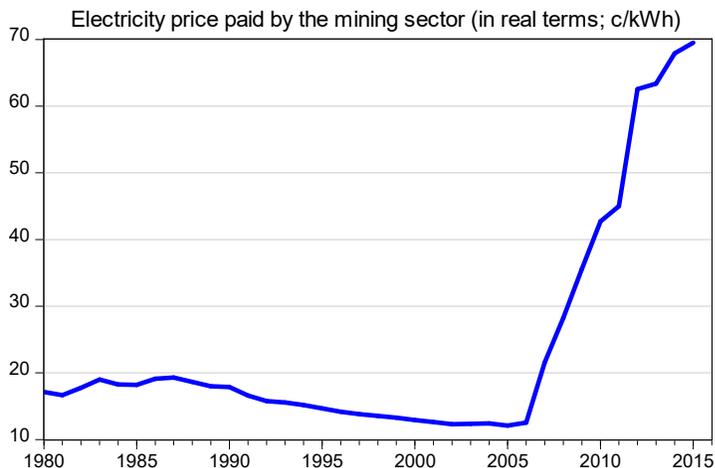
7. Potential Impact of this RCA application on the Mining Sector

Electricity in mining

Mining requires massive amounts of electricity. From base metals (aluminium, lead, nickel, copper, zinc, tin, and iron ore) to precious metals like gold, PGMs, and silver. Coal mining also requires substantial amounts of electricity.

Since 2006 the price of electricity has risen quite exponentially as seen in Figure 1. This not only served to reduce the industry's competitiveness globally, but it has also resulted in the loss of thousands of jobs.

Figure 1: Electricity price paid by the mining sector in South Africa



Source: Department of Energy Price Report

The nature and quantity of the machinery used in mining, often at significant depths can result in energy expenditure of up to 22% of intermediate input costs, as noted in the table below.

Table 6 – Mining Input Costs

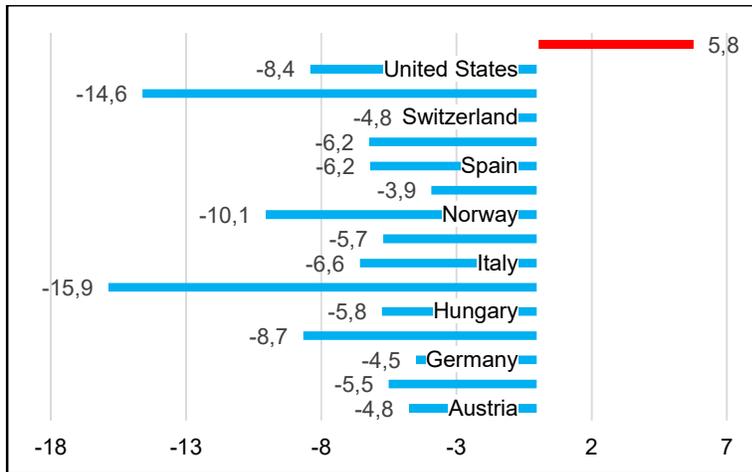
| Cost Basket | Total Mining | Coal | Gold and Uranium Ore | Other Mining |
|---|----------------|----------------|----------------------|----------------|
| Intermediate Cost Basket | | | | |
| Mining & quarrying | 1,22% | 0,78% | 1,29% | 1,26% |
| Wood & wood products | 1,52% | 0,44% | 8,01% | 0,43% |
| Coke & refined petroleum | 1,32% | 1,54% | 0,83% | 1,28% |
| Basic chemicals | 1,85% | 1,03% | 4,62% | 1,45% |
| Other chemicals & man-made fibers | 2,98% | 3,20% | 4,60% | 2,52% |
| Rubber products | 1,41% | 2,46% | 1,22% | 1,08% |
| Metal products excluding machinery | 1,85% | 2,12% | 3,56% | 1,36% |
| Machinery & equipment | 5,11% | 5,86% | 7,71% | 4,30% |
| Electrical machinery & apparatus | 0,93% | 1,51% | 1,23% | 0,63% |
| Transport equipment | 1,39% | 1,47% | 1,81% | 1,20% |
| Electricity, gas & water | 5,79% | 3,00% | 22,00% | 4,37% |
| Wholesale & retail trade | 4,93% | 5,90% | 7,02% | 4,17% |
| Transport & storage | 43,89% | 43,04% | 1,96% | 52,49% |
| Finance, insurance, real estate & business services | 4,69% | 4,71% | 9,78% | 3,59% |
| Community, social & personal: Other producers | 2,22% | 2,22% | 3,09% | 1,97% |
| Residual | 0,00% | 0,00% | 0,00% | 0,00% |
| Imported Intermediate Inputs | 18,92% | 21% | 21,30% | 17,91% |
| Total Intermediate Costs (Ex Labour) | 100,00% | 100,00% | 100,00% | 100,00% |
| Intermediate Costs | 65% | 69% | 47% | 69,5% |
| Compensation of Employees | 35% | 31% | 53% | 30,5% |
| Total Input Costs | 100% | 100% | 100% | 100,0% |

Source: Quantec, COM Estimates

Given the relative and absolute quantum of electricity to mining input costs, an increase to this line of costs can be the reason for operations becoming unprofitable.

The South African economy encountered high energy cost inflation in relation to the country's trading partners. Figure 2 shows that between 2013 and 2016 a majority of countries experienced negative energy inflation while domestic industries had to deal with average rise in energy costs of 5.8% (i.e. including all energy sources – liquid fuels and electricity).

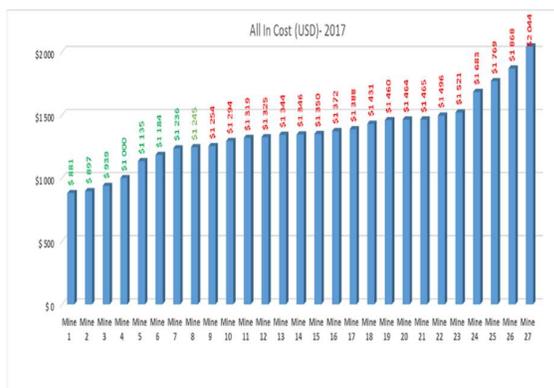
Figure 2: Average energy inflation for SA and selected countries (% , 2013-2016)



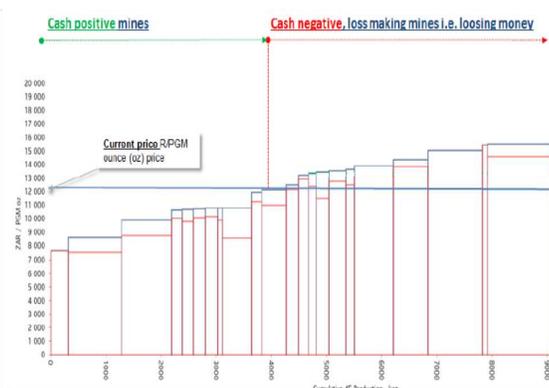
Source: OECD.Stat and StatsSA (2017)

The inflationary profile of electricity in South Africa is particularly concerning in light of the marginal nature of mining in the South Africa. One way of measuring the sustainability of a mining operation is to compare cost of production to the selling price of the product. Given the fact that mining companies are price takers of commodity prices (their selling prices), their sustainability is a function of controlling input costs. Producing at cost per unit that is above the selling price per unit results in unsustainable operations.

Figure 3: Gold Mining (69% Unsustainable) Figure 4: PGM Mining (65% unsustainable)



Source: Company AFS; Chamber of Mines



Source: Johnson Matthey

The figures above depict the status of the gold and platinum group metal (PGM) industries in 2017. These two industries employ 287 970 people, constituting 62% of total mining employment. They account for 79% of total mining exports and 29% of royalties. And yet the gold and platinum industries are sensitive to, even the most benign increase in costs, including hikes in electricity tariffs and the exchange rate.

The mining industry's costs in South Africa are mainly structural i.e. they are a result of geological aspects of which mining companies can do nothing about. Additionally, administered prices constitute roughly 50% of intermediate input costs, and here too the mining companies do not have control over these costs.

Due to generally depressed global commodity prices and structurally high input costs associated with South African mining, 69% of gold mining operations and 65% of PGM mining operations are producing unsustainably. A change in the fortunes of these industries in order to become sustainable entails either an increase in commodity prices and/or managing input costs downward. Regrettably a 35% increase to electricity prices would only serve to worsen the picture for these industries.

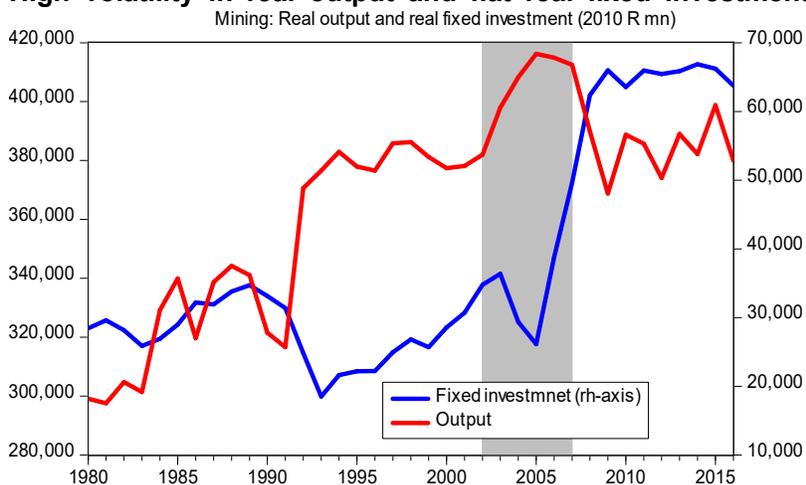
8. Time series Econometric Modelling

In order to quantify the impact of electricity price increases on the mining sector we have employed time-series econometric modelling.

The approach provides insight by the use of historical data to generate elasticities at an aggregate as well as industry level. The analysis shows the impact that a 35% increase in electricity prices would have on the mining sector. The indicators analysed are production/output, investment, employment, and gross operating surplus.

Figure 5: Mining Output and Fixed Investment

High volatility in real output and flat real fixed investment



1. Between 2002 and 2007 mining sector output increase significantly from R381 billion to R412 billion, respectively. Output peaked at R416 billion in 2005. This was at a time when the world economy was booming, until the financial crisis of 2007/08.

2. Post the 2007/08 financial crisis mining output has been quite volatile compared to any other period since 1980

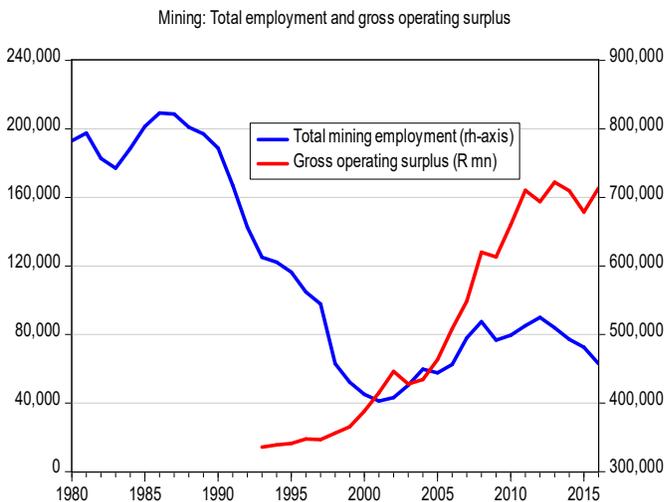
Source: Quantec

3. Real fixed investment followed a similar upward trend same trend from R34 billion in 2002 peaking at R66 billion in 2009. Since then real fixed investment has remained flat mainly an indication – not of reduced aggregate demand – but an austere policy environment

4. Fixed investment data also includes exploration expenditure. The lack of growth in investment is an indication that mines are not engaging in exploration activity largely on account of the regulatory environment

5. Structural break – Perhaps in anticipation of the new political dispensation in 1994, in 1992 mining output grew significantly, a trend that continued until 2007. On the part of investment – save for the drop in 2004 and 2005 - 1994 saw a consistent increase in investment until it levelled off in 2009, on account of a confluence of factors, among others, the 2007/8 financial crisis.

Figure 6: Employment and gross operating surplus



Source: Quantec

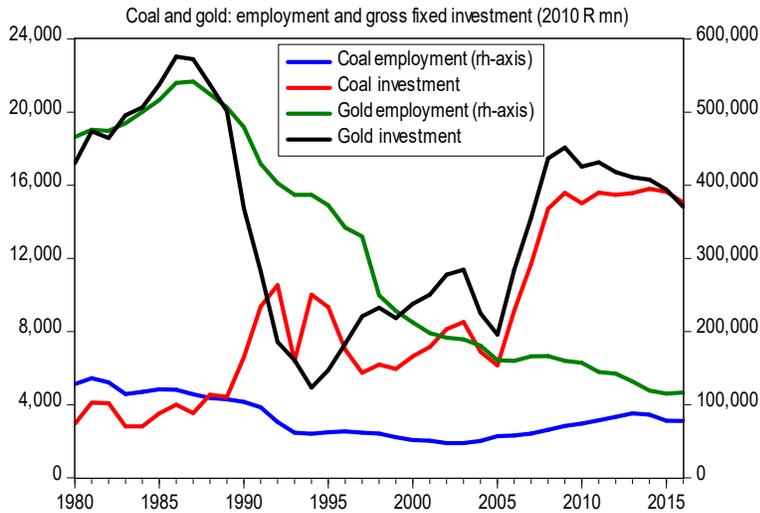
1. By the end of 2016 the mining sector employed 457 290 people. This is significantly lower than the peak of 823 169 employed in 1986; but still higher than the trough of 403 032 employed in 2001

2. Accounting for the decline in mining employment is a combination of factors: geological aspects where SA's mines are deeper than the world average; rising costs emanating from the fact that our mines are deeper; escalating input costs. including the

3. The increase in investment post 1994 was followed by high profits generated by mines (as represented by gross operating surplus)

4. Since 2011 gross operating surplus has flattened lower profitability of our mines

Figure 7: Coal and Gold industry employment and investment



Source: Quantec

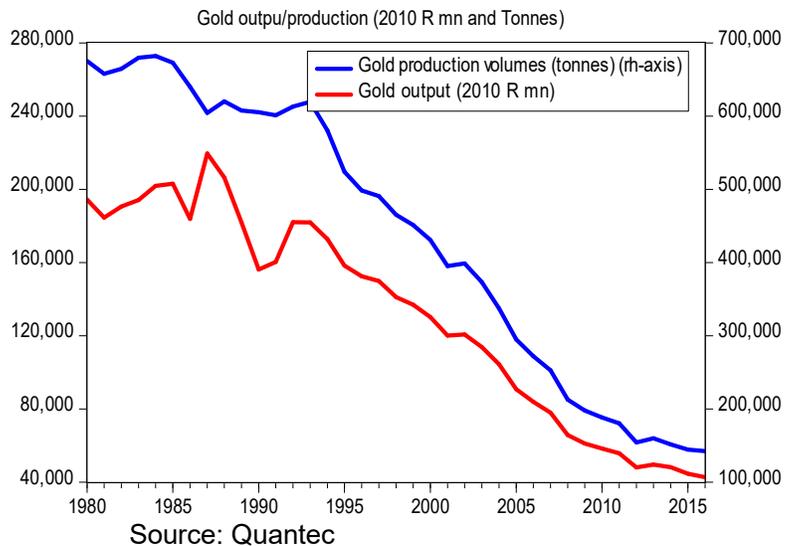
1. The pattern of investment between the two industries is similar. While 70% of coal volumes is consumed domestically it is only about 6% for gold. This may indicate the importance of the export sector or export price in making investment decisions for both industries

2. In the review period employment peaked in 1981 for the coal industry (136 140) and in 1987 for gold (541 621). The duction in employment for the gold industry has been faster than in the coal industry. In fact, between 2009 and 2014 coal emolvment rose steady

3. There is a tenuous relationship between investment and employment. This is particularly the case with the gold industry. The uptick in investment in the coal industry beginning in 2006 was followed by increased employment.

Downward trend for gold production/output (in terms of value and volumes)

Figure 8: Gold production and Gold Output



Gold production has been declining for a number of reasons:

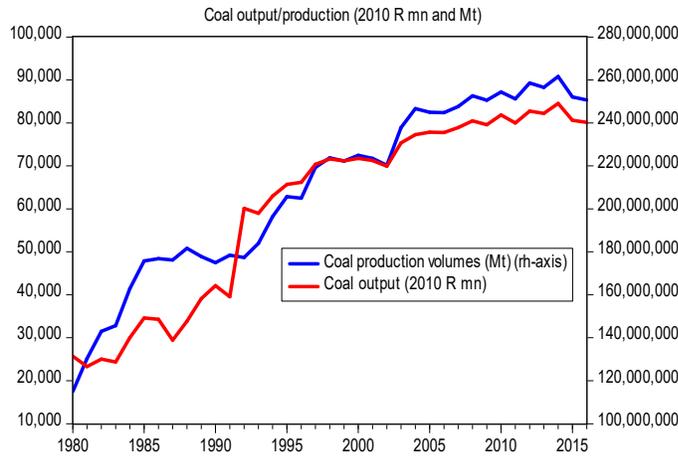
1. Most of SA mines, particularly in the Gauteng province, are deeper than our competitors such as China, Russia, US, Canada and Peru
2. Labour productivity has been declining compared to its peak in 1976. (In 1976, labour productivity as an index registered 210.6 (2010=100).)
3. On the other hand unit labour costs have increase substantially from 0.8 in 1976 (as an index, 2010=100) to 191.9

Source: Quantec

4. Because of the depth of the mine more machinery is required to obtain the gold bearing ore. (Our calculations indicate that a 10% increase in depth of a gold mine reduces tonnage by almost 9%.)

Coal production/output has been increasing

Figure 9: Coal Production and Output



Source: Quantec

1. Coal is a useful mineral resource in South Africa accounting for at least 70% of the country's primary energy
2. It dominates the country electricity generation, with more than 90% of the country's requirements generated from coal
3. Coal production has been steadily increasing since 2002 and because of a reduction in electricity demand as a result of the increased electricity prices there 2014 saw reduced production
4. Coal production is likely to remain resilient as new HELE technologies become cheap and

Summary Results from Econometric Simulations

This section presents a summary of the time-series estimations. It is important to state that whilst the elasticities are a plausible, the results are indicative. They are indicative as to the magnitude of the coefficients (elasticities) but not as they relate to the sign of the elasticity i.e. negative or positive sign. A negative sign implies a reduction; whilst a positive sign means an increase.

Table 7: Impact of electricity price increases in the mining sector

| LONG-RUN COEFFICIENTS/ELASTICITIES FOR THE PRICE OF ELECTRICITY IN THE MINING SECTOR | | | | |
|--|--|------------|---------------------------------------|------------|
| Sector/industry | The impact of a 10% increase in the electricity price on the mining sector | | | |
| | Output/production | Investment | Gross operating surplus/profitability | Employment |
| Total mining sector | -0.01% | -3.3% | -0.03% | -0.5% |
| Gold | -4.2% | -5.5% | n/a | -2.9% |
| Coal | -0.6% | -4% | n/a | -0.1% |

NB: How to read elasticities - For example, a 10% increase in the price of electricity (specific to the mining sector) results in a 0.01% decrease in total mining sector output; 3.3% decline in investment (real gross fixed capital formation); 0.03% decline in gross operating surplus; and 0.5% reduction in total employment.

Source: Chamber of Mines

The information provided in the tables below shows the actual decline in output, investment and employment resulting from a 35% hike in electricity prices. The impact on gross operating surplus is not presented in the tables below because of the unavailability of time-series data for coal and gold industries. It is otherwise presented on the estimations related to aggregate mining below.

Output Reduction (R bn), Employment Losses (number), Reduction in Investment (R mn)

| | Gold** | Coal | Other* | Total Mining | | Gold | Coal | Other* | Total mining | | Gold | Coal | Other* | Total mining |
|------|--------|------|--------|--------------|------|-------|-------|--------|--------------|------|-------|------|--------|--------------|
| 2000 | 1,7 | 3,8 | 8,3 | 13,8 | 2000 | 8 308 | 832 | 7 578 | 16 719 | 2000 | 706 | 358 | 2 405 | 3 469 |
| 2001 | 1,8 | 3,8 | 8,2 | 13,8 | 2001 | 7 744 | 822 | 7 757 | 16 323 | 2001 | 744 | 386 | 2 600 | 3 730 |
| 2002 | 2,6 | 3,7 | 7,7 | 13,9 | 2002 | 7 499 | 769 | 8 250 | 16 518 | 2002 | 824 | 439 | 2 960 | 4 223 |
| 2003 | 2,0 | 4,0 | 8,5 | 14,5 | 2003 | 7 410 | 765 | 9 079 | 17 254 | 2003 | 845 | 460 | 3 116 | 4 420 |
| 2004 | 1,8 | 4,1 | 9,0 | 14,9 | 2004 | 7 065 | 815 | 10 316 | 18 196 | 2004 | 667 | 372 | 2 529 | 3 569 |
| 2005 | 1,7 | 4,1 | 9,4 | 15,2 | 2005 | 6 289 | 923 | 10 775 | 17 987 | 2005 | 581 | 332 | 2 263 | 3 176 |
| 2006 | 2,2 | 4,1 | 8,8 | 15,1 | 2006 | 6 255 | 936 | 11 290 | 18 482 | 2006 | 844 | 493 | 3 376 | 4 713 |
| 2007 | 2,5 | 4,2 | 8,4 | 15,0 | 2007 | 6 501 | 979 | 12 573 | 20 054 | 2007 | 1 056 | 632 | 4 344 | 6 032 |
| 2008 | 3,0 | 4,2 | 6,9 | 14,2 | 2008 | 6 515 | 1 061 | 13 432 | 21 008 | 2008 | 1 297 | 794 | 5 485 | 7 575 |
| 2009 | 3,2 | 4,2 | 6,0 | 13,4 | 2009 | 6 261 | 1 147 | 12 510 | 19 918 | 2009 | 1 341 | 841 | 5 833 | 8 015 |
| 2010 | 3,4 | 4,3 | 6,5 | 14,2 | 2010 | 6 147 | 1 199 | 12 859 | 20 206 | 2010 | 1 263 | 811 | 5 648 | 7 722 |
| 2011 | 4,1 | 4,2 | 5,7 | 14,1 | 2011 | 5 669 | 1 273 | 13 830 | 20 771 | 2011 | 1 281 | 842 | 5 891 | 8 013 |
| 2012 | 4,2 | 4,4 | 5,0 | 13,6 | 2012 | 5 567 | 1 349 | 14 342 | 21 257 | 2012 | 1 241 | 835 | 5 874 | 7 951 |
| 2013 | 4,3 | 4,3 | 5,5 | 14,2 | 2013 | 5 158 | 1 426 | 14 068 | 20 651 | 2013 | 1 221 | 841 | 5 942 | 8 003 |
| 2014 | 4,2 | 4,5 | 5,3 | 13,9 | 2014 | 4 659 | 1 395 | 13 910 | 19 964 | 2014 | 1 210 | 853 | 6 063 | 8 126 |
| 2015 | 4,3 | 4,2 | 6,0 | 14,5 | 2015 | 4 504 | 1 260 | 13 737 | 19 501 | 2015 | 1 170 | 845 | 6 032 | 8 046 |
| 2016 | 5,2 | 4,2 | 4,4 | 13,9 | 2016 | 4 560 | 1 256 | 12 705 | 18 520 | 2016 | 1 099 | 812 | 5 833 | 7 744 |

*Other includes PGMs, Iron Ore, Manganese, Chrome etc.

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

Source: Chamber of Mines

9. Conclusions

During the period from 2013 to 2017 Eskom advised their customers to be energy efficient and to use less electricity due to their inability to supply electricity. This resulted in industries shutting down, other companies consumed less, others moved their load to off peak and smelters stopped consuming during winter. Residential were fitted with solar geysers as South Africa participated in the request to lower electricity demand. Some customers also installed different types of electricity generators (including fuel cells) at a cost to keep their operations going. New entrants into the market delayed their projects or used generators. The low growth of the GDP in SA can partly be attributed to the shortage of electricity in the period from 2013 to 2016.

Due to the above Eskom sales dropped considerably and resulted in the revenue variance of R44.381 for tariff customers and R9.81 billion from international sales. In a normal corporate environment Eskom was supposed to reduce their costs and when doing so also reduce their allowable revenue to show the declining sales volumes. Eskom should quantify how much of the energy efficiency implemented by its customers influenced the revenue variance and this amount should be removed from the RCA application. When Eskom requested SA to reduce their electricity demand they should

have known that their sales volume would not be reached but they did not adjust their business plan accordingly. The points below exacerbate the mining industry situation:

1. Mining in South Africa is a marginal industry. A slight increase in some of the cost items drive some operations out of business. This results in a number of job losses.
2. Of the four mining real variables modelled in this report – output, employment, investment, and gross operating surplus – electricity prices significantly and negatively affect mining employment. This is not good news for government for two reasons:
 - i) Among the major macroeconomic objectives of government is increasing employment. The mining sector is one of the country's major employers, with the second highest median wage earnings.
 - ii) SA miners are predominantly marginal players; thus, even the smallest increase in costs often results in the shutting down of entire operations or the retrenchment of labour
3. Since electricity prices are 'administered' they should rise in line with CPI for consumers and PPI for producers. In recent years electricity price increases have been more than changes in CPI thus eroding the mining sector's competitiveness.

10. Recommendations

It is recommended that NERSA

- Does not pass through the RCA onto customers and rather request the shareholder to deal with the continuing inefficiencies at Eskom
- Request the shareholder to consider the sale of some of the stake within Eskom as the shareholder cannot afford to bail out Eskom
- Recommend to Eskom to reduce its spare capacity from 35% to an industry acceptable 15%. This can be achieved by mothballing/cold storage some of the older power stations
- Recommend to Eskom to restructure their organisation to be in line with the sales volumes and revenue generated to avoid extreme tariff increases

The Chamber requests the NERSA not to pass through the RCA of R66.6 billion. If the variance in revenue is passed through to customers, the higher prices will lead to mines closing and the allowable revenue will be shared by a few. Mines contribute to other sectors like manufacturing which will also suffer when mines close. Eskom should rework their business plan to reduce its fixed and variable costs, whilst growing sales which will reduce the electricity tariff.