Analysis of Eskom's financial position

Full report

Parliamentary Budget Office

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This report has been compiled in response to a request from the Chairperson of the Standing Committee on Appropriations in Parliament. The Committee asked the PBO to investigate the financial position of Eskom.

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3 Introduction

This report assessing the finances of Eskom, focuses on the financial performance and the main factors affecting that performance of the group as whole (i.e., not individual divisions of the group). Eskom is a state owned enterprise (SOE) whose importance to South African society and the economy is unquestionable. Therefore, the health of Eskom's finances is a question of national importance, but the implications of problems related to the electricity supply industry in South Africa will have broader implication within the southern African region and beyond.

There is no doubt that the financial challenges faced by Eskom require ongoing close attention from the shareholder and in terms of legislative oversight. These challenges are complex and there are no easy fixes. The financial challenges stem from the condition and operation of the physical plant, transmission and distribution systems, as well as conditions that affect the cost structure and revenue collection of the utility, including regulatory issues. We also explore some of the broader political economy issues affecting outcomes for Eskom. Overall, these conditions have combined into a situation where Eskom has had to make substantial new investments while facing large increases in primary energy and other costs in a situation where political economy factors do not necessarily support expansion of the utility.

The role of a power utility such as Eskom is to supply electricity reliably at a price that is both competitive and sustainable. Decisions to add to Eskom's capacity were delayed during the 1990s. There was much strain on Eskom's existing plant as it struggled to 'keep the lights' on even if it meant postponing much needed maintenance of these plants. At the same time, Eskom faced higher costs for coal and was forced to manage peak demand with top-ups of expensive electricity from diesel consuming open cycle gas turbine (OCGT) plants. The visible side of the strain faced by Eskom was in its financial statements. There were shortfalls because Eskom was unable to secure the levels of tariff increases they sought from the National Electricity Regulator (NERSA). There is also strong public opinion against large tariff increases.

Eskom is in a situation where it has to service debt but has reduced financial space because of the past decade of higher primary energy and other costs. There is a possibility that unplanned negative developments may cause it to divert borrowing to fund operating costs and that there could be liquidity issues that cause it to struggle to service its debts. The downgrade to Eskom's credit rating and the negative views during 2016 by S&Ps and Moody's is due to these concerns.

There remains the possibility that Government will have to provide future equity investments into Eskom and provide further guarantees on Eskom's debt. The possibility that these decisions may have to be made requires an active monitoring and evaluation of Eskom's technical and financial activities. We can draw lessons from Eskom's history where it made large investments in new power stations. The country ended up with an overcapacity of electricity and Eskom's management was criticised for using its monopoly status to ensure large tariff increases. There was also criticism that Eskom managers focused on debt reduction and managing its finances while neglecting the efficiency and technical aspects of its business while there was an overcapacity. Recent developments with Eskom seem to indicate that we may be repeating some of those mistakes. There have been cost overruns, delays in bringing new capacity on line, reduced maintenance and efficiency of the current system, large tariff increases and an understanding that when the new capacity is on stream that Eskom will once again have an overcapacity.

The approach taken in this report is first to consider some of the accounting aspects related to Eskom's revenue streams and later to liabilities on its balance sheets. The discussion in between these two sections is about Eskom's expenditure and costs and a broader approach is taken. In addition to accounting and financial analysis related to the large increases in costs to Eskom we provide a political economy analysis that provides a broad historical background to understanding the financial problems faced by Eskom today. We argue that the relationships between major players in mining, industry and the state allowed for certain developments in the electricity supply and coal industries that led to mutually beneficial outcomes. The solution to Eskom's problems are constrained by changes in the industries and changes in the relationships between the state and big business, i.e., broader political economy factors.

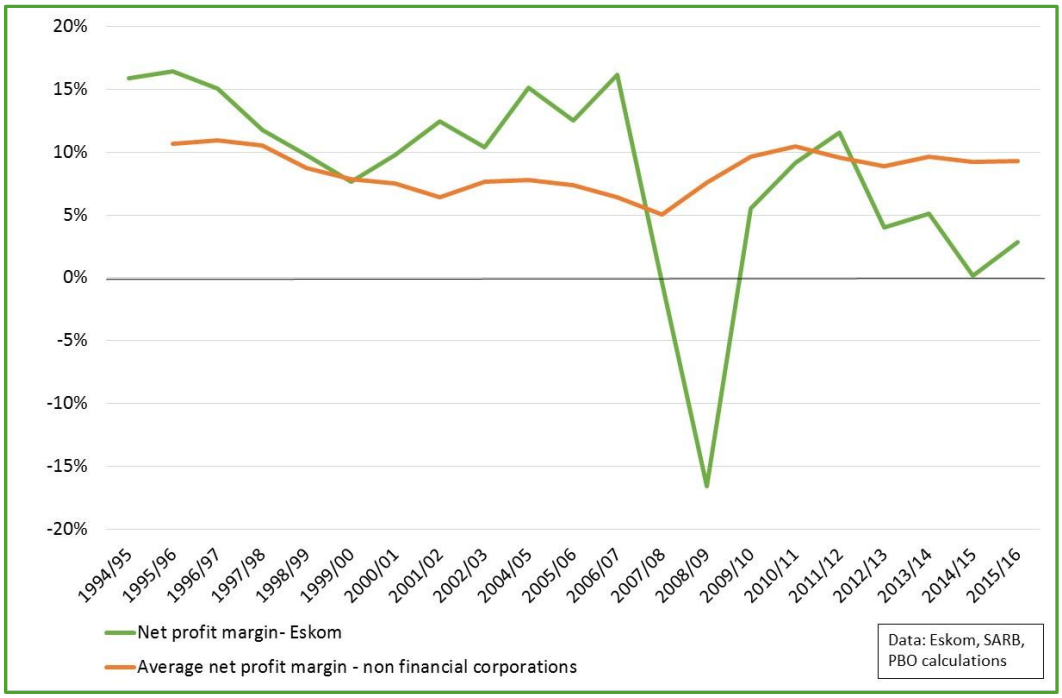
4 Revenue

This section analyses the trends in Eskom's revenue. It identifies how Eskom's revenues have contributed to its current financial position.

4.1 Profitability

Prior to 2007 Eskom managed to achieve significant profits. Between 1995/96 and 2005/06 Eskom's net profit margin averaged 12.1 per cent compared to the economy-wide average of non-financial corporations which achieved an average profit margin of 7.8 per cent in the same period. Since 2007, Eskom's profits have declined, its net profit margin has averaged 4 per cent (including losses in 2007/08 and 2008/09), compared to non-financial corporations which achieved an average profit margin of 9 per cent over the same period.

Figure 4.1: Declining profitability since 2008



Source: Eskom, SARB (PBO calculations)

The decline in Eskom's profitability since 2006/07 has occurred despite the significant and sustained increase in revenue. Between 2006/07 and 2015/16, Eskom's revenues grew by an annual average of 9.7 per cent in real terms (nominal: 16.9%), while profits fell by an annual average of 9.6 per cent in real terms.

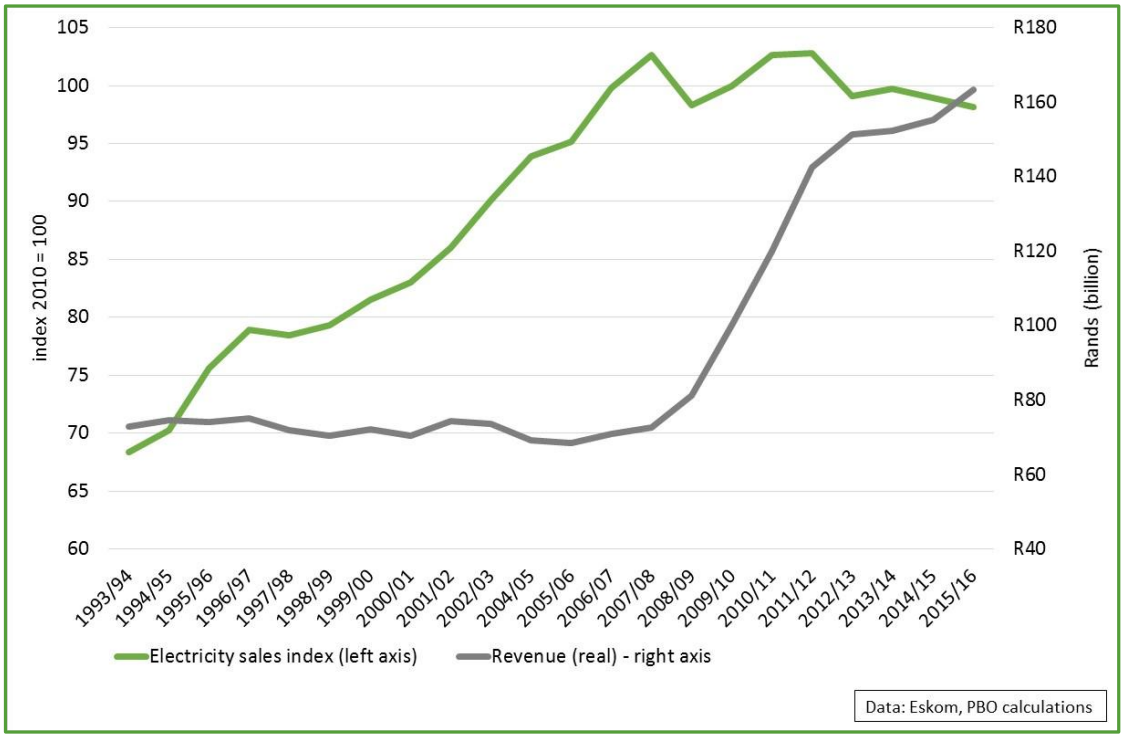
Figure 4.2: Declining profitability despite higher revenue (real 2015/16 prices)

Source: Eskom (PBO calculations)

4.2 Revenue and sales

The significant increase in Eskom's revenues since 2007/08 has not been due to increased electricity sales. Total electricity sales declined after 2007/08 in response to the effects of the global financial crisis, country-wide load-shedding, as well as sustained lower economic growth. Between 2007/8 and 2015/6 the industrial and mining sectors, which account for between 38 – 42 per cent of direct Eskom sales, decreased demand by 20.4 per cent and 5.5 per cent respectively. Between 2010 and 2012, electricity sales recovered to the 2007 levels, but have been in decline since.

Figure 4.3: Increasing revenue despite poor sales growth



Source: Eskom (PBO calculations)

4.3 Revenue, sales and tariffs

The significant increase in Eskom's revenues since 2007/08 has been primarily due to the large increase in electricity tariffs. Between 2007 and 2016 average electricity tariffs increased by 374 per cent (real: 168%) - a nominal annual average increase of 16.8 per cent (real: 10.4%). This reversed the trend of the preceding decade (1997 - 2007) wherein electricity tariffs decreased in real terms. In this period average electricity tariffs actually decreased by 21.6 per cent (real: -62.2%) - an annual average decrease of 2.4 per cent (real: -9.4%). The reasons for the real decrease in average electricity tariffs prior to 2007/08 and the subsequent sudden increases since, was due to the timing and size of Eskom's investments, as well as changes to the tariff-setting methodology.

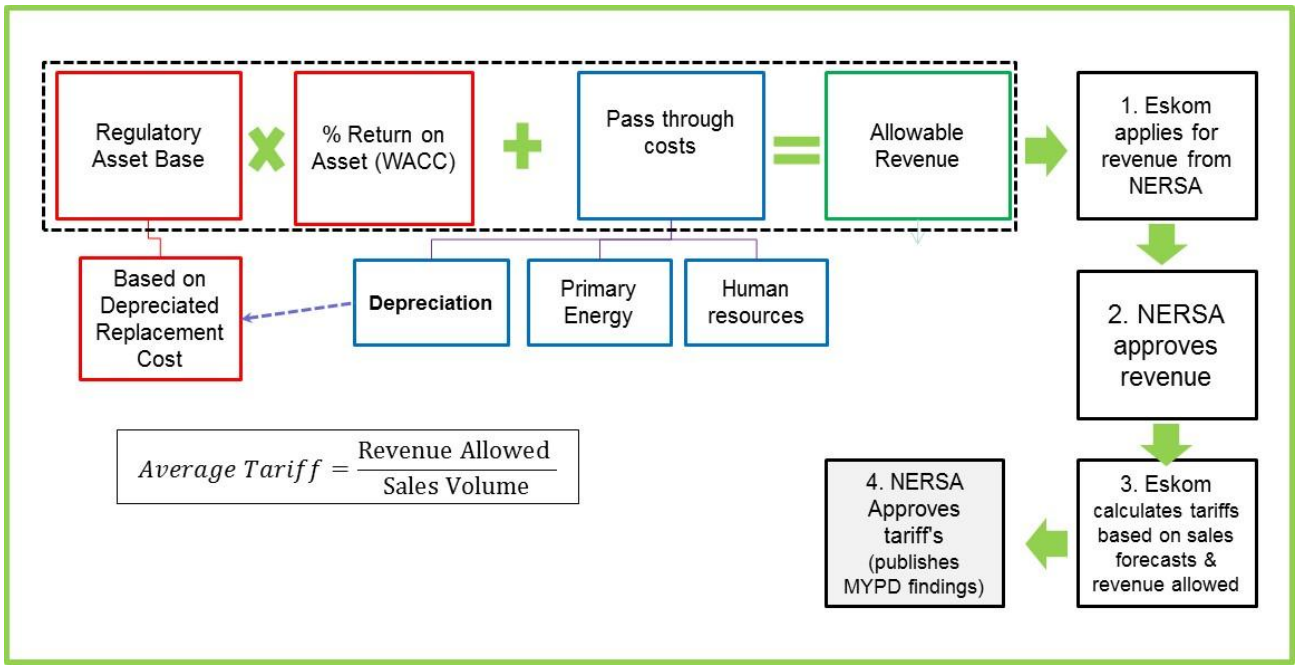
Between 1970 and 1994 Eskom embarked on a massive build programme, adding 33910 MW of new generation capacity to its fleet. With the support of a R19.1 bn subsidy from government, a favourable exchange rate, and open-ended forward cover from the SARB, the costs of constructing new power stations were relatively low (Steyn, 2003). With the additional capacity coming on-line, the country had accumulated surplus electricity generation capacity.

The surplus capacity and the favourable financial position of Eskom – due to its debt being paid off – allowed the state to embark upon a policy of setting extremely low

tariffs (beneath long run marginal cost) and offering special incentives to attract investment.

The period of low and declining real electricity tariffs came to an end around 2006/7. In 2006 the Electricity Regulation Act was passed, which made the National Energy Regulator (NERSA) responsible for tariff determination, and the Electricity Pricing Policy (2008) was adopted. Based on the Electricity Pricing Policy (2008), electricity tariffs need to ensure the utility's financial sustainability. In fact the EPP states that given its size, the sector has "the potential to generate strong cash flows to sustain a financially viable industry. The need for direct state support and subsidies should, apart from funding social objectives, be minimal" (Energy, 2008). Based on the EPP, electricity tariffs must allow Eskom to recover costs incurred (prudently) from supplying electricity, as well as fair rate of return on its asset base.

Figure 4.4: Eskom tariff determination process



Source: Amra (2013)

Around the same time, the regulator also adopted the "replacement cost basis" approach as part of the methodology it set out for electricity tariff determination. This increased the book value of Eskom's assets, resulting in a significantly higher regulatory

asset base. The increase in the value of the asset base, combined with additions to the asset base through the construction of new power stations, contributed to larger increases in average electricity tariffs. The EPP, while noting the need for electricity tariffs to be fully cost reflective, allowed for tariff increases to be phased-in toward cost-reflectivity over a five-year period (by 2013) to minimise the effects of large tariff increases on the economy and consumers. Despite this allowance, the return on Eskom's regulatory asset base, even after 2013, has not been adequate. This has resulted in electricity tariffs not being fully cost -reflective. Non-fully cost-reflective tariffs have placed a strain on Eskom's cash-flow and financial position.

Table 4.1: Increase in asset base value due to revaluation

Asset base values	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
Historic - plus inflation	203 656	291 264	378 260	482 066	598 108	747 235
Revalued: depreciated replacement cost - plus inflation	581 632	674 133	765 882	878 841	1005 937	1168 979
% change	186%	131%	102%	82%	68%	56%
						Source: Eskom (2009)

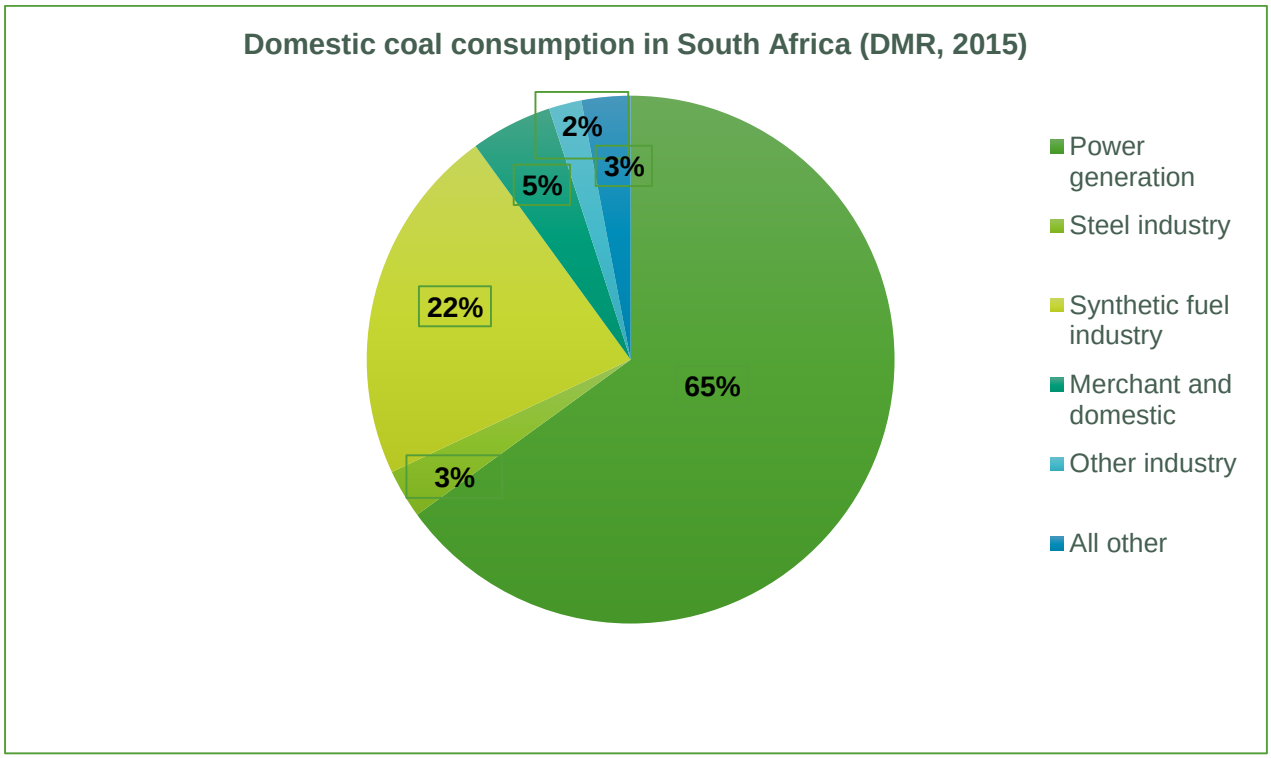
Source: Eskom (2009)

While lower-than-sustainable tariff increases reduce the burden on the consumers and industry, the cost of lower-than-necessary tariff increases places strain on both the utility and the fiscus as Eskom has required the government guarantees and capital injections

5 Expenditure

5.1 Introduction

Figure 5.1: Domestic coal consumption in South Africa (DMR, 2015)

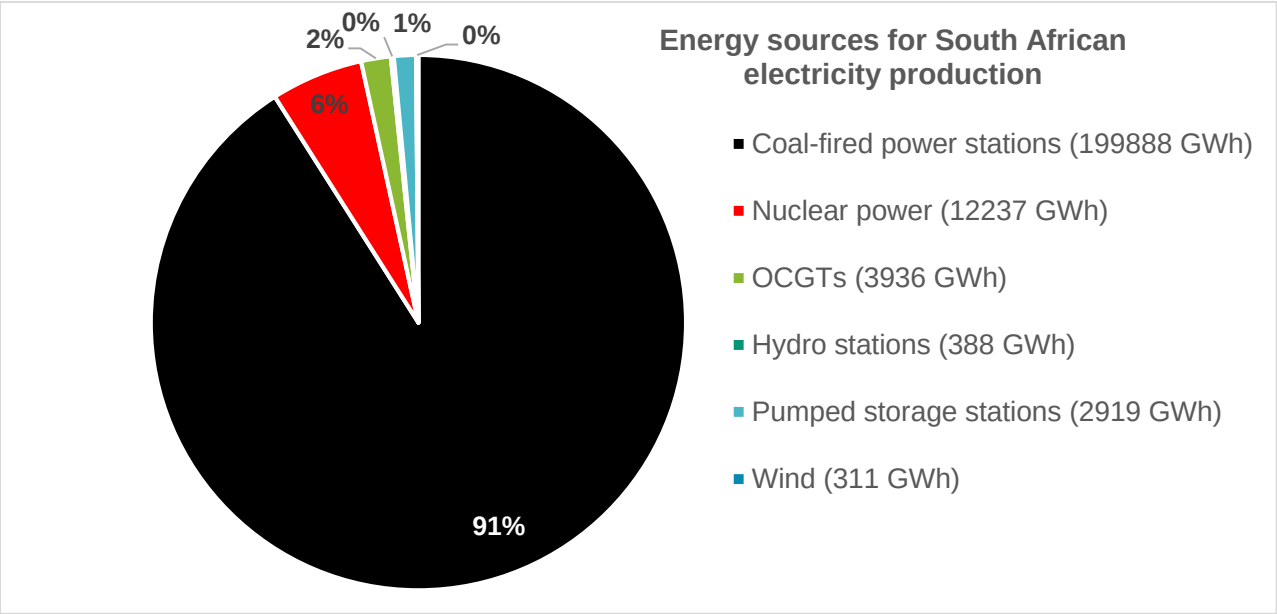


Source: DMR (2015)

While coal has not been the only reason for the rapidly rising primary energy cost of Eskom it is necessary to focus on coal as the South African electricity supply industry remains largely a coal generation business. Figure 5.1 shows that power generation accounted for almost two-thirds of South Africa's domestic coal consumption.

The cost of coal used in generation is one of the most important cost factors affecting Eskom. It is important to understand how the price of coal has changed and how this change has contributed to the problems Eskom continues to face. Figure 5.2 shows that over 90 per cent of South Africa's electricity production is from coal.

Figure 5.2: Energy sources for South African electricity production



Source: Eskom Annual Report 2016

This section provides a short discussion about the development of the South African electricity supply and coal industries. The history of coal and electricity industries can be analysed within the conceptual framework that South Africa developed a minerals and energy complex as a system of accumulation. Fine and Rustomjee (1996) developed the concept of a minerals and energy complex not only to show the central role of mining and minerals in the development of the South African economy but also to show that the specific nature of the colonial and apartheid states and the types of businesses that existed led to certain economic outcomes. The MEC analysis is different from mainstream economic analysis that assumes an unrealistic separation of the state and the market. Instead, the MEC as a system of accumulation developed in South Africa through the economic and institutional relationships between the state, state owned enterprises, such as Eskom, and big businesses in the private sector, that were in the business of producing coal for Eskom and consuming electricity as inputs.

5.2 The development of the South African electricity supply industry

Eskom was developed to support the requirements of energy intensive, heavy industries, particularly mining and minerals processing.

Eskom is a monopolist and has always had a role in supporting big businesses and market concentration through supply of electricity and awarding of large, long-term contracts. Steyn (2006, p.11) cites an interview with Ian Macrae former Chief Executive of Eskom who explained that the historic role that mining played in the development of the electricity supply industry influenced the management culture within ESCOM[1] (as it was then known) and the role managers understood their business up to the 1980s. These managers saw the mining industry as integral to the development of the electricity supply industry and were focused on ensuring that the mining industry would not be constrained by supply shortages and low quality of supply (ibid).

Baker et al (2015) provide a good summary of how the MEC developed using the example of Eskom's new generation build during the 1970s:

> The evolution of the MEC required closely aligned state and private capital coordination and decision-making. For example, Eskom's expansion of generating capacity in the 1970s to match mineral output and growth in mines was linked to the development of coal export railway line by the state-owned railways, private miners and Eskom. The railway line, developed in 1976 and connected to the privately owned Richard's Bay coal terminal allowed South Africa to export beneficiated (washed) coal to Europe while using the middlings (i.e., the coal that remains after washing) or low grade run-of-mine domestic coal for Eskom. (p.14)

Eskom was able to ensure a supply of cheap coal with cost plus contracts that supported the development of coal mines at the power station location. These mines generally fed coal to the mines via conveyors. They also went into fixed price contracts with multiproduct mines.

The process known as 'washing' coal led to a significant change in the economics of the electricity and coal industries during the 1970s. Washing coal allowed a separation of run of the mine coal into different grades. The development of this process led to a huge increase in coal exports from the 1970s (Eberhard, 2011). The development of the Richards Bay coal terminal and to several expansions of this terminal over the past few decades as well as the expansion of the port capacity in 2010. The coal industry and Eskom benefited from the washing of coal because the coal companies could export the higher grade coal to Europe and Japan and Eskom would use the lower grade remains.

[1] ESCOM was renamed in 1987 when the Electricity Act was revised and the Eskom Act was introduced in 1987.

As a state owned company Eskom provided 30 per cent to 40 per cent of the capital development requirements of cost plus mines located at generation plants; generally at better interest rates available to the mining companies. The mining companies received capital to develop their mines and a significant reduction in risk not just from Eskom's capital contribution but also because Eskom took risk on the geology of the mines by agreeing to buy a certain amount of output at a cost plus arrangement. These risks have grown now that many of these mines are 30 to 40 years or even older and close to depletion.

The period in the 1970s when there was rapid expansion of generation capacity was a time when ESCOM had a rapid increase in demand and by 1975 reserve margins dropped to 11 per cent when ESCOM engineers considered a sufficient reserve margin to be 17 per cent (Steyn, 2006, p. 14). By this point there had already been an order in 1969 to construct the Kriel power station (with six 500MW units) and in the mid-1970s construction of the Matla and Duva power stations (both with six 300MW units) was started as well as building South Africa's largest pumped storage scheme in the Drakensberg (with four 250MW units).

Steyn comments that barely two months after the 1976 Soweto uprising construction was started on the Koeberg nuclear power station. He says that Eskom management agreed that Koeberg "was never an economic option" but the decision was imposed by the apartheid government for military and political strategic reasons (ibid, p.15). By 1979 as a result of the oil crisis demand for electricity increased again and the reserve margin dropped. There was a decision made that the urgency of the situation meant that ESCOM could not go through drawn out tender processes and Lethabo and Tutuka were rapidly put into construction by ordering turbines and boilers from the existing suppliers (ibid, p15).

Steyn says that in theory ramping up construction of power stations should lead to economies of scale and reduce costs and prices but in practice those benefits were hard to achieve. The problem was that the building of larger power stations meant longer lead times. Steyn says that by the mid-1970s it took 14 years from the start of construction to commissioning of the last unit (ibid).

The debt position of ESCOM deteriorated because a large part of capital was tied up in projects under construction and were not available for earning revenue that could help service its debt. Steyn estimates that by 1983 forty per cent of ESCOM's assets by value, most funded by interest-bearing debt, was not in commission and, therefore, not productively used (ibid, p.16). Even though, there was large-scale construction ESCOM faced problems of keeping the reserves at suitable levels. The loss of Cahora Bassa supply from Mozambique in 1976 created supply problems. Further, the difficulties faced with getting the newly constructed units to perform at the proper levels meant that the amount ESCOM was able to supply was below its installed capacity.

Between 1979 and 1982 ESCOM faced four consecutive years of increased demand that led to load-shedding, to use older less efficient plants, to delay maintenance and to delay retirement of older plants. The response by management to the increased demand and supply problems was that by 1982 they had developed plans for a further 70 000 MW of generation capacity and had ordered turbines and boilers for 3 more 4 000 MW power stations, Matimba, Kendal and Majuba (Steyn, 2006, p19).

The large growth in investment meant that ESCOM would have to make large increases in its loans and its capital development fund that led to large increases in tariffs. There were large tariff increases in 1976 and 1977 and again in 1982 when overall prices were increased by 13.1 per cent and 1983 by 16.7 per cent. The public outcry about the increase in 1983 led to PW Botha calling ESCOM to a meeting and afterward announcing on television that the price increase would be 14.5 per cent and not 16.7 per cent.

The De Villiers Commission was appointed in May 1983 and lasted until 1985. The Commission criticised ESCOM management of being too concerned about creating excess capacity. It also criticised Eskom for taking advantage of their ability to pass on the costs of this strategy to consumers through price increases. They were also critical ESCOM's demand forecasting methods. An important recommendation of the Commission that would have negative long run implications is that with regard to tariffs it said that tariffs should be consumer privileging and not include long run marginal costs (i.e, the replacement costs of the system).

Eskom had to come up with ways to cut costs and deal with excess production and in 1987 announced that it would be mothballing older stations. Even though, the De Villiers Commission was critical of Eskom, the utility carried on with almost all of their expansion. By the early1990s Eskom had a reserve requirement of 40 per cent and had mothballed a substantial amount of capacity in older but still economic plants (Steyn, 2006, p. 38).

Eskom entered into long-term price contracts with Alusaf and ferrochrome production to reduce their overcapacity. Eskom was faced with a difficult environment for raising foreign funds with the increased isolation of the apartheid government, the 1985 state of emergency and the debt-stand still. Its solution was to convince the apartheid government that it required two increases of 10 per cent each in 1985 and 1986. During 1987, 1988 and 1989 they kept increases below the inflation level but in 1990 they wanted a 14 per cent increase.

By 1992 cash revenues were higher than debt-service requirements and the cash used for investments declined. However, the real return to assets declined from 5.6 per cent in 1988 to under 2 percent in the early 2000s. Eskom did improve its financial position, which was supported by its tax exempt status until 2001 and its freedom from providing a dividend to its only shareholder.

Steyn (2006, p46) makes the important point that much of the consideration of Eskom's management at that time was to improve its financials and to meet its financial obligations. He says the utility's management focused less on ensuring the efficiency and operations of its plant and assets than on improving its finances. Steyn says its "consumer privilege" structure meant that tariffs did not have to consider replacement costs (ibid, 47). Eskom was able to rapidly amortise that meant that Eskom could "… provide misleading price signals about the efficiency with which it was applying its capital resources (ibid)."

Steyn (2006) makes an important point when he explains the importance of uncertainty when tackling large-scale, multi-year projects such as building electricity generation plants.

Eskom faced problems, particularly relatively low rates of return and needed to pass on costs to consumers through large tariff increases during the 1980s and 1990s, even though, it invested in new technology and building at a scale where the benefits of economies of scale could be achieved. Steyn says that the managers and engineers at Eskom did not take into account the uncertainty associated with such large investment and bringing on stream new technologies.

The fixation with ensuring adequate demand at all costs combined with the ability to pass on costs to consumers created a situation that Steyn refers to as moral hazard. Managers could take risks with regard to large-scale investments but were not adequately accountable for these risks and could increase tariffs to bear the costs of those risks. Managers could also pass on the cost of their inability to improve efficiencies in the system and could pass on the cost of poor planning that led to overcapacity and mothballing of older but still economic plants through tariffs. This problem was exacerbated because of problems with transparency around the operations and finances of the utility. The pricing structure that did not reflect long run marginal cost meant that for long periods prices were lower than what would sustain the utility.

These low prices drove up demand and increased economic activities in South Africa reliant on more electricity. The electricity and capital intensive nature of South Africa's industrial base reflects the interests of those at the core of the MEC, which included maintaining cheap electricity prices. When it was time to increase supply capacity there were large tariff increases to manage debt repayments and operational costs but in general these tariff increases remained insufficient for the long-term sustainability of Eskom.

The drive to build new capacity and the continued tariff structure that did not cover future replacement costs supported pursuit of even more electricity intensive contracts. Even with the recent shift in governance where Eskom now has to present its plans to NERSA there remains problems related to how Eskom's capital expenditure plans are approved and the role of NERSA.

There also seems to remain an institutional bias towards investment in large-scale capital intensive projects with long-lead times without adequate transparency around implementation of demand side management plans.
The lessons from the 1980s and 1990s remain unheeded role and the importance of uncertainty and the need for cost-reflective tariffs are still underestimated within Eskom and by policymakers. The possibility of the existence of moral hazard problems remain a concern.

The energy intensive users remain a major influence over Eskom and Government thinking about electricity use and supply. The Energy intensive users group (2015), which has 33 members, claim to contribute 20.13 per cent of SA's GDP and use 78637 Gwh of electricity in South Africa. They employ 596000 people in South Africa and have a turnover of R740.67 bn.

The legacy of the MEC is clearly visible when considering the electricity use by energy intensive big businesses in South Africa. South Africa consumed 201044 Gwh in 2015 and the EIUG members used 39.1 per cent of that amount.[2] This scale of electricity use by energy intensive businesses is startling. The EIUG has 33 members while Eskom has 5.7 million customers in South Africa, including 50 816 commercial, 2733 industrial, 1013 mining, 82450 agricultural, almost 5.6 million residential customers and 801 redistributors. One wonders whether the culture and business mind set of Eskom management remains committed to these big businesses in mining and minerals beneficiation, similar to the mind-set mention by former CE Ian Macrae.

There have been significant changes at a political and economic level in the South African economy since the early 1990s. There has been democratic political change. At the same time, there was also significant corporate restructuring with movement of capital abroad and offshore listings. During this period the mining and industry sectors have declined in terms of their contributions to GDP and employment. However, there remains a reliance on the mining and minerals sector.

[2] Information about the Electricity Intensive Users Group was taken from their website http://www.eiug.org.za/about/membership/

The nature of the MEC has changed as a result of the end of apartheid and the increased internationalisation of South Africa's big businesses but the economy does remain dependent on mining and minerals beneficiation for its contribution to GDP and more so for its exports that help to ease balance of payments pressures. At the same time, many of the continued problems of the South African economy in terms of low levels of investment in fixed capital, high unemployment and increasing inequality are linked to the inherited structure of the economy. The MEC as a system of accumulation did not support the development of downstream, value adding productive manufacturing and services businesses. From the 1990s, the global economy has gone through a process of financialisation where many economies and large corporations have become more dependent on financial activities and speculation in financial markets for their increases in revenue and profits rather than real economic activities that support investment and employment creation.

The political changes in South Africa and the corporate restructuring that occurred during the 1990s occurred alongside a process of globalisation that integrated trade and financial markets. As South African big businesses restructured and internationalised there was a return of short-term capital flows to the South African economy that helped to offset the movement of large corporations and profits abroad. The economy became more dependent on short-term foreign capital flows to manage its balance of payments and the large corporations became increasingly financialised favouring financial market activities and speculation rather than fixed investment.

The focus on commodity price increases and decreases to explain the movements in GDP and the focus on foreign direct investment and the shortage of savings to explain poor levels of fixed investment misses the important change to the economy where the reliance on MEC sectors has grown while the economy and large corporations in the economy have become increasingly financialised. However, the MEC is not just separate businesses operating in certain sectors of the economy it is a system of accumulation as shown above in the discussion of Eskom and coal.

This system of networks and cooperation has changed and some of the factors that supported cooperation and joint projects has changed. First, while large corporations still supply coal and depend on electricity from Eskom, they have restructured and internationalised which means that they are less reliant overall on South Africa and Eskom for their businesses. The same coal companies have the option of exporting coal when the prices favour exports rather than supplying it to Eskom. At the same time, Eskom does not have the necessary capital to support developing new coal mines and seems interested in more arms-length contracts. Eskom's former CEO Brian Molefe when still at Eskom said he was in favour of scrapping cost plus contracts (Baker et al, 2015, p.9). He was of the view that Eskom could enter into new contracts. However, irrespective of Molefe's view, the development of the Richards Bay coal terminal seems to be less beneficial for Eskom now that coal demand from Asia for Eskom quality coal has grown relative to demand from Europe.

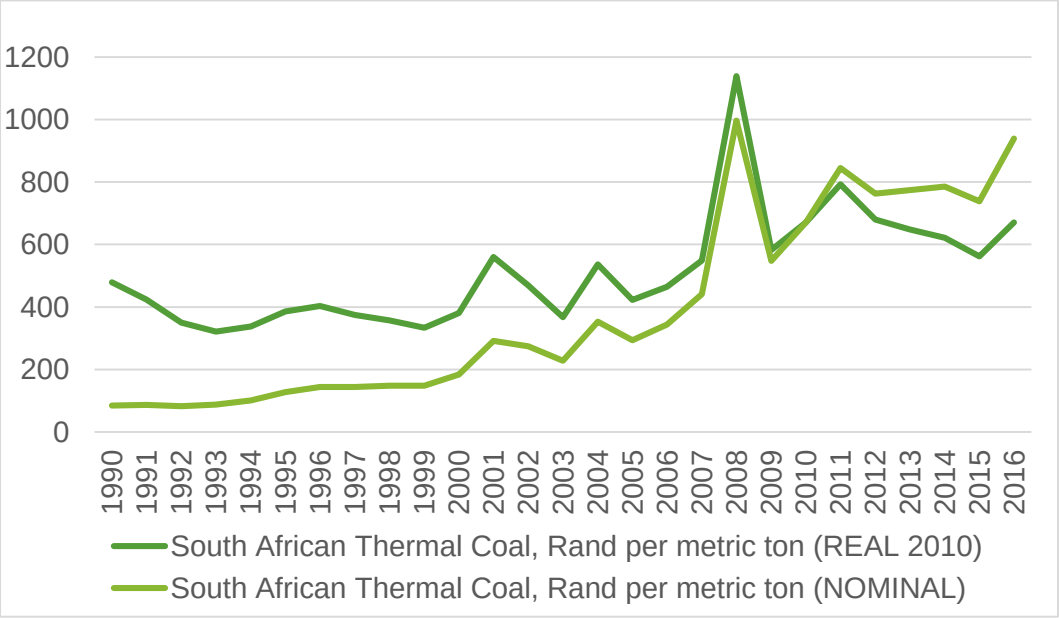
This section has outlined a background that shows the development of Eskom and coal mining in South Africa as an important part of the evolution of a minerals and energy complex in South Africa. It explained that the MEC refers not only to certain economic sectors but that it is a system based on cooperation and joint interests and investments across the state, SOEs and private corporations. It explained that the growth of the electricity industry, the coal mining sector and the rail infrastructure occurred in the context of a system of accumulation that supported certain types of economic activities with close linkages to mining and beneficiation but did not support downstream value-adding activities in manufacturing and mining leaving the South African economy in need of restructuring to support deepening and diversifying its industrial and productive services sectors. It finally shows the rapid growth in Eskom's generating capacity related to this evolution and growth of the MEC from the 1970s through the 1990s. It explains that the focus of Eskom's management was on expanding capacity to meet growing demand from mining and beneficiation without adequately ensuring efficient use and growth of capacity. As a result Eskom took on a huge amount of debt and management seemed to focus on managing debt sustainability rather than the efficient use of its assets.

The ability of the utility to pass on the costs to the consumer through large tariff increases at times when it had to manage its debt levels must be seen in the broader context that overall the cost of tariffs were not cost reflective because they did not have to take into account the replacement value of assets. This undervaluation of electricity prices supported more mining and mineral beneficiation and other electricity and energy intensive economic activities than would have happened if prices had been cost reflective. The lessons of these developments and the actions and behaviour of Eskom provide important background for a discussion of the post-apartheid period particularly in assessing the financial situation of Eskom today as it is in the midst of another expansion of generating capacity and once again has taken on large amounts of debt.

5.3 Eskom during the 2000s

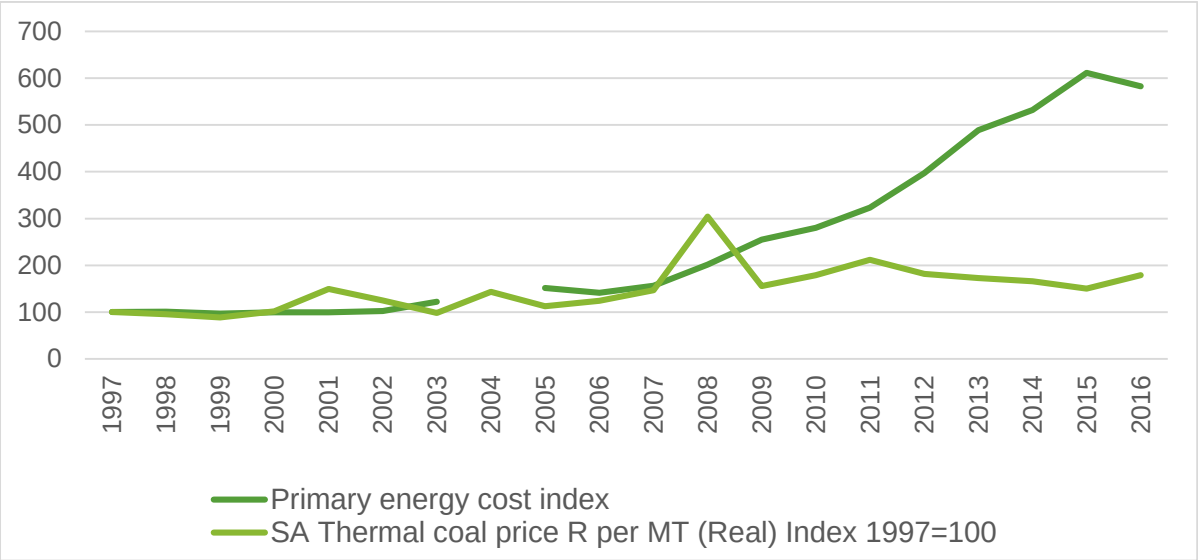
The period from the early-2000s until the global financial crisis was one where there was rising commodity prices, including coal and liquid fuels. Eskom was in a situation where new investment in generation was delayed and there was pressure to keep the existing plants operating at a high level.

Figure 5.3: South African thermal coal price per metric ton



Source: World Bank

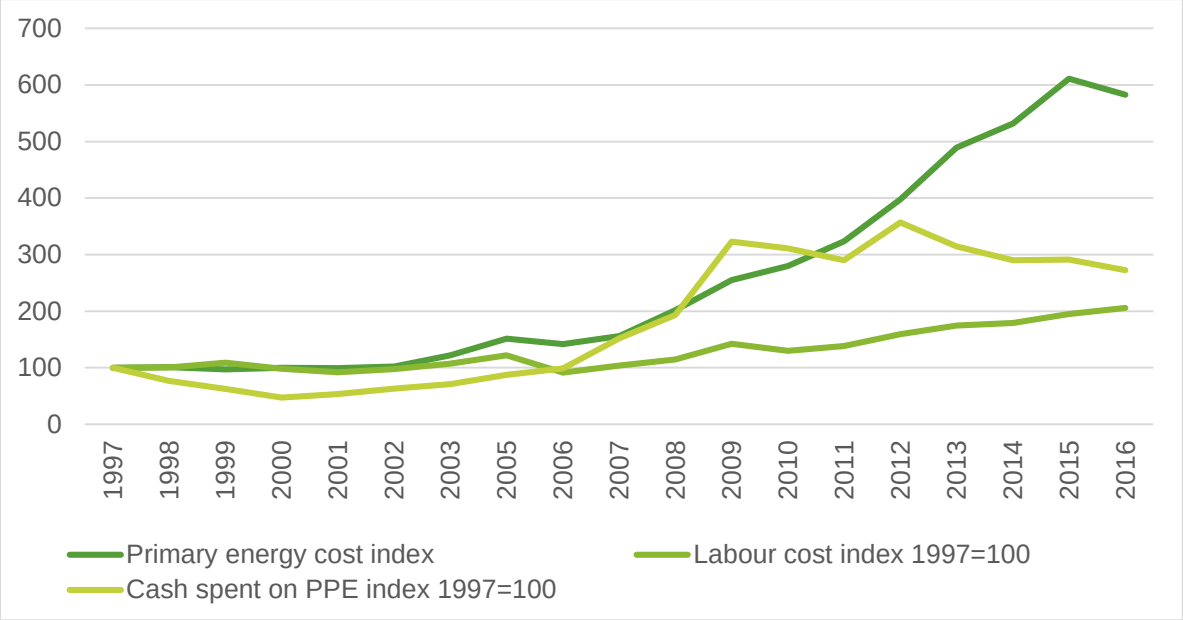
Figure 5.4: Index of Eskom's primary energy costs and the South African thermal coal price, 1997=100, real prices



Source: Eskom annual reports and financial accounts

The primary energy cost of Eskom grew by around 600 per cent from the early 2000s to 2015 (see figure 5.4). The increase in coal was an important factor as well as the increased use of diesel to run the OCGT plants to manage the peak and limit load shedding, the reduced efficiency of the plant existing plant, rising labour costs and the costs associated with the RE-IPP programme all had an important impact on Eskom's finances. These increased costs came at a time when there was investment in new generation capacity.

Figure 5.5: Index of selected expenditure items of Eskom 1997=100, real prices

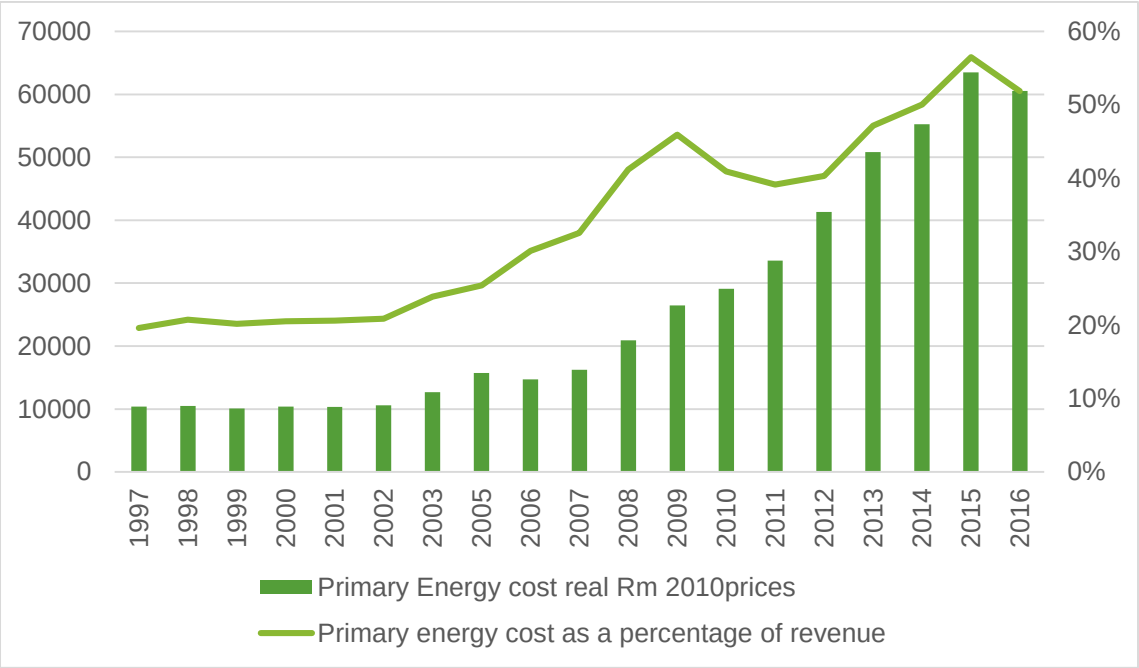


Source: Eskom Annual reports

Figure 5.5 shows the large increase in the primary energy cost, the real increase in labour costs and the growth in spending on property plant and equipment (PPE) from 2006. These increased costs affected the profitability of Eskom.

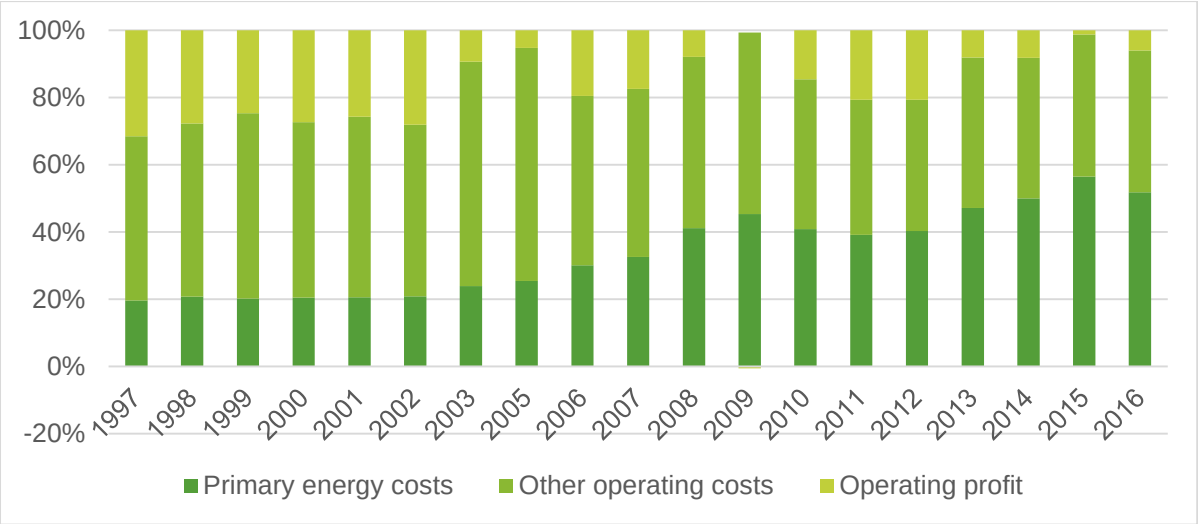
The increased primary energy and the other costs also led to increased demands for higher tariffs as Eskom (see figure 5.6). Eskom also passed the costs of higher primary costs to electricity consumers, particularly businesses, through load shedding. There were significant increases in the use of OCGTs to manage peaks (see Table 3.1 below) and as Eskom made huge efforts to avoid load shedding. However, since Eskom was not able to get NERSA to provide it with the level of price increases it saw as cost reflective, Eskom could only afford to incur the high cost of running OCGTs up to a certain point that it estimated to be affordable.

Figure 5.6: Change in Eskom primary energy costs



Source: Eskom annual reports

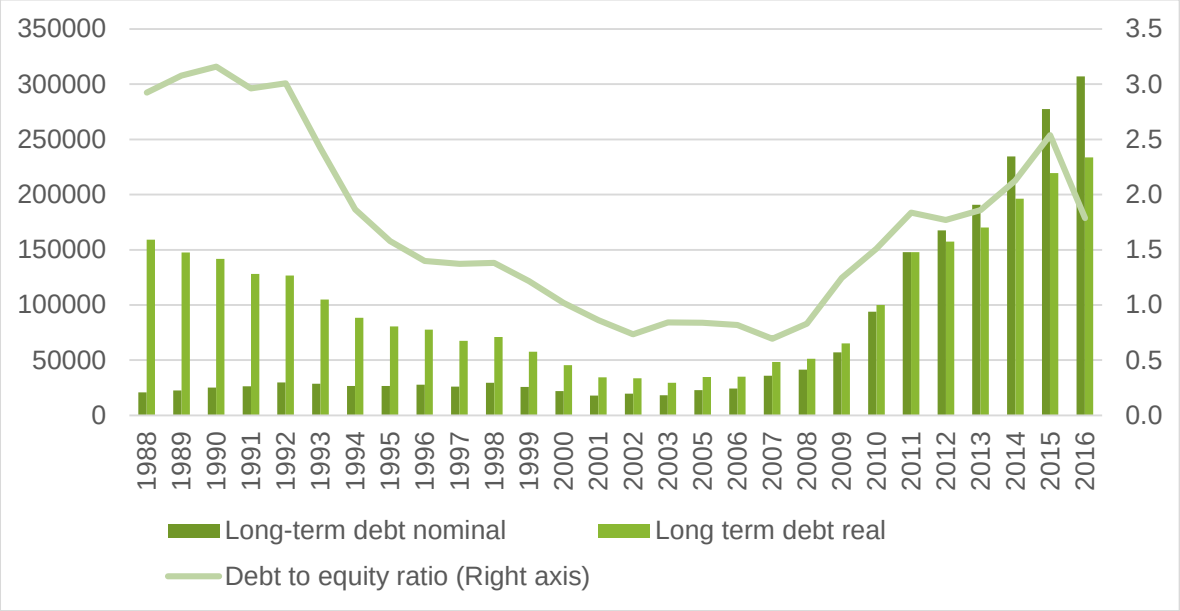
Figure 5.7: Eskom operating profit, 'other' operating costs and primary energy costs as percentages of revenue



Source: Eskom annual reports and accounts

Figure 5.7 shows primary energy costs, the other operating costs and operating profit shares of revenue for Eskom. The rising primary energy costs from 2013 lead to a decline in operating profits to the point where there is almost no operating profits in 2015. The increased use of OCGTs, particularly in 2015 accounts for much of this increase in primary energy costs. The good news is that the need to use the OCGTs has declined and will decline further as new generation capacity comes on line, not only new units of Kusile and Medupi but we have already seen the benefit of the RE-IPP increased capacity. At the same time, we do not expect demand for electricity to significantly increase.

Figure 5.8: Long term debt (R millions) and debt-to-equity ratio

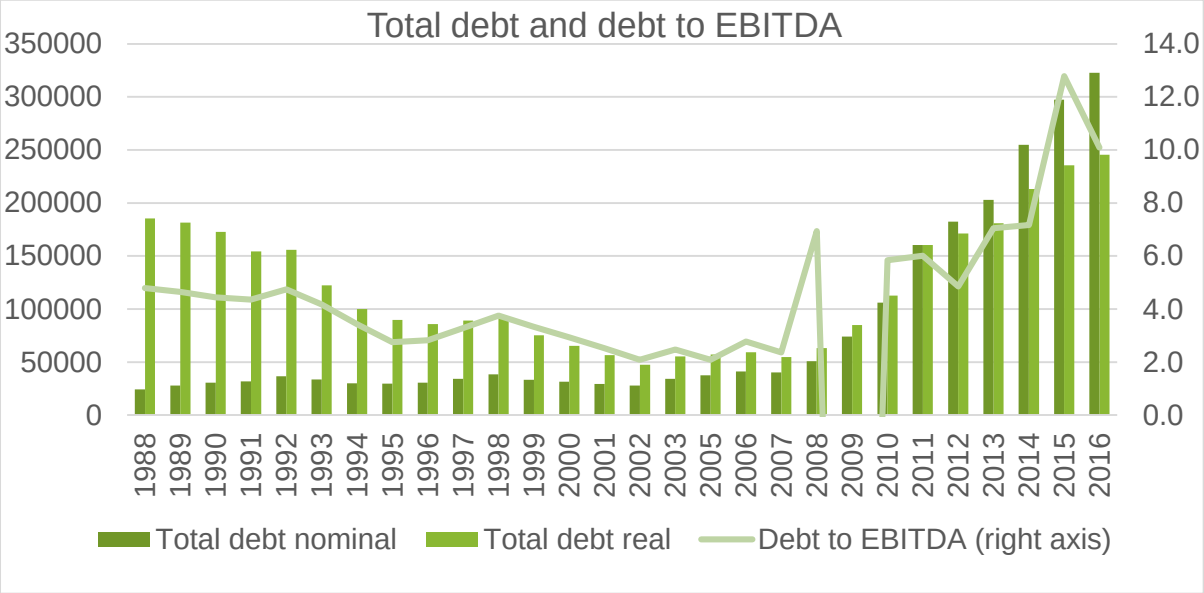


Source: Eskom annual reports and financial statements

The new generation build has led to an increase in debt and an increase in the debt to equity ratio. Figure 5.8 shows the trends for long-term debt and the debt equity ratio from the late-1980s. As mentioned above, the increase in generation capacity led to very large levels of debt during the 1980s. Eskom management were able to secure ongoing tariff increases to ensure that it could manage the debt downward. Over time, the increased income and the reduced demand pressures led to a lowering of debt during the 1990s. However, the focus of Eskom management on the finance and debt, the consumer 'privileged' approach to tariffs and not enough focus on improving efficiencies meant that the electricity supply system would face similar problems once demand increased from the late 1990s.

The increase in total debt during the 2000s reflects Eskom's new build from 2005 where capacity will be expanded significantly. The installed capacity of Eskom in 2005 was about 36 GW. The expected increase in capacity once the new power plants (Kusile and Medupi around 9.6 GW) and the Ingula (pumped storage of 1.3 GW) are brought completely on line will add another one-third to the 2005 installed capacity. However, as in the previous build era there was significant debt capital tied up in installing capacity while there is not sufficient capacity available to support revenue increasing activities.

Figure 5.9: Total debt and debt to EBITDA

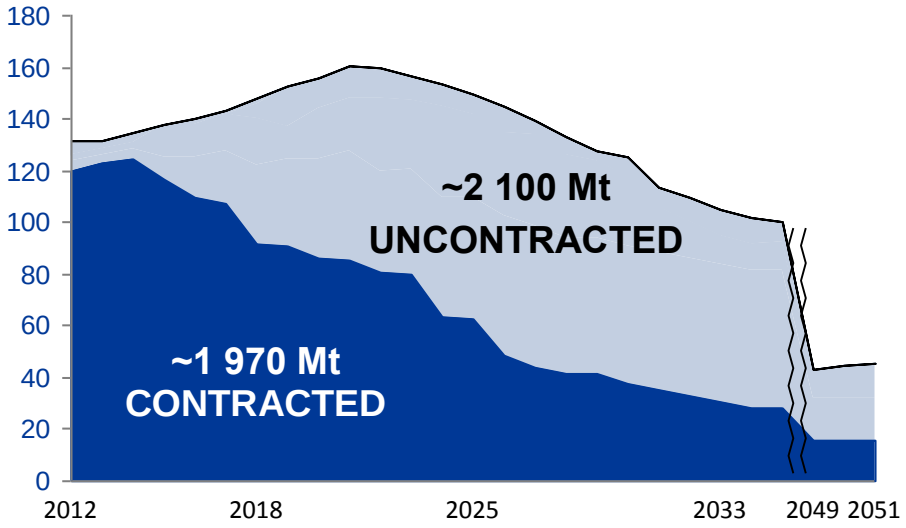


Source: Eskom annual reports and financial statements

The increased debt to build new generation capacity occurred when primary energy costs were rapidly increasing. As a result Eskom's leverage in terms of debt to income has increased. The tariff increases granted to Eskom served to meet the rising costs faced by Eskom instead of creating a larger space for Eskom to manage its debt by contributing towards lowering the debt to EBITDA ratio or the interest cover ratio (see figure 6.3). The interest cover ratio is the ratio of a firm's earnings before interest and tax payments to the interest charges. It shows how comfortably the firm can cover its interest payments out of its earnings. Eskom's interest cover ratio dropped to below one in 2015 when primary energy costs peaked and had grown to 56 per cent of revenue.

5.4 Looking forward: risks and opportunities for coal generation

Figure 5.10: Eskom coal supply for the next 40 years



Source: Eskom presentation to Portfolio Committee on Public Enterprises (2013)

One of the most serious problems facing Eskom and electricity security in South Africa is the availability of coal and the price of that coal. A presentation by Eskom to the Portfolio Committee on Public Enterprises "Portfolio Committee on Public Enterprises "Securing coal resources for power generation" in April 2013 lists serious problems with securing an adequate supply of coal to Eskom. They describe the current situation as one where there is a "real coal shortage". The presentation stated that from 2018 shortages of up to 40 MT per annum to Eskom could be expected. They explain that compared to the 1980 to mid-2000 period (discussed above) the situation for Eskom in securing adequate coal supplies has changed and that their bargaining power has reduced.

The South African Coal Roadmap (SACRM, 2013) developed different scenarios for assessing the security of coal supplies in South Africa. They estimated that coal short-falls in the country could be as high as 60 MT per annum. The early retirement of coal generation capacity was not seen as possible in any of their scenarios.

They noted that the real possibility of coal shortages meant a serious threat to energy security in South Africa. They noted that many of the long-term coal contracts of the older power stations will end within 10 years.

Eskom's coal cost plus contracts had periods covering 40 years based on the expected life of the generation plants. However, the life of many of these plants have been extended. Many of these plants have been run more intensively and used up coals supplies faster than expected when the contracts were signed. In some cases the supply of coal in the cost plus mines has been below that expected when the contracts were signed. The recommissioning of the moth-balled power stations has added to the demand pressures. The supply and quality of the coal from the cost plus mines has been lower over the past few years and Eskom has had to increase supply from long-term and short-term contracts where supply has been more expensive.

The older cost plus mines impose costs on Eskom as they would require capital investments to supply more coal at better prices. However, Eskom has very little financial space to invest capital into these mines. Eskom's 2016 Integrated Annual Report says:

> Almost all the cost-plus mines require significant investment or recapitalisation in order to increase production and/or maintain existing production, placing further strain on our financial resources. Lower production is expected from these mines until the collieries can be recapitalised. Although production at some cost-plus mines has reduced, we still pay all the operating and ongoing capital requirements to sustain the current operations of these collieries, resulting in an increase in the cost per ton of coal. (p.45)

Eskom is responsible for taking up supply of coal where contracts are still in place, which makes them responsible for the operational cost. For example, Eskom reported that at the end of their 40 year cost plus contract in December 2015 with the Arnot Mine the cost of coal delivered from the Arnot mine to the Arnot power station was R1132 per ton. The Arnot coal mine was closed because Eskom did not invest further capital into it after the contract expired.

The SACRM (2013) argued that unless R200 billion was invested into developing new coal mines and coal transport by 2018 there would be a serious shortfall by 2020. However, the shortage of coal is not only a problem in South Africa.

South Africa exported higher grade coal to Europe and Japan during most of the period from the 1970s when coal exports from South Africa grew. As discussed above, this situation was good for the coal mines and Eskom. However, during the 2000s there was a shift in South African exports. The export of low grade coal, particularly to south Asia increased. Europe imported about 80 per cent of South Africa coal exports in the years before the global financial crisis and Asia imported only around 15 per cent of these exports. After 2010 Asia imported close to 80 per cent of South African coal exports while Europe imported less than 20 per cent.

This shift puts huge price pressures on Eskom's primary energy costs and exacerbated the shortage. When prices and exports declined after the global financial crisis this problem eased but because of the huge shortages that South Africa faces these problems have not gone away. Concerns with energy security in south Asia remain a problem. For example, a report by the Institute for |Energy Economics and Financial Analysis (2015, p1) reports that the Government of India has ambitions to double Indian domestic coal production to 1500 Mtpa by 2021 to 2022 to ensure security of supply for India's thermal power stations. If these ambitions are not met then there will be pressure to import more coal.

All the SACRM scenarios show that high-grade utility coal from the Central Basin (including Witbank, Highveld and Ermelo) will be very constrained from the mid-2020s onward and essentially be depleted by 2040. A reading of the SACRM's analysis gives the impression that the problem for Eskom and other South African low grade coal users is that if even a single mine were to stop supplying into the domestic market and move low grade coal into the export market there could be a sudden supply problem within South Africa. The SACRM's solution was for relatively quick large investments into new coal mines, most of which will be in the Waterberg.

At present the levels of investment in new coal mines mentioned in the SACRM (2013) have not occurred. The presentation by Eskom to the Portfolio Committee on Public Enterprises in 2013 raised several problems for new investment in coal. They see reduced investment as a result of the global credit crunch combined with above inflation wage increases and other cost rises and creating risk aversion.

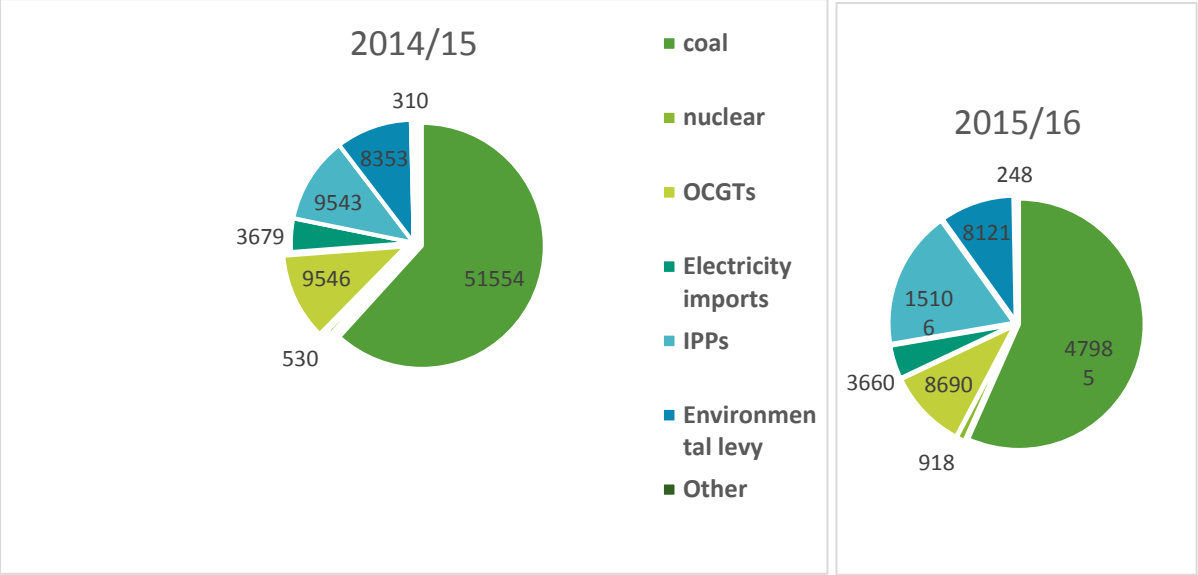
There has been uncertainty about coal prices since the price collapsed after the global financial crisis. The Eskom 2016 integrated annual report also mentions the problems related to logistics and efforts to increase supply of coal to power stations by rail as the high traffic of coal freight is causing much damage to the roads on Mpumalanga and Limpopo that is has already been associated with death of coal haulers and drivers of passenger vehicles. As Eskom shifts away from cost plus agreements to long-term and short-term contracts the logistics costs associated with coal supply increase. At the same time, there is a concern with above inflation wage increases in coal mining that has driven up prices.

The DOE's 2016 IRP update lists assumptions about the cost of coal to R450 per ton (p. 10) in their base case up from R350 per ton in their 2013 IRP update (p.39). This shift in price assumption is indicative of very real uncertainty. There is a huge uncertainty about the global economy and what to expect as the political situation has become more uncertain certain Brexit and the election of Donald Trump. Overall global demand that will affect demand for coal is, therefore, very uncertain as well. Within South Africa there is uncertainty over whether there will be adequate supplies of coal within the near future and the impact that this possible shortage could have on energy security. However, much of the uncertainty around finding a workable solution to a potential large coal shortage relates to the shifting relations between the large mining houses, the state and SOEs. The changes in the minerals and energy complex since the 1990s mean that the relationship between big business and the state in the coal industry has changed from one of cooperation and sharing of benefits related to the development of coal mines and export terminals to one where there is tension and less space for mutual benefits.

5.5 Other contributors to Eskom's primary energy costs

Figure 5.11 provides a breakdown of Eskom's primary energy costs. Below we discuss OCGTs and IPPs that are the biggest contributors to Eskom's costs after Coal (see figure 5.11).

Figure 5.11: Breakdown of primary energy costs (Rmillions)



Source: Eskom annual report 2016

5.5.1 Diesel and open cycle gas turbines (OCGTs)

The costs of diesel to fuel the Gourikwa and Ankerlig OCGTs used increased by much more than planned since 2012 to support Eskom's efforts to reduce load shedding. The use of these OCGTs are used to manage peak demand. During periods when Eskom output performance was low because of poor quality coal, generation capacity that was old and not sufficiently maintained. The delays with regard to bringing on new coal generation capacity has also contributed to the need to use the OCGTs. As mentioned above, the need for OCGT will decline and the large amounts spent on diesel will reduce as new units of the new coal plants are brought online. There was already a large reduction in use of OCGTs and spending on diesel recorded in March 2016, according to the 2016 annual report.

Table 5.1: OCGT electicity production and diesel usage (R millions)

	2015/16	2014/5	2013/14
OCGT production, GWh	3 936	3 709	3 621
OCGT diesel usage, R million	8 690	9 546	10 561

Source: Eskom annual report 2016

Eskom is implementing plans to convert the OCGTs to also use gas, which should reduce costs and emissions from these plants.

5.5.2 Renewable energy Independent Power Producers Purchase Plans (REIPPPPs)

The REIPPPP is a competitive bidding process that started in 2011 following the introduction of a renewable energy feed in tariff in 2007. The increase in electricity generation from renewables has provided some relief in terms of the amount coal used by Eskom with the cost of renewables declining. The 2016 Eskom integrated annual report shows that the REIPPPP provided 9033 GWh of electricity at a cost of R15.4 bn compared to the 2015 when it provided 6022 GWh at a cost of R9.5 bn. The report says, "Increased production from IPPs contributed to reduction in volumes required from coal-fired stations, which resulted in a reduction in coal usage (p.96.)"

The 2016 integrated annual report says that Eskom has contracted for 3901 MW of renewable IPP (RE_IPP) of which 2145 MW had already been connected to the grid. They reported that the load factor of RE-IPP achieved during the year was 30.7 per cent and that the weighted average cost amounted to 171c/kwh. The report goes on to acknowledge that the cost of renewables is now competitive compared to new coal-fired generation. They say "Successive bid windows of the RE-IPP Programme have seen reductions in the cost of renewable energy, such that it is now competitive compared to the cost of new coal-fired generation (p52.).

A presentation by Niemz and Fourie (2016) of the CSIR titled "Cost of new power generators in South Africa" estimated that the cost of renewables (solar, PV and wind) in South Africa was 40 percent cheaper than base load coal at the time of their presentation in October 2016.

The trend towards lower renewable energy electricity tariffs is part of a global trend. The trend globally is that renewable energy prices have reduced and more renewables than other sources of energy generation are being installed in developed countries. While in developing countries such as China, Brazil, India, Mexico, countries in the Middle East and South Africa there is rapid growth in renewables investments.

The Independent Newspaper reported on 31 May 2106 that combined investment by developing countries in renewables was more than that of the developed countries.

The Guardian Newspaper ran a story titled "Almost 90 percent of new power in Europe from renewable sources in 2016" on 19 February 2017. Forbes (25 January 2017) had an article titled "Solar Employs More People In U.S. Electricity Generation Than Oil, Coal And Gas Combined" on a new US Department of Energy report that said, according to the article, "Just under 374,000 people were employed in solar energy, according to the report, while coal, gas and oil power generation combined had a workforce of slightly more than 187,000." They attribute the increase in solar jobs to the construction associated with expanding the solar generation capacity. They added that the increase in employment in solar is occurring because net generation from coal in the US fell 53 percent over the last decade. They say that during that same time period electricity generation from natural gas increased 33 percent while solar expanded 5000 percent.

There are real immediate challenges to increasing the volume of electricity generated by renewables in South Africa. The first challenge is that while RE-IPPs do pay for connection to the grid there is a requirement that Eskom strengthen the grid and upgrade substations where renewables projects are to connect to the grid. The increase in renewables projects already connected to the grid have led to a concentration of projects in the areas where these projects can be most profitable causing problems for adding many new RE-IPP projects in those areas. Eskom's 2015 Transmission Development Plan estimated that an amount of R162 bn would be needed for this work to the transmission system up to 2024.

South Africa faces a situation where reduced demand for electricity since the global financial crisis means that Eskom will have a surplus of generation capacity once the new coal power plants are all brought on line by 2022. The existing contracts to buy electricity from renewables will lead to declining income for Eskom as they will reduce use their own capacity less. The impact of this decreased revenue on Eskom is that they get less value from their existing capacity that they have incurred large debts to build. Eskom has recently been reluctant to get involved in new renewables purchase contracts.

It seem that Eskom and energy planners are in a difficult position because on the one hand there is a cost to Eskom and indirectly to the tax payer if Eskom is affected by buying increased amounts of electricity from renewables while at the same time it seems to be in the interest of society and the taxpayers in general if South Africa can harness more electricity from renewables, which will cause less pollution and carbon emissions and also employ more people than any other types of generation capacity. It also seems that increased renewables can help contribute to a more flexible electricity supply industry in South Africa and possibly be of importance if the fears about a large-scale shortage of coal are not adequately resolved.

5.6 Large changes looming for electricity utilities

The discussion above about the rapid growth of renewable shows that across the globe new generation capacity and employment in energy sectors is likely to be dominated by renewables sectors over the next few years. This growth of renewables is driven by reduced costs of electricity from renewables, increased concern about environmental issues, and government support. This rapid growth is one of the important contributors to what is being described as disruption in the electricity industry. The improvements and declining prices in large scale energy storage is also seen as a potentially disruptive development for the electricity industry in the near future.

Another major development that will force utilities to change the way they operate will be the application of big data in all aspects of the electricity supply industry. This use of big data will allow analysis of customer behaviour and allow much more sophisticated demand management. Demand side management and the growth of individual household installation of renewable energy (solar water heaters, solar PV panels, wind turbines) and smart metering and energy management will contribute to this disruption.

At the same time, the combination of big data, smart meters and smart networks mean that there will be constant analysis of supply and demand and potential problems. This constant monitoring and evaluation across the system drawing on mining big data to understand the behaviour of all actors in the system will improve not only the efficiency of supply and demand. It will integrate systems management across a range of networks that will mean that all parts of network can respond and adapt to changes anywhere else in the system using highly sophisticated analysis.

Some analysts expect that the way utilities manage electricity grids, which are very hard to manage, will be revolutionised and the term "digitalised grid" is often used to describe these developments. The term the "self healing grid" has also been coined to compare the distribution system to the human body in its ability to respond to problems and attempt to fix them. Communities across wide geographic spaces connected by networks will develop system wide adaptation and responses to changes and problems that exist anywhere in the grid. The future of grid systems seems to be decentralised, digitalised and dynamic.

There is already much uncertainty for Eskom and the future of the South African electricity supply industry. The existing and potentially new areas of disruption will create increased uncertainty and there are areas of potential opportunities but also large risks. The current utility model of large scale thermal power generation is over a century old and was seen as having matured 50 years ago. The model allowed large-scale oligopoly or monopoly firms to dominate the electricity markets for decades. Therefore, there is not a very strong culture to accept change in utilities.

However, utilities such as Eskom, should be willing to look at recent examples of disruption that that caused rapid, widespread change in industries. A good recent example is the impact that cellular phones have had on the telephone industry in a relatively small period of time. One of the economists well known for his work on innovation and technology was Joseph Schumpeter (1942) who coined the term 'creative destruction'. He described cycles where the dominant most profitable firms will have their businesses undermined within their business environments by new upstarts with new technologies and products. Out of the rubble of the old the upstarts

will become the new giants but only for a certain time until a new technology and product is developed.

Kind (2013) explored the financial implications for power utilities of disruption in the electricity industry for the Edison Electric Institute, he said, "The financial risks created by disruptive challenges include declining utility revenues, increasing costs, and lower profitability potential, particularly over the long-term. Matt Rennie, a utilities advisor at Ernst and Young describes the culture in most electricity utilities:

> In electricity, the status quo is wrapped in an architecture and culture, which is strong, embedded and centred around safety, reliability, reasonable prices for consumers and – critically – complete market security. In this environment, when changes have been made they have been focused on doing the same activities with less resources.[3]

Electric utilities across the world are already feeling the impact of some of these potentially disruptive changes. China has been the country that built coal-fired power stations at a faster rate than any other country. China announced in January 2017 that it would cancel the building of 103 coal fired power stations across 13 provinces (New York Times, 18 January 2017). China is concerned with high levels of air pollution and a growing electricity overcapacity. China is also making massive investment in renewables energy and announced in January 2017 that it by the end of 2020 it would be spend $360 bn on renewable energy power sources.

India also made massive investments in coal power stations and by 2015 almost three-quarter of its electricity was produced from coal. India tripled its coal imports between 2011 and 2015. The IEEFA estimated in 2015 that India was the world's largest coal importer and consumed 20 per cent of all internationally traded coal. However, many coal plants perform at below capacity because insufficient supplies of coal. Even plants built to rely on coal imports have been making losses. Profitability is also affected by not having cost reflective tariffs and poor recovery of payments for electricity, and inefficient running of plants. India announced in 2015 that it would add 175 GW of renewable capacity by 2022.

[3] https://www.linkedin.com/pulse/disruption-utilities-why-challenge-culture-technology-matt-rennie?trk=mp-reader-card (accessed 4 January 2017)

The financial problems of Eskom are not unique. A report by the World Bank Independent Evaluation Group (2016) shows that of a sample of 40 leading power utilities across developing countries only 10 were profitable.
Eurelectric a sector association of electricity utilities in Europe published a report in 2013 on the financial situation of European electricity utilities found that operating margins have been declining. Overall, the problems in electricity utilities seem to systemic and it may indicate that the old model of utility that dominated over the past 100 years may be in trouble.

The question for Eskom, the shareholder and legislatures responsible for oversight is how does one manage a large utility whose value to the country is unquestionable when it may continue to have poor financial performance? The adoption of the changes that could be disruptive to the electricity supply industry in South Africa could be affected by the policies and regulations. In the short-run some of the decisions about policy and regulation may seem to benefit Eskom's viability and South African energy security. However, a short-term perspective could tie South Africa into a road of path dependence on an outdated electricity utility model that could be a burden on the economy and future generations.

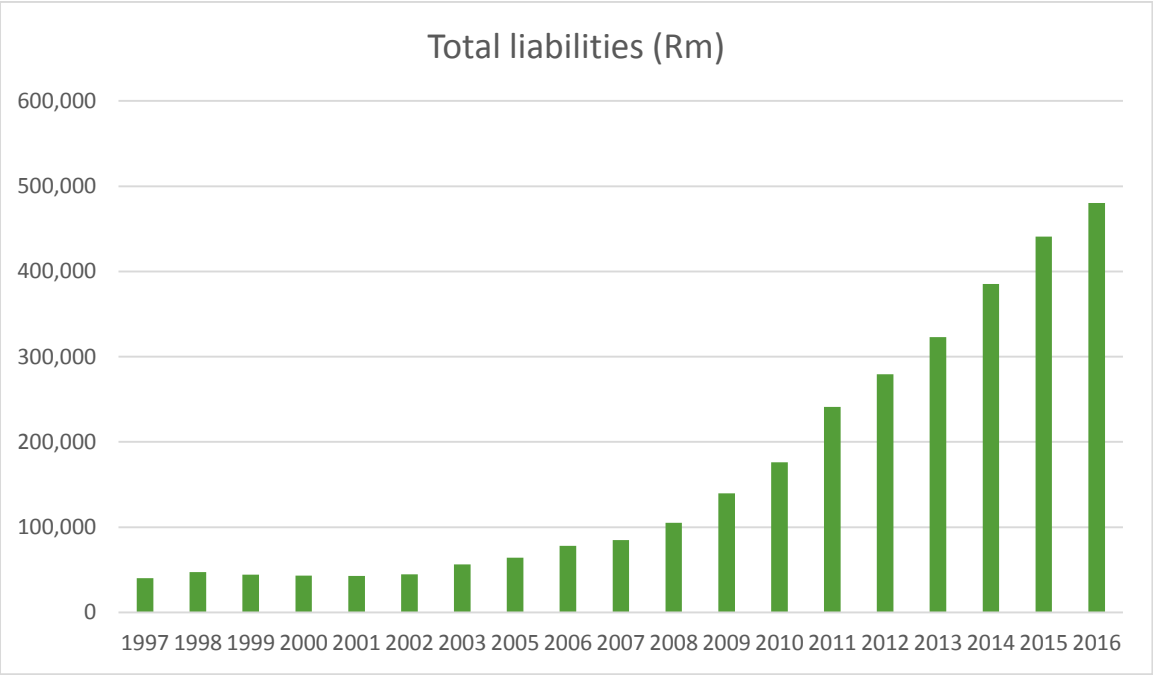
6 Liabilities

This section covers a quantitative analysis of Eskom's liabilities. For purposes of this analysis, Eskom is evaluated as an independent entity separate from government. Eskom's total liabilities have steadily been on the rise over the past ten years reflected at a total of R77 000 million (2006) compared to a total of R480 000 million reported in the March 2016 financial statements. This was mostly as a result of the capacity expansion programme and asset maintenance costs.

Interim financial statements for the 2017 financial year show total liabilities amounting to R502 000 million. Government being the sole shareholder has played a significant role in providing the SOE with the desired funding, in just one financial year (2016) government gave an equity injection of R23 billion[4] and converted a shareholder loan to equity amounting to R60 billion. The equity injection has significantly improved Eskom's financial position in the short term. See figure 6.1 for total liability levels in Eskom since 1997. In addition to the loan funding by government, Eskom relies heavily on government guarantees. Eskom had R350 billion available in government guarantees[5] of which R168 billion was used at the end of the 2016 financial year. Eskom takes up 75 per cent of the R467 billion SOE guarantees portfolio[6]. External funding becomes critical in maintaining the going concern status which the auditors and other oversight bodies might increasingly question in the absence of state funding and guarantees, in turn external funders might be sceptical to fund Eskom given the financial position coupled with the uninviting credit ratings in the recent past, during the 2016 financial year the rating agencies Moody's revised Eskom's outlook from stable to negative while Fitch downgraded Eskom's grading from B to B-. In a perfect scenario, Eskom, like any other independent company should be able to raise sufficient revenues to maintain healthy profitability ratios and more readily be able to obtain finances from commercial lending institutions.

[4] Eskom integrated report 2016 pg.82
[5] ibid
[6] National Treasury – 2016 budget

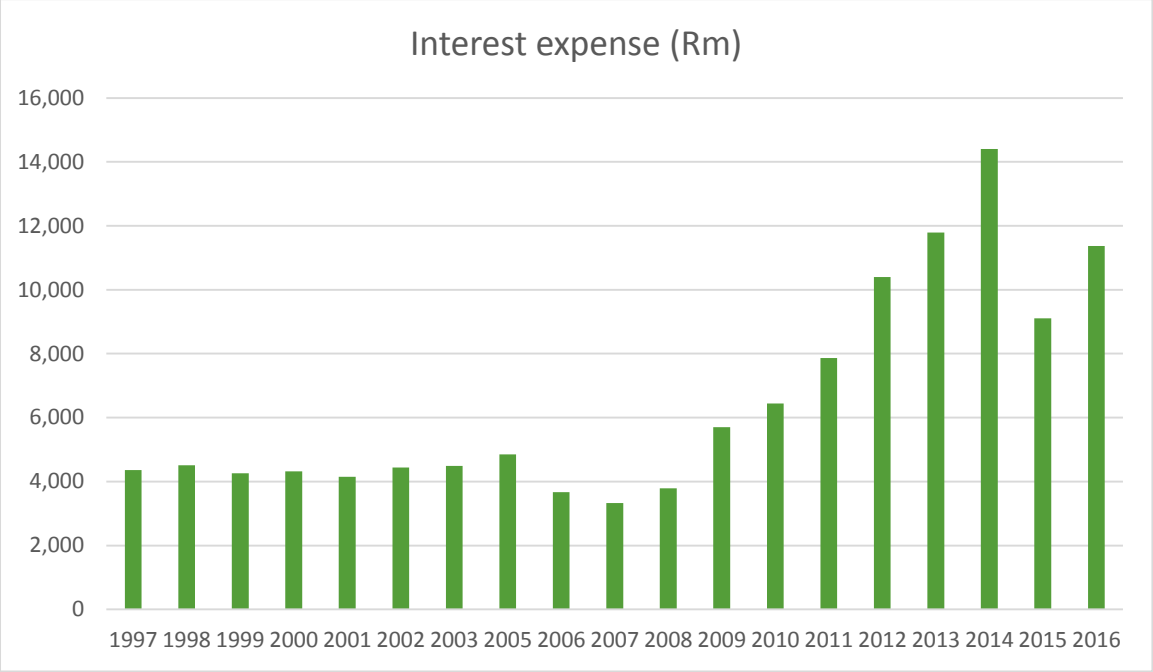
Figure 6.1: Total liability levels (per financial statements)



Source: Eskom annual reports and financial statements

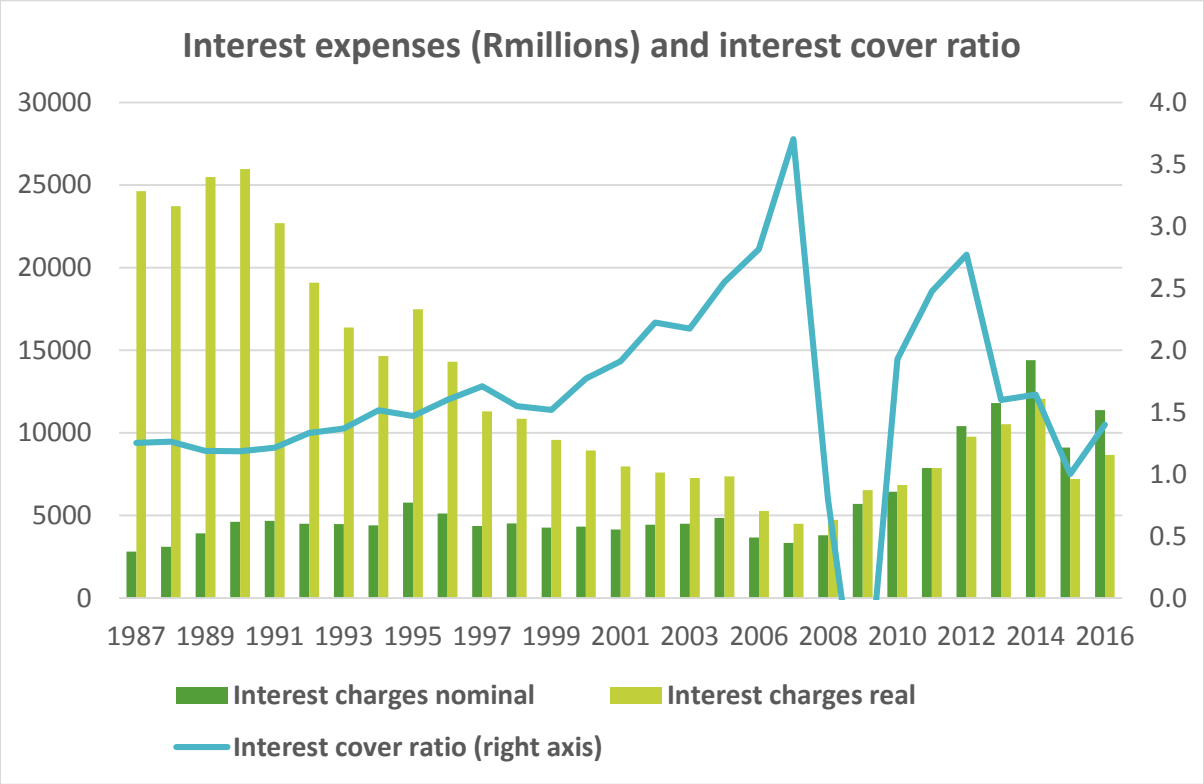
As detailed in the preceding sections on profitability, Eskom profitability has been on a decline since 2007. If the profitability indicators do not improve over time, Eskom is likely to find it difficult to finance daily operations and capital expenditure. Given the high cost of borrowing, it becomes costly when an entity relies heavily on debt to maintain liquidity, because more borrowings result in increased interest costs, see figure 6.2 on the cost of servicing debt over the years. Over 50 per cent of profit generated by Eskom goes towards debt financing. The 2017 interim financial statements reflect a significant increase finance costs from R5 billion in 2016 to R9.3 billion for the six months ended September 2016. We make use of the interest coverage ratio to show how easily Eskom can pay interest on outstanding debt based on profitability. For the 2016 financial year, Eskom's interest coverage ratio was calculated at 1.6. The lower the interest coverage ratio is, the more the debt expense burdens the entity. When an entity's interest coverage ratio is 1.5 or lower, its ability to meet interest expenses may be questionable.

Figure 6.2: Interest expense (per financial statements)



Source: Eskom annual reports and financial statements

Figure 6.3: Interest expenses and the interest cover ratio



Source: Eskom annual reports and financial statements

In evaluating Eskom's financial position, it is also useful to note what it means for government as the shareholder. For example, the conversion of a shareholder loan to equity amounting to R60 billion means foregone interest income for government. Given the poor profitability indicators, the return on equity for the government is bound to be unsatisfactory. The government's continual loan financing weakens government's balance sheet through cash outflows and increased contingent liabilities in the form of guarantees. National Treasury assessed the financial position of SOE's and concluded that Eskom's financial positon warrants close monitoring[7]. Given the slow economic growth and competing spending requirements, the sustainability of the continued financial intervention by government be it in the form of debt or equity warrants an evaluation.

[7] National Treasury Financial oversight of SOCs 2014

7 Conclusion

Our analysis shows that Eskom's financial situation has many challenges. The immediate situation has seen an easing of pressures on Eskom because global coal prices have declined and the bringing on line of new capacity means that they will spend less on diesel for the OCGT's to support peak demand. There also seems to be lower demand. However, the current outlook seems to indicate that commodities prices are recovering so coal prices may increase and demand could pick up during 2017. Eskom will in all likelihood be able to service its debts with a narrow level of comfort provided NERSA does not keep tariff increases too low.

In the medium term, the challenges facing Eskom seem more daunting because of the uncertainty about the supply of coal within South Africa. Coal is the major determinant of the primary energy cost for Eskom and a large shortage in coal could drive up Eskom costs and further reduce the narrow space it has to ensure that it is able to comfortably service its large level of debt. Shortages of coal could mean that Eskom is not able to ensure levels of supply that it requires and may have to depend on the more expensive OCGTs again to manage peak demand. There seems reluctance to connect more RE-IPPs to the electricity grid at present. These have costs in that they increase the overall primary energy cost of Eskom when it has to buy in more electricity from the RE-IPPS. However, this electricity could ease the situation if there were to be coal shortages and coal price increases. At present, the looming overcapacity of Eskom means that every unit of electricity they buy from RE-IPPs is a deduction to their operating profit because they would have to leave installed capacity unutilised.

Overall, there is a huge amount of uncertainty that is exacerbated by the risks associated with large increases in Eskom's debt and the pressure on Eskom's operating profit as a result of increases in its cost structure. Eskom required large tariff increases to operate without making losses and was not able to secure the level of increases they wanted, which means that there remains shortages that Government eventually will have to cover. Government will also have to step in with more equity and possibly guarantees to support much needed spending on maintenance and ensuring that the grid is strengthened and infrastructure in place for RE-IPP expansion to continue.

South Africa's energy security currently depends much on coal and electricity because of the importance that coal has played as a source of electricity (and also in the production of liquid fuels). This dependence has supported the growth of the coal sector and the state owned enterprise Eskom has played an important role in supporting the economic development of the South African economy. From the 1990s Eskom has been the backbone of electrification that has increased access to electricity for all South Africans. The importance of Eskom for the South African economy is unquestionable. However, its monopoly status and the important role it plays in the economy provides it with a level of power with regard to how it runs its business, gains increases in electricity tariffs, and lobbies for financial support and guarantees from the state. In a sense, one could argue that Eskom is too big to fail.

Steyn (2006) correctly warns about the problem of moral hazard when considering the case of Eskom. While Steyn (2006) analyses Eskom's investment drive during the apartheid era, the warning is still relevant. The management at Eskom may continue to have certain biases in terms of the needs of energy intensive users and may err in favour of overcapacity rather than supply shortages. These biases may support excessive risk taking in the form of investment at high costs that could end up causing overcapacity. The moral hazard is that the management of Eskom may know that they can take certain risks and not bear the full consequences of those risk. They can depend on Government to bail them out if they get into trouble. The recent equity injection by the Government into Eskom is one example of such a bail out.

Another moral hazard problem is that Eskom's management do not take adequate care to ensure that their existing capacity is well maintained and used as efficiently as possible. They could in theory pass inefficiency costs on to consumers and the Government. The same goes for building new capacity. Eskom could take inadequate care to ensure that new capacity is built at the best price in the shortest period of time and they could theoretically pass on these costs to consumers and the Government.

While not discussed above, much is made in the media of the possibility of corrupt practices at Eskom. If there is substance to these allegations, again the costs associated with corrupt practices could be passed on to consumers and the Government. Therefore, the rigorous oversight of Eskom is a really important.

In the longer-term there are big questions about the future of utilities and whether and how they adapt to possibly disruptive changes. Policymakers will have to serious discuss how their future vision of the South African electricity supply industry. They will have to discuss the future of Eskom in terms of the large sunk capital into Eskom and the importance of Eskom for energy security in South Africa. At the same time, they will have to recognise that certain choices today can constrain their options in the future and can reduce South Africa's ability to take advantage of improvements in technology and innovations that could lead support a more secure and cost-effective electric supply industry.

Finally, the South African economy still seems to be organised around a minerals and energy complex but one that has changed. Relationships amongst the major players seem less mutually beneficial and the economy seems stuck in a low investment and employment rut where available money is diverted to the financial markets and offshore. Government's stated goal is to support the restructuring of the South African economy to build downstream industry. A large powerful part of Eskom's customer base are energy intensive users who profit from low electricity prices and exporting relatively unbeneficiated, low value-added products. These businesses have disinvested from other sectors and become more focused on their core businesses. They have not since the 1980s and will not necessarily support future efforts to deepen and diversify industry in South Africa.

Eskom is unable to invest in cost plus mines and is more dependent on long-term and short term contracts. The cost of coal depends on export market prices and transport costs. The MEC grew because there was cooperation between the government, SOEs and the private sector that led to large-scale development in mining, transport infrastructure and Eskom. The experience of Eskom was that a focus on ensuring growing supply was problematic and put the utility in a difficult financial position where they had to approach Government for large tariff increases.

Today, with the shifts and weakness of the MEC, the strategic role of Eskom in restructuring the economy has not been discussed, instead the discussion is focused on ensuring adequate capacity. The continued operation and growth of Eskom comes with large costs and risk for Government and the people of South Africa. At least, the strategic role that Eskom can play in the economic restructuring of the economy should be a priority for policymakers.

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