



Energy Crisis: How Did We Find Ourselves in the Dark?

"The extensive short, medium and long term plan to deal with the energy challenge requires that we work together to ensure success."

President Jacob Zuma

1. Introduction

The importance of an efficient energy sector in the development of a country must not be down played; therefore, the rolling black-outs being experienced by South Africans are disconcerting. This briefing paper will look at South Africa's energy history, focusing on Eskom, the country's primary energy supplier. A recent CPLO roundtable held on the nation's current energy trouble will be touched on, and the paper will conclude by exploring some practical solutions ordinary citizens can implement to make this period of energy instability more bearable.

2. Background

Eskom has undergone some major changes from its origins in 1923: the utility has seen periods of almost complete autonomy, greater regulation, an oversupply crisis, rolling blackouts, and massive electricity price hikes. Historically, South Africa has followed a heavily capital and energy-intensive development pathway, based almost entirely on coal. This pathway has been driven by resource extraction and the development of a connected set of interrelated economic activities termed the 'Minerals-Energy Complex'. Traditionally defined, the 'Minerals-Energy Complex' is a system in which low-paid labour was exploited, and cheap, coal-based energy with costs externalised to society, was used to support an accumulation regime of a few highly centralised firms focused primarily on capital intensive, commodity-based industrial activities and the export of raw materials and low value-added products. Eskom was the cornerstone of this

Minerals-Energy Complex, and in turn, the Complex became central to the economy. It consists of mining, minerals processing, the energy sector, and linked industries. South Africa's industry-focused supply of electrification means that residential energy use makes up a relatively small portion of final electricity demand.¹

In 1987 Eskom revised down its demand projections and realised that substantial excess electricity was being generated as a result of overinvestment in the 1970s and 1980s. Although it was engaged in building more power plants, a decision was taken to mothball or shut down older, less efficient power stations. It was approximately during this period that a seemingly inconsequential resolution was made to introduce a marketing division to Eskom; it in fact proved highly consequential to our current energy predicament. Upon analysing an apparent rapid development capacity surplus, the marketing people went to work. They offered municipalities cut-price rates, provided that municipalities shut down their own power stations. Oil refineries were incentivised to use electrical energy and 'off-peak' tariffs were offered to people who could use power out of normal working hours. Farmers, who had for years used diesel generators, signed up to become connected to the grid. The marketing department went on strike deals with smelters, mines and industrial steam consumers to switch to electricity; all were enticed with dirt-cheap power.

3. How We Got Here

The new South Africa staggered Eskom. Among

the relics of apartheid two linger, tormenting society and impinging directly on the electricity crisis. The stark contrast between rich and poor, largely based on racial terms, is one; the second is the history of racially determined differentiation in infrastructure provision. Against this backdrop, Eskom was tasked with electrifying the nation, with the aim of helping to rectify centuries of social inequality; it would be naive to expect that there would be no political interference in such an essentially social programme. By 1998, Eskom had shed capacity by closing older power stations, and yet it had committed itself to supply on mammoth scale. As much as the massive Majuba power-station was coming online, its 3843Megwatts (MW) was still about 2000MW short of what Eskom had shut down or committed to. So despite various projects coming online and some stations being de-mothballed, the country still needed new power stations.

It is important to note that Eskom is not entirely to blame for the crisis we now face. The government was warned back in 1998 that money was needed for investment in new power stations, but it refused to provide the money, something which President Mbeki belatedly admitted and apologised for.² At the time that Eskom made the application for funding, the government was set on privatising it and other public utilities, and selling them off to the highest bidder. But this strategy was never followed-through, and by the time new generation projects (such as the giant Medupi and Kusile power-stations) were approved in 2005, it was already too late for the utility to guarantee sufficient supply to meet the growing anticipated demand.³

In addition to all this, Eskom remains the organ of state with the highest rate of non-compliance with environmental legislation.⁴ With increasing claims of environmental and financial mismanagement, Public Enterprises Minister Lynn Brown has expressed concerns about:

- the instability at power plants;
- the financial liquidity of the utility;
- the lack of credible information;
- the unreliable supply of electricity and its dire impact on our economy;
- progress with the build programme;
- cost overruns at Medupi and Kusile;
- delays in the investigation into incidents at Majuba and Duvha; and
- the issue of coal and diesel pricing.⁵

4. Roundtable Discussion

The CPLO organized a roundtable discussion on 27 February 2015 on the topic “South Africa’s Energy Crisis: How Did We Find Ourselves in the Dark?” The speakers for the event were Sisa Njikelana, the Chairperson of the South African Independent Power Producers Association; and Neoka Naidoo from Project 90 by 2030.

Ms Naidoo looked at South Africa's energy history, which reveals that the pre-1994 energy model was that ‘Environment feeds Energy which in turn feeds the Economy’. The post-1994 model, on the other hand, concentrated on policy and mechanisms such as the Integrated Energy Plan (IEP) and the Integrated Resource Plan (IRP). In this climate-sensitive era, we realise that the energy decisions we make as a country will have consequences for our descendants. Forward-thinking strategies include renewable energy solutions; an emphasis on energy equity; a spread out and localized energy system; and techniques to suppress demand. Miss Naidoo concluded that, as things stand, it would be inappropriate for South Africa to procure energy through nuclear, fracking, or carbon-intensive means.

Mr Njikelana made a presentation on measures being taken to alleviate the current energy crisis. He pointed out that a ‘Technical Implementation War-Room on the Electricity Crisis’, housed at ESKOM, has been established and that government had resolved to implement a five-prong stabilization plan involving:

1. Interventions by Eskom to stabilise the system, with a focus on raising the availability of its coal-fired plant to above 80%, from 72% currently.
2. Harnessing short-term independent power producer (IPP) and cogeneration opportunities.
3. Accelerating programmes to substitute diesel with gas at the open cycle gas turbines (OCGTs), in the Western Cape.
4. Launching coal and cogeneration IPP procurement programmes by the end of January.
5. Managing demand through energy efficiency projects within households, municipalities and commercial buildings.⁶

The keen discussion that followed the presentations was testament to how seriously these power cuts are impacting ordinary citizens.

One such case is that of people who take chronic medication that needs to be refrigerated at all times. It is essential for civil society to be involved in public participation around the crisis, and this ties in with the vital role played by active citizenship. Some of the solutions put forward included projects to convert methane from sewerage and to harness power from landfills; micro-grids like those used in India; smart grids; the efficient implementation of the Renewable Energy Feed-In Tariff (REFIT) programme; and energy efficiency rebates. The alarming silence and secrecy surrounding the need for the Integrated Resource Plan (IRP) to be updated, and what that means for our energy mix, was brought up in the conversation. Municipalities were criticised for hiking electricity prices at unreasonable rates in order to cover other expenses. It was noted that the Energy Intensive User Group (comprising heavy industry such as mines and smelters) has committed its members to contribute their expertise to the Energy War Room in aid of solutions. This led some to question who the other participants in the War Room were and whose interests were being protected at this crucial point for the nation. Were the poor represented in these discussions? It was noted that we need to start holding stakeholders accountable to the citizens of South Africa, lest we further perpetuate the preferential treatment that select groups of electricity-consumers currently enjoy.

5. Practical Solutions

Some low cost options that require simple behaviour change include:

- Turning hot water cylinder temperatures down to 60° Celsius. Maintaining the temperature at 60°C uses less electricity (energy) than maintaining a temperature of 70°C. This works best when both geyser and pipes are insulated. However, it must not be reduced to below 60°C for health reasons. Locate the thermostat inside the little cover over the electrical element of the geyser. Switch off the electricity circuit at the mains, undo the cover, and then turn down the thermostat using a screw driver.
- Using less hot water, for instance by taking showers instead of baths; by filling the kettle with only as much water as you need; by wash a full load of dishes, rather

than one dish at a time; and by using cold water where possible for laundry.

- Completely switching off equipment when it is not in use. Turn appliances off at the wall plug, rather than leaving them on standby, as this can still draw about 20% or more of normal electricity use. Examples of such appliances include TVs, music systems, computers, phone chargers etc. Also turn the hot water cylinder off when you go on holiday.
- Reducing pool pump operating hours. If you have a pool with a cleaning system pump, reduce its operating hours to the minimum e.g. 6 hours a day. Clean filters regularly, and consider a pool cover and turning off the pump at times in winter.
- Before using equipment, the best 'no cost' saving options are things like wearing warmer clothing and using blankets in winter, or opening the windows in summer. Reduce excessive heating or cooling by only heating or cooling occupied rooms. Space heating in winter is a big power 'guzzler'. The room temperature should not be more than 10 degrees more or less than the outside/ambient temperature. Fan or oil heaters with thermostats are best, and avoid under-floor heating. In summer use a fan rather than air-conditioning.

Saving investments include:

- Installing an efficient shower-head that limits shower flow rates to no more than 10 litres per minute. A good, modern product will save both water and electricity without compromising your shower experience, and the saving usually pays back the investment within a few weeks or months.
- Insulating the hot water cylinder with a geyser 'blanket' maximises heat retention. Check heat loss first using a basic 'hand test'. If the geyser is warm then it's losing heat and needs better insulation. This is particularly necessary for older geysers. Also insulate the water pipes leading from the cylinder for the first three metres.
- Switching off lights in unoccupied rooms and installing efficient lighting. Compact

Fluorescent Lamps (CFLs) use 75% less power than old incandescent bulbs, and last much longer. Note that CFLs contain small amounts of harmful chemicals, so they need to be safely disposed of, for example in bins provided at retailers like Woolworths or Pick 'n Pay. New light-emitting diodes, or LEDs, are even more efficient than CFLs, and last 130 times longer than CFL bulbs. They save the most, and although they are still expensive, the cost is coming down as the technology develops.

- Installing a solar water heater, which can save the most electricity of all. It typically saves about two thirds of water heating cost, but this varies and it should be installed with a timer for the best results. Install a heat pump as an alternative, if a solar water heater is not possible. Heat pumps can achieve similar savings but they are a new technology for homes, and may require more maintenance than a solar water heater.
- Insulating the ceiling/roof because good roof insulation can keep the home five degrees warmer in winter, and ten degrees cooler in summer. More comfortable indoor temperatures mean less need for electrical heating and cooling, with savings of about 75% for adding both a ceiling and insulation, or 25% for just adding insulation (if there is already a ceiling).⁷

6. Conclusion

The electricity fiasco is not *entirely* Eskom's fault; it can be attributed to a failure to

competently plan the nation's energy affairs by both Eskom and the government. However, with millions of South Africans still without access to electricity, it is clear that the focus on the Minerals-Energy Complex has had an extensive influence on the provision of energy for households, commerce and services. Furthermore, industrial players are offered confidential electricity prices which are substantially cheaper than average residential prices; this crystallizes the necessity for a more equitable, genuinely accountable system, and means that the dominant mind-set of placing the economy above all else must be challenged, demanding more responsibility from state owned enterprises.

The possibility of allowing private electricity companies to compete with one another to provide cost-friendly and adequate electricity supply must be considered. Additionally, as citizens we should be mindful to measure and monitor our home electricity consumption and costs, while also educating members of our households, including children and domestic helpers. It must be remembered that maximum saving requires both different behaviour and upgraded equipment. For example it is no use installing an efficient shower head if you then shower for twice as long. The extensive short, medium and long term plans mentioned by President Zuma need to ensure that the energy sources for future electricity supply must be chosen on good scientific and commercial grounds, combining the best interests of people, the environment, and the economy.

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¹ The Eskom Factor: **Power politics and the electricity sector in South Africa**. Greenpeace **Report 2012**.

² Former President Thabo Mbeki's State of the Nation Address – 08 February 2008.

³ The Eskom Factor: **Power politics and the electricity sector in South Africa**. Greenpeace **Report 2012**.

⁴ National Environmental Compliance & Enforcement Report 2011-12.

https://www.environment.gov.za/sites/default/files/docs/necer2011_12.pdf

⁵Statement by Minister Lynne Brown, regarding the decision by Eskom Board -12 March 2015.
<http://www.dpe.gov.za/newsroom/Pages/Statement-by-M0inister-Lynne-Brown,-regarding-the-decision-by-Eskom-Board.aspx>

⁶ CPLO Energy Roundtable Discussion - 27 February 2015.

⁷ *City of Cape Town*

<https://www.capetown.gov.za/en/EnvironmentalResourceManagement/EnergyEfficiency/Pages/Top10BestWaysToSaveElectricity.aspx>

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