# Eskom's history in the Free State

**Foreword by the General Manager, Lindi Mthombeni**

What a great honour to be serving in Eskom as we celebrate 90 years of lighting up South Africa! Since I joined Eskom in 1996, I have seen many changes happening in the business, but still there are some things that remain constant. This is our commitment to keeping the lights burning, our commitment to satisfying our customers and our commitment to contributing to the South African economy.

Eskom in the Free State has come a long way and many great men and women have left their mark in the Province. Amongst these are Allen Morgan, Spuitjies du Preez, Johann Geldenhuys, Hennie Oosthuizen, MK (Kenneth) Mohlala, William de Villiers, Peter Craig, Percy Sechemane, Louis Maleka, Alwie Lester and Peter Sebola. They left a heritage that we are proud to follow and many of them have gone ahead to reach even greater heights in Eskom. This chapter is dedicated to everyone who has contributed to our history and to all those who are currently investing their time in making the Free State Operating Unit a pleasure to do business with and an Operating Unit that can be relied on to provide one of the country's greatest commodities – electricity.

**History of the Province**

Although it is the smallest of South Africa's nine provinces, the Free State has a significant and turbulent cultural history. After many years of British rule, the Republic of the Orange Free State was formed in 1854 with its first president being Josias Philip Hoffman. Although politically and economically successful, the Republic ran into chronic conflicts with the British until 1900 when it was annexed as the Orange River Colony. On 31 May 1902 the Treaty of Vereeniging was signed and the Orange Free State seized to exist as an independent republic. In 1910 it joined the Union of South Africa as a province along with the Cape Province, Natal and Transvaal. The Union of South Africa became the Republic of South Africa in 1961. After the first democratic elections in 1994, the Orange Free State was renamed the Free State.

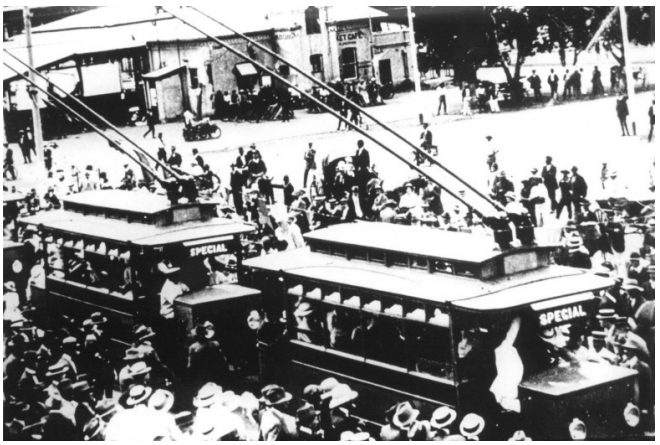
The Free State's history is not complete if the gold fields are not mentioned. Besides leading to a gold rush, the discovery of gold also had a big influence on the development of electricity and the entrance of Escom into the Province.

**The Free State skies are illuminated**

At an initial cost of £17 405, the first electrical lights in Bloemfontein were switched on on 8 November 1900. Although the system had an installed capacity of 180kW, the steam engines supplied were not capable of continuously supplying the installed capacity. With an initial number of 14 consumers, the demand for electricity rose quickly to 535 in 1906. Bloemfontein was the second town in South Africa and the first town in the Orange Free State to have electricity and piped water.

While these events took place, Professor Reinhardt Ludwig Straszacker who was to become the fourth Chairman of Escom in 1962, was born in the Free State in 1910. He matriculated 15 years later from Vrede High School.

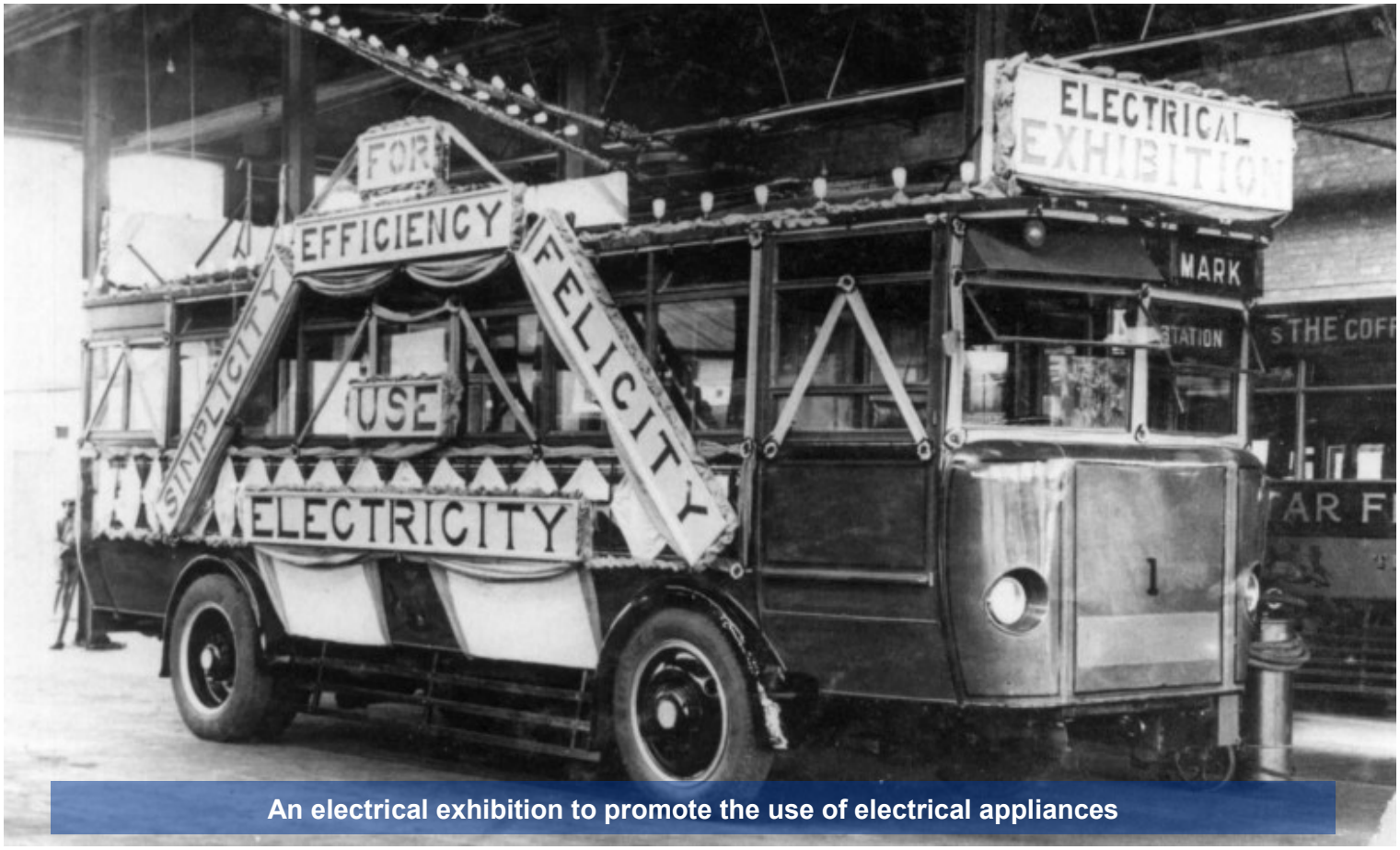
In 1915 another use was found for electricity when a trackless electric tram system was introduced, proving the importance of electricity for economic development. The demand for domestic electric appliances also rose and led to a series of upgrades to the system. By 1921, the total installed generating capacity rose to 2 600 kW. This didn't satisfy the need for long. In 1924 a new power station with a capacity of 6 MW was built at a cost of £180 000.




Meanwhile in 1922, the Electricity Supply Commission, ESCOM, was born. The Electricity Act, No 42 of 1922 stated that Escom should supply a cheap, sufficient quantity of electricity neither at a loss nor a profit.

Gold deposits were first discovered in the northern Free State in 1938. This magnificent discovery led to a significant increase in demand for electricity.

The power station in Bloemfontein




An electrical exhibition to promote the use of electrical appliances

**From past to present**

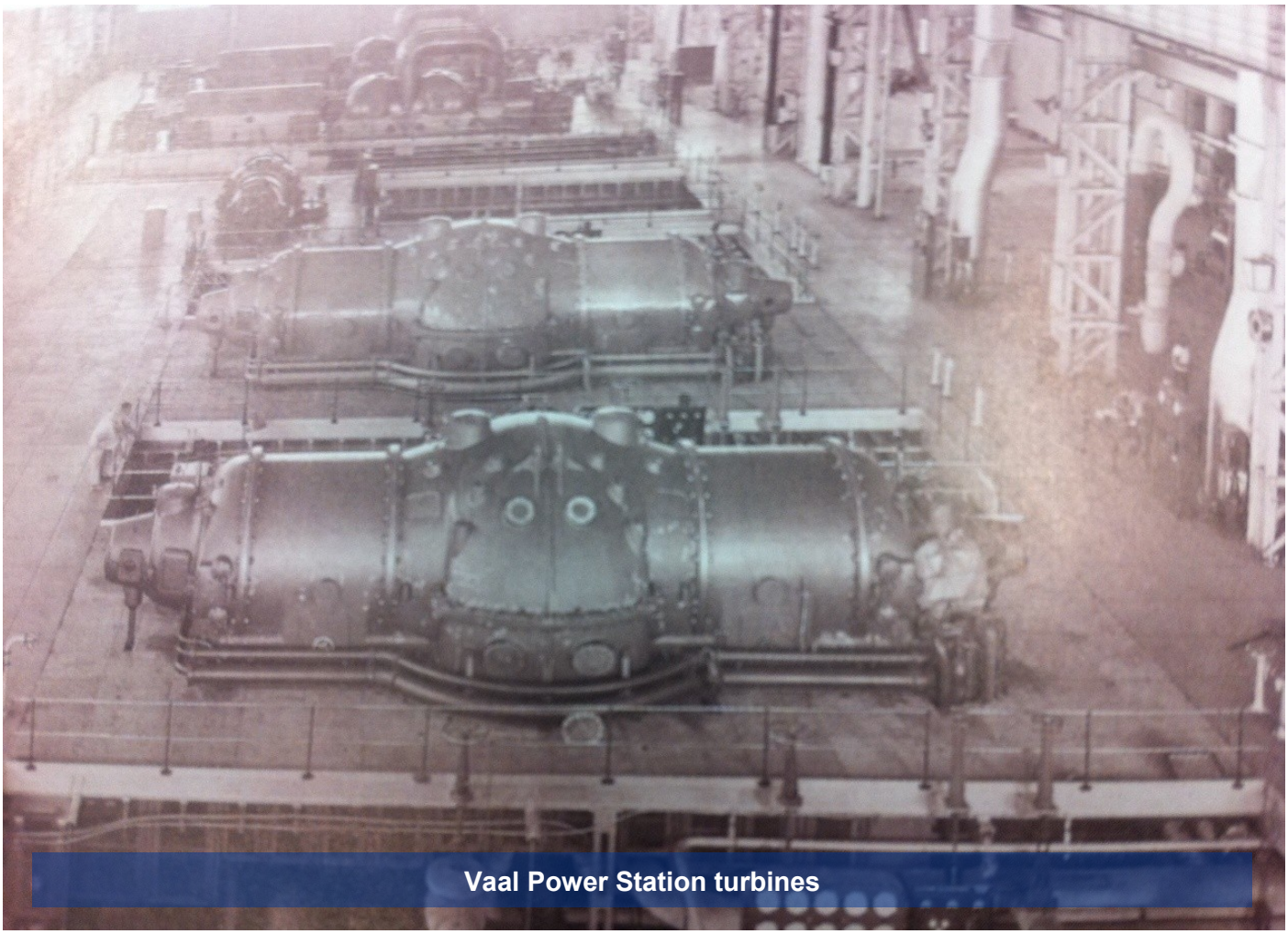
Escom's first plans to generate electricity in the Free State came into being in 1938 when the construction of the Vaal Power Station, about nine kilometres south of Vereeniging, began. The station used cooling towers to limit the use of water and took over Escom House's title of being the tallest building in the country. In 1939 the Second World War was declared preventing shipment of three Lungstrom radial-flo-generating sets from a German harbour. Two replacement turbines were manufactured in Great Britain and shipped to South Africa. The Lungstrom sets also arrived when hostilities ended. The station was completed in 1952 with an installed capacity of 318 MW.

The Vaal Power Station started generating electricity for the first time in 1945. Although the station had no specific supply area, it linked into the vast network of the Rand Undertaking and was connected to the Free State goldfields by means of a 99 kV transmission line. More applications for mines and towns were received and necessitated an extension of the Escom licence area in the Free State, western Transvaal and Northern Cape areas. This was called the Greater Rand Undertaking but was later changed to the Rand Undertaking and then to the Rand and Orange Free State Undertaking (ROFSU).

By 1947, an area of about 103 600 km² was supplied by the ROFSU. This included four major gold mining areas. The boundaries were that of Thabazimbi in the north, Mafiking (today Mafikeng) in the west, Winburg in the south and Witbank in the east. Other parts of the Free State were divided amongst neighbouring undertakings.

The Rand Undertaking faced acute shortage of supply in the period following the war. Causes of this included the exploitations of the Free State goldfields as well as the developments in Sasolburg where the South African Coal, Oil and Gas Corporation, Limited (Sasol) constructed a huge oil-from-coal and chemical complex at Sasolburg.

Electricity demand from the Free State goldmines continued to rise and by 1949 a demand of 240 MW was prospected by the end of 1955. The Rand system reached a critical point and during 1949 the peak period from 09:30 to 13:30 approached the entire available capacity, with no reserves in hand. This situation forced Escom to grant each mine a monthly electricity quota based on their consumption of the previous three months. Through proper management from the mines, the mining industry avoided serious impediments to its development that might have resulted from these restrictions.



**Vaal Power Station turbines**

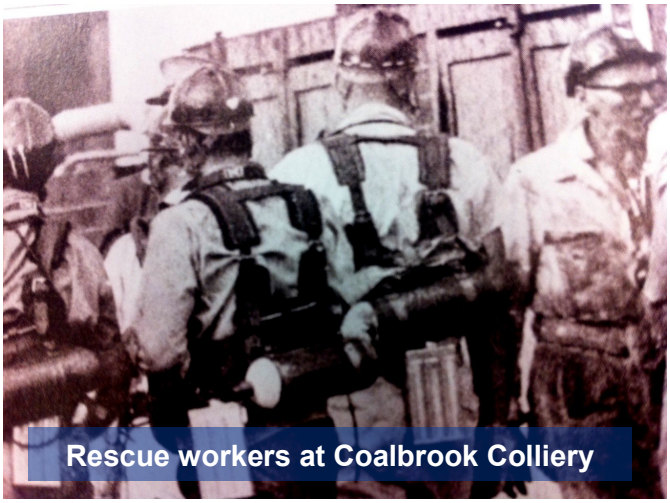
Escom couldn't ignore the rising demand and from 1952 to 1959, Escom started the construction of eight new power stations, including three stations in the Free State, namely Vierfontein, Taaibos and Highveld. Each of these stuck to 30 MW turbo-generator sets and modest steam conditions. Vierfontein supported Vaal Power Station in supplying the Free State goldfields and the Cape Northern Undertaking.

A significant characteristic of Vierfontein Power Station was that it could do "storm governing". With the Free State being well-known for its violent thunderstorms, the station could disconnect itself from the rest of the system. It would then ride out the surges caused by lightning striking power lines on its own. Even during the most severe storms, Vierfontein managed to keep the Free State goldmines securely supplied.

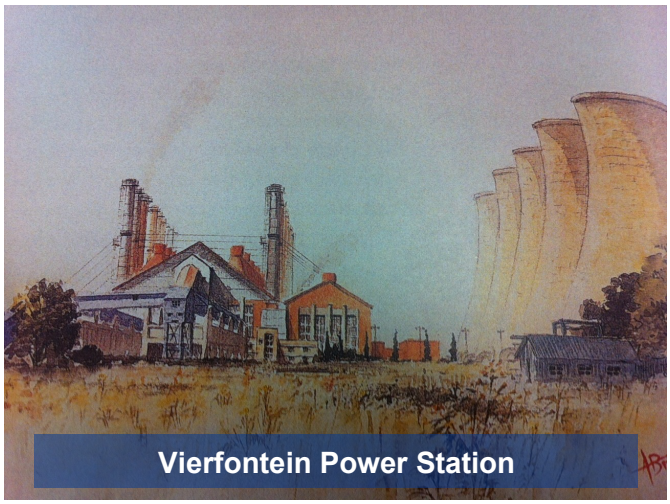
When Taaibos and Highveld Power Stations were constructed, they were to be the largest and most modern power stations in the Escom system at the time. These stations are situated 0.8 km apart, approximately 32 km south of Vereeniging. By 1963 the stations were running at full capacity and had 916 people working at the two stations.

Strengthening of the transmission capabilities between the Taaibos/Highveld complexes became necessary and two parallel, single-circuit 275 kV transmission lines were constructed of which the first was completed in August 1956. Both lines were put into full use and carried its design level by 1959.

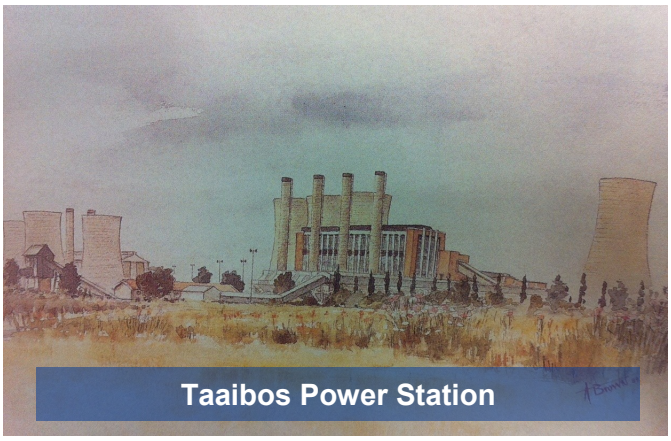
On 21 January 1960, disaster struck at the Coalbrook North Colliery of the Clydesdale Collieries Limited, the sole supplier of coal to Taaibos power station. Regarded as the worst disaster in South African mining history, 437 miners were trapped in the mine. This had a significant effect on the output of the station as Taaibos was burning 40 000 tons of coal per week prior to the disaster. The Taaibos boilers were designed to specifically burn the coal produced from the Vereeniging coalfields and efforts to obtain coal from Witbank proved unsuccessful. Steps were taken to transfer the load to other power stations and coal was obtained from the South Colliery and Cornelia Colliery near Vereeniging.



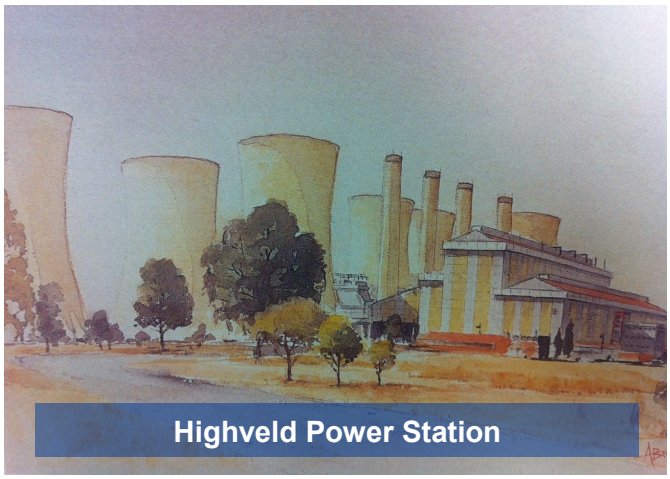
Rescue workers at Coalbrook Colliery



Vierfontein Power Station



Taaibos Power Station



Highveld Power Station

After all hope of rescuing the trapped miners was abandoned, the South African Mine Workers' Union demanded that the government immediately investigate safety at Coalbrook and three other of South Africa's principal coalmines. The ad hoc Mining Safety Committee demanded that all operations at Coalbrook be halted. Rock falls and sagging of the ceiling of the eastern shaft of the Vierfontein Colliery caused it to be shut down as well and the Mining Safety Committee forced the south section to suspend all work pending a safety inspection.

On 13 March 1960, Escom had no choice but to

reduce 20% in supplies to 20 goldmines. Domestic supplies in Free State goldfields towns were also cut from 08:00 until 11:00 and again from 13:30 until 16:00. All efforts to avoid load shedding was put into place but still it was necessary to reduce the supply to customers by 15% from 17 March for a few days. By the beginning of April 1960, production at Vierfontein, Highveld and Taaibos Power Stations were back to normal. The shortage of power led to the gold-mining industry losing nearly 83 000 ounces of gold worth £1 million.

An amendment of the 1971 Electricity Act gave Escom the authority to amalgamate the power stations of different undertakings and to supply electricity from one undertaking to another. The Central Generating Undertaking (CGU) was established in 1972 leading to all the power stations being transferred to this new entity. Escom could now benefit from the advantages of pooling.

By 1975, the Rand and OFS Undertaking was extended to 261 000 km² from the original 103 600 km², covering a vast area ranging from the Zimbabwean border in the north, to the Lesotho border in the south, and from Standerton in the east to the Botswana border in the west.

The formation of the CGU and all undertakings consequently being stripped of their power stations led to them being transformed to distribution undertakings and renamed regions. In 1986 the Orange Free State Region was formed with Allen Morgan as its first regional manager, Spruitjies du Preez as Assistant Regional Manager, Les Carlo as the first Engineering Manager, Peter Craig as the Distribution Manager, Ken Skinner as the Financial manager, Willie Erasmus as the Services Manager, Joepie Joubert as the Human Resources Manager, Wally Thurgood as the Marketing Manager and Phanus Zondag as the Commercial Manager. The first regional offices were located in the Bankovs building in Maitland Street, Bloemfontein, and later in the Masterbond building in Elizabeth Street. The Engineering department's offices were located in Zastron Street until 1990.


Allen Morgan

The process of closing down Taaibos and Highveld power stations began in 1986. Over a period of two years, the stations were "mothballed". This means that they were placed in reserved storage and could be brought back into service if necessary.



1987 marked a memorable year for Escom when it was renamed "Eskom". During this same year, actions were put into place to develop the Free State Region's Telecommunication and Control Centre infrastructure. The first temporary Control Centre was located at Alma substation until 1988 and could only handle 11kV and 22kV distribution lines. Ted Nissan was at the head of the Control Centre. In 1989 the first permanent Control Centre for the Free State was developed at Harvard Substation. Network Services was then formed as a separate department under the leadership of manager Phil Myburgh.

In 1988 Allen Morgan moved to head office where he first became Divisional Manager, then Assistant GM and Executive Director: Marketing and Electrification, and later Executive Director: Distribution and Electrification. In 1992 he became a member of Eskom's board and in 1994 he did the Free State proud by becoming Eskom's Chief Executive. Johann Geldenhuys took over the reins of Free State Regional Manager in 1988. Peter Craig was appointed as Deputy Regional Manager.

A delay at Cahora Bassa and Koeberg in the early 80s as well as the poor performance of new coal-fired stations necessitated Escom to build more power stations in a hurry. To speed up the process, two new stations were built that were clones of Matla and Duvha. Lethabo power station at Viljoensdrift between Vereeniging and Sasolburg was built as a clone of Matla. Lethabo (the Tswana word for "prosperity and happiness" – the results of using electricity) was first commissioned in 1985 and completed in 1990. The station was built near the coalfield that later became the Cornelia Collieries. During the initial operations, only six or seven per cent of the total reserves were extracted leaving enough coal to supply Lethabo for 40 years. The problem of water supplies were alleviated by the Drakensberg Pumped Storage Scheme and Lethabo was allowed to draw water

from the Vaal. The station stuck to the tried and tested wet cooling technology because of the low price of the coal and other cost considerations. Lethabo consists of six boilers each housed in a building as high as 35 storeys. The station daily burns approximately 50 000 tonnes of low grade coal and comprises six 618 MW generating sets for a total installed capacity of 3 708 MW. At 164 m, the cooling towers are as high as a 54 story office block. The two chimneys are both 275 m high.

Lethabo Power Station

The visitor centre at Lethabo Power Station

Lethabo Power Station

Eskom Centre, the current Free State head office was built at the beginning of the 90's and with this also came the current Control Centre.

The Transmission Group was established in 1991. At this stage Natal and the Free State were grouped together as the Natal and Orange Free State Area (NOFS). The Free State Transmission section also included the Northern Transmission network from Boundary Substation to Garona. Colin Cameron was the first Area Manager and Ronnie Millet-Clay was the first Section Manager of the Free State section of the NOFS.

More changes came along in 1993 when Eskom restructured in order to improve service delivery to its customers. The Northern Cape Region was amalgamated with the Free State Region and the Bloemfontein Distributor was formed with Hennie Oosthuizen as Distributor Manager, William de Villiers as Engineering Manager and Johann Geldenhuys as Sales and Customer Services Manager (Free State).

A decrease in the demand for electricity due to a decline in industrial and mining activities led to the decision being made in 1994 to dispose of Taaibos and Highveld power stations. After unsuccessful attempts to sell the station and taking operating and maintenance costs into consideration, it was decided that these stations were no longer viable as operating power stations.

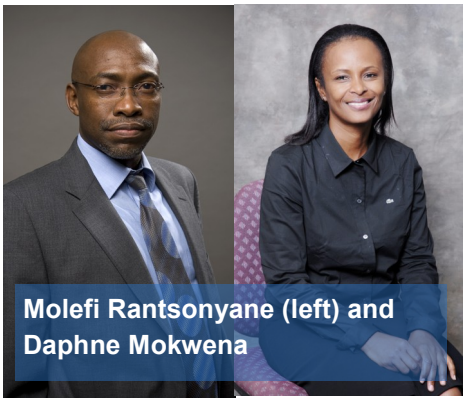
In 1997 Eskom restructured again. The North Western Region was formed with its head office in Bloemfontein. This region incorporated parts of the Northern Cape, North West and Ekurhuleni in Gauteng. Peter Craig was the Regional Engineering Manager and MK (Kenneth) Mohlala was the Regional Customer Services Manager. He was later followed by Percy Sechemane. After leaving Eskom, MK Mohlala became the head of City Power in Johannesburg. When Peter Craig left the Free State, he became the General Manager of the Southern Region. He is currently a General Manager in the Office of the Distribution Group Executive. Percy Sechemane moved to the Western Cape where he became a RED Manager. He later became the Chief Executive Officer of Rand Water.

The Transmission Group was also changed during reorganisation in 1999 and the Free State was established as a separate Transmission Grid. This included the whole Free State as well as the Northern Cape and parts of the North West Transmission network. Johan Harmse was the first Grid Manager. In 2006, he was followed by Sifiso Mazibuko and in 2009 by Alison Maseko.


**A geographical representation of the six Eskom regions**

After joining Eskom in 1990, Louis Maleka became the General Manager of the North Western Region in 2004 with Sydney Makaleng as Regional Engineering Manager and Ayanda Nakedi as Regional Sales and Customer Services Manager. Louis's vision for the future was to see the North Western Region become a power to be reckoned with within the REDs (Regional Electricity Distributors). When he left the Region in 2009, he became the General Manager of the Northern Region. He later acted as the Divisional Manager for Distribution before he became Senior General Manager in the office of the Distribution Group Executive. Louis was followed up by Alwie Lester who started as General Manager of the North Western Region in May 2009. When Alwie handed over the reins to Peter Sebola in 2011, Alwie became the General Manager of the Western Region and then of the Western Cape Operating Unit.

Another big change came about in 2011 when the six Distribution regions were split into nine Operating Units largely following the provincial borders. The North Western Region was split up and the Free State Operating Unit (FSOU) was formed with Lindi Mthombeni as General Manager. The former General Manager Peter Sebola moved on to become the General Manager of the newly established Gauteng Operating Unit. Molefi Rantsonyane was appointed as the FSOU's Operations and Maintenance Manager and Daphne Mokwena as Asset Creations Manager in 2012.

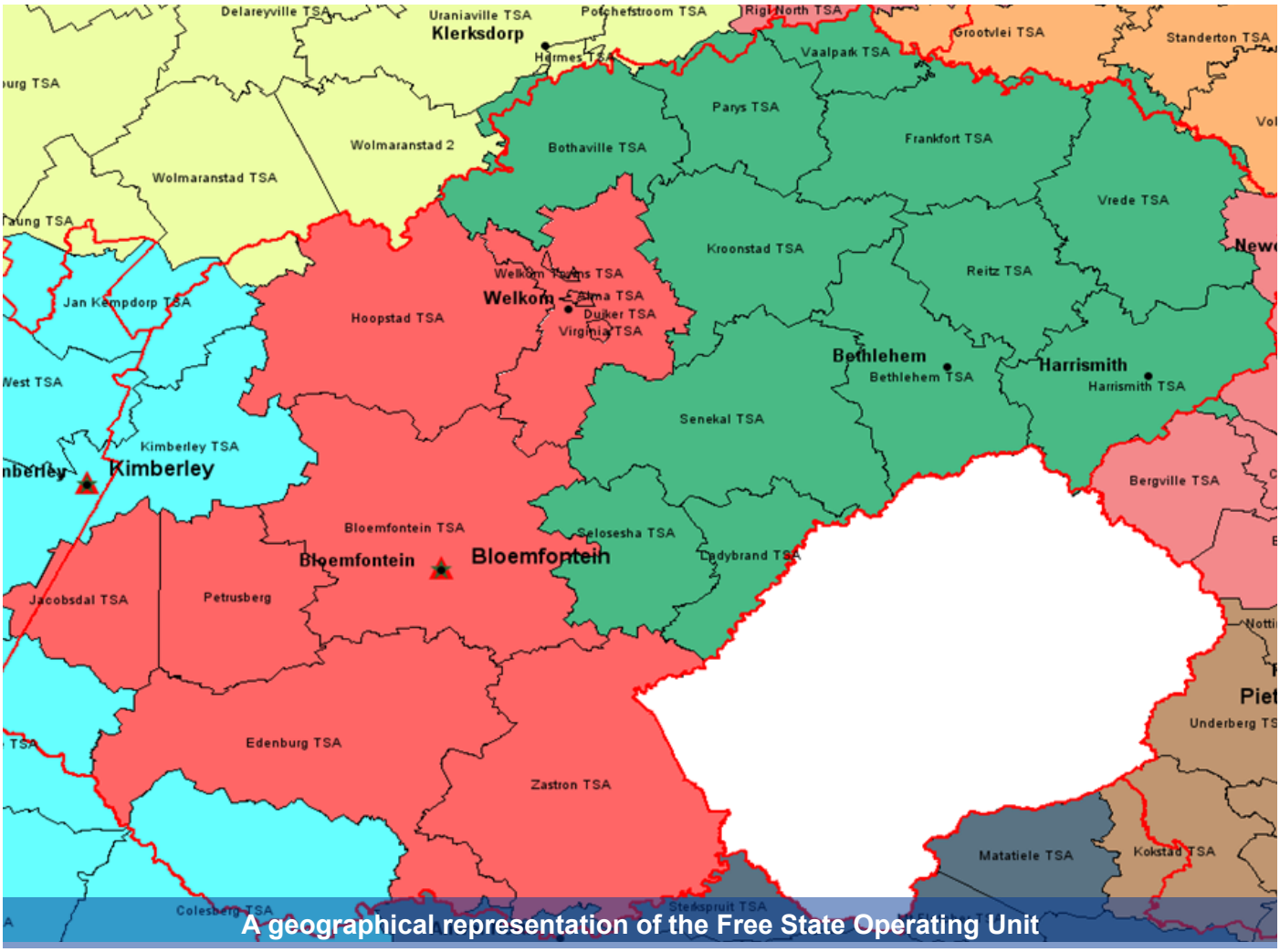


Molefi Rantsonyane (left) and Daphne Mokwena

**Present days in the Free State Operating Unit**

Today electricity use in the Free State totals 4.65% of national demand which comes down to 1 719 MW. 44 480 km of lines, 11 transmission substations and 284 distribution substations are spread across the Province. Eskom in the Free State has a customer base of 233 115 with 91.04% being residential, 0.09% being municipal and 8.87% being industrial, mining, commercial and agricultural customers.

The Free State Operating Unit (FSOU) is divided into two zones, namely the Bloemfontein and Bethlehem Zones. These zones are divided into four sectors forming the Bloemfontein, Bethlehem, Kroonstad and Welkom Sectors.




A geographical representation of the Free State Operating Unit

The FSOU has revenue of R3.4 billion which is divided as follows: municipalities 35%, agriculture 9%, residential 5%, mining 42%, commercial 4%, industrial 2% and other 3%. 808 staff members are employed in Generation, 1 555 in Distribution and 104 in Transmission.

The 2010/2011 financial year saw capital expansion and refurbishment to the value of R200 million being done on the Distribution network and 1.498 billion on the Transmission network with a planned spending of respectively R1.08 billion and R1.498 billion envisaged for the five years to follow.

Future investments in the Transmission network include the strengthening of the Greater Cape and Bloemfontein network as well as the Cape network and the strengthening of the Bloemfontein network and support of the growing loads in the Lesotho network.

From inception to date, 194 602 household connections have been made, further lighting up the Free State province.

Since January 2010, the Eskom Development Foundation (EDF) has invested over R2.4 million in the Free State in various causes. Amongst others, beneficiaries included schools, the Red Cross (in aid of the Meqheleng tornado victims), FET colleges and small businesses.

The FSOU faces some challenges. This includes residential energy losses ranging from 19% to 31% in townships as well as vandalism and theft. These issues are being addressed by Operation Khanyisa and Revenue Protection audits. Municipal debt, normalisation of the networks and upgrading of prepayment technology also pose great challenges. Adverse weather conditions such as tornados striking the province in 2011 and 2012 as well as snow fall, have caused great damage but the dedication and hard work of staff contributed to the swift restoration of electricity to affected areas.

**Snowfall in the Eastern Free State during August 2012**

**Damage to infrastructure caused by a tornado in Tholong in June 2012.**

South Africa's power system is still constraint and will be tight until the construction of the new power stations Medupi, Kusile and Ingula have been completed.

2008 saw a tough year for Eskom when it was forced to implement load shedding due to national demand reaching levels higher than Eskom's supply. To prevent this from happening again, The Demand Side Management (DSM) programme was introduced to induce cost savings. In the Free State, 2.1 million Compact Fluorescent Light Bulbs (CFLs), 14 684 solar water geysers and 24 897 ripple control units were installed from 2007 to date. In 2010/11 a total of R128 million was invested in the DSM programme. More energy efficiency project rollouts and rebate programmes have followed and are still continuing. Successful geyser load management projects were implemented in the Mangaung Metro as well as the Southern Free State towns where Centlec has Service Delivery Agreements with these municipalities, resulting in significant savings. Projects in Maluti-A-Phofung and Setsoto municipalities are currently completing implementation and savings achieved are being verified. In the industrial sector, efficient motors, air conditioning and heat pumps are some of the initiatives being undertaken at the mines in the Welkom area. Projects are currently in implementation at Goldfields, Harmony and Anglo Gold Ashanti.

The Integrated Resource Plan (IRP) for electricity published in March 2011 made provision for Independent Power Producers (IPPs) to supply renewable energy to be pumped into the National Grid. As part of this programme, a solar photovoltaic power plant with a net capacity of 64 MW will be built in the Bloemfontein area.

In November 2011, Lethabo Power Station made its contribution towards energy efficiency when it launched a photovoltaic power plant with a peaking capacity of 575 kW and a yearly production potential of 1.25 million kWh. The project was inaugurated by Public Enterprises Minister Malusi

Gigaba on the 21st of November. The plant provides power during daylight hours for Lethabo's administration buildings and reduces the facility's auxiliary power consumption.

The first privately owned commercial hydropower project undertaken in South Africa in 22 years was launched when Bethlehem hydro commissioned its Sol Plaatje (2.5 MW) and Merino (3.6 MW) power stations in July/August 2009 and April 2010 respectively. The project generates approximately 6.1 MW of renewable energy from the continuous flow transferred from the Lesotho Mountains into the Ash River as part of the Lesotho Highlands Water Project. This electricity is then sold to Eskom and the Dihlabeng Municipality.

By 2013 Sasol in Sasolburg plans to provide itself with 60% of the electricity it uses. Construction of the 140 MW gas power station of R1.8 billion started in June 2011 and should be completed by end 2012. This will replace coal electricity generation and will reduce carbon emissions in Sasolburg by 1 million ton per year.

**3.6 MW Merino Power Station**

**Sol Plaatje Power Station intake basin sluice-gates**

**Sasol's manufacturing plant in Sasolburg**

**The way forward: Our vision**

**As seen through the eyes of the GM, Lindi Mthombeni**


When the Free State Operating Unit was established in 2011, I made it my mission to establishing a Free State family where employees look out for each other and where they feel safe. Our staff members' families entrust us with their lives and their livelihood. We have a great responsibility towards them.

This is how I see the Free State Operate Unit:

- I envision an Operating Unit where no employee, member of the public or part of the environment is harmed in any way after dealing with Eskom.
- I envision an Operating Unit where no customer is unsure about the reliability of supply to his/her home or business.
- I envision an Operating Unit where customers are satisfied with the value they receive for their money.
- I envision an Operating Unit where all employees are treated fairly and justly.
- I envision an Operating Unit where pensioners can look back fondly at their years spent at Eskom while retiring in peace and comfort.
- I envision an Operating Unit where everyone has access to electricity.

Maybe all of this won't happen in my years in the FSOU but I can certainly contribute a few of the bricks needed to build the heritage that those to come will look back on and write about. I am privileged to work with a highly skilled, highly experienced and committed team who share my vision and with whom I can entrust my goals for our Free State Operating Unit. The past 90 years have been known for both highlights and lowlights but overall the history is a positive one. Let us make the next 90 years even better!